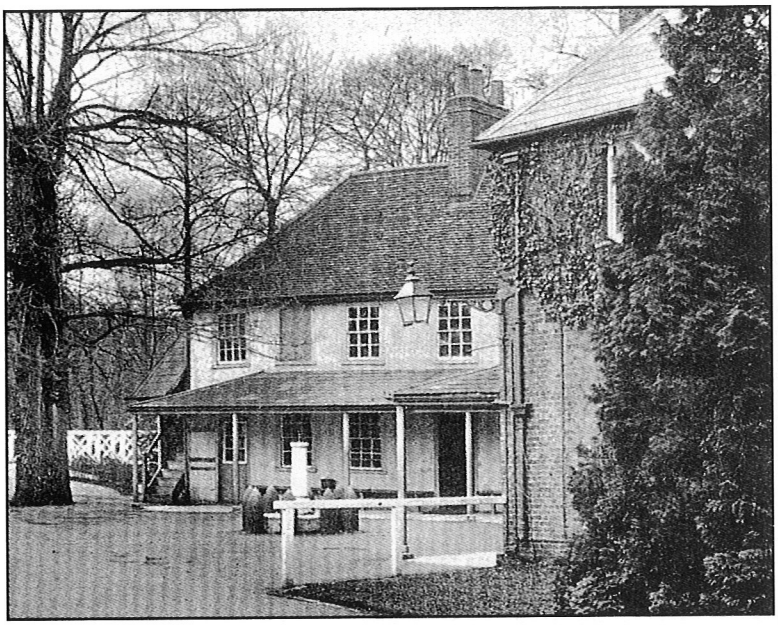
WASC 2117

'Classic Arms and Militaria' Article Oct. 1996

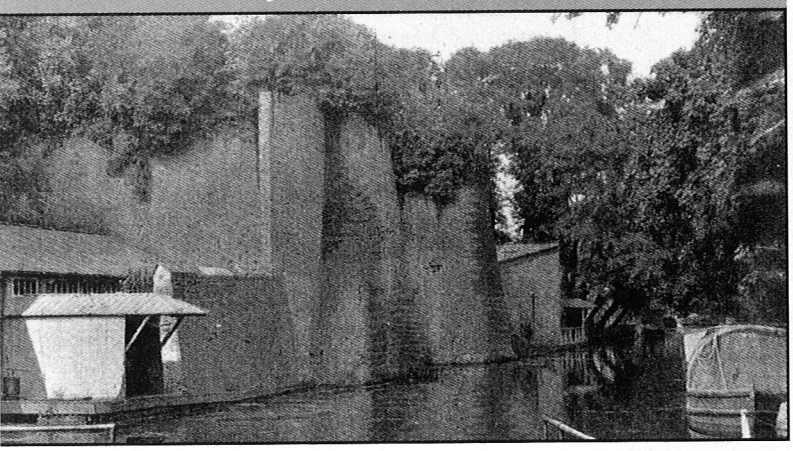
Waltham Abbey Gunpowder and Cordite Factory 1899

Waltham Abbey Powder & Cordite factory, 1899

Researched by GRAHAM SACKER

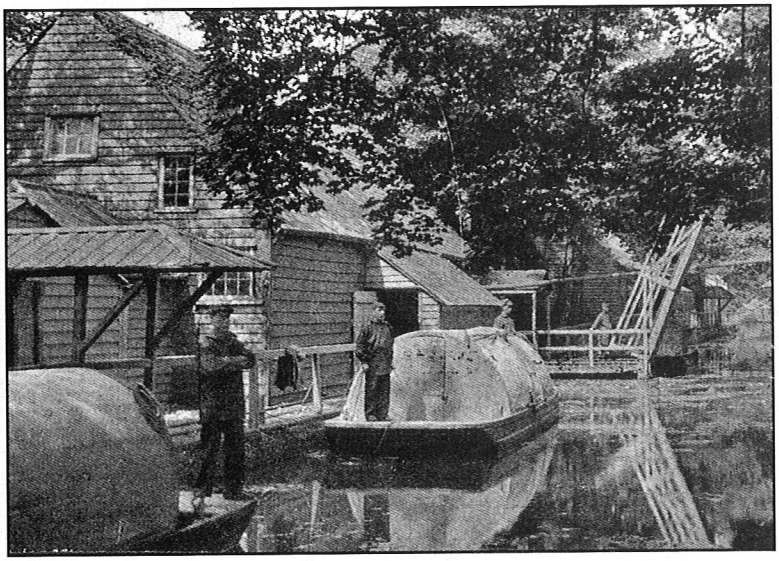


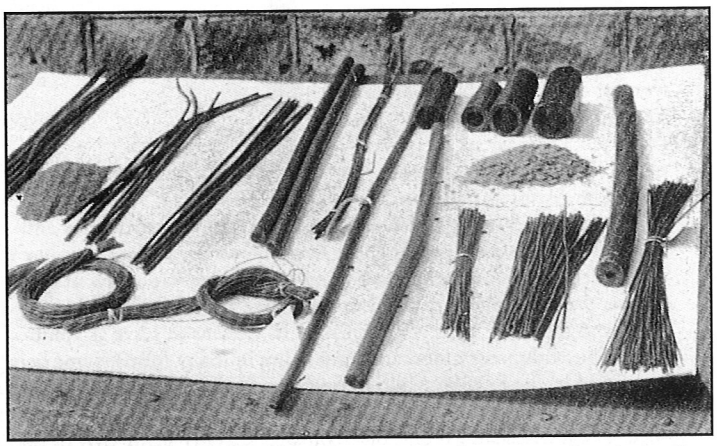
Employing 870 men and boys, situated one mile north of Enfield Arsenal, on and connected to the Lea Navigation canal, the Waltham Abbey factory covered an area of 302 acres.



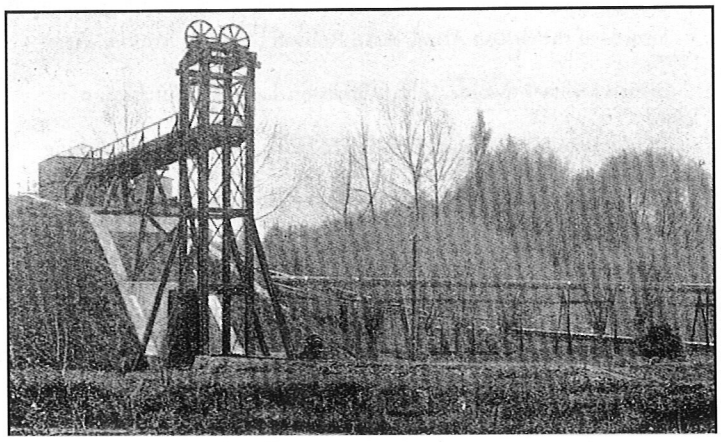
290 separate buildings, comprising corrugated iron and wooden huts, were situated at considerable distances from one another. Of flimsy construction so as to offer little resistance in the event of an explosion, the huts were positioned between, in some cases, high earth banks with brick ramparts and in most cases, plantations of poplar and alder trees. They were positioned alongside four miles of navigable waterways which enabled the explosives to be transported easily and with a minimum of danger. All the buildings were, however, linked by an extensive and tortuous series of steam heating pipes which kept an even temperature in the work places throughout the winter months.

In 1899, command of Waltham Abbey was in the hands of Colonel John Ormsby RA, who had wide experience in matters of ordnance and warlike stores. His post had, until a few years before, been chiefly concerned with production of black powder, but, at the turn of the century, cordite was the propellant then in favour.





A brown, cord-like substance, having as its base nitro-glycerine and gun cotton, forced into a mixture by the addition of acetone it was drawn out in a variety of sizes and shapes. In the illustration, a number of these can be seen, from .01" in diameter, for use in pistol cartridges, up to the .5" rope used for the charge of the 12" breech loading wire wound naval gun. All the components for the production of the cordite, with the exception of acetone, were manufactured within the factory.



in the county of Herefordshire. The archer, as already stated, has long been associated with this area of the country but below the figure of the archer, there is yet another potent symbol of the association of this sword with the county of Herefordshire. Here we have, beneath a fruit laden bough and with apples scattered underfoot, two barrels and a jug inscribed *"Cyder"* - see *Figure 1.* Cider has long been a renowned product from this part of the country but such a representation on a sword blade is unique in my experience. (Even as I write this article on a wintry Sunday afternoon, my attention was caught by an advertisement in the *Sunday Times* for Sales Manager required by *Westons of Much Marcle, Independent Cider & Perry Makers since 1880,* Much Marcle of course, lying in the heart of Archenfield). Thus we have three pieces of symbolism that comprehensively tie this sword in close association to a specific area of the country, namely Herefordshire.

In common with all decorated blades, this blade also contains copious amounts of foliage, foliate patterns and friezes, prominent amongst which are oak leaves and a flower which seems to resemble the primrose. There is a stand of arms but again, it is not of the "normal" type which commonly feature drums, trumpets, halberds, helmets, crossed swords and the like. This stand of arms comprises simply 5 lances surmounted by a light infantry bugle horn and a quiver of arrows, the latter again surely a reference to the close association with archery. However, it is now that I come to the final piece of the jigsaw that opens up and reveals the history of the sword. On the left hand, or reverse side of the blade, between the stand of arms and the figure of Britannia, we find a monogram: H A L M. Monograms or sets of initials on sword blades denote either the military unit (ie regiment) to which the owner belonged or they are the personal initials of the owner himself. In this instance, although one cannot discount completely the possibility that H A L M might be the initials of an individual, the other clues on the blade ought to tell us they may have something to do with Hereford, Archenfield and Local Militia. The history of the Militia and Volunteer forces in Herefordshire is however as confusing and tortuous as anywhere in the country.

Fig. 3

By one name or another, regiments of Militia had been in existence in England since the middle of the 16th century but towards the end of the 18th century the system had developed into a form of conscripted (and unpopular) service whereby each county raised a fixed quota of men set by government. These Militia regiments should be distinguished from the various volunteer corps which were raised in times of emergency and whose existence was generally short-lived. However, around the time of the French Revolution when fear of invasion from France was at its height, the government decided to encourage the raising of volunteer corps and capitalise upon willingness of its citizens to serve as volunteers. Thus volunteer units came into being in many forms, some being embodied in the Regular Militia, some forming supplementary units to the Regular Militia and some forming new volunteer units in their own right, Local Militia units and the Yeomanry Cavalry being part of the latter.

In Herefordshire, a Regular Militia had been in existence since 1539 and the returns for that year certify the number of *"archers and billmen"* fit for service. In common with many other counties, volunteer units began to appear from around 1793 and these were incorporated into the Regular Militia. When *"embodied for service"*, that is on permanent duty, the Regular Militia was available for service in any part of the United Kingdom, a state which the Herefordshire Regular Militia found itself in throughout the whole of the Revolutionary and Napoleonic Wars, save for a short period around 1802-1803 (the Peace of Amiens). 1797 saw the raising of a Supplementary Militia in the county but this unit was incorporated into the Regular Militia when it was embodied in 1798 (anyone confused yet?). It is now, however, that we come to the Herefordshire Permanent Local Militia which was raised in 1808 in place of the Regular Militia when the latter was embodied and in place of the various Volunteer units. This Permanent Local Militia was to be raised by local subscription where the number of volunteers failed to meet the ballot, the conditions of service being *"no substitutes allowed, ages 18 - 30 years, service for 4 years"*. All the existing volunteer corps were transferred into the Permanent Local Militia and the remaining ballot filled by subscription. It was formed into three regiments: the 1st Regiment of Herefordshire Local Militia, the Archenfield Local Militia and the North Herefordshire Local Militia. As far as our sword and the monogram "H A L M" is concerned, it is to the Archenfield Local Militia that I think we must look. The monogram, of course, does not fit exactly but, in those days people were less precise with official titles. Records exist showing that the North Herefordshire Local Militia simply referred to itself as the "Herefordshire Militia" whilst the 1st Regiment of Herefordshire Local Militia sometimes dropped the "1st Regiment" from its title. I am therefore inclined to the view that the designation "Herefordshire & Archenfield Local Militia" is probably how the Archenfield Local Militia referred to themselves or how they were locally known and this is where our sword belongs.

Finally then, something concerning the nature and doings of the Archenfield Local Militia. The regiment was commanded by Lt Col Sir H Hoskyns and had its headquarters in the City of Hereford, as indeed did the other two regiments of Local Militia. Rank and file comprised 9 companies of a somewhat undisciplined nature. Empressed service was very unpopular and records tell us that in 1809 the Local Militia were "very riotous" but, in particular, in 1810, the Archenfield Battalion rose against its officers at the instigation of a sergeant and encouraged by the local townsfolk who joined the mutineers in the riot (inspired by too much cider one wonders?) The spirit, however, within the units was generally good and there is an amusing record of a private who "having committed the crime of matrimony" was carried on a ladder through the streets (presumably of Hereford) by his comrades in accordance with ancient custom. Things then appear to have settled down and the "riotous" events of the early years then gave way various reviews and inspections with inspecting officers and local dignitaries expressing satisfaction with the state and conduct of the Militia. All regiments of the Herefordshire Permanent Local Militia were called out annually for training until 1816 when they were disbanded.

In this 1803 pattern "Archenfield" sword, we catch a glimpse of rural life in the early part of the 19th century where the traditions of medieval times had not yet been forgotten but where the traditions of the apple growers art were still very much alive.

References:

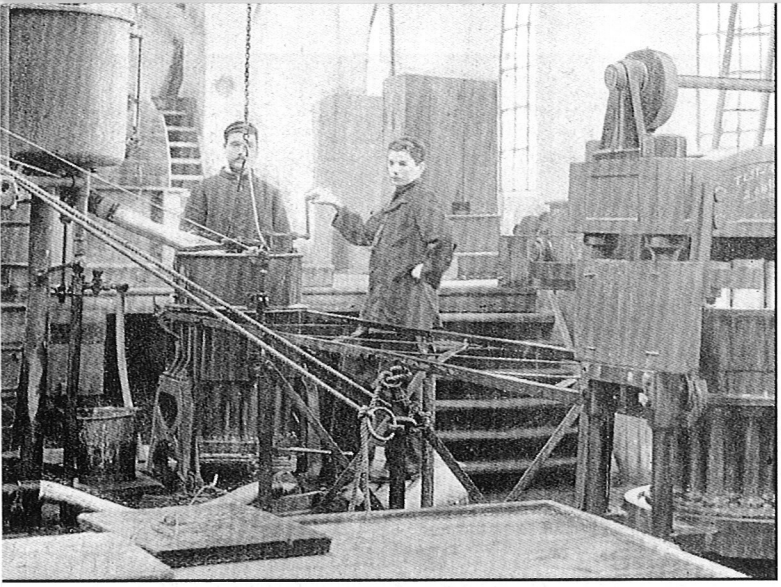
Swords of the British Army, Brian Robson (Arms & Armour Press 1975)

British Military Swords, John Wilkinson-Latham (Hutchinson 1966)

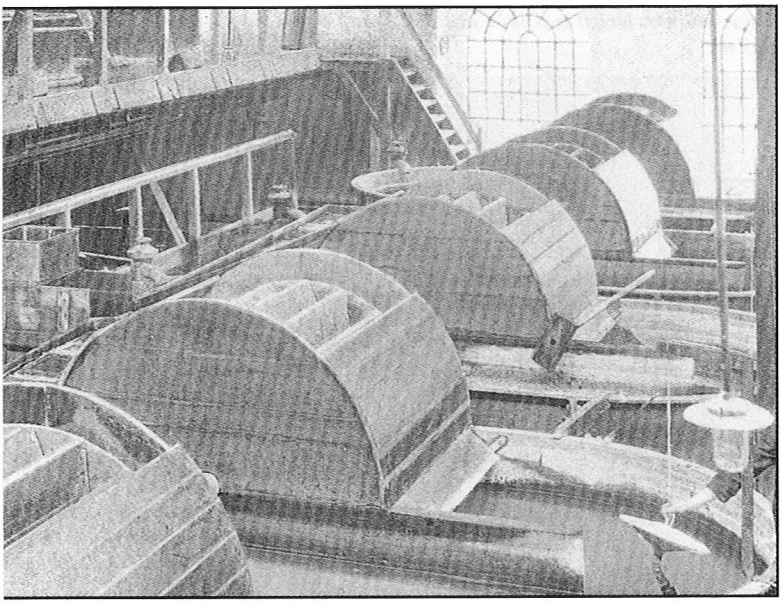
Sword, Lance & Bayonet, ffoulkes & Hopkinson (Arco Publishing 1967)

The Yeomanry Regiments, P Mileham (Canongate Academic, 1994)

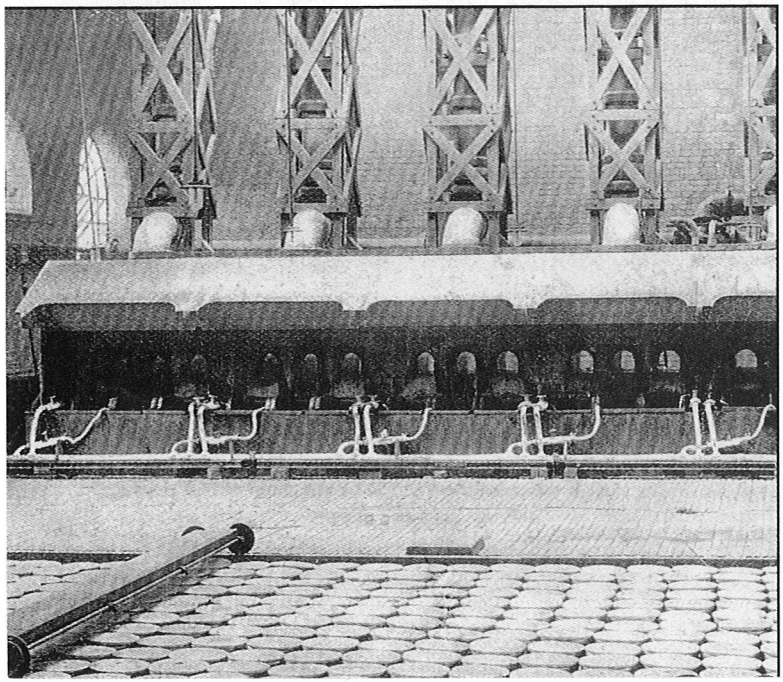
Records of the Herefordshire Light Infantry and its Predecessors, G Archer-Parfitt (Hereford City Library)

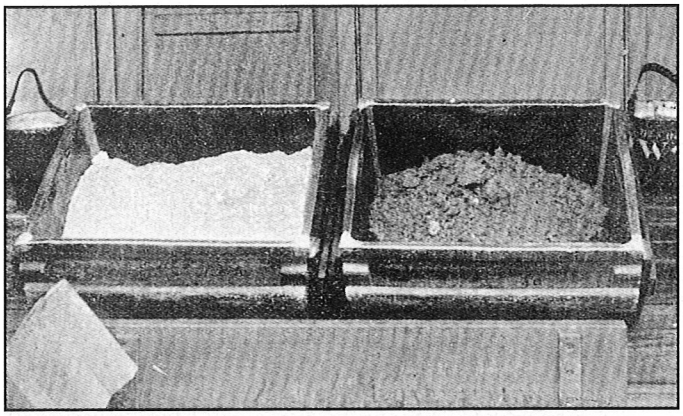


Each pack would soak up some 14lbs of acid during a five minute immersion, after which the excess was removed in wringers. In this area the fumes given off by the acids were extremely corrosive - workmen being issued with free worn-out army clothing which soon fell to pieces in these processes.



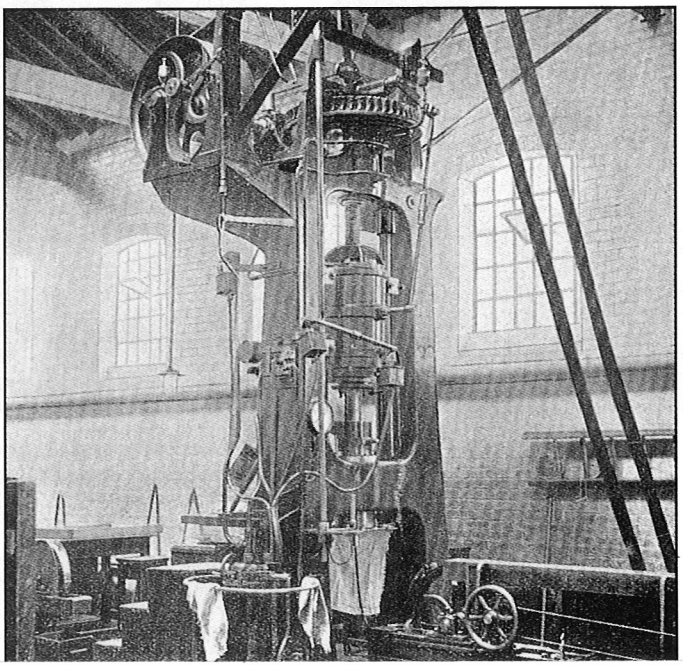
The cotton was then washed thoroughly to remove all trace of acid and later boiled in huge vats for a period of 72 hours. After wringing out, the material was placed in bags and taken to the pulping room where it was minced and again thoroughly washed. The excess water drawn off, the remaining cotton was transferred to a press and formed into discs. Having still too much water content, these discs then passed through another press where they were subjected to pressure of 7 tons per square inch, reducing their size by half and the water content to 14%.

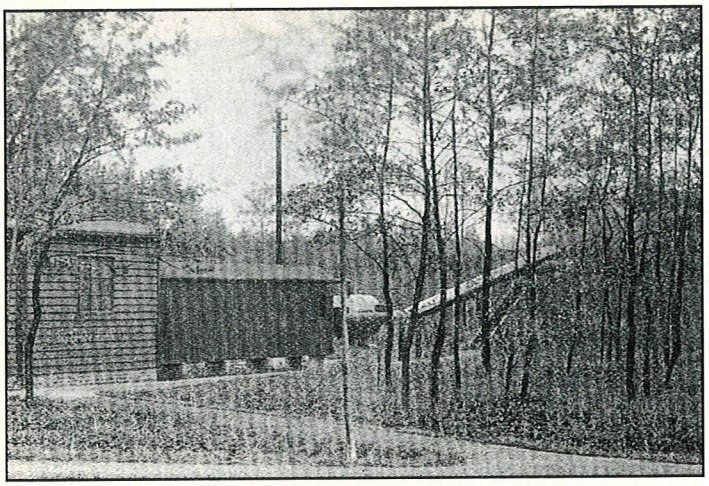




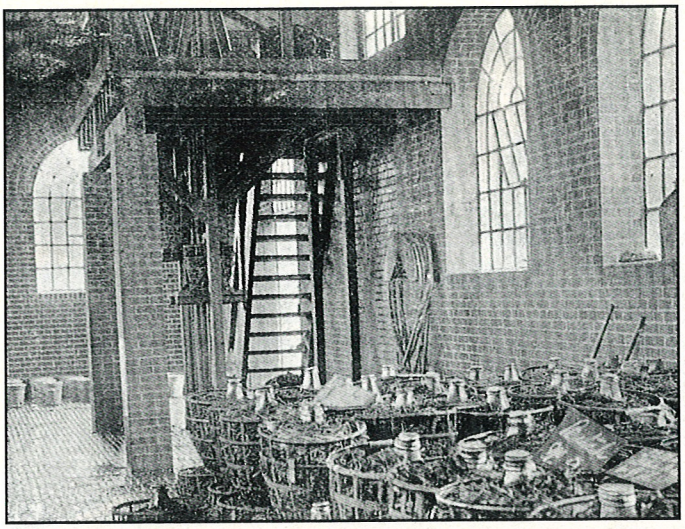
The nitro-glycerine part of Cordite was obtained by the action of nitric and sulphuric acid on glycerine, resulting in a heavy, oily fluid, straw-like in colour. Nitro-glycerine is exceedingly sensitive to concussion. For ease of handling and to limit possible damage by explosion, relatively small quantities were dealt with in each of the factory buildings. 44lbs of NG was mixed with 28lbs of gun cotton, the resulting compound resembling damp china clay. This was achieved by adding one substance to the other in a machine like a baker's dough mixer, containing a number of spiral knives which cut and mixed the material for three and a half hours. At this point 15lbs of acetone and 4lbs of jelly were added and a further three hours of mixing took place.

Incorporation complete, the cordite was taken in lots of 20lbs weight to the pressing room. Here it was loaded into a cylinder and subjected to

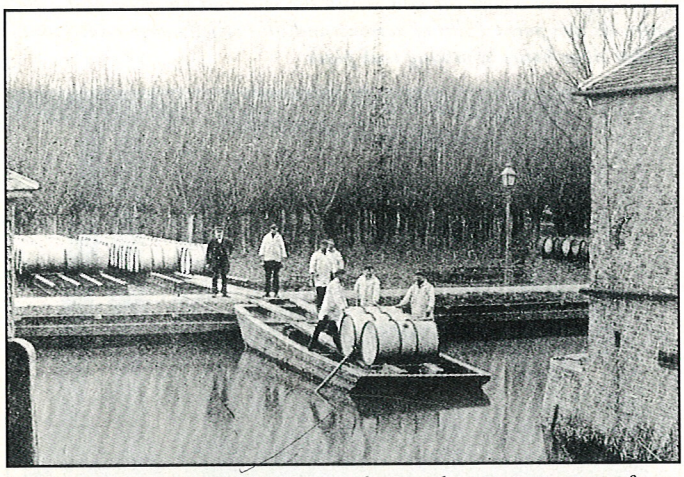




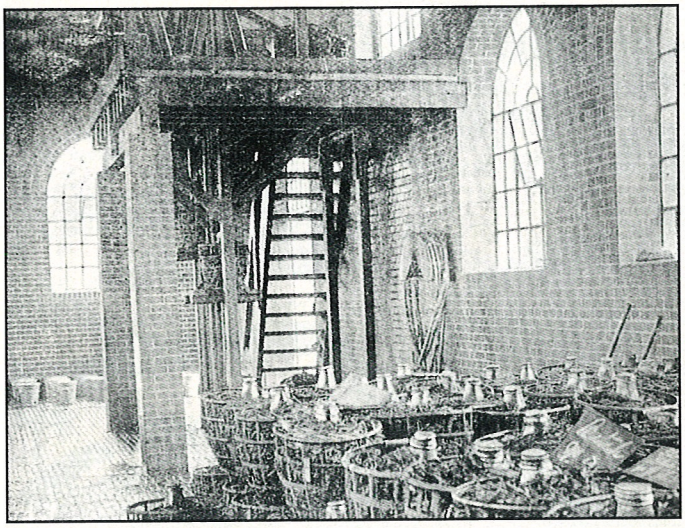
Another product was the explosive substance known as Lyddite, of which picric acid was the chief constituent. The acid stained everything with which it came into contact a bright yellow and those men working in that particular part of the factory were easily recognisable by their yellow tinged skin and hair. A formidable explosive. Lyddite was also found to be of great value in the treatment of burns.

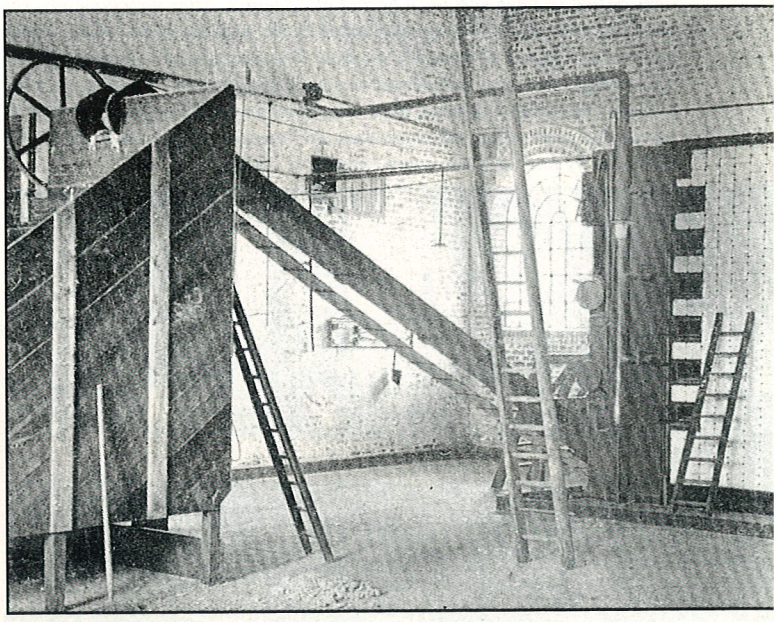


Gun cotton was produced by the action of nitric and sulphuric acids upon cotton and was, in its own right, a powerful explosive. To make it, carboys of acid were positioned near to the mixing boilers. Hoisted some 10 feet above ground level, the contents were tipped through a lead conduit, the nitric followed by the sulphuric, both flowing into cylindrical boilers. A jet of compressed air was used to ensure complete and even mixing of the two substances which was then drawn off into baths to receive the raw cotton.



Cordite was a mixture of 44 parts of nitro-glycerine, 28 parts of gun-cotton, 15 parts of acetone and 4 parts mineral jelly. The jelly was used simply to enable effective mixing of the other substances. Acetone, a derivation of acetate of lime, dissolved and amalgamated the gun cotton and nitroglycerine for the purposes of moulding both into shape. The excess solvent was removed by drying under gentle heat.





Fine cotton waste from the textile factories of the North was carefully hand picked and shredded to remove foreign bodies before being placed in a vast oven. Here it was revolved on racks which passed constantly up and down through the drying area for twenty minutes in a temperature of 180 degrees. On leaving the oven, packs weighing just over 1lb were sent in bins to the nitrating plant where they were allowed to fall into baths of mixed acid.

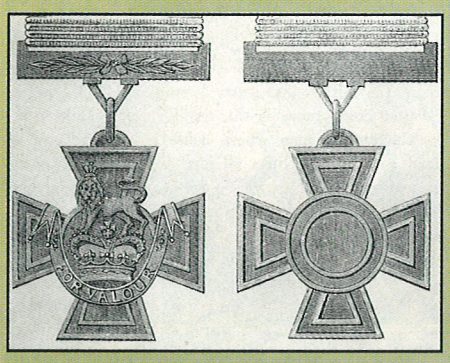
The History and Award of the Victoria Cross

By JOHN NORRIS

Moving episode after the King's accident in France. On October 26th, 1915, when visiting his troops in France, the King had a severe accident, his horse rearing and falling with him. While lying ill in the hospital-train his Majesty expressed a wish personally to present the Victoria Cross won by Lance-Sergeant Oliver Brooks, of the Coldstream Guards. Brooks was taken to the bedside, and the King tried to pin on the cross, but had overrated his strength and had to be assisted.

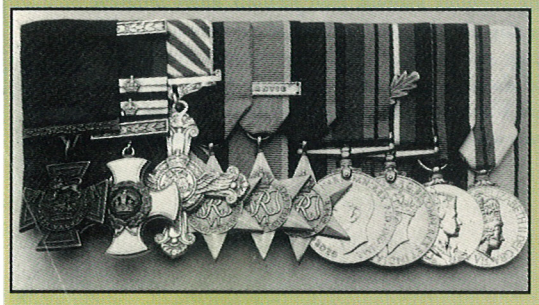
The Victorian Age was a period of great growth and development at home and abroad. For their part the Victorians liked nothing better that to fete heroes, both military and civilian, and honour their successes. In order to show due recognition to military gallantry a range of awards was introduced. The first of these was the Distinguished Conduct Medal, DCM, which was authorised by Royal Warrant in December 1854, prior to this, any act of bravery had gone unrewarded and largely unrecognised.

The following year, August 1855, the Royal Warrant to raise Britain's premier award was authorised. Known as the Victoria Cross its recipients have passed into legend and some have even become household names.



Above: The Obverse and reverse of V.C. showing method of suspension from ribbon by "V" clasp.

Below: Medal set of Group Capt. Leonard Cheskie VC. DSO. DFC.



On 26 June 1857 the Victorians turned out in their thousands to attend a special occasion in Hyde Park, London. On that date 62 servicemen were to be invested with the first Victoria Crosses to be awarded. Officers and men of the Royal Navy and Army were lined to have the medal pinned to their breasts by Queen Victoria, whose husband and Consort, Prince Albert, had designed it. The assembly in Hyde Park was drawn up only 16 months after the end of the Crimean War and only weeks after the start of the bloody Indian Mutiny, which was destined to drag on for more than another year.

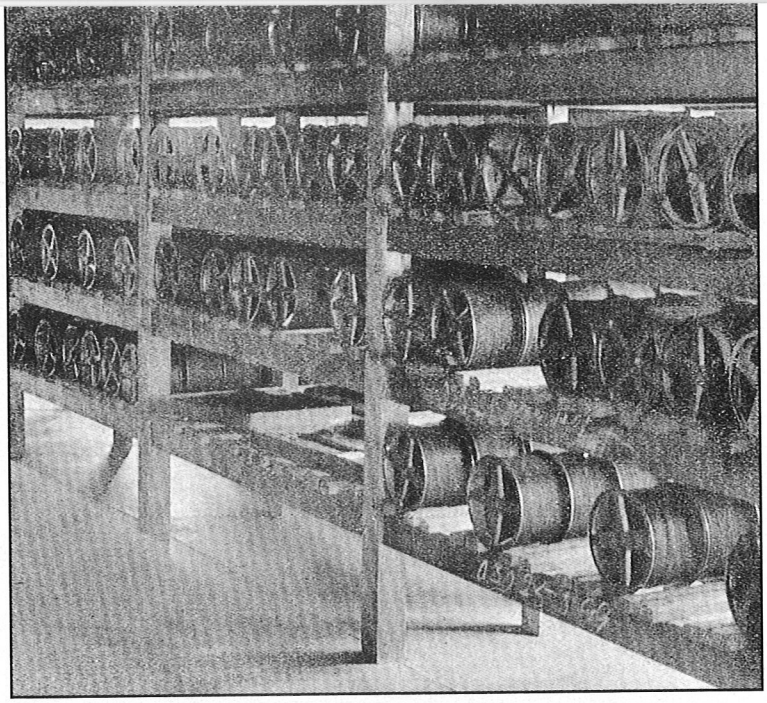
As to the exact origins of the Victoria Cross there are differences of opinion. Some say that the war correspondent for *The Times* newspaper, William Russell, instigated the award through his reporting on the hardships being endured by the British fighting man in the Crimean War.

Others claim that Queen Victoria herself conceived the idea of the Victoria Cross, but there is nothing to substantiate this theory. However, the most likely candidate for thinking up the idea of the Victoria Cross is the Duke of Newcastle, who was Secretary of State for War at the time. Evidence points towards the fact that he entered into conversation with Prince Albert and discussed the fact that a new order of merit other than the Order of the Bath was long overdue. It would serve to reward officers and men alike, regardless of rank, who had performed acts of gallantry in action.

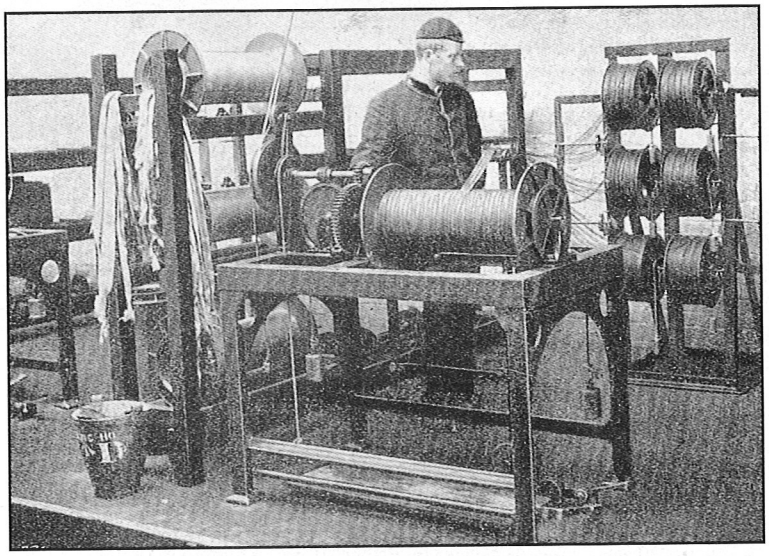
As with all things that commanded her attention, Queen Victoria took a keen interest in all aspects concerning the development and introduction of the new award. As early as 10 January 1855 the question of introducing the new award was raised in the House of Commons by Captain G.T. Scobell MP. Following this session public enthusiasm for the new award to cover military actions was considerable and this grew into a general concensus of opinion that such an award was right and proper.

The design of the Victoria Cross was drawn up by Prince Albert, who designed it to be cross patte in shape. As we know it today the obverse of the award has a lion guardant above the Royal Crown under which is a scroll bearing the simple legend 'For Valour' in relief. The reverse of the Victoria Cross carries the name of the

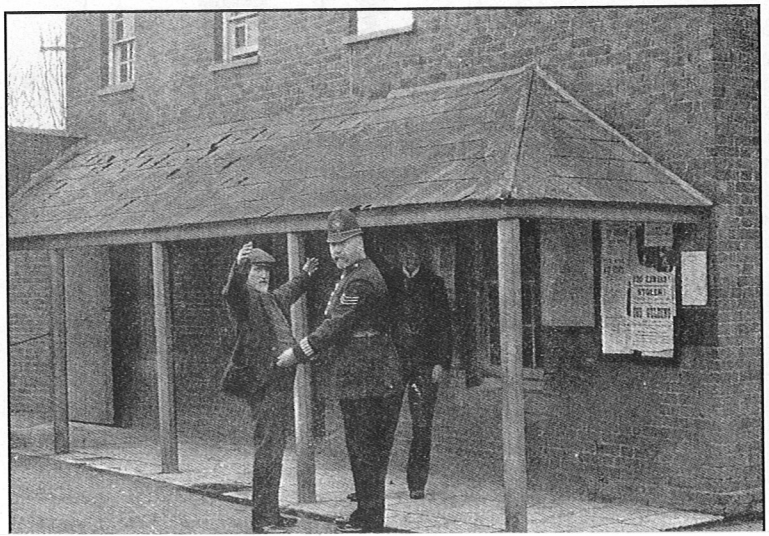
Captain William Peel of the "Diamond" won the V.C. in the Crimean War.

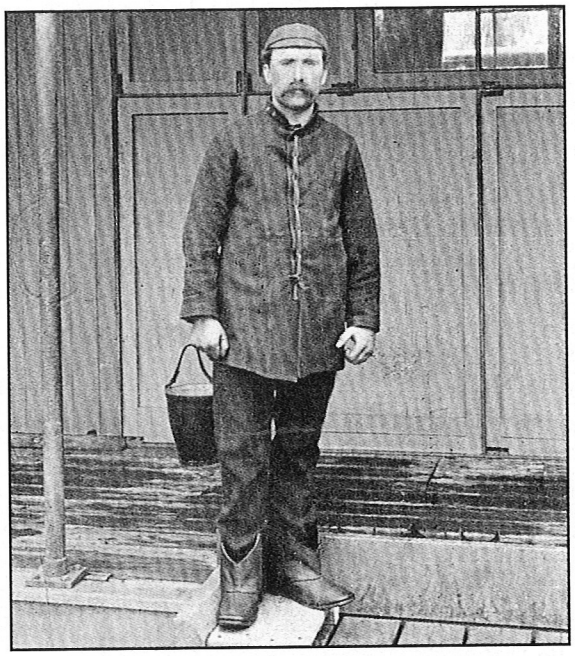


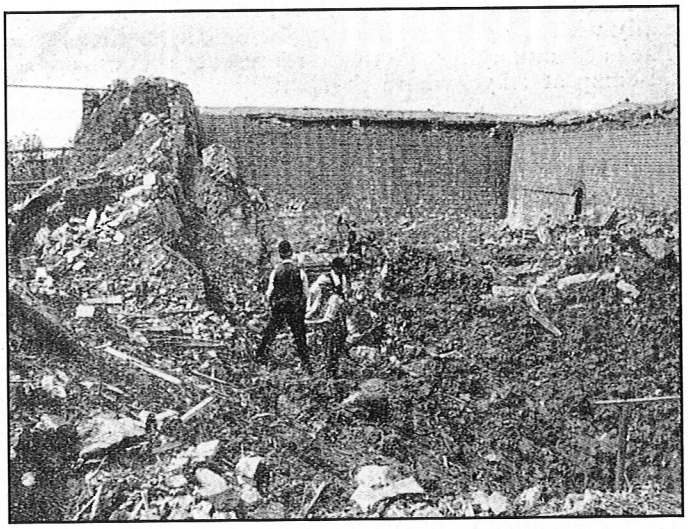
hydraulic pressure of 600lbs per square inch. Escape hole sizes being previously chosen from between .01 to .5 of an inch, the finished cordite was extruded into a grooved block and cut into lengths or wound direct onto drums. In order to remove excess acetone, the cordite was removed to a drying room and exposed to a heat of up to 100 degrees.

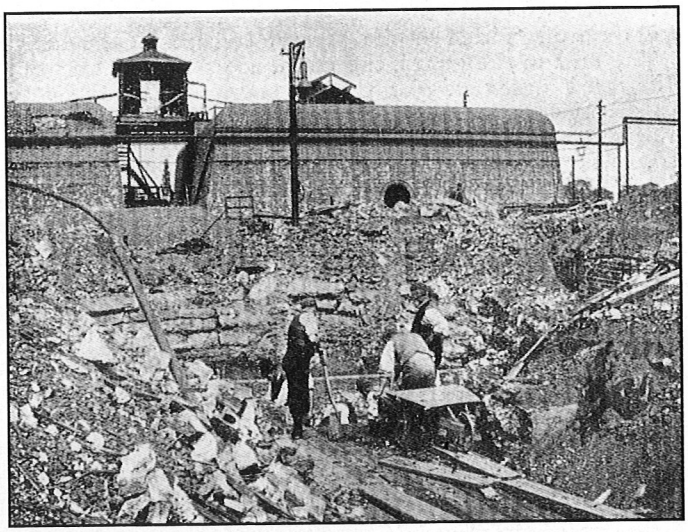


Half inch cordite required drying for 15 days, pistol and rifle cordite for 2 days. On those drums destined for use in rifle and pistol cartridges, ten reels of the dried explosive were placed on a machine and ten strands, one from each reel, were twisted and blended onto one new reel. Six of the new reels were again blended, as in the illustration, into one rope, consisting of sixty separate filaments. When cut to one and quarter inch lengths, these charges formed the 30 grains of propellant needed for the .303 ball cartridge. No cutting was carried out at Waltham - this hazardous process being delayed until the last possible moment, once the drums had been transferred to the Enfield factory.









All workers at the explosives factory were subject to the most stringent conditions which required daily physical searches for metal items or matches which might have caused a spark to ignite the contents of a workplace. Similarly, special clothing without buttons and pull-on boots without nails were the order of the day. Despite precautions, there were a number of incidents where buildings and ramparts were destroyed. Cordite was, however, an effective and durable propellant - charges taken from old cartridges found on Great War battlefields and having been exposed to the elements for eighty years will almost always ignite immediately when consigned to flame.