The Mills on Lea Brook, Derbyshire

By George Wigglesworth

Lea Brook

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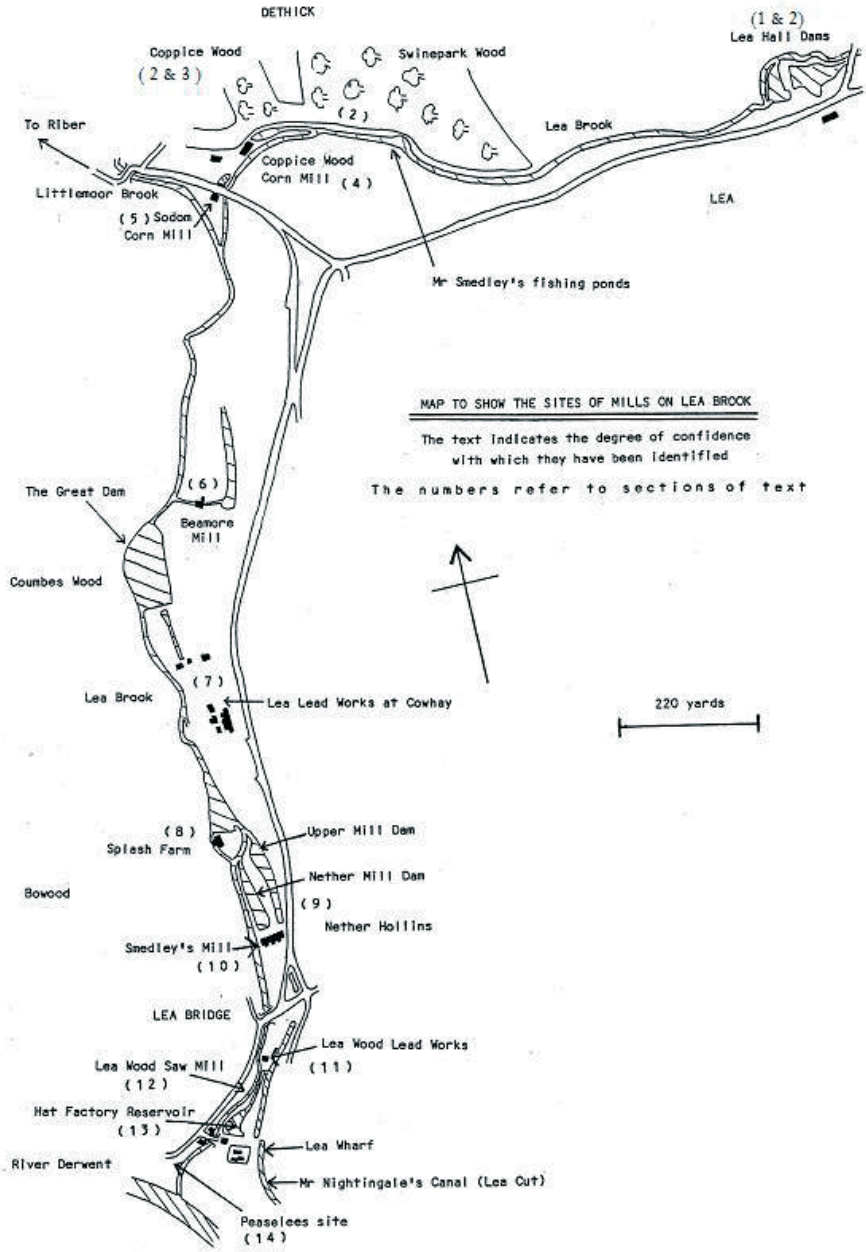
The Lea [1, 2] Brook (known as Lede, at the time of Domesday[1] and Leyh in 1519) is a tributary of the River Derwent, on its eastern side, about 3 or 4 miles south of Matlock in Derbyshire. It is a short watercourse (SK 3458 to 3156) but because of its reliability and noticeable fall it has seen up to possibly fourteen sites dependent on its stream for power. In its most significant length of 3 km it falls 100m. Its immediate source is its own nearby watershed, as a result of which it rises quickly. It is also situated at the south-east end of East Moor, an aquifer which feeds many springs, and these, together with the peaty ground, create a sustained supply. It reveals a number of locations where little or nothing is known and also many sites which may be known by a variety of names, as well as sites which have disappeared. Many people have authoritatively tried to bring some order to the problems identified but many of these problems still remain.

Lead smelting took place in this valley although there were no lead ore-bearing strata, even though such were to be found in neighbouring parishes as near as a mile away. For smelting a reliable, sustained, surface flow of water was needed which was not to be found in many of the adjoining limestone areas and also large quantities of wood for fuel were needed. Lead mining and extraction was an industry of cyclical profits, as responding to new techniques made less rich ores commercially viable. The upgrading of facilities caused by the introduction of these new techniques makes the interpretation of some of the sites difficult. The censuses in the 19th century reveal that twice as many people in the three Lea Valley villages of Dethick, Lea and Holloway, worked at the lead smelters as opposed to in mining.[2] It is a valley where the landowners took an interest in their employees and tenants, perhaps now judged by some as paternalistic. Evidence of this is to be found in the inoculation of village children paid for by Peter Nightingale,[3] the workers' welfare, health and religious concerns of John Smedley[4] and the local Sunday School movement.[5]

The developments in the 18th and 19th centuries revolved to a large extent round the Nightingale family who generated a large holding in property and the lead industry. Three generations of this family predominate, Thomas Nightingale (1665/6 - 1735), and a father (1705 - 1763) and son (1737 - 1803) both called Peter Nightingale. The latter had no legitimate family and left his estate to his great nephew, William Edward Shore, who then adopted the surname and was the father of Florence Nightingale. Because of the extensive involvement of the Nightingale family there was often no necessity to record water rights, storage and usage. This is particularly a problem in the lower half of the valley. Dam walls can be identified and flat areas where some of the millponds were situated, but it is sometimes difficult to attribute a date when some were built or improved. Also their use seemed to bear on mills anywhere below them in the valley.


DETHICK
(1 & 2)
Lea Hall Dams
Coppice Wood
(2 & 3)
Swinepark Wood
(2)
To Riber
Lea Brook
Coppice Wood
Corn Mill (4)
Littlemoor Brook
(5) Sodom
Corn Mill
LEA
Mr Smedley's fishing ponds
MAP TO SHOW THE SITES OF MILLS ON LEA BROOK
The text indicates the degree of confidence
with which they have been identified
The numbers refer to sections of text
The Great Dam
(6)
Beamore
Mill
Coumbes Wood
(7)
Lea Brook
Lea Lead Works at Cowhay
220 yards
(8)
Splash Farm
Upper Mill Dam
Nether Mill Dam
Bowood
(9)
Nether Hollins
Smedley's Mill
(10)
LEA BRIDGE
Lea Wood Lead Works
(11)
Lea Wood Saw Mill
(12)
Hat Factory Reservoir
(13)
Lea Wharf
River Derwent
Mr Nightingale's Canal (Lea Cut)
Peaselees site
(14)

At the present time Lea Brook is a clear, fast flowing stream, 2 to 3 metres wide, which supports grey wagtail, dipper and kingfisher families. However, in the middle of the twentieth century it was polluted, being an open sewer in the lower reaches or carrying farm waste such as skimmed milk dumped near its source.

1 & 2. Upper and Lower Lea Mills

The documents transcribed by Avrom Saltman[7] such as one in 1360, refer to two mills in Lea, and one in Dethick which was a separate lordship. Unfortunately, the passage of time has greatly obscured the solution of the issues connected to these two sites. Firstly, an attempt has to be made to identify these two mills when, perhaps, more than one name was used for the same mill, and then to locate the building in times past and discover if it coincides with any present building.

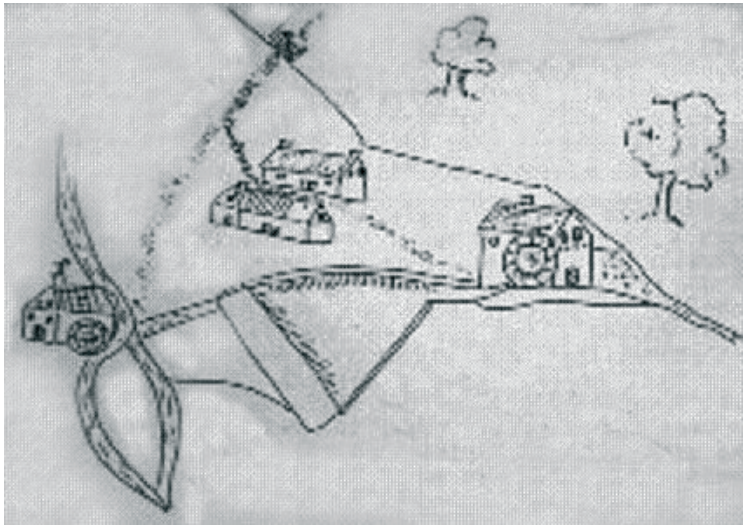
A contemporary account of paths describes one from Upper Holloway to Dethick as being "beneath the mill" which draws attention to the Hawthorn Cottage site (SK 332575). The elevation of two ponds nearby, across the road from Lea Hall, [8] and the rapid fall of the stream make it possible that this was the location of Upper Lea Mill. [9] Hawthorn Cottage is the only substantial building on that side of the road thereabouts and has a height of about 17 feet from its foundations on the stream bank to road level where the present house is contained in the two upper storeys. The lower storey has substantial walls, an earthen floor and two windows. It has the feeling of a high, industrial space. At the present time there are no indications of a mill wheel to be discerned. In the 14th century Upper Lea Mill was said to be only milling oats and hardly worth 10/- per annum (about £200 per annum by contemporary comparison).

Hawthorn Cottage

The Lower Lea Mill is impossible to locate without a considerable element of doubt. There was a mill at Coppice Wood (see below) shown on a map of 1718 but this is in the Dethick lordship not that of Lea. [8] If one of the Lea mills was just below Coppice Wood, at the confluence of Littlemoor Brook and Lea Brook, as was the second one shown on the map, then Lower Lea Mill could be the "mill at Sodom" (see below). If Lower Lea Mill was elsewhere in the manor of Lea, such as at Lea Bridge, then subsequent changes make any deductions regarding its location impossible.

The millers of the two Lea mills in the 14th century included "Adam" and "Robert". By 1367 the mills were, to an extent, decrepit, but before 1370 William of Wakebridge rebuilt the lower mill. The name "Nether Mill" was in use in 1633 when Wendesley Blackwall occupied it. It was sold by Elizabeth, the co-heiress of the Earl of Shrewsbury, and her husband the Earl of Kent.[10] Reference to the Upper and Nether corn mills at Dethick in 1760 stresses the problem caused by the names used because there does not appear to be any other reference to there being two mills in the parish of Dethick.

3. Swine Park Wood/Coppice Wood Lead Mill (SK 323578)
The names given to the significant woods have changed over time. Swine Park Wood is now divided, creating a separate section, called Coppice Wood, which is nearer to the remains of some mill dams. The Babington family of Dethick had an important position as lead merchants and in lead smelting (with boles at Riber, Ashover, Barrel Edge for example). [10]



Map of 1718 showing the mills at the confluence of the Lea and Littlemoor Brooks [8] (Reproduced by permission of the Derbyshire Records Office)

When Anthony Babington was hung, drawn and quartered in 1586 for treason in the aftermath of a conspiracy to rescue Mary, Queen of Scots, from nearby Wingfield Manor, the family muniments were seized and an inventory refers to an ore hearth smelting mill being in use, with bellows, located in a wood.

Evidence of the exact location on Lea Brook of this lead smelting is sparse. However, lead slag has been found south of the building remains, upstream of the existing Dethick Corn Mill (see below), and lead has been found at 500 p.p.m. in an analysis of stream sediments there. [11] Also two bowl-shaped lead ingots have been found thereabouts. The bodies of water named as "fish ponds" a little upstream were reportedly excavated on instructions from J. B. Marsden Smedley in the first half of the 20th century but whether he exploited existing works is unclear.

4. Coppice Wood, Dethick, or Lea Corn Mill (SK 323578)
This mill is on the Dethick side of the manor boundary, but while it was known as "Dethick Mill" in the 1851 census, [12] later, in the 19th and 20th century, it was called "Lea Mill". It became disused before the census in 1881. Traces of mill buildings can still be found. The pictogram on a map of 1718 shows that it had an undershot waterwheel. [8] There are the remains of a weir and a small dam with an external stone revetment on the north side of the valley, upstream from the house, which is now a fashionable private dwelling. The water was taken to a wheelpit (now choked) by a cast iron pipe of rectangular cross-section through the western end of the dam. [13] The tailrace fed a pond, now having ornamental ducks, but presumably this provided the water supply for the next mill downstream.

In the censuses and trade directories Charles Else, senior, was the miller in 1829, [14] followed by Charles Else, junior, from 1841 to 1871. [12,15,16] Corn being transported to corn mills was exempt from paying tolls on the Cromford-Langley Mill turnpike. The corn mill at Coppice Wood (as well as the one at Pear Tree Farm (see below)) seems to have become disused in the 1880s. [17] This was a time when flour began to be imported in bulk from North America and milling grain by steel rollers was being introduced. Isaac Spencer and Samuel Coupe are named as millers between 1821 and 1860 but it is not clear where they worked or if they were employees rather than proprietors.

5. Mill at Sodom (SK 322577)
As previously mentioned there was a mill shown at the confluence of the Littlemore Brook with the Lea Brook which features as a drawing on the map of 1718. [8] There it is shown with an undershot wheel fed from the dam, which can be seen on the opposite side of the road to the position of the mill. Its tailrace and the course of Littlemoor Brook are not clear, but the latter is less reliable than Lea Brook as a sustained source of power in times of little rain. Although a building is shown on the 1st edition of the 25 inch OS map, all that remains is a point where the water supply ran through the wall. However, this mill's identity is nowhere revealed and so it is given the name above, using the 19th century name for the area, but it is perhaps the best location for "Lower Lea Milne" (see above).

6. Pear Tree Farm/ Beamore Corn Mill (SK 320572)
Pear Tree Farm was previously known as Beamore Farm. Steven Turner wrote that Peter Nightingale (1736-1803) had Beamore Corn Mill built in about 1794, on the end of the farm where his family had lived for many years. [18] It could well have been erected by Joseph Wass, senior, a millwright who had recently arrived in the area from Mansfield. It was seen as a replacement for the corn mill at Lea Bridge (see below). [19]

Supposing, as seems likely, that this is the one mentioned in an advertisement for a "newly erected mill" in 1797, [20] then it had four pairs of stones, a carriage road under the mill for loading, and an "overfall wheel" thirty-four feet in diameter producing "power to spare". The miller in 1841 was Robert White and the mill was then called "Lea Mill". [14] The census, by reference to "Lea Old Corn Mill" in 1861, suggests that it ceased to be a corn mill before that date. [15] It was remembered by Turner as a sawmill/joiner's shop.

There is a dam nearer the road and there has been a description of a headrace. The wheelpit has been filled in but the alignment of a tail-race has been discerned running from the farmyard towards the stream. [13]

Pear Tree Farm

7. Cowhay Lead Smelter (SK 319568)

Lead smelting is the process whereby lead ore, usually galena (lead sulphide), is reduced to metallic lead by the application of sufficient heat. In early times boles were sited on hilltops, using wood as the fuel and wind for the draught.[21] This is known to have been the method used in Roman times and probably even earlier. An alternative method, known to be used by the ancient Greeks, was to use a forced draught created by bellows (powered by foot or by animal). Later the fuel used for smelting slag was "white coal" (dried chips of wood), or charcoal, and later still, coal.[22] Open hearths were enclosed and the improvement of designs, such as, eventually, the cupola, made the heat retention and a forced draught from a tall chimney often sufficient.[23] The term hearth can be used as a general term when waterpower was used in a smelting mill.

The early history of the Cowhay smelter runs parallel with that of the Hollins which was eventually to become a textile mill (see below). In 1630 the Spateman family seem to have been involved with both the Hollins and with a site which can be identified with Cowhay. In 1682 the younger John Spateman bought them from John Wigley. In the first third of the eighteenth century the Nightingale family became increasingly involved.

Their involvement was to continue until the last three or four years prior to the closure of the lead smelter in 1934. In about 1710 Thomas Nightingale was involved (with Thomas Allen) as leaseholder.[24] By 1732 he owned half the mill and two years after his death his son Peter, having inherited his father's half share, bought the other half from Samuel Clarke, who was related to the Spatemans by marriage.[25] Peter Nightingale, junior, was a central figure involved with the smelter and in the villages of Dethick, Lea and Holloway, but on his death executors and trustees managed the site. These included John Alsop whose family was connected to the Wass family by marriage. Leases, partnerships and trusteeships frequently involved the Wasses and the Alsops.

Cowhay Lead Smelter

Ore was brought to the site by pack animals, horse-drawn wagons, steam wagons and eventually by 3 ton to 9 ton motor vehicles. Coal was brought by canal (e.g. 2000 tons in 1854). Ingots were transported, at least in part, by boat from the nearby wharf (4000 tons in 1899). An initial exemption from the usual toll for using the turnpike for carrying lead (presumably including lead ore) was removed and replaced by a third of the normal toll. In a document, the leaseholders of Cowhay Smelting mill were specifically given authority to use the roadway which passes within the textile mill (see below), both sites being owned by Peter Nightingale, and they were required to keep up the roadways from the wharf to the lead works. [26] However, this route must have been part of the earlier one used by pack animals coming down the hollow way from Wirksworth through Birch Wood, crossing the Derwent at Lea Ford and continuing up past Lea Hall beyond which paving stones have been found hidden in the grass verge on the route to Wessington.

In 1739/40 there is a reference to the Upper and Nether Mills. It is not clear whether these were two separate mills, or alternatively were both within the Cowhay complex, or included the Hollins smelter. It is probable that the latter was in fact the case. There were two smelting mills, one of the new "cupola" (reverberatory) furnaces, a slag mill and an ore mill, which would all require waterpower. In 1763 there was also a rolling mill to make lead sheet using waterpower and in 1776 a further cupola was added. [25] The stream was further controlled by two dams built in 1784 and 1785. [27]

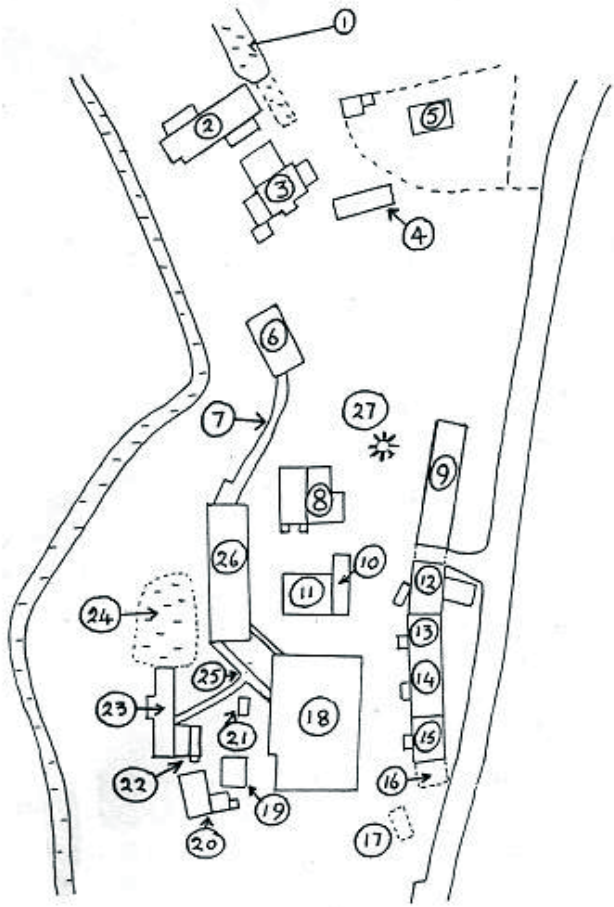
A continuing problem of the smelting process arose from the waste, both slag and volatile gases, which both contained poisonous lead. The former, sometimes called "black stuff", was re-smelted in special hearths which needed a forced (waterpowered) draught. This occurred either on site or elsewhere, even as far afield as Belgium. The waterwheels powered large wood and leather bellows and, at a later date, air pumps, or blowing engines as they were known. The flue gases polluted the area [28] and caused "bellanding", the lead poisoning of cattle. This may be why a downwind area in the Lea Brook valley is called "Sodom". Disturbed soil can still lead to the death of cattle and other stock.

In the early days of smelting the gases given off could be condensed using flues leading up a neighbouring hillside, but later specially designed buildings were used from which flue dust could be collected to be re-smelted. [29] Such work was obviously dangerous and worried employers (such as a Mr. Snowball here) [30] gave workers fat bacon sandwiches and milk to lessen the poisonous effects. In the 20th century the gases were scrubbed and the resulting calcium sulphate dried into a pile.

Joseph Wass, junior, was responsible for many innovations, such as building his 1822 "patent condensing tower" Patent Number 4682, [31] which was succeeded by the "haystack", both being an attempt to reclaim lead from the fumes and prevent contamination. A description of 1836 shows that the reclaimed dust was housed in barrels for transportation. [32]

Plan of Lea Lead Works at Cowhay

Key on opposite page



From 1835 Joseph Wass, senior, and from 1838 Joseph Wass, junior, were involved extensively, having leases for this mill. Joseph was followed by his wife Anne, who was succeeded by their son Edward Miller Wass. In 1839 Cowhay was producing 1400 tons of lead and by 1862 the output was over 2000 tons. The leases of 1848 and 1856 suggest that the red lead mill, rolling mill and slag mill each had a water wheel. However, in 1843, reference was made to a "powerful steam engine". [33] After the deaths of the Wasses, trustees tried to sell their lease but failing in that, managers were employed.

The dates given are for the first and last dates when a structure was shown.

	First	Last
1. Water supply from great dam	1810	1912
2. Rolling mill	1802	1899
3. Red lead mill	1856	
later washhouse and store	1922	
4. Smoke condenser	1879	1922
5. Foreman's house, Lead works cottage		
or Snowball Cottage	1810	present
6. Smoke condenser	1899	1922
7. Brick flues	1912	1922
8. Stable	1856	
Blacksmiths shop and store	1865	1880
9. Ore shed	1856	
10. Offices	1912	
11. Nether cupola	1856	
reverberatory furnace (disused)		1912
12. Slag mill (chimney)	1856	
reverberatory furnace (disused)		1912
13-15. Reverberatory furnaces	1856	1912
16. Blacksmiths shop	1856	1879
17. Weighbridge	1912	
18. Four Scotch hearths	1899	1912
19. Messroom and baths	1899	1912
20. Boilerhouse and shop	1879	1922
21. Blast engine house	1912	1922
22. Electric light plant	1912	1922
23. Slag mill	1802	
Slaghouse disused	1912	
24. Slag mill dam	1835	1879
25. Brick flues	1912	1922
26. Smoke condenser ('haystack')	1899	1912
27. Limekiln	1856	1879

In 1903 there were three reverberatory furnaces, four Scotch hearths, a slag furnace and a "haystack flue" producing 90 tons of lead per week, [34] however, the "haystack" collapsed in about 1929. After the smelting mill's closure in 1934, it was acquired by Millclose Mines Ltd of Darley Dale, which was owned by the Wass family. Then it was briefly an iron foundry before this was moved to Whatstandwell in 1948 and the site was dismantled. [6] The modern site has been described technically by Baker [29] and, from the point of view of one working there, by Bert Yeomans. [6] The last obvious remains of Cowhay Lead Works are being levelled only now at the start of the 21st century. Above the site some dams can be traced but on the actual site little remains, except some stone troughs and the foundations of the office. Slag can be found and the poisonous effects of lead remain, stunting or preventing vegetation. The growth of bee orchids are the only obvious benefit. The plan of the site (see Figure 8) indicates the later developments.

Cowhay Lead Works team

8. Splash Farm (SK 318566)
This was probably a corn mill but it does not feature in the contemporary documents in an identifiable way and no dates for it can be given. It is, in fact, located in Amber Valley District, the stream forming the boundary having been diverted and thus obscuring the issue. It is therefore necessary to look for evidence among records dealing with Matlock and with the Derbyshire Dales District. The tailrace was west of the cottage as was the original line of the brook. A drained pond lies west of Lea Brook, to the north of the cottage, which was named "the old corn mill dam" on an 1835 map. [37] The wheel ran in a wheelpit remembered by a former resident as discharging into a culverted tailrace. A building exists which might have housed a wheel of about 13 feet diameter with a breast of up to approximately 10 feet wide. The tithe map and census returns make no mention of a "miller" at Splash Farm. The best assumption is that this was one of the "two adjacent corn mills destroyed to make cotton mills" when the Pear Tree Mill was built in 1794 (see below). [20] An eroded date stone suggests a connection with Peter Nightingale in 1760, possibly when the building was erected or enlarged.

9 & 10. Lea Bridge (SK 318564)
This site seems to have been the location for the Hollins Smelting Mill, two corn mills and, over the last two centuries, the present long-lasting textile mill.

Hollins Smelting Mill
The early history of the Hollins since 1630 is mixed with that of the smelter at Cowhay when the Spateman family were involved with it, specifically when the ownership of the property passed from the Peshalls to Gilbert Clarke. [25] In 1694 Wigley sold the Hollin Mill to Samuel Wood. In 1758 Anthony Wood sold it to the two Peter Nightingales. The mention at this time of an "old" cupola is confusing in that cupolas had only been introduced into this area in the 1740s, at Ashover. Maybe it was simply a reference to an old smelting mill. [13]

There is a plan naming Nether Hollins Dam and Upper Hollins Dam which places the smelting mill roughly where the Hollins stream joins Lea Brook. [37]

The Corn Mill(s).

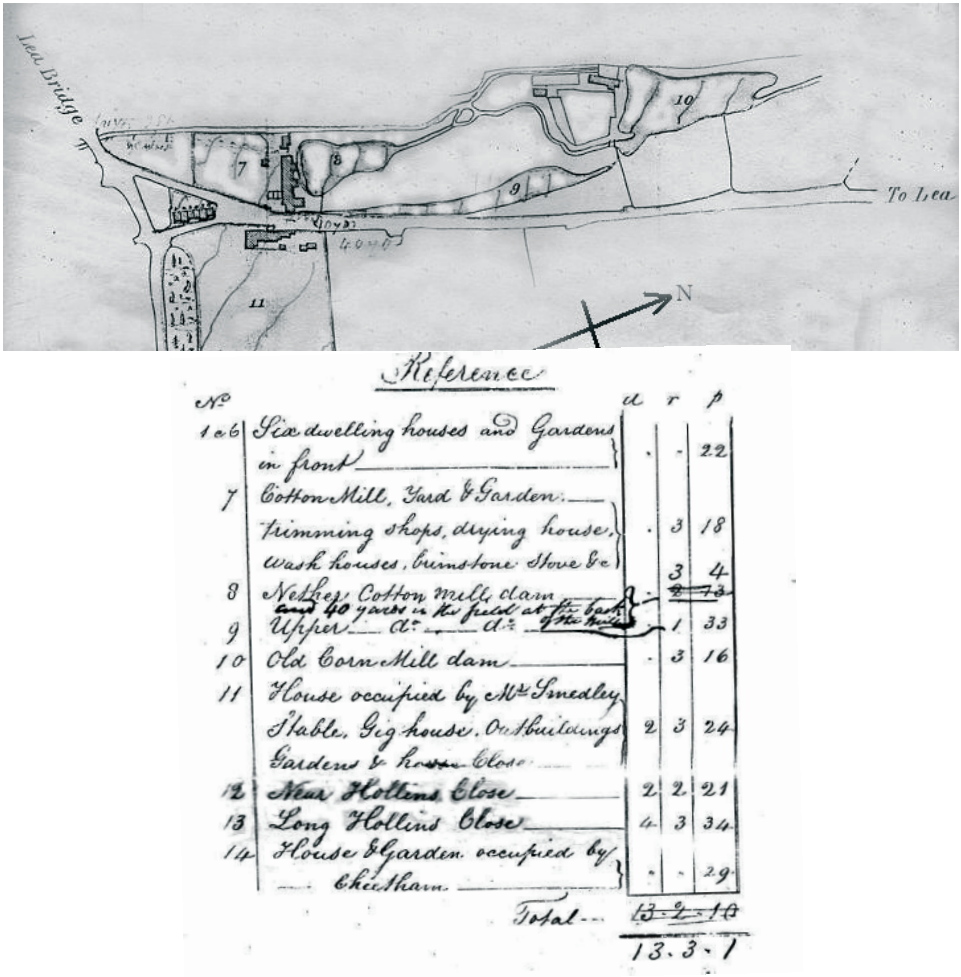
There is reference to one, if not two, corn mills in the Lea Bridge/Hollins area. Firstly, an advertisement in 179720 refers to two corn mills "recently demolished to erect cotton mills thereon" [39] (one of which, it is suggested above, might be Splash Farm). But in 1795 there is also reference to "an ancient mill useless because the water has gone to the mill". Secondly, the mill at Pear Tree Farm was specifically built in place of one at Lea Bridge and is named as "the new mill" on a map dated 1810. There were two dams mentioned above. The only remotely possible identifiable remains are a keystone engraved PN 17** safely built into the much more recent gas-house.

John Smedley's Textile Mill

In 1785 a reference stated "whereas a cotton mill has been erected at Nether Hollins". [40] The mill was built by 1783 at a cost of £800, the machinery and stock being insured for £1,000 and it was operated in 1784 by Peter Nightingale, junior, with the help of Benjamin Pearson, junior, as a spinning mill also weaving a little muslin. [41] The Nether Cotton Mill Dam (of 1 acre) was probably the first to be built (north-west of the mill alongside an existing dam). In 1784 it was agreed to build a dam of 5 acres (2 hectares) above the rolling mill at Cowhay. This, the Great Dam, was finished in 1785 but in the same year it was breached, causing up to £400 damage, although work at the mill could still continue. [38] The main building was four storeys high with, possibly, 14 bays, being about 55 metres long by 8 metres wide. The mill had two waterwheels, two picking rooms, a smithy, stables, and two warehouses for raw and picked cotton. A bleach croft is named overlooking the river. [42]

In 1818 John Smedley (the elder) took a lease on the mill. The mill's financial security was clearly in doubt until his son, also called John Smedley, started in the 1820s, with great effort, to revitalise the business based on spinning but which diversified into knitting as well. In 1828 it was already clear that Merino goods were to be the salvation of the business. In 1872, 500 workers were employed on the site, 1000 in total in the business. [4] John Thomas Marsden-Smedley was killed in a fall from a horse in 1877 after just one year of stewardship. Then John Bertram Marsden-Smedley assumed control on his coming of age in 1889 and the firm became a limited company (if with predominantly family shareholders) in 1893. In the early days thread had been delivered, for instance, to Manchester by road. Later the canal was an important means by which coal (1300 tons in 1854) and raw materials were brought in and products taken out. This was so much so that J. B. Marsden-Smedley was able to assert that his transport costs by rail would be half as much again when he gave evidence to a Parliamentary Committee considering the closure of the Cromford/Langley Mill canal when the Butterley Tunnel collapsed in 1900. [44]

J.B. Marsden-Smedley's time in the early stages was overshadowed by an onerous strike in 1911 [41] but he eventually developed a paternalistic business loved by many in the village. The company bought the site in 1946, probably when the Nightingale Estate was sold. J. B. Marsden-Smedley continued until his death in 1959 and the recent directors include family members. John Smedley, the man, was content to sell his knitwear through the great hosiery houses, many of which were local, but now "John Smedley" is a worldwide brand. It can still be claimed that the softness of the spring water [45] used for washing contributes significantly to the "handle" of the yarn. [46] The spinning department survived until 2005, while knitwear is still being produced, making the mill one of the longest lasting in continual production.



Plan of Lea Bridge from Sale Document 1859 showing the textile mill
(reproduced by permission of Derbyshire Records Office)

The pit of a waterwheel remains in the bowels of the mill which is known to have been fed by a pipe from the Upper Mill Dam. The water from the dam is now conducted onwards to the fire precaution system. The location of the other wheel is not known but presumably was associated with the Nether Mill Dam.

Three mill chimneys can be seen in an etching given various dates, one as early as 1825. [47] The last built chimney was dismantled in 1976, the others are hidden by later mill buildings or the mill yard. Later maps record a chimney from the 'gas house' where coal gas was created, some of which was used in the village, and the waste tar from Lea Bridge was a product exported for sale. The final phase of steam power generated steam in two Lancashire boilers. [48]

The land occupied by Smedley's Mill was confirmed by alternate kerb stones embellished with engraved brass plates recording Smedley's name. Maybe such assertion was associated with increasing wheeled traffic. The remains exist of a smithy incorporating a date stone of 1844. This site is currently subject to an exploratory excavation subsequent to its inclusion in the Derwent Valley Mills on the World Heritage List and hence it will obviously be the subject of a much more authoritative account after this excavation. Consideration is also being given to exposing more of the original textile mill building which is still in existence.

11. Lea Bridge Lead Mill (SK 317562)
This mill was also known as Lea Wood Lead Mill and also as Mr. Alsop's Mill. This surname adds to the confusion, there being two Alsop family lines in these villages with a John Alsop in five successive generations of the family that is of interest. When Richard Arkwright developed Cromford, and prior to the completion of his intended residence, Willersley Castle, in 1788, [49] the smelter in Cromford belonging to the Alsop family, which would have spoiled Arkwright's view, was dismantled. The site of this smelter, which can be seen in a water colour of 1786, was then used for the building of St. Mary's Church. [50] When Peter Nightingale left the bulk of his estate to the ten year old William E. Shore (eventually Florence Nightingale's father) a John Alsop seems to have been involved as a trustee, especially in the dealings of the other working smelter at Cowhay.

The mill was specifically referred to between 1802 and 1846. There is evidence that in 1802 Joseph Wass, senior, took over a lease of cupolas and smelting works next to the wharf (which at that time was just below Lea Bridge). [51] It is reported that there was a cupola for smelting lead belonging to Mr Alsop.[1] A partnership involving John and Luke Alsop, with Joseph Wass, persisted until John Alsop's death in 1834. Bagshaw in his trade directory of 1846 lists a smelting mill of Alfred Alsop at Lea Wood (alongside Lea Brook below Lea Bridge) but Alfred then went bankrupt in 1848, having also been associated with the Via Gellia Smelter. [52] The smelter must have used up-to-date techniques for it attracted many visitors, even from overseas. [23] In 1839 it produced 686 tons of lead, 15% of Derbyshire's production. [53]

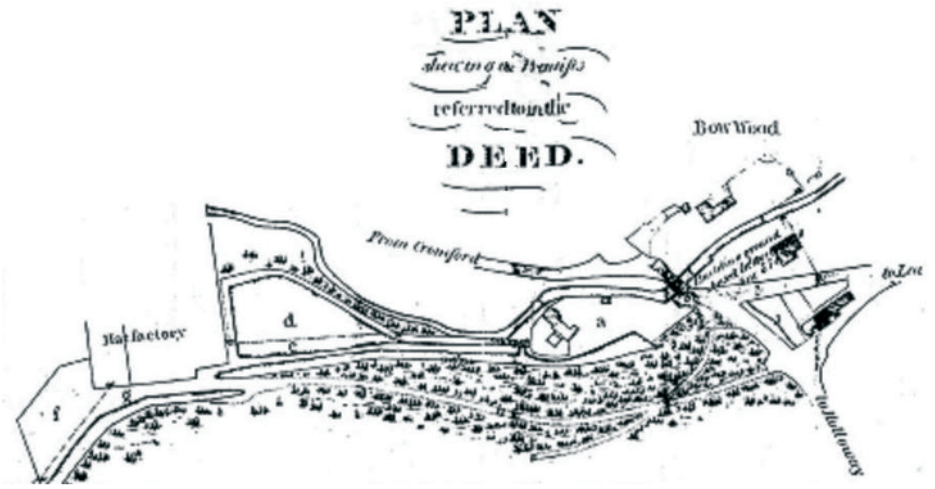
No dam can be traced but reference is made to pipes and troughs belonging to Mr. Alsop, whose house still stands facing Lea Bridge. [26] Adam refers to a "beautiful little cottage... belonged to the Allsops (sic)". [54] The mill may have utilised water directly from the textile mill as the textile mill tail-race is piped to below Lea Bridge and/or later could have depended on steam power. The Ordnance Survey labels "spoil" where Smedley's car park is now situated below Lea Bridge [55] and a large but un-named building is shown on a map drawn sometime after 1819 [26] as well as on one dated 1835. [56] Its biggest dimensions were about 9 metres by 18 metres. Masonry in the stream bank may well be the only surviving remains of this site.

12. Stone Saw Mill (SK 317561)
The field south-east of the turnpike road and north-west of Lea Brook, between the hat factory and Lea Bridge, was labelled as a saw yard. It was here that gritstone from White Tor Quarry was cut to make the coping stones for the construction of the locks and bridges on the Grand Union Canal. They were exported on the Cromford Canal starting from the wharf at the end of the Nightingale Canal arm, also known as the Lea Cut. Hopton Marble was also cut and exported. [57] James Platts was one occupier of Saw Mill Field [42] and he is variously described as carter, sawyer and farmer. Gauging records at the start of the nineteenth century show he owned three barges operating from here, mainly carrying stone.

The reservoir is too low to serve the wheel at the hat factory (see below) and presumably served one at the sawmill on the other side of the stream. In 1835 a map shows three small buildings on the Saw Mill Yard field but the only remains now are the dam wall and the concrete foundations for a footbridge.

13. Hat Factory (SK 316561)

The factory was built in 1792 by the younger Peter Nightingale, and on 6th July of that year he leased it, and the essential water supply from Lea Brook, to a Stockport hatter called James Daniel, for 200 years at an annual rent of £50. In 1796 Daniel went bankrupt and, until the factory was taken over by William Walker, operation and responsibility for the factory were complex, exacerbated by the death of Peter Nightingale. The many names involved include executors, trustees at one time or another, tenants and lawyers.



The division of the Old & New Leasehold is shewn by red dotted lines & the Letters W

a Old Lea bridge Wharf yard leased by Peter Nightingale in 1802.

b A part of Old Yard planted after 1819 when it became less useful

c Lea Bridge Canal where divided by W.E. Nightingale Esq^re in 1819

d New Reservoir made in 1819 – Part e is original Leasehold

f New Wharf yard made 1819 – Part g is original Leasehold

h Carriage Road in Lea wood to a part of Canal & New Wharf in 1819

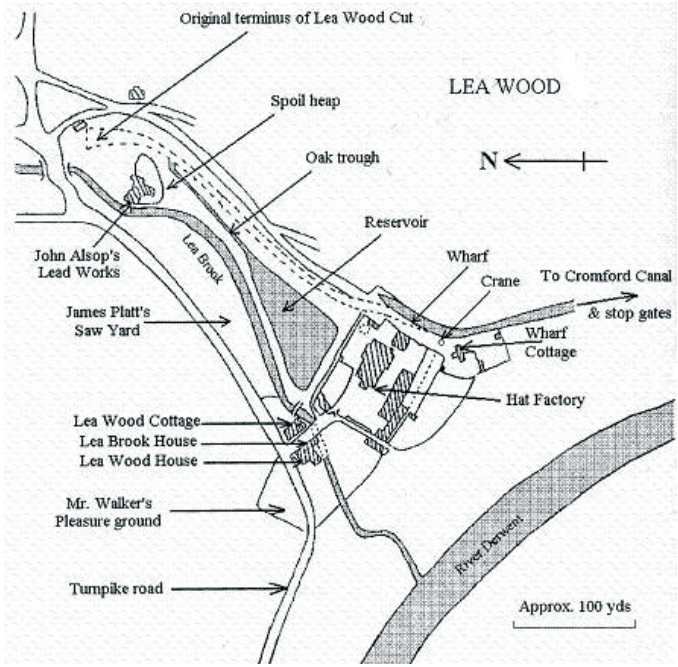
i Bow wood containing the Pipes & troughs belonging the late John Hoseps executors & to be repaired or renewed by them

j The late John Hoseps Garden still remains according to Deed of 16 June 1836

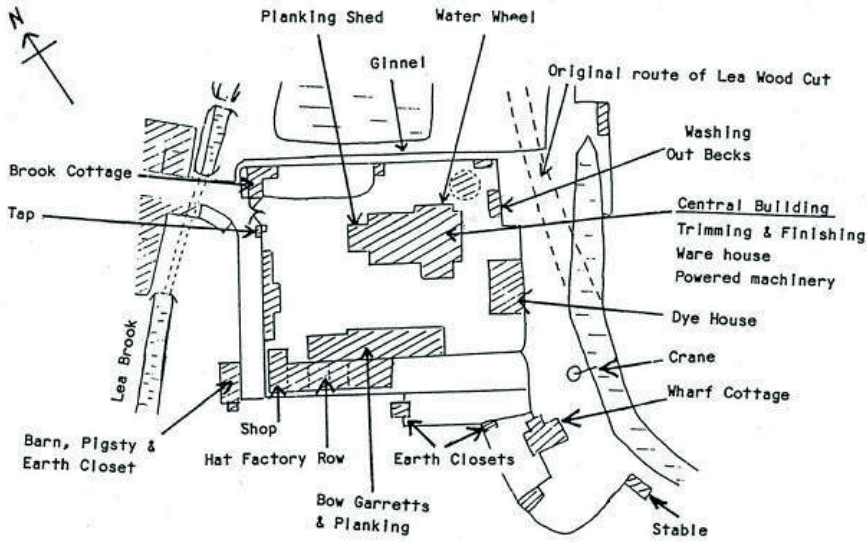
Plan showing premises at Lea Wood, 1836. [26]
(Reproduced by permission of the Derbyshire Records Office)

The most frequent names are Thomas Saxton and William Downall. In 1811 Saxton employed 120 hands. [1] William Walker operated the site from 1820 until about 1858. During the Crimean war Walker made considerable profits from the manufacture of military headwear but then, faced with the expense of mechanising the process to counter American developments, the Walker family opted to close the business and live on their money. William Walker was taken to task by the mill owners at Belper for wasting water, a view hard to understand in that it was fed back into the Lea Brook from which it had come. Water was a long lasting source of contention. The Belper mill operators relied on the water in the Derwent, and therefore also its tributaries, to operate their mill wheels. Such concern led them to require Peter Nightingale to separate the water from the Cromford Canal by lock gates and ultimately to shorten this arm so that it was not watered from Lea Brook. [59] It must be realised that the Derwent had a more varied flow before the river was dammed by the construction of the Ladybower Reservoirs. The low levels previously experienced allowed a ford to be crossable at Lea (replaced by a footbridge at the water treatment works) and stepping-stones to be viable at Holmesford, which are only visible today when the river is very low.

The Walker family long played its part in the local community, for example, from involvement with the local Unitarian chapel to providing a hand corn mill for employees to use when flour prices were high. Even at times in the twentieth century they gave the lectern and pulpit for the parish church and £1100 towards the building of its tower.



Features of Lea Wood in the 19th century



Plan of Hat Factory before 1900

From 1874, the main mill building was used as a wool and shoddy warehouse by Robert Lowe, who died in 1889. It is possible that it was also used as a bobbin mill. From 1888 to 1912 the buildings in the mill yard were used by John Else, and his sons William and Robert, for the bottling of aerated mineral water made from Lea Wood Spring. [58]

The hand-making of hats involved powered machines for separating individual hairs prior to felting. [60] Various styles of hat were made but essentially the manufacturing process always started with the body of the hat. For this loose hair was used which might be separated or cut free from the skins on site. Beaver, rabbit, hare and even camel were used. Long guard hairs were plucked out by hand, then loose hair was separated in tunnels about 36 feet long lined with flannel to catch the coarser hair which would not take up the dye as effectively. The hair was then prepared for felting using long wooden bows. The felt was then "planked" by employees or out workers, a job which could take as long as four hours a hat to make the rough shape. Finally it was "blocked" into its final shape and dyed. The ultimate products, in addition to those for the military, were top hats, exported to London to be labelled as "London Hats", [54] "Wideawakes" (which had no nap!), felt hats similar to those worn by cowboys in films, "Hossuth" hats favoured by bohemians such as the Pre-Raphaelites, and "Bobby Todds" named after a Chesterfield man. [58] The finished hats were transported in barrels and dispatched from the adjacent wharf on the Nightingale Arm of the Cromford Canal.

For the separation of the hairs etc there was an overshot water wheel 26 feet in diameter and 5 feet wide in a pit. [61] Its headrace consisted of a 6 inch pipe fed from Lea Bridge by a watercourse along the line to be temporarily taken by the canal cut. The tailrace ran into Lea Brook. Today the wheelpit and a two-hole toilet are the sole remains of the hat factory apart from the boundary wall (stained in parts by the blue dye used).

14. Peaselees or Bow Wood

There is a reference in the Chatsworth lead sale account, of lead being taken from "Bowood" to Bawtry in 1683. [62] This might well be Bow Wood (actually in Matlock parish) alongside which Lea Brook runs. Slag has been found in the stream and banks where it runs near the ancient field called Peaselees which is perhaps an ancient "assart". [63] Whereas in 1571 the then Earl of Devonshire brought in men to operate a "footblast" at Chatsworth, and by 1573-4 a water-powered smelter was being built elsewhere, so a Bow Wood site could have been established anytime after this date. [64]

Acknowledgement

This article has resulted from my local history researches over a period of fifteen years and, being those of a biologist without specialist knowledge of waterpower, it is enriched by the expertise of Alan Gifford and the water mills fraternity. Many people have contributed in producing this summary of the mills. Lynn Willies, David Kiernan and Peter Kirk, for example, have helped greatly. Special mention must be made of Stephen Turner of Derby (now deceased) who shared with me his extensive knowledge arising from his mother's childhood at Pear Tree Farm and the documents he had pertaining to the Nightingales, which are now in the Derbyshire County Record Office.

It will have become obvious there is a long and varied history to the very diverse water powered industries of our ancestors in this valley, as in the many neighbouring gritstone valleys in Derbyshire. It is equally obvious that the evidence of this history has already extensively disappeared and continues to do so. Maybe continued searches through the documentary evidence will bear further fruit and I will be happy if any more evidence is found, even if it shows any of my assertions to be wrong.

The Hat Factory

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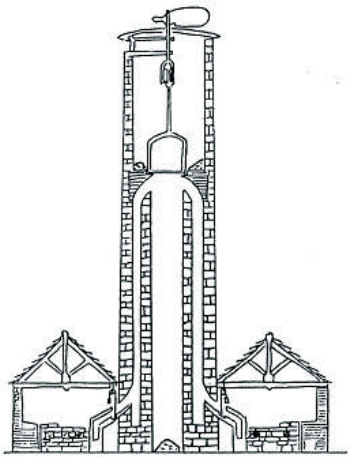
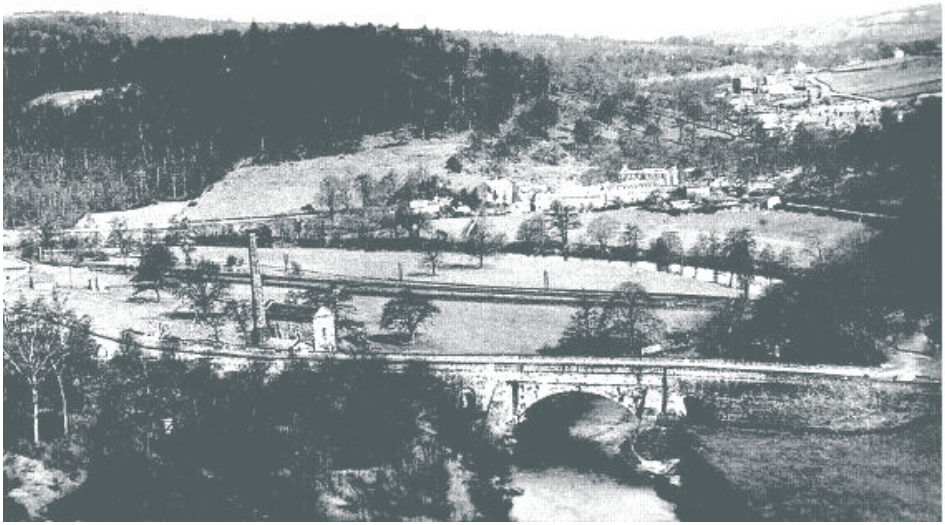


Joseph Wass' Patent Condensing Tower



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