

# The Oily Rag!

Spring 2013. Issue  
No 113.



**Dave Wood's new Feldbahn locomotive, more pictures and  
information in a future issue.**

*The Taunton Model Engineers'  
magazine*

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## From the Editor

A major change in the boiler test requirements has come into force since the last issue of the "Oily Rag" this will effect all of us who use model boilers. Mike Johns outlines the changes on page 6. The introduction of testing for superheaters has caused some discussion. Let us know what you think about the merit and practicality of this change to the regulations.

For those who like something technical to get their teeth into "Boffin" has written an article on boiler monitoring, I leave you to decide if it is any good, it's all geek to me!

A couple of issues back the magazine contained the first article about another club. This time Bob Jones from the "Vale of Aylesbury Model Engineering Society" has provided a fascinating article on the development of his club and the facilities they now enjoy. Bill Edmondson has contributed our first book review, a collection of essays in honour of L.T.C. Rolt. Shortage of copy meant I had to make good my threat to fill the space with an article of my own. I will have to go back to the old editor for more lessons in arm twisting.

Mr MDF. Has offered to make some name boards for the new station at Creech. The problem is neither station has a name. So we are going to have a competition with a "valuable" prize to whoever, in the view of the committee, comes up with the best ideas. Suggestions please before the next "Oily Rag".

In future I will use the last day of the month preceding publication as the closing date for copy for the magazine. This means articles for the summer issue are needed by 31st May. Surely some of you can come up with something by then?

John

# Chairman's notes

**By Andy Webb**

The AGM is almost upon us again and as I'm planning to stand down from the position of chairman it seems like a good time to have a brief look back at some of the events that happened over the past year.

The exhibition was as always one of the highlights, much enjoyed by all who visited as well as by the people showing their work. The quality of exhibits on display was exceptional, a fantastic shop window for the club. We were even blessed with good weather on both days! Sadly despite this and the enormous efforts by Gerry and the rest of the organising committee the number of visitors was again down on previous years, as were our takings. After much deliberation the decision was taken to suspend the exhibition this year (2013) and to look into having some form of open day at our Creech site during the summer.

Both our tracks were busy throughout last summer. Passenger numbers at Creech are on the increase and I'm sure they will rise a lot more now that new playground equipment has been installed next to the track and of course with so much new building going on in the area. This will mean a bigger workload for those who run the railway on Sundays, I have been asked to make a plea for more helpers especially at the start and end of the session when most of the work has to be done.

Vivary has had a very busy season with large numbers of the people coming to visit the new play area also taking the opportunity to have a ride on one of our trains. This is a major source of income for the

club and many thanks go to the members who give their time and effort to make it run so smoothly. At the end of the summer we held our locomotive efficiency competition there, great fun for everyone who attended and I'm sure it will again become a regular annual event.

Our programme of evening meetings has been a rich and varied selection of four usual club events, visits out and talks given by members and guest speakers. Many thanks to all involved.

If I should also mark the passing of Brian Jenkins, Alan Fradgley, Tony Bulmer and Don Martin all of whom were long standing members, they will be missed. Our condolences go out to their families.

Finally I would like to offer my thanks to my fellow committee members for making my time as chairman really easy, it's reassuring to know that when faced with a problem you haven't a clue how to deal with there is someone who can help. As always there is a need for new people on the committee with fresh ideas and enthusiasm. For those who have never been on the committee it's a good time to think about joining, remember the extra involvement will bring extra rewards.

## News from Crzech

By Mike Johns

In spite of the weather a few hardy souls turned out for our Santa running day and we managed to accumulate a reasonable amount in donation to add to those from Vivary Park to enable a significant sum to be passed to a local charity.

Since Xmas the weather has not been conducive to working outdoors and there have only been a couple of Thursday working parties so far. The Sunday morning gang has completed the steel work for 2 more steaming bays which have now been 'planted' by the Thursday lad such that at least 6 locomotives, 5" and 7¼" gauge, can be prepared or simply displayed at a time without affecting running activities. Work has also started on the permanent Bases for the portable track to allow it to be left assembled as a test track for smaller engines and for driver training.

Work is now progressing on fabrication of the hoist and traverser required inside the workshop to increase vehicle storage space. Once the associated staging has also been erected we shall be better placed to consider holding the 'open invitation' day mentioned in the last "Oily Rag".

Major changes have been taking place in the recreation field by our station where the Parish has been installing new children's play areas which replace the old facilities for the younger ones and provides some facilities for teenagers. From our point of view this should mean the field will become better used by our neighbours and we should see greater interest in our activities.

We are still in discussions with the Parish Council regarding our lease but have not yet agreed a revised document for signature.

## Report from Vivary Park

**By David Spicer**

As always the Santa Special was run to raise money for children's charities. The donations from Vivary Park were combined with those from Creech to make a total of £250 which this year went to The South West Children's Hospice.

We had two engines in steam both of which appear on the back cover. During the winter heavy rain resulted, once again, in the park being flooded. There was no damage to the track but the water did flood the pavilion, fortunately it did not get into the container. Since Christmas the track has been checked and the trolley serviced ready for the coming season. The fence erected to protect against cricket balls is not only ugly was also built in the wrong place. It is scheduled to be moved close to the boundary fence later this month, which means it will comply with the requirements of the HSE for miniature railways. The logic behind erecting it on the wrong side of the road still eludes me!

## The Ticklers (Horological Sub Group)

**By David Spicer**

Sorry nothing to report this quarter!

## Revised Boiler Testing Requirements

**By Mike Johns.**

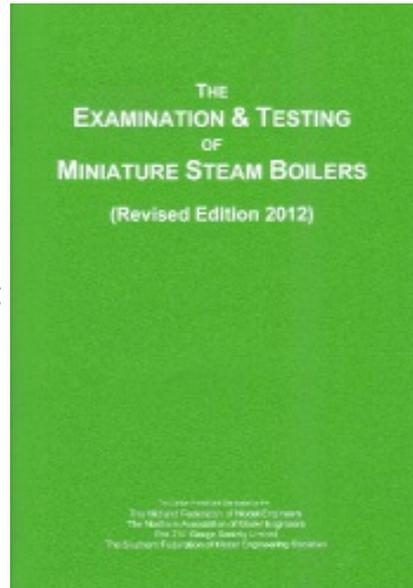
### **New Boiler Test Code**

The booklet Examination and Testing of Miniature Steam Boilers 2008 edition, originally known as the Blue Book, has been updated by the Model Engineering Liaison Group (MELG) and is now the 2012 edition Boiler Test Code BTC2012, the Green Book. The documentation has been upgraded to bring the procedures in line with the requirements of the Pressure Systems Safety Regulations 2000 with the introduction of a Written Scheme of Examination which is applicable to each boiler, or to be more precise,

the Pressure System.

The main changes in examination requirements are the inclusion of small boilers below 3 bar -litres and superheaters. While testing of the latter when new is required it is recognised that subsequent re-testing may be impractical depending on type of installation.

The scheme came into operation on the 1st January 2013. From that date old style boiler certificates may no longer be issued. However a boiler with remaining time on existing certificates may run the course under the old scheme and is only required to be tested under the new scheme once the current certificate expires.



Cover of the green book.

### **The Examination and Testing of Miniature Steam Boilers, Boiler Test Code BTC 2012.**

This is the new Boiler Test Code and will be issued by all of the Organisations that administer the affairs of our hobby. The content has been agreed and approved by the Royal & Sun Alliance, the principal insurer for the hobby. The Boiler Test Code forms part of the Written Scheme of Examination and as such is applicable to every boiler. Under these circumstances it is a requirement that every owner/user of a boiler should hold a copy of the Boiler Test Code.

### **The Written Scheme of Examination.**

The Written Scheme of Examination has been provided in order to comply with the requirement of the Pressure Systems Safety Regulations 2000 and is applicable to every single boiler. The document is to be used in conjunction with the Boiler Test Code BTC 2012 indicated above.

The Written Scheme of Examination form is to be filled in only once unless the boiler changes hands or if the boiler has undergone major repairs or the working pressure has been altered.

The Written Scheme of Examination certificate has three copies. The top copy is to be handed to the owner/user, the second copy is held on file by the boiler inspector and the third copy is to be sent to the Southern Federation Boiler Registrar.

### **The Examination Certificate of a Pressure System.**

The Examination Certificate is a combined Hydraulic and Steam Test certificate. The Examination Certificate has two copies; the top copy is to be handed to the owner/user, the second copy is held on file by the boiler inspector.

### **The Small Boiler Test Certificate.**

The Small Boiler Test Certificate combines a Written Scheme of Examination and a Test Certificate applicable to boiler with a pressure-volume product value of less than 3 bar litres. It may be used by Clubs and Societies whose members operate small boilers such as locomotives, stationary engines and marine models on the Club or Society site.

### **Boiler Test Record.**

This is the small Blue Record card issued previously with the original test certification. It is used to record the various tests and

over the ensuing years will form a historic record of the boiler. It is recommended that the card be continued to be used for the new documentation.

## A system to monitor miniature boilers.

By "Boffin".

I recently cleared the workshop of a deceased model engineer. In a tobacco tin were some plugs for boiler testing and some sooty ones with holes in, it was a while before I realised these were spent fusible plugs. These had protected the boiler, some people were not so lucky, last year I heard of two miniature boilers which had been destroyed by allowing the water level to get too low. Most model engineers are fairly long in the tooth and their eyesight may not be what it used to be, the small gauges on a miniature backhead can be difficult to read at the best of times, so I decided to look into designing an electronic boiler monitor which would give clear indications of the state of affairs in a small boiler.

### Water level.

Although it may be embarrassing to run out of steam in full view of other drivers there is no doubt that water level is the more critical parameter. In my copy of "The Model Steam Locomotive" by Martin Evans there is a section on "Recent Developments" which describes a water level monitor designed by Mr. C.R. Amsbury. The water level is sensed by conduction from the boiler to an electrode. His design has two electrodes, one for low and the other for high water level. These were fitted into bushes in the boiler set at the appropriate levels.

The problem with this is that it requires the bushes to be fitted when the boiler is made or it will require a fairly major modification.

Somewhat ago I had a problem with the water gauge on a boiler which was nearly impossible to read since it was prone to violent oscillations. I made an American pattern column gauge to see if this would help. Before fitting it, I opened out the bore in the original gauge which cured the problem, so the column gauge was never used. At the bottom of the column I had fitted a plug to allow the gauge to be cleaned. Fitting an electrode into this hole would allow one level to be sensed with no modification to the boiler. Fig. 1 shows the column water gauge and the completed electrode. The



Fig. 1

The electrode was made so that it would give a warning when the level dropped to a little above the bottom nut. Except for being mounted vertically and being rather longer the design is very similar to the Amsbury pattern.

Since the PTFE insulators are also pressure seals they were made to be a press fit into the body, the electrode was tapered so that this also became a press fit when fully home. Fig. 2 shows the parts of the sensor. The sensor works well with cold water but has not yet been tried on a boiler at working temperature.

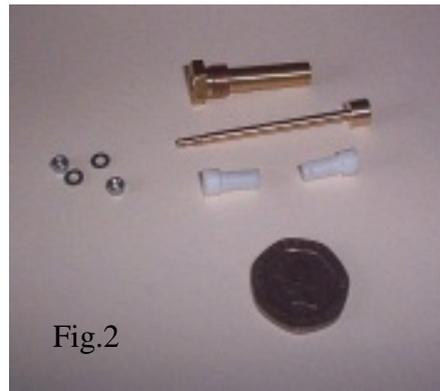


Fig. 2

Distilled water is quite a good insulator but Mr. Amsbury's test showed that in all the places tested

normal mains water had an adequate conductivity for successful operation.

### Steam pressure.

As with the water level sensor, the pressure sensor had to be capable of being fitted to an existing boiler without modification. The relationship between saturated steam pressure and temperature is well known and can be found in your steam tables. The best way to measure the temperature and hence the boiler pressure would be to place the sensor inside the boiler. The boiler used for the tests has a spare bush to allow an injector clack to be fitted, this is not used and the sensor was fitted into this bush. Glass encapsulated thermistors which work over the required temperature range (from 100 to around 180 degrees C) are readily available and also small.

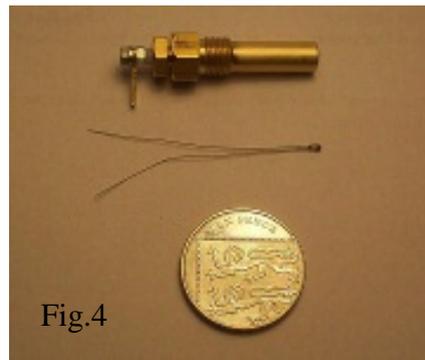


fig 3 .shows the components of the sensor, the glass bead with wires sticking out is the thermistor. fig 4. shows the assembled device. The hole in the body is blind so there is no contact between the water in the boiler and the electronics.

Although the accuracy may be affected there is no reason why the thermistor should not be strapped to the outside of the boiler. If the boiler is well lagged the error would be small. Although it adds complexity it should be possible to compensate for this small error with an additional sensor to measure the temperature

of the leading. Initial tests with laboratory equipment show that the sensor resistance closely tracks the predicted values over the working pressure range of the test boiler.

### **Locomotive box.**

When installed on a locomotive the two sensors will be connected to a buffer box (not that kind of buffer!) which will be connected to the display box by a suitable cable. The box will be quite small and can be hidden under the footplate.

### **Display box.**

The display box will have two LED's (light emitting diode) One to indicate the water level, green for OK, red when the level is low and another which would show green for power on, battery voltage adequate and no error conditions such as disconnected cables, it would show red when all is not well.

There will be a boiler pressure readout. This could be an analogue meter but I favour a digital display since it will be more robust. Potentiometers will be provided to set the display up to match the reading of the pressure gauge on the backhead. These will be preset and not adjusted in normal use. The size of the box is determined principally by the batteries and the size of the display so it does not need to be large. Modern LED's can be quite bright but the display would be best viewed out of direct sunlight.

### **Boiler control.**

Having derived the signals needed for a monitor there is no reason why they should not be used to control a boiler. The water level signal could very simply turn on and off an electric feed pump. If the boiler was oil or gas fired the pressure signal could be used to control the burner. But on a passenger hauling locomotive surely this is the job of the driver!

# The Vale of Aylesbury Model Engineering Society

**By Bob Jones**

Formed at an inaugural meeting in 1972, the story of VAMES, as it is known, is a bit different to many model engineering societies. While, like most societies, it started from small beginnings, with a few founder members having a bit of portable track and a couple of 5" gauge engines between them, it wasn't until the society managed to find a permanent home that it could begin to make real progress. This permanent site for a ground level track resulted from an invitation in the mid 70s from the Quainton Railway Society at the Buckinghamshire Railway Centre who happened to have a bit of spare ground. They own the whole site of 25 acres so when the offer arose serious thought and debate resulted. Concern was expressed that VAMES could be swallowed up by QRS and some members were very cautious. However, finding suitable sites for tracks is not easy and there is always the danger that landlords can change their minds or decide to sell out from under a club.

However, agreement was reached and they went ahead.

Fortuitously, at the same time, some track became available locally which, for the princely sum of £50 would provide enough for a circuit of 1200ft. The track had been a tabungalow called "Golding Spring" hence the transfer of the name to the miniature railway at BRC some 10 miles north of Aylesbury. The arrangement was that, for a peppercorn rent, VAMES would be open to the public whenever QRS was in steam. It still is but, instead of 7 days a year when QRS first opened, it has now increased to over 50.



A train hauled by an 08 diesel leaves the station.

There cannot be many clubs which are required to run every Sunday, Bank Holidays, Wednesdays during school holiday times and even the occasional Saturday, between Easter and the end of October plus February half term and 8 days of Santa Steamings in December. Such a commitment is quite onerous at times but, thanks to a core of stalwart members, who travel to the site from a 30 mile radius, we have so far managed to avoid rotas. Just!

Initially, rides were charged at 10p a time which generated enough income for improvements such as the purchase of a second hand builders' hut which was then cannibalised to make a station building. This enabled rudimentary refreshments to be served from better facilities than the caravan used beforehand. Over time the fares have been increased but they still remain low at 80p (for a 6 minute ride) as we are conscious that visitors have already paid entrance money to come on site.

By 2000 the society was giving 25,000 rides at 50p a time which provided considerable income for improvement each year. These developments are not just a result of track income but are largely due to 20 – 30 regular members who come to work on the site every Wednesday all the year round. They have a wide range of skills and each gravitate to jobs they fancy doing and whatever is needed. All that is required is a sense of humour and doughnuts are provided at 11.30am....

The original track was up and down but soon expanded to a oval with a simple bay loop at the station. It had 3½”, 5” and 7¼” gauges and was largely aluminium. By the 1980s a brick workshop cum carriage shed was built with some steaming bays and a line down to the track. Also, a brick building shop was constructed, for selling bric-a-brac to bolster club funds, and a signal box utilising ex London Underground equipment so that 3 aspects signalling could be installed and operated either automatically or by a signalman. Much of the track was now made of steel.

In 1995 the track was extended to encircle the workshop and the car park which necessitated the inclusion of a level crossing. In 1996 a three lane corrugated carriage shed was constructed to house the growing number of passenger trucks needed.

When in 1997 QRSA acquired an adjacent field, more space became available. This enabled a figure of 8 longer track total length 1km with a diamond crossing to be created. A figure of 8 was chosen, rather than an dumbbell shape, to even out flange wear. It is 7¼” and 5” gauges and made from 20mm steel welded onto metal sleepers. Each of these in turn is screwed onto wooden sleepers made from old railway sleepers cut up and soaked in creosote. Expansion joints were an necessity and at first we didn't have enough which became readily apparent when it raised over 6” into the air on the first hot day!

For many years the Bucks Railway centre has relied heavily on the income from 9 days of Thomas the Tank Engine events plus Santa Steamings. By 2000, quite apart from the demand on members' locos, and 16 passenger trucks each capable of holding 5 adults, getting passengers on and off quickly to try to keep the queues down was becoming a headache. The winter of 2001 was spent rebuilding the station layout to incorporate two platforms and an avoiding line. Each platform has an arrival end where passengers safely light and leave by an adjacent gate. Then the driver draws forward to the departure end ready for the next batch of customers to load up. Coal and water are available while loading up takes place. Queuing is arranged so that there is enough room for about 15 adults waiting in line after buying tickets so there are no delays. This has worked very slickly ever since and, with the subsequent addition of a station canopy and a cover over the waiting area, is appreciated by both staff and public when the weather is wet.

The next six years saw further major changes to the site. First, with the need to house the ever-growing home fleet of locos another carriage shed was needed. Most of the passenger hauling is done by 7¼" gauge locos. The two main club locos are a petrol hydrostatic sit-in Hymek, which was built by club members in the late 80s, and an electric 4-battery Baby Deltic which has a driving truck again built by club members in early 90s. Both have had to have a major overhaul in the past 12 months – regular maintenance tends to be overlooked!

Most of the steam locos owned and run by club members are 7¼" gauge. They are the usual range of Bagnalls, Hunslets, Romulus (or should it be Romuli?), a Wren, a couple of very reliable freelance locos and others.

Over the past few years several more standard gauge outline locos have come on stream so storage space continues to be a problem.

A new 3 lane carriage shed was built in 2002 with a concrete floor some 4' off the ground due to the slope of the ground where it needed to be. Much of the whole site is gently sloping which makes for interesting driving especially for newcomers with small 15" gauge locos. There is a ripple bay loop down the far end of the site, disguised as a miniature station building complete with Barbie Doll and Action Man figures, which is useful for an engine which runs short of breath on the way round!



A tunnel was constructed with a grass picnic area above it. This immediately became very popular with children as it added interest to the ride.



Wilberforce exits the tunnel

Next was the addition of public toilets so that no longer did parents have to trail down to the main BRC building just when they had started to drink a cup of tea. This encouraged members of the public to stay on the site for longer. Refreshment sales increased as did the number of rides. The track goes round the picnic area which is fully fenced off so that children can run around in safety.

A garden railway, construction of which started in the late 90s adjacent to the picnic area, was expanded and children and adults seem to spend hours just watching the trains go round. The members who run electric and steam driven 16mm scale train on 45mm and 32mm tracks now comprise a sizeable number and they try to run whenever the society is open for rides.



The garden railway

For a number of years it had become evident that the old wooden station building was past its sell-by date. The walls were starting to rot and it could only seat a maximum of 13 people; a bit of a squash at a doughnut time. Replacement was needed and savings up started. In the meantime, the shop had become redundant. There was plenty of

stock in the form of second hand tools available, but getting it opened and manned was too difficult. It was also apparent that washing facilities needed improving. The days of using an outside tap had long gone but no hot water was available for hand washing except in the kitchen and hygiene made use of that impracticable.

The answer was to brick up the front and split the shop into two. At one end there is now a wash room containing a pair of wash basins with hot water. At the other end is an exhibition room behind a large window display. The exhibition shows what we do, where we come from, etc. ie all about the society. It also has a small garden railway track with an electric loco and coach which disappears into a tunnel round behind the display and stops at a station at the front. It starts again when a button is pressed at the side of the window. This keeps children entertained while parents can read the displayed information. School visits to the site now take longer as every child simply has to have a go at pressing the button!

By 2010 enough money had been saved to fund the construction of a new station building, in place of the old one but as large as could be accommodated in the space available.

Costing £60,000, it was opened in May 2012 by Sir William McAlpine.

Comprising a club room to seat over 30 people and with improved kitchen facilities.

It is proving to be a great asset, although the society's monthly meetings in winter are still held at a larger community centre in Aylesbury.



Opening day

Current activities involve the construction of brick walls around the Carriage and Wagon Works. Passenger trucks need regular maintenance and hitherto it has had to be done under a plastic roofed lean-to with sides open to the elements during the winter months. At the same time a third carriage shed is being built. This will have two lanes with a very low roof and hold two standard rakes of three passenger trucks and a guard's truck. This will free up more space for home fleet loco storage in the other sheds. Despite the commitment to run the railway, the members are no different to those of other societies. Building and running steam locomotives is the highest occupation – mostly 7¼ gauge but some 5". New 3½" locos seem almost as rare as hen's teeth although there has been increased activity in running these round the short track in the past two years.

There are some members who have miniature traction engines and the society has held an annual miniature traction engine rally on the first weekend in June for the past 25 years and visitors are very welcome. Interest in the garden railway facilities has encouraged more members to join the society and membership stands at over 100.

In the absence of a pond there is no boat section and little interest in making clocks. Much more information



can be gleaned from the VAMES website, which shows plenty of pictures, and there is also a link to a separate 16mm. VAMES website. Visitors are very welcome so if you have a loco and fancy bringing it for a day visit, just get in touch. It is best to avoid Thomasevents but otherwise there are usually no problems in making arrangements.

## Landscape with Technology

By Bill Edmondson.

As an admirer of Tom Rolts, I collect books by him when they become available at the right price. EBay is a good place to look and after a while you get used to spotting the regulars – biographies of Brunel, Telford, the Stephenson's. The three volumes of his autobiography – Landscape with Machines, Landscape with Canals and Landscape with Figures; all highly readable. So when I spotted Landscape with Technology, although I recognised the echo of these three books, I didn't know the title. The descriptions soon revealed all.

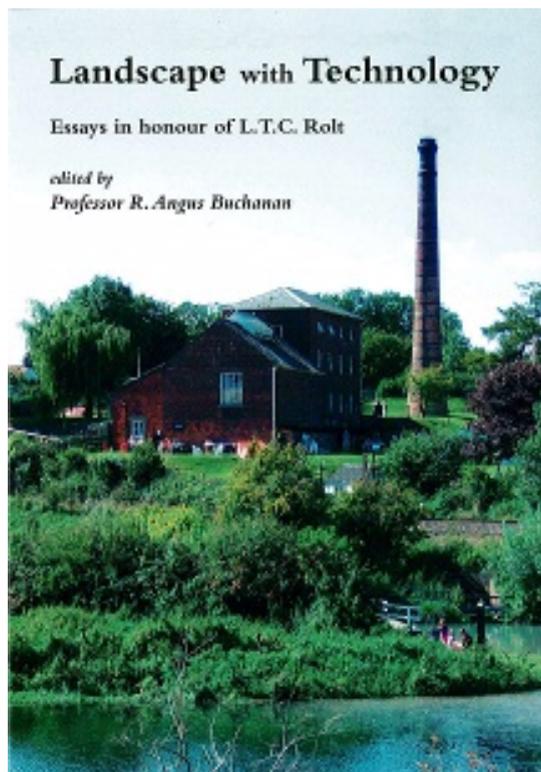
This is a compilation of essays brought together in 2010 (the centenary of Tom Rolt's birth), and published in 2011 by members of the Rolt Fellowship. This was formed in Rolt's memory around 1974 just after his death, by the University of Bath. Its aim is to research the history of technology. A quick search on Abe books found a seller asking just £1.81 for a new copy – clearly this book had not sold well. If one hasn't seen a single review of it. More's the pity because all nine articles are fascinating.

I won't mention them all, but Brenda Buchanan has written about

building the mole outside the harbour at Tangier in 1661 – 1684. This is important because it is where, we are told, gunpowder was first used scientifically to quarry large amounts of stone building material. Plus the use of “tarris” cement which sets under water. A technique used with great success by the British engineers and then promptly forgotten so that it had to be re-invented in the mid 18th century.

Then there is a plea for new investment in the aerospace industry which Britain still has; putting forward the suggestion that even now it could design and build a reusable spaceplane. The author, David Ashford argues it just needs a leap of faith.

But the article I enjoyed most is by Geoff Wallis who presents a view that too many historic sites are wrapped up in excessive Health & Safety. He makes his points by looking critically at the Crofton Pumping Station on the Kennet and Avon canal, where he points to alterations such as the installation of three staircases on the grounds that they are required for H&S. But as he points out, all of the preserved windmills in the UK retain their ladders to climb upward. His point being that the feel of what we see now is nothing like the



Victorian pumping station as built. He argues that too often the fear of litigation results in a fortress mentality.

In another essay, the photograph of a Comet jet aircraft taking off, propelled not by its jet engines but by two rocket motors is worth the purchase price. This is part of an article by Peter Stokes, one time apprentice and lifetime employee of the De Havilland Aircraft Company.

I thoroughly recommend this gem which seem to have slipped below the radar.

## Austerity American Style!

**By John Pickering**

As a child I was fascinated by the books my father used to produce. He was a regular subscriber to the "Model Engineer" and when the stack of old issues was taking up too much space he would take them apart, collect them together, the series he wished to retain and bind these into books with brown card covers. I still have a couple but unfortunately he gave the majority away over the years. One was a particular favourite this was "Austere Ada" LBSC's 2.5" gauge version of the British WD. austerity locomotive.

Having put the case for building and operating 2.5" gauge engines in a previous issue of "The Oily Rag". I decided to build another one and "Austere Ada" was the obvious choice. However there was one thing I was concerned about, my ability to fire a narrow firebox engine in this gauge. It was at this point I came across the S160 on

the "National 2.5" Gauge Association" website. N2.5GA could supply copies of the construction series and the drawings, they also have castings made for this and several other 2.5" gauge engines. Here was an even more brutal looking locomotive than "Austere Ada" with the added advantage of a wide firebox, which LBSC claimed made it more suitable for the "inexperienced engineman".

Decision made! I joined the association and ordered the bits.

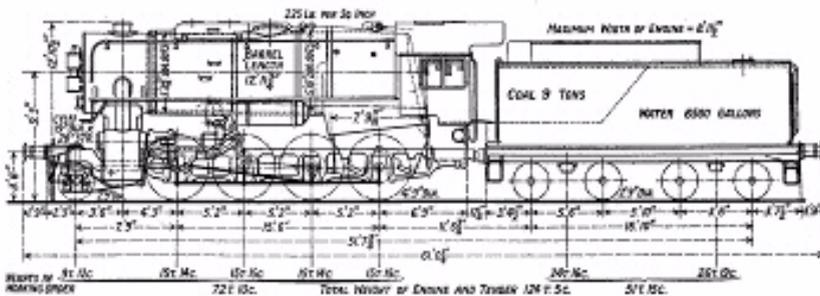


During the first world war, the American forces in Europe used Baldwin 2-8-0s as their standard heavy freight locomotive. In the 1930s the design was updated and designated the S159, since there was no requirement for them at the time, the design went no further than the paperwork stage. In 1941 eight were ordered from Lima Locomotive Works. During the build Lima introduced many design changes. Major J. W. Marsh took the original design and the modifications and designed the S160 during the early part of 1942. During 1942 and 1943 almost 800 were built by Alco, Baldwin and

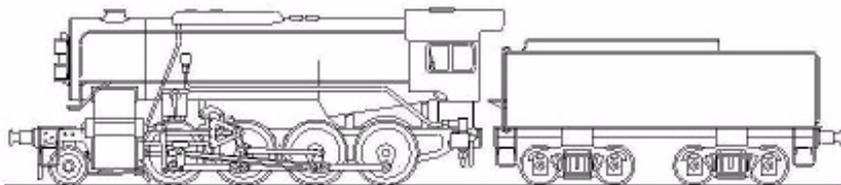
Lima. These were shipped to the UK to await the invasion. 400 of them were pressed into service in Britain to help with the shortage of motive power. These engines were redesigned quickly and intended to be quick and cheap to build. Cutting corners resulted in problems. The greased axle box bearing tended to run hot, the Westinghouse brakes were considered "woefully" inadequate and probably worst of all overheating of the firebox crown, probably due to an unreliable single water gauge, resulted in three boiler explosions in service. But they did have their good points, they were powerful and free steaming. After the invasion all the S160's left the UK.

I do not know how the problems were resolved but after their war service these engines ended up working on railways all over the world with some doing so for many years. The last one in China was not withdrawn until 1997. The long lives of some of these engines meant they survived into the preservation era and now there are around 25 scattered around the world, several in the UK. Not a bad service life for an expendable piece of military hardware!

I find CAD very convenient and started my version by transferring the LBSC drawings to CAD. I am not too good at sticking to "The words and music" and usually change designs as I go along, which is easier with CAD. In his introduction to the construction series LBSC makes the point that this is not an exact scale model but comparing his drawings with an outline from "British Locomotive Types" (1943) his basic outline looked quite close. The "scale" of the LBSC drawings based on the major dimensions, looks like 14mm/foot suggesting he was working from a gauge 0 drawing doubled up. 7mm scale drawings were obtained from PDH Drawing Services and the fine detail taken from photographs. Some changes were made to give the model a more scale outline. The N2.5 GA wheels castings are close to scale though those available in 1943 which also helps with the appearance.



Prototype from Ministry of transport drawings.



LBSC's version

Metal cutting started when I sent DXF files for the main and truck frames to Luffman Engineering for laser cutting. The ability to haul loads with small engines is often limited by their weight, so I decided to hide as much extra weight as I could in my engine. The frames were cut from 6mm. plate which is a little overscale but added useful weight. The bracketry for the front buffer beam and pony truck suspension was replaced by a solid block of cast iron as was the drag box at the other end. Neither of these modifications will show when the loco is complete. The cylinders, axles, wheels and pony truck are all as per the drawings. The close axle spacing means that LBSC's standard feed pump with the valve box inline with the bore has a very short ram so I moved the valve box to the side which gives a much longer ram and should improve the reliability.

There are many pictures of S160's on the net including some useful ones of locomotives during restoration. Pictures of a tender being



Stillearlydays

rebuiltmadeitclearthattheLBSCdesignhadlittleresemblanceto theprototype,sothetenderwasdesignedfromscratch. TheLBSCdesignallowsforarticulationofthetruckframesby havingtheaxlesasloppyfitintotheholes.Ididnotlikethis design mineareratherdifferent.Thewheelsaremountedontubularaxles withIgidurbearingsinside.Theserunonsolidaxles,oneendof whichisloctitedintoaframesideandtheotherendisrounded. Eachframehasonefixedaxleandonewhichpivots.Theresultisa tenderwithverylow rollingresistanceandthe abilitytorunovera1/8" stepinarailwithout derailingorobviousplay.

LBSC'sS160boilerhasa widefireboxbutalsoa veryshallowslopinggrate. Withaleveltoptothe firebedthebackofthe grateisnotcoveredwhen thefireisblockingthe lowerfiretubes.Atan exhibitionIdiscussedthiswithtwoN2.5GAmembers.They saidof twowhichtheyhadseenrunningonesteamedwellandtheother hadproblems.



Closeupofoneofthetrucks

The first boiler retained the siphon tubes which were a feature of both the prototype and the LBSC design, the second did not. Whether the differences were due to the modification or the ability of the drivers was not known. Initially I was going to reduce the steam space in my boiler and raise the fire tubes to get a greater depth of fire, but it struck me that the difference in the two boilers could be that the siphon tubes were preventing the fires sliding forwards in the unmodified boiler and making it easier to fire. I have since spoken to another N2.5 GA member who has driven S160's who said the standard design was fine and recommended I stick to it, so that is what I will do. The materials arrived a few days ago. I do my boiler making in an open fronted barn to avoid the fumes, but at the moment it is far too cold for "alfresco" boiler making so it will have to wait for the spring.



The 5" gauge versions spotted at the Midlands Exhibition.

A while ago an S160 in an early stage of build appeared on Ebay. It looked almost identical to mine but turned out to be 5" gauge. One of the first things which caught my eye on the club visit to the "Midlands Model Engineering Exhibition" was a 5" gauge S160. On the card it said that this was the LBSC 2.5" gauge design doubled up. It was an older model but clearly it worked well. One day I could set the scale on my CAD drawing to 2x and also build a 5" gauge engine, well may be not, too many projects!

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**Working Parties at Vivary Park** on occasion are by advice from Phil Mortimer —if you would like to become involved with these, then contact him —details inside the Front Cover.

**Working Parties at Creech** meet on site on Thursdays & Sundays from 9.30 a.m..

## Subscriptions

**Ordinary Membership is £25 with a further £5 for spouse or partner.**

**Junior Membership —£5**

**Membership Secretary contact details —see inside front cover.**

**If renewing by post, please enclose S.A.E. for Membership Card**

## Note

**Subscriptions for 2013 were due on the first of January**

# Vivary Park Running Days

**Public running will take place between 2p.m. and 5p.m.  
Weather permitting**

**Sunday 31st March (Easter Day)  
Sunday 7th April  
Sunday 21st April  
Sunday 5th May  
Sunday 19th May  
Sunday 2nd June  
Sunday 16th June  
Sunday 7th July  
Sunday 21st July**

**Date of the Flower Show is not yet known.**

# Creach Running Days

**Public running will take place between 2p.m. and 5p.m.  
Weather permitting**

**Monday 1st April (Easter Monday)  
Sunday 14th April  
Sunday 26th April  
Monday 6th May (Bank Holiday)  
Sunday 12th May  
Monday 27th May (Bank Holiday)  
Sunday 26th May  
Sunday 9th June  
Sunday 23rd June  
Sunday 14th July  
Sunday 21st July**

# Meetings Programme

2013

Tues 2<sup>nd</sup> April AG M  
Tues 16<sup>th</sup> April Trophy Night  
Tues 7<sup>th</sup> May Visit Williton Railway Works WSR  
Tues 21<sup>st</sup> May Aneven ingat Creech  
Tues 4<sup>th</sup> June Visit Newberry Rail  
Tues 18<sup>th</sup> June Visit Shute Railway  
Tues 2<sup>nd</sup> July Barbecue at Creech  
Tues 16<sup>th</sup> July Anevening at Vivary Park  
Tues 6<sup>th</sup> August  
Tues 20<sup>th</sup> August  
Tues 3<sup>rd</sup> September Bits and Pieces - Working progress  
Tues 17<sup>th</sup> September "Industry for War" - Terry Callaghan  
Tues 1<sup>st</sup> October Re-building "Dennis" - Steve Gosling  
Tues 15<sup>th</sup> October A "David Hartland Spectacular"  
Tues 5<sup>th</sup> November Auction Night - Mark Davis  
Tues 19<sup>th</sup> November Quiz Night - David Eaton  
Tues 3<sup>rd</sup> December Talk and Slide Show - Peter Triggs  
Tues 17<sup>th</sup> December Mince Pies and Natter

Meetings will be held at the Village Hall, Stoke St. Mary,  
Taunton, commencing at 7.30 p.m. unless otherwise indicated.

The views and articles featured in this magazine do not  
necessarily represent the views of all the Committee, Officers  
and Members.

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**PhilenjoyshaulingaSantaSpecialatVivaryPark.**



**Julietakesthingsrathermoreseriously!**