

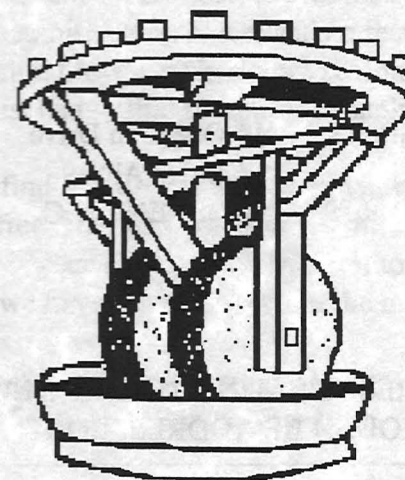
**ROYAL
GUNPOWDER
MILLS
WALTHAM ABBEY**

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Touchpaper

The Newsletter of the
**ROYAL GUNPOWDER MILLS WALTHAM ABBEY
FRIENDS ASSOCIATION**



**DECEMBER
2003**

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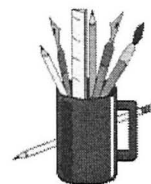
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PLEASE NOTE: Deadline date for submissions to
the next issue is 15th August 2003



EDITORIAL

Are you feeling in a festive mood? I must admit that it gets harder to muster up enthusiasm for Christmas each year. It's mainly the hassle of trying to find suitable presents that is the biggest headache - but then, perhaps it's just age creeping up!

This issue sees the continuation of Les Tucker's articles on the development of Chemical Explosives plus many other similar contributions and reminiscences. Not exactly a festive issue I thought until Cathy Morton Lloyd sent in a more seasonal couple of contributions that I just had to find room for - Thankyou Cathy.

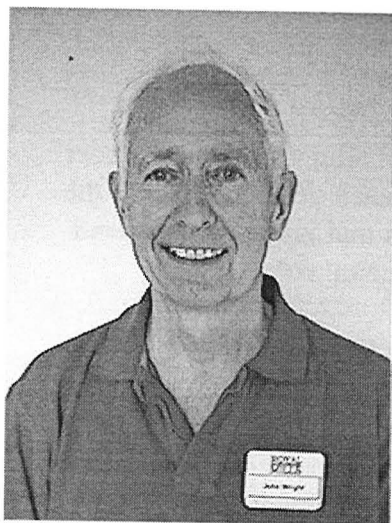
Members will find enclosed a form for renewal of membership (You've had a free 6 months and now it's time to pay up again). Why not make it your New Year resolution to renew your membership before we have to remind you in the next issue!

On a personal note I wish you all a very Merry Christmas and hope we can all look forward to Happy New Year.

Norman Paul
Editor



CHAIRMAN'S CHAT



Progress on the fire alarm system has been slower in the last two or three months due to other distractions. However, a refurbished fire alarm pillar has been installed in L168 near the Casting Liquid Lorry, together with two telegraph poles to transmit the signal to the control panel. Ann Manners has been doing an excellent job on repainting the enamelled plaques on the pillar.

The Friends are hoping to run an exhibition next summer in the Annex to L157 with the themes of 'Rocketry and Gun Propellants' and a typical 'Laboratory' of the 1950's/60's. We would welcome any potential exhibits you may have that you would be prepared to loan, at least for the season. Please get in touch with me, or one of the Committee.

The summer's dry weather has revealed the outline of a building at the southern end of Queens Mead, close to the road and less than 15m from the Grease Store. Earlier maps that we have consulted so far show no sign of any building. If anyone has any ideas please let the Editor or myself know. The building was about 11.5m square and appears to have contained 10 rooms.

Now that the season has ended the deer are spending more time on and around Queens Mead. The other day I even saw a muntjac in the Lodge garden.

With my Best Wishes for Christmas and the New Year

John Wright

CRACKERS - Another British Invention!

Before Victoria's reign started in 1837, nobody in Britain had heard of the Christmas decorations that we know today. The wealth of technology created by the industrial revolution of the Victorian era changed the face of Christmas for ever.

A London sweet maker, Tom Smith, discovered the 'bon bon', a sugared almond wrapped in a twist of tissue paper on a trip to Paris in 1840. Over the next 7 years, this simple idea evolved into the Christmas crackers of today.

He decided to put a small love motto into the tissue paper and the crackle of a log, as he threw it onto the fire, gave him the flash of inspiration that added the 'spark' to his novelty item.

After experimentation with the size of the 'bon bon' and perfecting the chemical explosion to create a 'pop' (caused by friction when the wrapper was broken), plus replacing the sweet with a surprise gift, Tom Smith had invented the British Cracker.

Our national bird – THE ROBIN, ever popular at Christmas

As a result of a meeting in 1960 of the International Council for Bird Preservation, the Robin was announced as Britain's favourite bird.

It is often depicted on Christmas cards, possibly because the first postman, whose uniform included a bright vermilion waistcoat, were known as 'robins' and sometimes are featured with a letter in the beak actually delivering mail.

A further reason for choosing the robin may have been the legend that the red on its breast was caused by the birds being pierced by a thorn from Jesus' crown, when He was on the cross.

The sole purpose of the robin's red breast is in territory defence – it is not used in courtship. A patch of red triggers territorial behaviour, which gives the robin a source of food all year and it is not unusual for one of the birds to die of its injuries in territorial fights. Fledglings do not develop a red breast until several weeks old and able to fend for themselves.

In cold weather, the robin's favourite food is meal worms, but it also likes scraps of fat, cheese, breadcrumbs and dried fruit. The robin has a sweet tooth and often takes cake, especially fruit cake, coconut cake, and uncooked pastry. At other times, sunflower hearts are eaten. Of course, they will take up a chance of an easy meal any time gardeners dig up soil and expose earthworms, leather jackets or other grubs! If feeding birds, don't forget to also put out some water.

Cathy Morton Lloyd

P. G. KNAPMAN DEDICATION OF SEAT AND TREE

Earlier this year, after visiting the site, Mr Knapman's daughter, June Cox gave a substantial donation to the Friends Association. Part of that money was used to plant a memorial tree and a bench seat near Walton House.



June, accompanied by her daughter, came on the 31st October and cut the ribbon on the seat.



GOVERNMENT HOUSE

Government House stood outside the Establishment on the South side of Highbridge Street immediately opposite the original entrance to Powdermill Lane (since diverted to make way for the roundabout). The last Superintendent of the RGPF, P G Knapman, lived there with his family until 1950 (*see letter by June Cox, p11 March 2003 issue*). It then became part of the administrative centre until about the late 1960's when the establishment moved all admin. functions inside the site boundary.

Planning permission has now been granted to build flats on the site and, accordingly, a team of archaeologists have explored the site to meet the legal obligations attendant upon erection of new buildings on an ancient site.

Very little of interest was found at the west end next to the Lee Valley Park offices, apart from some masonry derived from the dissolution of the Abbey. However there was a mushroom shaped millstone found which was probably used to grind grain; the Cornmill Stream flows along the southern end boundary.

Substantial footings of a Drill hall that had existed on the west side, a drainage channel next to the Drill Hall was also revealed but of Government House itself little could be seen other than a few red bricks of the foundations.

Prior to filling and levelling the whole area in October Ron Treadgold made a pictorial record and one of his photographs is appended.

Bryan Howard



CORDITE FOR SPITFIRE ENGINES



My experience in marine biology at the Fisheries Laboratory in Lowestoft led the RAF to employ me as an airframe mechanic when I was called up for National Service! After initial training, followed by technical training, I was posted to North Luffenham in Rutland where I made my first acquaintance with cordite while working on Mark 22 Spitfires.

During the Battle of Britain cordite was used in the Spitfire's machine gun ammunition but it may not be generally known that without the aid of propellant to start the engine the aeroplane itself would remain firmly on the ground.

Traditionally, aero engines for biplanes were started by swinging a twin bladed propeller by hand but the high compression Merlin and later Griffin engines used in Spitfires required more energy to start them.

The solution was the Koffman Starter which used hot propellant gases to drive a spirally grooved piston along a cylinder with matching grooves to impart a twisting action to the propeller shaft - giving it a 'kick' which would start the engine, if suitably primed with fuel. If the engine failed to start first time a fresh cartridge could be selected for a repetition of the starting procedure. A total of 5 cartridges were held in a rotatable magazine that resembled an oversize 'six gun'. Each cartridge was the size of a 12-bore shotgun cartridge.

After 5 failures the spent cartridges were replaced by fresh charges which involved removing a small access panel held by two 'Amal' cowling fasteners that were not easy to undo; this operation was not popular with the ground crew.

Bryan Howard

NON-LISTED PRINCIPAL STRUCTURES OF THE ROYAL GUNPOWDER MILLS

Part III DEVELOPMENT OF CHEMICAL EXPLOSIVES

Section 4. 20th Century - Guncotton Drying

The history of K.B.Quinan and the Quinan Stove

K.B.Quinan was one of the great figures of the explosives industry and the following gives a brief synopsis of his career and the Quinan guncotton drying system before discussing the Quinan stove at Waltham Abbey.

K.B.Quinan

The story begins in the rich gold fields of South Africa, indirectly of vital importance to the British economy.

Blasting was a fundamental part of the mining operation and blasting explosives were a significant component in the mines cost structure. Following his development of the chemically based dynamite and blasting gelatine and their meteoric success in world mining Alfred Nobel had been assiduously creating the empire which was to bring him immense wealth, by building new factories, licensing, by absorption of other companies and the forming of trusts for specific markets to the point where Nobel enterprises were a dominant force in world explosives. Too dominant for some - in South Africa they came up against an equally forceful influence in the shape of Cecil Rhodes and the De Beers Mining Corporation.

For the South African market Nobel had manoeuvred to the position where one of his trusts the British South Africa Explosives Co. effectively controlled the market. Rhodes considered that the trust's pricing policy represented abuse of a monopolistic position and after fruitless negotiation on price ordered that De Beers should create its own explosives works. The site chosen was the village of Somerset West near Capetown. The General Manager of De Beers was an American, G.F.Williams, and he was aware of the high reputation of an ex US Army Colonel W.R.Quinan who had become in civilian life manager of the California Powder Co. Quinan was approached to become manager of Somerset West and he accepted, bringing with him vital supervisory staff and technicians. In 1901 on a trial

In 1903 the Cape Explosives Works commenced production. From the outset W.R. displayed high leadership and technical development qualities and the works became one of the prominent explosives works of the world.

There must have been some genetic trait in the Quinans suited to explosives management. The nephew K.B. exhibited the same qualities and as his uncle gradually stepped back from the day to day activity of the factory so the nephew moved in, becoming an 'extremely efficient' works manager in 1904 and on the death of his uncle in 1910 becoming general manager. Space does not permit discussion of all of K.B. Quinan's achievements and innovations, but two give an idea of the scope of his activity. The first is an example of the strategic thinking which characterised him. The factory had been obtaining its glycerine from Holland and K.B. had ordered that a glycerine distillery be built at Somerset West. Although this was done on commercial grounds originally by an incredible chance the plant was completed on the day war was declared in Europe, thus avoiding reliance on what had now become the highly vulnerable sea lanes from Europe to Africa. The other was the system he had designed for drying guncotton which he had patented. The system was a substantial improvement on existing methods and there was sufficient interest to justify manufacture and marketing under licence by Fraser and Chalmers, engineers of Erith, Kent.

The Quinan system and its advantages are analysed in the Appendix.

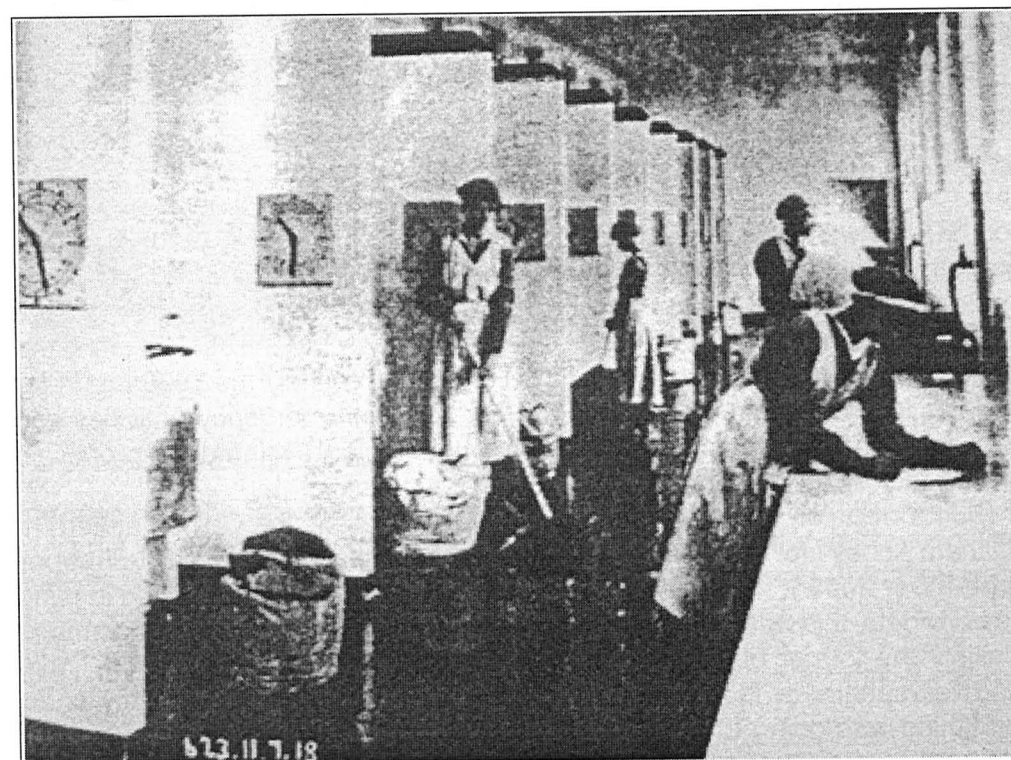
All this with Somerset West and his work highly respected must have caused Quinan some satisfaction. But war had come and fate decreed a wider destiny. By 1915 the British Army on the Western Front was in serious difficulty through lack of sufficient artillery ammunition and propellant. The Times called it 'The Shell Scandal'. Lloyd George was appointed Minister of Munitions with Lord Moulton heading the Committee on High Explosives to reorganise and significantly increase the output of the munitions industry. A telegram was sent to Quinan 'inviting' him to come to London to aid the effort with his advice. The telegram must have been persuasive - it was received in the morning, by half past four on the same day he was on the mail steamer for London. On arrival he was appointed Head of the Explosives Supply Department, charged with designing and overseeing the building of a series of factories which were to transform the munitions industry.

One of these came to be called the greatest explosives factory on earth. The site chosen was in Dumfriesshire in southwest Scotland, with good rail and sea links and safe from attack. The logistics were mind boggling, involving a torrent of materials and most of the construction workers having to be brought in from outside, mainly Ireland. Reflecting the name of the settlement in the middle of the site the works was named H.M. Factory Gretna. Building Gretna was not for the faint hearted. Work continued round the clock and the workers toiled in a sea of mud and materials. Local accommodation was hopelessly inadequate. There were three shifts a day and workers shared a bed, one coming off shift occupying it as the other left to go on. Until they could find something newcomers had to sleep in the massive drain pipes they had built beside the roads. Very high wages could be earned, a substantial part of which immediately in time honoured fashion found its way into the coffers of the local breweries.

Construction began in August 1915 and a year later the factory was complete - stretching for 9 miles from the west at Dornoch on the Solway Firth in Scotland across the border to Mossband near Longtown in England, connected to 3 main rail lines, 90 miles of internal rail lines, 100 miles of water mains, its own powerhouse with four turbo alternators serving 22 miles of electric mains, 8 hydraulic plants, 8 hydraulic accumulators, 54 steam boilers.

The first cordite left the works in August 1916. The pressure for output was intense. In the initial stages the works did not permit itself the luxury of any set breaks for meals.

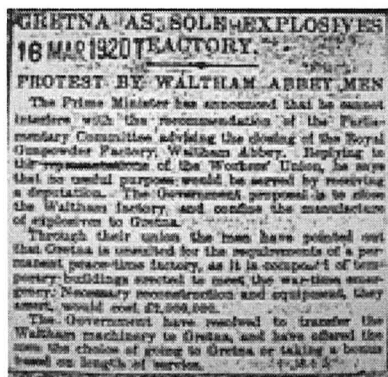
In the complex the guncotton drying stoves employed the system which Quinan had designed.



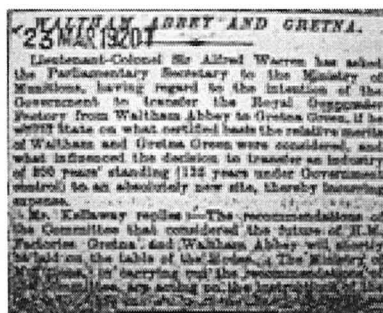
Quinan guncotton drying at Gretna 1918
(Drying time clock on each bay)

Gretna was an outstanding success. Productivity was excellent and by the end of the War a total output of cordite of 57000 tons had been achieved. After the War Quinan returned to South Africa. His contribution to the success of the munitions effort had been immense and he was awarded the nation's highest civilian honour, Companion of Honour; as a foreign citizen he could not be knighted.

After much debate on whether Gretna or Waltham Abbey would survive as the main Government cordite factory, at the last minute having decided it would be Gretna the Government changed its mind and Waltham Abbey continued. Gretna was largely dismantled in the early 1920's.



1920
Newspaper
cuttings



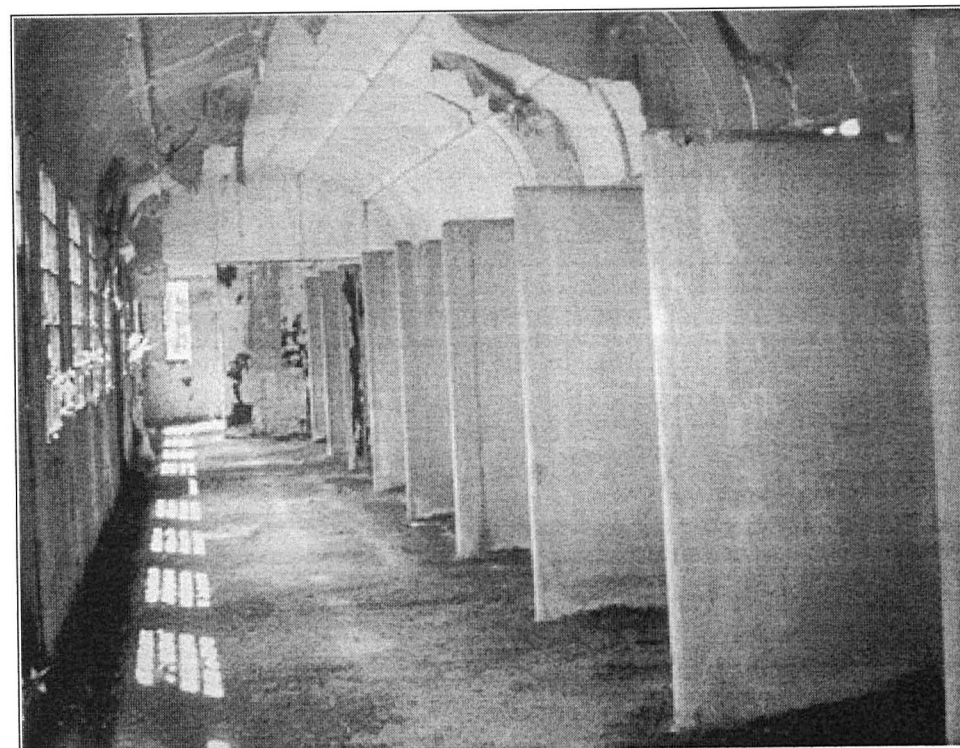
Installation of the Quinan Stove at Waltham Abbey

After the War the explosives industry turned again to civil use with the military side becoming again a largely unknown low key activity. By the 1930's however the first warnings of a tangible outside threat were being received within the Governmental machine and whilst the public, soothed by the speeches of Mr. Chamberlain, hoped for the best the military supply organisations behind the scenes quietly began to prepare for the worst. Revealingly the 1935 report for the Mills for the first time contained the phrase War Emergency Activities and mentioned uncertainty as to the 'removal of the factory', referring to proposals for new factory building in the safer west of the country.

In 1934 a decision was taken to install drying stoves on the Quinan pattern at Waltham Abbey (for location on the North Site see map in centre of **Touchpaper September 2003**). It is not entirely clear whether at that time, bearing in mind the early date, this was a basic plant update or part of a rearmament programme, possibly the former but overtaken by events as the 1930's moved on. Tom Gladwell speaks of the atmosphere influencing work in 1936 - 'They knew something was going to happen' (extract from Ron Treadgold's oral history archive).

Possibly partly arising from this increased tempo of rearmament activity, the Quinan development at Waltham Abbey attracted considerable interest in the national explosives activity. At the initial planning stage no less than five outside bodies participated - the Home Office, Government Research Department, Royal Naval Cordite Factory, Ordnance Factories, ICI.

It appears that considerable effort was directed to investigation of the structure and material of the building as a design exercise for future danger buildings, the basic advantages of the operating design being given.



Interior of Waltham Abbey Quinan Stove
showing drying bays and peeling painted calico.
2003

Waterways - The Stove was served by a cut off the main waterway system in the usual way. In 1936 two new boats were supplied with the description 'Dry Guncotton Boats - Quinan Type'. Swim headed both ends, at 26ft. they were 7ft. shorter than the standard dry guncotton boat and 2ft. narrower. The Quinan cut was already entering the maintenance work schedules. The Rivers and Cuttings report for the year includes 'The dredging of shoals at Quinan Stove Cut'.

The Quinan Stove was built on the site of the previous Guncotton Stove No.17, building No.22a, and rather confusingly the new building retained the same number. 22a/3 was allocated to the Engine/Fan House.

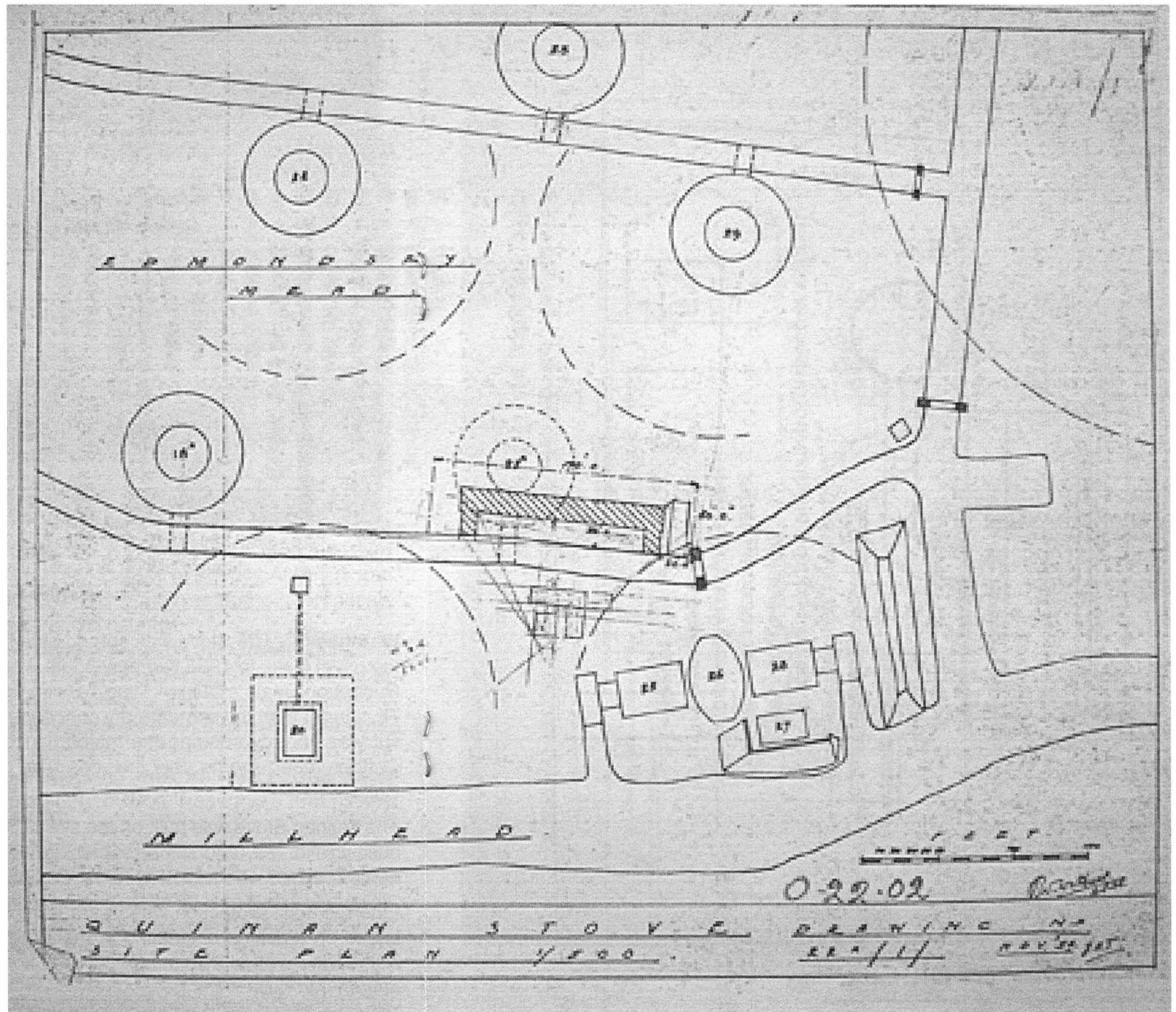
External blast protection was in the form of 'Chilworth mounds'. These were based on a design originating at the explosives works at Chilworth in Surrey, with earth revetted by bitumen covered corrugated iron sides, reinforced by flat bottom iron rails.

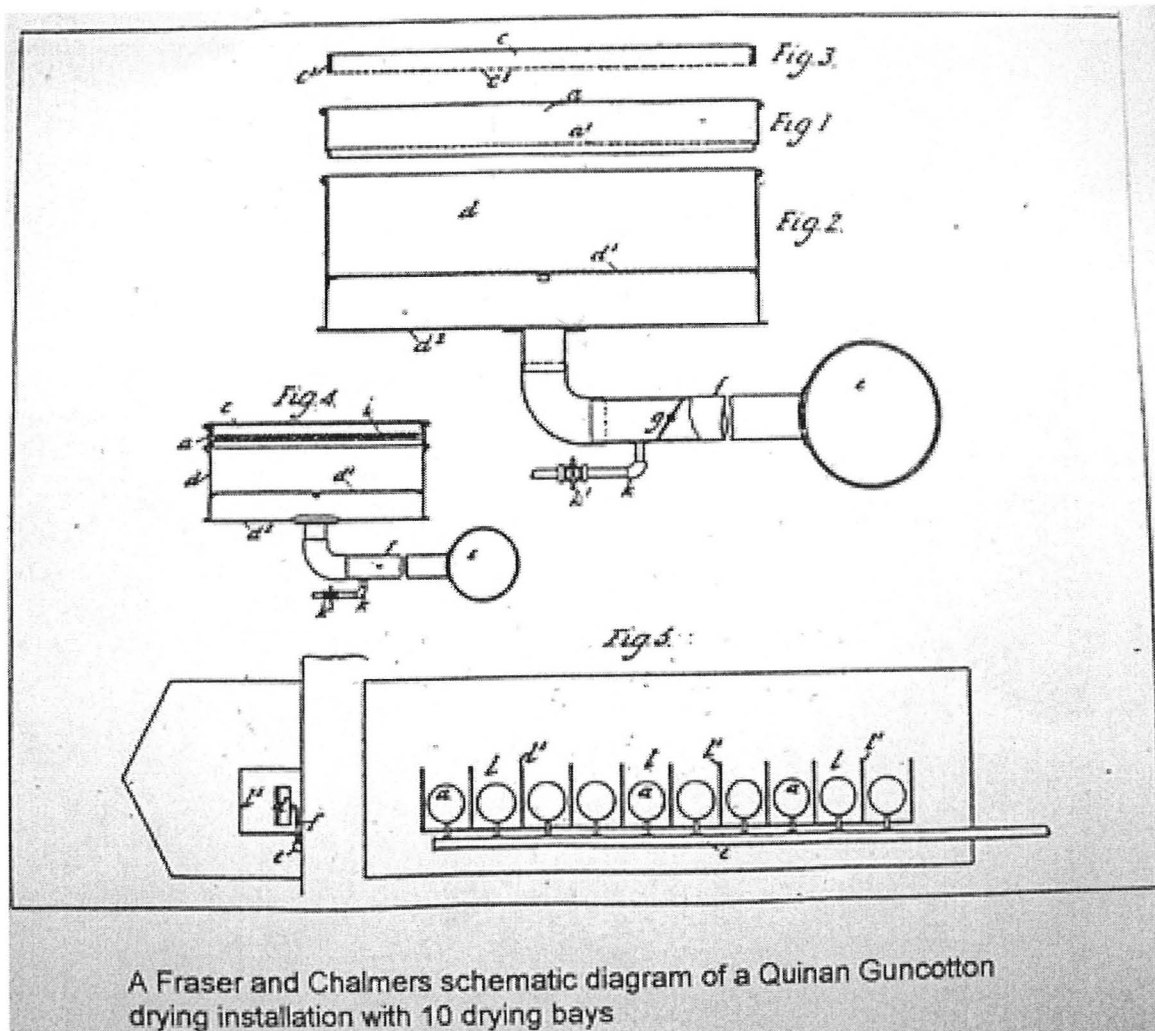
Traverse 22a/1 was between the Stove and the Engine/Fan House and 22a/2 protected the general area to the south of the Stove.

QUINAN SITE PLAN:

Originally drawn in 1934, the year the Quinan development was decided.

The stove, with its canal cut and the dotted line denoting the previous guncotton stove No. 17, is in the centre of the plan surrounded by older generation guncotton stoves.





KEY:

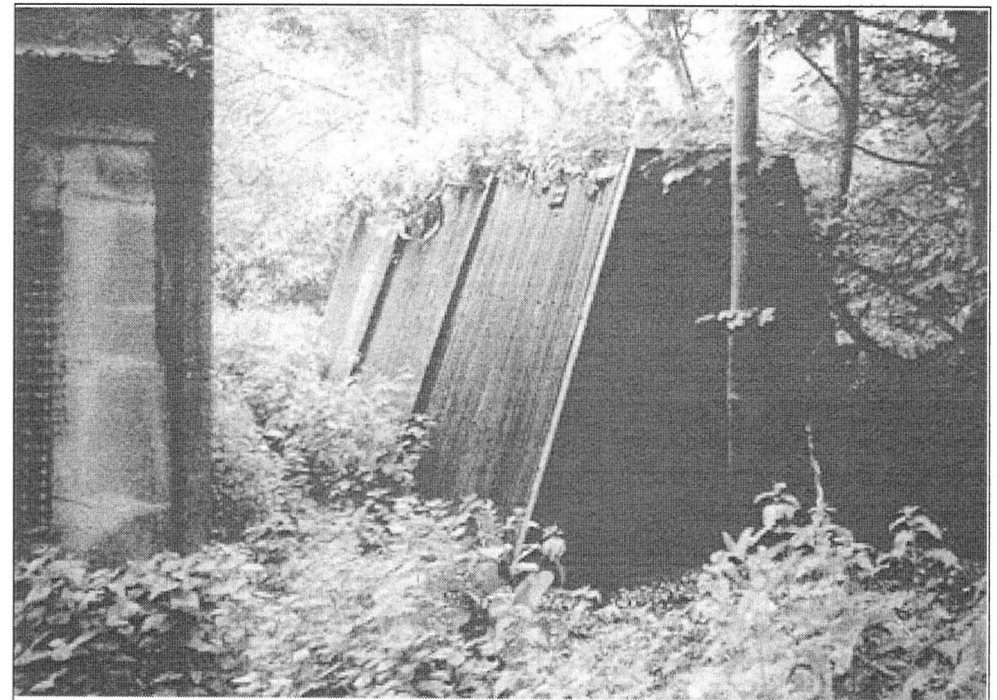
- a - basket
- a1 - perforated metal sheet
- c - basket retaining screen
- c1 - basket retaining ring
- c2 - cover for basket
- d - galvanized iron air distributor/basket support
- d1 - perforated false bottom
- d2 - closed bottom
- e - hot air main
- f - hot air pipe
- g - hot air valve
- k - compressed air pipe
- k1 - compressed air valve
- i - alcoves
- i1 - fireproof walls

What emerged, in 1936, was a building of decidedly modern appearance amongst what were becoming relics of the late 19th century. At that time in the wider world much experimentation was taking place in the use of concrete, both in the domestic and commercial fields, and this extended to the Quinan Stove. It was constructed of precast concrete with a barrel shaped roof, bitumen coated. The walls consisted of concrete panels on a steel frame anchored in the ground. Reflecting the need in a danger building to allow the passage of blast, the roof panels were relatively lightly secured and the walls were infilled with wire mesh concrete rendered. Natural light was provided through ten light sections in iron frames. Electric lighting consisted of the usual danger building system of wiring in small bore tube with lights hung on the outside walls. The standard shoeboards denoting clean and dirty areas were employed. There were 15 processing bays. The walls were covered in painted calico to facilitate cleaning.

A separate Engine/Fan House provided the warm drying air via pipes laid over the top of a protective traverse.



Quinan Stove - Waltham Abbey
(picture taken 2003)



'Chilworth mound' Traverse
Waltham Abbey - 2003

It can be conjectured that by this time it had become clear that future expansion of production would take place in the new factories being planned for the west of the country and no further Quinan Stoves were built at Waltham Abbey. Instead this became the test template for the new factories.

It succeeded in this function. In 1938 it produced 177 tons of dried guncotton and it was reported that 'the experience gained in operation has proved invaluable in the planning of the new cordite factory' (which would have been ROF Bishopton, Renfrewshire). Alf Nicholls recalls the smaller size pans, quicker drying and increased efficiency of the new installation and the design's successful transfer to Bishopton (extract from Ron Treadgold's oral history archive).

Some doubt has been raised as to the validity of perpetuating the Quinan system of drying when a system of cordite manufacture had been evolved which avoided the need for drying entirely by using a wet slurry of nitrocellulose pumped to the mixing house for blending with nitroglycerine. To examine this question is beyond the scope of this history of the Quinan Stove - did the designers decide to concentrate on the building, not wishing, under the pressures of war to change the whole manufacturing process ? (*comments please - Editor*) .

To-day and the Future

The Quinan Stove stands to-day in the deserted north of the site, threatened by encroaching vegetation, still looking modern compared with the surrounding relics.

As more explosives facilities disappear it is possible it is the sole surviving building of its type in Britain.

Until relatively recently it was in fair condition. However the fabric has now moved into a downward path. The roof bitumen has failed, the concrete on the walls is spalling, the window frames have rusted and most ominously the structural frame is rusting. Without attention to this the building will eventually collapse.

The building has recently been placed on the English Heritage Buildings at Risk Register. It is to be hoped that this will prompt some preservation action.

The Quinan Stove represented an important stage in development of chemical explosive processing and served the nation well in two World Wars, notwithstanding the possibility that, in ideal conditions, a new system development replacing it might have been introduced earlier.

It is :

- ↑ **An outstanding example of enlightened process design involving a challenge to existing received wisdom leading to increased efficiency, safety and to reduced cost**
- ↑ **A surviving physical reminder of the great political events of the 1930's when once again preparations for the unthinkable had to be made**
- ↑ **A little known example of the application of 1930's precast concrete techniques to the very specialised industrial function of danger buildings**
- ↑ **A memorial to the man of whom the *Times* said - 'It would be hard to point to anyone who did more to win the 1914-1918 war than K.B.Quinan'**

Les Tucker

In early November the Gunpowder and Explosives History Group visited the site of the Royal Naval Cordite Factory (RNCF) at Holton Heath, near Wareham, Dorset.



RNCF had some connections with Waltham Abbey. It was designed by Bt.Col. Sir F.L..Nathan, Superintendent at Waltham Abbey 1900-1909, who had just completed design of a TNT plant for Nobel Explosives, later ICI, at Ardeer. Mr.W.T.Thompson, previously Chemist in Charge of Guncotton production at Waltham Abbey, was Manager and Deputy Superintendent. Dr.R.S.G.Knight joined the RNCF from Waltham Abbey in 1915 as Chemist in Charge of Nitroglycerine and Cordite, ultimately in 1931 succeeding Mr.Thompson as Manager and Deputy Superintendent.

The factory was built in 1915 in response to a directive from Churchill, then Lord of the Admiralty, that the Navy should have its own cordite production facility. It covered 500 acres

of the heath, with a small hill in the centre affording the height for nitroglycerine production, drawing its labour from the surrounding Purbeck towns and villages and must have been quite an attractive alternative to low paid agricultural work.

Its history from 1916 was very similar to Waltham Abbey. Massive production in WWI followed by a period of relative quiet in the 1920's then 1930's rearmament and significant increase in activity in WWII followed by cessation of production and change to research establishment.

Of the 500 acres 40 are now owned by a property development company and are at present on a care and maintenance basis pending the outcome of a lengthy planning enquiry and the company permits visits organised by the RNCF Association. The rest is now a light industrial estate and conservation area.



The main entrance area contains the main admin block, the Captain Superintendent's block and the inspection monitoring block. The Association runs a museum in the admin block and the tours start from there. The first impression is of walking in a highly wooded country estate with well kept grassy banks. In the 1920's 27000 trees were planted, which must have brought joy to the nurserymen's hearts - their invoices are still preserved. It is evident that some care was taken in selecting species appropriate to local conditions. The mature trees are now in fine condition, many could be called specimen examples and the area rivals the grounds of outside estates. The factory was surrounded by a high fence of spiked metal uprights painted black. The paint used was made on site using byproduct from the factory gasworks. This was something of a Forth Bridge job and there was keen competition amongst the painters to paint the outside face of the fence - they were permitted to smoke, the inside face people were not - a problem solved by passing lighted cigarettes through the fence.

Steam lines ran throughout the site, very similar to those at Waltham Abbey and now characterised in a similar way by rows of brackets and their supports, the pipes having been removed as an asbestos risk. There is one significant difference, the RNCF lines ran about 2ft. above the ground, Waltham Abbey's were above head height, presumably to clear the canals.

Unfortunately most of the nitroglycerine and guncotton facilities are within the industrial estate and visits are not permitted. The buildings which are seen in the 40 acres include admin, what was called the physics block, the hospital (following an explosion early experimentation in the use of water beds for burns victims was carried out here), engineering workshop - as much repair work etc. as possible was carried out on site and this policy extended over the whole range of activities, metal work, leather work, glass, extending even to a sail makers shop making anything in canvas, toolbags etc., engine sheds - two types of loco were used in the danger areas, electric battery driven and 'fireless' steam, called in the factory 'Fowler's Ghosts' ; the latter were not of course coal fired but were charged up with high pressure steam from insulated storage chambers. The internal rail system comprised about 5 miles of track, of which only about 12ft. remains, embedded in concrete.

Cordite was taken by rail from the factory to a nearby jetty in Poole Harbour, from where it was barged to Royal Naval Armament Depots at Upnor Castle Chatham and Priddy's Hard Gosport. Apparently some manoeuvring of the barges in harbour channels was required and local fishermen were employed for this.

Most fortunately however within the 40 acres are the acetone raw material preparation building and the 'biggest flower pots in Dorset', the giant concrete acetone fermentation tanks, very significant artefacts of the era of solvent based propellants. The raw material was mainly maize, imported from America and stored in the factory's granary, demolished in 1934, leaving about 5000 tons of rubble. There are many stories of schoolchildren collecting chestnuts etc. for this unit. This apparently happened only in one year 1917, when the U boat attacks on the the Atlantic sea lanes were reaching their peak. The scientist in charge of the acetone production was Chaim Weizmann, who famously having only produced a laboratory amount was told by Churchill they needed 30000 tons. Weizmann later became the first President of Israel and it is not too fanciful to imagine that the interchange with Churchill included some background political quid pro quos, leading ultimately to the founding of the state of Israel, and so one can draw a link between giant concrete tanks on a Dorset heath and to-day's cataclysmic events in the Middle East. The acetone facility became redundant when the RNCF went over to solventless cordite in 1927. During WWII the tanks served as air raid shelters.

Finally the tour returns to the Museum. This contains much of interesting cordite history. What one is not prepared for is the very impressive factory model. This represents the entire 500 acres and everything on them - buildings, rail lines, the nitroglycerine hills etc.etc. and occupies a considerable part of the floor area of one room. Apart from being of great interest to model builders it must now be a unique piece of explosives history. It was built in 1942. What is puzzling is whilst admiring the workmanship one wonders what determined that this should be done, with consequent diversion of resources, in the middle of a war. The Association are equally baffled.

After the tour Group members gave talks on areas of interest. A Waltham Abbey Friend described the history of K.B.Quinan and the Quinan Stove at Waltham Abbey.

Debate followed on the merits of the Quinan guncotton drying system and why the use of dried guncotton continued for quite some time after the introduction elsewhere of the safer wet mix process for cordite.

Les Tucker

More on Nitre Cake and Nitroglycerine

Nitre Cake Disposal

Further to Dave Hartley's letter on Chemistry and Nitre Cake from the Acid Factory in **Touchpaper September 2003**, it appears that the Mills ran into difficulty in disposing of this bye product. A note in the 1938-1939 Report reads - 'The disposal of Nitre Cake has become a troublesome business. Formerly this by product was sold but under present conditions the Director of Army Contracts has, despite all enquiries, only found one firm who will take it away, and it is costing some £8000 a year for the service.' This seems an astonishingly large sum for those days and must have been quite a significant dis-economy in nitric acid production at the Mills.

Les Tucker

A brave try

In 1906 the company Explosives and Chemical Products Ltd. developed a site at Great Oakley in Essex which they had purchased from The High Explosive Co. In the 1970's a new nitroglycerine based product was developed, requiring less labour. In a commendable endeavour to avoid redundancies the company decided to diversify - the product chosen was parfried chips for the catering industry ! - it does not immediately spring to mind what nitroglycerine expertise was transferable to parfried chips. Unfortunately the venture was not a success.

Les Tucker

Powfoot and the Railway

Further to John Wilson's Railway News in **Touchpaper September 2003**, it has been confirmed that the wagons illustrated came from the Government explosives factory at Powfoot in Dumfriesshire when it closed in the 1990's. Two of them are now in the large exhibits Building L168. ICI had a factory there from WW1, then under the name Nobel Explosives, and the Government connection commenced in the early 1940's when it built a propellant plant there along with two others in that area, at Dumfriess and Dalbeattie. ICI, who had their main explosives complex at Ardeer further up the coast, managed the three on an agency basis.

A semi-local informant from the Eastriggs and Gretna Heritage tells me that the site is now called 'The Broom Fisheries', a long way from explosives, and has said he will try and visit it when next in the area to see what is going on.

Les Tucker

ANSWERS

Questions have been raised concerning work in the Edmondsey area in the years 1960 - 75 and we have had this reply from Dr Mark Phillips who, as a chemical engineer in the Process Research Branch did much work there during that period.

My memories are somewhat hazy it being 35 years ago but I have written down what I could remember although details (like actual building numbers and what they were used for) are a little 'iffy'. Last summer Mary and I went around North Site, travelling on the landtrain and it brought back floods of memories, most of which came back after we departed. Mary used to work there as well before the kids came along.

I started work at Edmondsey in about 1979 when I had finished my thesis. I didn't know there was such a thing as the 'Grand Nitrator'; the nitrator that was there was in Building E1 and was just known as the **Nitration House**. I don't think it was used to make NG after the end of the war (that is WWII, not the Crimean as the building was dated 1898!) and it was a batch process. There was a second NG plant based on the Schmitt process that was taken as war reparation from Germany but was never installed. I think it was stored in Building S16.

Prior to my working there the nitrator had been used for making Diethyleneglycol Dinitrate (DEGDN) and Triethyleneglycol Dinitrate (TEGDN) by Phil Coxon and John Kemp, the latter now sadly dead. These two nitrate esters were shipped to South Site, dried and used for research into high performance gun propellants by P1 Branch.

I started by designing and operating an NG extraction plant in the (?)House, Building E3. This building was used because it was then connected to the **Wash Water Settling House E7**). The NG (from dynamite made at ROF Bishopton) was extracted with hot water and mixed with 'Daltorol' for polyX explosives research by Ernie Cook *et al* in the building next to G430 South Site). The NG was measured using the 10lb burette made by Arthur Witham and now kept in the main exhibition hall.

Ron Jones used the nitrator for making Dinitroethylbenzene (DNEB) and Trinitroethylbenzene (TNEB) used to make K10 liquid, the plasticiser used in explosive compositions for some atomic weapons.

The last thing to be made in E1 was Hexanitrostilbene (HNS), used as a nucleating agent for TNT in 120mm calibre shells. The pilot plant was located in the building and latterly it was the plant for HNS production before production was taken over by ROF Bridgwater. Edmondsey ceased to exist in the working sense at the end of HNS production and the nitrator was 'taken down' by Bert Betts and his safety crew and the building left.

The NG gutter was different. All products were flowed by gravity (hence NG Hill) and the gutters were surrounded by warm water to prevent any NG from freezing. This was still in existence when I was at Edmondsey and the question about the length of guttering being just south of Newton's Pool is difficult for me to answer as I knew the buildings by name and sometimes the number. After NG had been extracted washings were taken to the Washing House (E18 I think) before being treated to remove residual NG and discharged to the local river.

Mark Phillips.

MODEL RAILWAY APPEAL

If anyone has unwanted model railway items, railway books or videos etc I am willing to sell them to raise money for the Friends projects. Bill Smith kindly donated a 1950's Hornby clockwork train set. Most items sell quite easily at our model railway exhibition but this proved to be a bit of a challenge. Eventually I took it to Adam Partridge, a star of TV auction shows, and he offered to sell charity items for me commission free.

We hoped the train set might fetch a bit more but it did meet its £60 reserve. This money will help the Friends with their projects at the Powdermills. The work of the Friends is essential to the development of the site and although labour is free, cash is needed for materials.

I think the Friends and volunteers who have worked on site during this last difficult and uncertain year should be applauded and supported. So if anyone has unwanted model railway items I would be pleased to try to convert them into cash to pay for further improvements. Tony Barratt – Tel: 01663 750357

THE DEVIL'S PORRIDGE

On the way back from a holiday in Scotland recently we stopped to see the Devil's Porridge! This exhibition at Easttriggs tells the story of the WW1 Gretna explosives factory and is in one of five churches built especially for the workers. This Solway factory was one of the largest ever built, 9 miles long by 2 miles wide, and produced more cordite than all the other British factories combined. There were 30,000 workers (compared with Waltham Abbey's 6,000); it had 125 miles of railway track and the bakery produced 14,000 meals and 13,000 loaves daily! The Devil's Porridge was the name given by Sir Arthur Conan Doyle to the nitro-glycerine/nitro-cotton cordite paste which was mixed by hand. There are many photographs of workers, descriptions of manufacturing processes, various exhibits and a video show. We found one reference to Waltham Abbey – that of a worker who received a bravery award at Easttriggs and also an MBE for his work at Waltham Abbey.

Do pop in to have a look if you're in the area - the exhibition volunteers were very friendly and helpful. (Website – www.devilsporrige.co.uk for more information and opening times).

RAILWAY NEWS - An Answer.

In the Easttriggs display is a photograph showing a wagon with extraordinary overhangs (similar to that shown in the September 2003 Touchpaper (page 9). The wagon had high open shelving and was being moved by two women workers, I can't remember whether the load was specified. The wagon was on a small turntable where tracks crossed at right angles which explains the need for a short wheelbase.

Beryl and Tony Barratt

DON'T FORGET
DEADLINE FOR THE March 2004 ISSUE:
15th February 2004

[AND DON'T FORGET TO RENEW YOUR SUBSCRIPTION !]

My sister law, a Mrs Diana Payne, now living in Cambridge, met a one-time ROF worker and made me aware of the Waltham Abbey Friends Association. Copies of the June 2003 booklet "Touchpaper" and "The Listed Buildings" have now reached me together with some relevant photographs.

My interest stems from my time there in the period 1941 to 1944 not as a member of the ROF staff but as one of the team of "resident inspectors" based at Woolwich. What I joined in 1937 was then "The War Department Chemist Department" which later became "Chemical Inspectorate, Ministry of Supply". My first contacts with the ROF Waltham were to collect samples of cordite and take them for analysis at Woolwich, but following the outbreak of war and the "phoney" period, air raids destroyed the house I had moved to in Plumstead and some of the buildings in Woolwich Arsenal. I was sent to the ICI works in Scotland (1940) but after a few difficult but relatively peaceful months there while my relatives in the south were suffering the air raids I was moved, by request, South again first to Bridgend but finally to Waltham Abbey. In the early days at Woolwich I had cycled from Ilford, my birthplace, the ten miles daily to Woolwich, crossing the Thames on the free ferry or walking under it through the foot tunnel.

Back again at Barkingside, Ilford, in 1941 I again cycled the ten miles or so to work at Waltham Abbey ROF in northerly direction rather than the previous southerly direction to Woolwich and through more open country rather than the docklands of North Woolwich.

There was a little chemical laboratory up in the water tower in the ROF area south of the road through Waltham Abbey. I was working in it at a balance when an explosion blew in the windows and I received minor glass cuts. At first I thought the RDX / Beeswax had exploded, but it happened that no one was working in it – it was a V2 rocket on it. I went down to the surgery for attention to my cuts and a clean up and to report another casualty I saw on the way needing attention. Oddly enough, my wife heard the explosion (from 10 miles away!) and was convinced it was at the ROF. It happened that our neighbor was a police constable, so she asked him to use his influence (wartime!) to contact the ROF. He did so, but got the answer that the incident was in the ROF but no one of the name Bowell was on the employee list! Well, it wasn't, because I was an outsider, an employee based on Woolwich Arsenal – a resident inspector! However, after being patched up I was deemed fit enough to make the cycle ride of ten miles back to my home in Barkingside. Arrived there, my wife was not surprised to see my bandages and bloodstained shirt! – despite the (false!) reassurances she had received! A second V2 fell just outside South of the South ROF area. It made the typical steep sided enormous crater but no problem except the labour of filling it in! – a local authority task!!

After the war, the same laboratory at Woolwich Arsenal I had worked in on explosives and propellants was taken over for the then completely new type of work for the development of atomic energy - 1945 onwards. Analytical work on materials destined for that purpose proved to be very interesting, far more so than had been the work on explosives, involving as it did all the 92 elements of the then known elements – plus a few more man-made ones beyond uranium! This work expanded to such an extent that more laboratory space was needed – which led to a takeover of ex-army facilities in Chatham and a move of a number of staff there. In my case, it involved removal from my abode in Barkingside (Ilford) to a house at Wigmore, just outside Chatham to which the family moved in 1950. In the meantime, specialised facilities had been built at places such as Aldermaston and Harwell, and later at Winfrith. In 1960 I was transferred to Winfrith and worked there until my retirement in April 1976, which is how we came to live at Briantspuddle, Dorset in 1960 and continued so to do to the present day.

Ernest Bowell