



LeedsLines

Newsletter of The Leeds Society of Model and Experimental Engineers

From The Chair

Jack Salter

The Hobby is in good health!

I was delighted to hear the feedback from Arthur, David, Trevor and Malcolm as to how popular the new Manchester Model Engineering Exhibition was, indeed the only problem was that it was too popular for the size of the venue! Similarly I've heard that some of the Midlands clubs were unable to secure stands at the new Doncaster exhibition as club space was over subscribed.

I recall that when I started reading Model Engineer in the mid 1970s letters to the correspondence pages worrying about the future of the hobby, given the age of participants, it looks like, in our part of the country at least, that the hobby is continuing to boom.

I say our part of the country as the feedback I receive as a member of London SMEE is quite different, the Sandown Park event is a shadow of its former self and space at Ally Pally is being taken over by less demanding modelling hobbies.

Traders at Harrogate have told me in the past that they sell vastly more silver solder at the northern exhibition than "down south".

Many members will be aware that my other hobby is vintage caravans, I recently bought a beautiful old caravan from the London suburbs, the owner was selling as he had obtained planning permission to build a 3 storey house on the space where he parked his caravan, I wonder if the same is happening with workshops?

Given our track and facilities are in the best condition that I have ever known, thanks largely to the efforts of the Monday bacon sandwich and cake crew (I mean Working Party), we can be confident that the hobby will continue to thrive in our area at least for many years to come.

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2016 Running Season Opens

A chilly but fine Sunday 13th of March saw the first public running day of the new season with drivers being very complimentary about the smooth running provided by the newly laid track.

However since some work still needs to be completed, previous advice on checking the track status before setting off for a private running session still applies.

The next scheduled running day is Sunday 10th April, when the Leeds Trophy will be awarded.



2015 Leeds Trophy Winner
David Wood

Steam Boats

The tragic of events of January dictated a late, and hurried, reorganisation of the February edition and it's early publication. The final instalment of David Beale's 'Steam Boat' article was left out of the newsletter but since David was not one to start something and leave it unfinished the article is completed in this issue.



National Model Engineering Exhibition – 20th/22nd May 2016 - Doncaster Race Course

We assume that arrangements are the same as at Harrogate - see below. Hon. Sec. will let you know if it is any different.

Delivery of Exhibits Thursday 19th May. Please see Geoff on arrival.

Arrive after 12-30 pm please. If you will be later than 6 pm please let Geoff know. You must register your exhibit at the organisers desk and obtain a white display card attached to which is your entry ticket for all three days. The white display card must be left with and be visible with your exhibit.

Collection of Exhibits - Sunday 22nd May.

On Sunday pm Geoff will collect up all the white display cards and get them signed en-bloc by an exhibition organiser. Removal of exhibits from the stand is only possible after the Exhibition closes at 16-30 hrs. To exit the exhibition with your model you must be in possession of the relevant signed display card.

Leeds Stand Stewards.

The steward's rota will be drawn up and Geoff will e-mail or phone you during the week prior to the exhibition by way of a reminder and to check that your slot is still convenient for you. The exhibition is open from 1000 until 1700 on Friday and Saturday and 1000 until 1630 on Sunday.

Early/late stewards should be at the stand before morning opening and remain at the stand until the public have cleared the venue.

If you do not hold an exhibitors pass please collect your one day stewards pass from the exhibition organiser's desk on the day of your stewarding having gained entry via the exhibitor's entrance.

If you require any further information please e-mail leedssmee@sky.com or phone 01977-798138

Sunday 21st February Auction

An auction of David Beale's tools and other small workshop equipment was held at the Eggborough Power Station Sports and Social Club and lasted most of the day.

Hon. Sec. did a stalwart job of auctioning a huge amount of small tooling, quantities of metal stock and a bewildering array of fasteners and fittings accumulated over a lifetime of model engineering.

Arthur managed a stall of books mostly related to engineering topics and another table '*Sumat for Nowt*' was devoted to unlikely looking objects some of which still managed to find a new home in return for a donation to the sale funds.

Nigel and Karen kept track of proceedings of the sale and a legion of elves helped keep track of the sold lots.

The sale of larger machine tools over the previous week raised £6,100 plus a further £2,269 at the auction making a total contribution of £8,369 to David and Marcia's chosen charities.

Thanks must also go to Sue and Steve the social club managers for use of the room and for keeping folks happy with a variety of meals being available throughout the day.

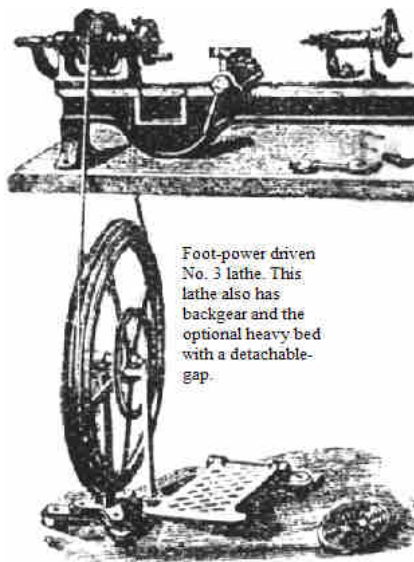


Mystery solved, probably.

Some months after 'LeedsLines' published the saga ([February 2015](#)) of my father's first lathe I visited the Haynes Motor Museum at Sparkford near Yeovil. It offers quite a trip down memory lane for the older ones among us, some eye-openers for younger people: 'Mummy, this one's got brass lamps / wooden wheels /no radio / no doors / no front brakes. Did you really go to Italy in one of those? You told me that "Bristols" was a rude word.'

Quite deep in the museum is a mock up of an early roadside garage: it's intended to afford a photo opportunity for those wanting to take pictures of their friends or family sitting in an old car and a sop to those who have dutifully kept their hands off the elderly and not so elderly exhibits. Surrounding the car are racks of 'period' spare parts, oil drums, a work bench, welding hearth, hand tools and a decent size lathe.

I'm not a good sightseer or particularly observant, my visual memory is poor and – to quote a family member - it's only a short time before I'm 'all templd-out', but something made me give the lathe a second look. Eventually I realised that it looked remarkably like my father's first one, just half-a-dozen times bigger. There's enough space on the bed to accommodate the maker's name which proved to be 'Britannia' and once home It didn't take long on the internet to find a historical overview of Britannia products (<http://www.lathes.co.uk/britannia/>). Near the end of the article I found the illustration below.



The Britannia Nos. 2, 3 and 6 plain-turning lathes were intriguingly described by the makers as suitable for, "*Amateurs, Jewellers, Dentists or any Light Use.*"

The price was £2 : 5s : 0d as a bench model, or £4 : 5s : 0d. on the treadle stand. With the basic machine, the first owner received two hardened centres, a driver chuck or catchplate for between centres work and a hand rest, and then the 'extras' list starts – rather like a modern BMW that comes with four seats, a speedometer and all the air inside, anything else seems to be an option.

A gap in the bed was optional for both the No.2 and No. 3 models and cost an extra 10 shillings - but, at this price, this gap did not bring with it a new bed of deeper section; instead, a small portion of the bed was simply cut away in front of the headstock.....

Both models could also be ordered, for £1 : 10s : 0d extra, with the headstock spindle and bearings in hardened steel.

Backgear was also available on the No. 3 lathe but, as this involved an entirely different headstock with two spindle bearings, and the end thrust taken by a swan-neck casting bolted to the end of the bed (the arrangement can just be made out in the picture), the cost almost doubled to £4 : 0s : 0d. When fitted with backgear the lathe could also be specified with a heavier pattern of bed, where the section that bowed downwards as it approached the headstock held a proper detachable bridge - and all for an extra charge of just £1.

It seems clear from this snapshot of an earlier and simpler age that my father must have saved his pocket money for quite a while even to buy a 'bench model' Britannia number 3 lathe with optional gap in the bed.

And, yes, Alan Westby was probably right: Britannia lathes were made at Colchester.

Ian Macdonald

Model Engineer to Marine Engineer Part 3

David Beale

The Engine. Many model engineers that have built locomotives or traction engines will find the construction of a steam launch engine and auxiliary components relatively straightforward.

Again there are decisions to be made:

- Single cylinder or multi cylinder.
- Simple or compound expansion.
- Type of valve gear to be used.
- Direct coupling to propeller shaft or indirect via chain or belt.
- Will the engine exhaust up the funnel or into a condenser.
- Will a vacuum pump or feed pump be part of the engine.

You will see that the complexity of the steam plant is increasing but totally satisfactory results may be obtained with a simple engine exhausting up the funnel, again as in locomotives and traction engines. In this application boiler feed water is either carried on board or drawn from the river or canal. The downside of exhausting up the funnel is the irritation caused by the noise it can produce, steamboats tend towards a quite tranquillity except for that annoying and elusive engine knock!

If the condensate is reused the oil must be removed to prevent internal contamination of the boiler, this is usually achieved in the hotwell with baffles and oil absorbing materials. This closed cycle is essential if you intend steaming on dirty canal water or on sea water, the alternative is to carry on board an adequate supply of fresh water.

I operate a simple total loss system by exhausting the steam into a keel condenser which overcomes this noise problem but requires removal of the oil before discharging to the waterway.

My choice for both *SL Cherub* and *SL Cherubino* was for a simple robust single cylinder engine. My very first engine was a Stuart Turner 5a but this rapidly developed knocks and rattles. The lesson here was that the 5a is a large model and not a small workhorse. Bearing proportions are minimal particularly the small end, a component that is also unlikely to receive adequate lubrication. The steamboat engine is called upon to work at full power for many hours unlike many model locomotives and traction engines.

My choice has been to build single cylinder engines because of their simplicity and for my hull size adequate power was readily attainable. Castings were purchased for a 2½" x 2½" which has a three bearing bedplate that is shown being line bored in *photo 1*. The finished engine is shown in *photo 2*, ready for painting.

A single cylinder engine has the drawback of not being self starting in all crankshaft positions, this is an important consideration because the 'brakes' on a boat are engaging reverse propeller rotation. A twin cylinder engine with cranks at 90° does overcome this problem and although expressing my preference for a single I acknowledge this important advantage.

Suitable designs are available for both twin simple or compound engines.

Crankshafts are traditionally made from one piece forgings or sg iron castings. Machining from a solid billet is another option but has the downside of requiring significant metal removal and one mistake could be costly in both time and expense. Satisfactory results can be obtained using a built up crankshaft. *Photo 3* shows my finished item and displays the large bearing proportions. In making this and other crankshafts I have used Loctite Retaining Compound adhering rigidly to the instructions 'on the bottle' and have not had a failure to date.

The most demanding test for a crankshaft is when a partly submerged piece of wood jams between the propeller and the skeg bringing the engine from full ahead to a dead stop. This leads one to consider where to fit a flywheel. If the engine flywheel is on the non drive end of the crankshaft in coming to a dead stop the crankshaft will experience the twisting moment resulting from the stored energy in the flywheel this has the potential to cause failure. The stored energy in a flywheel mounted on the drive end would be seen by the propeller shaft alone and not by the crankshaft. This decision has a further consideration, that of being able to achieve clearance between the flywheel periphery and the bilges. The inclination of the drive permits a larger diameter to be accommodated at the non drive end of the crankshaft. To add to this decision dilemma a twin cylinder engine directly coupled to the propeller shaft does not require a flywheel.

A chain or toothed belt drive connecting the engine to the propeller shaft provides the flexibility to vary speed ratios, optimise propeller shaft inclination and engine position.



Photo 1



Photo 5



Photo 8

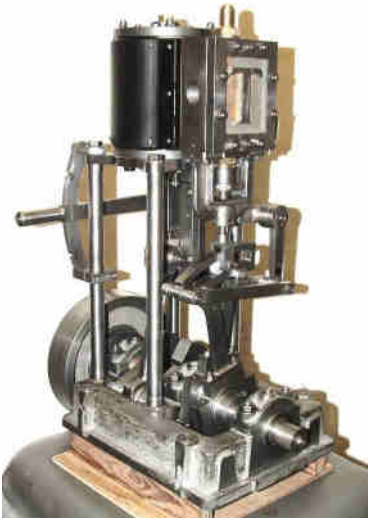


Photo 2



Photo 6



Photo 9



Photo 10



Photo 3



Photo 11



Photo 4



Photo 7



Photo 12

Enough decisions, back in the workshop machining an expansion link is shown in *Photo 4* where it will be observed that the vertical slide dating from pre milling machine days is being used to provide the fine control of rotary table movement. For anyone wishing to make swift progress I am informed that water jet cutting will produce a finished ready to fit component. A nylon die block has been used by some boat owners proving to be both silent in operation and long lived.

For anyone wishing to build more efficient engines that more closely resemble the prototypes of the 1900's a compound is the answer. A well proven example extensively used in medium sized boats is the Stuart Turner 6a. If fitted with a simpling valve reliable starting in any crankshaft position is possible. A condenser and vacuum pump will be necessary to maximise the engine performance and to extract water from the condenser returning it to a hotwell where it is re-used by the boiler feed pump. This introduces the question of engine cylinder lubrication. Many engines using saturated steam do not require any additional internal cylinder lubrication, but if superheated steam is used suitable oil is injected into the steam supply in the same way to that on model locomotives.

In case you are forgetting the objective of all this work I have included a holiday picture of *SL Cherub* on Loch Ness on a warm sunny day moored up for a picnic lunch in the company of another boat of the same Frolic 18 class. *Photo 5*.

Still interested? Then add to the intrigue of steam on the water by building a steam operated feed pump. *Photo 6* shows a most suitable example for which drawings and castings are available from Southworth Engines at Chesterfield. I constructed two of these pumps and found the project both interesting and challenging, first of all to fully understand the workings and then deciding how to achieve the accurate drilling of ports and steam passages.

Photo 7 shows the water valve block being machined. *Photo 8* shows the end faces of the water cylinder being machined with the casting fixed on a mandrel with a spot of superglue. The bond is easily broken if the glue has been used frugally but if not the application of heat facilitates release. *Photo 9* shows the finished water valve block with mitre valves.

Other methods of feeding the boiler are an engine driven pump, steam injector or a hand pump for emergency use. Once again these items are larger versions of those used on our models. I have made batches of injectors for use on my 5" gauge locos and have used one of these to feed the boilers of both my boats. Although looking tiny the injector is capable of providing an adequate quantity of boiler feed water, but, a fine filter in the water supply is essential. An engine driven pump is useful when underway but in locks and when moored an injector or steam driven feed pump is the ideal way to keep the boiler under control.

Transportation.

A well designed trailer is essential particularly if you intend attending rallies where travelling long distances may be necessary, towing stability is very important. Suspension units matched to the load will ensure that the boat has a smooth ride, and accurate nose weight must be achieved to prevent snaking. If the trailer is used for launching and recovery it is important that it carries the hull as low as possible, remember that the trailer will be submerged to the depth at which the boat floats off. Make sure that in achieving this objective that the trailer will not ground particularly on hump back bridges. To achieve the correct nose load a weighing device was made using an Enerpac ram and pressure gauge. The ram has a piston area of 1 square inch resulting in the pressure gauge giving actual load. The ram is fully extended and filled with oil before fitting the gauge. This rig has been used in conjunction with a jack and has enabled calculations to achieve good load distribution particularly when making twin axle trailers. Bathroom scales are adequate to determine the nose weight of single axle trailers.

To further engage your interest in the hobby the boat shown in *Photo 10 SL Nokomis* was constructed by a member of Nottingham SMEE and is seen underway on Lake Windermere. *Photo 11* shows *SL Nokomis* and *SL Cherubino* moored for a coffee stop on an Irish waterway and for those living near sheltered coastal water *Photo 12* shows the fleet moored for lunch at Hamworthy during an event at Poole Harbour.

I have covered almost randomly many issues that may have caused readers to doubt if a steamboat is a suitable project. But I have saved until last the easiest way to look and learn. Non boat owning members of The Steam Boat Association are welcome at almost every event where organisers will arrange for them to participate in the activities as a passenger on one of the boats. At these events it is possible to compare the varied designs and question the owners. These events are not for the anorak but for family participation, tell me of another steam club where attendance at the AGM is about 40% ladies.

I hope that I have shown sufficient to convince you that a steamboat is a possibility for your next project and for more information see the Steam Boat Association web site www.steamboat.org.uk.

Working Party Update February 2016

Hon Sec Geoff

Track Renewal:

Well, we almost made it, only 50ft. short. The old track which remains is on the first quarter of the large bend by the ladies golf tee. It has been so wet and cold that standing in 50mm of water and unable to use levelling compound due to the low temperature the working party made the decision to halt track relaying pending the arrival of Spring.

Work has continued however on making up some more track sections and the preparation of sleepers in readiness for the final push. We have also taken laser measurements on the large bend for about the sixth time to be sure that all the changes we have made on that section will give the correct gradient and super elevation. By the time we fit the 'golden fish plates' on the very last joint we will have spent as much time on the 'big bend' than half of the rest of the track taken together.



Two Geoffs (An Ingenuity of Engineers?) double checking the levels.

Pre-Season Safety Checks:

Having a couple of working party days free from track laying the working party has taken the opportunity to complete the 'Pre-Running Season Safety Checks'. These checks involve checking out all the infrastructure from station lighting to signalling and compressed air supplies, traverser operation, safety interlocks, even to the extent of checking that there a spare fuses for the 12 volt blower electrical supply. The checks also include examination of all the riding cars and recording their braking distance on test. Having completed the checks for the main track, similar checks are carried out on the portable track, the portable track riding car and the trailer.



Safety checks being carried out on the south traverser

Portable Track Events 2016

The portable track season has started again and John Hunt is looking for volunteers to help run the following events

Askham Bryan College Countryside	Sun 12 June
Goole RSPCA Show	Sat 18 June
Strensall	Sat 25 June
Collingham Gala	Sun 26 June
Camblesforth School fair	Sat 9 Jul
Hensall School Fair	Fri 15 Jul.
Selby Abbey Yorkshire Day	Sat 23 Jul
Rodley Nature Reserve	Sat 20 August
Cawood Craft Fair (3 day event)	Sat/Sun/Mon 27-29 Aug.
Pocklington School event	Provisionally September



If you can help out at one or more of these events please contact John or put your name on the form in the clubhouse.

Society Officers and Committee

President:	Arthur Bellamy
Chairman:	Jack Salter
Secretary:	Geoff Shackleton
Treasurer:	Nigel Bennett*
Committee:	John Hunt
	Steve Russell*
	Peter Smith
	Nick Morley
* Boiler Inspectors plus	
	Martyn Chapman

Leeds S.M.E.E - Dates for Your Diary – Spring 2016

Working Party	Steaming Days/Meetings
Working Parties every Monday whilst track renewal takes place Excluding Bank Holidays	<p>10th April Public Running Day - Eggborough <i>(Awarding of the Leeds Trophy)</i></p> <p>20th April Battery Electric Locos <i>Jack Salter</i></p> <p>4th May Advanced Steam <i>Nigel Bennett</i></p> <p>18th May Members Hints and Tips</p> <p>20th-22nd May National Model Engineering Exhibition, Doncaster.</p> <p>29th May Safety Training Day</p> <p>12th June Mid-Summer Steam Up 12.30 until late</p> <p>10th July Public Running Day - Eggborough</p>

Newsletter by E-mail

You can save the Society postage costs by electing to have the newsletter, in pdf format and in full colour, delivered to your personal E-mail address.

Simply e-mail your request to [Glynne Hughes](mailto:Glynne.Hughes@leedssmee.co.uk) and it should happen automatically.

Send articles for inclusion in the newsletter to the [Editor](mailto:Editor@leedssmee.co.uk) or via mail to the Club Secretary

The Society web page can be found here

<http://www.leedssmee.btck.co.uk/>

Please note the society now has a new web address although visiting the old web site will provide a link to the new one.

THE VIEWS EXPRESSED IN THIS NEWSLETTER ARE NOT NECESSARILY THE VIEWS OF THE COMMITTEE