THE GUNPOWDER MILLS

The Powder Mill – Leigh: Historical Notes

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From the middle of the Napoleonic Wars until 1934 the Leigh Powder Mill's site was being used for the production of various types of gunpowder and other later explosives. Currently, little remains of the early factory workings but the site does represent an industrial archaeological feature which is very unusual in southern England.

The Site

To a lay observer in 2005 – when the site was first visited - there seemed little to excite interest. Yet to the experts who visited the overgrown wooded area, there were many remains that indicated the various processes and the history of the Leigh Gunpowder Mills.

The site is owned by Glaxo SmithKline (GSK), who generously gave permission for Leigh Historical Society to work on the site. However, the site is NOT available to be viewed by the general public.

Experts who have visited the site have included English Heritage; the KCC's Heritage Department; the Kent Young Archaeologists Club; a good number of people from the Gunpowder & Explosives History Group; and representatives from both the Sevenoaks District Council and the Tonbridge & Malling Borough Council (parts of the site are in the two Councils' area). Experts were agreed that the site is important but with little documentation.

The gunpowder works reached its maximum output during the First World War. Looking at a large-scale 1916 map which GSK have found, the gunpowder works can be divided into three. The part to the north of the mill stream, now largely occupied by GSK's research division; a long strip of land to the east bordering the 500m. canal leading to the Medway which belongs to the residents association of a new housing estate; and the land on the south of the mill stream. It is this last third of about 700 metres which has been investigated and which has always contained the main processes of gunpowder manufacture since its inception in 1812/1813.

What Was There in 2005

To the laymen and experts alike, the most interesting aspect of the site both in 2005 and now is the water – the main mill stream, overgrown but some 4-5 metres wide and 800 metres in length; the lower tail stream with the remains of sluices between the two, only one with water flowing through; the canal which runs to the Medway with the lock bastion (a single gate); and a series of small waterways off the tail stream which enabled the gunpowder to be transported around the site.

Even to the lay person, foundations of one or two buildings were just visible in 2005 – although usually completely over-grown. Most had been knocked down to ground level and with little to be seen, with the exception of the mill with water flowing through the sluice and another strange double mill set well away from the mill stream.

Then there were large earth mounds, which were placed to prevent blast damage. Once again, these were overgrown and covered with trees.

Also, there were straight, slightly raised pathways. These were the lines of the old tramway, about a mile and a half of which existed around the various parts of the site at the height of its production in the First World War.

Finally, there are occasional remains of machinery in the undergrowth, the most eccentric and ankle twisting being a heap of what looked like old WC bowls thrown down to fill in a hole.

However, as Wayne Parrott immediately guessed, they were the remains of heavy ceramic retorts which would have held caustic materials needed for the post-gunpowder explosives. He suspected that they would have been made by Doulton: and the first piece he picked up proved him right, with the familiar name clearly in the middle of the porcelain.

This then was the site which needed much manpower to clear and expert interpretation once careful clearance of the main features had been undertaken.

The Early 19th Century Processes For Making Gunpowder

The early gunpowder manufactured from the start of the Leigh works in 1813 consisted of a mixture of charcoal (carbon 12%-15%), saltpetre (potassium nitrate 75%), and brimstone (sulphur 10% - 12%). Willow and alder were the main source of the charcoal. Charcoal would have been obtained by putting local wood into special cylinders – a process developed in the 1780/1790s. A Cylinder House is mentioned on one of the early maps of the site. Sulphur would have been brought up the Medway in barges – almost certainly imported initially from Mount Etna (the King of Naples was looking for British investors for the trade around 1800), (although after 1900 the sulphur was mainly imported from Mexico). The saltpetre, which in Mediaeval times was taken from dovecote droppings, would almost certainly have all been imported from India.

The charcoal and sulphur (which would have first been distilled) would have been pulverized in mills where edge runners – large millstones where the edges were used on the flat bed – were initially used. The resulting mixture was then sieved to remove grit and impurities – not least because they might cause sparks later in the process. All three components were then mixed into a damp cake or “wetten dough” which was limited in size by Government regulation – 40lbs from 1772 and 60lbs after 1860. The resulting mixture was pressed; then reduced in size – a process known as “corning”; the dust was removed; the grains were glazed with black lead to keep moisture out; was dried and finally, when packed, was sent to storage houses on the outlying parts of the site.

[For descriptions of later types of explosives – cordite/gun cotton etc – and methods of manufacture at Leigh, see later sections and coverage by many books about explosives.]

The Start of the Firm and Reasons for Siting the Mill

The first record of what was initially called The Ramhurst Powder Mills is in 1811 when a group – mainly of Tonbridge worthies - decided to start a company for the manufacture of gunpowder. The names on the original licence application were: J G Children, J W Burton, W F Burton, W F Burton, Humphry Davy and A B Valle. However, relatively soon afterwards, it was only J G Children and the two Burtons who were pursuing the proposition. The Children family was well-known and respected landed gentry, whose main home was Ferox Hall on the corner of Tonbridge High Street and The Bordyke. (It is now part of Tonbridge School). They owned a large portion of the parish of Leigh and in particular the Manor of Ramhurst. In 1792, George Children, with two other local dignitaries, had set up a bank which by the turn of the century seemed to be flourishing. George Children’s son, John, was educated first in Tonbridge, then at Eton and went to King’s College, Cambridge where he developed an interest in scientific discoveries. By 1806 he was working on electrical batteries. Both he and his father were early subscribers to the Royal Institute and they would have been aware of Humphry Davy’s electrical experiments which were reported in the Institute’s journals. It is almost certain that this shared interest led John Children and Humphry Davy meeting and they undertook various experiments in a small building in the garden of Ferox Hall.

The other family involved in starting the Powder Mills was the Burtons – the father, James, and his eldest son William Ford Burton. James Burton was what we might call today a high-class speculative builder and later they were very much concerned with the development of Regent’s Park. Both he and his son initially lived in a large house at the top of Quarry Hill to the south of Tonbridge, Mabledon. (William’s brother, Decimus, became a renowned architect).

To both these families, it seemed a sensible investment to go into gunpowder.

The Reasons for Starting The Powder Mill Works

Clearly the state of war with Napoleon meant that gunpowder was in demand. But what other factors were involved? The availability of ready cash from the two families was an obvious asset. In the event, they raised £30,000 as the start-up capital, a very considerable sum.

The interest of at least one of the sons – John Children - in science and gunpowder must have been another factor. The site itself, however, had a number of major advantages. There was the old corn mill which had been operating at Ramhurst for probably 250 years – it appears on a 1579 map – which had a mill stream from a reliably full river, the Medway. The height of water to drive the flour mill was about 10 feet which was sufficient to power a fair number of water driven gunpowder mills. The River Medway was vital in another way. The Medway Navigation Company had started in 1742 and had brought great prosperity to Tonbridge. The ability to bring raw materials for the gunpowder –particularly the saltpetre and the sulphur – to the Leigh works and the ability to send the final gunpowder back to the Thames was very important.

Sir Humphry Davy

Humphry Davy was born in 1778 in Penzance, where his father was a wood carver. He was apprenticed to a surgeon; wrote verses (meeting Coleridge and Southey); and entered into an encyclopaedic course of studies, particularly chemistry. By the age of 21, he had become well-known for his researches and was appointed as a lecturer at the Royal Institution where his brilliance and unusual experiments gained him renown. In 1803 he delivered epoch-making lectures on agricultural chemistry and by 1806 he gave one of his other famous lectures, this time on electricity. It was around this time that he met John Children, both in their late 20s and both interested in electricity. They became friends and started conducting their experiments in a small building that George Children had erected in the garden of Ferox Hall for his son as a laboratory. Davy was convinced that a new and more accurately measured mix of ingredients would produce better gunpowder. His final formula was charcoal 11.42%; sulphur 12.3% and saltpetre (nitrate) 76.55%. This formula did not differ very substantially from the proportions that had generally been used in England since 1781 – Charcoal 15%; sulphur 10%; saltpetre 75% - and there is no evidence either that the works at Leigh ever used the new formula or that the revised formula would have produced any appreciable difference.

In 1811 Humphrey Davy had become one of the partners in the new Gunpowder Mill project – with the two father and sons, George and John Children, and James and William Burton. However, Davy never actually contributed any of the start up capital and in December 1812 he resigned from the project. Some suggest that the reason that he did not continue was because he had married a wealthy widow, Mrs Apreece née Jane Keir, and that she did not wish him to be tainted by trade. However, it also seems possible there were two other practical explanations. By 1812 Davy had become focused on other scientific matters – he had recently discovered a new metal – potassium; and then sodium, barium, strontium, calcium and magnesium; he had been knighted in 1812; and was starting to be pre-occupied with a new theory of volcanic action. It seems just as likely therefore he was left with little time to devote to a small commercial enterprise some way from the London scene. The second contributing factor is shown in correspondence between him and John Children, which shows that Davy was annoyed by the way his name was being used by the new firm in their advertising.

However, his vast enthusiasm and ability to exploit new discoveries – including his famous safety lamp for miners – led to an international reputation and his being made President of the Royal Society.

Establishing The Gunpowder Mills

By 1813 a great deal had been achieved on the twelve and three quarter acres rented by the Company from George Children. Two out of the three initially planned double mills, a house

for the manager (called “a mansion” in the Rateable Valuation) and some cottages for the workers had been erected. (In fact, other processing buildings must also have been built in order to produce the gunpowder, but there is no record of the detail.) The main mill stream had been widened to extend from the old corn mill (which had been demolished) to where it drove the new powder mills; and a new canal of about 500 metres had been dug from the lower end of the mill stream. The newly constructed tail stream had the beginnings of branches around the mill site to enable goods to be moved between the various processes in punts which were normally poled around the site. The spoil from these excavations had probably been made into blast prevention mounds, although there is no specific evidence that the numerous earth mounds were constructed at this time.

The main who must take credit for the successful start of the enterprise was James Monk, the first manager, who seems to have run the Mills until about the mid-1830s. He was succeeded by William Silver who was manager until the mid-1840s.

There are no records of the details of all this work but there are a number of sources for the construction of canals which relate to this period and the years before when canal building reached its peak. The new canal down to the Medway; the widened mill stream; and the new tail stream are about 2/3rds of a mile long. Based on general figures about canal building, around 1780-1790, the main building era, it would have taken fifty experienced navvies around eight months solid work to dig these waterways. (In 1780-1790 there were 50,000 navvies in the UK, so by 1812 there would still have been many experienced men available – although we have as yet no details of who did the work). Navvies were paid 12½p a day which compared well with an agricultural wage of 9d or 10d. Usually the navvies were Irish and usually they were unpopular with the locals. The cost of a mile of canal averaged £3,000 a mile, or £3 million in today’s money.

The Company leased a wharf at Tonbridge and it had a magazine at Erith as a staging post for sales at home and abroad.

The main benefit of waterborne traffic was in the much reduced cost. Canal barges normally carried thirty tons. A pack horse carried only an eighth of a ton – and the roads were appalling, particularly in winter, and with high tolls.

Unfortunately, the Children family bank was having financial difficulties and the Children’s sold out to the Burtons at the end of 1812. William Ford Burton – the son – was left as owner in sole control in 1824 after the retirement of his father. It was in the early 1820s that the company, which had initially leased the Powder Mill site from George Children, actually bought the land.

The Burton Years

Production at what became known as the “Tunbridge *(sic)* Gunpowder Works” seems to have run successfully from 1813 to 1859, with the canal barges belonging to the Medway Navigation Company carrying the gunpowder down to the firm’s magazine at fifteen shillings a ton – more than twice the rate for other goods in 1859.

However, there was nearly a problem. In 1829 the Penshurst Canal Company was formed with the aim of making Penshurst the top navigable wharf of the Medway, rather than Tonbridge. The Straight Mile – a canal above Tonbridge - was started which would have taken water out of the Medway above the start of the mill stream. It was clearly something which was thought to be liable to affect the power for the Powder Mills and William Burton objected. However, the canal project was abandoned in 1832. (George Eliot’s ‘Mill on the Floss’, written in 1860, has the height of the mill stream as one of its main background themes. As mills grew and needed more power, so the millers sought to raise the level of the mill dam: any threat to take water out of the river above a mill was extremely worrying even in 1860 when steam power was mentioned as about to be introduced).

Local newspapers reported various incidents. As so often with the media, news meant disasters and with gunpowder mills, this meant explosions. On 21 April 1835, the Maidstone

Journal told of a third explosion in three years which had occurred on 16 April in the Leigh works Corning House in which two people were killed. Another accident happened ten years later, 21 July 1845, although no one was killed (Maidstone Journal 29 July).

Explosions at gunpowder works were a well-known hazard in the 19th century and 1837 when the railway line from Croydon down to Ashford via Tonbridge was being planned, serious consideration was given to siting the line further south to keep it away from what was called The Ramhurst Gunpowder Mills. However, in the end, difficulties with the landowner, Lord De L'Isle & Dudley, meant that the line took its current route.

By 1840 there were nine cottages for the workers and by 1851 the number had increased to fifteen. At the time of the 1851 census, Charles Sealy, aged 45, was the resident manager, employing sixteen men, five boys and four women, all of whom were residents of the Powder Mill cottages. (As often seemed to be the case, Charles Sealy's family continued in the trade). In 1855 new mills – still water powered – were installed.

The Firing/Testing Range

It is not clear when it was dug but there still remains a deep trench about 60-65m long. (It was almost certainly originally 100 yards long – the standard length - before the barrage was built). It is about 2/3m wide at the lower end at ground level, widening to 3/4m deep and 10m wide in the main part. It is situated some 200-300m above the Weir Lane entrance to the top end of the site and on the opposite (north) bank to the original works. The gulley seems to be shown on some maps from the middle until the end of the century, but is not at any stage identified. However, it is clearly the firing range where the gunpowder was tested. These ranges were regularly used as a means of providing practical demonstrations of the reliability of the Black Powder being produced. Although we know nothing about the Leigh method of testing, normally a shell of about eighteen inches in length and five inches diameter was fired from the bottom end of the range from a special cannon, into a sand bunker.

At a much later date, there was also a rifle range on flat ground to the north-east of the main site in what is now a field. It appears on the 1816 map.

The Sale to the Curtis Brothers

In 1856, William Burton died, leaving the Powder Mills to his brother with instructions that the firm should be sold. The works were therefore put up for sale in 1859 and the sale particulars exist. The property had by now been enlarged to cover "50 acres and upwards, including pasture, plantation and water" and included the charcoal processing area; four mills with eight pairs of stones; the press house, the corning house and the glazing and dusting houses; the twelve-roomed manager's house; and fifteen cottages built for Powder Mills workmen (who paid rent). The annual gunpowder output was said to be between 7,000 and 14,000 barrels.

The firm was bought by an established gunpowder manufacturer 'Curtis & Harvey' for £10,000 and, as the annual profit was said to be £2,000 - £3,000, it seems like a good buy for the new owners, whose firm had been started in the 1820s and which had continued to grow over the following forty years and over the next fifty years.

In 1860 an Act of Parliament was passed which aimed to ensure the making of gunpowder became safer. However, in spite of these new regulations, accidents continued to happen. The Tonbridge Telegraph of 9 July 1864 gave details of an inquest report about an explosion which had taken place at 7.30 am on 6 July. There were four fatalities, three in the dusting house and one who was towing a boat. A boy, George Lewcock, who was in the boat, survived. The nearby glazing house was also destroyed. Mr Curtis, one of the two brother proprietors, said that the dusting house was regarded as one of the safest parts of the works and the men were all wearing safety slippers; he had never previously known of a dusting house explosion. There would have been not more than one and a quarter of a ton of powder in the house, he said. The inquest report stated that there had only been three fatalities in the past which had been 29, 28 and 19 years ago, but gave no further details. All four men were buried in Leigh Churchyard.

It is said that during the main part of the century there were on average about two explosions a year per site at UK gunpowder works but only one fatality every twenty years. This was in spite of careful regulations for individuals – including handing in matches, pipes and cigarettes before a shift; special clothes only to be worn on site; and where possible the use of non-steel materials in the more dangerous parts of the premises.

There is one other point about powder mill working and safety precautions.. From mid-19th century drawings/prints, it seems that the boats – shaped rather like Cambridge punts and with a very shallow draught – which carried the finished gunpowder round the site, were quanted around the site, usually using a pole. However, the report of the explosion seems to show that at least for part of their journey round the Leigh works, the boats were towed by hand.

By now, forty people were employed including a few coopers who either made or more likely just finished packing the barrels to hold the gunpowder. However, it does not appear that barrels were actually made on site (or even in Tonbridge) and the conclusion seems to be that the barrels brought up the raw materials and were then re-used to take the gunpowder down to Erith.

The Medway Navigation Company was increasingly becoming unreliable, although it did not go out of business until 1911. In 1874, the inhabitants of Maidstone complained that they were worried about the safety of the gunpowder barges and subsequently transport on the Medway ceased. From then onwards, horse-drawn wagons were used to take the gunpowder all over the country.

The firm seems to have taken its moral duties to its staff seriously. A descendant of James Swain, one of the workmen there, has a bible with the inscription - “The Society for Promotion of Christian Knowledge. Curtis’s & Harvey. Christmas 1876”.

<u>The Emergence of Prismatic Powder, Cordite and Gun Cotton</u>

In 1876 Continuation Certificate No. 21 was issued for the company and about this time steam power was introduced to supplement water power. There are a good number of remains of steam pipes around the site even today. By this time gunpowder was normally being replaced by cordite for military use – the latter was much safer – although the Powder Mills’ old style gunpowder continued to be used for sporting guns and as a blasting explosive.

Military authorities, particularly the Navy, wanted an explosive which produced less smoke. (The smoke gave away the position of the battleships and meant the crew had difficulty in seeing what they were trying to do!). Prismatic powder or smokeless powder had, therefore, been developed. It was a much safer explosive than the old gunpowder. Wayne Cocroft’s book “Dangerous Energy” mentions how ‘very heavy and expensive machinery’ was installed at Leigh and prismatic powder started to be manufactured there in 1885, some time after it had been introduced in a number of other mills around the country. Instead of charcoal, the process used rye straw, ground down with metal edge runners suspended three eighths of an inch above a metal bowl to prevent sparks. Even so, explosions continued to occur. Lawrence Biddle’s book ‘Leigh In Kent’ notes that there were five in the years 1878 – 1885.

The Annual Report of H M Inspector of Explosions for 1878 lists four ‘minor’ explosions on the site plus one more major one which involved a fatality. It reads, “On 20th July the mills were not working owning to a deficiency of water. They had been prepared for working by steam and the deceased was waiting in No. 3 incorporating mill for the engine driver to help him put the mills into gear for the steam working ...” .

A second more serious explosion took place in July 1885, once again apparently caused by the change from water driven to steam driven milling. The Tonbridge Free Press 25 July 1885 reported that “Henry Humphrey, age 27, had been killed by an explosion at 11.55 Monday last. One mill was in flames and a second caught fire but was saved by the efficient operation of the tipping pan”. An investigation was headed by Col. Majendie CB, the head of the

Government's Exposions Inspectorate and often a man much disliked by the gunpowder mill owners. Mr George Gray, manager of the mills who had been living at the works for the past 23 years, said that Mr Humphrey had been employed for 12 years and was a head mill keeper: before his death he had told the doctor that the explosion was his fault as he had tried to change a gear on his own and 'drew fire' i.e. caused a spark. The gear change was necessary as they were switching from water to steam power. Mr Gray said that this should have been done by two men using an iron bar, after pouring water on 'the charge'. Henry Humphrey appeared not to have been wearing his non-inflammable tunic and this would have added to the severity of his burns, he said.

The newly installed equipment referred to above was to produce the cordite needed for the larger artillery pieces of the time (developed by the British government from the 1880s and subsequently mandated by government requirement). By 1897 the manufacture of the old black gunpowder had ceased, although smokeless powder using 'nitro cellulose' (gun cotton) for sporting cartridges was still being produced.

In 1898, Curtis's and Harvey became a public company, owning powder mills all over the country – over a hundred by 1909 - with over 50% of the UK's output, with the Leigh works a relatively small part. By 1897 it seems that the manufacture of the old black powder had ceased. Wayne Cocroft notes that in 1900 "with so many mills struggling to survive in a changing market . . . the only closure directly attributable to the change in military propellants . . ." (and competition) ... "was that of Leigh Mills, a factory modernized just over a decade earlier specifically to manufacture government prismatic powder".

However, in spite of this seeming closure in 1900, there is some contradictory evidence. One well-known local character, Noel Jempson, who was employed as a carpenter for the Powder Mills for many years around this time, later said there were around 80 people employed in 1906. Probably they were making the smokeless sporting powder.

The Tramway System

Various maps show that there was a tramway or light railway which connected various parts of the site. The 1916 map shows it at its most extensive, with over a mile and a half of track going to all parts of the by now enlarged site. However, the 1899 map also shows about a mile of track. There is no indication of a tramway on the 1865 map and one expert – John de Haviland – suggests that it was probably initially built during the major 1885 improvements. Supporting this suggestion is the fact that two other mills acquired at this time by Curtis's & Harvey – at Dartford and at Faversham – both had extensive internal tramways built at this time. De Haviland had visited the Leigh site in the 1960s or 1970s and had measured the gauge from some of the very decayed sleepers, estimating it to be 1ft 10ins (note 8). Other experts have suggested 2ft or 1ft 11½inches. The reality is almost certainly that the gauge was 60 cms, a size introduced as standard by the Germans some years earlier. A large number of broken pieces of rail still exist but from the few unbroken rails it seems they were made in six foot lengths with three holes each side to take 3½" iron spikes. The rails are 30mm high with a 60mm base and approximately 20/23mm top. De Haviland suggests they had a 10lb/yard capacity. None of the track is now in place on sleepers but a number of local residents remember bits of the track, including a bridge section, remaining in the 1960s. From one particular rail, which has for some reason been left well preserved, it is clear that red lead paint was used to preserve the metal.

The tramway 'bogies' or trucks were pushed along the lines by the workers – "manumotive" as de Haviland says. There is a very indistinct photograph supposedly from 1928 which shows the bogies as about six foot long and six foot high with curved roofs and four spoked wheels. A second expert, Robert Whitehead who has lived locally all his life and knew many of the workers in the 1920s/30s, has further details about the bogies, although he estimates that the rail strength was 15 or 20lbs. "They were four wheeled trucks with ends but no sides, mainly of wood, with axles, wheels and some fitting of iron or steel but, I believe brass or copper nails and screws in the woodwork. There were no locos, all the haulage being by manual labour."

World War I

In the period leading up to the First World War, the firm was still producing sporting powder but the approach of the war meant a big expansion to produce explosives for munitions.

Extra young boys and, more unusually, women, were taken on from Leigh, Tonbridge and other villages and a tarmac cycle path, commonly known as “The Black Path”, ran to the Powder Mills from both Ramhurst and Tonbridge to cope with the big increase in production. The original white workmen’s cottages were demolished and the current houses erected by Curtis’s and Harvey.

There is a large-scale, hand-drawn map of all parts of the site as it was in 1916. It lists 91 buildings and shows the extended track way. There are various mentions of G.C. (i.e. Gun Cotton). These processes would have needed the use of solvents and the broken remains of some of the china retorts are still on the site. It seems almost certain that the main manufacture of the new explosives was carried out in the area now built upon by Glaxo SmithKline whilst the more hazardous gunpowder part was carried out in the old original site between the mill stream and tail stream (the part of the site which has been being excavated).

In 1917 there was an explosion when a building was struck by lightning. The noise woke up sleepers in Leigh and debris was said to have fallen as far as “The Plough” pub. Another report says that people could read a newspaper in Tonbridge High Street in the glare.

Robert Whitehead adds “Work had stopped in the thunderstorm and no one was killed. Fragments of plant were scattered all over the fields – mostly fragments of the ether plant where several tons of ether and commercial alcohol went up. The site manager’s house and the workmen’s cottages suffered blast damage to windows, roofs, chimneys and doors”.

Although one account had initially seemed to indicate some people were killed, Leigh resident Eric Batchelor says that his family memories confirm the explosion occurred on a Sunday night when the only person there was the night-watchman, Eric’s grandfather, Alfred Batchelor. He was blown off his feet but not badly hurt and there were no other injuries.

Post World War I

At the end of the Great War, production was – not unnaturally – dramatically cut back and the firm changed ownership. Curtis & Harvey had become part of Explosives Trade Ltd in 1918 which changed its name to Nobel Industries Ltd in 1920; and then in turn formed part of Imperial Chemical Industries with virtually a monopoly of explosive manufacture in the UK. ICI’s best known product from the Leigh factory was Black Diamond Gunpowder. Coincidentally, one of the founders of ICI, Robert Mond, lived at Combe Bank in Sundridge from 1906-1924 and used his large gardens to try out explosives, causing some concern to the locals.

Under Curtis & Harvey and its successors, the Powder Mills had an active social scene for both adults and children. In the 1920s and early 1930s there was a club on the site now occupied by Cherry Oak and Sefton, with billiards – not snooker in those days – darts, table tennis and cards. There was the use of a tennis court and cricket pitch at Meopham Bank; and shooting at targets was enjoyed in the field opposite the Ramhurst Manor entrance. A formal picture still exists of the shooting club, with 20 men in dark suits and ties with two trophy shields and two cups. There was a soccer team with its pitch on the water meadow below what is now the Hunter Seal Close. There is a 1923 article and photo of this soccer team which had won the Division II Charity Shield. The soccer team included Noel Jempson who not only worked at the Powder Mills for many years as a carpenter but in the 1950s and 1960s was behind the bar of the nearby public house “The Plough” of which his wife, Violet Jempson, was the licencee. There were also regular Christmas parties for children.

There was another large explosion in 1927 and two people were killed both from well-known local families with a long association with the Powder Mills – the Batchelors and the Scotts.

A 1930 photograph shows the well maintained tailgate, the towpath and the buildings. And a further photograph and article from the Tonbridge Free Press in September 1934 showing "some of the buildings which will be demolished".

The End of the Leigh/Tonbridge Gunpowder Works

In September 1934 ICI moved all its explosive operations to Ardeer on the west coast of Scotland where it was thought there was less risk of wartime attack and where hydroelectric power was a new cheap source of energy, but, most particularly, because ICI needed to compete in world markets and needed the economies of scale. The land and the houses were sold off and a good number of staff left unemployed, although ICI was acknowledged to have tried to look after its staff – some of whom, including John Evelyn, who had been the Manager for 14 years, being re-employed in Ardeer. There is a description by Bob Whitehead of the way in which ICI had all the buildings demolished to ground level. "The works were closed down in stages after ICI was formed and in 1934 it was dismantled by Hind & Co of Middlesbrough. A chain-drive McCurd lorry in beautiful order with polished brass lamps was towed out into the field and burnt. Most of the plant was broken up and was shipped abroad for scrap – much of it to Germany. All the buildings with double skins (i.e. sheds with corrugated iron outer walls and match-board linings), if they had been in danger areas, where explosive dust might have penetrated between skins, were burned as they stood. The nails inside these buildings were copper and boys were employed to rake over the ashes in order to recover the nails".

Evidence from the archaeological dig confirm the fact that all the wooden parts of the structures in the Danger Houses were burnt on site. Not only are there occasional fragments of charcoal in the rubble but pieces of window glass have been distorted by fire. A few of the copper nails which the boys had missed have been found.

The Site After Its Explosive Manufacturing Days

After 1934 the site was left derelict for several years. However, in 1942 the land was bought by a firm called East – run by a father, T.G. East and his son, David. The father lived in the big house, the old Manager's House, and the son in Aynho. The company had a factory in Barking which manufactured Eastlight files but the idea of bringing the work to the Powder Mills fell through. During the Second World War, some of the buildings were used for war work. Mr East had a variety of light engineering schemes which included a sawmill. At one stage after the War the firm made garden furniture. As well as the sawmill, there was a forge with several workshops – one in the old Cart Houses. Some of the waterways inside the works were altered – the Easts had a motor boat and various families from Leigh had small boats on the Mill Stream. There was a boathouse in the land belonging to Meadow Bungalow and there were various disputes about water levels and rights.

It is claimed that one man artificially raised the water level by heightening the dam and erecting his own sign saying "Southern Water Authority". When SWA found this, it is said they were not pleased. All the waterways now fall under the authority of the Environment Agency, whose main S.E. Headquarters is, coincidentally, on Powder Mill Lane by the old testing range.

Redevelopment By Chemical Companies

When the Easts' backer withdrew, the site was bought in 1949 by a small pharmaceutical company, Menley & James, who were the UK agents for the US firm, Smith, Kline & French Laboratories and whose main UK works had been in Coldharbour Lane in London. It initially only employed five people. In 1952 it became wholly owned by Smith Kleine & French. By 1956 it was employing around thirty people. There is a 1950 photo, which shows some of the old powder works buildings. There is also a photo of the demolition of the five storey ether recovery distillation tower in 1965. The firm's newsletter gave details of its construction during the First World War expansion. Smith Kline & French became Smith Kline Beecham and by the end of the 1970s was employing 100-130 people. In the late 1980s/early 1990s, the Old Watch House (built around 1920) and Fairview were bought by SmithKline. Finally, at

the turn of the century GSK (Glaxo SmithKline) took over, erecting more buildings and employing more people with the integration of the research side of Wellcome from Dartford. The site, now employing around 300 people, concentrates on pharmaceutical research rather than the actual production of chemicals/drugs.

Other Uses of the Site

In addition to the firms mentioned above on the old original site, various other firms dealing in chemicals and light engineering were established after the Second World War on the site opposite the main Powder Mill entrance and on the site now occupied by the Hunter Seal houses. On the former, there was Ward Adams which dealt in timber and light manufacturing; and the latter included Bridge Chemicals which had started in 1963 and which produced paint, Vivien Chemicals, who processed polymer (there was at least one explosion) and Hunter Seal, a light engineering company. The latter site was left derelict for a number of years.

In 1996, the developers, D H Ward, applied for permission for a change of use on the Hunter Seal site from industrial to an all housing scheme. The proposal was strongly supported by local residents and, although the Sevenoaks District Council would have preferred a mixed light industrial/residential scheme, the all-housing proposal was eventually agreed and seventeen houses built. It is the Residents' Association of this Close, Hunter Seal, who now own the part of the Powder Mills which includes the canal down to the Medway.

Other Gunpowder Sites with Links to Leigh

The reference books contain the locations of gunpowder mills in the UK. There was a concentration in the 19th century in the South East, in the Bristol area and around Liverpool and in the Lake District.

At Faversham there were various major gunpowder works including Chart Mills and later at Oare which was for a period in the second half of the 19th century and early 20th century owned by Curtis & Harvey. At least one person – William Charles Sealy 1848-1931, a number of whose family had worked at the Leigh site – ended up working at Faversham from Leigh. Other families from Leigh also went to other gunpowder mills, including mills in Cumbria.

The Tonbridge Powder Mills at Old Forge Farm near Southborough (TQ 5943) operated from 1771 until at lest 1807 and perhaps to 1812. In some books there is a confusion between this gunpowder works and the one in Leigh (also often known as the Tunbridge or Tonbridge Gunpowder Mills) but there was no connection between the Southborough and Leigh operations.

Current Status in Archaeological Listings

The Leigh site was listed in the English Heritage 1998 document "Monument Protection Programme: Gunpowder Mills", where it was assessed (although, apparently, without being visited) as "not of schedulable quality but undoubtedly of regional value". The KCC County Archaeologist's department have the site on their register. However, since the Leigh Historical Society's new project, and following site visits, English Heritage have considered classifying the site as of national archaeological/industrial importance. However, this would have some disadvantages as far as any further excavation was concerned.

Ownership of the Site and its Future

Two thirds of the site is in the Sevenoaks District Council area and one third in the Tonbridge & Malling Borough Council area. Both Councils have been kept in the picture about the project. Whether there might be the possibility of some kind of preservation or restoration has been considered but ruled out. There is no parking available and a direct link with the Haysden Country Park would not be straightforward. There would be potential problems for GSK, the owners, and public access would in any case present major public safety problems

which would be extremely expensive to overcome. It is likely, therefore, that now the archaeological and historical research documents, funded by the grant from The Local Heritage Initiative of the Lottery, have been produced, the site will revert back to its natural state and only be visited by expert groups on an occasional basis after liaison with the owners, GSK. Currently, no parts of the site are available for viewing by the public.

Summary

For around 125 years the Parish of Leigh had a company which produced explosives. Whilst it employed a number of people from the village of Leigh, it was always a separate community, with up to a hundred people living in the houses, largely built for the powder mill workers. The site continues to be the parish's largest employer, although the vast majority of the workers at the site come from outside the parish.

References

The two associated books are about the gunpowder works at Leigh are:

"The Lost Powder Mills of Leigh: The History of the Gunpowder Mills at Leigh, near Tonbridge, Kent" by Chris Rowley. ISBN 978-0-9539340-1-0. 240 pages including 20 maps and over 100 photographs/documents. Price £20 plus p&p for third edition, from Oak Cottage, The Green, Leigh, Tonbridge, Kent TN11 8QL. This book has an extensive reference section relating to the Leigh site and general books on gunpowder.

"The Lost Powder Mills of Leigh: Part 2 – Site Gazetteer" by Chris Rowley. ISBN 978-0-9539340-2-7. This book gives details of the archaeological dig and of the individual buildings excavated. It is available at libraries and various history and archaeological groups and societies.