

**Gunpowder & Explosives History Group**

**Newsletter 6, Spring 2003**

**GEHG SPRING MEETING**

Purfleet Heritage and Military Centre, Saturday 17<sup>th</sup> May 2003

- 10.00 Purfleet Heritage and Military Centre opens
- 10.15 Meet for coffee in Magazine No.5
- 10.45 Introductory talk by Alan Gosling, Chairman of the Heritage Centre
- 11.45 Tour of the site. As well as the magazine, one of five on which work began in the 1760s, the following also survive – a proof house (later barrel and hoop store), clock tower, and sections of the inner wall.
- 12.45 Lunch – sandwiches and drinks will be available for purchase
- 13.45 Afternoon session –
- Brenda Buchanan on ‘Purfleet, Benjamin Franklin, and the lightning conductor dispute’
- Beryl Williams on ‘The gunpowder magazines at Weedon’
- Alan Crocker – ‘The Liverpool magazines’
- Ken Major on ‘The storage of gunpowder in castles – some examples’
- Wayne Cocroft – ‘Spandau gunpowder works and the Kirchmöser explosives factory’
- 16.00 Tea and discussion
- 16.30 Meeting concludes

Tilbury Fort, Sunday 18<sup>th</sup> May

Visit to the fort, with its two early eighteenth powder magazines.

## GEHG AUTUMN MEETING AT WALTHAM ABBEY ROYAL GUNPOWDER MILLS, 8 NOVEMBER 2002

We were pleased to accept the suggestion of the History Group of the Royal Society of Chemistry, that our autumn meeting should be held jointly with them at WARGM. We are grateful for the initiative taken in this matter by Dr.Gerry Moss, a long-standing member of our Group and a Fellow of the Royal Society of Chemistry, and would like to record our thanks to him. The WARGM provided an admirable venue for this conference, as the lecture theatre is able to hold comfortably the 90 or so who attended, and the site itself has so much of interest to engage the attention in any spare moments. The members of the GEHG had few such opportunities however, because after lunch we retired to hold our AGM. On-site duties as guides claimed several of our members, and apologies were received from the following who were also unable to attend: Glenys Crocker, David Harding, Charles Trollope, and Mary and Tony Yoward. 10 members were present. The officers were confirmed in their duties, and brief summaries were presented by: Brenda Buchanan, Chairman, on the activities of the past year; Kenneth Major, Treasurer, on the present healthy financial situation with a balance of £1,550 in hand; and Wayne Cocroft, Secretary and Editor of the *Newsletter*, on content and production. It was agreed to make no change to the present subscription rate of £5 per member or institution and £7.50 per two members living at the same address. Appeals were made for more material for the *Newsletter* and for suggestions for future meetings. The meeting then ended hurriedly as the afternoon session was about to begin and our Secretary was scheduled to give the first of the papers. We had however managed to cover the essential matters.

No attempt has been made in this report to summarize the papers given, for through the good offices of Gerry Moss the full text of the Wheeler Lecture by Professor Mauskopf, and summaries of the five accompanying papers, have already been circulated to our members. Just for the record however, the following presentations should be noted:

Seymour H.Mauskopf, 'Long Delayed Dream: Frederick Abel and Smokeless Powder'

Graham Vincent, 'Decontamination of Waltham Abbey Royal Gunpowder Mills'

Wayne Cocroft, 'Chemical Archaeology of Explosives'

Brenda Buchanan, 'Sir Charles Frederick, Comptroller of the Royal Laboratory at Woolwich 1746-1782'

Simon Coleman, 'Oswald Silberrad, Superintendent of Research Royal Arsenal Woolwich, 1901-1906'

Wesley Harry, 'The Chemical Laboratories at the Royal Arsenal Woolwich'

The meeting, which had begun with an introduction by the Chairman of the RSC Historical Group, Professor Jack Betteridge, finished with concluding remarks by the Chairman of the GEHG, Dr.B.J. Buchanan. Brenda J.Buchanan

## **GUNPOWDER MANUFACTURE IN MASSACHUSETTS IN 1776**

Mike Davies-Shiel has provided the following paragraph printed in the *Cumberland Pacquet* of 3 June 1776.

*Extract of a letter from Boston, June 3*

"I am told that there has been made at Andover within six weeks past, about a thousand weight of gunpowder weekly; and as the powder mills at Stoughton will begin to work in a few days, and two or three others will soon do the same, this Colony will then be able to furnish the Continent weekly with above a ton of gunpowder. So rapid is the increase of manufacture of salt-petre in this colony, that on Tuesday last was received at the Commissary-General's stores at Water-town 12310lb., for which, the sum of 14630 dollars was immediately paid out of the colony treasure, which is at or near the rate of seven shillings per lb."

Andover is about 32km north of the centre of Boston, Stoughton about 24km south and Watertown, which is still a US arsenal, about 9km west.

Alan Crocker

## **1930s HERCULES POWDER TIN**



Large 1930s Hercules Powder Company powder can

The construction of the Hoover Dam, Nevada, in the 1930s required vast amounts of explosives, including nitroglycerine based explosives - gelignite and dynamite. The project also used tons of blackpowder some of which was transported in tins like this.

Wayne Cocroft

## BLACK POWDER AND GOEX



*1990s GOEX blackpowder can, produced at the Belin Plant, Moosic, Pennsylvania*

In the years before the American Civil War and the First World War, many black powder plants started up in Pennsylvania's upper anthracite region to supply the booming coal mining industries that became the backbone of the region's economy. To meet the growing demand for black powder, E. I. Du Pont de Nemours of Pennsylvania began construction of the Belin Plant in 1908, and produced the first batches of black powder in 1912. Under DuPont the factory was soon one of many thriving black powder plants within the organization.

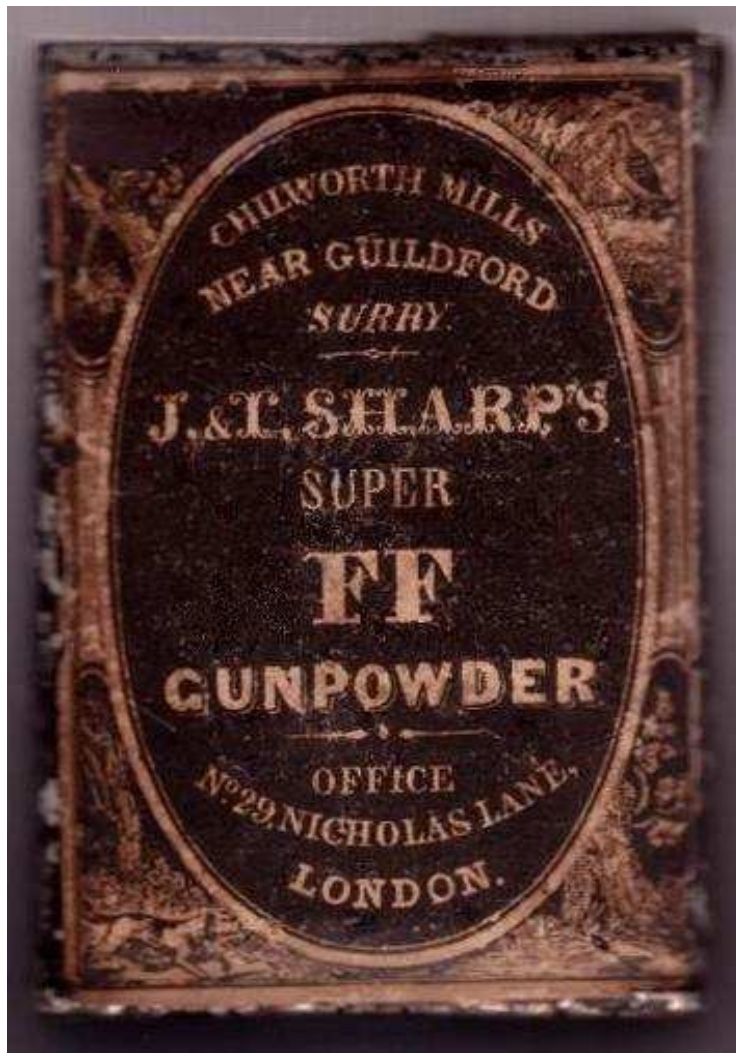
Within three years the Belin Plant became the second largest producer of black powder in the country. Over the years, production remained steady as the plant provided millions of pounds of military black powder during the world wars, and the Korean and Viet Nam conflicts.

Gradually other explosives were introduced, military ordnance changed, and the market for black powder diminished. In the early 1970s E. I. Du Pont withdrew from the manufacture of black powder and the Belin Plant eventually became part of GOEX and a major rebuilding programme followed.

In late 1997, GOEX moved to the former headquarters of the Louisiana Army Ammunition Plant in Doyline, Louisiana. GOEX is now the sole manufacturer of black powder and sells produces blackpowder for muzzleloaders, the fireworks and safety fuse industry, speciality manufacturers, the mining industry and the military.

Wayne Cocroft

## CHILWORTH GUNPOWDER WORKS



Sharp's powder tin. Sharps traded between 1819 and 1881, this may be an early tin as they later traded as J, T and S Sharp.

© Picture Jim Buchanan

English Heritage has recently completed a detailed archaeological survey of Chilworth gunpowder works, Surrey. The report is in preparation and should be ready by summer 2003.

In the meantime, a planning application has been made to demolish some of the raw materials processing buildings adjacent to Blacksmith Lane to make way for a small housing estate. A number of objections to this proposal have been lodged with Guildford Borough Council.

Wayne Cocroft

## ENGLISH HERITAGE'S CUMBRIAN GUNPOWDER INDUSTRY PROJECT

English Heritage (EH) Archaeological and Architectural Investigation teams are currently collaborating on a project to record and interpret the physical remains of Cumbria's once thriving gunpowder industry. In part, the project came about in response to EH's own recent overview of the gunpowder industry for the Monuments Protection Programme (which aimed to identify which gunpowder works on a national basis are worthy of legal protection through scheduling and listing). It is also giving us the opportunity to examine the development of civilian explosives manufacture from a regional perspective, to complement our recently published study of the national military industry (Cocroft 2000). For those reasons, it is intended that the project will look at all gunpowder works in Cumbria, including those where the physical remains are now too poorly preserved to merit legal protection. This will be achieved through detailed survey of the standing structures and other archaeological remains visible on the surface, combined with documentary research. The results will help us, the Lake District National Park Authority (LDNPA), the National Trust, the Environment Agency, and others, to manage and conserve those sites which are already protected monuments, whilst at the same time enhancing our understanding of how the industry functioned and developed in both regional and national contexts. Individual site reports are being produced as each factory is investigated, all of which are publicly available through EH's Archaeological Investigation Report Series. But it is hoped that once fieldwork is complete in a few years' time, there will also be a synthetic book or series of articles presenting the project's main findings.

Members of the G&EHG will be aware that there were seven blackpowder manufactories in Cumbria (or eight if Gatebeck is treated as two discrete entities), for Alan and Glenys Crocker organised a study tour of the sites in 1992 (Crocker and Crocker 1992). All lie in the south-eastern part of the modern county (formerly Westmorland and the Furness area of historic Lancashire), in four distinct groups: Old Sedgwick, Basingill and New Sedgwick lie in close proximity to one another along the banks of the River Kent south of Kendal; Lowwood and Blackbeck are situated close to Haverthwaite; the Gatebeck High and Low Works are beside the Peasey Beck, south-south-east of Kendal; whilst Elterwater is somewhat isolated from the others in Great Langdale. Old Sedgwick was the earliest works, established in about 1764 by John Wakefield and partners as a speculative commercial venture to supply mines and quarries in the north of England with blasting powder. Until that time, gunpowder manufacturers had concentrated on supplying the military market, and in consequence works were concentrated in the south of England, especially around London. Old Sedgwick prospered, and in 1790 Wakefield expanded its productive capacity by erecting additional incorporating mills at Basingill 0.5km downstream; the company relocated to Gatebeck in 1852 following expiry of the Old Sedgwick lease, but kept Basingill open. In the meantime, Wakefield's success had prompted two other companies to set up locally in competition: Lowwood in 1799, and Elterwater in 1824. Two further ventures were set going shortly after Old Sedgwick's closure: New Sedgwick in 1857, and Blackbeck in 1860. All made good profits until World War I, but ran into difficulty thereafter. Gatebeck was the last of the Cumbrian blackpowder works to close in 1936.

Most of the sites are extremely large (New Sedgwick is almost one kilometre long), and are now also heavily overgrown, making survey a difficult and protracted (not to

say occasionally dangerous) exercise, best undertaken in the winter months; a number are also in use as caravan parks, country hotels, or industrial estates. Fieldwork commenced three years ago in winter 2000/1 at New Sedgwick, but was interrupted by the Foot and Mouth outbreak; survey there is now finished and the report nearing completion (Dunn *et al*, in prep). In the meantime, a further three sites have been investigated and the reports written: Old Sedgwick (Jecock and Dunn 2002), Basingill (Hunt and Goodall 2002), and Elterwater (Jecock, Lax and Dunn 2003). Fieldwork is due to start at Lowwood in the very near future once vegetation clearance has been effected by the LDNPA.

Results so far have been very encouraging. Of the three sites written up to date, Elterwater is probably the best known in the existing published literature because of the work of Mike Davies-Shiel (Marshall and Davies-Shiel 1969, 75-88). However, the survey has been able to document the development of that factory and interpret what still survives in far greater detail (the site is now a holiday resort and country club); it has also thrown new light on the connections which existed between David Huddleston, Elterwater's founder, and John Wakefield. Although not much of the Old Sedgwick site survives above ground, documentary research has uncovered considerable new evidence relevant to its history and development. The survey of the Basingill incorporating mills, meanwhile, has resulted not only in an understanding for the first time of how that site grew from an initial two mills in 1790 to eight by the middle of the 19<sup>th</sup> century, but has also revealed a previously unrecognised picturesque garden cheek by jowl with the mills, laid out by Wakefield's granddaughter, Isabella, around 1820.

To order any of the site reports, please contact Rachel Ashcroft at EH's York Office, 31 Tanner Row, York (tel: 01904 601906), the reports on Basingill and Old Sedgwick are £10 each, including postage and packing, the report on Elterwater is £15 including postage and packing, cheques should be made payable to English Heritage. For more information on the project generally, please call Chris Dunn, Abby Hunt or Marcus Jecock on 01904 601901, or visit the EH website [www.english-heritage.org.uk](http://www.english-heritage.org.uk).

Cocroft, W D 2000 *Dangerous Energy* (Swindon: English Heritage)

Crocker, A and Crocker, G 1992, 'Gunpowder mills of south Cumbria', *Gunpowder Mills Study Group Newsletter*, **11**, September 1992, 8-14

Dunn, C, Lax, A, Berry, A, Goodall, I, Hunt, A, Jecock, M and Taylor, S in prep, *New Sedgwick Gunpowder Works, Cumbria: an archaeological and architectural survey* (York: EH Archaeological Investigation Report Series)

Hunt, A and Goodall, I 2002 *Basingill Gunpowder Works and Garden, Cumbria: an archaeological and architectural survey* (York: EH Archaeological Investigation Report Series **AI/42/2002**)

Jecock, M and Dunn, C 2002 *Old Sedgwick Gunpowder Works: an archaeological and historical survey* (York: EH Archaeological Investigation Report Series **AI/11/2002**)

Jecock, M, Lax, A and Dunn, C 2003 *Elterwater Gunpowder Works, Cumbria: an archaeological and historical survey* (York: EH Archaeological Investigation Report Series **AI/9/2003**)

Marshall, J D and Davies-Shiel, M 1969, *The Industrial Archaeology of the Lake Counties* (Newton Abbott: David & Charles)

Marcus Jecock



## **POWDER MAGAZINE LLANION BARRACKS, PEMBROKE DOCK**

The Subterranea Britannica web site (see [www.subbrit.org.uk](http://www.subbrit.org.uk)) reports a visit to Llanion Barracks, Essex Road, Pembroke Dock (NGR SM 972 043). The report notes that the powder magazine is set into a steep overgrown coastal slope on the north side of Connacht Way. The magazine comprises two bays and appears to be stone-built with a slate roof, although the latter has almost been removed. The magazine is surrounded by a 20ft high stonewall which is itself surrounded by palisade fencing. Internally all the pitch pine floor boards have been removed and the glazed lighting recesses have been filled.

During the 1950s the magazine was converted into an Anti Aircraft Operations Room whose function was to control the anti aircraft guns defending Pembroke docks.

*Wayne Cocroft*

## **CORDITE NOTES**

The Friends Association at Waltham Abbey has acquired a copy of the working notes made by Tom Gladwell, a process worker at the factory from 1936 to 1945, and from 1961. The notes comprise 27 sides of notes, including observations on manufacturing procedures as well as notes on holidays. The notes reveal that six different types of cordite might be manufactured W, WM, MD, MK1, RDQ, and RDN/A/Q, providing details of their constituents and amounts of solvent required.

Les Tucker

## **THE MILLS ARCHIVE**

We are pleased to incorporate this progress report on the Mills Archive which has the support of this group and several members individually. It is presented by Ron Cookson.

It is now just over one year since we set up the Mills Archive. In that time we have achieved a great deal.

- 1 We have started the scanning and cataloguing process for "Mills Archive Online". This catalogue, supported by the Heritage Lottery Fund, will be launched on the Internet later this year, showing our first 5000 records.



- 2 We have accepted some 20 historically important collections (and been promised several more). Together with the Foundation Collections our holdings will now encompass at least half-a-million documents and images
- 3 We are opening a new office and library/research room at Watlington House in the centre of Reading. As we are dependent on volunteer help, visitors will only be allowed by prior appointment. During 2003 you will see big changes to our website as we use it to launch our Internet catalogue and provide you with the opportunity to search our databases as well as the main catalogue. If you would like to see more about our new premises go to <http://www.millarchive.com/library.htm>

Providing adequate premises is a high priority for us. Having committed ourselves to the Research and Cataloguing Room and Library at Watlington House, we are actively organising improvements to the storage and care of our archive material. To ensure our long-term sustainability we need the assurance of endowments and regular donations. We need to demonstrate long-term sustainability to attract large Government capital grants.

Although our initial fundraising has given us enough to start the development of our catalogue and pay the first year's rent on new premises, we urgently require more regular donations to ensure the continued growth of this valuable resource. You can help us straight away by making a donation via our web site on our secure server. Please consider a small regular donation; as little as 3 pounds per month (5 dollars or 5 euros) will make a big difference. The trustees and a number of private individuals have provided generous support; please join their number so that we can share this wonderful material with you!

You can either visit our website or click the link [http://66.216.26.227/acatalog/Donate To Mills Archive 38.html](http://66.216.26.227/acatalog/Donate_To_Mills_Archive_38.html) and follow the instructions.

Email:- [RCookson@netcomuk.co.uk](mailto:RCookson@netcomuk.co.uk)  
The Mills Archive Trust, Registered Charity No 1091534

Ron Cookson

**THE FIREWORK BOOK: GUNPOWDER IN MEDIEVAL GERMANY** 2001, Gerhard Kramer (Trans. into English by Klaus Leibnitz). 89 pages, 11 figures incl. 4 in colour. The Arms & Armour Society, London. To order a copy contact Anthony Dove, FRSA, Honorary Secretary, PO Box 10232, London, SW19 2ZD, price approximately £10.00.

This English translation of *Das Feuerwerkbuch* forms the first part of a volume designed to mark the fiftieth anniversary of *The Journal of the Arms & Armour Society*. It is also capable of standing on its own for it makes a significant contribution to our knowledge of early guns and gunpowder history.

*The Firework Book* was a manual of instruction by which a master gunner might through a technical catechism instruct his apprentice in the principles of gunnery and the art of making gunpowder. As such it would have been copied and re-copied by practical men rather than scribes, before its first printing in 1529. Quite remarkably, fifty-five copies survive in manuscript form, mostly in Germany and Austria but with one version of the mid-fifteenth century in the Library of the Royal Armouries in Leeds (Manuscript I.34). The copy under review, on which three hands may have been at work at different times, is held in the Library of the German University of Freiburg (Manuscript 362), and dated 1432. It has been transcribed Professor Gerhard W. Kramer, who provides an Introduction and Commentary, and translated by Klaus Leibnitz. This is the first full English translation, but here I must declare an interest for a detailed account of *The Firework Book* by Kramer is included in the volume entitled, *Gunpowder: The History of an International Technology* (Bath Univ. Press, 1996), which I edited. It may be noted, for comparative purposes, that this chapter was followed by one by Sarah Barter Bailey on ‘The Royal Armouries “Firework Book”’, which includes twenty-seven illustrations not available in the version here under consideration.

The three most important areas of interest raised by *The Firework Book* are: the preparation of the ingredients (particularly saltpetre) and the manufacture of gunpowder; the design and firing of the stone-throwing heavy gun or bombard, the *steinbuchse*; and the role of Berthold Schwartz in both these matters. In the case of saltpetre there are detailed instructions for the collecting and crystallizing of ‘the best’, which ‘likes to grow on walls and in cellars which are moist’ (folio 76v). The inadequacy of local sources is demonstrated by references to the trade with Venice, but there is no mention in the text of the ‘nitre beds’ set up from at least the 1380s to boost the home supply, nor of the addition of potash to the mix in order to convert the extremely hygroscopic calcium nitrate to the more satisfactory powdermakers’ saltpetre, potassium nitrate. Yet both were mentioned by Conrad Kyesser of Eystadt in his *Bellifortis* of c.1405, perhaps showing that the text-book nature of *The Firework Book* inhibited the absorption of new information. Nevertheless the manuscript has much that is of prime importance. It contains the first instructions for making *knollenpulver*, the gunpowder ‘dumplings’ which reduced the surface area exposed to the damp and could be crumbled before use in guns. It also provides details of the varying proportions of saltpetre, sulphur and charcoal needed to meet the different requirements of the gunner, reminding us that powder making was still at this stage one of the skills of the artillerymen rather than a separate craft.

The importance of the *steinbuchse* in siege warfare is shown by the recommendation of one of these gunpowder mixes (Folio 80r - 5 parts of saltpetre: 2 parts of sulphur: 1 part of charcoal), as suitable for bombarding 'someone's castle or town'. This early heavy gun had a powder chamber that was longer and narrower than the short broad barrel in which the stone cannon ball was wedged before firing. The powder was ignited through a touch hole at the rear of the powder chamber and the resulting gases, sealed by a plug of limewood at the front end, surged forward to expel the stone ball. The manual provides advice on handling the gun, but some of this is conflicting. For example, the advice in Folio 83v that the chamber 'should be filled with good powder...behind the plug' would, if followed, have been much less effective than that in Folio 73v which advises that the chamber should be filled only one-quarter to one-third, so that 'the vapours can exert their power'. The advantages of the latter approach have been explored by Bert Hall (in *Gunpowder* 1996, referred to by Kramer), in terms of the speedier ignition of particles of powder in gaseous suspension in the space allowed.

And what of Berthold? Was he an historical figure, an alchemist responsible in the third quarter of the fourteenth century for the introduction of gunpowder and the heavy gun in Germany, or was he a legendary figure to whom these achievements came inexplicably to be attributed? As there is no evidence for his life and death other than that contained in the different copyings of *Das Feuerwerkbuch* itself, the historian will veer towards the latter view. After all Roger Bacon had written of gunpowder a century earlier, despite which his life can be well-documented from his birth in Ilchester to studies in Oxford and visits to Paris. Indeed, once historical verification slips wild attributions can be made, as by the German writer of the late seventeenth century who referred to 'that *Welshman* Berthold Schwartz' (J.R.Partington, *Greek Fire and Gunpowder*, 1960, pp.94-5, my italics). None of this however diminishes the work done by Professor Kramer in transcribing this manuscript, by Klaus Leibnitz in translating it, and by The Arms & Armour Society in publishing this version of *The Firework Book*. It is a splendid and thought-provoking achievement on which all are to be congratulated.

Brenda J.Buchanan

This review was commissioned by the Book Reviews Editor of the Newcomen Society *Transactions*. I am grateful to Michael Chrimes, Books Review Editor and Head Librarian of The Institution of Civil Engineers, for permission to reproduce it in the GEHG *Newsletter*.

Postscript

It is with sadness that I report the death of Gerhard W.Kramer, in early 2002. A Professor of Chemistry, he undertook research in the chemical industry before developing a special interest in the early history of black powder making, leading to a close study of the oldest dated and comprehensive copy of *Das Feuerwerkbuch* (1432), held in the library of the University of Freiburg, Germany. Ill health prevented his attendance at meetings of the Gunpowder Section of the International Committee for the History of Technology, but the paper he submitted for the first meeting of the section, at the University of Bath in 1994, caused quite a stir. Having organized the translation of the paper from the German, I was understandably alarmed

to have two prominent American scholars Bert S.Hall and Kelly DeVries asking to see the original text, so that they may check Kramer's evidence on the chemistry of early gunpowder. The translation was approved and since then the challenge posed by Kramer's new insight, that the earliest saltpetre if produced in the then known manner was likely to be of calcium rather than the more efficient potassium nitrate, has become a matter of significance to be taken into account by students of early gun and gunpowder history. The question has recently been put to a practical test by the Medieval Gunpowder Research Group, based in Denmark. With the assistance of Klaus Leibnitz in the making of the saltpetre from animal detritus, and of Gerhard Kramer in its refining, a powder was prepared in the early manner, to be fired in a replica of the Loshult gun in the Historical Museum, Stockholm. Unfortunately ignition proved difficult to achieve, probably because of the hygroscopic nature of the calcium nitrate. A modern commercial potassium nitrate was substituted and the firing trials of this replica early gun, assumed to be representative of small guns of the mid-fourteenth century, were then carried out successfully. It is a measure of the interest aroused by the work of Professor Kramer that these trials were undertaken, even though unsuccessful on this occasion.

Brenda J.Buchanan

**GUNPOWDER MILLS: DOCUMENTS OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES** 2000, A.G.Crocker, G.M.Crocker, K.R.Fairclough and M.J.Wilks. xxvi, 181p., 27 figures, 3 tables. Woking: Surrey Record Society (vol.36), ISBN 0-902978-11-X. £15.00 (non-members). [available from 130 Goldsworth Road, Woking, Surrey GU21 1ND]

This volume is nicely produced and reasonably priced. It makes a welcome appearance as part of a growing interest in the subject at the national and international level, that depends in part for its understanding on painstaking local work undertaken within the counties and regions. It is particularly appropriate that the Surrey Record Society should have supported the publication of these documents, for with its proximity to London and good supply of waterpower and timber, this county was for many years a major centre of gunpowder production. The volume presents four documents, each relating to one year between 1661 and 1791, all transcribed by the authors concerned. They include: a Deed of Sale of the Carshalton Gunpowder Mills, 1661, introduced by the late Professor Michael Wilks; the Inventory of William Buckler, 1678, comprising his dwelling house and powder mills at East Molesey, Wandsworth (and Faversham in the county of Kent), presented by Dr.Keith Fairclough; the Inventory of Thomas Pearse and Company, 1753, part of an indenture of co-partnership relating to the powdermills at Chilworth (as well as those at Faversham, and to magazines and offices in London and Liverpool), discussed by Mrs.Glenys Crocker; and the Letter Book of William Tinkler also of the Chilworth Mills, 1790-91, prepared by Professor Alan Crocker. Each author has worked diligently, consulting where appropriate sources beyond the county. The volume has been co-ordinated by Glenys Crocker who has also written introductory chapters on the gunpowder industry and the processes of manufacture within it, the latter drawing especially on the account prepared by Robert Henshaw for the Royal Society in 1662.

The documents reveal many little gems which, together with the well-chosen illustrations and maps, will interest readers of this journal. These include particularly the evidence on the early use of edge runners, the glazing of the grains produced, their different sizes for different purposes, the great effort to remove dust from the finished product, and the packaging by coopers in a variety of containers. Some of the terms used mystify, but that is all the more reason for the work to be studied by specialists from other fields. It should however be noted that the documents are slight in size, the first three together representing only twenty six pages and the letter book forty seven, so that a greater responsibility than is usual in such Record Society volumes is placed upon the four authors. They respond to this challenge by describing the contents and context of their documents in great detail, but this very weight of narrative leads us to expect more in the way of interpretation. Perhaps more space could have been allowed in the introductory chapters to enable these documents to be considered as a whole. For example, there is a reference in those pages to the powder produced in the region being 'largely for military use', but with the strong element of chance in the survival of these four disparate documents, which in any case owe their genesis and timing to the personal circumstances of death, bankruptcy, and legal arrangements, we find that although ranging over more than a hundred years they manage to miss all the significant wars in that time. This circumstance could offer a great opportunity for reconsidering the whole question of the balance of production for the military/civil markets. Like all welcome contributions to the literature therefore, this volume leaves us hoping for more, as we nevertheless enjoy such items as the letter writers of the early 1790s, uncertain as to the prospects for peace or war, continuing their deliveries to merchants in Scotland and sporting clergymen in England. In the absence of the conclusions wished for, the indexes, especially those pertaining to the Tinkler Letter Book of 1790-91, provide an excellent entrée to the subjects covered.

Brenda J.Buchanan

This review was commissioned by the Society for Post-Medieval Archaeology and appeared in their journal, *Post-Medieval Archaeology*, vol.36 (2002), pp.305-6. I am grateful to the Assistant Editor, J.R.Kenyon, for giving permission for it to be reproduced in the *GEHG Newsletter*.

**THE LISTED BUILDINGS AT THE ROYAL GUNPOWDER MILLS  
WALTHAM ABBEY** Les Tucker 2002, Friends Association of the Royal Gunpowder Mills, Waltham Abbey A5 booklet, 29 pages, 17 illustrations.

This small booklet provides a short guide to the listed buildings of the Royal Gunpowder Mills, Waltham Abbey.

Copies of the booklet may be ordered from Mr N Paul, 24 Anglesey Close, Bishops Stortford, Hertfordshire, CM23 4PE. Please make cheques for £2.00 payable to N.Paul.

*Les Tucker*

**CAPTAIN PILKINGTON'S PROJECT THE GREAT WORKS AT WEEDON 1804 TO 1816** 2002 Beryl Williams, Privately published ISBN 0 95434480 0 4, 139 pages, 49 illustrations, £15.00

Captain Pilkington's project was the construction of the Royal Depot at Weedon, Northamptonshire. The government, fearful of possible French invasion, built a large supply ordnance depot at one of the furthest points from the sea. This book recounts the story of how Captain Pilkington set about his task of planning the site, designing the buildings, searching for local building materials, estimating the costs, finding the contactors and housing the workers. The project included the building of a new canal branch, armouries to house 200, 000 muskets and stores to house the equipment for 24 brigades of field artillery.

Of particular interest to this group is the chapter on the powder magazines.

Wayne Cocroft

### **The R.N.C.F. ASSOCIATION NEWSLETTER**

The editor has received a couple of recent copies of the Royal Naval Cordite Factory Association Newsletter, the newsletter is A5 and generally contains around 12 pages.

The latest issues have contained the following articles:-

No.7 Spring 2002 – A ballad of the factory; The RNAD gun runners; Some background to the siting of RNCF Holton Heath and RNPF Caerwent and observations on the production of cordite at both establishments; World War II air raid warnings in the Holton Heath area; RNCF anti-aircraft defences.

No.8 Autumn 2002 – INO laboratory staff c.1944; Music while they worked; Tetryl and its manufacture at the RNCF; The association's reunion; Mrs Kathleen Ballam (née Rose).

The editor is Malcolm Bowditch, 45 West Way, Broadstone, Dorset, BH18 9LN, [malcolmbowditch@45westway.freeserve.co.uk](mailto:malcolmbowditch@45westway.freeserve.co.uk) or if you are interested in joining or contacting the group please get in touch with John England 01929 471469.

Wayne Cocroft

### **GUNPOWDER TRAIL A guide to Faversham's explosive past!**

Arthur Percival has sent a copy of an attractive A3 sized leaflet produced in association with the 'Walking to Health' Initiative. It describes an approximately two-mile walk around the surviving features of the Home Works and the mass grave at Love Lane for the victims of the 1916 explosion.

Arthur also notes that Groundwork Medway Swale is preparing a Heritage Lottery Bid on behalf of Swale Borough Council to create a countryside/industrial park through the Oare gunpowder works. Work is also continuing on the *Faversham Gunpowder Personnel Register 1571-1841* by Ray Godfrey and Arthur Percival, which is due to be published as a Faversham Paper.

Copies of the trail leaflet are available from the Faversham Society, but please enclose a stamped addressed envelope.

Arthur Percival

## RECENT RESEARCH QUERIES

In March 2003 Angus and I gave a one-day course in Oxford on 'Engineers and Entrepreneurs'. I was interested to find that one of the students, **Andy Phillipson**, was working on a history of military engineering in the eighteenth and early nineteenth centuries, to be submitted for the degree of Ph.D. at Portsmouth University. He has since sent the following note, with questions to which some of our members may be able to suggest answers: 'My research on military engineering will measure the methods and resources used by France, Austria and Britain, and include all aspects of the subject and not just fortifications and sieges. Links between education, training and operational performance form a major line of investigation. With this in mind can you suggest any sources which cover the use of gunpowder for blasting? Quarrying, tunnelling, mining or demolitions in civil as well as military engineering are of interest, as are any treatises on the subject printed before 1820.'

Information on the quantities of powder used in petards and four types of military mines would also be of interest. The four types are – *Rectangular mines*, in which the superior diameter of the funnel is equal to twice the line of least resistance; *Globes of compression*, in which the superior diameter of the funnel exceeds twice the line of least resistance; *Fougasses* in which the chambers are placed from three to eight feet underground; and *Camouflets*, small fougasses, made to act against the enemy's miners, heard working'.

Since March 2003 I have also been in correspondence with **Peter Sandbach**, who has written about an item in the Barrow Record Office on which he would welcome advice. He is a member of the Newlands Furnace Trust, which aims to preserve the remains of Harrison Ainslie's iron furnace, a survivor of the dominant firm in mining and smelting in the area until the rise of the Barrow Haematite Steel Company. An item has now been discovered in the Barrow Record Office which will be of great interest to our Group. This is the Letter Book of the Melfort Gunpowder Works, 1859-65, which some of us visited in 1990 on an heroic expedition to Scotland organized by Alan and Glenys Crocker that involved rain, hail, snow, and a confrontation with an angry farmer (Newsletter 7, May 1990, pp.6-11). The Letter Book is a 'huge ledger' of which the first fifty pages record the daily affairs at the powder works, especially the ships carrying materials between Melfort, Oban and



Glasgow. Unfortunately this is all difficult to make sense of and Peter would welcome advice.

More briefly, **Arthur Fairhurst** has written with reference to his special interest which is the former National Explosives Factory at Hayle, Cornwall.

The compilation of this short list leads me to make two observations. First, I wonder whether some of our longer-standing members might like to contribute a short note for the Newsletter on their current subjects of research. Second, in looking for a spare copy of our now out-dated but still very useful *Gunpowder Mills Gazetteer* (1988) to send to Peter Sandbach, I found a number of duplicate copies of the Newsletter which Glenys Crocker had kindly let me have at different times, for our international contacts. I find I have the following, which I will gladly post to members who may not have them, but please send stamps to cover postage. I have available Newsletter **4 (July 1988); 5 (February 1989); 7 (May 1990); 8 (November 1990); 10 (February 1992); 16 (February 1995).**

Brenda Buchanan

#### **PUBLICATIONS FOR SALE**

Crocker, G 1988 *The Lowwood Gunpowder Works A Short History* £1 incl.p&p

Palmer, A 1998 *The Low Wood Gunpowder Company its inception and early growth 1798-1808* Gunpowder Mills Study Group Cost £7.50 members £6 p&p £1

Harding D F, 1999 *Smallarms of the East India Company 1600-1856 Volume III Ammunition and Performance* Foresight Books (Offprint of Chapter 21, Gunpowder – including relevant sections of contents list, introduction, index, etc). Cost £5 p&p £1

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