



NEWSLETTER OF THE COLCHESTER SOCIETY OF MODEL & EXPERIMENTAL ENGINEERS LTD

**No 50**

**Spring 2017**

**Summer Events**

Wednesday 14<sup>th</sup> June

U3A (University of the Third Age) are visiting us from 10am to see what we get up to, and hopefully we can have some loco's in steam and offer rides.

Saturday 17<sup>th</sup> June

Chelmsford Society of Model Engineers 'Invitation Day' to be held at Meteor Way, Waterhouse Lane, Chelmsford. If you want to go along and take your loco / traction engine, please let me know so that I can advise on numbers.

Wednesday 19<sup>th</sup> July

2<sup>nd</sup> Visit to Chelmsford has been arranged from 10:00 onwards with the hope that being a Wednesday more members will be able to attend. If you intend to come please let me know so I can advise Chelmsford of numbers.

Saturday 16<sup>th</sup> September

Meet the Neighbour's Day. From 10:00 onwards so come along and enjoy the party atmosphere.

Sunday 8<sup>th</sup> October

Chelmsford is visiting us and their members will have first priority on track. We will provide our normal hospitality and will need club members to act as 'hosts' to our invited guests.

Saturday 21<sup>st</sup> & Sunday 22<sup>nd</sup> October

CSMEE and its members have been invited to Lowestoft Model Engineering and Model Making Exhibition taking place at the Ormiston Denes Academy, Lowestoft, NR32 4AH. CSMEE are unlikely to exhibit at this event but if you want to take a model along to show, then contact me and I will provide copies of necessary paperwork.

**Ian Pryke**

**Activities during this period of LINK**

Invitation Weekend was held on the 4<sup>th</sup> and 5<sup>th</sup> June where representatives of Chelmsford, Ipswich, Norwich and Peterborough model engineering clubs visited Colchester to use and view our wonderful facilities.

A 'Special' 70<sup>th</sup> Anniversary family Day held on Sunday 4<sup>th</sup> September with a Hog roast and live music, including a bouncy castle for those not interested in trains!

Night run held on November the 5<sup>th</sup> with fireworks and hot food organised by Peter and Sue Bohn.

January 22<sup>nd</sup> saw 41 bodies on a Kings coach bound for North London and the “Ally Pally” London Model Engineering Exhibition. Another great trip organised by Ian Pryke.

As well as the normal trade stands there were a good number of societies/clubs displaying their models and generally talking about their ‘hobby’. We have made contact with St. Albans model engineering club and may look to arrange visits with them during 2017. Chelmsford MES had a very good display of models – so good, it won First prize. Here are a couple of photos of their stand.



This is the second year in a row that Chelmsford MES have won first prize!

Could we do better?

### Station and Steaming bay canopies

Last September a proposal, together with sketches, was presented to the committee to construct a Station canopy in front of the clubhouse to provide weather protection to members of the public during the children’s parties and also for a canopy over the raised track steaming bay to allow for steam testing during periods of rain. After discussion and minor tweaking of the design, approval for a free standing station canopy and steaming bay canopy was given. Peter Bohn has used his engineering contacts to purchase the structural steel and at the time of writing this, the 4 support columns for the station canopy have been set in place and are awaiting the fabrication of the roof truss frames.

**Don Black**

### The kitchen

This story started with a con!!, and a lesson for me. I must learn to keep my mouth shut. Ian P and Don G from the Wednesday gang lead me by the nose into agreeing to refurbish the kitchen. One of many trips to B&Q later I gave 2 quotes to Ian, one very cheap and one for full refurbishment. Wanting only the best for the Club, the committee agreed to the refurbishment.

So with the help of Don B, Gordon and Julien, the work started with enlarging the hole for the serving hatch. Many comments later and after removal of a 4ft concrete lintel the hole was suitably increased in size to save us having to bend down to look through it. Oh yes, sorry to those people still finding plaster dust in their tea!!

The new hatch frame was fitted and doors made using recycled timber from the Council tip. In terms of “Bob the Builder” yes we can fix it. Some new and some refurbished bottom units were fitted together with new wall units. The original quote was for the cheapest white faced panel doors. After careful consideration, a slightly more expensive grey wipe-able finish was thought to be more appropriate for greasy fingered model engineers. It was decided to keep the

original sink but reposition it to provide more space by the serving hatch area but this resulted in Don B being upside down in the cupboard trying to mend pipe leaks for the next three Wednesdays.

We got much encouragement by everyone's comments and help from people making tea in the kitchen when we were working!! Many thanks to Gordon, Don and Julien, who kept on painting throughout all the disruption.



**Martin Courtis**

### **The Wednesday Wrinklies Report**

It seems a long time since the last LINK (Spring 2016) and I cannot remember how I missed giving Don something for the October issue. I get the impression that there is a lack of interest in providing contributions for the Link lately. Is this due to not having a printed version available? As my wife said, having to look it up is not the same as sitting in the armchair for a read in the evening, usually more than once. If I have to look it up on a screen, it is not the same. I would be prepared to pay for my copy to cover costs. How do other members feel about this, or am I one of those oldies who need to have something written down.

Things have changed at the Society of late. The members do not seem to be as actively involved in making models as we used to be. When I first joined the Club there were times when it was difficult to get in the clubhouse on a Friday night. Is it due to the local engineering works shutting down and the skill levels being run down? I admit that I just do not know. Speaking to people at the exhibition at Ally Pally I get the impression that it is the same with some of the other clubs. I was told by one person at the show that the lesser skilled were going out and buying a loco from the trade. When something goes wrong the skills are just not there to fix the problem. I know of some members who have built a nice loco that does not perform very well, and the loco is never seen again, sad!

It is the same in model engineering magazines. There are designs that are donkeys' years old, and are still being repeated in new designs. If something is proven to be better, surely any new design should incorporate the improvement. PTFE piston valves, piston rings and injectors come to mind.

As usual at this time of the year, I add the mileages that I have done over the year. During 2016 I managed to do 135 miles on my loco's. Of this total, 28 miles were run pulling children at birthday parties. With any luck, I look forward to even more miles pulling children round the track in the coming year. I find this a most entertaining use of the hobby. The remainder was run on Wednesdays, Canvey [8] and Chelmsford [7.09] being the mileage run on foreign rails.

There are a number of projects in hand at the club site. I am delighted that we are going ahead with the erection of a canopy over the station area. This will be a vast improvement on our track. Similarly, a canopy over part of the steaming bays will make it easier to do steam tests etc. on

days when the weather is wet, and other tasks that can only be done outside.

There has been a lot of talk recently about putting a “round house” in the steaming bays area. I have stated that in my opinion this would be squandering away our money. All that is needed is some discipline in the steaming bays. If everyone would only move along the bay onto the area around the steaming bay traverser it is possible to steam five loco’s at the same time, with no one being trapped for going out onto the main lines.

**Geoff King**

### **Tuesday Junior Club**

During school holidays, Gordon Ager and I organise a Members Grandchildren Day on a Tuesday to play with electric locos. For the Easter break, Tuesday 11<sup>th</sup> April was a mild sunny day and the 9 children had great fun riding and driving the 2 electric locos initially on the raised track and then on the ground track before the batteries expired. Geoff King and Bev Corkett brought along their steam locos and provided rides for the children. We will continue to run the Tuesday Junior club on other school holidays and hope that more children will get the opportunity to join in.

**Don Black**

### **Steam Locomotive Driver Training**

Steam locomotive driving experience using “Sweet Pea” and possibly “Firefly” will be commencing 12<sup>th</sup> May on Friday evenings, starting from around 7 pm onwards until the light fails. Instruction will be given on opening up the site in readiness for a steam up and the operation of the steaming bays including the water supplies to both the stand pipes and steaming bays. Drivers will be given instructions on firing the locomotive, controlling the water level, and general care of the locomotive under steam. After running, instruction will be given on blowing down the boiler after the fire is dropped and draining down the water tanks before putting the locomotive to bed for the week.

How to start up the signal system and read the signals on the raised track will also be shown together with operation of the traverser and bridge and include the method of controlling the safe usage of the bridge key to prevent anyone running into the bridge when it is required to be lowered.

If anyone would like to have a copy of the Sweet Pea driving instruction disc, please ask me for it so that you can take a copy onto your computer. Look forward to seeing you there on Friday nights.

**Geoff King**

### **Children’s Parties with a difference**

By the time you read this we will already have completed the first party of the year (29<sup>th</sup> April). We are fully booked for this year and already have several bookings for 2018.

We need a minimum of 12 club members to run the parties so please if you are available to help put your name on the website and on the list for each of the planned parties displayed on the noticeboard in the clubhouse. Most parties we are either short of people or just enough which means there is nobody to give the guards or drivers a break so your name on the list is very very welcome.

For those who wish to help out at the remaining booked parties for this year the dates are:-

29 April, 3 June, 24 June, 8 July, 22 July, 19 August.

### **Club Badged Clothing**

The sale of club badged clothing has been dormant now for several months. If you would like to have a sweat shirt or a polo shirt embroidered with the club name and badge, please fill in the list on the club notice board and I will order you one. For an extra fee you can have your name embroidered on if you so wish. I also have embroidered badges for attaching to your overalls at £8 each, and lapel enamel badges available to order on the notice board. You will find a shirt with the club logo on the front useful if you visit another club or attend an exhibition.

**Geoff King**

### **Chairman's Ramblings**

There have been some changes to the Council of Management. Andy Hope, our Chairman for approximately 40 years has retired for personal reasons. Robert Clarke, Council member, has stepped down to go off travelling. We wish them well for the future. We welcome two new faces in Council, Graham Willmott and Dave Hammond, I am sure they will bring a different perspective to Society matters.

The Society has acquired a test pressure gauge from Mike Gipson's workshop. This will be for members' use to test their boilers prior to presenting them for formal testing by the Society's Boiler Inspectors. It should be noted that this gauge under-reads slightly but this shouldn't prove to be a problem. Should a member wish to use the gauge please speak to a Council member.

Now, many of you will be aware that I have been building a Simplex for many, many years. I think that I am on the home straight. It seems to have been 2 steps forward and 1 step back. Do other members experience this? Only recently I have been trying to fit the ash pan and grate, a five minute chat with Andy and the problem was solved; thanks Andy! The point I am trying to make here is that this is one of the many reasons for joining a group of like-minded people; there is a wealth of information and expertise within our Society. I am sure that these people will be only too willing to offer advice, just ask!

### **MEMBERSHIP**

Total membership stands at 116 consisting of:-

94 Full members, 13 Juniors, & 9 Associates (Scale 4)

14 members have neither renewed nor resigned. If you are one of them, please contact the Treasurer and help us to understand why. This will be your last LINK.

**David Cocks**

### **Secretary's Report**

The Council have reviewed our documentation, so that we can embark on a sensible plan to ensure compliance with all necessary legislation, and have revised and re-issued our Bye Laws. Minutes of Council meetings (once approved) are always on display in the Clubhouse and on the 'members only' section of the website.

### **AGM – 28 April**

This meeting saw a major change in the way CSME Ltd. elects its Officers.

The position of Chairman, Treasurer and Company Secretary have been voted on by the membership and not from within Council. This gives all members the opportunity to have a say in how this unique society is managed.

Another major milestone at this AGM was Andy Hope retiring from the position of Chairman. His achievements are all around us – whether it is the design of the raised level track, the ground level track, signal box or footbridge – his knowledge and handiwork are a truly wonderful legacy. He continues to support all of our activities but without the additional burden of being

our Chairman. Thank you, Andy. In recognition of his wonderful contribution the membership endorsed the Council recommendation that he be awarded Honorary Membership of CSMEE.

As a result of this major change, David Cocks has been duly elected to the position of Chairman. I know that you will all wish him well and support him in this role.

Peter Bohn continues as Treasurer and I as Company Secretary. We thank you for your continued support, but please remember, we will need 'others' to share some of the burden as we plan for our retirement. Succession planning has not yet made the agenda, but I am sure it will !!

Two new members have been duly elected onto Council – Dave Hammond and Graham Willmott. One has been around as long as many of the society's members and the other a relative newcomer. They may have felt they have had their arms twisted up their backs a little to stand for Council but I know that they will assist in the ongoing development of our wonderful society.

Friday night attendance is waning, Ian Pryke continues to seek new and interesting ideas for the winter talks and our membership is forever aging, so we welcome Dave and Graham to come sit with us and contribute - we need their enthusiasm and ideas.

So your Council members for 2017/18 are:

Chairman: David Cocks  
Treasurer: Peter Bohn  
Secretary: Ian Ransome  
Council members : Dave Hammond  
Alan Ilett  
Geoff King  
Ian Pryke  
Graham Willmott

### **Local Shows**

CSMEE are supporting three local shows this year – Great Bentley, Tolleshunt Knights and Five Parishes.

Dates are:	Tolleshunt Knights	Sunday 30 <sup>th</sup> July
	Five Parishes	Sunday 6 <sup>th</sup> August
	Great Bentley	Saturday 2 <sup>nd</sup> September

We hope to have numerous exhibits and at Tolleshunt and Five Parishes we plan to have the 100 ft. of track with a loco in steam (and/or Peter B with his Union Pacific horn !). As usual, we need your support to help manage these – they are our shop window and we look to publicise our society at these events.

### **Station Canopy**

For those that have attended the site recently you will have seen the four galvanised posts ready to hold our planned station canopy. Don Black has been instrumental in designing, planning and now fabricating this new feature within our site. Thank you Don (and all the others) who are helping achieve this. At the time of writing Andy Hope is wielding his welder, Don is directing operations and fabrication has started.

### **2017 Neighbours Day**

For those of you that attended the AGM, you will have been part of the decision within the Society to hold another Neighbours Day. We have decided upon Saturday 16<sup>th</sup> September and without any pressure from me (or other Council members) Yvonne and Peter Chappell

volunteered to take on the management of the day. They managed the previous neighbours' day event in 2015 and it raised over £450 towards our funds – so we look forward to another very successful day. Please help in whatever way you can.

**Ian Ransome**

## **INDENTURED**

### **Episode 16**      **A tale of old time learning in industry**

Readers may recall from the previous episode that Dorman's contingent had just been met by their guide outside the Crewe works. Because it was a Sunday morning little activity was taking place but even so one could only be impressed by the sheer scale of the place. The erecting shop appeared capable of holding perhaps forty locomotives -- but then in its heyday Crewe could turn out two completely new locomotives per week. Moreover, everything was made at Crewe. Forgings, castings, myriads of machined components-- and, of course, the boilers which were produced in a separate shop featuring some truly enormous bending rolls and presses. Only the most basic raw material was bought in. Much of this vast organisation was due to Francis Webb who came, over the years, to epitomise Crewe works. Sad, that in the end, he became rather truculent and found himself at loggerheads even with the General Manager (Harrison)-- in fact going so far as to ban the General Manager from entering Crewe works ! This was, surely, a step too far and moves were made to persuade Webb to retire -- it is thought that he had no such intentions but a statement was issued by the Board stating that: "Mr. Webb has expressed a wish to retire". As mentioned previously he seems then to have suffered something like a nervous breakdown and was taken away from Crewe works by his brother the Rev. A.H. Webb.

The very works that Webb had made into such an efficient manufacturing organisation was now used to scrap many of his locomotives. This was not a particularly rational policy and, in due course, it was to result in a serious, and quite unnecessary, shortage of motive power. Whilst many of the compounds were somewhat idiosyncratic in their design and advances in train weight rendered some of them obsolete, this hardly applied to the later engines -- especially the 'Alfred the Greats'.

In their tour of the plant it was evident that most of the works was given over to component manufacture and wasn't so different from Dorman's except for the size of everything. Julie, who had spent time in both the Dorman's foundries (ferrous and non-ferrous), thought that the process was similar except that at Crewe they would make up a mould actually using the floor as the base. This was the practice in other foundries committed to making large components, an example being ship's propellers. Something that Dorman's definitely did not do was to cast steel. Crewe cast in this material for certain critical items such as the hornblocks and wheels. In fact Crewe, under Francis Webb, had installed the first Bessemer plant in Britain. It wasn't until you reached the erecting shop that the end product of this entire endeavour was clearly discernible. At this time the works were still building 'Britannia's' and the view of the partially completed locomotives gave one an excellent opportunity to consider some of the design features. The use of a welded frame contrasted with the other locos in the shop which were there for routine overhaul. Additionally, the eye could readily detect the unusually narrow spacing of the main frames; Edward was aware that this feature had been copied from the Bullied Pacifics. When the group eventually emerged from the works, into full sunshine, the first thing to catch their eye was the Britannia locomotive No 70037 'Hereward the Wake' which was standing in the yard. It was resplendent in fresh green paint and with its polished brass and copper made a stunning sight -- particularly when viewed from ground level. The whole of Dorman's contingent gathered around it -- Edward taking the opportunity to look at things more closely. Peering at the frame, behind the driving wheels, he could see that someone had welded scraps of steel plate in a radial pattern around the top corners of all the horns. There could only be one reason for this: the frames were already showing signs of failure. (Number 70037 was a Norwich engine and had only been in service for about twelve months).

Returning to work on the Monday morning he could not help but think how small everything seemed after Crewe. In truth, Dorman's itself was remarkably self-contained; after all, they had their own foundry and undertook all machining themselves. They also had a die-casting shop and a limited facility for pressing sheet metal components. They could not, however, forge their own connecting rods-- these were procured from a company in Bromsgrove. The first task that awaited him was to put the 4L, with its rotary pump, back onto the dyno (now vacated by the '2L' ) but not before the millwrights were given an opportunity to check that the foundations of the bed were still in a satisfactory condition. As far as Edward could tell, after a lengthy discussion, they confined their efforts to just tightening up the rag bolts. This was followed by the classic injunction to 'give them a shout' if it was thought that the bed was showing signs of movement!

The following day Mr. Jones was away on business and had asked Edward to look after the 4L. This would entail running a succession of power curves with different timings. Naturally, he was a bit apprehensive at being left to undertake this task on his own -- he was not worried about the engine so much as the novel nature of the rotary injection pump. Additionally, there was more data to be recorded now than he had ever had to concern himself with before. In consequence the whole task took longer and at the end of the test he had quite a sheaf of log sheets from which he was required to graph the results. Also available were the baseline figures for the engine running with the standard (in-line) injection pump. Preparation of all this data in a graphic format took up much of the week whereupon he was able to detect that the new pump scarcely equalled the baseline performance -- especially when considering fuel economy. Much discussion was to take place concerning these results and he found himself involved with both the experimental people and the drawing office team. Unlike the 'in line' pumps-- with which they were all familiar -- this rotary worked the 'wrong way round' -- that is, in a manner of speaking. The 'in line' (or jerk pumps) had a characteristic where the rate of pumping speeded up during the injection period itself. (It was sometimes called a 'rising rate' pump). The DPA, however, had a falling rate characteristic. How much this quality affected the engine performance was not, at this time, fully understood. Clearly, a final decision on Dorman's use of the DPA would not be made overnight. Unfortunately, about this time, a mildly disquieting incident had occurred relating to him and Julie.

It seemed that a certain individual at the college had been shouting his mouth off during the lunch break to the effect that he was going to give the guy who was courting Julie a bit of competition. This, of itself, didn't mean much but the fellow managed to make his remarks within earshot of Julie. Possibly this was unintentional but he did have a loud manner of speech. (It was an unfortunate chance that her day at the college coincided with that of this fellow. (Edward went on a different day). Naturally, she related this incident to him later. Whilst he could see that it was offensive to her, he felt that it was only the mutterings of a young and probably egotistical male seeking to impress his fellow beings. Nonetheless, he decided to find out more about the individual concerned. Fortunately, he'd a couple of good pals in English Electric where this obnoxious youth was an apprentice. His name, apparently, was John Fortesque - Pugh (the John being pronounced 'Yon'). The common view was that he had a high opinion of himself which was not borne out by his displaying any discernible talent in any particular direction. Moreover, one of his fellow apprentices made the observation that if his brains were in his mouth then he might well have been a genius. In view of all this, Edward felt that there was not much that he could do at the moment unless, of course, the wretched fellow started pestering Julie. Up to now, this certainly hadn't happened -- she declaring that he'd never spoken to her and she certainly wasn't planning to speak to him. So, for the time being, that was how matters rested.

Nonetheless, it started him thinking that perhaps it was time that they made their relationship more obviously permanent. This, at that time, would mean them getting engaged. He did not envisage any problem here - he was confident that Julie's parents would be happy about this - but

then she had not, as yet, met his own folks. He mused that this must be put in hand fairly soon -- the only thing being to choose a weekend and decide how to get there. On his own, he had often made the trip to South Wales in the Morgan, but seeing it was now getting pretty cold, he pondered whether or not Julie would find this agreeable. He had, on one occasion, made the trip in heavy snow but had to concede that it was touch and go -- particularly on the high ground beyond Brecon. The other snag was that the Morgan did not provide any heat whatsoever. (Well, you could rest your gloved hand on the exhaust pipe for a short while and get it burnt -- but meanwhile you had to contend with something like frostbite in your feet). It was, of course, perfectly possible to make the journey by train but it took longer than the road journey and cost more.

Meanwhile, back in the experimental shop, testing of the rotary pump continued. They tried different injectors and also looked at the part load timing. Nonetheless, it seemed to Edward that it simply did not equal the standard (in line) type of pump. Whilst smoke measurement was, at this time a little crude, he had nonetheless attempted to establish the Ringelmann smoke readings throughout the tests. (Readers may recall that this entailed viewing the smoke through a hole in a printed card and attempting to relate the colour to various shades depicted thereon). In truth the CAV/DPA pump was a bit too small for the 'L' type engine; this comment relating to its output rather than its physical size. About this time the small IDI engine -- usually with a Ricardo Comet combustion system -- was beginning to make an impact in the market place. This concept was destined to expand to many thousands of engines per year and the DPA pump found total acceptance in this field. It was wise for Dorman's to steer clear of this type of business -- there was no way that they could compete with the mass producers like Ford, BMC, and Peugeot Etc. The mass producers also tended to dominate the 'one litre per pot' size of direct injection engines -- mainly to suit their own commercial vehicle markets. Perkins was an exception to this inasmuch as they did not manufacture vehicles themselves but nevertheless managed to keep hold of a fair chunk of the market. Incidentally, they were to become major users of the DPA pump.

In the light of all this, Dorman's were currently planning to go up market by making bigger engines. The 'Q' range was the first manifestation of this policy and building of the prototype was now well under way: it was expected to be started up within a fortnight or so. In their consideration of the DPA pump the design team considered several features to be highly significant:-

- \* It could not provide excess fuel for cold starting. (This was a commonplace starting aid for virtually all diesel engines and it was readily made available on the 'in line' pumps).

- \* Whilst it had speed based timing advance as an integral feature-- which was a good thing -- an inherent characteristic was to retard the timing when the load was reduced. This was not beneficial to part load economy; it could also lead to a phenomenon called hot misfire. (At high speed, light load, the engine might actually fail to ignite the fuel).

- \* You could not spill time the pump. It had to be timed by means of marks on the rotor and these had to be, initially, set on the bench (i.e. a test machine) using an airline.

- \* It was impossible to adjust the fuel level whilst the engine was running. The pump had to have its fuel level pre- set on a test machine. (This was a serious disadvantage to a manufacturer like Dorman's that set each engine up individually).

All diesel manufacturers possessed such equipment -- normally it was used for testing rebuilt pumps or for experimental work where it saved time to avoid using an actual engine. The machine featured a set of test tubes into which the pumped fuel was delivered via injectors having a known flow quality. By its design the machine would deliver -- typically 200 shots of fuel. Thus the quantity delivered per stroke could be calculated with some accuracy and the setting used could be related to the delivery on the engine. It also revealed how closely the pump was managing to deliver the same fuel down each individual line. Companies such as Perkins preset their pumps in this manner and would not expect to set the fuel on the production line at all. (It was simply impractical to do so. Nonetheless, within the confines of the

experimental shop, Edward was to become reasonably adept at this task and could make adjustments either up or down with reasonable accuracy and without removing the pump from the engine). The upshot of all this was that Dorman's did not take the DPA for the 'L' engine range. However, they were currently preparing a new design called the 'DA' -- an air cooled engine of smaller cylinder size than the 'L' -- and, in due course, this would make use of the DPA. Although the DPA was not to feature again in Edward's time at Dormans he was, in later years, to be particularly grateful for the experience that he had acquired.

Like all firms, Dormans would, from time to time, suffer occasional instances of petty pilfering; but for the most part this was of a minor nature. A possible reason for this was an enlightened policy whereby an employee was able to purchase any item in the stores at cost price plus 10%. Typically, people would buy steel barstock in this way and probably nuts and bolts; another favourite was paint. Sometimes the price advantage was considerable. For instance: Lodge sparking plugs were sold for a shilling each. (This included the 10 %!). The same plug bought in the town would cost you five bob. However, despite the friendly nature of the firm, odd individuals would sometimes attempt to illegally remove material. It so happened that in order to expedite the walk to his lodgings Edward would sometimes leave from a 'pedestrian only' gate situated on the town side of the factory. The gate keeper on duty here was one with whom he had a nodding acquaintance. A pleasant man -- possibly insufficiently vindictive for the job! -- He was apt to make humorous comments as some of the men passed by his gate. Now, in the foundry there was a labourer named Bill Moss, certainly not the sharpest needle in the box though generally considered affable enough. It seemed that this chap had noticed that the foundry was casting lead bars. These were about a foot long-- apparently for some electrical job -- and having heard that lead was of value in the market place -- decided to avail himself of a few. Sadly, he probably did not realise how heavy the cumulative weight might be and proceeded to string them around his waist by means of a convenient hole at one end. Naturally, the whole ensemble was concealed beneath his overall as he made his way out of the works. It was quite a long walk from the foundry to the gate and the weight was beginning to take its toll on his stature when he reached that point. Even allowing for the humorous nature of the aforesaid gatekeeper, everyone was surprised when he called out to Bill Moss saying, 'I see you've got another load of lead there tonight Bill'. On hearing this remark Bill promptly released his grip on the cord allowing the bars to cascade to the concrete floor with a clanging din. Of course, Dorman's had no choice but to prosecute and the law took its course. He was not seen in the foundry again. Later, the gatekeeper told Edward that he had only really been fooling. Sure, he thought that the man looked a bit weighed down but made his comment in jest little thinking that he was spot on with the truth.

On a personal front, things had moved on, and plans were made for the two of them to visit his folks in South Wales. After due discussion, they had decided to make this initial trip by train. Fortunately the town, Pontardulais, where they lived was easily accessed from Shrewsbury by means of the central Wales line. Shrewsbury itself was on a direct line from Stafford. Edward had no real apprehension concerning this visit though it did occur to him that his mother might be keen on them attending Chapel on the Sunday morning. Well, he thought, they would just have to go along with this: Julie would inevitably be on display to what would seem like half the population of Pontardulais.

Sometimes, Dorman's would display a kindly side to apprentices who came from distant parts by allowing them to leave at lunch time on a Friday. This enabled the happy couple to catch the 3.00pm train from Shrewsbury to Swansea. Despite being hauled by a tank engine (a Fowler 2-6-4) it was in fact the fastest train of the day. The reason for the Fowler was that the line abounded in curves and these engines rode -- in the words of a driver -- like a coach. Furthermore, because the line had many single track sections it was necessary to exchange tokens fairly frequently and the Fowler tank, with its open sided cab, facilitated this task. (The Stanier version had previously been tried but the side windowed cab caused one fireman to suffer injury whilst making the exchange). Representation by the men had brought the Fowlers

back within days. Of course, it was an unspoken point of honour amongst the crews as to who could exchange the tokens at the highest speed. As a boy, Edward had had many a footplate trip on these engines -- the central Wales line was nothing if not friendly.

A possible 'downside' resulting from this friendliness was that trains could be delayed because the engine crew had seen a would be passenger waving to them from across a field. Old Welsh courtesy demanded that they should stop and await his or her arrival! Of course, they always said that they would make up the lost time but, in practice, with many single line sections, this was easier said than done.

**Paul Davies**

#### Water gauge sight glass levels

I was thumbing through an old copy of Model Engineer and came across an article related to capillary action in gauge glasses by A. Beaven. Whilst I am aware of capillary action in tubing I must admit that I have never given it a thought when monitoring the level of water in the boiler. As long as I can see the water in the gauge glass it should be alright as I know it is above the crown of the fire box. However, just in case there are others out there who may be concerned at the difference in levels between the boiler and the gauge glass, I reproduce the table below for anyone who may be interested. The table was calculated for water associated with steam gauge pressure of 80 p.s.i and shows the difference in level between the boiler and the appropriate gauge glass.

Inside Dia of Gauge Glass (inches)	Height Difference (inches)
0.08	0.404
0.09	0.360
0.10	0.324
0.11	0.293
0.12	0.270
0.14	0.231
0.16	0.202
0.18	0.180
0.20	0.162

**Don Black**

#### Railroad Tracks.



The US standard railroad gauge (distance between the rails) is 4 feet 8.5 inches. That's an exceedingly odd number.

Why was that gauge used?

Because that's the way they built them in England, and English expatriates designed the US railroads.

Why did the English build them like that?

Because the first rail lines were built by the same people who built the pre-railroad tramways, and that's the gauge they used.

Why did 'they' use that gauge then?

Because the people who built the tramways used the same jigs and tools that they had used for building wagons, which used that wheel spacing.



Why did the wagons have that particular odd wheel spacing?

Well, if they tried to use any other spacing, the wagon wheels would break on some of the old, long distance roads in England, because that's the spacing of the wheel ruts.



So who built those old rutted roads?

Imperial Rome built the first long distance roads in Europe (including England) for their legions. Those roads have been used ever since.

And the ruts in the roads?

Roman war chariots formed the initial ruts, which everyone else had to match for fear of destroying their wagon wheels.



Since the chariots were made for Imperial Rome, they were all alike in the matter of wheel spacing. Therefore the United States standard railroad gauge of 4 feet, 8.5 inches is derived from the original specifications for an Imperial Roman war chariot. Bureaucracies live forever.

So the next time you are handed a specification/procedure/ process and wonder ‘What horse's arse came up with this?’ you may be exactly right. Imperial Roman army chariots were made just wide enough to accommodate the rear ends of two war horses. (Two horses' arses.)



Now, the twist to the story:

When you see a Space Shuttle sitting on its launch pad, there are two big booster rockets attached to the sides of the main fuel tank. These are solid rocket boosters, or SRBs. The SRBs are made by Thiokol at their factory in Utah



The engineers who designed the SRBs would have preferred to make them a bit fatter, but the SRBs had to be shipped by train from the factory to the launch site.

The railroad line from the factory happens to run through a tunnel in the mountains, and the SRBs had to fit through that tunnel. The tunnel is slightly wider than the railroad track, and the railroad track, as you now know, is about as wide as two horses' behinds.



So, a major Space Shuttle design feature of what is arguably the world's most advanced transportation system was determined over two thousand years ago by the width of a horse's arse. And you thought being a horse's arse wasn't important? Ancient horse's arses control almost everything...

And CURRENT Horse's Arses in Brussels are controlling everything else!



I do hope this has been helpful!

**Peter Bohn**



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