

Reading Society of Model  
Engineers  
www.prospectpark  
railway.co.uk  
Charity Number 1163244

# The Prospectus

December 2018



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The editorial Austin at Weybourne in September 2017  
Photo John Billard

**DAWSONS DIARY  
BROKEN RAIL TRAIL  
ORPHANS  
MORE ANALYTICS  
WHERE IS IT?**

## DAWSON'S DIARY

kept by the President

The November Prospectus was a very good mix of articles by the members. I like John Spokes and Mike Manners contributions which make it a very interesting read for the membership. Also, younger members sending in copy for the editor. Let them air their views on the RSME. Than cannot be a bad thing.

Very good to see Chris Symons out and about at the club on Wednesday walking well. We hope you will soon make a complete recovery Chris.

Roger Pattie has had a successful hydraulic test on his much-modified Rail Motor based on Don Young's design. Made as a 2-4-0 it looks very colonial with a cowcatcher in the front and a tall chimney. Alf and his team have been busy rebuilding Santa's Grotto ready for him to come to Prospect Park once again this year. Where has the year gone!

Alf had on show in the club house for us to admire two 5" scale nicely detailed private owner wagons to add to his stock making a very nice goods train. I notice that the club's 00 layout is being refurbished with some very nice upgraded backboards. The corners look really good, the main station building having been improved last year. Makes all the effort worthwhile. Well done the 00 Section members!

I would like to wish all members a very Merry Christmas and New Year 2019.

## PONDERINGS

by 61249

### **BR Research part of AEA Technology**

One of the most difficult business changes to manage has been the change from the enveloping warmth and security of state ownership, to the heady and challenging scrutiny of the market for a private company. Some businesses make this change well and survive long term. If I were to pick one out just now it would be QinetiQ, spun out from the MoD twenty odd years ago and doing well according to its market report this week. AEA was not so fortunate in the long run, and the differences with QinetiQ are probably many. One obvious difference is the continued investment of the state in defence capability which must surely be more productive than a government spurning your core nuclear technology for decades – only to come back in on the back of foreign states that kept it going, such as France, Japan and China. That's governments for you!

In the early years of AEA Technology Rail, as BRR (British Rail Research became known) we were not so worried about the long-term future, more about delivering a return on the investment AEA made in buying the business and operating in a highly competitive environment. Our job could be defined simply as "selling technology to railways". Our competitors were many, the

biggest and worst being “do nothing” as conservative managements decided to carry on as they were. For many UK rail businesses these were also the first days in the private sector, and the business risks were many without introducing technical risk by buying the latest gizmo from Research.

The excellent article by John Spokes in last month’s “Prospectus” reminded me of a story where we met these issues head on. It was in selling the wheel measuring device that BRR had developed called “Wheelchex”. At the time BR was suffering from over 1000 broken rails a year, and there were many factors that contributed to such a high number. Rail steel does not like cold temperatures which make it brittle, the control of rail stress and joint welding was variable, and of course, the wheels that came along with flats and hammered the rail with every revolution peaked in the autumn and continued to run into the winter before they got to a lathe for repair. The precise relative effect of each of these factors was not well known. There was at the time an anecdote of one Class 47 in Scotland returning to depot one day leaving a trail of six broken rails behind it. Of course the train maintainers lived in a state of denial protected by the silo management necessary in a “joined up” railway. If you listened to them (and I used to be one) their wheels were never that bad, and anyway, it was the other factors that broke the rails. If the Civil Engineer did his bit there would be many fewer. BRR had the answer to all this in “Wheelchex” a device which measured the wheel condition by measuring the stress placed on the rail. Aligned with TOPS, the operating system that knew which train was where and composed with which vehicles, bad wheels could be traced, and either repaired or banned from using the infrastructure.

We know now that bad wheels were probably the most significant factor in breaking rails, and we know this because of what happened when Railtrack was bold enough to fit 14 sites with Wheelchex measuring equipment. Figure 1 below shows clearly how bad wheels were reduced. This was a highly significant order for AEA rail but was hard won. Competitor systems existed in the US and in a less developed (but cheaper) form in the Netherlands (State railway NS). We had factored the sale into our forecast for the end of the year and this was known to the City and the markets. We had agreement in principle from the Chief Engineer of Railtrack that they would go ahead, but we met obstacle after obstacle as a series of folk who had the power to say “NO” in Railtrack exerted their influence. There was the Permanent way engineer who said “you cannot fit that on my railway because me sleepers are closer together than other peoples (and the specified standard!) and if you think I am moving them for your device you are mistaken. This was not funny until another one down the line said “you cannot fit that on my railway because my sleepers are further apart than other peoples and I am not going to move them for your device”. Then we could see the amusing side and swore at the fact that a devolved Railtrack had no one who could overrule the local engineer.

## Improvement in Alarms per Site (14 UK Network Sites)

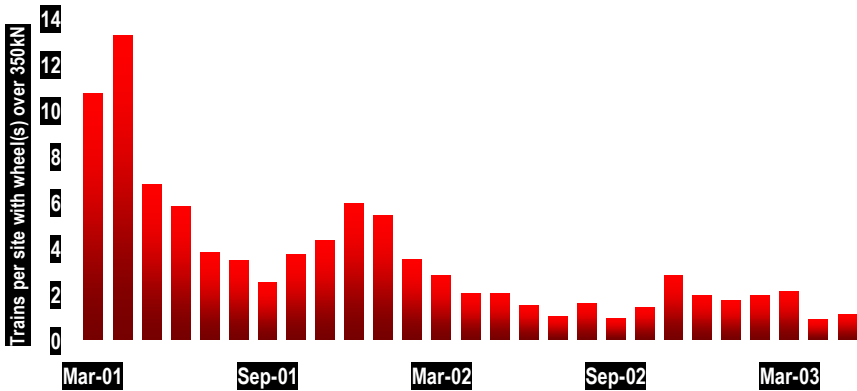


Figure 1 – Wheelchex impact on “bad” wheels – Exerting over 350kn force on the rail. Improvement in year one from March to October, reversed through autumn leaf fall. Improved again in year 2 to a lower level, and even lower in year 3.

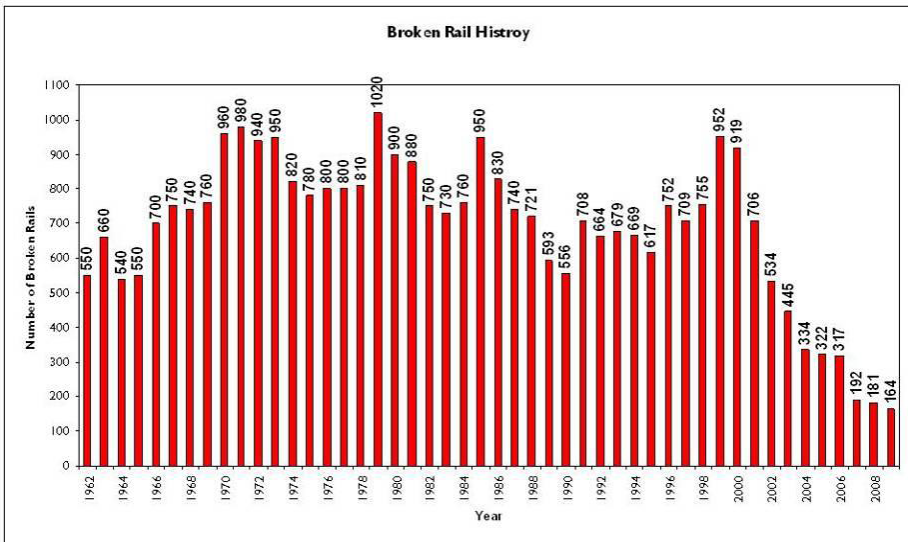


Figure 2 Shows 40 year long history of high levels of broken rails under BR. Dramatic reduction from 2001 “Wheelchex” fitment ORR Track Safety Strategy 2018 says “Generally, track geometry and rail performance is improving, and in some cases, such as broken rails..., at historically low levels” (Less than 100 per year)

The year end was fast approaching and all the indications were that we would not get the order, our orders would then be lower than predicted, we would look as though we did not know what was going on and AEA might be pushed into a profits warning. I was close to the sack again. In desperation I despatched myself to the office of Railtrack's Chief Engineer, refused to sit down, and made it clear that I would leave when I had the order, not before. I had just returned from a tour of the US of A with the Chief Engineer and counted him as a colleague with whom there was a mutual respect. He got the message and understood my behaviour that was driven by the disciplines of the private sector, rather than the easy-going ways of BR, where the order and the fitment would probably not have happened for another year.

In order to get rid of me they gave me the order. We fitted the kit over the next 18 months or so, and Figure 2 shows the immediate and lasting impact on the incidence of broken rails – another safety and disruption risk that BR tolerated for years sorted by the private sector. Success!

## Les Deux Orphelines

## John Spokes

With apologies to renowned Scotsmen such as James Watt, Alexander Graham Bell, John Boyd Dunlop - probably not John Logie Baird, but it is my opinion that in these Isles we are good at inventing and yet an innovative idea, usually to a profitable end, is often fulfilled by others. The steam engine is no less an example and was generally developed in the early part of the 19th century in an area ranging from Leeds to Newcastle; however, by the turn of the century we find the USA were leaders in respect of size and power and the French in efficiency and sophistication. Pleasingly, the Brits always led in style and grace; the company liveries up to Grouping were unparalled anywhere in the world.

In pursuit of efficiency the French adopted with some vigour the concept of Compounding and although Webb, albeit controversially, promoted the technique in many of his LNWR locos, it was the French who fastened on to this, culminating in the re-builds by André Chapelon and particularly his 2.4.2 A1 loco of 1950, arguably the most efficient and complex steam engine ever built, capable of producing 5500 ihp. By the beginning of the 20th century there were half a dozen different systems of compounding. Significant amongst these was the de Glehn-du Bousquet system and three such equipped examples were bought by Churchward to trial on the GWR. However, because of contemporary developments in superheating, and the immediate and obvious benefits this bought, post-Webb, compounding found little favour in the UK. Chapelon was a strong advocate of compounding and used this synergistically, together with high superheat, large steam circuits and Kylchap exhaust, as the four design tenets of his exceptional locomotives.

Alfred de Glehn worked for the Société Alsacienne de Constructions Mécaniques, in Mulhouse, Alsace, where the French National Railway Museum is now located and Gaston du Bousquet had been appointed Chief Engineer of the Nord Railway in 1890. Their system uses two HP and two LP cylinders. Initially du Bousquet put the larger LP cylinders outside and the HP between the frames, but at de Glehn's suggestion the alternative and now more conventional arrangement was adopted. In normal operation the HP cylinder exhausts into its respective LP cylinder via a small intermediate receiver. However, if more power is required, especially for starting, then the steam circuitry allows for operation of the LP cylinders on boiler steam. The HP exhaust goes then directly to the blast pipe. This switching is done by a rotary valve sometimes referred to in English as the Simpling or Intermediate valve, but called by the French La Lanterne Tournante, the Turning Lantern, and takes its name from a toy lantern which would have been familiar to French children at that time. This Lanterne, one for each HP/LP pair, forms part of the intermediate Receiver and on many engines was actuated, i.e. rotated, by compressed air. Because of this bi-modal operation the locomotives had separate regulators and reversers for the HP and LP circuits and, therefore, the cut-off of the HP and LP cylinders could be set separately. Although the LP regulator was normally closed during compound operation it could be used to permit live steam into the LP cylinders. This type of operation was called reinforced compounding.

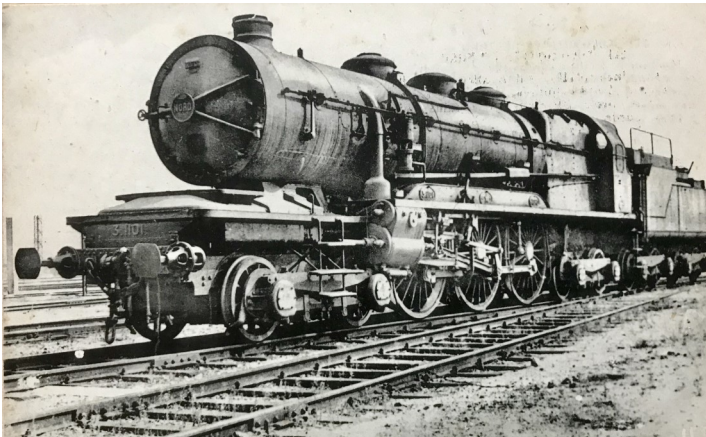
The NORD was a network that operated between Paris and the Channel Ports and the Belgian Border. and by the early 1900s the increasing introduction of bogie carriages and heavier vehicles on the NORD, such as restaurant and travelling post office cars, increased train weights from typically 350 tons through 400 and occasionally 450 tons. The initial counter-measure was to split heavier trains, but this added to the traffic on an already crowded railway. Du Bousquet's response in 1909 was to design, as an experiment, two locomotives - the NORD Baltics - the first locomotives constructed with this 4-6-4 wheel arrangement and at that time the most powerful locomotives in Europe developing 2100 ihp and with some estimates for simple mode operation of 2800 ihp. The two prototypes, 3.1101 and 3.1102, differed: the former had a parallel fire-tube boiler with straight-sided Belpaire firebox, whereas the latter had a water-tube boiler. This was prone to tube problems and within a few years was replaced with the other, more conventional, boiler type.

Apart from the steam circuits, mechanically the locomotives were relatively simple and unrefined. The leading and trailing bogies and the two on the tender were identical. Westinghouse brakes were fitted and mechanical forced lubrication applied only to the cylinders. The outside HP cylinders, which drove the second coupled axle, had piston valves but the inside LP cylinders, which drove the first axle, were equipped with slide valves. The

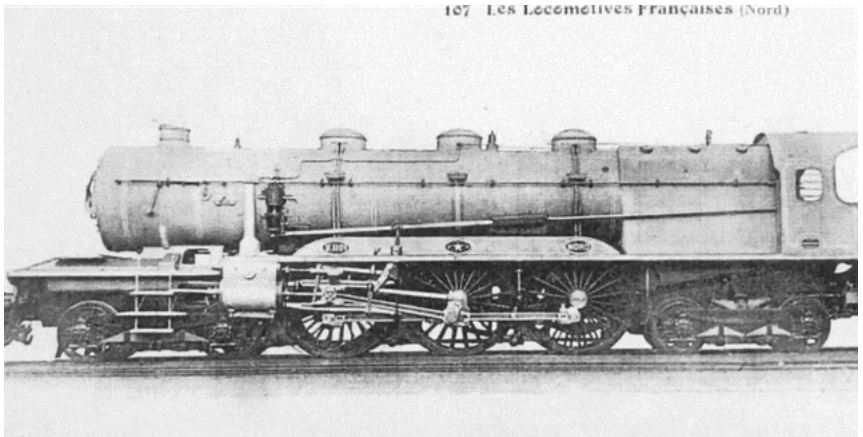
size of the LP cylinders, 24 7/16" piston diameter, prevented them from being positioned side-by-side between the frames and instead were located one behind the other, one to the front on the right and the other immediately behind on the left. As if the challenge of two regulators, two reversers, and the ability to run in either simple or compound mode (or a mixture) was not sufficient distraction for the driver there was the added complication of a variable diameter blast nozzle.

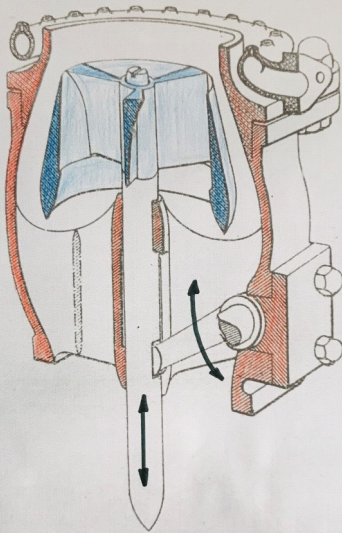
In reality the two locomotives were too innovative and unfortunately Gaston du Bousquet died while they were being constructed. Probably in accord with the principle of "not invented here" the locomotives under his successor did not receive the attention they deserved and were laid-up for long periods. In 1937 the second engine, 3.1102, was sectioned for an exhibition and now resides in this state, however, much renovated, in the Mulhouse Museum.

Perhaps if du Bousquet had survived then his "children" would have



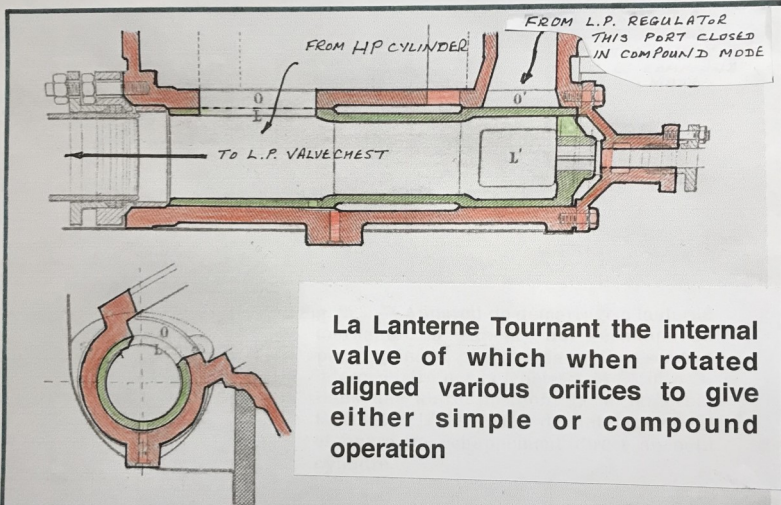
developed into something more tangible, but instead these largely forgotten monsters were given the nickname Les Deux Orphelins - The Two Orphans.





**NORD variable orifice blast nozzle. This was operated from the cab by the lever positioned on the left hand side of the smokebox.**

All illustrations  
courtesy John Spokes



**La Lanterne Tournant the internal valve of which when rotated aligned various orifices to give either simple or compound operation**



# ANALYTICS

Where WP looks at some photos taken by the editor



## **Blue Pullman at Paddington 1972**

In 1960 2 x six car Blue Pullman sets were introduced for the Midland Main Line to provide a Pullman service between London and Manchester, whilst the West Coast route was being modernised. Also 3 x eight car sets were introduced on the Western Region for services to Bristol, Swansea and Birmingham.

When the electrification of the West Coast reached Euston and the full electric service on a rebuilt railway commenced it included new mark 2 pressure ventilated Pullman services to Liverpool and Manchester.

The 2 six car Blue Pullman sets on the Midland route were then redundant and the sets were transferred to join the other three on the Western Region, running together as a 12 car set. In order to avoid two sets of traincrew they were modified with jumper cables to provide through control. These extra vehicles allowed the WR to introduce a mid-day Pullman service to and from Oxford. They were then painted in the reversed blue and grey livery used on Pullman vehicles.

They were all withdrawn in 1973 and sadly non survived and they were all scrapped principally at Briton Ferry in South Wales.



#### **Nord Pacific at Carnforth 1974.**

Steamtown Carnforth opened as a preservation centre in the early 1970s by Dr Peter Beet. He had aspirations to run services on the closed Lakeside branch but these plans were scuppered by a new road which cut the branch off from Carnforth.

For his new museum he bought two foreign express locomotives. The one shown here PLM Railway 4-6-2 no 231K-22 (built 1948), which worked the last steam hauled Fleche D'or in France and DB Pacific 012-104-6 (ex 01-1104). Needless to say, neither of these could run on the BR network and in circa 2000 both went to the South German Railway Museum at Heilbrun and were reported still there in 2016.



#### **Swindon 1975**

This is outside the works. The last Westerns were withdrawn in February 1977 and at the beginning of October 1975 there were still 42 in service,

though some would be in store by then. So, in 1975 it is likely the one depicted was still in traffic.

The Warship however is most likely number 818 Glory. The last Warships were withdrawn at the end of 1972. 818 was kept next to the turntable at Swindon Works with a view to preservation as a sort of 'gate guardian' at the works. However, during the GWR 150 celebrations the closure of the works was announced. 818 was scrapped in the November of that year.



### **1976 Totnes? ... asks the Editor**

I am sure it is not Totnes as there are up and down through lines at Totnes and the picture shows up and down lines only. Also, the bridge carrying the railway in the distance is a bit too close to the station. The only thing I can suggest is possibly St Germans as there were camping coaches there and the line curves onto the viaduct in that way.

The loco 47500 started life in June 1961 allocated to the LMR Western Lines as D1943. It was fitted with ETH at Crewe I believe sometime in 1972 and transferred to Landore, Swansea in connection with the introduction of Mark 2 F air-conditioned coaches. It was named Great Western in 1979 in blue livery and then in connection with the GWR 150 celebrations in 1985 in GWR lined green. At sectorisation it went to Rail Express Systems and became 47770 Reserved. It finally ended up with West Coast Railway Co. in 2010 and restored to 47500. It is currently in WCRCO. maroon livery and stored at Carnforth.

The leading vehicle of the passenger train is BCK S21274, which is very unusual indeed as that vehicle was one of fairly small fleet of air-braked mark one vehicles which worked Southern Region commuter and mail trains. They very rarely left the SR. This one was based at Clapham Jn. I don't recall SR loco hauled sets regularly working beyond Exeter. A special working perhaps!

*Can any PROSPECTUS reader identify the location? Sheila and I (she's in the picture) can't recall being in St Germans but it was a long time ago!*

## DIARY

### December 2018

Saturday	1 <sup>st</sup>	Birthday Party	11:00 to 13:30
Sunday	2 <sup>nd</sup>	Public Running	13:00 to 16:00
Wednesday	5 <sup>th</sup>	Members Christmas lunch	
Saturday	8 <sup>th</sup>	Club Running	11:00 onwards
Monday	10 <sup>th</sup>	Trustees Meeting	19:30
Saturday	15 <sup>th</sup>	Santa Event	11:00 to 15.30 (Setting up from 9am )
Sunday	16 <sup>th</sup>	Santa Event	11:00 to 15:30 (Setting up from 9am)

### January 2019

Tuesday	1 <sup>st</sup>	Club Running	11:00 onwards
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Opinions expressed in PROSPECTUS are the personal views of the contributor and cannot be taken as reflecting the views of the club committee or editor.

**The deadline for the January PROSPECTUS is  
18 December This is the final date.**

Contributions from all members are greatly welcomed

They may be submitted in hard or soft copy to the editor.

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**Please note that because of editorial commitments the February PROSPECTUS will be published during the first week of February or shortly after.**