



The *Squeaky Wheel*



Issue #40 – June 2021

SOCIETY TRIP TO WHANGAREI MUSEUMS

Some days don't start too well but end up just about perfect if you know what I mean. I'm sure that you must have experienced it, allowing plenty of time plus a bit to get somewhere, only to get snarled up in the traffic jam from hell, there's no use in diving in and out of back streets to find the magic way, nope, everyone else is doing that so just sit tight and hope that the bus is still there! It wasn't, the bus was even more jammed than the rest of us when we were stuck in our tin top cars. However the sun shone on us waiting outside of the ADH when a very generous security guard gained the authority from on high to allow the MOTAT Society members, by now hopping from one leg to the other, to seek temporary refuge in that magnificent display hall.

Good things come to those who (im)patiently wait and eventually the bus arrived with its headlights drooping in apologetic disgrace - and so with a full load of now anxious members we turned once more onto Meola Road to face the horrors of Auckland's peak hour or two of dense traffic.



Where was it? By now fortunately the commuters were safely behind their desks trembling in anticipation of the snarl-ups on the homeward journey, but not us, we were on a high. cruising toward Whangarei looking forward to the displays of the Whangarei Steam and Model Railway Club and the incomparable Packard Museum. AND we were not disappointed.

John T. Society Chair and Jodie our very able administrator between them have made an impossible to surpass day of learning, entertainment and interest at these two museums. From the moment of arrival at The Steam Museum we were greeted by the volunteer team who had fired up their Peckett engine (the very last steam engine ever to be built and delivered from England to New Zealand in 1955) and who after loading us all into the period

carriage took us for a steamy ride through the bush to their engine shed where we stopped for a brief nose around followed by the delightful ride back along a kilometre of track and from thence on to a 1919 tram. The Lisbon Tram 526 has been converted to the rail gauge and is ingeniously supplied with 250 to 550 D.C. voltage by towing its own diesel/generator trolley situated between the two tram carriages thus allowing it to travel anywhere on rail, very clever indeed.



The grounds of this museum are vast and variable between bush and rolling grassland the latter of which is where the kilometre or so of scale model rail track is laid. The model rail is a scale model of the big diesel units which roamed New Zealand far and wide in the sixties through to the nineties. Pulling three sit on units behind it the scale engine effortlessly hauled a full load of septuagenarians around the very charming gardens and grassland even climbing inclines without slowing from a good 10kph canter!

The generosity of welcome cannot be overstated, the writer really hopes that we can reciprocate in a similar manner when perhaps a return visit can be arranged. But on to the inner man, sorry person, Lunch. Most important a fabulous and fun lunch, where once again, the efficiency of our administrator had forewarned the Jolt Cafe of the septuagenarian takeover and so prandial disappointment was denied us. In other words we all liked it and ate lots and found a fabulous new beer called Spitfire which we highly recommend.

And so replete we leapt nimbly back onto the bus and off to the world famous Packard Museum where the oohs and ahs of the overwhelmed Society members could be



heard all over town, several kilometres away. The welcome from owners, Geraldine and Fenton Craw, was brief and to the point the succinct message giving a little of the long and at times amusing history of the start-up of the Packard collection. In brief it involved in buying thirteen sheep in the early fifties from a saleyard in Morrinsville and having no way of transporting them home until it was pointed out that that there was a large American car for sale up the road. More haggling ensued and thus duly purchased, the car was filled to the gunwales with the thirteen hoggets which were brought back to Whangarei in style, their fate being unknown but predictable.

The car survived, was restored and now has pride of place in the Packard museum where anyone with the slightest interest in New Zealand transport history should spend a day or two ogling not just Packards, but an enormous host of vehicles varying from enormous bulldozers awaiting restoration to perfectly restored motorcycles (my personal favourites).

It cannot be emphasised enough the vastness of the collection in the Packard Museum and the variety of interesting and illuminating artefacts that exist here. Apart from the requirement to respect the vehicles for what they are, there were no restrictions on where we could go in any of the five or so large sheds and so as the time to go came around the reluctant to leave Society visitors were herded into the bus for the long ride home...

...which turned out to have a bit more fun than imagined. John T. had arranged a small quiz based on what we had seen during the day. The winners of the quiz were rewarded with a small, slightly melted, chocolate Easter egg...the losers had the rest. A lot of laughs as we tried to recall where an artefact came from or what the c.c. rating of a motorcycle was. What else can I eulogise on other than to say a whopping thank you to Jodie and John T. for their organising skills and to ask that maybe we do it again next year?

-Article by Henry Swan

-Photos by Michael Smith & Robyn Brown



View more photos from this excursion on our website at www.motatsociety.org.nz/post/society-trip-to-whangarei-museums or on our Pinterest account www.pinterest.nz/TheMOTATSociety/.



JULY EXCURSION

**HORTON MEDIA
PRINTING PLANT TOUR
HOME OF THE NZ HERALD**

Thursday 22 July 1pm

**Get together with
fellow MOTSoc
members for a
fabulous tour of the
Horton Media
Printing Plant.**



**Contact the Administrator on
admin@mototatsociety.org.nz to book now!**

BOOKMARKS PRINTED ON ARAB TREADLE PRESS

The MOTAT print shop has a tradition of printing bookmarks. From the classic designs for visitors to collect from the take home shelf, to helping visitors to customise one with their own name, the format has been a staple for a while. What I enjoy about the format is its printability on the Arab treadle press, and the small scale allowing for low pressure experimentation with typography design and printing processes.



The process used to print the READ bookmark developed from a solution to a problem from an earlier bookmark. I had designed a bookmark to have a Janet Frame quote printed on it, with a few picture blocks, including one of a long arrow with an asterisk shape on the

end. When printed, however, I found that the asterisk had a significant dent and did not print correctly. Rather than redoing the entire design, I decided to keep the arrow, but not print the asterisk end. To do this, I needed to *mask* off the asterisk – I couldn't stop it from inking, but I could stop it from printing. This is a technique I picked up when screen-



printing, and a digital version of the process now exists in Photoshop. The mask was made from the thinnest material I could find that still had enough rigidity to not flop around, and then attached to the gripper arm on the press, so

that as the platen closed, the asterisk was printed onto the mask, and the remainder of the arrow was printed onto the bookmark.

The READ bookmark idea came to me when I was looking at our wooden type collection, and I saw the outline type. I knew from a previous project that we had the long rectangle blocks that I could print, and I thought it would be interesting to have the block go “behind” the outline type – no colour showing through inside. The process started with printing the word on the bookmark, and then carefully tracing the outline of the letters onto the masking material. The mask was carefully aligned and attached to the gripper arm of the press. In the end, a second mask had to be made, as the thickness of the masking material meant that the print of the rectangle wasn't fully flush with the text, but like all printing, a process of trial and error solved the problem.

Thanks to Scott Pilkington for support on the project with compositing.

-By Richard Kearney



THAMES GOLDMINE EXPERIENCE & SIR KEITH PARK MEMORIAL AIRFIELD VISIT

Date in August to be advised

Join us on a day trip to the Coromandel Coast to experience the best of Thames heritage. Pay for your lunch, everything else free to MOTsoc Members (non-members travel for free).

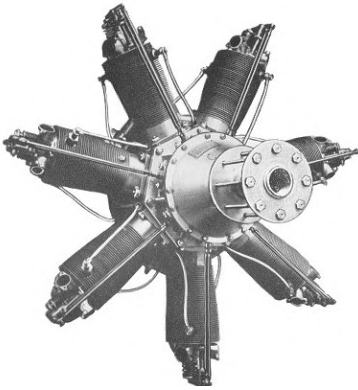
KEEP AN EYE ON YOUR EMAIL INBOX FOR FURTHER DETAILS OR BOOK YOUR SEAT WITH THE ADMINISTRATOR ON ADMIN@MOTATSOCIETY.ORG.NZ



THE RADIAL ENGINE

All volunteers are asked questions by the visitors to MOTAT and frequently ADH volunteers are questioned as to how the radial engine works as it is so different from the inline engines. SO the first question is why did it evolve? This one is easy, a problem that was already emerging was that inline engines were getting heavier and longer thus reducing the power to weight ratio and also putting the pilot further back in the aircraft. As airframes were improving so the need for more horse power was called for and the radial was the perceived practical answer.....However....

Before the *Radial* engine was successful there was a fully rotating *Rotary* engine which was fixed directly to the propeller. This, as you may imagine, meant the enormous spinning engine and propeller, mass rotating together as a single unit caused great flying difficulties. It was used in some very successful and famous aircraft on both sides in the first world war but was surpassed by the radial engine which was fixed to the airframe



Above- A rotary engine with the propeller fixed to the crankcase

with only the crank shaft spinning the propeller, not the whole engine. And so it was that the radial overcame the mass rotation problem of the rotary.

The first person to develop a radial engine Was Jacob Ellehammer (1871-1946) way back during 1903–1904 when he used his experience in constructing motorcycles to build the world's first *air-cooled* radial engine. This was a three-cylinder engine which he used as the basis for a more powerful five-cylinder model in 1907. Aircraft manufacturers were slow to adopt them preferring instead to use the more trusted inline four or Vee design.

Jacob Ellehammer was a Danish born watchmaker whose genius for invention deserves a separate recognition at a later date as he paralleled our own Richard Pearse for diversity and ingenuity of creative engineering.

In a radial engine the pistons are connected to the crank shaft by a master rod and an articulating rod assembly. One piston, generally the uppermost one, has a master rod which is directly connected to the crankshaft with a weighty counterbalance opposite it. The remaining pistons connect their rod attachments to a separate ring around the edge of the master rod. Through this it makes all rods connect to the crankshaft indirectly or directly in the case of the master rod.

Four-stroke radials always have an odd number of cylinders for each bank, this allows a consistent every-other-piston firing order to give smooth operation. For example,

on a five-cylinder engine the firing order is: one, three, five, two, four, and restarting the cycle with cylinder one.

This firing sequence always leaves a one-piston gap between the piston on its combustion stroke and the next piston on compression about to fire. The active stroke directly helps to compress the next cylinder to fire reducing vibration and making the motion more uniform. If an even number of cylinders were used, an equally timed firing cycle would not be feasible.

There was a prototype two-stroke radial Zoche aero-diesel which had an even number of cylinders - sometimes four or even eight - but this was not problematic, because they were two-stroke engines with twice the number of firing strokes as a four-stroke engine for each crankshaft rotation. Diesel driven aircraft operated commercially by a German airline briefly in the 1930s flying from Germany to South America.

The radial engine normally uses fewer cam lobes for valve lifting than other engine types. As with most four-strokes, the crankshaft takes two revolutions to complete the four strokes of each individual piston (induction, compression, combustion, exhaust). The camshaft ring is geared to spin slower and in the opposite direction to the crankshaft. The cam lobes are placed in two rows for the intake and exhaust. For example, four cam lobes serve all five cylinders, whereas ten would be required for a typical inline engine with the same number of cylinders and valves.

Most radial engines use overhead poppet valves driven by pushrods and lifter on a cam plate which is concentric

with the crankshaft just like your car does. A few engines use sleeve valves such as the 14-cylinder Bristol Hercules as used on our Solent aeroplane and also the powerful 18-cylinder Bristol Centaurus. These are quieter and smoother running but require much tighter manufacturing tolerances. They offered greater power but were designed and built toward the end of the life of radial engines which were by then being rapidly superseded by the

more efficient jet engine which offered a much better power to weight ratio and a longer service interval ratio giving us further and faster flights but also lowering travel costs for the passenger.

It is sad to see the old piston engines disappear but they were too complicated, too heavy and too thirsty for modern economies of flying - but oh-boy did they sound great! Now please excuse me while I re-charge my hearing aids.

-By Henry Swan



Above- Jacob Ellehammer

MAUNGAUIKA/NORTH HEAD EXCURSION

Ross "Goldie" Goldsworthy of Military Section suggested this trip to Maungauika/North Head and lead the tour since he knows the way around having actually worked there 65 years ago when serving in the Royal NZ Army. Naturally, in those post-WWII years the place was still alive with mates and machines. Some of the machines are still there. The biggest predate Ross. Massive "disappearing guns" are sited facing the approaches to Auckland by sea – cast in solid bronze, too large to pocket and walk off with. There are rumours of airplanes and munitions stored in undiscovered tunnels – "Not true," says Ross.

April 10 has a history of stormy weather, and it was raining on this day but the trip was on and the bus was pretty full, we left from MOTAT 2 on time.

Aucklanders know North Head/Maungauika well. With Takaparawha/Bastion Point its forms the harbour mouth to the Waitemata and Auckland City. North Head/Maungauika has strategically controlled the northern approach to the Waitemata for centuries. It is a superb grandstand for



Above- The gun in firing position

observing the comings and goings of shipping into the harbour (friendly and potentially 'not-so-friendly'.) The terracing of Maungauika/North Head is not the work of Maori occupation but of successive colonial defensive occupations.

The first Auckland Pilot Station (1) was established on the summit of North Head/Maungauika in 1840 to signal the arrival of vessels into the Waitemata. Tunnels were dug into the Maunga from the 1870s to provide accommodation and storage for defence forces manning the original gunnery and later search light generators. Russian naval activity was an initial concern in 1870s. These tunnels, hand dug and skilfully shaped to shed water, are the major intrigue of the place. Ross populated these places with stories and activities describing the various living and sleeping spaces, the machine rooms and explosives storage rooms (magazines).

The WWII guns were removed and cut up for scrap after hostilities ceased. Some remnants remain on the north side but unfortunately weather prevented us from examining these. In addition, Covid19 had closed some of the tunnels at the time of our visit for reasons of social distancing.

Thus the south battery disappearing gun was our main focus. Goldie was involved in the operation to move this gun from the North Battery to its present position in the South Battery. This magnificent piece was designed to fire, recoil to



Above- Gun recoil mechanism

be reloaded and fire again, all from a position of hiding. Covering the inner harbour, while able to be rotated north or south of its current direction and aimed at Takaparawha/Bastion Point, it fired an eight inch shell 2500m. A fantastic engineering invention and with great capability contiguous with our own L507 loco at MOTAT.

Other armaments were the summit battery which had an eight inch disappearing gun and the saluting battery, in front of the south battery eight inch gun, established for the Queen's visit in 1953. We viewed the search light mountings at closer to sea level contour, where once search lights swept the surface of the sea to detect hapless vessels caught in the beam. There are also many interesting concrete and plaster



Above- Tunnel to the disappearing gun



Above – Ross speaks to the group

finishes and texture remnants on the Maunga as artefacts of the occupation, including fireplaces, chimneys and difficult

stairs of equal tread and riser.

Once our tour was over we made our way by bus down to Torpedo Bay where we explored the wonderful Navy Museum and dined in one of Auckland's best and few water's edge café restaurants. Brilliant!

It is hoped that we can return at a later date (next year) when the complex is more fully open so we can look at the North Battery, Director Station and more of the tunnel network.

Thank you Goldie, for a wonderful trip greatly enjoyed by all.

-Article and photos by Bruce Wild

(1) Department of Conservation/Te Papa Atawhai: History of the Reserve, publication <https://www.doc.govt.nz/parks-and-recreation/places-to-go/auckland/places/maungauika-north-head-historic-reserve/north-head-historic-reserve-history/history-of-the-reserve/>

View more photos from this excursion on our website at www.motatsociety.org.nz/post/maungauika-north-head-excursion or on our Pinterest account www.pinterest.nz/TheMOTATSociety/.

SAVE THE DATE!

FROM TYRES TO FIRES: A JOINT AUCKLAND MUSEUM INSTITUTE & MOTAT SOCIETY EXCURSION TO PORTLAND CEMENT, WHANGAREI

Thursday 16 Sept

MOTSoc are linking with the AMI to visit a landmark sustainability project for manufacturing. This exciting project was made possible thanks to a \$16m grant from the Waste Minimisation fund administered by the Ministry for the Environment. It will divert approx 50% of the 6.3m tyres heading for landfill in NZ each year to fire the furnaces at the Golden Bay Cement Works. The \$25m (Total cost) project operated by Fletcher Building only opened in March 2021.

This is an all-day excursion, leaving from MOTAT2 and will include refreshments at Golden Bay and a 90-minute tour of the plant. Return travel is free to members. E.T.A back at M2 is late afternoon, traffic dependant.

Keep an eye on your email inbox for our July "Events & Announcements" newsletter which will have reservation information. Note: Numbers are limited.



OCTOBER EXCURSION



MOTSOC VISITS MATAKOHE



Spend the day exploring heritage abundant Matakoho with the MOTAT Society's October Excursion (date to be advised). Matakoho has so many heritage sites to explore from the Kauri Museum and Totara House, to the post office, pioneer church and cemetery. Then enjoy lunch at Gumdiggers Cafe.

The Society pays for members travel and entry, non-members also travel free. Contact the Administrator at admin@motatsociety.org.nz to book your spot on the bus.

Sign up for our regular Events & Announcements Email. It's the best way to find out about our up and coming Society Excursions and other future events. Send your email address to admin@motatsociety.org.nz

MOTSOC VISITS THE BUSH TRAMWAY CLUB – PUKEMIRO JUNCTION



Blessed, yet again, by the Weather Gods a full busload of Society Members departed MOTAT2 on Sunday 2nd of May in glorious sunshine.

Spirits were high and exceeded only by expectations of a fun day ahead filled with Smoke, Steam, Coal and Steel. We were not to be disappointed.



Above: The V-Twin cylinder configuration. Heisler.

The nice thing about the Industrial Heritage world is that, like the Olympic Rings, there are many overlaps. Thus, we knew we would be enjoying the company of old friends and

new acquaintances down at The Bush Tramway Club who are based at Pukemiro Junction on the Glen Afton Line.

Originally opened on the 20th of December 1915, the railway was conceived to carry coal from the Pukemiro and Rotowaro mines out to the Main Trunk Line in Huntly. (Rotowaro – Coal Lake. Pukemiro – Hill with Miro trees.)

The line was extended in 1924 by the NZCDC to supply the boilers at the dairy factory in Glen Afton. The Pukemiro Mine closed in 1967 and the Glen Afton Mine followed suit in 1973.

Originally headquartered at MOTAT itself and forming the core of the Rail Section, the Bush Tramway Club were able to lease the Pukemiro Line from NZ Railways and thus focus their attention on locomotives unique to the haulage of logs and coal through the winding valleys of New Zealand's bush. An unusual feature of such machinery is that it is often 'gear-driven' to maximise traction hauling

large loads on rough tracks at slow speeds. One such example can be seen at MOTAT on occasion when on-loan periodically. This is the popular Price Cb117 built by A&G Price at Thames in 1927.

Unlike many heritage rail collections the Bush Tramway features smaller loco's and jiggers, powered by steam, diesel, petrol and even batteries. (Climate Change enthusiasts please note.)

We were fortunate to be able to ride the rails behind the BTC's 1923 Peckett steam loco Number 1630 (1) (similar to that at the Whangarei Steam Railway which we visited earlier this year). It is proudly still running on the line to which it was delivered between the wars.



Above: Our guide Theresa B.

Talk about Chalk & Cheese - A second train operating for our visit was pulled by a Drewry Diesel shunter (2) supplied new to Meremere Power Station in 1957. There is something sonorous about the lovely lazy Gardner 8LW diesel in these loco's.

The day was like stepping back in time with informality and a genuine friendliness coupled with home-made hospitality in the Tea Room. Lovely savouries, sandwiches and copious cups of char. Thank you ladies.

We enjoyed a tour of the workshops, wandering amongst the projects and ephemera. Our guide was the ever enthusiastic Theresa B. Our visit was over all too early and we boarded the bus for home about 3.30pm. The consensus was that this will become an annual visit. The enjoyment was plain to see on the faces of attendees.

There was the ubiquitous Chairman's Quiz contested keenly as we crested the Bombay Hills and members were offered a souvenir CD of Country & Railway songs (clearly an acquired taste – not all offers were taken up).

If you can't wait a full 12 months for our return please take



Above: Peckett #1630 approaching Pukemiro Junction.

a run down to Huntly, any time, for a fun day. The BTC is open on the first Sunday of every month (wet or dry). (3)

One project locomotive in need of support is the unusual 1903 Heisler #1082 (4) with its V-Twin steam cylinder configuration and shaft-driven crownwheel & pinion bogies.

Our thanks go to the staff and members of the Bush Tramway Club for a wonderfully smoky, steamy and sunny day-out. We'll be back!

- Article and Photos by John Tutchen

(1)<https://www.bushtramwayclub.com/locoimages/indexpeckett.html>

(2)<https://www.bushtramwayclub.com/locoimages/index401-402.html>

(3)<https://www.bushtramwayclub.com/visitus.html>

(4)<https://www.bushtramwayclub.com/locoimages/indexheisler.html>

View more photos from this excursion on our website at www.motatsociety.org.nz/post/Pukemiro-bush-tramway-club-visit or on our Pinterest account www.pinterest.nz/TheMOTATSociety/.

DAVID MARTIN (1936-2021)

HONORARY LIFE MEMBER MOTAT SOCIETY

David Martin was born in the UK and moved to NZ in 1960.

Dave joined MOTAT as a volunteer in the Rail Section in 1969 and became increasingly involved in the activities of the section. At the time Rail was undergoing rapid expansion with track laying and artefact acquisitions in the gully behind the pump house at MOTAT 1. A rail yard was being formed, the Waitakere station building was to arrive, the Railway workshop was to be constructed and in 1975 the signal box then located on the upper level had to be relocated to make way for MOTAT's largest acquisition, steam locomotive K900. Dave was heavily involved in all these activities and became the Section Head for 2 years until in 1980 when, because of business requirements, he moved to Tauranga.

Dave returned to Auckland in 1982 and became involved with the relocation of equipment to the "Sir Keith Park Memorial Airfield" site at Meola Rd (MOTAT 2) where a Rail Compound had been set up. The recovery of track materials from NZ Railway locations near and far around Auckland, and the installation of tracks for the Western Springs Railway was ongoing. At this time the Rail Section was very fortunate to have the assistance of a Work Party every Saturday from the Periodic Detention Centre, and Dave was one of three or four volunteers from the Rail section that were prepared to spend time over many years providing and supervising work for the Work Parties which also included the erection of several of the storage buildings. Dave was very dedicated and particularly enjoyed building track using the second-hand track materials available from the track recovery sorties and working with the Work Parties.

In 2004, following the opening of the carriage workshop Dave was appointed Rail Section Manager/Curator, a position he held for 2 years until his wife's health forced him,

regrettably, to relinquish the position. However, he carried on as a volunteer until he moved to Waiuku and eventually to Queensland, Australia in 2010.

For most of his time at MOTAT Dave was particularly interested in the diminutive 1913 Oberursel, a unique petrol driven locomotive of which there is only one other operating in original condition in the world. He formed a friendship with an Oberursel historian in Germany who was able to supply him with valuable details of MOTAT's locomotive and Dave provided the Walsh Memorial Library with a detailed article on the locomotive's interesting history. Even after moving to Australia he retained a strong tie with MOTAT and kept a very close interest on the Rail Team's activities and in particular on the progress being made on the locomotive's restoration. It became a lifelong ambition to see the Oberursel actually restored and running again. Thanks to Dave's persistence restoration work is now well advanced.

Dave was a hard worker and over the years gave many thousands of hours of his time as a volunteer to MOTAT. He was a great team member who was good to work with and had a subtle sense of humour. As a fellow volunteer and a good friend for 50 years he will be sadly missed.

Dave died in Australia, after a long illness, on 10 May 2021.

-By Richard Croker



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