

Winter 2022

TOUCHPAPER

The Newsletter of the Royal Gunpowder Mills Friends Association
Registered Charity No. 1115237

National Heritage Memorial Fund Grant

A Rather Big Bang

A Big Bang Witnessed

7 ¼" Railway

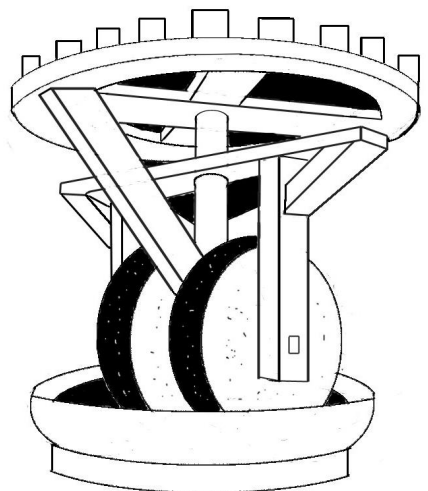
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Winter 2022

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Deadline for the next issue is 25 February 2023

Chairman's Chat

Sunday openings to the public have now finished and by the end of October over 2400 visitors had come to the site. Winter tours of the site are still ongoing, the next one being on the 10th December, school visits continue.

Recently the Mills has been awarded a lottery grant of £420,575 for repairs to L157 our grade 1 listed incorporating mill, L157 had not been open to visitors for all of the 2022 season.

The Friends are covering the cost of repairs to John Wilson's miniature railway. Rotten wood sleepers are now being replaced with recycled plastic ones that look identical and should last much longer. Other work includes attention to the control electronics in the tram and repainting.

John Cook has now taken over the post of Treasurer with Daphne Clements as Membership Secretary.

Next September will see the canoeing world championships at the White Water Centre with over 50 countries competing. This should bring us extra visitors as well as our being represented at the opening ceremony in the Abbey Gardens.

And finally, wishing you all a Happy Christmas and prosperous New Year.

Len Stuart

Editorial

Back in 2011 I took on the task of completing an issue started by our previous Editor, the next (Winter) issue was the first that I started in my somewhat reluctant role as the new Editor. Les Tucker encouraged me my promising to submit an article for each issue while I continued and this he has done and still keeps up the good work. I have been greatly helped by many others and while people contribute I quite enjoy the work. New authors are always welcome and I try to leave their work largely as submitted; please feel free to join the happy band!

Enclosed/attached with this issue is the renewal form for 2023; please complete and return this as soon as possible before it is lost/forgotten, no cheques will be paid into our bank account before the New Year.

The form is slightly amended to allow choosing to have the email version in addition to the printed at no additional cost if you wish. This has recently been an option but not explicitly stated on the form. Another change to the form relates to paying directly to the Friends bank account, which is of course convenient for Daphne but not compulsory.

We wish you all a Merry Christmas and a Happy New Year.

Brian Clements

National Heritage Memorial Fund Grant



We have twenty listed buildings on the Royal Gunpowder Mills site, one of which is listed at Grade One. This is building L157, situated at the southern end of the Queens Mead and better known when the site was operational as Dr Uri's lab. In its original form it was a gunpowder mill, subsequently converted for cordite production and after World War 2 into laboratories. The picture below shows it in the 1970s as laboratories.



When work was underway to re-open the site as a heritage visitor attraction it was converted back to the form that it would have been in Victorian times. The building was found to have more of the original features than any of the other mills, hence the Grade One listing. The next picture shows it now:



The COVID pandemic and the associated site lock-down in 2020 and 2021 meant that normal preventative maintenance was put on hold. The unfortunate consequence of this has been the significant deterioration in the condition of several buildings, including L157. We therefore approached the National Heritage Memorial Fund for financial assistance.

The work required to rectify the situation is quite extensive, embracing the following:

- The woodwork on the veranda is suffering extensive rot, rendering it unsafe
- Skylights are leaking resulting in water ingress into several bays
- Various gutters are either failing or non-existent
- Several windows need repair or replacement
- The external cladding of the building has seen extensive damage, mainly by birds.



In addition there is a need to re-provide the services, such as foul water drainage, which had been disconnected in the 1990's after site closure.

We are pleased to say that the National Heritage Memorial Fund is making financial provision for this repair work to go ahead.

Geoff Hooper

A Rather Big Bang

When I moved from the X-ray crystallography section to the explosives group in the early 1970's, a test called the Large Sealed Vessel (LSV) test was already in use, ably performed by Peter Hart and Dave Manners and over 100 tests had already been performed. The aim of the test was to determine whether explosive materials, and in particular, gun propellants, would constitute a mass burning hazard or a mass explosion hazard in the event of an accidental ignition occurring in storage or in transport. One of my tasks was to further develop the test.

The test vessel itself appeared to be adequately designed and reproducibly procured and manufactured using a combination of machine shop, welding and blacksmithing techniques. The Large Sealed Vessel is manufactured from a well specified grade of steel, it is cylindrical in shape, 76mm internal diameter, 9.6mm wall thickness and is 543mm tall. Each end of the cylinder houses a 25mm thick circular steel disc welded into the tube and machined to accept taper threaded plugs, 1¼ inch at the top and a ½ inch at the base. Peening over ends of the tube had been demonstrated to help ensure that the tube failure following propellant ignition initially occurs in the body of the tube rather than ejecting one or more of the end discs. The top plug is perforated and welded to a steel tube in order to locate a 3 gram pyrotechnic igniter at the centre of the vessel with the electrical connecting leads feeding out at the top. Test vessels were usually filled through the top plug in a manner appropriate to the form of each test material. For each test material four vessels were filled and fired, one at a time, in a facility at New Hill designed to retain all or, for very violent events, most of the fragments. The fragments from each firing were recovered, counted, photographed and weighed.

Their numbers were statistically compared to those from tests on a propellant thought from experience of previous incidents to be close to the borderline between mass explosion and mass deflagration (i.e. big bang or big fire, neither desirable but the short term structurally damaging effects from big bang cover a much greater area than big fire).

Gun propellants are designed to eject the appropriate bullet, shot or shell from the barrel at the required velocity without compromising the safety of the operator/s. This is achieved by selecting an appropriate propellant shape, size and formulation to ensure that most of the propellant has burned by the time the projectile leaves the barrel. In order to meet this criterion for the wide range of military weapons, the total initial surface area of propellant available for combustion varies hugely. Thus both the dimensions and complexity of the initial grain shape are varied. They range from powder through grains, sticks, hollow tubes with or without slots, perforated or multi-perforated cylinders and can even be quite complex perforated shapes. The thickness of propellant required to be burned through before each grain is all consumed is called the propellant web size and for a given propellant formulation, the smaller the web, the quicker it is going to be burned. Propellants for smaller calibre weapons are usually preloaded into rounds to suit the particular weapon. Propellant for the larger calibre weapons has usually been stored in C128 wooden boxes in explosives magazines until it is loaded into the configuration appropriate to the weapon. The boxes of propellant are stacked on pallets within the magazine to the appropriate height and spacing.

So gradually the range of LSV tested gun propellants and web sizes began to increase, testing tending to concentrate upon those either in-Service or under development and potentially coming into Service. As designers strove to meet increasing military requirements more energetic fillers (some of them high explosives) began to be included in gun propellant formulations and in increasing proportions.

The consequences of an unintended ignition of gun propellant in storage or in transport therefore presented an increasing hazard. What was initially thought to be a critical mean number of LSV fragments from testing was gradually reduced as our database of results increased and more information relating to real world accidents was gleaned, but it was generally not possible to procure those foreign explosive materials to test in the UK and thus it became more important to get closer to reality and test how in-Service UK gun propellants reacted to simulated worst case magazine storage events.

This led to a series of larger scale trials and, in sympathy with the Waltham Abbey surroundings, there was a need to conduct them elsewhere, initially at Shoeburyness. At that time there were many more UK gun propellant storage facilities than there are now, no two were the same and some were underground. So a larger scale trial was discussed with the Ordnance Board and was set up using a triple base in-Service propellant formulation known as DX. LSV trials at Waltham Abbey had indicated that the critical web size for these multi-perforated grains was likely to be 0.7 or 0.8mm, hence known as DX M07 or DX M08. Whereas slotted tubular propellants were packaged 25kg to a C128 box, multi-perforated propellant fills space more efficiently and is packaged 40kg to a C128 box.

In explosives magazines such boxes of propellant are stacked on a standard wooden pallet within the height and handling limitations of the magazine. In order to represent something approaching a worst case scenario, it was agreed that an appropriate sized pit be accurately dug in the ground and wooden pallets placed at the base as they would be in a magazine. Then five layers of three boxes were added in an alternating π shape up to flush with ground level, so fifteen boxes in all, with five empty C128 boxes added at each end. By alternating π shape is meant that looking at one end of the propellant filled boxes one would see the side of a box and then one end of two boxes as one looks either up or down layers of the stack.

A 3g SR371C igniter was located in the propellant, near the centre of one of the two parallel boxes in the third layer, thus close to the centre of the stack. A thin steel sheet was then added on the ground to cover the stack and half a metre of soil overburden placed on top. Not too surprisingly, firings were limited to one a day, beginning with DX M08.

The results from the first two trial days were similar to each other, the plate and overburden were shifted and enough soil displaced to allow flame and combustion products to escape. After the initial event intermittent burning continued for a significant period and so the remains were not cleared until the following day.

On the third firing day the trial involved the slightly smaller web size DX M07. It was obvious that the event was a lot more vigorous than that with DX M08 but nevertheless was still no more than rapid burning.

By the fourth firing day I was inwardly quite concerned about all the effort that had been expended in the trial so far. Shouldn't have worried though! As the end of the countdown was reached our reinforced building shuddered, there was a very loud bang and small flecks of white paint fluttered down from the ceiling. The high speed video of the event showed that a wide column of what was a small part of the Rugwood range had been ejected straight upwards and the vast majority of what had gone upwards returned to earth over the following thirteen seconds. A few minor bits of debris landed on the roof of our building and some of our transport parked to the rear of it. The damaged steel plate had flown a lot further, landing outside of the range in the farmers' field of crops from whence it was subsequently recovered.

Over the following years further trials were performed at Shoeburyness and other ranges but since this trial had clearly demonstrated box to box propagation, most only required single boxes of propellant and appropriate confinement.

A Big Bang Witnessed

Earlier in this edition of Touchpaper Dave Mullenger, has given us a fascinating account of one of his trials at Shoeburyness's Rugwood Battery. I am afraid that Dave is being much too modest. As a witness to his trial, it is one that I shall always remember as a highlight to my career.

Just to summarise Dave was carrying out a trial to determine if gun propellant could be made to mass explode under confinement, rather than to burn violently. He was testing small web DX in a NATO Stack Trial. The day before the trial that Dave has described, and that I was due to witness, the material had burned violently. Just a reminder that on top of the stack was a large (possibly 12mm thick and maybe three metres square?) steel plate. When all was ready, we retired to the Rugwood battery "Strong" room; a windowless reinforced concrete box (or so we thought at the time!)

There was the usual countdown to ignition followed immediately by the kind of explosion that makes you worry about your bowel security. We sat in shocked silence as flakes of paint came from the ceiling and landed on and around us, thankful to be in a reinforced concrete box. Only later did I learn the ceiling was actually only made of hollow beams and would have offered very little protection from the afore mentioned steel plate. Just as we were realising that we were unharmed and relaxing, there was the thud, thud, thud of debris landing all around the Battery. It occurred to us all at the same instant that our cars were unprotected just outside and in the open! When we did tentatively, and with some trepidation, venture outside there was a massive crater. Perhaps 4 metres deep and maybe 10 metres across where the boxes of propellant had been. Thankfully, and by some small miracle, all our cars were unharmed. The sentry at the sea Wall 100 meters away had heard the steel plate fly overhead! It was later recovered.

The trial conducting officer, Major Hills, was ecstatic. He felt that having performed so many trials, where not much happened, that this one had made it all worthwhile. It is worth noting that Major Hills was famous for always having his black Labrador dog with him. I was never quite sure about the wisdom of this. but on balance I thought that the Army Officers dogs were less of a hazard than their owners.

Peter Stone

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7 ¼” Railway

John Wilson, whose obituary appeared in the last issue, built the railway, mostly funded by himself. During the two year Covid lockdown no maintenance was possible and wiring on the tram was eaten by mice. By this time John was having health problems and was unable to do the necessary work although he did decide that the motor control system would be replaced by one removed from another of his loco projects.

We made a start on the work when he went into the nursing home , occasionally reporting progress. Luke Saville took over leadership of the project with assistance from others and we managed to provide rides to visitors on most Sundays during the open season. Harry Ward and Luke did most of the driving/guarding ably supported by other volunteers who had worked with them in past years.

The Friends have agreed to fund some of the necessary work and during the close season we plan to replace original wooden sleepers with plastic ones similar to the majority that John had installed. Other jobs are repainting the tram and carriages, general maintenance and attention to track ballasting. Alan ?? has volunteered to replace the original damaged wiring loom so the old control system can be reinstalled, thus making life easier for the drivers.

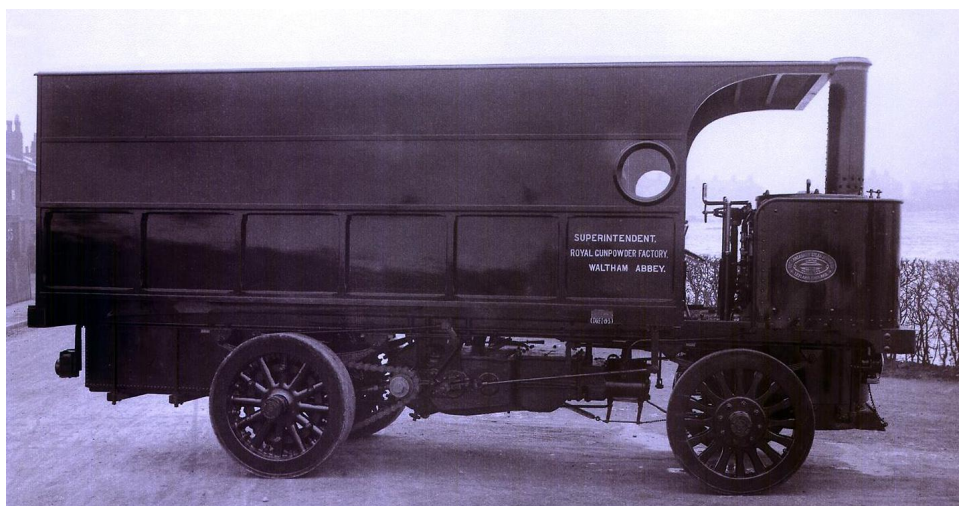
The railway has been renamed the ‘John Wilson Railway’ and a station sign purchased.

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Lorry Lore

Further to correspondence on the steam lorry postcard in Autumn Touchpaper, the Mills were quick to take up the new form of road transport, in 1905 - could be conjectured connected with the new chemical plant on the South Site.

The images show a lorry at Leyland Lancashire awaiting delivery to the Mills in the early 1900's, resplendent in its gleaming new livery.



WAI 468-01

The signwriting on the side read

Superintendent

Royal Gunpowder Mills

Waltham abbey



WAI-468-02

Although in road transport internal combustion ultimately triumphed over steam for cars, steam found a niche surviving market for lorries or wagons as they were then called. A major competitor to the Mills supplier was the Sentinel Waggon Works of Shrewsbury, originally from Glasgow. Sentinel succeeded in producing attractive designs and their steam wagon sales continued surprisingly late into the late 1940's / 1950, albeit steadily declining in later years until steam production finally ceased in 1952. In the immediate years after WW2 export was quite successful and Sentinel steam went out with a bang when in 1950 an order for 100 steam lorries was received from an Argentine coal complex. Sentinel went on to produce diesel lorries and engines and a range of engineering products.



Sentinel steam waggon

Tennents brewers of Glasgow of original Tennents Lager fame were still using steam around Glasgow in the late 1940's for delivery to thirsty citizens and I vaguely remember from schoolboy days seeing one of the older steam lorries and thinking what a strange beast it was. From early days Tennents had adopted a T logo. This was a very powerful visual and they have used it to this day on every permissible flat surface.



**Tennents Steam Waggon
1905**



The modern lorries in bright yellow livery are a perfect mobile advertising board for the logo and whatever slogan the marketing men dream up. The sides were used for a very necessary security message, the end panel had a very large T.

Les Tucker

Letters

Sir

Pipe down.

Further to Dr. G.Hooper's article in the Gunpowder Mills Friends Autumn Newsletter on the Events of 2nd. June in Waltham Abbey

I was sorry to learn that a certain segment of Waltham Abbey society failed to appreciate the rendition of the important branch of classical music which was offered.

Perhaps a course of musical appreciation could be arranged.

This could culminate in attendance at a performance by massed pipes and drums to fully appreciate the power and depth of this music,

A concerned observer

Draft seen by Les Tucker



Novel Propellant processing

I felt a bit of a fraud when I joined Safety Services, as I knew so little about High Explosives (HE). Everyone else seemed to. Someone pointed out to me that it takes 10 pounds of propellant to project a pound of HE. Propellants are what moves either a projectile or a bullet out of a gun and what powers a rocket to the target or to the moon. In P1 we dealt with Nitrocellulose based propellants. These are variously referred to as Cordite or solvent propellant for guns and Cast Double Base (CDB) or Solventless Cordite for rockets etc, depending on the manufacturing process used. Gun Powder was the first propellant, but it was also used as an explosive. Cordite was introduced in to British Service in the 1890s. It is more powerful than Gunpowder and produces much less smoke. Also, it is not so susceptible to damage from moisture. Britain also added a substance called Picrite to Cordite for use in artillery ammunition to reduce the flash and to reduce barrel wear. Flash of course gives away your position. I have been shocked recently to see the flash from Russian howitzers. Presumably they haven't found out about Picrite!

When Steve Bell became SP1 (in the 1970s) he instituted a programme to investigate the possibility of using novel techniques for the manufacture Nitrocellulose based propellants. We "Old Lags" were sadly excluded from any input into the new programme. Perhaps it was thought that we were too "Dyed in the wool"? As I understood it, one of the aims was to investigate continuous processing. I have to say that I felt (and still do) that this was fraught with danger and that batch processing had the advantage in that at least the damage was limited when, as inevitably happens, things go bang. So perhaps the powers that be were right and I was too reactionary! But it maybe that an opportunity was lost. Earlier attempts at automating processing had almost been forgotten by then.

Not many people now know about this earlier work to modernise propellant manufacture. The evidence was all around me when I joined in 1967. There was strange pipework and collection vessels that were never used in P718, the Solvent Cordite Press House. Also, there was the outline of a step ladder burnt into the gritless asphalt floor of this building. There was an empty traverse in a part of this building where an 8 inch High Level press had once been. I asked the process workers about these phenomena and they told me that this was the result of Richard Wallace's attempt to modernise propellant processing. I was warned that this was a "Don't mention the War" topic for Mr Wallace. He had identified (correctly in my view) the area most amenable to automation. Making gun propellant and casting powder is a very labour intensive process.

For both processes a dough is made by mixing Nitrocellulose and Nitroglycerine with a solvent plus various additives and ingredients. We used modified machines, that are normally used for making bread, for the mixing. The dough looked very similar to a bread dough. This was then put into the cylinder of a hydraulic press and extruded. The press consisted of a cylinder with a ram (rather like the piston in a car engine cylinder) that forced the dough through dies to form cords, tubes or other shapes. As the cord came out of the dies it was collected in baskets or drawn onto long boards and cut to 10 foot lengths. If the finished product was to be a long length, say 18 inches, the extruded product was cut manually. However, if short lengths were required each cord was passed into a rotary cutting machine¹. This consisted of a brass plate with holes in it through which the cord was fed. There was an electrically powered rotating disc with several steel blades attached behind, and just touching, the brass plate. The speed of this could be adjusted to give the required length. This was very laborious process. And both gun propellant and casting powder (simply a chopped cord) is required in large quantities. The extruded material was then dried in a stove to remove the solvent.

To make CDB rocket motors, casting powder is put into a mould and a mixture of Nitroglycerine and plasticisers then filled into it. This then is cured in an oven to form a solid in much the same way as a rice pudding might.

Mr Wallace devised a cutting machine that cut the cords as they came out of the die. The granules were then intended to be collected by being forced along the afore mentioned pipework by compressed air and hence into the large collection vessel. Mr Wallace supervised this “remotely” by standing on a step ladder and peering over a wall. Hence the burnt silhouette of the ladder when the inevitable ignition took place! It must have been a very dramatic event and to have put Mr Wallace in some danger.

The mystery of the empty traverse was explained me by an eye witness. He was an incorrigible rogue. We shall call him George Hood (mainly because that was his name). He may not have been a reliable witness! Originally there had been two identical High Level 8 inch presses. A trial of Mr Wallace’s press cutter in one of these resulted in something much more like an explosion on this occasion. There was an escape tunnel conveniently located for the process workers in the occurrence of just such an event. The Scientist in Charge (Terry Greenall) was walking past when the explosion happened. My eyewitness said that Terry rushed in to check on the workers just as they were coming out. When Terry, who had been knocked over, came out after the process workers, there were boot marks on the back of his shirt.

It was said that Mr Wallace was so traumatised by the Boards of Inquiry that followed these two events that he dropped the whole idea. When he had another fire in the Combustible Cartridge Case processing area, he allegedly had it covered up and got the room redecorated on the quiet.

I did once use the 3 inch Press Cutter and, on one memorable occasion, Mr Wallace and I used the (remaining!) 8 inch Press Cutter. Its use was hedged about with safe guards.

We were allowed to use only a low energy Ether Alcohol dough and viewed it through a hole in the wall. The result was spectacular. We produced as much powder in about an hour as would normally take a team of four or five all day. The granules produced also had a small hemisphere formed on one end as they were cut straight out of the die, which aided packing density

I came across a drawing and photographs of a seven hole cylinder once in a discarded file on the subject. One problem with multi die extrusions using a press cutter is that different dies extruded cord at different speeds. So, Mr Wallace had a cylinder made with seven smaller cylinders machined into it so that each die would extrude at the same speed and each cut granule would be the same size. I thought it was a brilliant idea, but sadly I was told that did not work.

I wonder if anything ever came of any of the modernisation initiatives? I believe that at some point, on the more recent modernisation programme, a visit was made to Italy. I can see that their expertise with pasta must be very useful for propellant manufacture. Not in the UK obviously as we foolishly gave up gun propellant manufacture. But that is another story. I can't help thinking that if computer control and automatic safety systems were available to him, Mr Wallace would have succeeded.

There were other initiatives evident from the purposes of some unused buildings on the South Site. There was, for instance one for the manufacture of Ball Powder, an alternative for small arms propellant. The original process for small arms propellant was to extrude small tubes and to chop them as mentioned above. Ball Powder was made by allowing small spheres of propellant to be formed from a solvent solution. This avoided the pressing and cutting process normally used for the manufacture of small arms ammunition. The building was never used to my knowledge, but rumour had it that we had tried and had trouble getting a consistent size. I believe that other countries have succeeded.

Roy Stenson had tried to make a CDB propellant using “raw” Nitrocellulose (instead of casting powder) and Nitroglycerine and mixing them to into a slurry. This would have cut out the need to make casting powder. Again, nothing seems to have come from it. There were many unused, or hardly used, buildings on the South Site for many propellant processes. They were superbly designed facilities and it was criminal that they were all destroyed. I have in the past tried to find out where the design expertise came from. But I have drawn a blank. I hope to try and compile a list of them.

I understand that IMI Summerfield continues to manufacture Cast Double Base rocket motors. I presume that they get their casting powder from the Nobels Explosives Company in Ardeer.

1. We called ours a Wrexham Cutter. Bishopton had an identical one called a Du Pont Cutter. This caused us some puzzlement until we discovered that there is a place called Wrexham. And during World War II it had an ROF which made gun propellant.

Peter Stone

December Miscellany 2022

Home Fire Alarm

The Editor decided to update his home fire warning system. Fortunately he was able to have installed a newly introduced domestic alarm system.



Gerald Miller and Brian Clements with the 100-year-old Siemens fire pillar they have restored to its former glory.

WAI 466 – 01

**Gerry Miller left and
Brian Clements right
with restored
Siemens fire alarm
pillar**

Here he is standing urbanely beside a gleaming new state of the art alarm.

The Editor denies any responsibility for this entry

I can remember - 2000



I can remember can be addictive. These two were taken on a wilderness roam in 2000. It would be interesting to return to the spot to see the effects of a further over twenty years in natural state.

Hide Sight



WAI 1585 01 02

L135 Magazine

**This is part of the floor
of L 135 loading bay
floor.**



Spark causing grit was a constant threat and floors were covered in materials which could be kept thoroughly cleaned. Animal hide was frequently used – cow hide for less demanding applications and elephant hide for high risk. Where possible off cuts were used, tacked down with copper nails.

Waltham Abbey Gunpowder Street Names



Someone in Waltham Abbey Council must have known his Mills history.

Canals

An earlier attempt to shore up the In Out lock. Inevitably It has further collapsed and once imposing lock gates are now pieces of rotting timber in the bottom of the lock.



The dried up course of the canal can be seen in the view from the lock. This is the kind of restoration of an apparently hopeless site, including the lock, which the Waterway Recovery Group (WRG) is able to undertake.

There are some examples on the national waterways where a lock has been restored to stand in an as yet waterless and derelict canal route, in order to initiate a project and hopefully spark public and Council interest / funding.

This interesting paddle gear in the lock by the car park was still in quite a good state.



The crescent shaped paddle was raised to allow water from a feeder to flow in to fill the lock with the gates shut (on right in photo).

Canal enthusiasts would have found the design of paddle interesting.

Martin – Baker

The story of Valentine Baker of the firm Martin-Baker is interesting in its own right and there is a further element of specific Mills interest applicable to his partner in the firm, James Martin.



Valentine Baker MC DFC

The military career of Valentine Baker is something of a record, in that he served progressively in five different wings of the Services. Initially, in WW1, he joined the Navy as a petty officer mechanic and from there moved steadily upward in terms of branch of Service, injury, rank. After about a year he was transferred to the Royal Naval Air Service as a dispatch rider and served at Gallipoli. He was wounded there and discharged as unfit for further service. Undeterred, he somehow managed to get himself commissioned in the Army, as a 2nd Lieutenant in the Royal Welch Fusiliers. After service in the trenches he applied for and was accepted for pilot training in the newly formed Royal Flying Corps (RFC). Later he transferred to the newly created RAF as a flying instructor.

So Baker's service record read – Royal Navy, Royal Naval Air Service, Royal Welsh Fusiliers, Royal Flying Corps, Royal Air Force.

After the War he became chief flying instructor for the London Aero Club.

Then in the late thirties he was joint founder, with James Martin one of his pupils at the Aero Club, of the Martin-Baker Company. The company was initially dedicated to developing a fighter aircraft to be supplied in large numbers to the RAF and Baker performed the vital function of company Test Pilot.

A truly remarkable record.

James Martin (later Sir) CBE



Martin was the engineer / inventor part of the partnership.

The fighter, named the MB, evolved through five prototype versions. Tragically Baker lost his his life testing the MB3. However development continued and the last version the MB5 was considered superior to the Spitfire. One of the world's leading test pilots, Capt. Eric 'Winkie' Brown said it was 'most magnificent' and should go into production.



Government orders however were not forthcoming and this magnificent aircraft never went into production, to join the sad list of inventions which were technically sound and attractive but for a wide range of reasons foundered. – Why – The late thirties saw a rapid increase in the tempo of defence development and a fighter aircraft was a key element. Perhaps the Spitfire had secured a lead in the race and the MB5 was perfected a little too late? Maybe someone has written a study of what happened.

Doubtless disappointed, Martin turned his attention to another project – pilot ejection from aircraft. He was successful in designing the Martin-Baker ejection seat and many pilots owe their lives to his genius.



WAI 462-02

A vital part of the system was of course an effective and safe propellant material and one of the Mills achievements was the development of this material.

The Martin-Baker company exists to this day and still supplies a large proportion of the world's ejection seats – which could be taken as a memorial to Valentine Baker.

Les Tucker

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Julie's Nature Column

Here we are once again in the winter months and with the changing of the season brings the changes in wildlife behaviour. Birds flock together during these months to improve their chances of survival, with the trees being bare they are an easier target for a predator, many pairs of eyes in a flock increases their chances of spotting danger. Roosting together at night can offer some warmth if they huddle together. Our Alder trees already have flocks of Siskins and Goldfinches feeding on the seeds. Flocking together doesn't apply to all birds though such as the highly territorial Robin. They seem to tolerate each other more in the winter and you may well see as many as 3 in the same area, but it can break out into a squabble. Robins are quite often puffed up like a round ball in the winter to help keep them warm.



Other changes in wildlife behaviour may include a change of territory, moving to areas providing more food opportunities or cover from the elements. I have noticed that our visiting Otters are less frequent in the winter months. I don't know if this is because they are less territorial or whether the food supply in the waterway's change. After my attempts for many months to get Otter photos facing the camera instead of their back end, I finally achieved it. One particular Otter seems to stop and rest for a while, a full tummy or a long journey, who knows. I will be interested to see how the next few months ago and whether they stop visiting for a while.



We are hoping to position a Tawny owl box on a tree soon. Placing it at this time of year gives the owls plenty of time to inspect it and decide whether it's a good nesting opportunity for the spring. I know that they have bred in the woodland in the past and they can be heard at night calling to each other. Fingers crossed that we get lucky.

I recently potted 100 Alder seedlings to be planted out at a later date. These seedlings will be planted in a protected area and hopefully regenerate the Alder woodland creating a better habitat for more wildlife to move in.



I'm still seeing Buzzards high in the sky and often when I least expect it they are suddenly overhead. It's a bit tricky spotting them in the trees; it's normally when they take flight that you realise that it was sitting watching you. I did manage to spot a young one land in a tree recently and I snuck up on it to get a photo.

I haven't seen many foxes this year. It could be because I'm in the wrong place at the wrong time, but then out of the blue when I wasn't paying much attention this rather wet looking fox popped up and stopped only for a moment for me to get a photo.



Our beautiful fallow deer have finished rutting. I noticed a few of them have lost quite a bit of weight which is normal, but it's time for them to bulk up before the winter gets too cold. I have been putting out carrots for them which are high in sugar and we have had our Haylage bales delivered and ready to go out in the woodland to help the deer get



through until the spring. Haylage is full of nutrition and the smell of it lingers in the wind which should attract them to it straight away. Here you can see one deer enjoying a bit of warm morning sunshine whilst the other is entertaining a magpie sitting on its head!

Well that's all for now, but I will be looking for more photo opportunities and wildlife stories to bring you again soon.

Julie Matthews
Mills nature conservationist

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