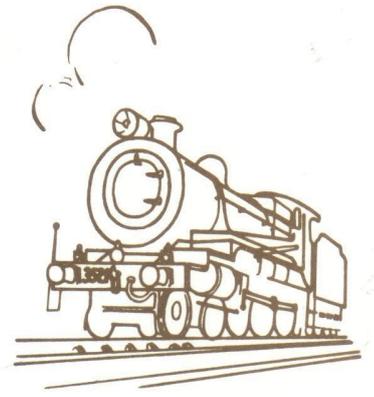


Sydney Live Steam Locomotive Society

Anthony Road, West Ryde, N.S.W.

'Newsletter'

Volume 48. No. 3.
August 2020



Arthur's recent acquisition is a PLM French Class 241C 4-8-2 built by the late Helmet Ecker of ILS. It is an unusual model and most impressive and very French. Arthur is in the groove with his beret and large striped shirt!

Editorial

"The times they are a changing", written and performed by Bob Dylan in the mid 1960's reflected the changes that were underway at the time. The song has been covered by many noted performers since then and is very appropriate at the present time.

It is August 2020 and we have only enjoyed two public running days so far for the year. With the limitations that were imposed by the initial lockdown a limited number of members were able to keep up the maintenance on our grounds to keep things looking reasonable. With the easing of numbers of people able to gather we were able to hold a members day, enjoy some train running and a BBQ lunch. While it was necessary to book in and record our presence for tracking if needed it was a step back to normality. Since then we have had good attendances, getting on with the improvements of our facilities. By the time you are reading this we will have all the concrete piers cast for the next stage of elevated track replacement. The western retaining wall will have been extended further south from its starting point and more sections of ground level track panels will have been re-sleepered. As well other projects are in early stages of preparation.

Many of us have been able to make good use of our time in isolation with catching up on model engineering activities and we see examples of this in the pages of this Newsletter. For my part I feel that we are fortunate that we, at least, have something to do as many others have had their work and leisure time completely disrupted. We do not know where things are headed and how long it may take to return to life as we took for granted. Follow the rules and stay safe and make the best of how things are!

John Lyons

Fill in Editor.



through his profession as a lecturer in the Graphic Arts faculty of the Sydney Technical College knew many of the staff of the museum at the time. On some visits if things were not too busy we would be escorted past the Cobb and Co coach and out a door to the College grounds. The main purpose of this was to visit the building where NSW Railways No. 1 locomotive was stored along with the Bolton and Watt beam engine. At such a young age I did not fully appreciate the historical significance of the beam engine. Outside the museum building there were, on display some

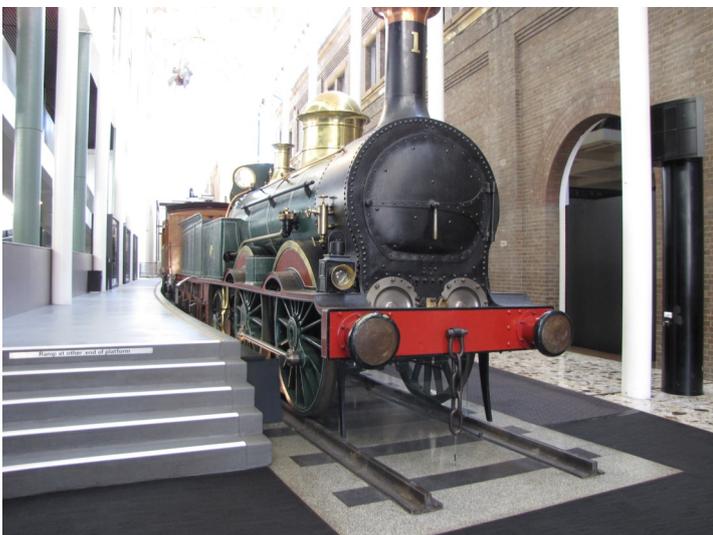
A letter from John Lyons, fill in Editor, to Mr. Mark Taylor MP, Member for Seven Hills. The Powerhouse Museum.

I was NEVER in favour of the once proposed move of the Powerhouse Museum to Parramatta!
 I agree that Parramatta deserves a Museum in its own right but not at the expense of the existing museum at Ultimo.
 As a child I was very fortunate to have many visits to the Museum when it was back along Harris St. with the Sydney Technical College. I was always happy to see the models of all sorts of engineering, stationary steam engines, miniature locomotives, aircraft and ships. The sectioned automotive chassis helped explain the workings of the internal combustion engine. Watching the operation and hearing the details of the Strasburg Clock was fascinating and then turning around to view the large glass display cabinet of antique fire arms was equally interesting. Then there was the Planetarium showing the wonders of the night sky. My grandfather,

test components dating back to the time of the Sydney Harbor Bridge construction. These components were fabricated beams that had been tested to destruction as part of the testing of design principles for the bridge construction. As well there were a series of photographs showing various stages of the construction of the bridge. I hope these test beams are still in the museum collection. I have not seen them in storage at the Discovery Centre at Castle Hill but hopefully they are hidden inside one of the many storage buildings.
 Seeing the great examples of model engineering at an early age helped me develop an interest in model engineering to this present day. I was able to introduce this into my Industrial Arts teaching career as many of my Metal Technics students completed working model steam engines. A lot of these students gained great satisfaction seeing their models come to life and operate and took the engines as examples of their work to job interviews.

When the concept of “The Powerhouse Museum” was first announced and the initial opening in the old Tram Shed and then the move to the present site I was very impressed with the potential that this had. Part of the appeal was seeing the columns, gantries and travelling crane mechanism reflecting the industrial past of the site. My children enjoyed visits and in turn their children have likewise enjoyed the experience a number of times.

I did begin to be concerned when the travelling Exhibitions started taking up space at the expense of other items on display. Harry Potter, Star Wars, fashion designers, and then the second Star Wars exhibition that I believe lost \$750,000, and many others. The Museum was beginning to be treated as a museum of social history. Some of the statements that were published after the move was announced were, I feel, misleading. The Editorial of the Daily Telegraph Wednesday April 18 2018 paints a very bleak picture of the building itself and ends with, to quote, “You get the picture. The



Members Projects



Powerhouse Museum is no longer a fixer-upper. Matters have moved beyond that point. Just as well, then, that the Parramatta move is planned." I think that we all have seen enough of the many Restoration programs that have run on TV to know that if there is a will to do something it can be done.

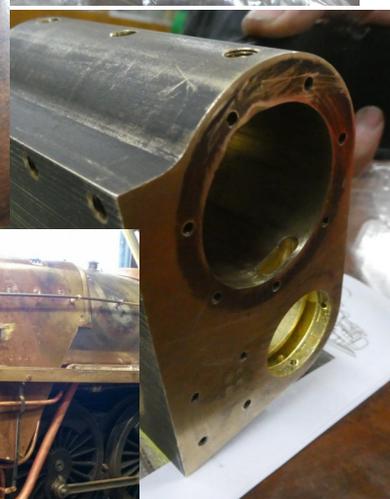
In the Sydney Morning Herald of Friday November 9 2018 Linda Morris introduces the new director Lisa Havilah. In the introduction Linda Morris writes "One of her first priorities is building and developing programs that connect the museum's 500,000 item collection with socially and culturally diverse communities across western Sydney, particularly Indian, Pacific Islander and Indigenous communities." To my thinking this seems to be setting out to create a Museum of Australian Social History at the expense of a museum of Technology - Applied Arts and Science.

In Sydney we have the Art Gallery of NSW, the Museum of Contemporary Art, the Australian Museum (Natural History), a Maritime Museum and the Powerhouse Museum. A Museum of Social History is something that is needed but not at the expense of an existing established Museum.

Parramatta is the ideal location for such an undertaking, although, not at the expense of some of the city's historic buildings.

A good development some years back was the establishment of the Discovery Centre at Castle Hill. The first exhibition space was excellent and then when the area for display was increased it was much more interesting. It is sad now that public access is so limited. It made me feel that it was a museum of what a good museum should be. Lots of displayed items with good lighting and descriptions. The one thing on the down side was to sit and watch the video projected on a wall showing many of the other treasures in the collection. Knowing how close they were and not having access to see them was disappointing.

I would like to see the Ultimo Powerhouse Museum returned to how it was and that Parramatta could be the location of a Museum that covers the social history of New South Wales and Australia.



Members Projects from the top:

1. Johns Lyons', 20 class driving wheel set.
2. Neal Bates' buffers for his diesel shunter.
3. John Lyons split axle box for the driving axle.
4. Crosshead for Tony Kidson's BR Class 4 made by Paul Brotchie,
5. and the cylinders with enlarged ports also by Paul.
6. Brake gear for Ken Baker's N & W J class.
7. Exhaust steam injector pipework on Warwick Allison's Britannia.

Speedy Boiler Progress James Sanders

Over the 14/15 July Geoff Hague came to the Sanders' residence in Yeoval to do some work on his LBSC Speedy boiler. On the 14th we were able to join the barrel to the outer firebox, plus the tubes were silver soldered into the inner firebox. After clean up and inspection we had to do reheats due to silver solder missing where it should have gone, despite having carefully placed rings or strips in the respective places. The reheats were successful and the desired results were achieved, backed up by another close inspection following pickle and clean up.



Geoff had already drilled holes for stays prior to assembly of the two wrappers, which assisted with us getting to the stage of joining the inner and outer together on the 15th, with the foundation ring sealing the deal. During the same heat we did the crown stays. Rings were placed around the stays and the job was baked. To assist with securing the inner and outer together to join the foundation ring we made some 7ba screws from copper rivets and made some nuts from some phosphor bronze hex that I had picked up at a deceased estate some time ago. This made tightening up the joint very easy, much easier to tighten a screw rather than bash a rivet in a confined space like the inner firebox!

All of the silver soldering on these two days was done with two propane "flamethrowers". There is still a bit to do, however Geoff went home happy with progress and a road map of what can be done prior to our next boiler cook up session .





The B2s Injector.

Warwick Allison

I had the opportunity to acquire an LNER 4-6-0 B2 locomotive, which only needed a small amount of work plus a repaint to get running..



When the B2 was acquired, it was fitted with an unusual injector and some particularly odd plumbing. The locomotive had had a fire in it, but it could never had held pressure due to a defect in assembly of a longitudinal stay. In the subsequent rebuilding, the peculiar injector arrangements were removed and a standard commercial injector installed. The plumbing also had to be redone mostly because the nipples had been soft soldered and the plentiful supply of soft solder had also blocked the pipes! There was evidence that the fine craftsmanship on the locomotive itself had been added to by some fairly ordinary work which appeared to be an attempt to correct some damage that had occurred

The injector was mounted above the running board snuggled in behind the reversing rod, the rear splasher and the cab, as is evident in the picture in its original

Below is the injector and its convoluted plumbing.



Diary

Ever hopeful, these dates are tentative and subject to confirmation with Government restrictions and advice from the Board.

- 29 August Central Coast Steam Co-op Interclub
- 18-20 September Blowfly & Sweet Pea muster Illawarra Live Steamers/
- 19 September Public Running Day
- 17 October Public Running Day
- 31 October- 1 November Small Gauge Festival
- 21 November Public Running Day
- 5 December SLSLS Christmas Party
- 19 December Public Running Day
- 31 December (Thursday) New Years Eve

Please see AME for other events.

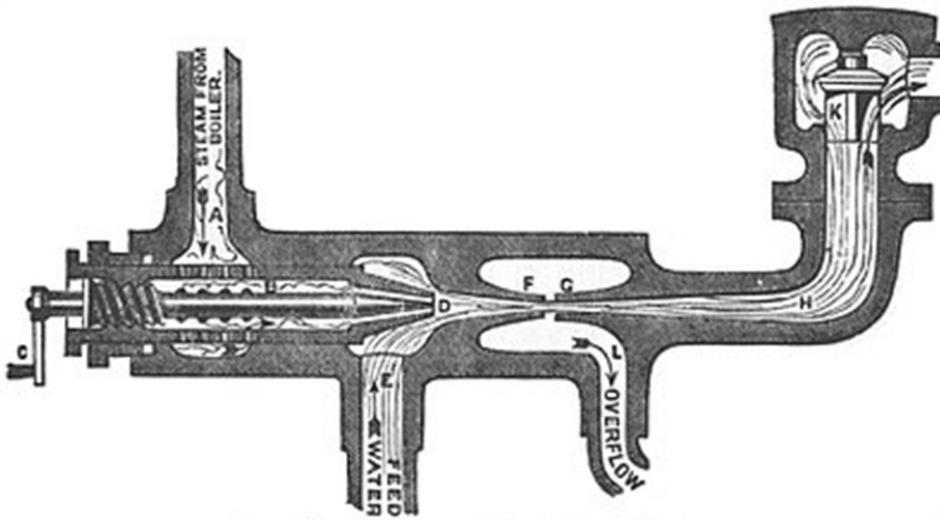


FIG. 6.— Section of Giffard's Injector.

To start it requires a good flow of water and a very gentle, slow opening of the steam to ensure the volume of steam present is fully condensed in order to start the stream. Opening the steam too quickly will result in steam not becoming condensed and blow back down the water line. Once the stream is established the steam valve may be opened fully. It works very well and such an injector would be considerably easier to make than a fully automatic lifting type, but unlikely to be particularly reliable in a

condition.

Andrew dismantled the injector and its essential characteristics are noted in the picture. It has only a single combining cone. It does not lift water so its original positioning on the B2 above the running board would never have worked. It did work on test however and delivered a fairly fast stream of water as the cones sizes would imply.

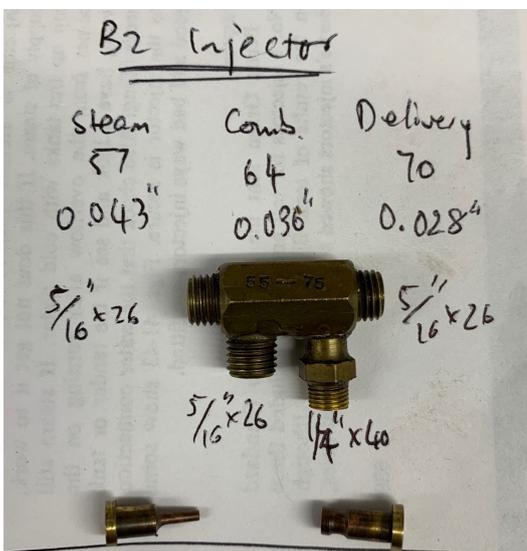
It is not known if this is a commercial injector or built by a studious model engineer. Interestingly I have never seen a design for an injector of this type. Andrew explains: The injector is essentially exactly the same as Giffard's original injector. There were commercial injectors of this type available commercially under the brand name 'Cert' - these are sometime referred to by LBSC in his writings as well as by Keiller. These are not automatic (i.e. they require careful regulation of steam and water to start, and cannot restart automatically) and cannot lift.

The 55-75 is the dry range. This was confirmed on test.

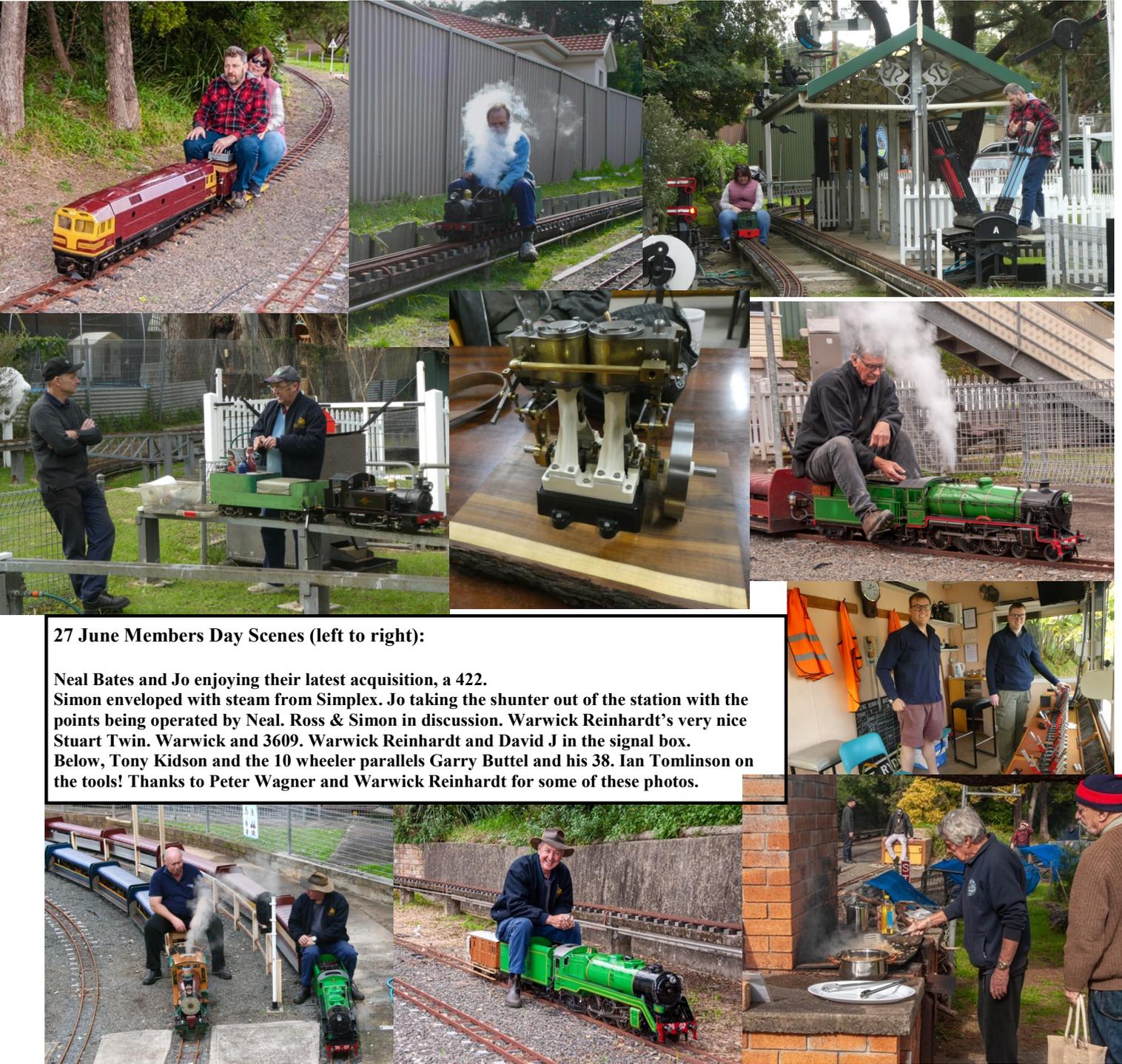
dynamic situation where there may be disruptions to water supply and starting cannot be afforded full attention.



Above: A close up of the injector. Below, the B2 as it was restored. It is a startling performer!



Members Day Pictures



27 June Members Day Scenes (left to right):

Neal Bates and Jo enjoying their latest acquisition, a 422.
 Simon enveloped with steam from Simplex. Jo taking the shunter out of the station with the points being operated by Neal. Ross & Simon in discussion. Warwick Reinhardt's very nice Stuart Twin. Warwick and 3609. Warwick Reinhardt and David J in the signal box.
 Below, Tony Kidson and the 10 wheeler parallels Garry Buttell and his 38. Ian Tomlinson on the tools! Thanks to Peter Wagner and Warwick Reinhardt for some of these photos.



Duty Roster.

September: Ross Bishop / Neal Bates, Tony Eyre, Jo-Anne Topp, Ray Lee, Peter Wagner, Paul Taffa, John Tulloch, Zac Lee, Nick Kane.

October: Mick Murray, Andrew Allison, Mark Gibbons, Wayne Fletcher, Graeme Kirkby, John Noller, Ian Tomlinson, Glenn Scott, Bruce Hartwell.

November: Evan Lister, Simon Collier, Garry Buttell, Barry Millner, Scott Murray, Graham Tindale, Paul Brotchie, Mike Dumble, Deven Shirke

December: David Thomas. Bernard Courtenay, Greg Croudace. Stuart Larkin. Lionel Pascoe. Shaun Sorensen. David Lee. Brad Wilkinson. Geoff Hague. Martin Dewhurst

Gate Roster and Track Superintendents To be advised when running recommences.

Around the



Grounds!



Around the Grounds!

From top left and counter clockwise:

1. Mixing concrete to form 3 more new elevated track piers.
2. Mike machining a splice piece for a fence post repair.
3. Evans' line of locos for testing.
4. Mike watches Andrew install the fence post splice piece.
5. Craig and Paul attending to track refurbishment.
6. David cleaning a smokebox-what boiler inspectors have to do!
7. The ground level turntable repair.
8. Graeme and Barry cleaning up leaves (there were plenty!)
9. Mick's battery loco and train entertaining Cameron.
10. David and Andrew observing a steam test on Warwick's Ayesha.
11. Mike replacing lamps on the banner signal.
12. John replacing the carriage shed fan.
13. David testing a marine boiler for a potential member.
14. John cleaning up!
- 15: Neal and his new 422.





Sydney Live Steam Locomotive Society Co-Op Ltd.

Chairman's Report-2019/2020

COVID-19 and SLCLS

As we are all very much aware, the COVID-19 pandemic has, and is having, a significant effect on our lives and activities with our Public Running Days, our regular Saturday maintenance and improvement activities, and our face to face meetings, being cancelled in accordance with Government and Council requirements.



In mid-April we received from Council an agreement that we can have limited access to the Grounds to perform essential or necessary maintenance. Whilst not ideal, this arrangement has allowed us to perform security inspections, do some mowing, attend to the gardens, and keep the weeds under control, in anticipation of a relaxation of the "stay at home" rules.

The decision to close the Grounds, coming on top of our Running Day cancellations, was not an easy one, but given the Government directives, one that had to be taken for the good of the community, and in particular our Members, Friends and their families.



As I write this, there are some signs of the "stay at home" restrictions being gradually eased. Easing of the restrictions, though, comes with the risk of a future spike in COVID-19 infections, and re-tightening of the restrictions.

Hopefully, we will be able to resume our Saturday maintenance and improvement activities sooner, rather than later. This would require us to comply with any requirements of the Government and Council related to gatherings and use of facilities.



What is clear, though, is that resumption of our Running Days will be very much dependent on the lifting of restrictions on large outdoor gatherings and on social distancing.

Our planned President's Breakfast, AGM and SGM scheduled for 30 May will not take place as planned.

The AGM will be held with Members not physically present. Voting will be by proxy, and with questions being submitted in writing, with answers provided in the Minutes.



The President's Breakfast and SGM will be re-scheduled to a date to be determined.

On behalf of myself and the Directors, our best regards to you and your loved ones during the COVID-19 shutdowns, and a special thank you for your ongoing support in a difficult time.

Running Days & Events

Passenger figures for the year to the end of April totalled 16,794 compared to 23,220 for the previous year and 30,151 the year before. There were three (3) lost days in the last twelve months, one (1) due to a Catastrophic fire restriction and two (2) due to COVID-19 restrictions. Additionally, the January 2020 Running Day numbers were extremely low due the wet conditions on the day.



Our annual injury rate is currently 0.012%, with the long-term average since 1994 being 0.017%. Unfortunately, we had 5 injuries in July 2019 along with a couple of near misses. These incidents reinforce the need for ongoing vigilance in identifying and pre-empting situations that would cause derailments or passengers falling off. In this regard, the warning to passengers before train departure is one of our key

controls and will be amended to address the use of cameras while the train is moving.

Our charity day for RedKite last November had 1604 rides, which was down about 400 from 2018.

The Society's special events for members and friends, the Presidents Breakfast in June, the Family day in September, the Christmas Party, and our March members' day were all very pleasant affairs, with reasonable numbers attending.

We also had our annual West Ryde Community Centre function in December and our Small Gauges Weekend in November.

Financial Results

John Hurst has again done a professional job as our Treasurer during the year. The end of year figures showed a decrease in our reserves of around \$8,000 which reflects the Running Day results and our spending on capital projects during the year. As well John has led our dealing with council regarding our lease renewal, which is edging closer. Having sound financial management is an immense benefit for us and we owe John another vote of thanks for this. Thank you John,

Our Membership

We ended the year with 66 members (including country and provisional members) a reduction of two during the year.

Alan Mackellar, Foundation Member, model engineer and Life Member of the Sydney Live Steam Locomotive Society passed away on Monday 4 November aged 98. Alan was involved with the society from its very beginning; it was a major part of his long life. A lot of the early locomotives in the society had boilers built or partly built by Alan. He often had little bits of advice as how something could be done that just made the task easier.

The regular Saturday email has continued and is good up to date information for supporters of the Society as well as members. Thanks to David Judex and Warwick who are our regular correspondents to others who have assisted when David and Warwick were not available.

We have continued to have good coverage in AME, and Model Engineer, from articles by Members, reports of club activities and photos from our newsletters. Thank you to John Lyons and Warwick Allison who have produced our excellent Newsletters this year. Thank you also to John Lyons who has arranged the printing and Jo who sends them to other clubs. Thank you to our signallers, Mark, Barry, Steve, Martin and Deven, and to our Track Superintendents, David Lee, Steve Border, David Thomas and Neal Bates.

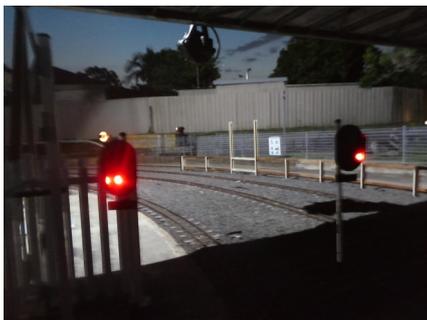
I again performed our formal amusement device inspection which is a requirement for the Code of Practice and shows due diligence on our part in keeping the operation safe.

In the kiosk, we are grateful for the assistance of Liz, Di, Joy, Margo, and Gai and others who help from time to time. Ticket selling was principally handled by Peter Wagner. Thanks also to our Gatekeepers who are the public face of the Society on Running Days.

Thanks as always to Andrew Allison, Bernie Courtenay, David Thomas, Brian Kilgour and Ken Baker who handle our boiler inspections and maintain our boiler records. There were no boiler incidents at the club during the year, which is what we like to see.

David Thomas continues to weave his green magic with our gardens and grounds which provide a very pleasant venue for our visitors and members. A special thanks





to Sheila Dewhurst who has continued to care for and develop the clubhouse garden and to Simon who tends the Ticket Office garden.

Mark Gibbons and Martin Dewhurst continue maintenance on the point motors while bogie maintenance is usually done by myself. Thanks also to our librarian Peter Wagner who organises our collection of magazines and books. Tony Kidson looks after our lawnmowers and powered equipment, again a never-ending job, thank you Tony.

Secretary Jo has spent many hours during the year handling our correspondence, records, and the general workings of the Society. Thank you, Jo.



Many thank you also to the many other members and friends who assist as guards, stationmasters, drivers, and who help to maintain and improve the grounds. Much behind the scenes work is performed by the Directors in the management of Society activities and planning for the future. Thank you to John, Jo, Evan, Neal, Ross and David.

Projects

This year we have seen important progress on some of our key projects.

The level crossing audible warning has been activated and cabling has been installed for an additional signal near the south west corner of the Clubhouse. Planning for Stage 2 of the project covering the automatic signals and CCTV camera power supply has been substantially completed. Thank you to David Lee and Peter Wagner who have spear-headed this work, and to the others who have assisted from time to time.

Renewal of the western retaining wall has progressed with several panels being completed and steelwork for the remaining panels is on hand. The planned purchase of a petrol post hole digger did not progress as it was found more effective to hire a heavy-duty digger as required. Thank you to Neal and Jo who have taken the lead with this work which is a key enabler to the Elevated upgrade project.



Following engineering verification of the design of the new elevated track structure by Dr Allan Wallace, the construction of the trial section of around 20 metres was completed and placed in service. The ride over this section is very much improved. Casting of supports for the next section of around 30 metres is under way, and the required steel for the beams and tracks is on hand. Thank you to all the team who have contributed to the work so far, and to Andrew who is project managing the task.

Bernie and Mike done a great job in painting our signalling equipment with much of the work now being completed. The signals are looking very spick and span.



Ongoing work has been performed on sleeper replacement on the ground level track to address corrosion, particularly in those areas affected by leaf fall. On many weeks, a panel of track is lifted and re-sleepered by Paul Brotchie, Tony Kidson and Peter Dunn.

Following some incidents in July 2019, we have implemented improvements including a “soft fall” cover on the drainage grate, improved safety signage and an updated CCTV system. Many other smaller projects have also been completed during the year.

Thank you to everyone who has contributed not only to projects but also grounds maintenance throughout the year, and I encourage members to involve themselves in the upcoming projects for 2020/21.

Model Engineering Activities

As has been the case in the past, we regularly see member’s progress on their Model Engineering projects.



David Judex's prize winning HG guard's van was completed; David Thomas has made significant progress on his 620 class; Warwick is working with Andrew to construct a set of NCL cars. Warwick is also progressing his Britannia and Andrew has completed his Austere Ada and a number of G scale items.

Paul Brothchie regularly shows more parts for his O class; John Lyons his Avonside; Bill Perrin his Isle of Mann; and Geoff Hague his Speedy; Mark is nearing completion of his Blowfly.

James Sanders has completed a Sydney Tram Motor; Scott Murray has started a VR Na class, and I have continued work on my Hunslet. Not to be outdone by all the locomotive and rolling stock work, Ross Bishop and Jim Mulholland continue along the path to completion of their Fowler ploughing engines.

There is no doubt that Model Engineering continues to remain alive and well at SLSLS!

AALS & AMBSC & Other Visits

Unfortunately, this year's Convention and the Hot Pot Run were cancelled due to the COVID-19 restrictions and many other regular events have also been cancelled.

Our planned Small Gauges Festival at the end of October may also be affected by the restrictions. The situation will be monitored to determine if the Festival can go ahead.

Prior to the restrictions Members also attended other clubs Interclub and Invitation days as is the usual practice.

Our Future

Yet another year has passed, and we still do not have a lease, however it is finally getting closer with our comments on Council's draft being submitted.

Council's proposed 10 year lease with a 5 year option will give us the security of tenure to plan and implement some more of the projects we have been talking about for so long.

The drop off in patronage since the 2018 fee increases has continued, with more comfortable crowds each month and a more relaxed afternoon's enjoyment for our Members. Fortunately, the higher fees implemented in 2108 have meant our revenue has been sustained.

Like many organisations, our cashflow is currently being severely impacted by the curtailment of our regular income generating activities. Fortunately, we have some financial reserves that will allow us to cover our recurring costs and to continue with our improvement and maintenance works for the near future. A longer-term continuation of the COVID-19 restrictions will necessitate a review of our expenditure plans.

Our offering at SLSLS is unique, in providing a service to our visitors; in showcasing the days of steam; and in progressing the hobby of model engineering.

It is hoped that activities and fellowship the Society provides will continue to benefit and encourage not only our current, but also our future membership.

We have taken some small steps in broadening our membership catchment, but I would also encourage members to promote the Society to those who might like to join us.

On behalf of myself and the Directors, I thank each, and every, one of you for your confidence and support during the past year, and as we all collectively take the Society forward during the 2020/21 and beyond.

Thank You.

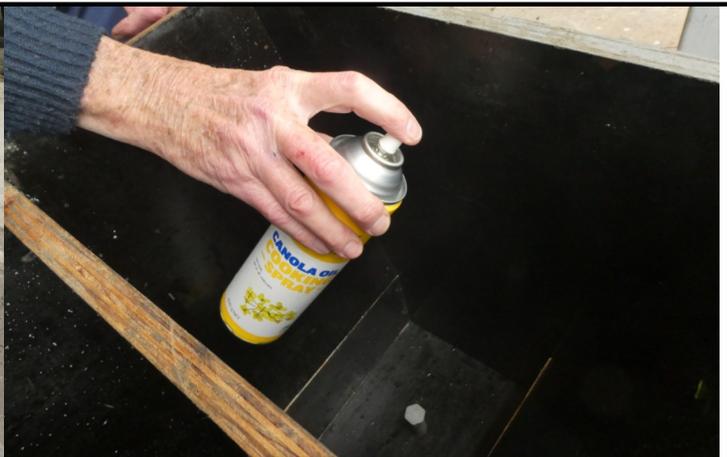
Michael Murray 12 May 2020



How to Make a New Elevated Track Plinth



Left above: The moulds have been cleaned from the previous pour and the threaded insert has been installed. Right: The support timbers are readied and levelled by using wedges (the ground slopes!) The moulds need to be off the ground to clear the bolt head holding the threaded insert.
Below left: The moulds are placed together and then clamped together. Right: We use cheap and plentiful Canola Oil sprayed on to prevent the concrete sticking!

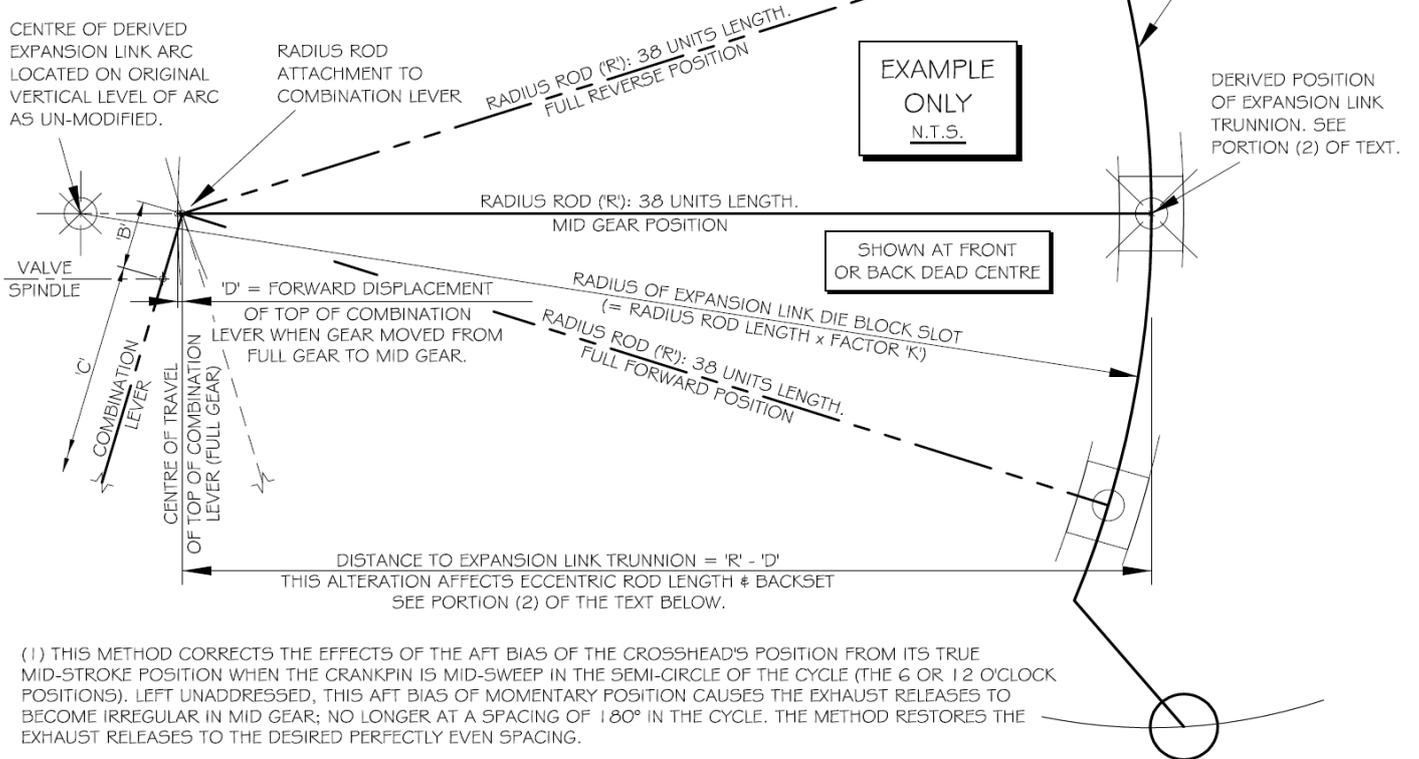


Below left: The ancient vibrator is pressed into service to ensure the concrete is vibrated into the corners and that air bubbles are removed. Right: Tape had been placed inside at the level which the concrete is to be filled to. This batch has short plinths.



Peter Dunn has produced the below analysis of an improvement to Walschaerts gear .

A METHOD OF ACHIEVING EQUALLY SPACED EXHAUST RELEASES AT MID GEAR DESPITE THE CROSSHEAD NOT BEING AT MID-STROKE WHEN THE CRANKPIN IS AT 6 OR 12 O'CLOCK.
(FOR INSIDE ADMISSION WALSCHAERTS)



(1) THIS METHOD CORRECTS THE EFFECTS OF THE AFT BIAS OF THE CROSSHEAD'S POSITION FROM ITS TRUE MID-STROKE POSITION WHEN THE CRANKPIN IS MID-SWEEP IN THE SEMI-CIRCLE OF THE CYCLE (THE 6 OR 12 O'CLOCK POSITIONS). LEFT UNADDRESSED, THIS AFT BIAS OF MOMENTARY POSITION CAUSES THE EXHAUST RELEASES TO BECOME IRREGULAR IN MID GEAR; NO LONGER AT A SPACING OF 180° IN THE CYCLE. THE METHOD RESTORES THE EXHAUST RELEASES TO THE DESIRED PERFECTLY EVEN SPACING.

THE AFT BIAS OF THE CROSSHEAD'S POSITION FROM MID-STROKE AT THE CRANKPIN POSITIONS MENTIONED, IN TURN INTRODUCES A BIAS OF THE VALVE AFT OF ITS CORRECT LONGITUDINAL POSITION IN THE STEAMCHEST, MOST PRONOUNCED AT MID GEAR, THOUGH PRESENT TO SOME DEGREE AT ALL POSITIONS NOTCHED UP. THIS ERROR IS MOST IN EVIDENCE AT THE CRANKPIN POSITIONS MENTIONED, AND IS 'ONE OF' THE MANY POSSIBLE CAUSES OF THE DETERIORATING QUALITY OF THE SPACING OF THE EXHAUST RELEASES OBSERVED IN SO MANY VALVE GEAR LAYOUTS WHEN THEY ARE NOTCHED UP (AKA: 'ROUGH BEATS').

BY MAKING THE RADIUS OF THE EXPANSION LINK DIE SLOT LARGER THAN THE LENGTH OF THE RADIUS ROD BY A FACTOR ('K'), AS THE DIE BLOCK IS DRAWN FROM EITHER FULL GEAR POSITION TO THE MID GEAR POSITION, THE TOP OF THE COMBINATION LEVER IS DISPLACED FORWARD AS SHOWN IN THE DIAGRAM, BY THE VALUE 'D'.

THIS CORRECTS THE ERROR INTRODUCED BY THE CROSSHEAD (AND THUS THE BOTTOM OF THE COMBINATION LEVER) BEING AFT OF ITS MID-STROKE POSITION AT THE CRANKPIN MID-SWEEP POSITIONS, RESTORING EVENLY SPACED MID GEAR EXHAUST RELEASES.

REFERRING TO THE NOTATIONS ON THE DIAGRAM ABOVE, IF ONE ALLOWS THE DISTANCE BETWEEN THE MID-STROKE POSITION OF THE CROSSHEAD AND THE POSITION IT ACTUALLY OCCUPIES WHEN THE CRANKPIN IS AT 6' O'CLOCK TO BE THE VALUE 'A' (NOT SHOWN, BUT DESCRIBED), THE DISTANCE FROM THE RADIUS ROD'S ATTACHMENT TO THE COMBINATION LEVER TO THE VALVE SPINDLE TO BE 'B', AND THE DISTANCE FROM THE VALVE SPINDLE TO THE BOTTOM OF THE COMBINATION LEVER TO BE 'C', THEN THE FORWARD DISPLACEMENT REQUIRED TO EFFECT EVENLY SPACED EXHAUST BEATS IN MID GEAR IS GIVEN BY: - $D = A \times (B/C)$

THE VALUE OF FACTOR 'K' RESTORING EVENLY SPACED MID-GEAR EXHAUST RELEASES WILL BE A FUNCTION OF THE RATIO OF CON ROD LENGTH TO PISTON STROKE, AND THE LENGTH OF THE RADIUS ROD. IT MAY BE DERIVED BY GRAPHICAL MEANS (MANUALLY SO, OR BY AUTOCAD), OR BY TRIGONOMETRY. ONCE DERIVED IT WILL PROMPT THE NECESSARY FORWARD DISPLACEMENT 'D' AT THE TOP OF THE COMBINATION LEVER.

(2) THE EXPANSION LINK TRUNNION SHOULD BE MOVED FORWARD FROM THE POSITION IT WOULD CONVENTIONALLY OCCUPY BY THE VALUE OF 'D'. MOVING THIS POINT FORWARD WILL AFFECT BOTH THE ECCENTRIC ROD LENGTH AND THE BACKSET OF THE EXPANSION LINK.

THIS PORTION (PORTION 2) OF THE TEXT RESTORES THE FULL GEAR VALVE EVENTS VERY CLOSELY TO THEIR ORIGINAL PARAMETERS PRIOR TO APPLYING THE STEPS IN PORTION (1) OF THE TEXT CORRECTING THE MID-GEAR SITUATION.

(3) TO RETAIN EQUAL (LIVE STEAM) LEADS AT MID GEAR IT WILL THEN BE NECESSARY TO HAVE UNEQUAL LIVE STEAM LAPS ON EACH END OF THE VALVE; LESS LAP ON THE AFTER END OF THE PISTON VALVE, AND MORE ON THE FORWARD END. WHILE THIS WILL RESTORE CORRECT MID GEAR ADMISSION EVENTS, IT WILL INTRODUCE A SLIGHT ERROR OF ADMISSION TIMING AT FULL GEAR. THOUGH OF LITTLE CONSEQUENCE, THIS LAST ERROR WILL DIMINISH IN MAGNITUDE TO ZERO AS THE GEAR IS DRAWN FROM FULL TO MID GEAR. THE VALUE BY WHICH LAP IS VARIED ('V') FROM THAT WHICH WOULD NORMALLY OBTAIN IS GIVEN BY: - $V = D \times (B + C)/C$ THE VALUE 'V' IS THEN ADDED TO THE LAP OF THE FORWARD HEAD OF THE VALVE, AND SUBTRACTED FROM THE LAP OF THE AFTER HEAD OF THE VALVE.



Above: Garry Buttel with his 38 class and Craig Deaken on the 10 wheeler on the members day on 27 June 2020.
 Below: 3609 on the ground level turntable on the same day. Photo Andrew Allison.



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Track location is Anthony Rd, West Ryde adjacent to Betts St, behind West Ryde shops. 33° 48' 15.99" S; 151° 05' 12.78" E

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Public Running Day is the **THIRD** Saturday in each month from 1.30pm. Entry is \$4 adults, \$2 children. Rides are \$2 each.

To ride on the trains, enclosed footwear must be worn.