

Spring 2018

TOUCHPAPER

The Newsletter of the Royal Gunpowder Mills Friends Association
American Civil War - Southern Confederacy Contd.

A 'Line' Quiz

Acetone, Conkers and the State of Israel

Post-script to Tom Lewis Obituary

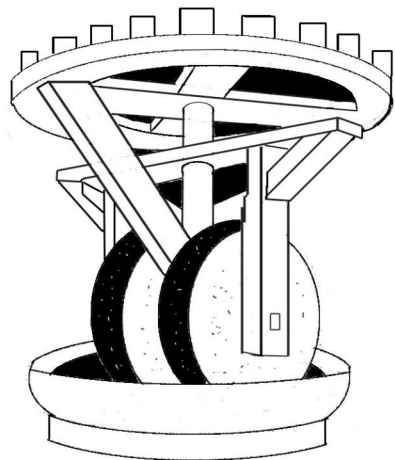
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Spring 2018

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Deadline for the next issue is 25th May 2018

Chairman's Chat

Despite the cold weather over half term we had very good attendances at the Powder Mills. We were very pleased to see so many visitors and hope you all enjoyed your visit. Unfortunately several of our guides for the Rocket Vault had had falls in the two weeks before half term and so were unable to act as hosts in the Vault. Thankfully they are now mostly recovered.

There is a not surprising lack of interest in working outside at the moment so some jobs will have to wait until the weather improves. One of these is working on the 7¼" inch gauge railway. The drivers get particularly cold in the breeze. The deer don't seem to mind the weather too much, we are pleased to say.

We are working on replacing the outer wall covering of our Grade 1 building L157 gunpowder mill. The material requirements need to be close to one of the original coverings used, while maintaining low resistance to blowing out if an 'imaginary' event were to occur. Looking forward to seeing visitors in the Easter and Summer holiday periods.

John Wright

Editorial

I had hoped to get this issue out sooner but waited to receive more copy. Once more thanks to all those who contributed and please do consider contributing. Almost anything is welcome as we do need variety, both in writers and content.

Once more I have had notice that one reader was unable to read the email version of the last issue. I do check that the output PDF file is readable on my machine using Adobe Reader, and usually Foxit Reader as well. I cannot check all ways of reading PDF files under all operating system so please let me know if you have a problem.

Jim Burgess has written a very interesting book of his career and with his kind permission I include a short extract. Many of his chapters are considerably longer and I hope to include regular installments but decided to start with an amusing tale.

Sadly I have to announce the death of John Bowles who was a long serving trustee with especial interest in the railway. We hope to include an obituary in the next issue.

Near the end I have included some photos by Len Stuart, there are no prizes for answering the question but do feel free to send me your answers or comments. Finally there are some photos by John Wilson taken during the recent cold spell when he was too cold to do real work!

Brian Clements

American Civil War - Southern Confederacy Contd. Pt. 2 Gunpowder - Col. Rains - The Augusta Story

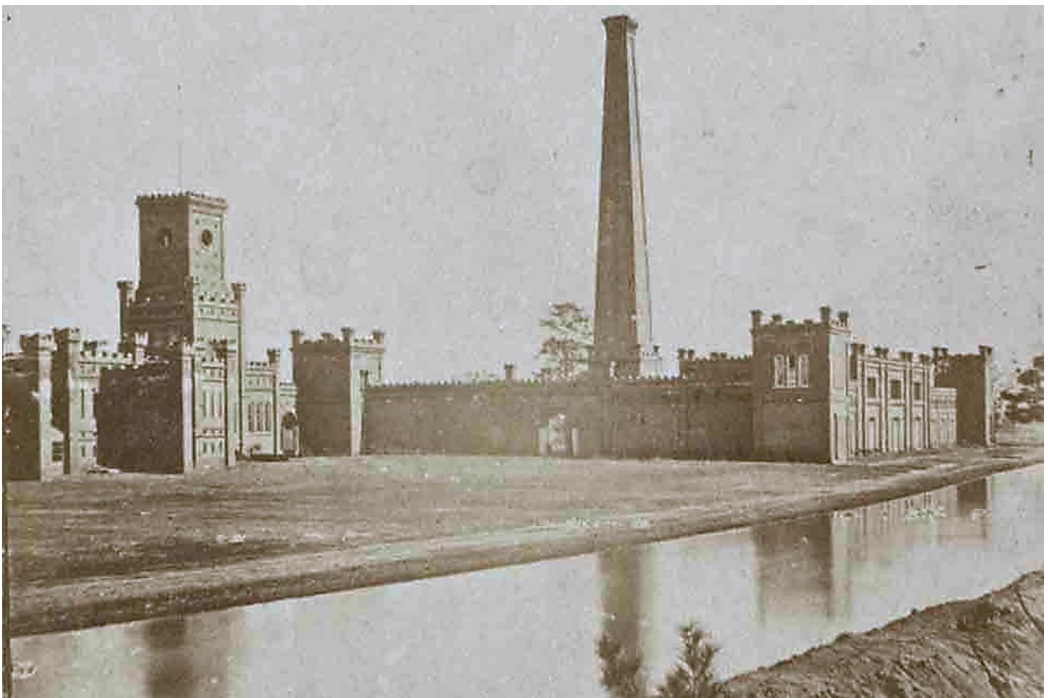
Augusta Gunpowder Mill 1862 – 1865

In spite of the difficulties the Confederacy managed to keep ahead of the saltpetre shortage. However it had insufficient finished gunpowder capacity and to remedy this Col. Rains was commissioned to design, procure the necessary machinery and oversee the construction of a gunpowder mill.



Col. George Washington Rains

He selected a site at Augusta, Georgia alongside the Augusta Canal and set about his daunting task. The resultant overall building design was grandiose, reputedly partly modelled on the Gothic revival Houses of Parliament and there were some dark mutterings that some features were being devoted to the greater glory of George Washington Rains rather than the operation of the mill, but the test which really mattered was whether it could deliver the quantity and quality of powder required.



**Main buildings of Confederate powder mill Augusta,
Ga. 1863**

‘A masterpiece of industrial ingenuity’

Process plant was built was built up, improvised and constructed from a wide variety of sources across the Confederacy, including a 130 hp steam engine purchased from a flour mill in Augusta. The drive shaft for power take off, imported from England, was 300 ft. long.

Diverse manufacturing problems were encountered and had to be solved, often by Rains modifying existing procedures and on occasion introducing new concepts. For instance, possibly based on English research, he pioneered 'wet mixing', converting the gunpowder mix to slurry by application of high pressure steam allowing the saltpetre to penetrate the minute pores in the charcoal and partially crystallise in subsequent cooling, cutting incorporating time by three quarters. When willow supplies for charcoal became scarce his investigations demonstrated that cottonwood which was in plentiful supply was a suitable substitute. As more modifications and innovations were introduced Rains came to be called 'Chief Chemist to the Confederacy'.

Rains was an admirer of Waltham Abbey powder and by lucky chance Waltham Abbey provided two important sources of support – firstly he obtained a technical treatise on gunpowder production at the Waltham Abbey Mills written by the Assistant Superintendent Major Baddeley providing valuable information on building design and layout, machinery, processes etc., and secondly he recruited Frederick Wright to his staff. Wright had been an Assistant Master Worker at Waltham Abbey before emigrating to America and therefore had expert knowledge of Waltham processes. Wright was working in powder making in the south and Rains lost little time in appointing him to a key advisory and training role.

Finally in April 1862 Augusta started production, at the time said to be the second largest gunpowder factory in the world. It was an outstanding success, never failing to meet all the demands placed on it, delivering over three years and eight days of production 2.75 million lbs .of high quality powder. It was regarded as one of the finest examples of American engineering ingenuity of its day and was the greatest construction achievement of the Confederacy.

Having successfully advised at Augusta, Frederick Wright was appointed Agent for the Nitre and Mining Bureau. The Southern nitre caves were prime targets for Northern raiding parties and on one such raid Wright was captured and spent the rest of the war uncomfortably in a succession of Northern prisoner of war camps – a long way from Waltham Abbey! After the War he returned to powder manufacturing, in Tennessee.

The Augusta mill was intended to be an enduring model of Southern manufacturing capability. But it was not to be. Augusta's gunpowder capacity was no longer needed after the War and it was demolished, apart from the works chimney, the bricks being used to construct a cotton mill on the site for the Sibley Manufacturing Company continuing the Gothic theme, generally regarded as a model of its kind and surviving until 2006 manufacturing denim. Although no longer a manufacturer the Sibley mill's water turbine continued to be employed generating electricity for the Georgia power company.

By 1878 post War tensions had eased and it was considered that a memorial to the Confederacy and its dead could be permitted. The surviving Augusta chimney was transformed into a memorial obelisk, it's ownership together with a small protective enclosure being transferred to the Confederate Survivors' Association and it survives to-day.

Rains, who had become Professor of Chemistry at Augusta Medical School, freely acknowledged the debt he owed to Major Badelley and Wright, whilst at the same time enigmatically referring to the latter as 'sadly defective in a certain way', which most would have deduced referred to an over fondness for Tennessee whisky.



The Sibley mill 1894



The Augusta site



**The memorial
obelisk**

Not the best attribute in a powder maker! but it doesn't seem to have affected the quality of his advice.

The demolition of his achievement must have been a grievous disappointment to Rains. In a final gesture to the old loyalties his will specified that the Augusta garrison flag which he had retained should be buried at the base of the obelisk.

Les Tucker

A 'Line' Quiz

Each answer contains the word 'line'. Eg the answer to 'ship' would be 'liner'.

1. Salty
2. Cat like
3. Reluctant/refuse
4. Almond shaped
5. Eagle-like
6. Church service
7. To mark out
8. Laid back
9. Knot
10. Girl's name (two if possible)
11. Direct route
12. Cloth made out of lint or flax
13. Slope
14. Heredity descent
15. Capital city dweller (foreign)
16. A key to lock a wheel to its shaft
17. Free from dirt
18. Amiability
19. Citizen of a western Capital
20. Medicinal gel

Hints:

- 4 Think "chocolate flavour"
- 5 Often referred to nose shape
- 6 Sounds like a moaning cockney

Bryan Howard

Acetone, Conkers and the State of Israel

Soon after the start of WWI it became apparent that acetone, vital to the production of nitrocellulose gun propellants was in very short supply.

In 1914 acetone was made by the dry distillation of calcium acetate which gave calcium oxide, carbon dioxide and acetone as products.

However, calcium acetate was imported from Germany and the only alternative was the destructive distillation of wood which yields charcoal, tar, water, methyl alcohol and a small amount of acetone.

A better method of making acetone was urgently needed and was provided from the unlikely source of a fermentation process developed by a Jewish chemist, Chaim Weizmann who was doing research on fermentation at Manchester University.

Weitzman was trying to make isoamyl alcohol as a starting material for the production of synthetic rubber by the fermentation of maize but the experiment was considered a failure at the time as the products were butyl alcohol, ethanol and acetone.

Knowledge of Weizmann's work was brought to the attention of the government through the agency of another Jew, L W Rothschild, who lived in Waddesdon Manor.

The Minister of Munitions, Lloyd George and Churchill requisitioned Nicholson's gin distillery in Bow for a pilot plant development which paved the way for production on an industrial scale at six distilleries.

Eventually 30,000 tonnes of acetone was made during the war although a nationwide collection of horse chestnuts was needed to replace maize.

In recognition of the services to the country Lionel Walter Rothschild received a letter on November 2nd 1917 from the British Foreign Secretary, Arthur Balfour, in which the British Government favoured the establishment of a National home for the Jewish people in Palestine.

This letter is now known as the 'Balfour Declaration' and Chaim Weizmann was honoured by eventually becoming the President of Israel.

Bryan Howard

Footnote

I am indebted to a reprint from Chemistry in Britain on Chaim Weizmann in providing the incentive for this article.

My thanks are due to Dave Hewkin who trawled the internet on my behalf.

Further details may be found in Wayne Cockcroft's book 'Dangerous Energy' which includes a photo of the decommissioning of the Holton Heath plant on page 159.

Post-script to Tom Lewis Obituary

Dave Debenham's obituary to Tom Lewis in the Winter 2017 edition of Touchpaper was spot on; Tom was much liked on account of his people-friendly nature, and also very well respected for the excellent chemist that he was. I remember this being noted by another SPSO - Rick Richards, himself no slouch when it came to innovative chemistry, who regarded Tom very highly indeed. There is, however, just one point of timing in Dave Debenham's write-up that I would like to comment upon. Dave is quite correct when he says that Tom was not totally spiritually committed to the wisdom of the move of himself and his team from Waltham Abbey to Fort Halstead, but he made a good fist of it, and the synthetic chemistry work did move with him to the Fort, albeit in later years after his retirement it did diminish in scale. At Waltham Abbey Tom had his office in a Portacabin. This was small room, totally saturated with his pipe smoke; that was the way he liked it. The Portacabin was next door to G432, a relatively modern two storey building on the South Site and, as I recall, most of his folks were housed in that building. The attached picture, taken on 5th December 1991, shows what their new home at Fort Halstead looked like.



It was known as building A28 and featured lots of tall chimneys to disperse the effluent from their pot-boiling chemistry which was done in state-of-the-art fume cupboards in the laboratories. The building was not liked at all by the local residents who saw it as a blot on the landscape, but it was regarded as vital for the defence of the realm, so its construction went ahead. The synthetic chemistry that took place first at Waltham Abbey and later at the Fort was ground-breaking stuff which focussed much around making energetic polymers using dinitrogen pentoxide as the nitrating agent. Energetic binders known as Poly-NIMMO and Poly-Glyn were the order of the day. The total cost of the new and refurbished buildings needed to house all the ex-Waltham Abbey staff at Fort Halstead was £25.942M, a figure etched on my mind to this day as there were battles galore over it, and A28 accounted for a significant fraction of that figure. The other major new builds included X48, shown here during construction on 3rd April 1990, built to house our vitally important energetic materials characterisation and ageing work, and also various other buildings for colleagues from the southern end of Waltham Abbey South Site.



Materials work and that from Westcott went into refurbished buildings. To return to A28, what were we all doing outside the building on that December day in 1991? Well the clue is in the tree just behind the group. This had formerly been outside the Headquarters offices at Waltham Abbey and Norman Paul had used his much valued organisational skills to get it moved down from Waltham Abbey to the Fort so that we had some tangible memory of “home”. The picture was taken at the re-planting ceremony. The sharp-eyed amongst you will note that three of us are proudly sporting our “Waltham Abbey 200” ties for the occasion. As far as I know, only Ian King (third from left in blue jeans) and Eamon Colclough (back row wearing a yellow jacket) are still working at the Fort for QinetiQ, albeit Peter Honey (next to Eamon wearing the decorative jumper) is also still working for QinetiQ and visits the site regularly in his capacity as their Explosives Adviser. I am not sure about Frank Kirby (fifth from the right); he was working for DSTL at the Fort.

Geoff Hooper

Extract from Jim Burgess's book

Chapter 11: The Iron Fairy

A section of the Engineering Department was known as The Riggers.

The Riggers were a handful of tough men whose tasks included, amongst other physically demanding jobs over the Site, the movement of heavy items of furniture and equipment. In the late 1960s or early 1970s this important group acquired what came to be their pride and joy — a mobile crane called an Iron Fairy. The Iron Fairy wasn't very big as far as mobile cranes went but it was self-propelled and mounted a revolving jib which could be controlled by the driver from the cab. It ran on four wheels rather than caterpillar tracks.

The Riggers were led by a massive man with a bald head. He looked like an inflated Kojak.

The task I particularly remember was the moving of a 'safe' to a building opposite to my office. The 'safe' was of the old type and may well have dated from the early 1900s. It was made of thick steel and was large, 6' x 4' x 3', and literally weighed half a -ton. I witnessed the crane and its cargo as it approached its destination. The 'safe' was swinging at the end of the jib in a rather alarming manner. The office for which the 'safe' was destined stood back from the road. Its most accessible door was external and could be reached only after going down a kerb and across a sort of forecourt.

Clearly, the operation hadn't received adequate thought or reconnaissance.

As the Iron Fairy drove down the kerb towards the office door, the driver shouted to his apprentice to go and get the office key. The apprentice duly set off on his quest.

As a result of descending from the kerb, the 'safe' started swinging really wildly at the end of the jib and within seconds it had crashed through the office door, completely demolishing it. "Don't bover wiv the key". The Rigger shouted after the disappearing apprentice!

The Rigger was completely unperturbed by the incident. Laissez fair ruled!

The last time I saw the Iron Fairy, it was on its side with the jib badly bent. It seems that the Riggers had been responding to the Director's request to remove a tree from his garden — from outside the fence!

Jim Burgess

Letters

Halifax explosion

I was watching the latest item on YouTube tonight, (The Great War) channel for this week and it chimed with Geoff's article about the SS Richard Montgomery.

On the 6th December 1917 a French steamer the Mont Blanc collided with a Norwegian Aid ship, the Emo in Halifax Harbour, Nova Scotia, Canada.

The Mont Blanc was carrying 200 tons of TNT, 2300 tons of Picric acid, 35 tons of petrol and 10 tons of Gun cotton.

The Mont Blanc caught fire and the crew abandoned ship. Needless to say the ship exploded causing damage out to 80 kilometres from the blast with 25,000 made homeless, 10,000 injured (many blinded by the blast) and 5 British steamer that were in port at the time, suffering serious damage.

Up until the dropping of Little Boy Atom Bomb on Hiroshima (which was reckoned to be 7 times more powerful) the Halifax explosion was the most powerful on record and used as a reference for other explosions.

The photos shown on the program, were of total destruction with no buildings standing, just piles of rubble. one photo shows a ship (unidentified) with no superstructure above deck level.

Just imagine if the Montgomery did go up.

John Wilson

Julie's Nature Column

Spring...a sign that winter is behind us, birds singing territory songs, woodpeckers drumming, the odd bumble bee here and there, daffodils almost about to burst into flower and then we all get walloped with a huge dumping of snow and freezing temperatures. It must be very confusing for all animals, but they seem to adapt and cope and hopefully most will survive. I saw a muntjac the other day which had already started to moult, it looked like it only had half it's winter coat left. I bet it felt the cold when the snow arrived. Here's a photo of one that's managed to hang on to it's winter coat.



There has been an increase of Parakeet sightings over the last few months. I'm not sure if they've taken up residence at the Mills or whether they are just passing through. Sometimes when I'm out on site they land in a tree nearby and check me out which gives me photo opportunities. They seem to be on the move quite a lot going from tree to tree and although they are very active and can be heard all over, the most I've seen grouped together is 4. I actually saw 3 Parakeets chasing a Buzzard away, but they didn't get too close, just bombarded it with a lot of squawks.



I went looking for signs of spring before the snow arrived and found cherry blossom in bloom, lots of snowdrops in the woodland and Herons picking out favourite fishing spots. I've heard the Kingfisher calling up and down the waterways and recently had a Red Kite soaring above me, what a lovely sight to see. The birds have been singing their hearts out and large flocks of Siskins mixed with Goldfinches and Chaffinches have all been feeding on seed in the Alder trees. Here's a Blue Tit that had just had a bath somewhere along the edge of the car park. I can recall how cold it was, but they still need to keep their feathers in good condition.



The deer probably don't know whether they're coming or going with the recent weather. Some days have been extremely windy bringing down trees and they seem to know that it's best not to stay in the woodland so they gather on Queens Mead. This little pricket decided to get comfortable and sit in a clump of sedge.



We have taken good care of the deer during the snowy weather and made daily trips to ensure that they had food. A special dry feed and fresh carrots helped greatly to keep them going with large stacks of haylage placed in the woodlands. I normally give a couple of calls and they mostly come running - including muntjac and a pheasant. I'm sure that the deer can't wait for the grass to start growing again and perhaps a bit of warm sunshine would top it off nicely.



I'm hoping that our resident Robins that like to nest in our store area will have a nice surprise if they return this year. I have placed a robin nest box in there for them in the hope that they will use it. I will be keeping a close eye on any activity.



Let's hope that the winter is behind us now and I'm sure that it's not just the wildlife that will appreciate some nice warm sunny days.

Julie Matthews

Mills nature conservationist

Line Quiz Answers

1. Saline	11	Bee-line
2. Feline	12	Linen
3. Decline	13	Incline
4. Praline	14	Lineage
5. Aquiline	15	Berliner
6. Compline	16	Spline
7. Delineate	17	Cleanliness
8. Recline	18	Friendliness
9. Bowline	19	Dubliner
10. Caroline / Adeline	20	Vaseline

Poem - Now to be Still and Rest

A poem, chosen by the Archive team of Les, Richard, Ian and myself appeared in the Autumn 2014 edition of Touchpaper to commemorate the 100th anniversary of the start of WW1.

The following poem, chosen by me, commemorates the 100th anniversary of the end of WW1.

Michael Seymour

Now to be Still and Rest

*Now to be still and rest, while the heart remembers
All that is learned and loved in the days long past,
To stoop and warm our hands at the fallen embers,
Glad to have come to the long way's end at last.*

*Now to awake, and feel no regret at waking,
Knowing the shadowy days are white again,
To draw our curtains and watch the slow dawn breaking
Silver and grey on English field and lane.*

*Now to fulfil our dreams, in woods and meadows
Treading the well-loved paths – to pause and cry
‘So even so I remember it’ – seeing the shadows
Weave on the distant hills their tapestry.*

*Now to rejoice in children and join their laughter,
Tuning our hearts once more to the fairy strain,
To hear our names on voices we love, and after
Turn with a smile to sleep and our dreams again.*

*Then – with a new-born strength, the sweet rest over,
Gladly to follow the great white road once more,
To work with a song on our lips and the heart of a lover,
Building a city of peace on the wastes of war.*

P. H. B. Lyon – who was a captain in the 6th Durham Light Infantry and who was awarded the Military Cross in 1917.

Membership Renewal

Thank you to all the members who have renewed their membership for 2018.

If you have not yet renewed please use the enclosed/attached renewal form and send it together with your cheque to:

Membership Secretary

Royal Gunpowder Mills

Beaulieu Drive

Waltham Abbey

Essex, EN9 1JYI

I would like to remind you that from the AGM the friends Association will require a new membership secretary.

Daphne Clements

Friends Association AGM/Reunion 2018

This year the AGM/Reunion will be held on Friday May 11th in the café at the Mills.

10:30 Tea/coffee

11:00 AGM

12:00 Reunion

12:30 Lunch

13:45 Group photograph

14:00 Land train/2' 6" railway

Cost of lunch £10 per person.

We look forward to seeing as many of you as possible. Please use the enclosed/attached form to book your lunch, and return it with your cheque to the same address as for membership renewals (see opposite page).

New for this year, a ride on the narrow gauge railway which runs from near the Main Lab. To 83B.

Daphne Clements

Where were these photos taken?



Photos (taken January 2007) and question by Len Stuart

The Mills in Winter





Photos by John Wilson