

Reading Society of  
Model Engineers  
www.prospectpark railway.co.uk  
www.rsme.co.uk



**President**

Les Dawson  
0118 969 4654

**Vice President**

John Sargeant  
01491 681520

**Secretary**

Peter Harrison  
secretary  
@RSME.co.uk  
07920 833546

**Editor**

John Billard  
0118 9340381  
john@jegbillard.plus  
.com

Free to members

50p when sold

# The Prospectus

February 2016



7808 Cookham Manor at Didcot in 1976. This engine has been out of service for many years and the Editor for one would like to see it going again! Photo John Billard

**DAWSON'S DIARY  
DISC BREAKS  
BANG BANG BANG!  
LIFE IN AN AMMUNITION DEPOT  
CHRISTMAS QUIZ ANSWERS**

## DAWSON'S DIARY

kept by the President

First public running Sunday for 2016 was rained off just like last year! History does repeat itself sometimes, let us hope next month will be dry.

Over the past few working Wednesdays the members have been doing all those ongoing jobs that have to be done to keep the club up and running. Without this dedication every Wednesday our club site would not be looking so good as it does now. Many thanks to you all. Mike Sinclair has been beavering away over the past few months putting up fences between the containers making a secure area for the water tank for the parks and gardens. It will become the inner sanctum for George and his team! Mike is making the gate and when all the gaps are sealed it will be a good job done. A number of members have been tidying up the A4 hedge removing dead wood etc., also the barrier has been strengthened. It works well thanks to all those who were involved.

Rain was promised for club running the rain did not come till later. It was busy on the track with a good number of engines steam and electric. Mike Sinclair's 3 ½" Royal Scot ran well this time. Mike has at last got it sorted; the problem being a leaking smokebox.

First boiler test for 2016 was carried out on Alan Broodbank's Rob Roy. It passed the hydraulic test okay for the next four years. When the steam test is done he will steam away once again. Marcus was having a good run with his Polly Two, the young members enjoyed having a drive on all types of engines. This is what it is all about having a good day at the track. We may have a new member who called by to have a look at us. Stuart Kidd took him around the club and showed him what we do at RSME. Steve Harland came down to visit us once again. A long journey to have a drive on our track. He must be keen! Nigel Penford had his Baldwin out once again. He's really caught the bug. His loco runs very well and I saw Steve lurking on the footplate of Nigel's engine! The club Baldwin will be out of action for a while to have some remedial work done on the water pump and cylinder drain cocks.

A good number of the membership paid a visit to the Great Hall at Alexandria Palace for the London Model Engineering exhibition. It did not seem all that busy this time, but the club stands had a good selection of items to look at and the trade stands were busy at times. In all a nice day out. We had a good run back thanks to Mr Penford!

## PONDERINGS

by 61249

### **Director Traction and Rolling Stock, Network South East**

Not all our problems were on the new fleets, and I remember one with deep technical overtones on the class 319. This fleet was built with dual AC/DC capability for the Thameslink service and crossed town all day every day, changing power

system at Faringdon.

The service was pretty demanding, loadings were heavy, and we could not run any more trains due to signalling restrictions in the centre section – 8 trains an hour in each direction was it. Don't ask me why, that's the way it was. I once had the pleasure of conducting a group of Japanese visitors from CJR (Central Japan Railway) around London, and took them into a cab on Thameslink. The feature that they commented on as a difference from Tokyo was the speed. Not that we were slow in the UK, but the idea of a commuter train touching 100 mph between stations was a new concept for them, and at the far stretches of the line (beyond Luton particularly with a limited stop service) it was regular Thameslink practice. The maximum speed of their very dedicated high capacity service being closer to 50mph. There is a lesson here of course, that if you want maximum capacity and the highest levels of reliability, then design and operate a single purpose, slow and simple railway. In the UK we are dedicated to the idea that we have a very mixed purpose railway, and feel it is a good thing to turn our metro train into an inter-urban express half way through the trip. Hmmm...

The technical impact of the mixed railway that is Thameslink is the braking duty cycle. Without Regen/Rheostatic braking we relied entirely on the disc brake system. Repeated stops from high speed set the practical limit for the train, as they give high disc and pad temperatures and brake fade. The standard system fitted to the Japanese metro just will not cope, and neither, as it happens, did the 319 system. One unfortunate customer sitting over a bogie had the somewhat disconcerting experience of a disc breaking up and trying very hard to get into the compartment with him. One of those disconcerting telephone calls was the result, "Chief, we think you ought to know all about this".

The immediate concern was whether we could allow the fleet to continue in service, examination of the failed disc suggesting that rather than the disc fragmenting through thermal cracking, we had a complete failure of the bolting system that held the disc to the wheel. This was a proprietary item



very similar to that fitted to other fleets. Examining the fleet for cracked discs was probably easy, looking for bolts within a trip of failure was not.

At this early stage in the investigation the real problem is lack of knowledge, and if the fleet is withdrawn, there will be no more failures to help understanding. Knowledge that leads to the "Root Cause" can only be gained through testing,

which may or may not be revealing, and can carry low levels of confidence that the tests match real life in a meaningful way. However, if the risk of injury, and derailment are high, it is irresponsible to let the train run, and the real purpose of the phone call to the chief is to share the responsibility, and give folk the confidence that their decision making is sustainable in a the awful circumstances that something went seriously wrong, derailment and injury resulting. Of all the things that bother railway engineers, it is bits of the running gear coming off in an uncontrolled way, luck then determining what happens. Fragments of brake disc are quite enough to derail the train if they get in the wrong place at the wrong time.

Discussion uncovered the slightly uncomfortable fact that this failure was not the first, a previous failure having been treated as a “one-off” some months previously. This was possibly the closest I ever came to withdrawing a fleet from service.



In the end we decided to keep them running, with a special check on the fleet checking every bolt for torque, and any signs of movement around it. Only one depot was really involved in their maintenance, (Selhurst) which helped, and the A exam (smallest, most frequent) was enhanced to keep an eye on the issue.

In parallel the technical wing of NSE went into overdrive, with meetings across Europe with the manufacturer of the brake system, getting to the designers (a rare feat) and talking to other owners of vehicles with the same system, thereby breaking through the usual customer support line trotted out by all manufacturers as a first response “we have never seen this before, we have millions of miles of the same system in many countries and no problems at all – it must be a failure of your maintenance”. The really worrying thing was that the technical analysis from the designers (remember they made their living by designing brake systems for trains) made completely inadequate allowance for the stresses generated by high

disc temperatures under heavy braking. This was the main conclusion from the sums done by our own guys, coupled with the vague response to challenge from the OEM design staff. What we thought was technically sound, was actually little more than an extension of a similar system that had worked before, done empirically, rather than on the basis of a sound engineering analysis. The bolts could withstand the braking force and hold the disc to the wheel, as long as it did not get hot!!

We lost confidence in the system, fortunately others were available, particularly as I remember it, a switch from a complete disc to a split one. The class 317 had the alternative arrangement, and had worked successfully on the higher speed sections of the Thameslink route (St. Pancras to Bedford) for some time without incident. We held our nerve, changed a lot of bolts and then the system, but I came away from the experience with a much reduced confidence in the technical competence of well known and established suppliers. Train OEMs often understand the parts of the train they actually manufacture quite well, but can have very poor knowledge of the parts they buy in and fit.

One illustration of this I had already experienced was the failure of motors in the air conditioning on HST Trailer cars. BR bought the modules from an HVAC specialist, whose response was of the usual “loads of these work everywhere else” variety. “You had better talk to the motor manufacturer”. In essence this was really their job but as we wanted an answer we did speak to the motor supplier, whose answer was close to the “never had these fail before” line as well. “However, it may be worth talking to the brush suppliers, as we think this is a commutation issue”. We are now talking to the 4<sup>th</sup> company involved, and the rep appears on the depot, looks at a failed unit under a train and says “What idiot told you to fit that brush in this application? Miles too hard for a vibrating motor, fit a soft one and all will be fine”. So it proved, and in the process we got to know more about the system than the train maker, the HVAC supplier or the motor specialist. Such is the delight, and the challenge of railway maintenance engineering.

## **NOTES FROM THE TRUSTEES**

**by Peter Culham**

### **Raised Track Extension**

Now that the Santa grotto has been taken down, the insulation and electrical work is continuing in the large container, ready for reorganization of stored items from the smaller container. Discussions continue on the raised track extension; initially it is intended that an 'example' length of track and support work is put together to prove the plans workable. we are looking towards the purchase of a trailer to help transport materials and tools across the site.

### **New Event Day Toilets**

These are now complete bar outside painting which will be looked at in the Spring. In the meantime, they are ready for use during birthday and Public Running events.

### **Renewal of Club Lease**

The documents remain with Reading Council while they decide upon final wording.

### **Club Finances**

We continue to be in a good position with targets set to be within known income such as birthday parties and Open Days.

### **Young Engineers**

The engine build continues and we are now looking at the purchase of the next kit to maintain the progress being made.

### **Work and Projects Sheet**

The list of work to be done seems quite lengthy at times but it does focus on a range of jobs which can be chosen by members of our Wednesday Warriors. A lot of work gets done each Wednesday as can be seen whenever visiting the site.

## **FOR SALE**

**Peter Harrison**

Myford ML7 around 1950's vintage. Sale to include a genuine Myford cabinet and drip tray, both of which needs a little clean up and paint job.

Please contact Peter Harrison, mobile phone number 07920833546, for more details. Can deliver. £675.00 o.n.o.

## **e-BAY SALE**

**John Spokes**

Just a word of thanks to RSME member John Nicholson who asked me to sell on e-Bay a set of castings for a 5" Stirling 2-2-2 single with the proceeds as a donation to the Club. Following e-Bay's deductions, which I consider somewhat excessive, the net amount was £46. The person who bought the item lived in the wilds of one of the Orkney Islands and getting the package to him is a story best left for another time.

Anyway thank you John for this gesture.

If any member has an item they would like me to sell with the objective of deriving a benefit to the RSME then please let me know, but not if you're planning to move to the Highlands and Islands.

## **THANK YOU**

The editor would like to give his thanks to members who have passed on good wishes during his recent illness.

## LIFE WITH A BANG, RAILWAY STYLE

by Mike Burke

BANG BANG BANG is a sound familiar to many railwaymen as it is the noise of three detonators exploding under the wheels of a train and signalling DANGER , STOP, to the driver. Other uses were during foggy weather or falling snow when one detonator would be fixed to the line near a signal showing caution. This to ensure that the driver was aware that he was passing a signal at caution and should slow down prepared to stop at the next signal ahead.

This job of placing detonators fell to the duty of the fog signalmen who had the thankless job of sitting in a tiny concrete hut watching the distant signal and removing the detonator if the signal should change to green or replacing it if the signal should show caution plus showing a yellow light to the driver. He would have a tiny brazier to keep warm and relied on the kindness of passing locomotives to keep his meagre coal supply topped up. As an added safety feature some signal boxes had emergency detonator placers attached to a lever painted white with black chevrons often referred to as sergeants stripes. This lever to be operated to place two detonators on the running line to warn drivers if they should overshoot a stop signal at danger. A supply of detonators is also carried on locomotives and in guards vans to enable the crew to carry out emergency train protection during breakdown or incident on the line. Finally they were used during engineering work to protect the worksite.

With all these explosive devices readily available it was no surprise that the mischief makers would find some illegal use for them, the most usual being to clear the soot and ash from signal box or mess room chimneys where the heat from the fire would quickly cause them to overheat and explode.

The detonator looked like some kind of toy as they were brightly painted in different colours to denote the year of manufacture starting on 1<sup>st</sup> July each year . These bright colours were orange, red, green, grey, yellow, blue, and white then the sequence repeated ad infinitum. The explosive content was deemed safe for 5 years then the detonators should be returned in an ammunition box to the MOD for disposal. However I doubt if any ever reached the disposal point, certainly not at Edge Hill, Liverpool as the normal practice was to keep all old detonators hidden until New Years Eve when they would be fixed on a steep gradient in the Grid Iron sidings. Then at midnight several brake vans, filled with happy cheering shunters would have the brakes released and rapidly descend the hill loudly exploding the many detonators collected. At the bottom the shunters, would celebrate by sharing a drink (illegally) of something festive with the men working at that end of the grid. While this was happening all the locomotives on Edge Hill shed (8A) would have their whistles blown to herald in the New Year. Plus Driver Soldier Lee was often seen with a detonator strapped to his wrist and as he passed the box

he would violently point to this as an indication to give him the road as he was in a hurry. As he was in a hurry. He was a hard hitter and would run loose coupled freight trains at passenger train speeds. Firemen told me that if he felt the engine wasn't steaming to his liking he would throw a detonator into the firebox and close the doors. The ensuing BANG would clear the soot off the tubes but would also cause leaks in the firebox stays due to the detonation and this meant more work for his fireman as the loss of water and steam had to be contained.

We would use a detonator to clean out our signal box chimneys so never needed a chimney sweep, just a bricklayer to refix loosened bricks or a toppled chimney pot. I even heard of one platelayer who would carefully hacksaw a detonator open and use the powder to refill shotgun cartridges. These he used to shoot rabbits and vermin as he walked the length.

## **WOLVERTON PUG - THE CENTRAL AMMUNITION DEPOT (CAD) KINETON**

Before finalising the Special Trains era and moving on to Freightliner I would like to revert to a short tale from my years in InterCity Fleet Planning. Whilst InterCity continued to modernise, with the opening of the East Coast electrification and introduction of 31 new Mark 5 trainsets (IC225), a large number of older carriages were becoming surplus. By now (1991/92) these were air-conditioned Mark 11 D and E vehicles. Additionally, with the continuing increase in the speeds of long distance daytime InterCity trains, the need for overnight sleeping car trains had diminished considerably. There were therefore some 30 or so surplus Mark III sleepers. These vehicles were far from life expired and with past experience of growth trends we decided they needed to be kept in store.

I had caught a cold by storing a rake of about 12 Mark II D and E vehicles in Tyne Yard south of Newcastle. Despite them being stabled near the ECML and the hump flyover, they received the attention of the graffiti brigade and as it was over Christmas the local lads had a field day (or perhaps I should say a yard day!). We decided that although stabling on sidings on the BR network was free (at that time the infrastructure was still all BR) we needed to consider secure storage at a non-BR site even if it involved a charge.

After looking at a lot of options I came up with a proposal to meet the military with a view to secure storage at their Central Ammunition Depot at Kineton near Leamington Spa in Warwickshire. This site had extensive railway sidings connected to the former Stratford on Avon and Midland Junction Railway leading to the GWR at Fenny Compton. Being a military ammunition depot meant the security would be the best possible. So a meeting was duly arranged with one Captain



Pardoe in charge of the railway operations at Kineton.

I caught a train to Leamington Spa and was picked up there by Peter Lister a railway engineer who was to arrange the mothballing procedure for the vehicles. He drove us to the main gates where we got out of the car and were escorted by a heavily armed soldier into the gatehouse to sign in. This done we returned to the vehicle and now complete with a large 'A' displayed in the windscreen we drove through the camp past the NAAFI etc to another set of gates and barbed wire leading into the railway sidings. Out of the car and into a second gatehouse. Inside the attendant soldier spoke " Do you smoke". Yes, I replied, a pipe. He then proceeded to unlock a large long steel ammunition box, opened the lid and said " Put your pipe, any lighter/matches, and the tobacco inside here please". Having done so he promptly slammed the lid shut and snapped the padlock closed, handing the key to our escort. Out of the gatehouse we were marched past the immaculately manicured grass, edged with white painted stones and still following the escort complete with ammo box we ascended the exterior concrete steps of the flat roofed, second world war vintage control tower. Inside, down the corridor and two sharp raps on a green painted door we entered Captain Pardoe's domain. Ammo box deposited on desk and escort salutes turns and departs closing the door behind him.

Do you want to smoke? enquires the Captain, at which point he unlocks the padlock and opens the ammo box. Rather stunned I blurt out " I thought smoking here was banned!" Pardoe's response " This is an ammunition depot-you can't smoke outside but you can inside". I extracted pipe, tobacco and lighter, filled my pipe, lit up and we introduced ourselves.

After agreeing they could take a substantial number of vehicles, he was quite happy when I said it would be approximately 60 and I would get them moved to Kineton in the next month or so. His price quoted (subject of course to final approval by Aldershot) was agreed as being reasonable on a per month basis per vehicle.

He did add the caveat that should there be any short term urgent military requirement that needed the use of the sidings obviously that would take precedence. You have to remember this was not long after the first Gulf war and not so very long after the Falklands war, when military logistics were working flat out.

After finalising the discussion the Captain said " would we like a trip round the rail system on one of their internal diesel shunters". This was too good to miss. So we set off into the yard to find the diesel shunter, duly climbed aboard and the driver set off. After we had gone a little distance the Captain said to me, " Do you want to have a go driving?" Well yes. Why not? Under the driver's guidance I set off with my hand on the power lever. Having been shown the brake lever and tried that I felt quite confident. Certainly this was a first. I had once moved a 2-6-4 tank a few feet on Wakefield shed! But this was much easier.

On we trundled past mysterious connections, sidings and loading points. Ahead appeared a gate closed across the track we were running along. Naturally I eased the power back and began to operate the brake. Don't worry said the Captain, the chappy knows we are coming and will open the gate by the time you reach it. I crept nervously on with the gate looming ever larger. No sign of the chappy. Fortunately, I was proceeding slowly enough to put the brake full on and stop, inches from the still closed gate. After a couple of minutes chappy suddenly appeared and opened the gate. I let the driver carry on after that!

As far as I know a lot of those vehicles are still there. Though goodness knows whose budget the storage costs are being charged against. Even the British Railways Board Residuary no longer exists! I believe they were finally subsumed into either the Office of Rail and Road or the Department for Transport. So presumably the portfolio of abandoned viaducts, bridges, tunnels and embankments went there also. If any disputes arise over who pays what for upkeep of the interface between existing roads and former railways, then the flow of paper work round the Department can only be guessed at.

To return to the final period of the Waterman years. Pete had employed a Managing Director who lived in Coventry. He had worked in the car industry at Jaguar before joining Pete, and had obviously lived through the troubled years of industrial strife in that industry. He was very polite to us 'railway types', principally because we were not subject to TUPE. Pete Waterman bought 200 carriages, 6 class 47s and the customer portfolio of the InterCity Charter Train Unit. All the staff remained with the BRB Freight Group. This meant that Waterman Railways had to offer us posts in their organisation which we would be happy with. A set of job specifications were drawn up by the Managing Director and circulated to the existing team. Only one person found a job she would be happy with and duly signed on with Waterman Railways.

I found a job that included my current remit more or less but it was for less money than I was then earning. We all had interviews with the MD. Mine was very good natured. My list of discussion points was basically in this order. Salary, Pension, Travel facilities, moving expenses (We were then located at Euston. Waterman's Offices for WR were to be located at Derby in the old locomotive works).

I did not get past the issue of salary. Without any loss of dignity or face by either party I shook hands with the MD and left his office. In order to effect a smooth handover, I worked at Derby for WR for two weeks after the sale on secondment from BRB Freight Group handing over my remit to the MD's son! I lodged with Bernard and Dorothy Staite in Litchfield during the week and went back to Theale at the weekends. Bernard and I travelled a couple of times by train from Lichfield City changing trains at Lichfield Trent Valley and Tamworth, but Bernard preferred to drive up the A38 to Derby. *(to be continued)*.



Above: Derby May 1995 Davies the Ocean.  
Below: Cardiff Canton 47488 James the Ocean

More pictures on p 13  
Pictures WP



# RSME CHRISTMAS QUIZ - THE ANSWERS

Compiled by John Spokes

1. Which year was the Model Engineer magazine first published? **1898**
2. What did the S stand for in the name of railway author Oswald S. Nock?  
**Stevens**
3. Which of these trains had the longest and the shortest rail distance? (one point for each correct answer)  
**Cornish Riviera 305, Irish Mail 264, ACE (to Padstow) 260, Cambrian Coast Exp (to Pwllheli) 271, Hibernian (Fishg'd/Padd) 261.**
4. Who is generally recognised to have made the first screw-cutting lathe?  
**Henry Maudesley**
5. Which valve-gear did Webb's improved Precedent (eg Hardwicke) have?  
**Some books state Allan but our President is sure it was Joy. Look it up yourself (or go and have a look! Ed)**
6. Diesel Prototype D0260 built by BRWCW in 1962 was named? **Lion**
7. Which is currently the highest station in Scotland? **Corrour**
8. The locomotive wheel arrangement 2-8-4 is sometimes referred to as?  
**Berkshire**
9. At the end of the 19th Century which of the following railways was the largest joint stock company in the world? **LNWR**
10. The highest auction hammer price for a single item of UK Railwayana was £6000 for the name plate?  
**Dartmoor £52,500, Golden Fleece £60,000, Cock'o'the North £54,000, Queen Elizabeth £57,400, Nottingham Forest £43,000 , Manchester United £40,000. Note the second Golden Fleece plate sold 3 years later for only £30,000 and the brass football in the Man Utd was subsequently found to be a forgery - hence the dangers of investing in railwayana!**
11. The largest existing driving wheels are those from a Bristol and Exeter 4-2-2 engine built in 1877, What size are the wheels? **8ft10inches**
12. Cecil Paget built an experimental 2-6-2 loco for the Midland Railway. The cylinders were single acting. How many were there? **8**
13. When did trains first run regularly from Paddington to Reading? **1840**
14. In how many directions can you travel by rail from Crewe? **6**

John Spokes adds, “I organised a railway/ME quiz, which was deliberately difficult, but answers were multi-choice so that participants could guess or use their intelligence (really!). I have been asked to include the questions in Prospectus, together with the answers. 6 persons tied on 6 correct answers and the deciding question was answered by our Treasurer, Jim Brown. He was closest in estimating the 13h 23m scheduled travel time of the longest direct journey in the UK, which is the Cross Country train from Aberdeen to Penzance (722 miles). Jim had some advantage as he has taken this journey in the past.”



Left  
Army train at  
Tidworthy with  
Rolls Royce  
loco No 265 on  
27 Sept 1987.

Right  
The Chatsworth  
Kings Cross 29  
April 1995





Lewis Carroll  
at Cardiff  
Photo WP

## FOR SALE — O GAUGE 0-6-0 LSWR TENDER ENGINE Peter Harrison



An enquiry has been received from a member interested in purchasing the O gauge 0-6-0 LSWR tender engine currently in a display cabinet in the club house. The trustees have agreed that this model could be disposed of as it has not been used for many years. In the interests of openness and fairness it has been decided to open up the sale of this item to all interested members. Any member interested in purchasing the loco can do so by making a sealed bid. All bids will be opened at the Trustees meeting on Monday March 15<sup>th</sup>. A reserve will be established to ensure that loco is not sold under value. The reserve will be determined by consulting members of the O gauge section. If you are interested in owning the loco please place your bid, along with your name and contact details in a sealed envelope and hand it to a Trustee by Sunday March 14<sup>th</sup>. Any bids received after this date will not be considered.



**FIFTY YEARS  
AGO**

**Photos by  
John Billard**

Not a very inspiring photo but it just qualifies as it is dated 6 February 1966. It shows a LMR DC Electric disappearing towards Watford Junction taken from Northwick Park, Harrow. By then I had just about given up on steam and turned to motor racing instead. I know that the SR lasted longer but that was Sarff London mate, and I was a Wembley boy! This view is today obscured by vegetation.

I know that a certain engine has been in the news recently so here it is again. Carnforth, June 1974  
Photo JB



## DIARY

### February 2016

Tuesday	2nd	00 gauge layout	19.30
Sunday	7th	Public running	13.30 till dusk
Tuesday	9th	Blaggrave Nursery	10.00-14.30
Saturday	13th	Club running	11.00
Monday	15th	Trustees meeting	
Tuesday	16th	00 gauge DCC	19.30
Saturday	20th	Birthday party	11.00-13.30
Sunday	21st	Birthday party	11.00-13.30
Thursday	25th	Talk "A life offshore"	19.30
Saturday	27th	Young Engineers	10.00-14.00
Saturday	27th	Club running	14.00
Sunday	28th	Birthday party	11.00-13.30

### March 2016

Tuesday	1st	00 gauge layout	19.30
Saturday	5th	Birthday party	11.00-13.30
Sunday	6th	Public running	13.30 till dusk
Saturday	12th	Club running	11.00
Monday	14th	Trustees meeting	
Tuesday	15th	00 gauge DCC	19.30
Friday	25th	Young Engineers	18.00-22.00
Saturday	26th	Young Engineers	10.00-14.00
Saturday	26th	Club running	14.00

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 February PROSPECTUS is  
18 February This is the final date.**

Contributions from all members are greatly welcomed

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

John Billard Old Station House Twyford Reading RG10 9NA  
01189 340381