

# Touchpaper

---

**The Newsletter of the  
WALTHAM ABBEY ROYAL GUNPOWDER MILLS  
FRIENDS ASSOCIATION  
[a registered charity No. 1115237]**



**DECEMBER  
2007**

## OFFICERS OF THE FRIENDS ASSOCIATION

### **Chairman:**

John Wright                      1 Albury Ride  
Cheshunt  
tel: 01992 624210                Herts EN8 8XE



### **Secretary:**

Richard Penfold                10 Thaxted Way  
Waltham Abbey  
tel: 01992 712623                Essex EN9 1LQ



### **Treasurer:**

Norman Paul                    24 Anglesey Close  
Bishop's Stortford  
tel: 01279 465568                Herts CM23 4PE



ALL ENQUIRIES RELATING TO THIS NEWSLETTER  
SHOULD BE ADDRESSED TO THE EDITOR :-

### **Malcolm Bergh Touchpaper Editor**

3 Kingsley Avenue  
Cheshunt  
Herts EN8 9PU



tel: 01992 632941  
e-mail: malcolm Bergh@hotmail.com

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



## *Editorials*



### *It's Goodbye from Me.....*

*After nearly 16 years this will be the last issue with me as editor although I shall probably write the odd article from time to time.*

*I have enjoyed editing this newsletter and thank you all for your support over the years,*

*Best Wishes for a Happy Christmas  
and a Prosperous New Year.*

*Norman Paul*



### *...and Hello to Him*

*Sincere Wishes to you all for the Christmas Season and  
With All Best Wishes for the coming Year.  
(Can't wait to receive your articles etc!)*



*Malcolm Bergh*



# ££££ SUBSCRIPTIONS ££££

Subscriptions are due from January 1st for 2008 and a renewal form is enclosed with this issue.

Annual subscriptions have not been increased since the Association was founded in 1998 but with ever increasing costs the time has come for a review of our finances. Approximately half of our income goes towards the printing and postage of Touchpaper and this year has seen a dramatic increase in the cost of postage.

We have spent significant sums on funding major projects and purchasing vital equipment for major improvements on the site and hope to continue to do so in the future.

**For these reasons the annual subscription rate will be increased for 2008:**

**Adult membership from £7 to £8  
and  
Family Membership from £10 to £12**

**For those opting to receive an electronic version of Touchpaper as detailed on page 3, there will be no increase. Please mark the renewal form with your choice and remit accordingly.**

---

## GIFT AID

To remind you; as a registered charity we can claim Gift Aid on subscriptions from HM Customs & Revenue (currently at 28p in the £) for all UK taxpayers.

This would be significant extra income but the take-up of this by members has so far been disappointing.

If you have not already done so please consider returning a Gift Aid certificate. As a continuing mandate this only has to be done once.

It doesn't cost you anything but it does mean that part of the income tax you pay is returned to us.

**Norman Paul  
Hon. Treasurer**

## NEW ELECTRONIC TOUCHPAPER

As an alternative to paper copy, Touchpaper will soon be made available in an electronic version which those of you with internet access will be able to opt for instead of a paper copy. This will be in pdf format openable by Adobe Acrobat.

This has advantages both for you and for the Association:

1. You will be able to view all pictures in full colour. Something which we cannot afford in the paper version.

You can, if you wish, print out your own copy, once again in full colour.

2. If taken up by a significant number of members this will result in considerable savings in the cost of printing and, especially, in the postage bill which has been subject to large increases in the past year. The current cost of printing, envelopes and postage for Touchpaper is currently about £300 per issue.

3. The annual subscription rate has stayed at the same level since the Association was formed in 1998 but as costs increase we have less and less to spend on projects and equipment and the Treasurer has recommended that there be a modest increase in subscriptions starting in 2008 but there will be no increase for those opting for the electronic version of Touchpaper.

**You can request an electronic version on the renewal  
notice accompanying this issue and if so**

**YOUR SUBSCRIPTIONS WILL NOT BE INCREASED.**

*If you wish to view an electronic version of this newsletter before making your mind up, please contact either:*

Malcolm Bergh - [malcolm.Bergh@hotmail.com](mailto:malcolm.Bergh@hotmail.com)

or

Norman Paul - [wargmfa@aol.com](mailto:wargmfa@aol.com)

## CHAIRMAN'S CHAT

It has been a good season for the Mills with increased visitor numbers and some very good events introduced for the first time - particularly the mediaeval jousting event which has been booked again for next year.

My thanks go to those Friends who have acted as guides on the land train, controlled the making of rockets by children on Wednesdays in the summer, painted this and that, making the replica gunpowder mill and many other things done during the season.

We are now trying to complete the replica mill before the start of the 2008 season and to stabilise the un-restored end of the Gunpowder Boat to show the difference compared with the restored end.

For the fortnight 29th October to 9th November the Education Department ran their 'Gunpowder, Treason and Plot' experience for primary school-children. Friends and other volunteers were involved in guiding children (150 each day) between the various parts of the experience. This has now been run for several years and is greatly enjoyed by the children and is also good advertising for the site.

Repainting of the two Pendulum Machines donated to us by the Health & Safety Executive at Buxton is almost complete, particular thanks to Brian Clements and Dave Hewkin with a little help from me.

Bob Eldridge has repainted the second Tangye propellant press with help from Dave Hewkin. Both the press and pendulum machines now look very good.

As always more volunteers are welcome. If you don't live too far away, give me a ring and we can arrange your admission to the site. Regular working parties are held on Wednesday and Friday mornings throughout the year.

Wishing you all a Merry Christmas and looking forward to another good year at the Mills.

John Wright

## Coming Up in 2008

The 2008 Programme of Events will soon be finalised and sent for printing and we hope to include a copy with our next issue.

Most of the old favourites and a number of exciting new events are planned.

A special mention must be made of the '**Rocketry Weekend**' event on the **21st & 22nd June**.

We shall be very much involved in this with a revamp of our Rocketry exhibition and supervising air and water powered rockets.

A number of organisations involved in model rockets will be demonstrating live firings.

There will also be a programme of speakers on missiles and space topics.

It promises to be a very exciting weekend.

A date for your diary:

The Association **AGM** and **Reunion**  
will be held on site  
on **Friday 9th May**

Full details in the March issue

## MORE DETAILS ON ORFORD NESS

With regards to Bryan Howard's visit to Orford Ness (Sep 07 issue), I too visited back in June 2005 and think that these photos may be of interest to readers.

The National Trust print an excellent booklet detailing the island's history, flora and fauna and there is a web site for those that are interested:

[www.nationaltrust.org.uk/orfordness](http://www.nationaltrust.org.uk/orfordness)

The Atomic Weapons Research Establishment used Orford Ness from 1953 to 1966 for the mechanical test of atomic weapons, starting with the 'Blue Danube'.

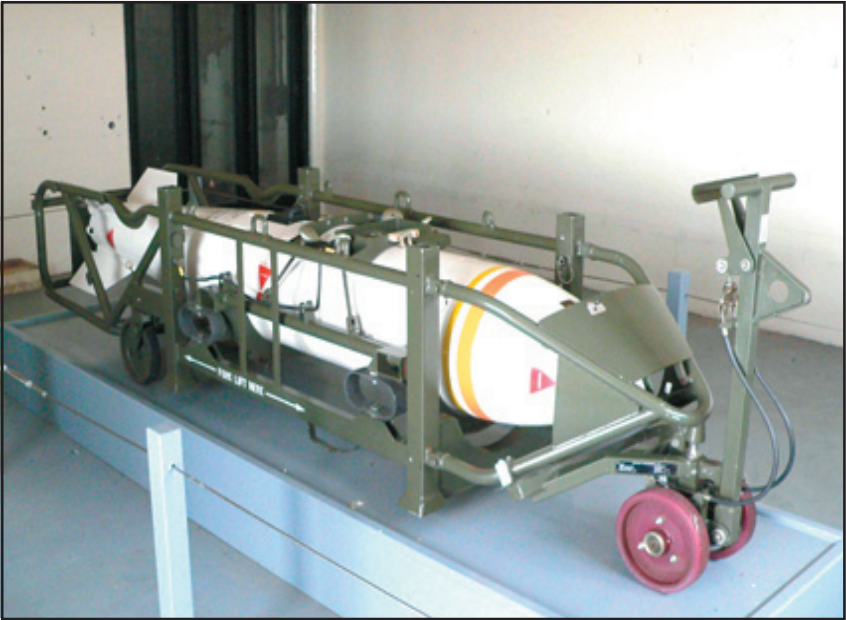
The tests covered vibration resistance as well as environmental conditions such as heat and cold. It should be pointed out that the weapons had no radioactive content but they did have live initiators fitted, hence the large concrete buildings to protect against explosion.

**John Wilson**



The Lighthouse





Atomic Bomb type WE 177A



Testing Building

## EXTRACT FROM THE ARCHIVE NO.4

### Charcoal at Waltham Abbey Skills Transfer, Iron, Gas & Murder

The Gunpowder and Explosives History Group recently held the third of its meetings on the three constituents of gunpowder – this time Charcoal – see Report in June 2007 Touchpaper. The following is an Archive Note covering supplementary information specifically relating to Waltham Abbey.

Unlike the other two materials, saltpetre and sulphur, which could be purified to a reasonably uniform quality, pit charcoal which was produced by burning wood in air restricted turf covered clamps presented severe problems of quality variability reflecting type of wood, condition and the generally imprecise mode of manufacture. Wm. Congreve Snr. had grasped the importance of a more controlled charcoal quality in establishing a more uniform and better performing powder quality and in the late 18C he introduced at the Government Mills at Faversham a method of manufacture of charcoal involving the distillation of wood by burning in closed iron cylinders termed ‘slips’ in retorts consisting of horizontal larger iron cylinders in a brick surround. This system had been developed by Dr. Richard Wilson, Lord Bishop ( largely absentee ) of Llandaff and Professor of Chemistry at Cambridge. Two cylinder works were established in the Sussex Weald at Fernhurst and Fisher Street to supply Faversham and, from 1794, the Waltham Abbey Mills. A manuscript record of powder making written in 1798 by John Ticking a Master Worker at Faversham has survived and the two drawings are his illustrations of cylinder charcoal manufacture ( **WANBD 4** ).

Supply to Waltham Abbey from Sussex continued until 1830 when a Charcoal Establishment for manufacture was constructed at Waltham Abbey. The Establishment was situated in a bend of the Old River Lea east of what was to become the site of the first steam mills Gp.A. This is shown in an Engineers map of 1865 ( **WAMP 900/41c** ).

**WANBD 4 Waltham Abbey Non Building Drawings**  
**Charcoal Cylinders in 1798** Extract from MS by John  
 Ticking on Royal Gunpowder Mills Faversham 1798

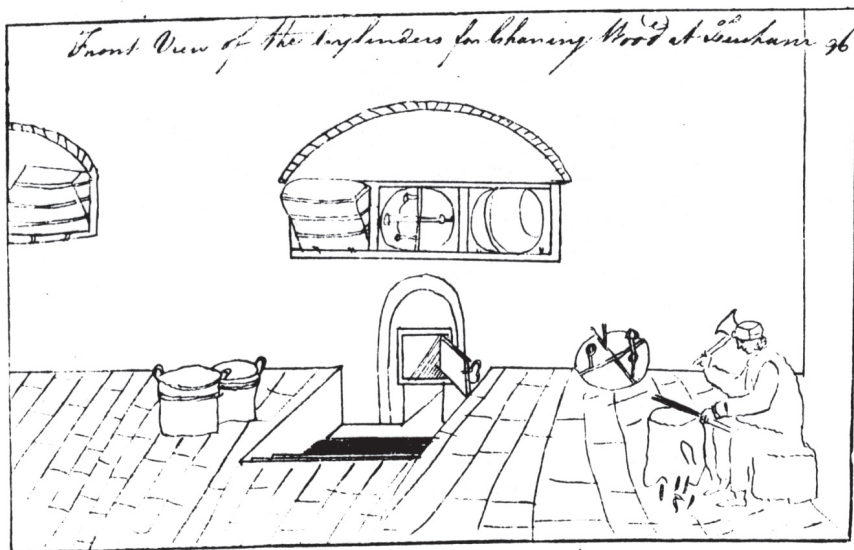


FIG. 6. CHARCOAL CYLINDERS IN 1798. FRONT VIEW.

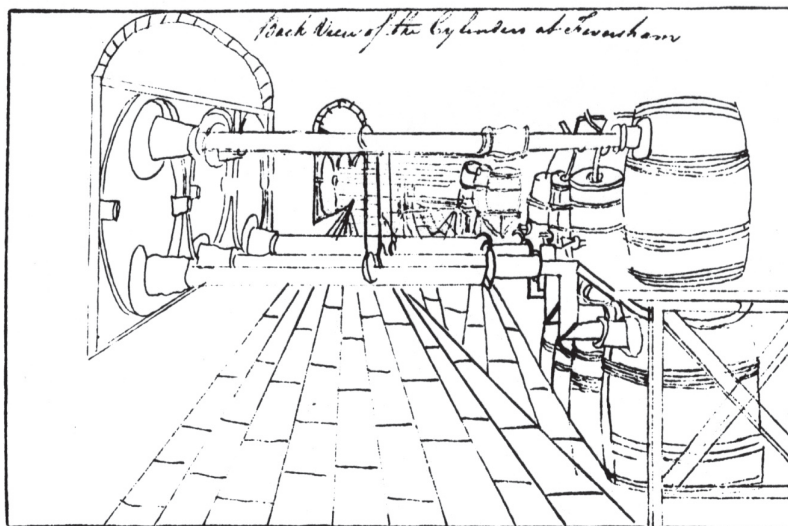
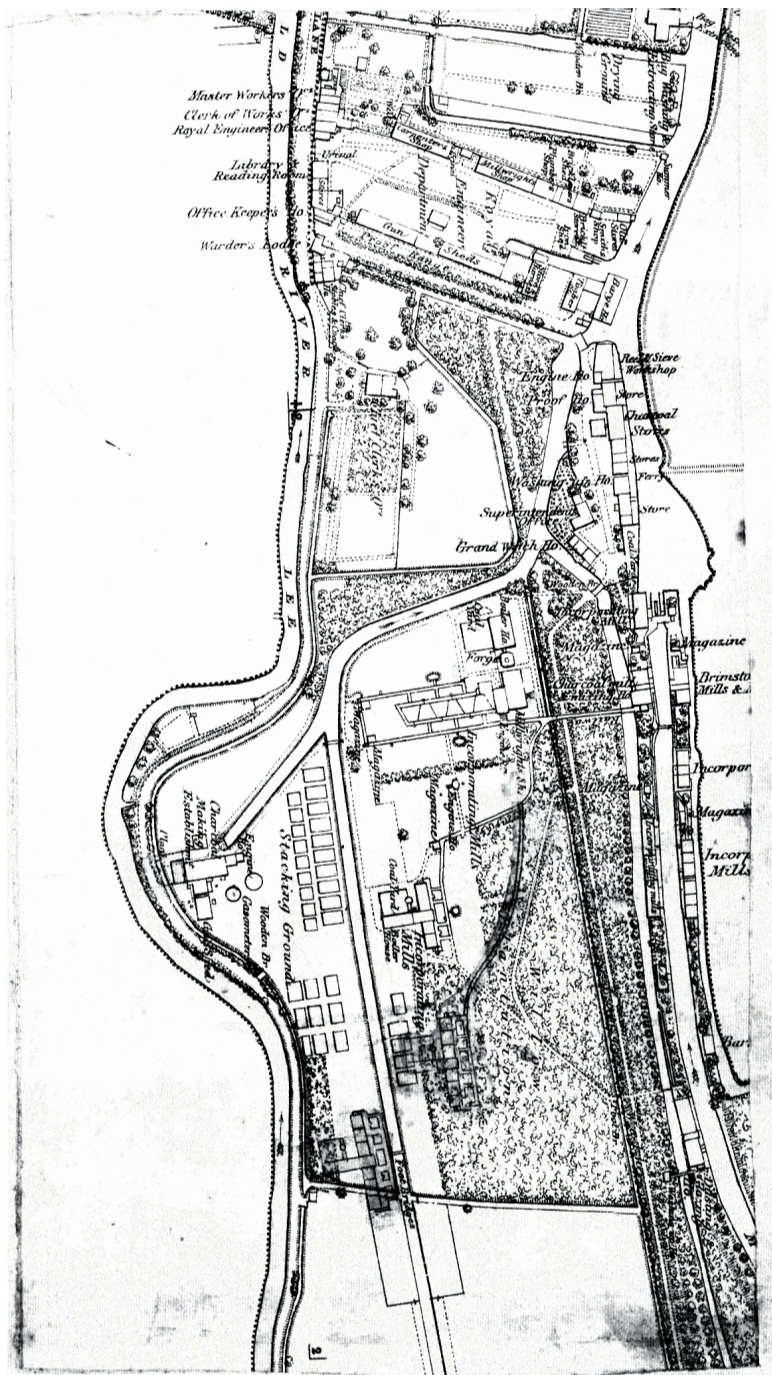


FIG. 7. CHARCOAL CYLINDERS IN 1798. BACK VIEW.

WAMP 900/41c Waltham Abbey Maps @ Plans Extract from Royal Engineers map  
of the Royal Gunpowder Mills Waltham Abbey 1865

14/526 2323





## Skills Transfer

Congreve continued development of the system at Faversham and by 1830 a body of expertise in plant design and operation would have been available for transfer to Waltham Abbey.

William Winters in his Centenary Memorial of the Waltham Abbey Factory P.102 ( WASC 11 ) records the transfer from Faversham to Waltham Abbey of five cylinder house men – Richard Higgins, John Wraight, Joseph Perry, John Wildey and Patrick Hayes.

Higgins' knowledge and experience would have been of particular importance as he was promoted Cylinder Foreman at this time and similarly John Wraight later Second Foreman. At the same time staff were sent from Waltham Abbey to Faversham to be instructed in cylinder manufacture.

The importance of skills and experience is highlighted in Capt. Smith's authoritative 1870 account of gunpowder manufacture at Waltham Abbey in which he emphasises the fundamental importance of uniformity of quality of charcoal and to obtain this it is essential to determine the optimum manufacturing condition, reflected in the flame characteristics, in relation to the wood being used.

It is interesting to see that Smith is at some pains to point out that whilst foreign manufacturers rely on mechanical means to achieve this at Waltham Abbey ' the process is entrusted to the experience and careful watching of the foreman '.

This exemplifies a broader point – the debate which still continues as to whether Britain's loss of her earlier industrial lead arose from a continuing over reliance on the knowledge and experience built up originally from the millwrights – 'inspired empiricism' with a reluctance to accept the benefits of scientific research whilst the foreign competition was embracing the new technologies.

## Iron

Iron was related to charcoal at Waltham Abbey as it formed the material for the cylinders. However it was also connected in a different aspect – the buildings of the Establishment.

The Mills employed for their machinery etc, purchases the leading engineering firms of the day. At the time one of the leading mechanical engineers of the day, if not the leading, was the firm of Maudslay, Sons & Field at Lambeth.

The records of this firm have survived and in these a record exists of an order placed by Wm. Drayson Civilian Clerk of Works to the Engineers at Waltham Abbey for an ‘ iron building for charring wood ‘ i.e. the Cylinder House ( from Paper ‘ Maudslay, Sons & Field as General Engineers ‘ J. Foster Petree ). This is shown in a drawing in Frederick Drayson’s Treatise on Gunpowder 1830 ( **WABD 342** ).

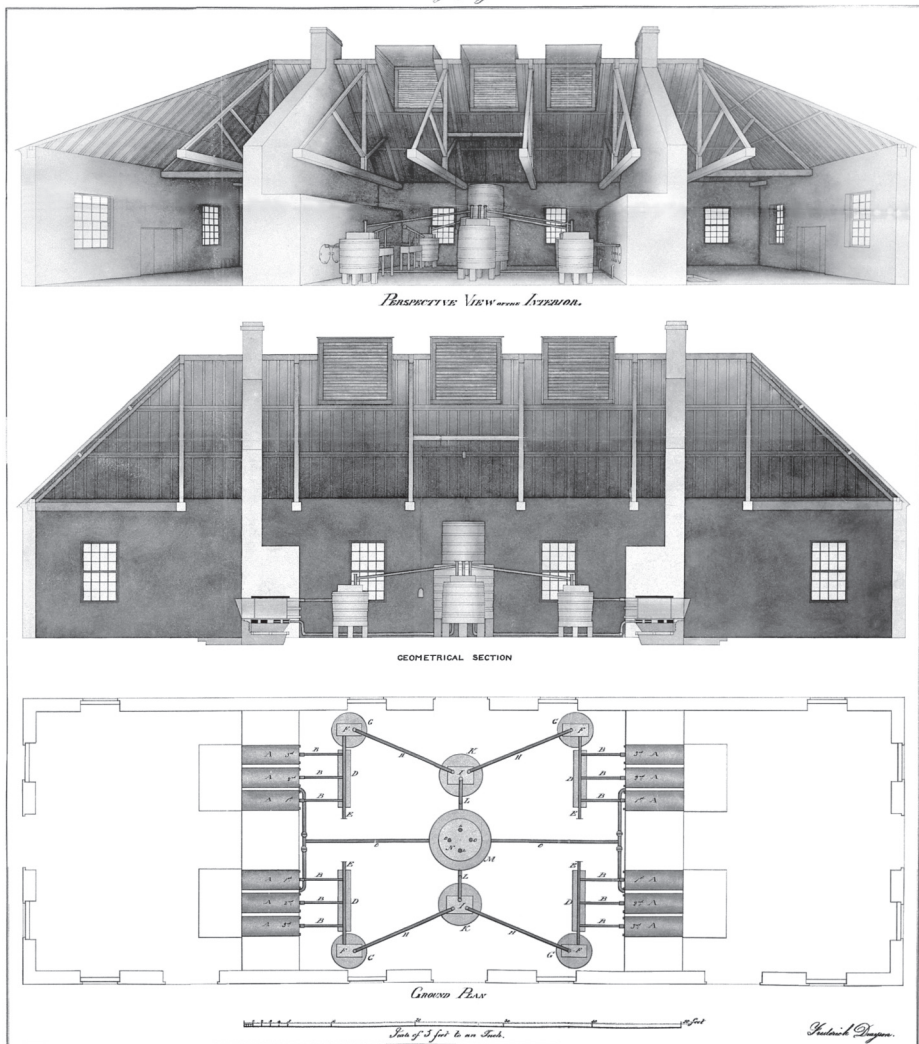
It would be tempting to see this as an early example of iron used for structural purposes in a prefabricated building of the type which Fairbairn’s shipyard on the Thames started to export from the 1840’s but in fact study of the Mills Building Ledger ( WASC 1680 ) reveals that the iron refers to what was to become widely used corrugated iron – in itself an interesting example of the early use of this material ( the firm’s contract record refers to construction of ‘ iron roofs ‘ at Lambeth Works ). Iron also formed the construction material for the ‘gasometers’, see below.

## Gas

The intention of controlled charring of wood was to remove materials which would render charcoal useless for gunpowder – mainly gases and tar. The gases given off by burning were piped from the retorts and progressed through a succession of condensing vessels termed ‘gasometers’ where elements of the gas and tar condensed and were run off into tubs.

WABD 342 Waltham Abbey Buildings Drawings Drawings of a  
Cylinder House Drawing No.4 From A Treatise on Gunpowder  
1830 ; Frederick Drayson

N<sup>o</sup> 4  
*Drawings of a Cylinder House.*



The gaseous element remaining was then returned to the system as fuel. Experiments on charcoal manufacture had continued at Faversham conducted by James Wright, later first Storekeeper at Waltham Abbey after Government purchase, under the supervision of Congreve and later his son. A drawing of a gasometer has survived from Wright's records ( **WANBD 23** ) and carries the note ' The whole is constructed with pipes that were in store and were considered unserviceable for other purposes. They are all 4-in. bore '.

Evidently Wright was at some pains to assure the Board that the new fangled scientific research was not resulting in any frivolous equipment expenditure.

It appears that at some point between 1830 and the 1860's within the Charcoal Establishment at Waltham Abbey the gas plant acquired the separate title Gas House, shown in a drawing of 1864 WABD 901/221 (not shown here ). Also in the drawing it can be seen that the terminology of the towns gas industry was being used – Scrubber, Purifier and Condenser.

Drawing **WABD 901/222** shows the detail of the retort surround with inner lining of fireclay, then fire tiles and fire bricks for flues and outer shell.

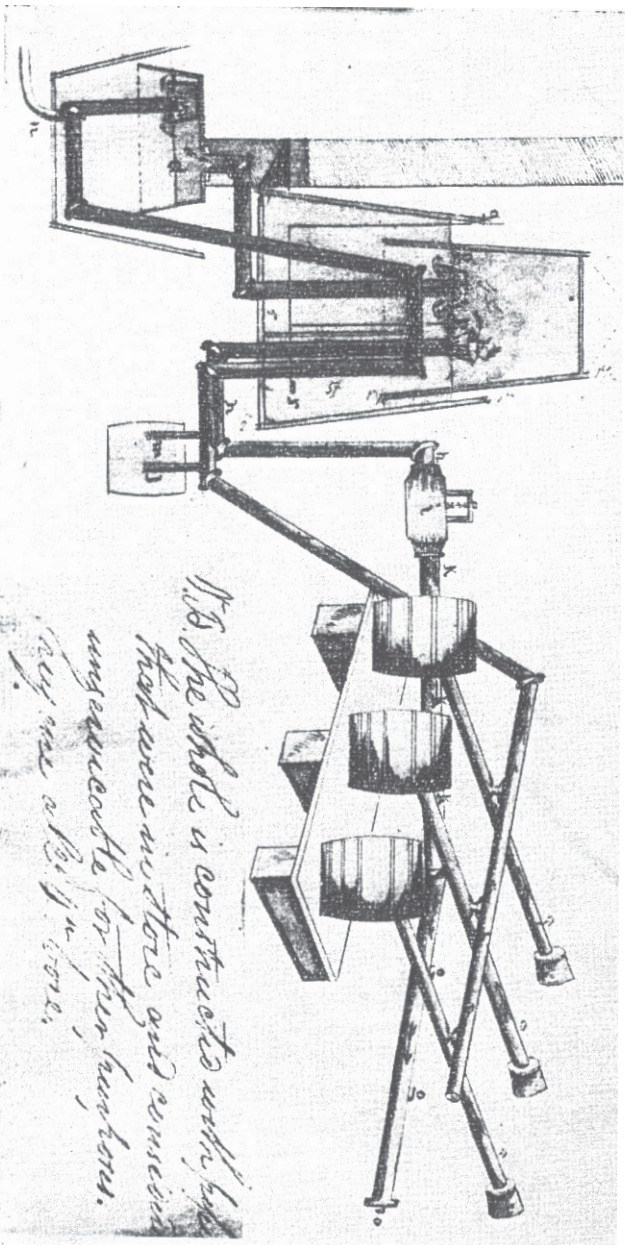
## **Murder & Gas**

The Mills operated as far as possible under a cloak of secrecy, avoiding the public gaze. However in 1875 this situation was breached in a most unexpected manner. The Victorians had a fondness for grisly murders and the Times of 13th and 14th September 1875 reported a gruesome case in which Henry Wainwright had been arrested after being discovered transporting a mutilated adult female body in a cab. The body was identified as that of Harriet Lane, daughter of John Lane. Her father had to appear at the trial and at this he gave his occupation as ' Gas Manager at the Royal Gunpowder Works Waltham Abbey ' – see Touchpaper March 2007.

Les Tucker



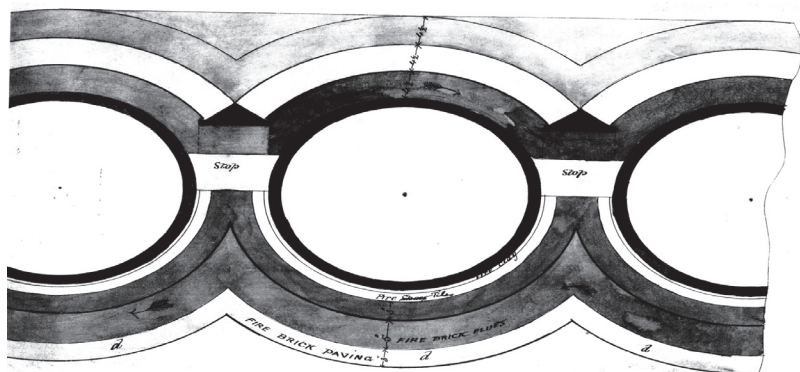
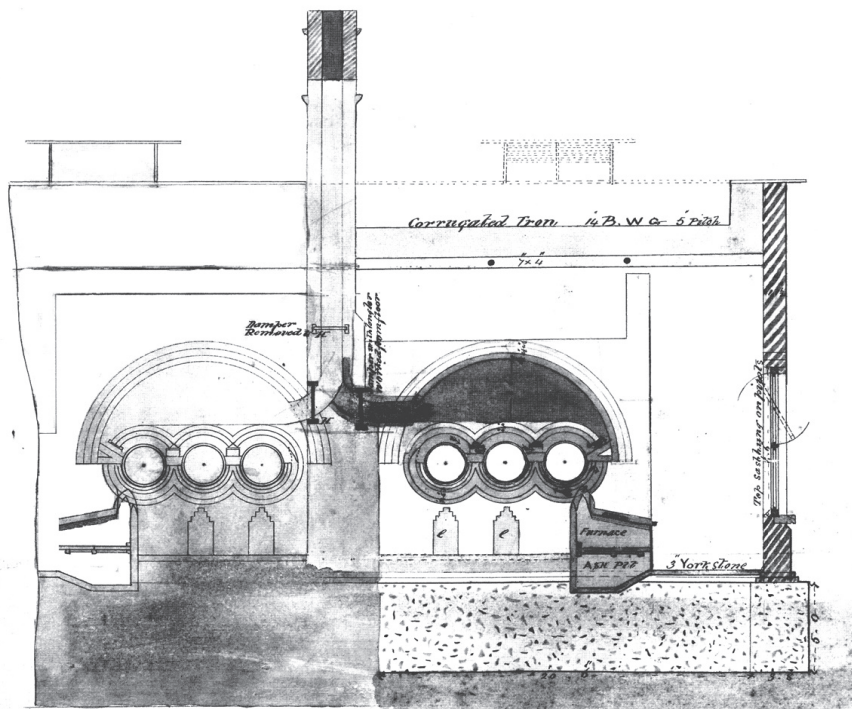
WANBD 23 A ' Gasometer ' Extract from  
Laboratory Notebook of James Wright,  
Storekeeper Royal Gunpowder Mills  
Waltham Abbey End 18C



WANBD 23

A sketch of "the gasometer" used in Congreve's research into charcoal production.

**WABD 901/222 Retort Extract from Drawing  
Proposed Additions to Charcoal Establishment  
1877**



*Cross Section of Floor under the Retorts*

# EVENTS

The 2007 season of events finished up in October with the return of the Napoleonic Association re-enactment group seen here parading on the concrete pad to the south of Queens Mead.



Always a colourful and very popular event with visitors and almost certain to make a return visit next year.





# **‘THE WORLD AFLAME’**

## **Living history and Re-enactment**



This event combined the activities of a number of re-enactment groups with a large number of ‘living history’ displays. The picture above shows the filling of cartridges with gunpowder used in the skirmish below.



---

## TOUCH BYTES

---

Jim Burgess' story in the June edition of the 'impregnation behind the incorporator' reminded me of an event that befell me shortly after my transfer to ERDE, in the early 1960s. There was (unbeknown to me at the time) a certain industrial who was a notorious womaniser. His first name was George, and I couldn't possibly reveal his real surname even if I could remember it - which I can't. Anyway, one day I was required to collect a piece of apparatus from one of the industrial workshops. On enquiring who I should ask for, I was told "Oh, see George Upham, he knows all about it." On my arrival in the workshop (I'd never had occasion to go there before) I was mystified by the roars of laughter when, in all innocence, I asked "Where can I find Mr Upham?"

Old hands will of course remember that the gentleman in question was known throughout the establishment by a nickname befitting his amatory tendencies. What I had taken to be his surname was, of course, his nickname. It was not 'Upham' but 'Up 'em'!

**Jim Hawkins**

---

<p><b>DON'T FORGET</b> <b>DEADLINE FOR MARCH 2008 ISSUE</b> <b>15th FEBRUARY 2008</b></p>
---

ALL FUTURE ARTICLES TO THE NEW EDITOR:

**Malcolm Bergh**

**Touchpaper Editor**

3 Kingsley Avenue

CheshuntHerts EN8 9PU

tel: 01992 632941

e-mail: malcolm Bergh@hotmail.com



## FROM THE CHEMIST'S COOKBOOK

# 'BOILED CHRISTMAS CAKE'

### INGREDIENTS

1 bottle whisky (or 2)  
1 cup butter  
1 cup water  
50g walnuts  
1 tsp salt  
1 cup granulated sugar  
4 large eggs  
1 cup mixed fruit  
1tbs brown sugar  
1 tsp baking soda  
some lemon juice

### APPARATUS

small saucepan  
electric mixer  
shot glass  
large mixing bowl  
hotplate  
oven

### PROCEDURE:

Place dried fruit, water and half cup granulated sugar in small saucepan. Boil for 15 minutes. Pour whisky into shot glass, sample to check quality. Get large mixing bowl. Check whisky again – pour 1 level cup and drink. Repeat previous step.

Turn on mixer and beat in a large fluffy bowl. Add 1 spoonful baking soda, half cup sugar and beat again. Resample whisky to make sure it hasn't gone off. Turn off mixer, break 2 eggs and add to bowl. Check whisky for consistency. Next, sift 2 cups salt or something, whatever. Check whisky!

Now sift the lemon juice and strain your nuts. Add 1 tablespoon brown sugar, or whatever colour you can find. Mix well. Grease the oven and turn pan cake to 350 degrees. Don't forget to beat off the butter.

Pour mix into cake pan and over bench. Throw bowl out of window. Stagger to laundry, put pan cake in over set to hot rinse. Continue sampling whisky until bottle exhausted.

Bo to ged!

## HAPPY CHRISTMAS !

**ROYAL**  
**GUNPOWDER**  
**MILLS**  
WALTHAM ABBEY

‘TOUCHPAPER’©

Published by RGM(WA) Friends Association  
Printed by PRONTAPRINT Bishop's Stortford