Touchpaper

The Newsletter of the ROYAL GUNPOWDER MILLS WALTHAM ABBEY FRIENDS ASSOCIATION



JUNE 2008

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PLEASE NOTE: Deadline date for submissions to the next issue is 15th August 2008



Editorials

A great start to the new season with some excellent events and a record breaking 2,011 visitors for the Grace Spitfire display on Bank Holiday Monday. Let us hope for a good summer with more attendances like that.

I would like to thank the friends who emailed me to say that they enjoyed my first edition of Touchpaper, hopefully I am doing something right. I would also apologise to anyone who has sent me material which has not been used. I had more material than I could fit in, but please keep sending it, it will appear in the future.

A Puzzle Page has been included in this issue at the expense of the joke page, which will return in the next issue.



Malcolm Bergh

CHAIRMAN'S CHAT

The AGM and Reunion were held on 9th May. The weather was fine and everybody that attended seemed to enjoy the day. All the main exhibitions were open and the new rocket exhibition in L157 was a popular attraction. Unfortunately attendance was rather less than last year, which was a pity. We are all getting older and for some the journey may be more difficult than it used to be. If there are any ways in which the committee can help, please let me know.

We hope that as many of you as possible will be coming to the rocket weekend on 21st, 22nd June. There should be some interesting displays including those in the marquee especially erected for the weekend.

The previous Touchpaper was well received and congratulations are due to Malcolm for producing it in a limited time scale. Please keep sending him articles for future issues.

We are watching developments in and around the old boilerhouse with great interest. Some of the upper brickwork has had its white paint removed with water blasting and now looks very attractive. Why was it ever painted? Following removal of the floor in the boilerhouse and excavation to a lower level, water is being pumped out, it seems almost continuously, using three pumps. We did warn them about the height of the water table!

John Wright

REMAINING EVENTS FOR 2008

- 21/22 June Rocket & Space Weekend
- •
- 5/6 July Multi Period re-enactment
- •
- **12/13 July** Medieval Jousting Display, Knights of Royal Arkley
- •
- **19/20 July** Victorian Experience, family activity event
- •
- **26/27 July** English Civil War (by the ECW Society)
- •
- 2/3 August Medieval Siege Society
- •
- 9/10 August Classic Vehicle Show
- •
- 16/17 August American Civil War re-enactment
- •
- 23/24/25 August The Legend of Robin Hood, Golden Eagle Archers
- •
- 6/7 September Essex Militia, Living History
- •
- 13/14 September Home Front, Family Activities
- •
- **20/21 September** WWI Display
- •
- **27/28 September** Guy Fawkes Experience (Last weekend of the 2008 season)

2008 AGM and REUNION

Friday 9th May at the Royal Gunpowder Mills

At the AGM Daphne Clements was elected to the post of Treasurer and the other Officers and Committee Members were re-elected. Dave Hewkin will replace the retiring Ted O'day as auditor, whilst Roy Atkins has agreed to continue..

After the AGM , the reunion followed which was attended by 54 friends. A list of the attendees is given below.

David Manners John Rowley Harry Edwards Ted O'Day Gordon Bromberger Peter Honey John C Wright Stan Wills Bryan Howard Martin Ives **Roy Atkins Denis Mansell Richard Penfold** Daphne Edwards Mike Healey Jean Mansell Sheila Cooke Ann Wright Margaret Lee Eric Kendrew John Vernon **Brian Clements Daphne Clements Jim Burgess** Frances Burgess **Terry Stemman** Peter Hart **Eileen Scrivene** Ron Darby John Scrivener Peter Eickhoff Mike Bagley Ron Treadgold David Hewkin Sheilagh Owens David Debenham Christine Hewkin Minnie Fenton Nila Monckton David Keil Gordon McKinnon Jacalyn Keil Len Stuart David Steel Geoff Hooper Anne Steel Les Bates Malcolm Bergh Stephen Hutchings Robert Cook Doreen Darby **Carol Porter** Frank Porter Jock McDougall [4]

2008 REUNION



William Congreve Jnr. 1772 – 1828 Rocket Man & More

With the forthcoming Rocketry Weekend the time seems opportune to remind ourselves of the remarkable career of William Congreve Jnr.

Part 1 Congreve and the Rocket

For centuries the rocket, with its sound – the roar of take off, its sight – the fiery trail in the sky and power – as it explodes in the sky in firework displays or on the battlefield, has captured the imagination of Man.

Beginnings

As with gunpowder, the origins of rocketry cannot be stated with any precision, rather there is a body of accounts and reports of varying degrees of reliability. However the most commonly accepted premise is that the origins of the rocket lay in China. The Chinese had been slowly developing gunpowder and applying it in fireworks and in the military field. It is possible that the military rocket arose from the application to fireworks of a stability stick. The first dependable report of what could be termed a rocket appears in a history of the Chin dynasty in which the use is described against Mongol invaders in 1232 of fei-huo ch'iang, flying fire lances.

The use of rockets in battle spread to India, possibly via Mongol invasions and by the 18th. Century it was an established part of Indian weaponry, particularly in the army of Tippoo Sultan who had a corps of racketeers numbering 5000. The range of these Indian rockets was about 1000m. They made a powerful impact on the army of the East India Company as they threatened the British tactic of fighting in squares and their existence was reported to the authorities in London, where they came to the notice of the Woolwich Arsenal. Interest was such that Lt. Gen. Desaguiliers, Chief Firemaster of the Arsenal, instituted a series of experiments with a much heavier British design. These were not successful – the weight was too much for the launch gear. Meanwhile the French had also experienced rocket warfare in India and their Col. Prevot had successfully developed their version of the Indian rocket. This was deployed with some success against the Ottoman fleet in 1788. After this around 1795 the Board of Ordnance succeeded in producing a version for use in India. These embodied the principle of a guiding pole with a paper cylinder at one end packed with gunpowder with a low sulphur content for slow burning acting as the propellant – the 'rocket motor' and a more powerful gunpowder charge which exploded when the burning fuze reached the end of the cylinder. These performed poorly. However the scene had been set for the entry of the Congreves.

William Congreve Jnr. 1772-1828

In Britain the history and development of rocketry is symbolised by the name Congreve.

William Congreve Jnr. was born in 1772, the son of Major later Lt. Gen. William Congreve. Congreve Senr. although also a field commander was a technically minded officer responsible for several significant improvements in artillery equipment and the technical side of artillery generally. This was recognised in his appointment as Deputy Comptroller of the Royal Laboratory at Woolwich.responsible for overseeing a range of Governmental scientific activity in the military sector. Much of this was connected with the artillery and inevitably therefore with the supply and quality of gunpowder used by the Forces.

Congreve Jnr. therefore grew up in an environment surrounded by military technology and combined with a lively and enquiring mind it is not surprising that from an early age he was fascinated by science and technology. An early example was his enthusiastic interest in ballooning as a means of flying to the moon! However, initially at the beginning of his career he commenced legal studies. In parallel he managed to publish a rather provocative newspaper. This resulted in his having to pay a large fine resulting from a libel action by Lord Berkeley.in 1804. This decided the young Congreve to turn his creativity to the world of inventions. In an age where advancement to high official office depended on political patronage Congreve Senr. was a shrewd self publicist and it is possible that Congreve's decision to take up rocketry was at least based partly on advice from his father as to what might be viewed as a coming thing and therefore the most likely to attract patronage from the high ranking personages with whom Congreve Senr. was already on friendly terms. If so this was abundantly borne out for Congreve Jnr. whose experiments attracted the attention of the then Prince of Wales, later Prince Regent then King George IV.



William Congreve Jnr.



Fei-huo-ch'iang Launch of Flying fire lance used in the battle of K'ai-feng-fu in 1232



Congreve Rockets Weight labelled WAI 1022



Launch of Congreve Rocket from A frame WASC 115/6



Sea Launch of Congreve Rocket WASC 115/11



The Battle of Waterloo

The Years of the Rocket 1804 -1815

Congreve's initial experiments in 1804 were at his own expense. In 1805 his father arranged a demonstration of his son's design to important political figures – Wm. Pitt the Prime Minister, the Minister for War Lord Castlereagh and Lord Mulgrave Foreign Office Minister. The background to this was the prevalent fear of Napoleonic invasion. A major aspect of Congreve's thinking was that his rocket would be particularly suited to shipboard use since it would avoid the violent recoil associated with cannon. In his words 'The projectile force of the rocket is exerted without any reaction upon the point from which it is discharged '.

Following this through Pitt, impressed by the demonstration, authorised a rocket attack on the French port of Boulogne, the mustering point for Napoleon's invasion forces. The rockets were to be fired from ten launches from the English blockading Boulogne squadron. However five were sunk in a storm and the attack was called off.

Undeterred Congreve continued with development. In the following year 1806 he replaced paper with iron in the cylinder and improved the range. Towards the end of the year a further attack on the French invasion flotilla in Boulogne was authorised. This time there were to be eighteen rocket boats towed to France. The results were mixed. The rockets were blown off course away from the French vessels but caused substantial damage to the port. Hardly a resounding victory but it was enough. Congreve rockets were there to stay.

In 1807 there was a concern that the Danish fleet of forty ships would fall into the hands of Napoleon. After a demand that they should be surrendered to Britain was rejected a flotilla of rocket boats and land forces was sent against the Danish city of Copenhagen. The rocket bombardment demolished a large part of Copenhagen and the fleet surrendered to the British. In the book Recollections of Rifleman Harris Harris describes the rockets ' as they rushed through the air in the dark, they appeared like so many fiery serpents, creating, I should think, terrible dismay among the besieged '. There were many civilian deaths and politically the campaign damaged British interests but militarily it was counted a great success for the Congreve rocket. Ever the publicist Congreve lost no time in publishing ' A Concise Account of the Origin and Progress of the Rocket System ' In 1809 the French fleet was attacked at Rochefort. The same year saw the surrender, during the the Battle of Antwerp, of Walcheren Island to 25 rocketeers.

In 1811 by command of the Prince Regent a Mounted Rocket Corps comprising two Troops was formed in association with the Royal Horse Artillery.

In 1813 Rocket Troop No. 2 under the command of Capt. Richard Bogue was the sole British presence at the Battle of Leipzig, fought against Napoleon by an Austro-Prussian army. The Troop distinguished itself. Unfortunately Captain Bogue was killed. His lieutenant took command and was decorated on the field by the Tsar of Russia. Congreve was later awarded the knighthood of the Order of St. Anne by the Tsar.

In the Anglo – American War 1812-1814 there was a concentrated bombardment with Congreve rockets of Fort McHenry during the Battle of Baltimore in 1814. This was witnessed by an American poet who was writing the words for the American National Anthem ' The Star Spangled Banner ' and was so impressed that he included a reference to ' the rockets' red glare '.

By this time Congreve had developed a range of rockets, classified by weight, firing incendiary or explosive missiles. The heaviest was the 42 pdr. with a range of about 2750 yards used in incendiary bombardment. The medium range comprised 32 and 24 pdrs. and the light 18, 12, 9 and 6pdrs. The 32 pdr. was employed either in bombardment or in the field and the balance were field weapons.

True to form, Wellington was sceptical on the usefulness of rockets, but he authorised their use in the Peninsular War.in a variety of actions – the Siege of Bayonne and other sieges, barring river crossings – R. Tage and R. Adour and against ships – Gen. Hill against the French at Villafranca. By 1814 Wellington's army had pushed the French back into France. Their progress was blocked by the fortress of Toulouse. The Siege of Toulouse commenced on 10 April 1814. Unfortunately nobody had told Wellington that Napoleon had abdicated on 6 April !. Rocket volleys caused panic amongst the French troops. Beresford established rocket batteries on a dominating hill position. Recognising the implications Marshal Soult ordered withdrawal from the city. Congreve continued to publicise his invention, writing in 1814 ' The Details of the Rocket System '.

After Toulouse the Peninsular Army must have heaved a sigh of relief, unaware that many of them were to meet their destiny at Waterloo in the following year 1815. The Rocket Troops participated in the battle. Rocket officers seemed to be particularly adept at quick reactions and initiative. A good example occurred just before the main battle. British infantry were withdrawing towards Waterloo when their path was blocked by a French horse artillery battery. No.2 Rocket Troop commanded by Captain Whinyates was with the infantry. Whinyates speedily deployed the Troop with what were called ground trough launchers for low angle firing and succeeded in putting the French centre gun out of action and scattering the rest of the French gunners. This allowed the British infantry to continue to their positions at Waterloo and averted what could have been a serious situation. The Troop continued with the infantry and provided supporting fire throughout the afternoon of the Battle of Waterloo. Whinyates was a busy and lucky man that day. He had three horses shot from under him and was badly wounded in the arm and leg. He survived to pursue his career in the Army, rising to the rank of General. Also in 1815 Congreve made an important change in the rocket configuration, moving the guidestick from side to centre, improving accuracy.

Following the original concept Congreve rockets were widely deployed in the Victorian Navy. Congreve was particularly interested in a combination of steam powered iron ships and rocketry. This came to fruition in 1840 in the shape of HMS Nemesis, a steam powered iron gunboat and the fore runner of the formidable battleships of the Royal Navy. Amongst her armament was a Congreve rocket battery. The mission of the Nemesis was to take on the Chinese war junks and support land forces in the so called Opium War. This she did with conspicuous success. The victory demonstrated for better or worse that Britain could fight and win a major colonial war and ushered in the era of the dominance of West over East, a process which is now beginning to unravel.

In 1817 seeking to exploit private opportunities Congreve established his own rocket factory at West Ham in East London.

In 1827 he published 'A Treatise on the General Principles Powers and Facility of Application of the Congreve Rocket System as compared with

Artillery' in which he propounded the view of rockets as an entire weapons system including prophetically the idea that the infantry would have its own missiles.

After Waterloo the function of the Army turned from the battlefields of Europe to the era of colonial conflicts. The Congreve rocket made an appearance from time to time. It continued in service until 1864 when it was supplanted by the Hale model. This included a clever piece of design whereby the flow of gas from the rear was directed to cause the rocket to rotate in flight producing a steadier path of travel without the need for a stabilising stick.

How effective overall were Congreve rockets? The record is patchy. Personal accounts have to be approached with caution. However some conclusions can be drawn from accounts such as the following by Captain Cavalie Mercer of his experience at Waterloo. ' I saw the guns standing mute and unmanned, whilst our rocketeers kept shooting off rockets, none of the which ever followed the course of the first: most of them, on arriving about the middle of the ascent, took a vertical direction, whilst some actually turned back on themselves '. Captain Mercer then goes on to describe the unnerving experience of one of those turning back appearing to be following him until it exploded. Broadly, the Congreve rocket was effective in an incendiary bombardment role of such targets as buildings in mass, fortresses and to some extent shipping. It was less effective on the battlefield. It was difficult to aim, its flight was erratic and crucially it was at the mercy of the wind. However it did have some successes and it was capable of causing immense confusion in the areas in which it struck, albeit sometimes not the areas at which it had been aimed. This in itself was a not inconsiderable advantage.

Technologically Congreve's work was important in introducing the concept of a complete weapons system.

Also it should not be forgotten that the Congreve rocket was adopted by 14 foreign armies.

The title of this article included the phrase 'and More'/ The above Part 1 has dealt specifically with Congreve in his rocket role. However his activities went far beyond this and Part 2 in the next edition of Touchpaper will outline his career beyond rockets.

Les Tucker

EVENTS APRIL/MAY 2008

The opening weekend of the 26th/27th April saw the Napoleonic Re-enactment with the Napoleonic Association.



The Association put on a great display and on the day I was there, the British troops won the battle.



EVENTS

The VE day event on the weekend of the 3rd, 4th and 5th of May was a fantastically successful event with marvellous weather and record breaking crowds on Bank Holiday Monday to see the Grace Spitfire.



The afternoon's highlight was the mock battle with British, American and German troops taking part, aided by the French resistance.



EVENTS 17th/18th May - Steam Fair 2008







The model on the left was for sale at the steam fair and can purchased for £10 from Ramsey collectables on 01708 470773.

The final event in May was the Regia Anglorum Saxon and Norman Re-enactment on the 24th, 25th and 26th May. This event unfortunately suffered from 2 days of very bad weather on the Sunday and Bank Holiday Monday.





WARGM Rockets Exhibition

Following the delivery of a large number of rocket motors from Summerfield last year we have completely revamped our exhibition area. Those of you who attended the recent reunion will have had a chance to see this, for the rest here is a summary of what we have achieved so far.



Arrival of the Summerfield Rocket motors.

The exhibition shows the development of rocket motors and propellants from Congreve's gunpowder rocket of the early 19th century through to the guided missiles used in the cold war and Falklands war.

Among the exhibits on show are a rocket engine from a V2 that broke up in mid air over Waltham Abbey in 1945, a Gosling motor from a Thunderbird anti aircraft rocket of the cold war era, cutaway to reveal its internal construction, a Blowpipe ground to air missile from the Falklands war and a ship launched Sea Dart missile from the same period, still in service today. A number of anti tank missiles - Vigilant, Swingfire, LAW and Milan, plus full size models of ALARM and SkyFlash. On the scientific front are the Raven motor from the Skylark research rocket that provided valuable scientific information over a period of some fifty years and some

450 launches and the Waxwing motor used to inject a satellite into orbit. Also on show are examples of the various propellants used in rocket motors - gunpowder, cordite, plastic and rubber.

Outside is a Petrel launcher and rocket used for scientific research purposes and later as target practice for the Royal Navy and a Stonechat motor which at 36" diameter was the largest plastic propellant motor we manufactured.



Petrel Launcher

Due to space limitations we can only show a small part of our collection at any one time and therefore the display is continually changing and may include parts of our scientific equipment collection. Current work in progress includes a Gosling flight test vehicle, a display showing strip laminate motor production and an electrically operated thrust vector control unit. Alongside this we are currently building a full scale replica of an incorporating mill in one of the original mill bays.





The exhibition is located in the boiler room of the incorporating mill building L 157. Former employees are on hand most weekends to give guided tours of the mill and answer any technical questions concerning rockets and propellants. We are always looking for new volunteers to talk informally to members of the public at weekends over the summer months and to weekday group visits from time to time.

Len Stuart

TOUCH BYTES

Thanks for a warm welcome back

Since my days of working for Lee Valley Park and watching the change of this historic site to a visitor attraction and then working at the Royal Gunpowder Mills when it opened, many of you will know that I have always been passionate about this unique place, its significance in the development of Waltham Abbey, the people who worked here, as well as its place in history.

So I am delighted to be back, working a couple of days a week, to help develop projects into fundable propositions and to seek out money that will enable us to treasure what we have, but also to continue to make this a vibrant, engaging and inspiring place for the future that people will want to visit and support.

Support comes from a variety of sources and so we are looking at maximising the opportunities for recouping Gift Aid from the Government, making more information available for making a gift in your will, as well as exploring donations from charitable trusts and grant applications.....plus recycling printer cartridges and mobile phones (so please start saving now!)

I look forward to working with many of the Friends, volunteers, partners and supporters. I would be very interested to hear what the Royal Gunpowder Mills means to you and if you have any contacts or know of anyone who could help us to meet the challenges of maintaining, managing and developing this fantastic site, please do not hesitate to contact me.

Cathy Morton Lloyd

Development and Fundraising Manager

E mail: Cathy.mortonlloyd@royalgunpowdermills.com

Colin Butler

Sadly we report the passing away on the 1st May 2008 of Colin John Butler, the Team Leader at WARGM Railway since 2003. His obituary will appear in the nexx issue of Touchpaper.

The Affair of the Electric Typewriter

Back in the 1970's I got my first promotion, to HSO, and I decided that as I was now head of the computer section in H10 and very important, I would start reorganising everything. There was an IBM electric typewriter sitting in the computer room which, to my knowledge, had never been used since I had joined as a student in 1971. It was a rather large beast and so I attempted to take it apart in order to move it. I noticed that it was an American 110 volt machine with a small, built in, transformer and when I removed the back I promptly received an electric shock from some sort of capacitor inside.

Feeling rather annoyed, I phoned up admin to inform them that I wanted to dispose of the machine and was told to take it across to the stores on South Site and they would arrange the paper work. I put the typewriter into the boot of my car and drove across to South Site stores, only to be told that they did not want it there, just dump it in the rubbish skip at H10 and they would sort out the paperwork.

So I put the typewriter back in the boot, drove back to North Site, and forgot all about the typewriter. The next day I had to drive over to South Site again to fix a VDU that was playing up. When I had finished, it was about 5 pm, so I went to drive home.

As I approached the South Site gates I noticed that the MOD police were conducting one of their periodic stop and search operations. Sure enough, I was told to pull over and when I opened the boot, there was one electric typewriter, sitting there, smiling up at me. The officer asked me if it was my property and, after my feeble 'I can explain everything officer' , I was asked to take the typewriter into their office and they would speak to me again tomorrow. As I was leaving, I told them whatever they did 'Do not mess around with it as it has an electrical fault.'

The next day I spent an uncomfortable half hour in the Director's office while he lectured me on the importance of paperwork, but that the police would take no further action. When I got back to H10, I received a phone call from MOD police informing me no further action would be taken and did I realise that their Police Inspector had received an electric shock from it. Which just goes to show that nobody listened to me. Not my family, certainly not my staff in H10 and it seems, not the MOD police. Such is life !

Malcolm Bergh

Profiles

This is not a complete profile as none had materialized by the time this issue went to print, although I have been promised two. So instead we have a year at ERDE by our 'rocket man' Len Stuart.

I started work at ERDE in September 1959 straight from school with three A Levels as a Temporary Unestablished Assistant Experimental Officer. The full meaning of Temporary and Unestablished had yet to sink in and I was put to work in the Rheology section of SPR I in building L148 under John Vernon. The work involved routine mechanical testing of the propellants in use at that time:- cordite, plastic and rubber, along with the development of new testing methods. Mechanical tests included tensile tests at various temperatures and humidities using bench top Hounsfield Tensometers and Charpy impact tests on notched square and round test pieces. Under development was a high rate tensometer, although I never saw this operational and a device for measuring Poisson's ratio as a function of temperature. Other machines in the section but not in use were a floor standing Avery and a set of cordite rolls. Devices purchased during my year of employment included a blood centrifuge and a butter tester. I was assigned the latter to modify for extrusion tests on polyisobutene based plastic propellants used for the Skylark Raven motor. Other propellants tested were cast double base for the Gosling motor used in Red Shoes (Thunderbird), Bloodhound and Sea Slug missiles and polyurethane rubber as used in Polaris, along with cruciform extruded cordite for 2 inch air to air missiles still in use at that time. Other interesting projects include the ad hoc construction of a seismograph from an old pen recorder following complaints concerning the effect of our explosions on the stability of the Abbey. Other people in the section included Dyson England, Beryl Collings, Sheila Rosenberg, Geoff Church and Bob Rainbird.

Finding a permanent, pensionable post in the scientific Civil Service meant a move to NPL Teddington where I spent the next 5 years in Metallurgy Division working on alloy thermodynamics and surface energies followed by 20 years in Radiation Science Division standardising isotopes for medical and power station use and contributed to a definitive measurement of the end point energy of Tritium.

Fast forward to 2005 and retirement and picking up a leaflet in the local library with a picture of L148 and the other Mills on it and I am back with people I hadn't seen for 45 years. **Len Stuart**

[20]

PUZZLE PAGE

Contributed by Bryan Howard

Example Question: Child's Father answer Pa Pa.

Child's Toy
A Type of Ferry
A Pop Group
Hire Purchase
A Ballroom Dance
Top Secret
A Prison
A Type of Bullet
A Ballet Skirt
A Stage Dance
North African Granulated Flour
A Style of Painting
A Medical condition (lack of Vitamin B
A Kenyan Terrorist
A Drum
A Sweet Desert
A Ditch that prevents animals from entering a garden
From surrounding grazing land
Pour scorn on
Anti-Aircraft Gun or woolly ball
A tasty 'dish' from the 'Mikado'
An Extinct Bird
Christian name of much married film star
Tropical Fruit
Species of African Antelope
Thor Heyerdahl book
Even chance or split
Flak
Operatic Bohemian Girl
North African Pirate
'Beware the bird and shun the frumious Bandersnatch

ROYAL GUNPOWDER MILLS WALTHAM ABBEY

' TOUCHPAPER' Published by RGM(WA) Friends Association