THE MIDLAND WIND AND WATER MILLS GROUP

This Journal is published by the Midland Wind and Water Mills Group, which is concerned with the study of the history and technology of mills and with their preservation and restoration. Its area is the region loosely defined as the Midlands, especially the central counties of Staffordshire, Shropshire, Worcestershire and Warwickshire.

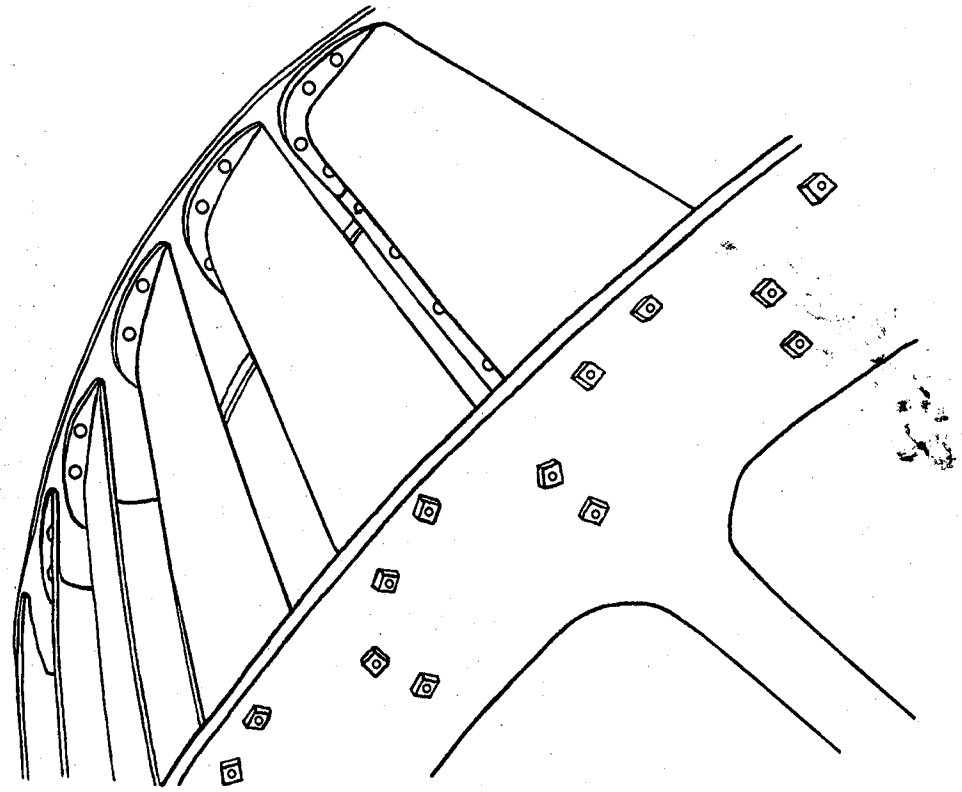
The group holds monthly meetings, with talks and discussions, during the winter, and arranges mill tours and open days during the spring and summer. Members periodically receive a Newsletter and the Journal.

For further particulars, please contact:-

Mr. A. C. Perryer,
Whitcot Mill,
Bishop's Castle,
Shropshire, SY9 5EB

Wind and Water Mills

Number 26



The Midland Wind and Water Mills Group

Wind and Water Mills is the Journal of the Midland Wind and Water Mills Group and is therefore naturally concerned with the mills of the Midlands, but it is not intended to be narrowly parochial. Interesting and important articles relating to mill matters in other parts of Britain and the world will be included whenever available. In general, articles by members will have priority for publication, but submissions by non-members will be willingly included.

Cover illustration: The shrouds and buckets of the cast iron waterwheel constructed in 1793 at Galton's Mill, Bellbroughton. (see pages 2 - 31)

ISSN 0260-504X

Publisher: The Midland Wind and Water Mills Group
Editor: Mr. A. Bonson,
14, Falmouth Road,
Congleton,
Cheshire, CW12 3BH

Wind and Water Mills

The Journal of the Midland Wind and Water Mills Group

Number 26
2007

CONTENTS

GALTON'S MILL, BELBROUGHTON, WORCESTERSHIRE.

Tim Booth & Madge Jones

Introduction

Galton's Mill stands on the Belne Brook to the east of the village of Belbroughton, just off the B4188 which links the village with the A491. Although much of the present buildings is either new or recently modernised, this mill does retain the last surviving waterwheel of the nineteen which were still in place in Belbroughton's mills in the 1940s. This waterwheel is of particular interest for both its age and construction.

However, before turning attention to Galton's Mill, it is relevant to look at the surrounding area and its long association with metal working, particularly the manufacture of scythes and other edge tools - an industry which flourished here from early times until its demise in 1968.

Belbroughton is situated in north Worcestershire and is still a pleasantly rural village, with a population of about 2000, despite its proximity to the urban sprawl of the west midlands. Its origins stretch way back in time. In the 9th century it was two separate settlements, Belne and Brocton. Belne is the name of the brook which surges through the village from its source in the Clent Hills. Brocton, in early English, meant a farmstead or settlement by a brook. Both are identified in the Domesday Survey of 1086. By the late 13th century the two settlements had merged to become Bellebrocton, then, through variations, to Bellebroughton in the 14th century.[1]

It was the Belne Brook which played such an important part in the area's development. Before the age of mechanisation, a constant flow of water was a precious commodity which could be readily utilised as a source of power. Twenty-five mills sites have been identified along its course between the source and where it merged with the River Stour just south of Kidderminster.[2] Many of these were clustered around the village of Belbroughton.

The first known reference to a mill in the area is in 1295[3] though it is likely that there were more in this period. Metal working, particularly the manufacture of scythes, was well established by the 16th century when Belbroughton, along with neighbouring Chaddesley Corbett, was considered to be at the heart of the west midlands agricultural tools industry. A study of local wills from this time indicates trading over a wide area: from Gloucestershire to Nottinghamshire and from Buckinghamshire to Cheshire. Inventories record the value of

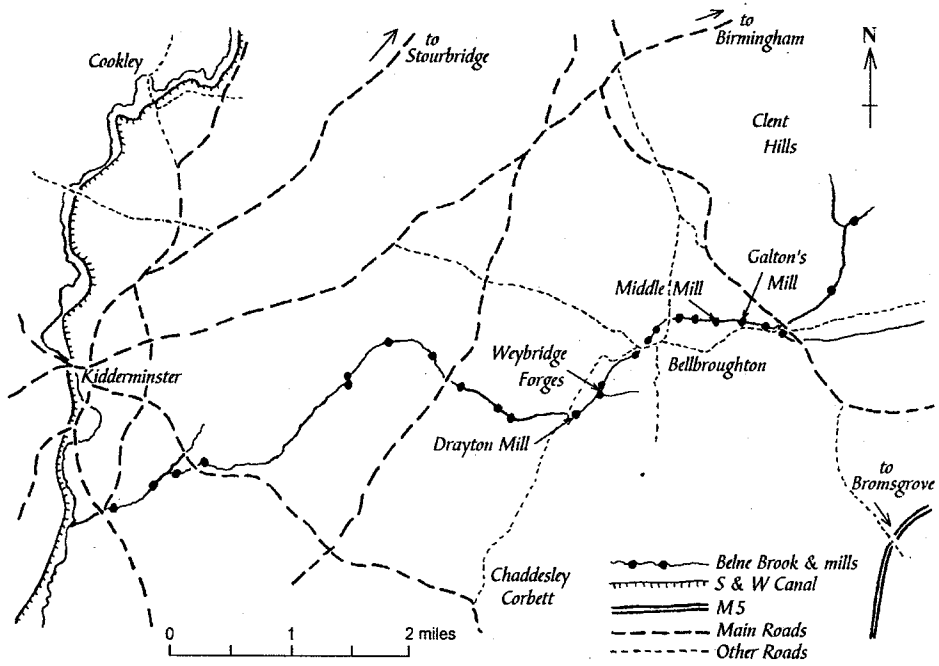


Figure 1. A sketch map of the area between Kidderminster and Bromsgrove showing the position of the watermills on the Belne Brook.

implements and equipment. John Waldron, who died in 1541, had "six hondered sythes and half", valued at £52 and "stones for the blade myll with other things thereunto belonging 40s." In 1577 the appraisal for Henry Sitch itemises "Sithes hokes and Irne and Stele £110-0-0".[4] It is unfortunate that, though these documents refer frequently to mills, only rarely are sites identified. The Belbroughton industry appears to have been in the hands of a small number of families in these early times, with leases of mills and contents handed down from fathers to sons. The Waldrons, originating in Clent, were dominant and remained so through successive generations until the 19th century.

Industry in the area declined at the end of the 16th century as sheep rearing and grain production became prominent. Scythe and tool making died out in Chaddesley Corbett but continued to a lesser degree in Belbroughton alongside farming, often as a dual occupation.[5]

The 18th century brought diversification to Belbroughton's metal working activity with investment from an outside source. In 1751 a partnership of James Farmer, Samuel Galton, John Galton, Samuel Bradburne and Randall Bradburne agreed to invest £5000 to develop forges at or near Weybridge, just south of the

village, and at Belbroughton itself.[6] James Farmer had previously obtained a lease of a corn mill in Belbroughton in 1746[7] but it may be that development in the area was delayed by a depression in trade in the late 1840s which looked like causing financial difficulties.[8] The partners were to act as "joint traders in the Trades and Misterys of Iron Master and Steel Man and in Buying Making and Selling of Iron, Iron Pigs, Converting of Iron into Steel." In fact James Farmer and Samuel Galton were well established as gun makers by the middle of the 18th century, with a large manufactory at Steelhouse Lane in Birmingham. John Galton, Samuel's brother, was a merchant in Bristol and the Bradburnes were merchants from Birmingham. A rapid upturn in the gun trade from 1750 led to difficulties in obtaining supplies of parts, at the right price, from specialist makers. Presumably Farmer and Galton decided they could now risk increasing their capacity to manufacture gun parts themselves, with the financial help of other investors, probably in the same trade. Perhaps Belbroughton, with a ready source of power and a long tradition of metal working, was seen as ripe for development. James Farmer would have known the area well as his family home was at Bromsgrove.

In the 1780s all water powered industries in the area came under threat from a proposal to construct a canal from Stourbridge to Bromsgrove and then south to Worcester.[9] The intended route was just to the east of Belbroughton, cutting across the headwaters of all the streams rising on the south-western slope of the Clent Hills. The canal would have needed huge quantities of water, taken from these streams, to maintain its levels, thus depriving the many mills of their source of power and the owners of their livelihood. The owners and tenants of these mills rose up to protest, raised petitions and gained support, claiming that such a project would bring about the end of their industry and subject communities to untold hardship. A bill to authorise the canal was introduced in 1786 but was defeated in the House of Lords and the proposal was never revived.[10]

Although gun making came to an end early in the 19th century, the Belbroughton scythe and tool industry flourished. In the early 1800s the Waldron family worked the main forge in the village centre in addition to others in the surrounding area. The firm was acknowledged as a leading supplier of agricultural tools. Then, in 1840, a newcomer arrived in the area. Isaac Nash was a young man who had served his apprenticeship in Dudley, learning forging and plating. He leased a forge from Squire Noel of Bell Hall and embarked on his career as a scythe and edge tool manufacturer. Over the following years he was to build a successful business, adding more premises to his initial venture and gradually expanding until by 1870 he was employing ninety men and seven boys. In 1873 the Waldron company was in decline and Isaac Nash bought them out of the main forge in the village. Eventually he absorbed all the works sited along the Belne Brook and established a virtual monopoly. In 1880 he bought the Somerset

edge tool firm of Fussells, based at Mells in Somerset, and merged it into his midland empire. He revitalised the industry, further developing an export market in addition to a thriving home trade. The name of Isaac Nash became synonymous with high quality edge tools, due in no small way to his innovative manufacturing processes. He died in 1887 and was succeeded by his son, Isaac junior.

The company continued to trade under family management in the 20th century but, as time went on, mechanisation took over the agricultural industry. The need for scythes and other edge tools diminished and cheap imports made high quality, hand crafted implements redundant. The firm of Isaac Nash and Co., which had provided employment for generations of Belbroughton men, finally closed in 1968, bringing to an end an industry which had been carried on here for centuries.

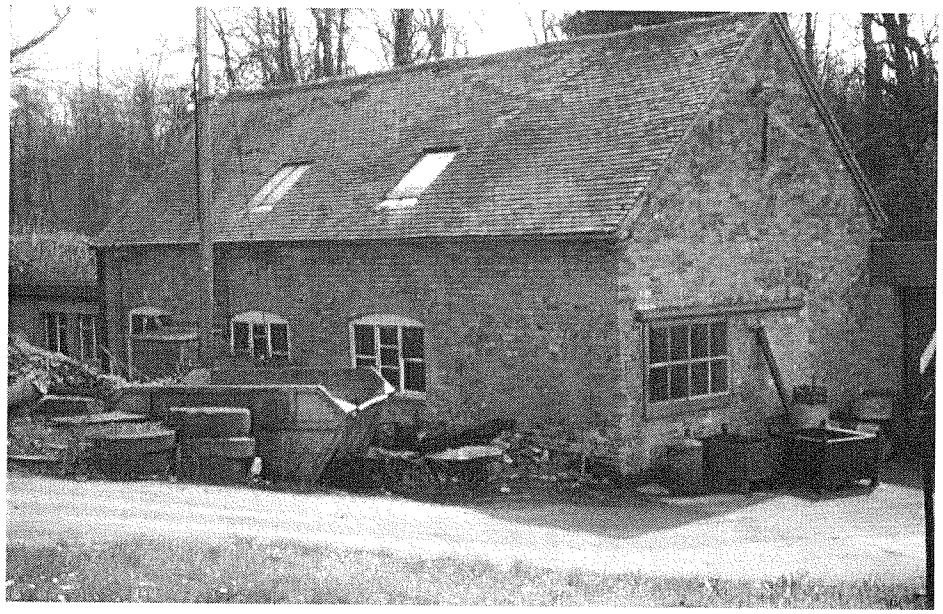


Plate 1. The grinding shop in 1978, still with many discarded grindstones in the yard.

A History of Galton's Mill

Evidence to trace the early history of this mill is sparse. It is often difficult to identify locations from documents but there is sufficient to indicate that one has stood on this site from early times. This mill and the two immediately upstream, at Bell End, were in the manor of Brians Bell which belonged to the owners of Bell Hall. Therefore, it was probably one of the three mills in the manors of "Broyns Bell and Ablench" which John Conway inherited from his father Edward in 1546.[11] The mill was formerly known as Savage's Mill and is mentioned in a survey of the parish of Belbroughton, dating from the time of Elizabeth I. The survey, which names property holders eligible to pay tax, survives in an early Belbroughton parish register. An entry records "Savage Mill, the lands of Sir John Conwaye (Knight) and now in the tenure of John Savage conteyneth one half yard land.." Sir John Conway conveyed his lands to Humphrey Perrott in 1592 and one source attributes the survey to c.1570.[12]

In 1733 a blade mill called Savage Mill was in the tenure of Benjamin Whitaker who was paying an annual rent of £14.[13] Whitaker was still there in 1751 when the Farmer, Galton and Bradburne partnership obtained a lease of the mill from John Perrott of Bell Hall for ninety-nine years, paying £20 per annum.[14] Correspondence between Samuel Galton and James Farmer shows that they were anxious to get Whitaker out as soon as possible, even by finding him alternative premises, so that they could develop the mill for their purposes.[15] The letters refer to setting out the foundations of a steel furnace close to a forge they were erecting. Presumably this was a cementation furnace, described as being rather like a baker's oven with a fire-box about two feet wide, heating coffers that contained over half a ton of iron in bars up to five feet long. Cementation was effected with charcoal and was continued for between three and seven days and nights.[16] In the list of mills that would have been affected by the canal proposed in 1786, the owners were Rev. Thomas Vernon, K. Noel and J. P. Noel while the occupiers were Samuel Galton and Son and Samuel Bradburne. The mill was described as "A Plating Forge, one Boring Mill, and one Grinding Mill". By this time James Farmer, John Galton and Randall Bradburne had all died.

The most important product of Farmer and Galton and, later, Galton and Son was the muzzle loading flintlock musket. They would largely have organised the assembly of these from parts made in specialist workshops in Birmingham and the Black Country. However, they certainly manufactured their own barrels and probably the steel springs which contolled the flintlock mechanism. Before the advent of tube drawing, all methods used to form gun barrels involved welded seams.[17] The simplest used a strip of iron, known as a skelp, which had been drawn out under a water powered plating hammer so that it was the correct thickness, but reduced at the edges, and rather longer than the intended barrel.

The skelp was then bent longitudinally around a cylindrical rod so that the edges overlapped slightly. These were then welded together to form a tube which could be trimmed to the required length. As these longitudinal welds were not particularly strong, the tube was sometimes twisted so that the weld formed a spiral along its length. The same effect could be achieved by wrapping a long thin strip of iron around the tube so that the edges overlapped and the whole lot welded together. The overall thickness could then be reduced by boring out much of the inner tube. An alternative method was to roll short strips into tubes, weld the joints, and then weld the short tubes end to end to make a barrel of the required length. All the processes of actually forming the barrels were carried out in hand forges. The barrels were bored out using a revolving cutter on the end of a long thin rod which was slowly advanced into the barrel. At Galton's Mill, the boring machines would have been driven by the waterwheel. Although there is nothing to indicate what actual machinery was in the mill, Figure 2 shows a typical arrangement. The final process was to polish the outside of the barrel using a water powered grindstone, also shown in the diagram.

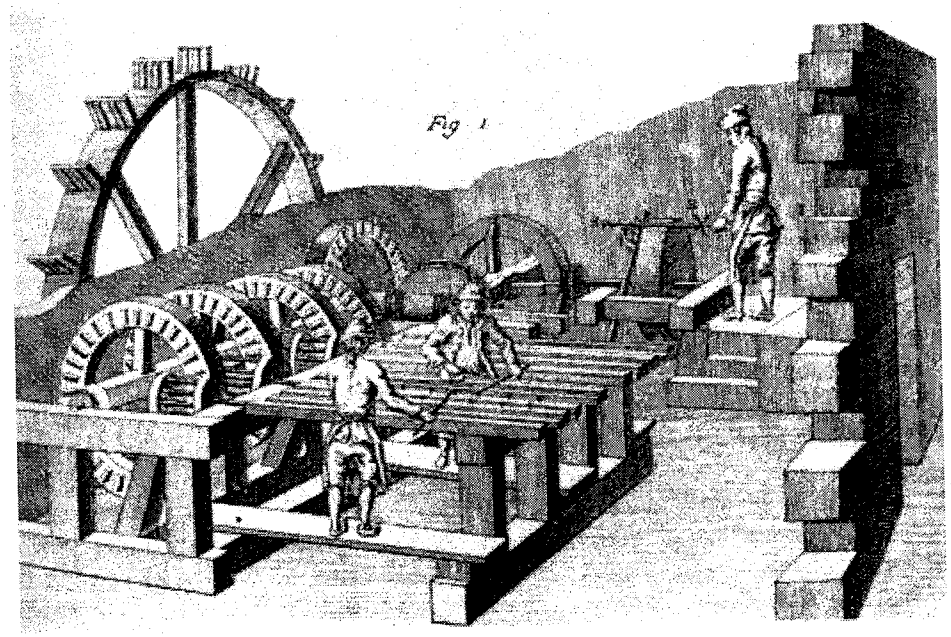


Figure 2. Machinery for boring gun barrels and the outside of the barrel being ground on a stone at the rear. The boring bit is welded onto a long iron rod and is turned, through gearing, by the waterwheel. A sliding carriage holds the barrel which is forced on to the boring bit by a lever. (Reproduced from *Encyclopédie* by Denis Diderot & Jean d'Alembert.)

The performance of a gun was determined by the quality of its barrel but its reliability depended on the lock. At times of greatest demand, locks of suitable quality were difficult to obtain. Having their own steel furnace would certainly ensure a supply of raw material for lock springs. The operation of the flintlock is shown below in Figure 3.

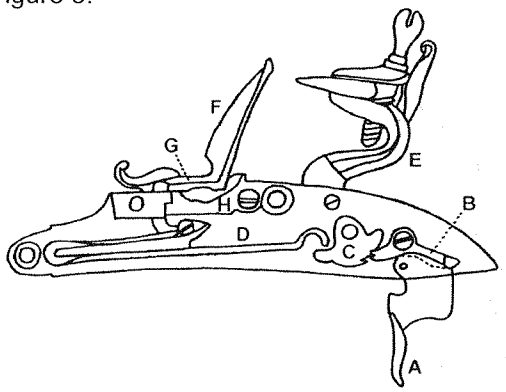


Figure 3. The mechanism of the flint-lock. On pressing the trigger, A, the sear, B, is released from the tumbler, C, which rotates under the action of the spring, D. On the same shaft as the tumbler is the cock, E. This carries the flint which strikes the steel, F, raising the pan cover, G, attached to it. The sparks fall in the pan, H. (Reproduced from Singer, C., *A History of Technology*, Vol. 3, p354.)

Early in 1788 Samuel Galton, in partnership with his son Samuel John Galton, bought the remainder of a thousand year lease of the mill which was described as "...the said Blade Mill, Messuage, Steel Furnace, Warehouse, Meadow Land, buildings and hereditaments".[18] Samuel Galton and Son must have altered part of the mill again in 1793 when installing the cast iron waterwheel which still survives today. The castings were purchased from the Cookley Foundry, operated by John Knight, for a total cost of £200.[19]

The Galtons finally gave up gun making in 1818 and the mill was leased to William Waldron for scythe making. The Belbroughton Tithe Award of 1840 gives the tenants as "Messrs Waldron" and the premises were described as a "scytheworks". The owner is named as William Galton but was actually Samuel Tertius Galton, Samuel John Galton's son. The property was sold back to the Bell Hall estate in 1846[20] and in the same year Isaac Nash took over the lease of the mill from William and Thomas Waldron. When a new lease was drawn up in 1855 it was described as "...all that Blade Mill formerly called Savages (but now Galtons Mill) with the Forges Pool Dam and Floodgates.".[21] Isaac Nash, later Isaac Nash and Co., continued there until the 1940s using the mill for scythe grinding.

The mill was visited by H. E. S. Simmons in April 1945, who reported that it had closed down in 1942 when "a breakage in the pit wheel occurred and although otherwise in excellent working order has not been repaired owing to the firm not having sufficient labour to keep all their mills fully at work".[22] The break never was repaired and by the time David Jones visited in 1954 the building was being used by a sheet metal company.[23] Subsequently, a new flat roofed building was added for Belbro Precision Engineering.

The site was purchased by Air Technology Systems Ltd. in the 1990s. In 2000 planning permission was granted to modernise the former grinding shop and add an extra storey plus a pitched roof to the 1960s flat-roofed structure. Work on the latter did not commence until 2006, after the premises had been sold to the present owners, Commercial Carpets & Interiors Ltd.

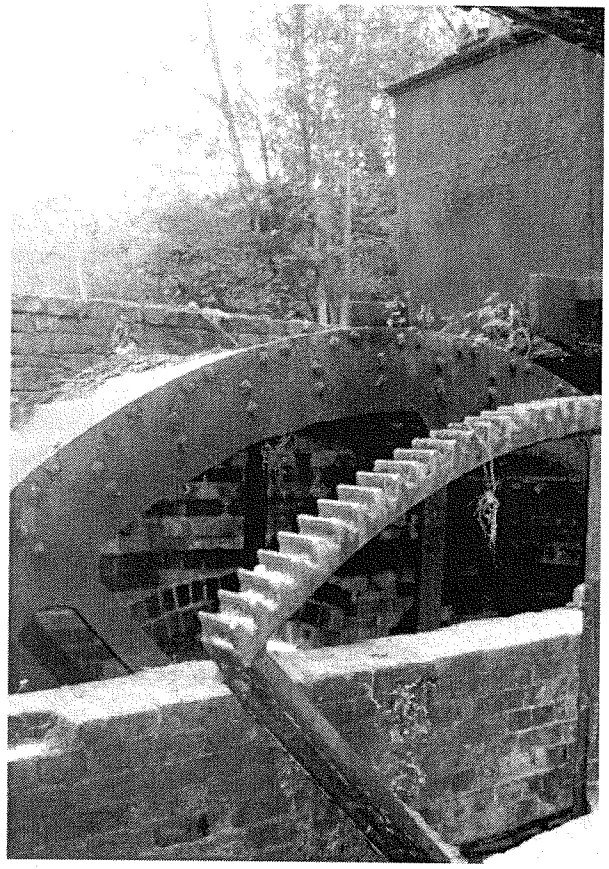


Plate 2. The waterwheel, penstock and broken pitwheel, 2006.

The Gun Making Business of the Farmers and Galtons

As the mill has been known as Galton's Mill for well over two hundred years, it seems appropriate to give some information about the family and their business.[24]

This had its origins in a workshop in Old Square in Birmingham occupied by Joseph Farmer from the beginning of the 18th century. He was sometimes described as an ironmonger but actually seems to have been manufacturing goods in iron and steel. From the 1720s some of these goods were almost certainly gun parts. He had already visited America in 1717-18, seeking out sources of good quality iron to import for conversion to steel. It would seem that much of his trade at this time was through the port of Bristol and it was probably there that he came into contact with the Galton family.

The Galtons were merchants trading in a variety of goods in Bristol and may well have been supplying cargo to the same ships as Joseph Farmer. These were usually destined for the west coast of Africa where goods were exchanged for slaves. Another reason for contact is that both families were members of the Society of Friends. Contact must have been frequent and friendly because Robert Galton married Joseph Farmer's daughter Hannah in 1735.

In the same year Joseph Farmer moved to new premises in Steelhouse Lane, Birmingham. In 1737 he told the House of Commons that Maryland iron was better than English or Swedish and that he imported this to make the best gunlock springs, sword blades, tower musket barrels and the files and bits used to bore gun barrels. It is possible that the importing of iron was all done through family connections as Robert Galton went to live in America while his brothers John and Samuel remained in Bristol.

Joseph Farmer died in 1741 and left the business to his son James. In 1746 Samuel Galton, described as a "haberdasher of smallwares", married James's sister Mary and within months had moved to Birmingham and joined James in partnership. With Samuel Galton in Birmingham, James Farmer moved to London to open a warehouse there, so expanding their trade. A dip in trade in the late 1740s caused some financial problems but the business expanded very rapidly from 1750 becoming one of Birmingham's largest gun makers. Although they received many government contracts, a large part of their output went to Africa. They supplied vast numbers of cheap flintlock muskets which were sold to African tribes in exchange for hostages from enemy tribes. These men and women were then transported to America to become slave labour on the plantations. At times Farmer and Galton not only sold guns but were directly involved in procuring and equipping ships and selling slaves in America.

James Farmer also developed trade with Portugal, supplying muskets to merchants in Lisbon who then traded them for slaves in Angola. However, in

the aftermath of the Lisbon earthquake in 1755, James Farmer lost heavily having sold guns on credit to merchants who were killed or simply unable to pay their debts. He was declared bankrupt and his partnership with Samuel Galton quickly dissolved. Farmer family assets and estates were transferred to Samuel Galton to keep them from creditors. A new partnership was arranged two years later but with Samuel Galton as the senior partner. The business continued to prosper producing an average of 12,000 guns every year. Occasionally, exceptionally large government contracts were undertaken, perhaps the largest being an order for 16,000 guns in 1772.

James Farmer died in 1773 and Samuel Galton became sole proprietor. Two years later he made his twenty-one year old son, Samuel John Galton, manager of the Steelhouse Lane works, having transferred £10,000 into his account. In 1777, Samuel John Galton became an equal partner and the business subsequently traded as Samuel Galton and Son. Ten years later Samuel John Galton was said to have amassed a personal fortune of just over £43,000. Aside from the business, he found time to indulge his interest in science. He had joined the Lunar Society in 1781 and, after preparing one or two papers on light and colour, was elected a Fellow of the Royal Society in 1785.

In the 1790s, as the anti-slavery movement became more vociferous, the Society of Friends finally started to pressurise the Galtons about their trade, threatening them with loss of membership. Samuel Galton bowed to this pressure by handing over the business to his son in 1795. Samuel John Galton refused to give up the gun trade and was eventually barred from attending the Friends' business meetings. However, he and his wife continued to worship at the Bull Street Meeting House in Birmingham.

Samuel Galton died in 1799 leaving the entire business to Samuel John Galton whose personal fortune now amounted to £139,000. Samuel John Galton retired from gun making in 1804 to establish a bank in the Steelhouse Lane premises under the title of "Messrs Samuel Galton, Joseph Gibbons and Samuel Tertius Galton". Almost immediately the Society of Friends was pleased to accept a donation from him towards the enlargement of the burial ground in Birmingham. However, this did not signal the end of the family's interest in the gun trade as that part of the business was now in the hands of Samuel John Galton's son, Samuel Tertius Galton. He continued exactly as had his father, grandfather and great-grandfather, even complaining to the Board of Ordnance in 1806 that the abolition of the slave trade prevented the firm from selling the barrels which they rejected to Africa. Remarkably the Board accepted this as fair comment and allowed him to raise his prices to them. In 1807 Samuel Tertius Galton married Frances Darwin and gave up his membership of the Society of Friends. He finally abandoned gun making to concentrate on the banking business in 1818.

Figure 4. Samuel John galton, drawn from an original pastel by Louis de Longstre, courtesy of D. Yates.

Samuel John Galton died in 1832 leaving £300,000 which provided each of his three surviving sons with a handsome income of £4000 per annum. The bank had closed the previous year and much of his property had already passed to his sons. Those premises now held by Samuel Tertius Galton, including Galton's Mill, were let until his death in 1844 and subsequently sold.

Other Mills Associated with the Business

Duddeston Mill, Birmingham SP092878

Leased from the Holte family in the 1740s and used for making gun barrels until 1815 when it was let to William Twamley.[25] Samuel John Galton lived in nearby Duddeston House.

Hayseech Forge, Old Hill SO960849

James Farmer suggested this forge be sublet or the lease sold early in 1750.[26] However, Samuel Galton still had an interest in the mill in 1794-5 when it was being used for making gun barrels.[27]

Middle Mill, Belbroughton SO927774

This is possibly the mill James Farmer leased from John Harris in 1746.[28] James Farmer agreed that, at the end of his lease, he would leave the mill with "two substantial mill hursts" and three pairs of stones, a pair of "Flints" 3 feet 9 inches diameter by 10 inches thick and two pairs of "Darbys" 4 feet 9 inches diameter by 8 inches thick. In 1749 James Farmer told Samuel Galton to let "Harris Mill" for £25 per annum or less if necessary.[29] However neither the lease nor James Farmer is mentioned in a later Abstract of Title. By 1751 it was a blade mill occupied by Thomas Cole.[30]

Weybridge Forges, Belbroughton SO911765

This is the location of the other works in Belbroughton operated by the Farmer, Galton and Bradburne partnership. A deed of 1750 refers to "...all that Mill called Weabridge Mill heretofore used as a fulling mill or mills and part thereof lately converted into a Blade Mill or Mills for grinding of Scyths and now used for boring Gun Barrells and the other part thereof hath been lately pulled down and a forge for plating of Gun Barrel Skelps erected in the place thereof.".[31] In 1786 it was described as a plating mill occupied by John Ryland.[32] Greenwood still marked it as a gun mill on his map of 1821.

Drayton Mill, Chaddesley Corbett SO906760

A letter written by Samuel Galton's clerk, J. Nottage, in 1780 refers to gun barrels being ground at "Drayton".[33] In 1770 John Timmins, who described himself as a gun barrel grinder, claimed in his Poor Law Examination that he had come to Chaddesley Corbett in 1767 and rented a house and part of a mill from Thomas Timmins for £32 per annum.[34] In 1786 it was described as a forge occupied by Homfray and Penn.[35]

The Buildings and Machinery at Galton's Mill

Much has changed at Galton's Mill since David Jones' visit in 1954. Up till that time the site was much as it had been from at least the early 1880s. However, the mill buildings surviving then seem to bear little resemblance to those shown on the Tithe Map of 1840. Even the pool and watercourses were considerably altered in that period of forty years. So far no plan has been located to show how the buildings were arranged when in use by the Galtons. However, gun making only ceased twenty-two years before the Tithe Map was drawn so it is distinctly possible that these are essentially the same buildings.

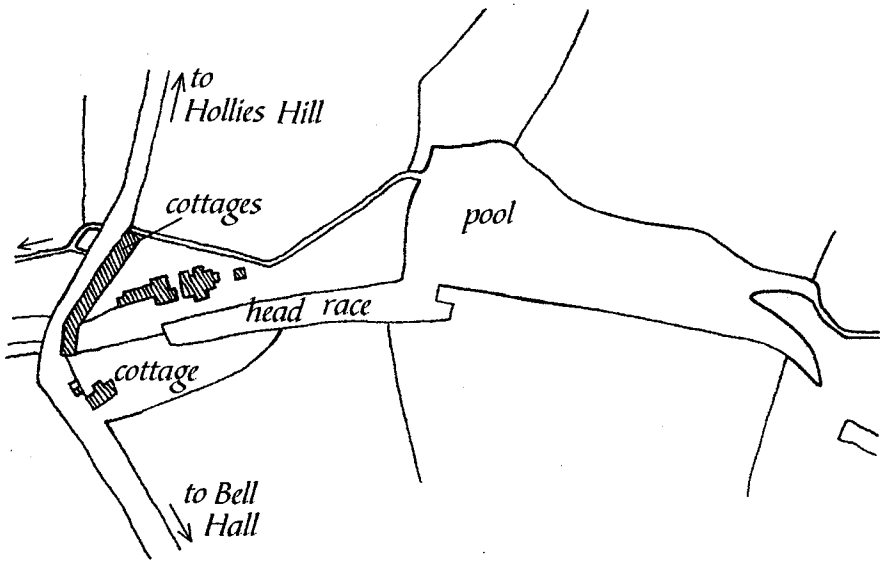


Figure 5. Belbroughton Tithe Map of 1840 showing Galton's Mill, headrace and pool.

The Tithe Map, see above, shows the Belne Brook opening out into a large pool some distance upstream of the mill. A long head race then brought the water along the south side of the valley behind the buildings. On the other side of the valley surplus water was carried away from the pool in an open channel. The two main buildings near the downstream end of the head race appear to be very different in character. The upstream building is shown with several projections and, at least in outline, looks rather like the forge at the main works in the centre of the village. Possibly this building housed the plating hammer. Of course in scythe making days there would have been a second cam on the shaft driving a steeling hammer as well. The steeling hammer was used to weld together the sandwich of iron and steel bars to form "strings". These were then drawn out under the plating hammer to form the scythe blade.

That leaves the downstream building to have included the scythe grinding shop and perhaps earlier to have been the boring and grinding mill for the gun barrel works. This is the most likely situation for the surviving waterwheel, though exactly where is not obvious. Most of the other buildings marked on the Tithe Map are rather easier to identify. The long building beside the lane downstream of the mill was a row of cottages, most of which survived until the 1950s. It might also have included the warehouse mentioned in various leases.To the south of them is a detached cottage, perhaps once the manager's residence, which still stands. Upstream of the possible forge was a small square building which presumably could even have been the steel furnace. The overflow from the pool crossed the site north of the buildings and passed under the lane where it was joined by a culverted tail race coming roughly from the direction of the mill buildings.

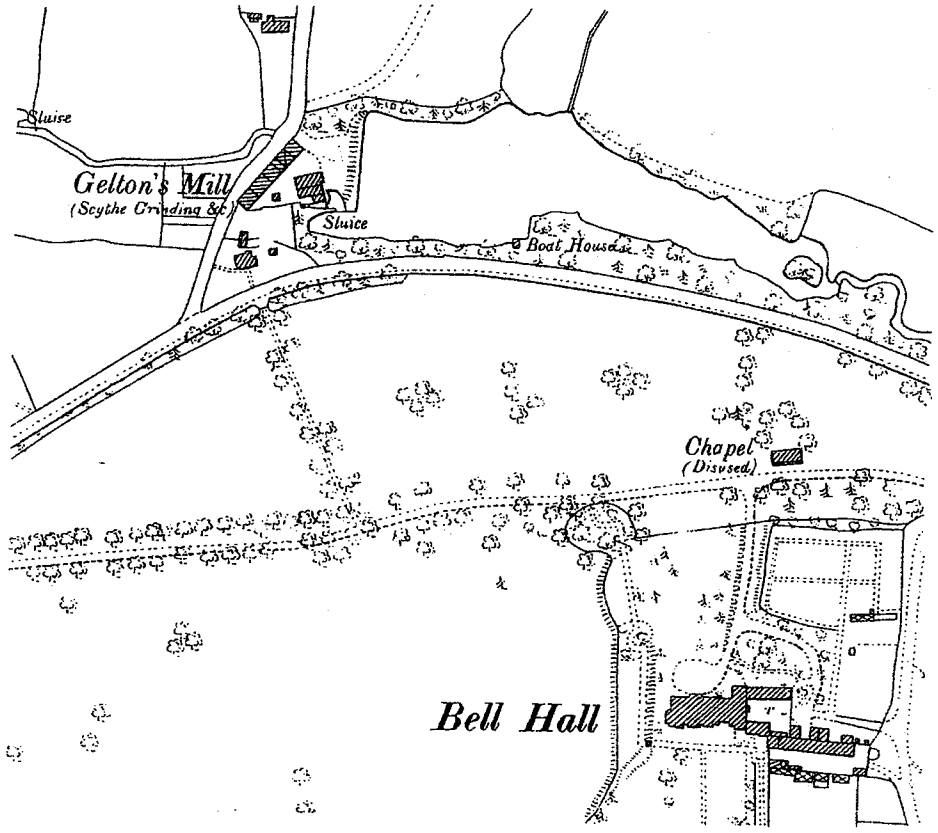


Figure 6. Part of the 25 inches to 1 mile Ordnance Survey map of 1884, showing the changes that had taken place since the Tithe Map of 1840.

By the time of the survey for the 1884 Ordnance Survey 25 inch to 1 mile map both the watercourses and the buildings had changed radically. The pool had been enlarged with a substantial dam across the valley where the possible forge had stood. However, the end section of the head race remained with a weir and sluice just east of the mill. The surplus water is shown falling into a small pond beside the building before disappearing into a culvert. The only remaining mill building, now solely used for scythe grinding, looks very different to its predecessor but retained the 1793 waterwheel at its south eastern corner. This possibly locates its position in the earlier building which had a pronounced projection from its south eastern corner. Presumably the tail tunnel from the waterwheel still existed in the 1880s though its outlet is not marked on the map. The building now consisted of a narrow two-bay section housing the waterwheel and pitwheel fronted on the north side by the much longer grinding shop. This had a narrow shop with a very shallow-pitched roof on its south side. It is not known when these changes occurred but could well have been shortly after the mill was bought by Charles Noel of Bell Hall in 1846. A busy scythe forge about three hundred yards from your front door would certainly have been an audible irritant from dawn until dusk, even if its rental did contribute to your income.

A description of the machinery at Galton's Mill was written by H. E. S. Simmons when he visited in April 1945.[36] He commented on the very close-fitting wheel house which clearly made recording the dimensions of the wheel difficult. The pitwheel drove a small pinion on a low level shaft which also carried a sprocket for a chain drive to an upper shaft. Another chain took the drive into the grinding shop. At that time the five grindstones were still in position, driven from a shaft that ran the length of the building. George Watkins also visited the mill in the 1940s, possibly before the pitwheel broke in 1942 as there is no mention of this in his notes.[37] He recorded that the final chain drive was a late replacement for "drums and vertical cross belt" but only noted four grindstones. When David Jones visited in 1954 the lineshaft drive was still intact as well as five drainage troughs for the grindstones. At that time the row of cottages by the road was still standing. The slope of the ground allowed their basements to be accessed from the mill yard. Apparently these were used for storing grindstones in the mill's working days. The cottages were condemned as unfit for habitation and demolished c.1955.

The subsequent alterations to the mill buildings have already been noted. When the flat roofed workshop was constructed in the 1960s, the narrow shop adjoining the grinding shop was demolished and the roof covering the waterwheel and pitwheel was removed. All shafts above ground level were taken out and the drainage troughs for the grindstones infilled. The most recent development, raising the height of the flat roofed section and and giving it a pitched roof, was only completed in December 2006. The grinding shop is essentially intact though

with new windows and doors and a single storey extension on its eastern side. Part of the foundations are exposed behind the grinding shop showing that at least that part is built on several layers of old grindstones.The interior has been thoroughly modernised though the 19th century roof trusses are visible. The bays housing the waterwheel and pit wheel show some rather older brickwork in their lower courses, probably dating from the late 18th century, but with many signs of subsequent alterations. The brickwork of the gables, now demolished, looked comparable with the grinding shop. Indeed, David Jones' photograph of the exterior in 1954 shows similar detail on both visible gable ends.

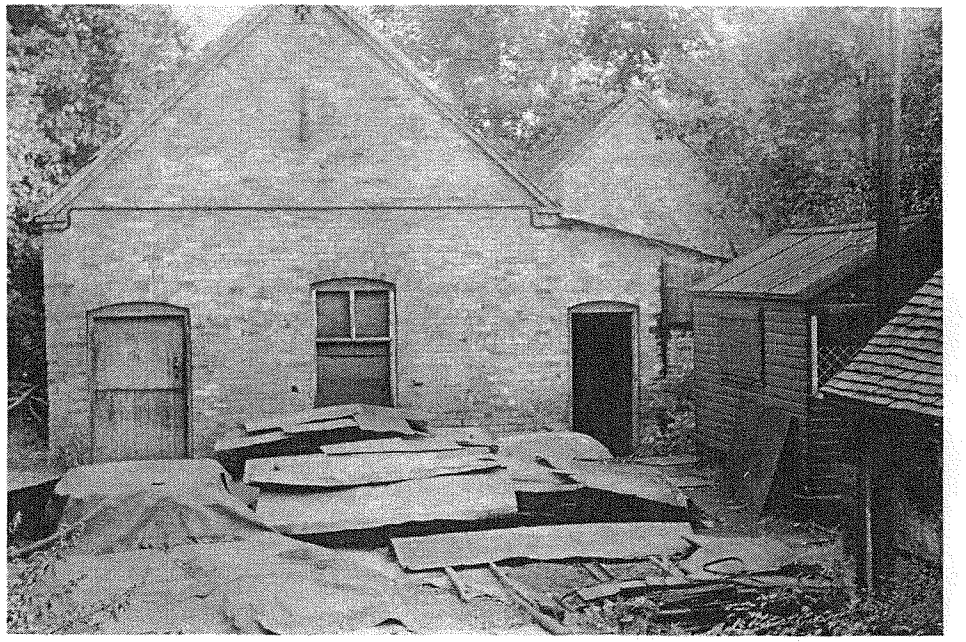


Plate 3. The gable ends on Galton's Mill in 1954. The former grinding shop is on the left. (Reproduced by kind permission of David Jones.)

The bay housing the waterwheel is linked to the retaining wall of the head race which has been badly damaged over the years by both floods and tree roots. By the end of 2006 much of the face near the mill was missing. However, repairs are due to be carried out in 2007. After the last serious flood, in 2000, the upper part of the weir was removed so that there is now no head of water to turn the wheel. This action has meant that the pool, already badly silted, is now non-existent. The brook meanders through the bed of the pool and flows over the remaining section of the weir which is a vertical drop of about twelve feet into a small pool. The water level in the pond is probably about three feet higher

than it should be as rubble brought down by the last flood is partly blocking the outlet. This is a culvert running northwards before turning to the west some distance in. This turn is at a junction in the culvert with an arm coming in from the east, running under the dam. It seems to follow the line of the earlier open overflow channel and was probably culverted and eventually blocked when the alterations to the pool were made. Water from the head race was carried to the wheel through a rectangular cast iron pipe made up of sections 5 feet long with a flange at each end for bolting up. There is a lead gasket in between the flanges keeping the joints watertight. The end section of pipe nearest the waterwheel is rather different being open on top for more than half its length. This allowed the section forming the tank of the penstock to be bolted in position. Most unusually this is cast as a single piece. The gate is still in place and was raised by a rack and pinion operated via a long wrought iron rod from inside the grinding shop. A lever fixed on the rod would have allowed an alternative operating point, long since lost. The sides of the end section of pipe continue forward of the penstock and over the wheel to form shaped cheek pieces. These would ensure that water leaving the penstock was directed onto the wheel. The total weight of the penstock and pipe has been calculated to be over eight tons. Its only support is a wrought iron rod, in poor condition, across the bay housing the wheel. It is perhaps not surprising that the section over the wheel has drooped a little.

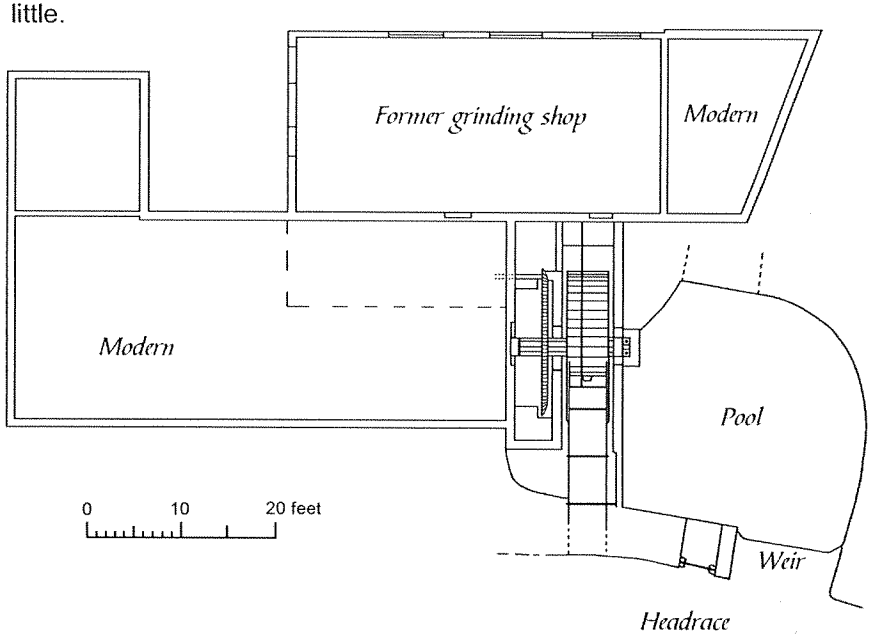


Figure 7. Plan of the building at Galton's Mill. The watercourse details are approximate.

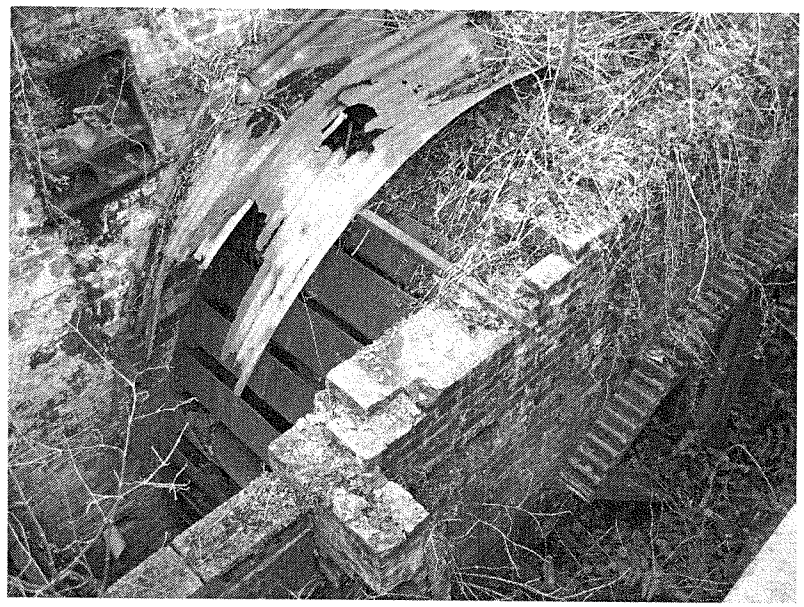


Plate 4. The overgrown waterwheel chamber. Note the remains of the pitwheel on the other side of the wall to the waterwheel.

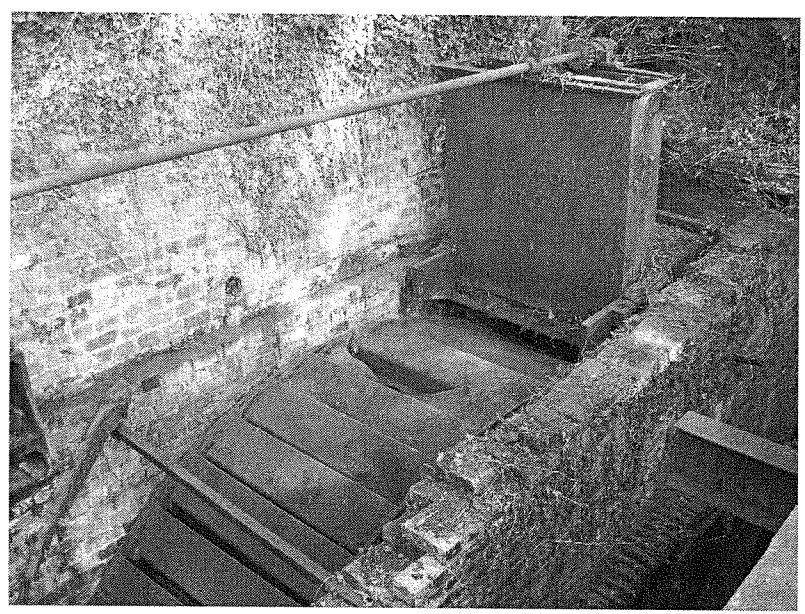


Plate 5. The waterwheel and penstock cleared of tree growth in 2005.

The internal wall between the bays housing the waterwheel and pitwheel was lowered in November 2006 making the waterwheel much more accessible and its construction easier to appreciate. The construction of the wheel is certainly unusual and suggests an early date. This is supported by the inscription on the penstock which reads "CAST AT COOKLEY 1793". Fortunately, the accounts of Cookley Foundry for that period have survived as part of the Knight Manuscripts now in Worcestershire Record Office.[38] The Knight family was involved in iron making in Shropshire from the late 17th century.[39] In the early 18th century Richard Knight joined various partnerships which gave him increasing control of the ironworks in the Stour valley, including that at Cookley. A drop in demand for iron in the 1760s lead to reduced profits for the Stour Partnership and the increasing availability of cheap coke iron made their charcoal fired furnaces uneconomic. The decision was taken to stop producing themselves and rely on buying in and converting iron from elsewhere. To that end the foundry at Cookley was constructed in 1788. The main product of the foundry is said to have been cast iron plates for the Partnership's own forges and other local ironmasters, though the only information given in the accounts is the weight and price of castings. There is also a retail account but this specifies neither purchaser nor product. However, in the account for 1792-3 there is a sale to Samuel Galton, Esq. of 3 tons 2 cwt 1 qr of castings at a cost of £35-15s-6d.[40] In the following year's accounts Samuel Galton & Son purchased 12 tons 19 cwt 2 qr 25 lb of castings for £155-17s-3d. They also purchased 63 lbs of "Brass Brasses" for £4-4s and over 3 cwt of lead rings for £4-3s-3d.[41] Rough calculations of the weights of the waterwheel, shaft, penstock and pipe add up to close to the total weight of castings of a little over sixteen tons. The need for brasses is obvious and the lead rings are the gaskets in between the pipe sections. No inscription has been found on the waterwheel but the castings are of a similar quality to the penstock. Although none of this is conclusive proof, it is almost certain that the surviving waterwheel does date from 1793. Of course, this would make it a very early example of the substitution of iron for wood in the structure of a waterwheel. Indeed, no earlier surviving example has so far been located anywhere.

The waterwheel is overshot and measures approximately 16 feet diameter by 4 feet 6 inches wide. Apart from the wooden sole boards, now mostly rotted away, it is made entirely of cast iron. The hubs, arms and shrouds of each ring of the wheel are cast as a single piece. The difficulty of transporting two 16 feet diameter iron "wheels", each weighing more than a ton, from Cookley to Belbroughton, a distance of about seven miles, can well be imagined. These two castings are extremely simple, just over 1inch thick, and rather crudely shaped, especially where the arms join the shrouds. There are no strengthening ribs and the only flanges are one, 2 inches deep, around the inside edge of each

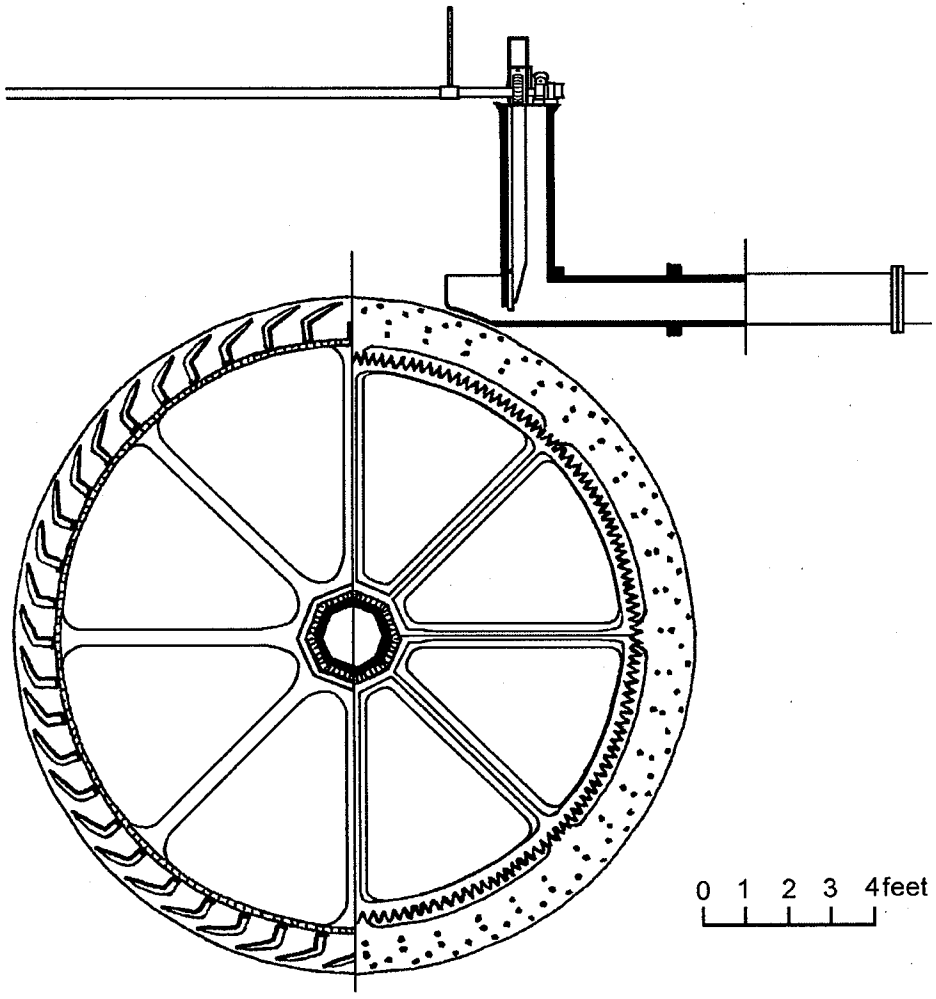


Figure 8. A section of the waterwheel, pitwheel, penstock and pipe based on a drawing by David Jones.

shroud to position the sole boards and one at the octagonal eye of the hubs. The hub flanges are 6 inches deep and would have provided a seating for the wooden wedges positioning the wheel on the shaft. There are two wrought iron straps around the flange on the hub of the inside ring of the wheel and one on the outer. These were presumably added as an afterthought. Perhaps it was feared that the castings might fracture at this point when additional or alternative machinery was operated, increasing the torque on the wheel. The forty-eight

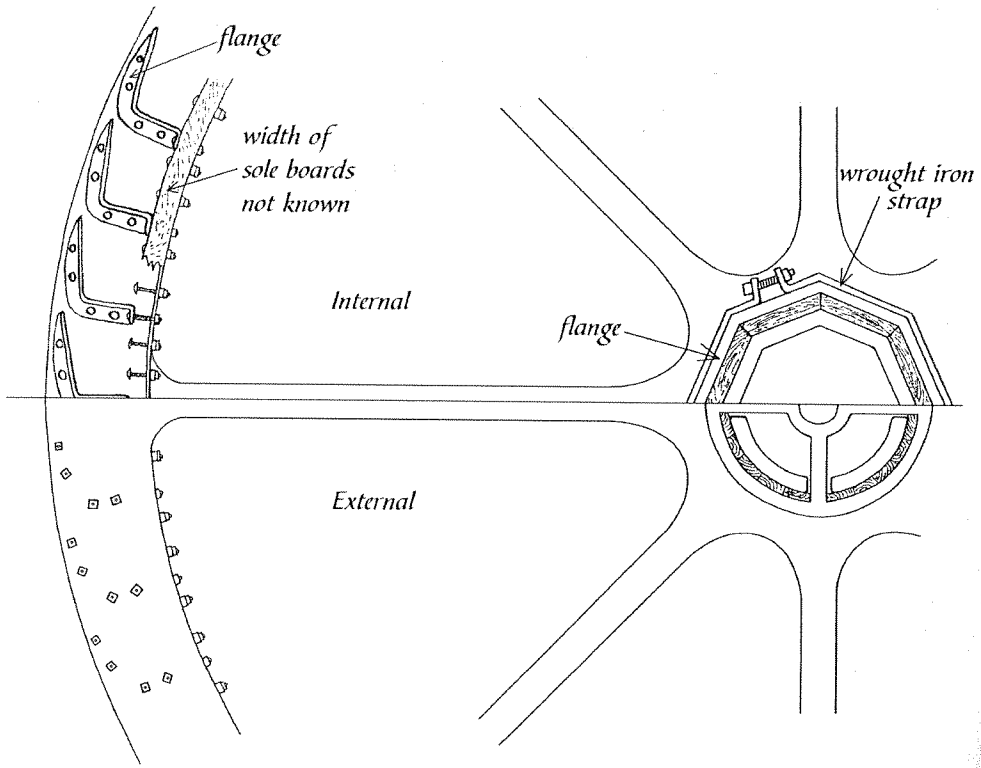


Figure 9. Details of the waterwheel.

buckets, which are about ½ inch thick, are cast with flanges on each end so that they can be bolted to the shrouds. With four bolts at each end of every bucket, the accurate positioning and drilling of the three hundred and eighty-four holes in the shrouds would have been a considerable task so perhaps they were incorporated in the castings. A flange on the tail of each bucket allowed them to be bolted to the 2½ inch thick wooden sole. One advantage of using cast iron for the buckets is that they mostly remain as sound and true as when they were fitted. A disadvantage is that falling masonry has chipped one or two buckets in recent years. One bucket was clearly damaged while the mill was working because a broken section was fixed back into place with wrought iron straps. Of course, these have since rusted away. Very little of the wooden sole remains. The boards must have been difficult to replace without removing the buckets yet that appears to be the case. Possibly the reason for using wood was to lessen the overall weight of the wheel.

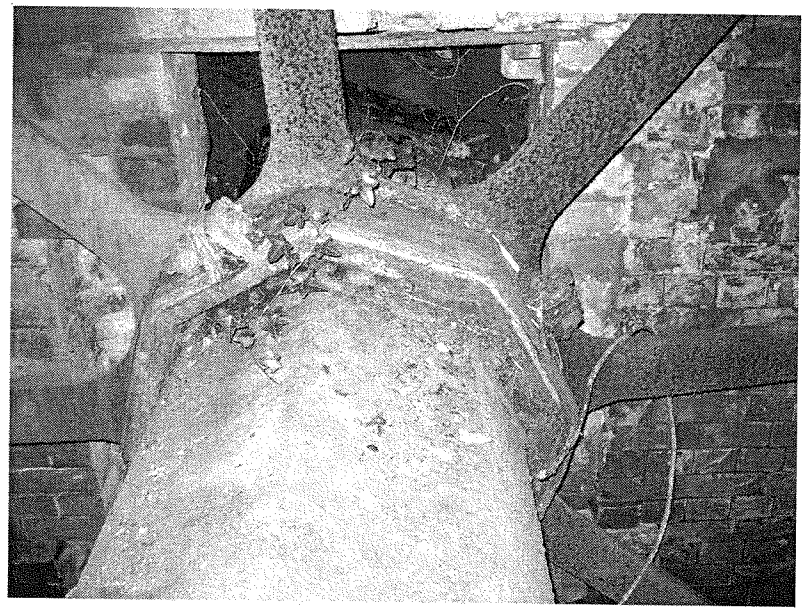


Plate 6. Details of the inner waterwheel hub showing the wrought iron straps and flange.

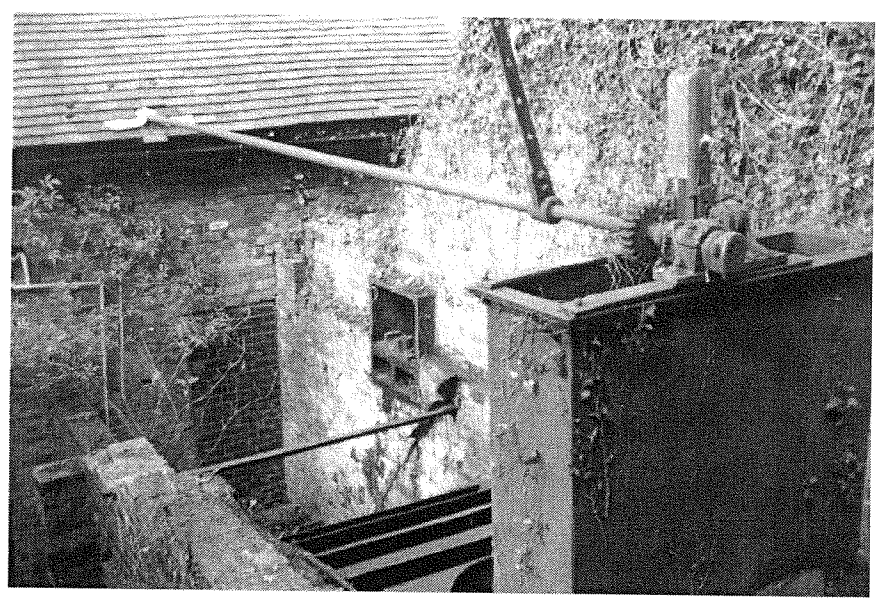


Plate 7. The penstock and the control rod from the grinding shop.

The wheel is mounted on a hollow cast iron shaft about 11 feet long. The majority of the shaft is octagonal in section but about 1 foot at each end is circular with four slots to take the wings of the gudgeons. The gudgeons are much smoother castings than the wheel or the shaft and are most likely 19th century replacements of the originals. They incorporate a ring which allowed them to be wedged onto the circular end sections of the shaft. In its profile, and in the way the gudgeons are fitted, the shaft is simply a replication in iron of a timber shaft. The gudgeons are identical to those fitted to the square oak shaft at Wrickton Mill and could well have been cast at George Turton's foundry in nearby Kidderminster. Equally, the plummer block for the outside end of the shaft looks like a standard 19th century casting. This plummer block used to rest on a thick piece of timber which has almost rotted away. As the gudgeon pin has worn through the brass this means that the wheel has dropped at least 6 inches at this end. The inner gudgeon pin and plummer block are buried under the concrete floor of the new building.

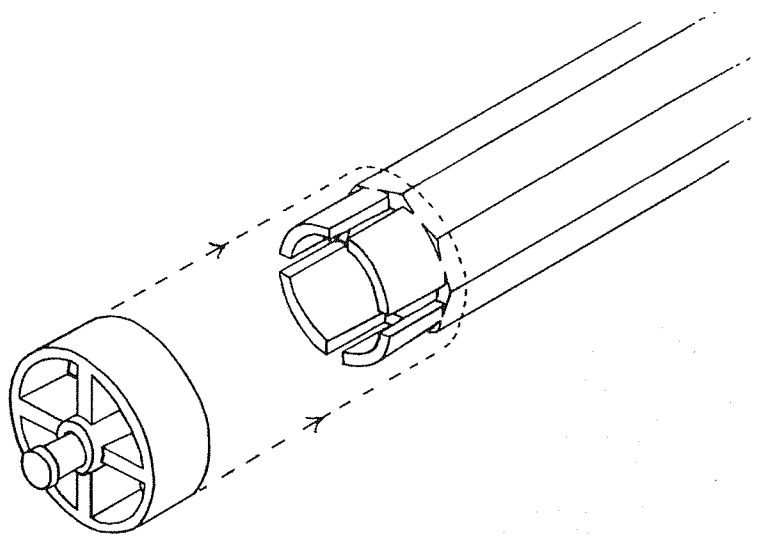


Figure 10. A sketch showing how the gudgeon fits on the wheelshaft.

In the second bay the wheel shaft carries the pitwheel which is a cast iron spur gear about 13 feet 6 inches diameter with a 6½ inch face. It has eight ribbed arms and was cast in two halves which are bolted together. The segment of the gear where the break occurred is missing but it looks as if it was carefully cut away and bolt holes drilled in the adjoining arm to take a replacement. The pitch of the gear is only 2¾ inch so it probably dates from the mid 19th century.

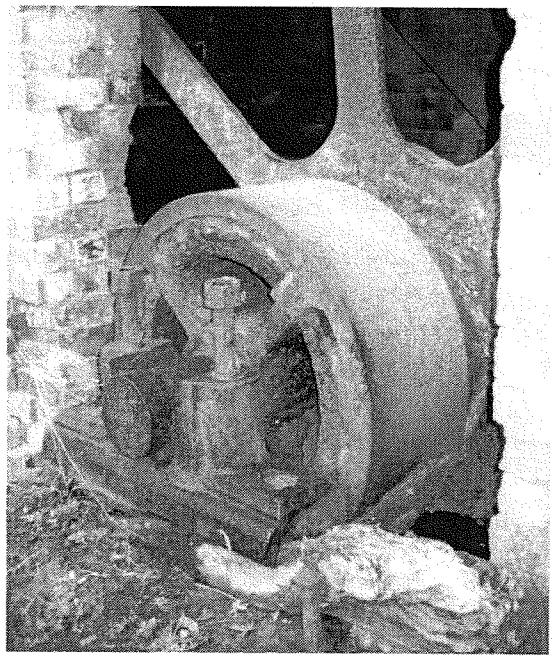


Plate 8. Details of the gudgeon on the cast iron wheelshaft at Galton's Mill, 2006.

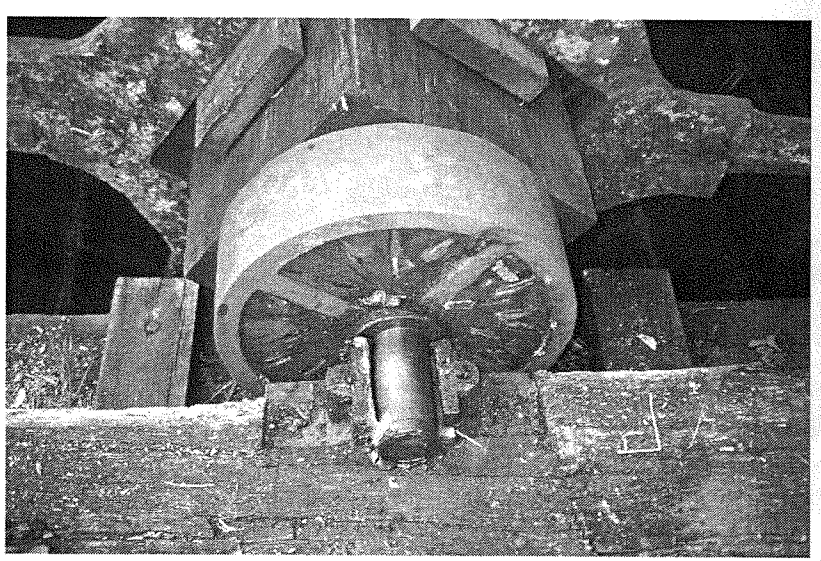


Plate 9. Details of the gudgeon on the wooden wheelshaft at Wrickton Mill.

The pit below it has been extended to accommodate this gear wheel and it appears that its predecessor was no greater than 12 feet diameter. However, as the pit extends the full 4 feet width of the bay, it could previously have held a drum with flat belt drives to overhead shafts. Recent excavation of the pit has revealed the pinion which was driven by the pitwheel. It is 21 inches diameter and mounted on a 5 inches diameter shaft which disappears under the floor of the new building. In the outer wall of the waterwheel bay is a wall box and bearing for the high level shaft which must have run above the waterwheel and pitwheel and then the full length of the narrow shop adjoining the grinding shop. David Jones' photograph shows a wooden hatch in its end wall which, judging by the heavy oil stain below it, covered the wall box at that end of the shaft. Nothing else of the machinery remains apart from a few discarded grindstones in the mill yard. These are all of sandstone from the quarries on the east bank of the River Severn between Upper Arley and Alveley.

Plate 10. The wheelhouse in 2005 with the headrace overflow on the left. Notice the difficult access to the waterwheel.

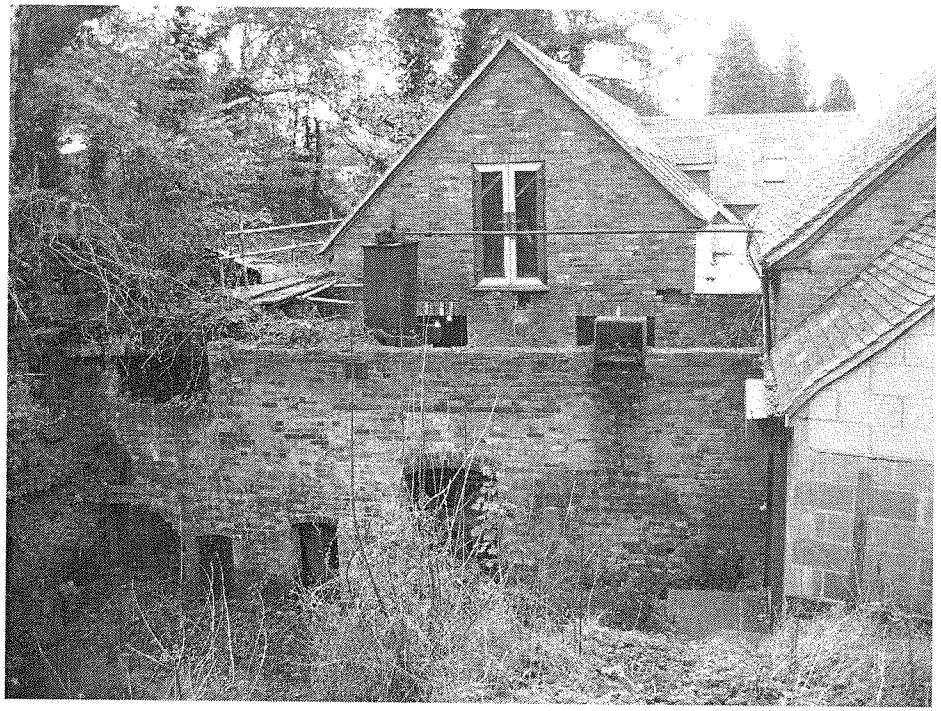


Plate 11. The new buildings almost complete in December 2006, showing the much reduced wheelhouse.

Conclusions

Galton's Mill certainly has an interesting history but the most intriguing surviving element is its cast iron waterwheel. The inscription on the penstock, the Cookley Foundry accounts and the similar appearance of the castings imply that the waterwheel, shaft, penstock and pipe were all cast in 1793. A lack of contemporary examples means that it is difficult to assess whether this was a unique experimental assembly or local practice of the period. The use of a pipe and penstock, rather than an open pentrough, is certainly common practice for this region but no other known example is constructed in this way. Cast iron waterwheels with the rings cast in two pieces have been noted at various locations and were locally cast by George Turton from the 1830s. Small, late 19th century pumping wheels often have the rings cast as a single piece, occasionally even the entire wheel cast as one piece. However, no other example with one-piece rings 16 feet diameter has been found.

The use of cast iron for the buckets of a waterwheel is also unusual. Of course, there would be no alternative in 1793 as rolling wrought iron plate was

Plate 12. The cast iron shrouds and buckets at Galton's Mill showing how the buckets are fixed to the shrouds.

in its infancy at that time. Only two other comparable surviving examples are so far known. The waterwheel at Bersham Mill (SJ307492), on the site of John Wikinson's ironworks near Wrexham, has buckets of similar form, bolted through the shrouds. Although the mill at Bersham is known to have been set up for corn grinding in 1828, it has been argued that the waterwheel could have been the one designed by John Wilkinson and used to drive his new boring mill at Bersham in 1779.42 If this could be proved then there is a possible link between the two sites which might account for some similarities. Samuel John Galton, as a member of the Lunar Society, was an associate of Matthew Boulton and James Watt who used John Wilkinson to bore their steam engine cylinders for about twenty years from 1775. The whole point of the Lunar Society was the free flow of scientific ideas so it is more than likely that Samuel Galton would discuss his ideas for an iron waterwheel with such eminent engineers. Townsend Mill at Bromsgrove (SO967721) is the other example though on this wheel the flanges are cast on the inside of the buckets. The wheel is marked on the arms "EDWARD WHITE ENGINEER REDDITCH". Edward White started his business

in 1868 which would make this a very late example of the use of this type of bucket. However, the arms are thought to be replacements on a much earlier wheel. It may be significant that, at the end of the 18th century, the mill belonged to a member of the Knight family.[43] One example of cast iron buckets of conventional form has been recorded at Brookhouse Mill near Denbigh (SJ073657). The wheel would appear to date from the mid 19th century and the use of cast iron in this context is inexplicable. An estimate by John S. Buttifant, dated May 1850, for a new 14 feet 6 inches diameter by 14 feet wide waterwheel at Lakenham Mill in Norfolk included "eight half rings" and "cast iron buckets".[44] It would seem, therefore, that the use of cast iron buckets may once have been quite widespread if not common practice. Photographs of one of the fan wheels at the main works in Belbroughton and one at Weybridge Lower Forge show that they also had buckets bolted through the shrouds. However, the buckets were of wrought iron on both wheels, at least in their last use.

Equally interesting is the choice of foundry. It is surprising that Cookley Foundry had a casting pit big enough for a 16 feet diameter "wheel" and deep enough for an 11 feet shaft. There certainly were foundries with this capacity in the 1790s as one-piece flywheels, engine cylinders and long pipe sections were being cast at various locations in the midlands and elsewhere. However, Cookley Foundry mainly provided castings to the Stour forges and had only been in operation since 1788. Considerable expertise would have been required to cast all the components for Galton's Mill. Both Samuel Galton and Samuel John Galton kept diaries which would almost certainly have answered all the unknowns. Although both diaries survived until the 1880s, recent researchers have not found them among the considerable collection of family and business papers in Birmingham City Archives or University College, London.

Acknowledgement

The authors are particularly grateful for the assistance of: John Allen, John Bedington, Steve Boon, John Brown, Dorothy Cope, Mary Hinton, David Jones, Peter King, Ken Major, Derek Ogden, Alan Stoyel, Martin Watts and Alun Williams.

References

1. Foxall, W., Notes on Belbroughton History, Belbroughton History Society.
2. Briggs, J. & Tucker, G., "The Mills and Watercourses of the Belne Brook", *Wind and Water Mills*, Number 1, Midland Wind and Water Mills Group, 1980, p30-4; and Gwilliam, H. W., "More Mills on the Belne Brook", *Wind and Water Mills*, Number 2, Midland Wind and Water Mills Group, 1981, p2-5.

3. Cope, D., *The Scythemen of Belbroughton*, Belbroughton History Society, 1989, p2.
4. Roper, J., *Early North Worcestershire Scythesmiths*, Dudley, 1969.
5. Clark, P., (Ed.), *The Transformation of English Provincial Towns*, Hutchinson, 1984, p173-83.
6. Birmingham City Archives, Galton Papers, MS3101/A/B/1/2.
7. *Ibid.*, MS3101/A/B/1/1.
8. *Ibid.*, MS3101/C/D/15/5/5; *ibid.*, MS3101/C/D/15/5/9.
9. Worcestershire Record Office, BA2636 009:1/52.
10. Hadfield, C., *The Canals of the West Midlands*, 3rd edition, David & Charles, 1985, p75.
11. Public Record Office, E150/1198 m.12.
12. Amphlett, J., Copy of Belbroughton Survey, 1879, private collection.
13. Worcestershire Record Office, BA5467/137.
14. *Ibid.*, BA5467/62.
15. Birmingham City Archives,Galton Papers, MS3101/C/D/15/1/1.
16. Singer, C., Holmyard, E. J., Hall, A. R. & Williams, T. I., *A History of Technology*, Vol. 3, Oxford, 1969, p34-5.
17. *Ibid*, p357-8.
18. Birmingham City Archives,Galton Papers, MS3101/A/B/1/3.
19. Knight Manuscripts, Kidderminster Public Library, Accounts of the Stour Partnership, documents 182 &183.
20. Worcestershire Record Office, BA5467/62.
21. *Ibid.*, BA5467/62.
22. Simmons, H. E. S., "Watermills and Forges on the Belne Brook", *Wind and Water Mills*, Number 1, Midland Wind & Water Mills Group, 1980, p36.
23. Jones, D. H., "Belbroughton, A Water-Powered Edge Tool District", *T.I.M.S. Eighth Transactions*, 1993, p2.
24. This synopsis is mostly drawn from:.
Smith, B., "The Galtons of Birmingham: Quaker Gun Merchants and Bankers, 1702-1831", *Business History*, Vol. 9, July 1967, p133-50.
Richards, W. A., *The Birmingham Gun Manufactory of Farmer and Galton and the Slave Trade in the 18th Century*, Birmingham University MA Thesis (unpublished), 1972.
25. Birmingham City Archives, MS28/69a.
26. *Ibid.*, Galton Papers, MS3101/C/D/15/5/9.
27. Lease in private collection.
28. Birmingham City Archives,Galton Papers, MS3101/A/B/1/1.

29. *Ibid.*, MS3101/C/D/15/5/5.
30. Abstract of Title to Bradford Estate, Private Collection.
31. Worcestershire Record Office, BA5467/140.
32. *Ibid.*, BA2636 009:1/52.
33. Birmingham City Archives,Galton Papers, MS3101/C/D/15/15/2.
34. Everett, D., "Worcestershire Watermills - References in Settlement Examinations", *Studies in Worcestershire Local History*, 7, p58-9.
35. Worcestershire Record Office, BA2636 009:1/52.
36. Simmons, H. E. S., *op cit*, p36.
37. George Watkins' notes and photographs are housed in the NMR, Swindon.
38. Also on microfilm at Kidderminster Public Library.
39. Ince, L., *The Knight Family and the British Iron Industry 1695-1902*, Ferric Publications, 1991.
40. Kidderminster Public Library, Knight Manuscripts, The Accounts of the Stour partnership, Document 182.
41. *Ibid.*, Document 183.
42. Braid, D., "Cast Iron Buckets For A Waterwheel", *Wilkinson Studies*, Vol. 2, Merton Priory Press, 1992, p21-6.
43. Worcestershire Record Office, BA2636 009:1/52.
44. www.norfolkmills.co.uk

Bibliography

Hinton, M. & Spier, A. (Eds.), *A Belbroughton Miscellany*, Belbroughton History Society, 1985.
Hurst, M. E., *The Quakers in Peace and War*, Swarthmore Press, 1923.
Uglow, J., *The Lunar Men; The Friends who made the Future 1730-1810*, Faber and Faber, 2002.

CORN MILL WORKERS IN CENSUS RETURNS, GLOUCESTERSHIRE, 1841-71

M. J. A. Beacham

The term 'miller' is not defined in census returns. It would seem to cover both millers who owned their mills as well as those who rented or leased them, besides those who simply worked in them for someone else. During the period under study more than two thousand men and a few women were millers in Gloucestershire by one of these definitions. A successful miller, whether owner or tenant, might employ a journeyman; a 'miller's man', who might describe himself as a 'working miller' or a 'grinder' if he spent most of his time simply operating the mill. Also he might employ a loader or a waggoner and, like many businesses before the advent of the telephone, also an errand boy. If he had sons, they were expected to follow their father into the business, and may well have had to 'go through the mill' and learn the different jobs performed by the foregoing employees, before taking their places when they were of an age to do so. They are often termed 'Assistant Miller.'

Anselm Bailey, 'a mealman', ran Boseley Mill near Westbury on Severn in 1841 with the help of three male servants, whose individual jobs are not given. Ten years later, he was still a mealman, and had an apprentice and two waggoners working for him. In 1861, then 'a mealman, maltster and farmer' of forty-one acres, he and his son William ran the mill, with five labourers working the farm, and perhaps lending a hand at the mill as required. By 1871, when Anselm was seventy-five, he was listed as 'a miller and farmer', and William was running the mill with his one labourer working the farm.

An apprentice, in the sense of an indentured trainee, would appear to have been rare. There are two recorded in the Gloucestershire census returns of 1841, nine in 1851, three in 1861, and seven in 1871: not a lot for the number of corn mills in the county. It has been pointed out, however, that learning how to simply operate a mill is not a lengthy business. It must also be borne in mind that journeymen in their twenties may well have served apprenticeships between censuses, and have thus slipped through the net, so the actual total may have been considerably higher than it appears to be.

Only experience could make a flour miller, and most journeymen moved around to acquire sufficient know-how to eventually take on a mill of their own. Journeyman Robert Keylock was living in Arlington, Bibury, in 1851. From the

parishes in which his children were born, it seems that in 1852-3 he was working in Lechlade; by 1856, in Ablington; and by the time of the 1861 census he was living next to Laurence Castle's mill in Coln St. Aldwyns. Laurence Castle was 'a mealman and baker', employing a man to do the baking and Robert Keylock to take care of the milling. In 1871, Keylock's two eldest sons were working as a groom and a ploughboy respectively, with Keylock himself seemingly still, in effect, Castle's journeyman, although described as 'miller.' Although this manner of tracing their movements is not infallible, the work histories of a number of married journeymen with young families can be deduced.

Plate 1. Arlington Mill, Bibury. Notice the buttresses which were added when steam power was first used in 1859.

There were twenty-two journeymen millers in the 1841 Gloucestershire census, of whom at least six became tradesmen in their own right. In 1851 there were fifty-six journeymen listed, with at least eight becoming tradesmen; by 1861 there were twenty-eight journeymen, with at least five going on to become tradesmen; and seventeen journeymen in 1871, of whom, seemingly, only one became a miller. These figures from 1851 onwards do not take account of journeymen like George Millard of Nailsworth who spent his working life from 1841 to 1881 at that level, apparently never attaining trade status, despite moving

to Dudbridge in 1871. The few similar journeymen are counted only in the year that they appear in the census returns for the first time. These figures, again, may seem low, but for most rural mills one miller was enough. The urban steam mills employed 'millers', many of whom were in lodgings and were not native to the towns in which they worked. They were, effectively, journeymen too. Mill foremen make appearances from 1851, controlling the (usually young) workforce, and clerks, too, became more numerous as time went on.

As might be expected, John Reynolds at Gloucester Dock was among the largest employers of millers and mill workers in the county. In 1861, for example, there were thirty-seven men and nine boys in his steam powered flour mill, and by 1871 the total had risen to fifty-four. In Stroud, Samuel Butt and Samuel Skurray, were employing fifty-five men, two boys and seven women in their three mills at Stratford, Cainscross, and Badbrook. Samuel Healing at Tewkesbury was employing nine men and two boys in his original watermill by 1851. Ten years later, the number employed in his mill, which had been updated and improved but was still driven by water power, had risen to twenty-seven. Once this mill had been superseded by a steam powered one in 1865, its twenty-one pairs of stones needed thirty-six men and thirteen boys to service them. Yet

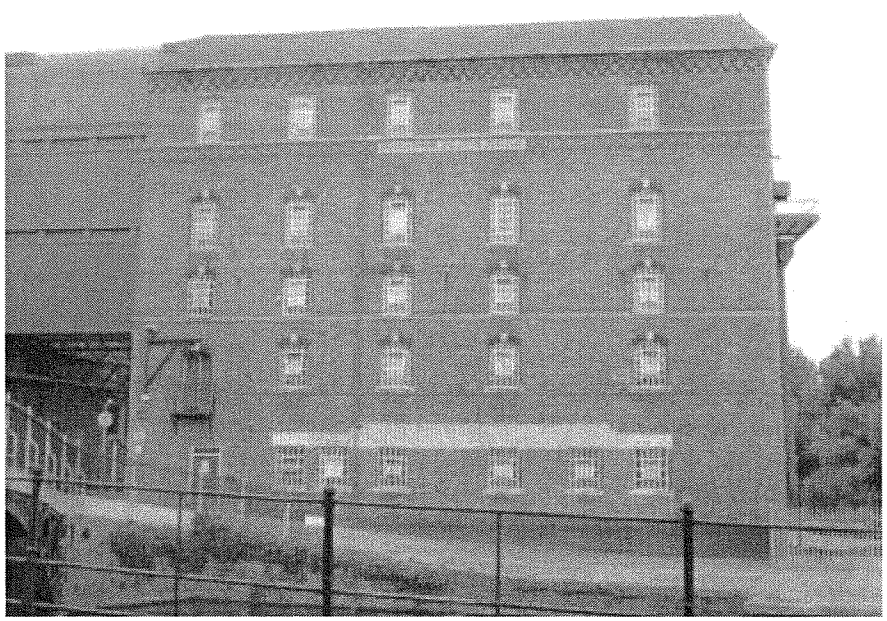


Plate 2. Borough Mill, Tewkesbury, the original steam powered mill of Samuel Healing. After 160 years of production its new American owners closed the mill in 2006.

another Samuel, with the surname Sims, employed sixteen men and four boys at Lightpill Flour Mills in Rodborough during the 1850s. However, not all steam mills had a large payroll, the Albion Steam Mill in Cheltenham had only two men and two boys in 1871; Framilode Mills had only three men; and the roller plant at New Mills, Wick, needed only six men and a boy for errands.

The advance of steam power is reflected in the increasing number of 'engine drivers' in flour mills, who were chiefly boiler men and stokers. None are recorded in 1841 or 1851; only six in 1861; but twelve by 1871. There were doubtless others who were actually recorded as 'servant' or 'labourer,' but the trend is visible. The same job title also appears in the later census years in cloth mills, collieries and breweries as they also turned to steam power in ever greater numbers.

Only four employees in flour mills were given specific job titles. In 1861, Joseph Freland,15, of Stroud, was 'Hopper Boy' in an unnamed flour mill, which might have been Stratford Mill as it was not far from his home. The term is now used for an American automated device which cools meal as it comes from the stones, and was exceedingly rare in English mills. Its use in 1861 may refer to a lad who made sure the grain got to the right hoppers and that they were kept topped up to prevent the stones running dry. A number of boys worked in the larger mills and some may have been similarly employed. In the same year, 45 year old Henry Percell of Butterrow, Rodborough, was recorded as a 'Smutter.' Again this term is now used of a machine, one that cleans smut from the grain preparatory to milling. It may be that Henry's job was to check consignments of wheat for signs of contamination, though it seems more likely that he operated a smutter machine. To have someone on this sort of job regularly might seem to imply poor storage of grain either by the supplier or by the mill - which again was not named. The third occurrence is in 1871, in Stroud, where James Compton was a 'Flour Dresser.' This term, too, refers to a machine or series of machines, all of which were available at the time, and so it is likely that James was the machine operator. Another Flour Dresser was John Whitcombe, aged 37, who lived next-door-but-one to Ryeford Mill, Stonehouse, in 1861. In each of these cases, someone doing such a job regularly would have to be employed in one of the larger mills that was not yet completely mechanised. In the next census, incidentally, Whitcombe was listed as 'a miller', perhaps indicating a step up the ladder.

Many millers had 'Servants,' and the term is best defined as 'employee.' If the servant was female, her work would most often be to do with the miller's house and family, though not always: Barratt's Mill in Cheltenham had a forty year old woman as 'Miller's Boy' in 1851. If the servant was male, it may be assumed that his work would be based around the mill. However, many whose status is given as 'Servant' had their occupation given not as servant, but as

miller, loader or carter. They lived at the mill, often sharing the miller's accommodation. This had been customary in many places in various endeavours, particularly in farming.

A number of millers were also farmers, and some farmers had millers among their servants. Only fifty-four of the one hundred and seventy-three farmers and millers noted give the size of their holdings, too small a proportion from which to derive any useful conclusions. It can be assumed, even so, that the thirteen with less than twenty acres were primarily millers who happened to have some kind of smallholding and the twenty-two with between one hundred and four hundred acres were farmers whose property included a mill. As an example, Edward Besley, accompanied by his son James, was working as servant-miller to a Thornbury farmer in 1851. Does this imply a hitherto unknown farm mill at Thornbury? Can such entries help to pinpoint other unidentified mills? At Yanworth, the farmer who owned the mill as part of his farm put in a servant-miller to work it, hoping to get the best of both worlds, a mainly commercial mill that nonetheless would deal with the farm's orders first. The neighbouring mill at Stowell operated in a similar environment, and in fact continued working until about 1990.

Plate 3. Stowell Mill, a typical well preserved estate mill in 2004.

THE GREAT DIURNAL OF NICHOLAS BLUNDELL OF LITTLE CROSBY LANCASHIRE 1702-1728

Transcribed by Robin Clarke

Introduction

Little Crosby is a small village in South-West Lancashire, about 6½ miles north of Liverpool, in the old parish of Sefton. Not much has changed since the early 18th century as the urban sprawl of the city stops just short of the village. At some time in the past the land around Little Crosby Hall was walled off to form parkland maintaining the rural aspect of the area. The road layout is still very much the same as it was some 300 years previously.

The manor of Little Crosby was held by the Blundell family from 1362 but during the Reformation they remained resolutely Catholic, refusing to acknowledge the Elizabethan Settlement. A number of generations of Blundells spent time in gaol for their recusancy including Nicholas's grandfather, known as William the Cavalier. Nicholas, who was the eldest of fourteen children, lived as a child at the hall with his parents and was educated by his grandfather before being sent to the Jesuit College at St. Omer in Flanders. After returning to Little Crosby he helped the family in running the estate. In 1698 his grandfather died, followed in 1702 by his father William, leaving Nicholas to succeed as Lord of the Manor at the age of 32. He also inherited property elsewhere, such as in Ditton (9 miles east of Liverpool), Ince Blundell, Orrell (about 4 miles west of Wigan) and Warrington.

Unlike his ancestors, Nicholas was not troubled by the same religious difficulties, except a shortage of money caused when the family had to buy back their sequestrated estates in the mid-17th century. Eventually he was able to negotiate a marriage with the younger daughter of Lord Langdale of Holme in 1703, but only with a relatively small dowry. However, the Blundell religion became a problem again in 1715 due to suspicion of being involved in the Jacobite Rebellion led by James Stuart. Nicholas considered it prudent to absent himself and his family from Little Crosby, going initially to London and then to Flanders between November 1715 and September 1717. He returned without his two daughters, who remained in a convent in Flanders until 1723.

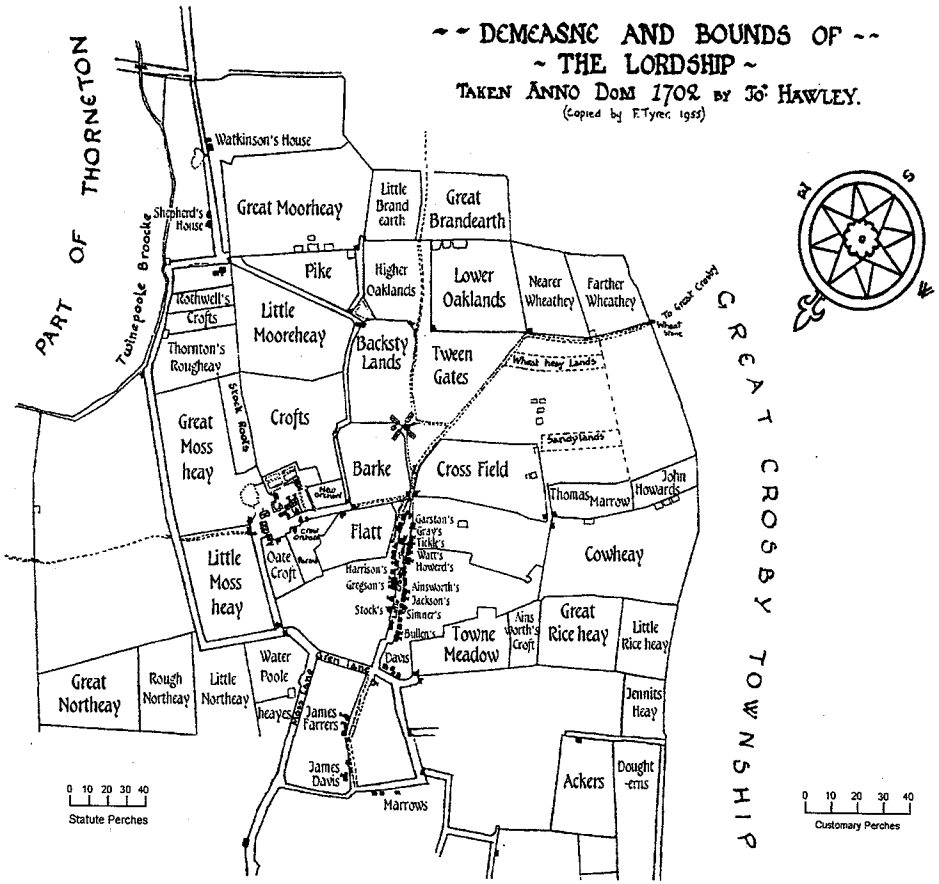


Figure 1. Part of the map of the manor of Little Crosby made for Nicholas Blundell in 1702. The windmill is shown in the middle of the map.

Nicholas Blundell did not have a male heir and although his elder daughter married in 1730, she died without issue two years later. His younger daughter married in 1733 and bore a son, Christopher Peppard, two years before Nicholas died in 1737. Unfortunately, Christopher died before his parents and the estate passed to his younger brother, Nicholas Peppard, in 1771. The following year Nicholas Peppard assumed the name "Blundell of Crosby" and the arms of the Blundell family.

In 1702, when Nicholas Blundell became lord of the manor of Little Crosby, he introduced a whole new set of books for recording his and the manor's activities. A new Tenant's Book noted all land transactions and a Disbursement book recorded all monies spent. He also had a Letter Book in which he wrote

drafts of letters, a Prescription & Recipe Book, and a book for recording anecdotes, jokes and magic tricks! However, his greatest work was his Great Diurnal or diary which covered the period from 27th July 1702 to 4th April 1728 with an entry for every day except one.

The Diurnal has had a long publishing history, beginning in 1895 with extracts covering about a fifth of the Diurnal, called *Blundell's Diary*. In 1952, Margaret Blundell produced a book called *Blundell's Diary and Letter Book* containing extracts from the Diurnal, the Disbursement Book and the Letter Book. Between 1968 and 1972 the Record Society of Lancashire and Cheshire published three volumes, edited by Frank Tyrer, containing a transcript of the whole of the Diurnal. This is of interest to molinologists because Nicholas Blundell owned a windmill as part of the Little Crosby estate and many entries refer to his mill. The information about the windmill has now been extracted from Frank Tyrer's transcript of the Diurnal to present a picture of the life and times of an early 18th century windmill. Non-mill information has usually been omitted, these part-entries are indicated by a † sign. The idiosyncratic spelling and use of capital letters has been reproduced as in the original document. The original editor's notes have also been reproduced where relevant and some further notes added.

Diurnal Entries

1703

29th September.† I stayed in my Closet Receiving of Rents & paying Wages to Servants.
This day I paid two quarters wages to most of my servants, and the some of them were but one quarter behind. I set both down as paid this day being they were paid to this present 29. [*Ed. Note.* 14 payments listed including]

Walter Thelwall, Steward		£3	0s 0d
Thomas Howard, Butler		£1	0s 0d
Rich. Jump, Ploughman		£2	0s 0d
Willi: Starkey, Cowman,	at their	£4	0s 0d
John Kerfoot, Miller	own board	£4	10s 0d
Catherine Fisher, Cook			17s 6d

1704

23rd March The Higher Spindle of the Mill was broke.
[*Orig. Ed. Note.* Mending the Spindle of the Mill which was broke by the Wind, 4s 6d]

25th May. The Miller fidled in the Mill-Kill to the Neighbours.
[*Orig. Ed. Note.* The mill-kiln in which grain and hops were dried for making malt.]

1705

Fron Nicholas's disbursement book.Payments for June to December 1704.

20th January

Mill wrights work	4s	2d
Drying 752 Busshell of Oats at four pence per Score	12s	6d
Malting 96 Busshell of Barly	18s	0d
Dutty to the Queen for 96 Busshell of Barly	£2 12s	11½d
Smiths work at the Mill & sharpening Picks	5s	0d

20th August Henry Dauber came to prepare a New Millstone to be put up.
[*Orig. Ed. Note.* Henry Dauber, millwright, and his brother, Richard, were often called in to do work at the Little Crosby Windmill. The cost of a millstone at this time varied between £4 and £4-10s.]

23rd August I discoursed George Cottom in the Mill concerning Lord Molineux & John Hurst about wood.

Figure 2. A portrait of Nicholas Blundell.

29th August I was at the Puting up of my new Millstone.

1st September† The Mill rights finished, they had put up a new Stone, New Coggs & Rongs, a New Coller & Saddle for the Shaft, the Iron Geer was new drest & a new gate plased in the Step.

28th November† I began to pull down the Fire place and Spark-Stone etc in the Kill to prepare it for a Garden house.

1st December† I sent my Cart to fetch Darbys Oats to the Kill.

7th December Philip Syer began the division Wall between the Kill & the Gardiners-Hous.

13th December Richard Cartwright drue some Nailes out of the Burned Joyses in the kill.

1706

17th January† I shewed Mrs Mary Gorsuch the Oat-Kill. we walked through the town.

5th April† The Mill-Rights went hence.

22nd June† My Lord Langdale went to the Buriall of Mrs Metham, my Brother Midleton & I walked to the Mill & to the Church yard.

[*Orig. Ed. Note + addition by R. Clarke.* Lord Langdale of Holme upon Spalding Moor at SE 8138, twelve miles ENE of Selby, Yorkshire, was his father-in-law. Peter Middleton, Esq. of Stockeld at SE 3749, 2 miles WNW of Wetherby, Yorkshire, was married to Elizabeth, the sister of Nicholas's wife.]

3rd October† I had severall Coggs brocke in my Mill though it was but a moderate Mill wind.

1707

19th February† Ralf Low desired I would let my Lord Molineux have my new Millstone

21st February† My Lord Molineux his Teame of Oxen took a New Milstone from my Mill-Hill which I let him have.

4th March† Ralf Low payed me £4-5s-0d for a Mill Stone which my Lord Molineux had from me.

20th March† I and Walter Thelwall rid into the Morehouses to Examain after Torves of mine which were said to be stolne by some of the Family of William Sumner the Miller.

28th March† I Acquainted William Sumner the Miller that I had got a Witness against some of his Family.

27th May† I had a Millstone brought.

3rd July† Coming home [from Stony-Hurst, Dungenhall* & Ormskerk] I stayed at Whitley Hills where I saw them rase up a Millstone.

[*Orig. Ed. Note.* The quarries at Whittle-le-Woods, near Chorley, were noted for the stone which was excellent for making millstones.] (See *Wind & Water Mills*, Number 22, 2003)

[*Ed. Note.** now Dunkenhalgh Hotel, Clayton-le-Moors, at SD 740301]

12th September† I was out of order with a Cold, I walked to the Mill & took a nap in it.

21st December I went to the Mill & finding a great number of Baggs with Ground corn in, we counted them & there were just 100 beside nine that were but nuly carried away, there was not one Bag to grind.

1708

7th February My Wife & three Servants walked to Leverpoole, I walked after them & Shot at the Sea-side. I called to look at the Oyl mill, My Wife etc was come to Leverpoole before me, we all dined there at the wool-pack. My Wife & I went to Mr Hursts, ere we came out of Town Mr Plumb came to us & profered us a horse but we did not accept of it.

18th April † The Mill was Lickered & whisked about.

[*Orig. Ed. Note.* Oiled and lubricated. Very often done with lard.]

25th October† Henry Dauber came to work here in order to put up a New Millstone.

29th October† Henry Dauber put me up a New Mill Stone, I was at the puting of it up.

30th October† The Mill-Rights went hence.

1709

27th January† Henry Dauber came to Fall some Crab Trees and to make them into Coggs and Rongs.

[*Orig. Ed. Note.* Crab apple tree wood was often used to make the teeth in the large wooden gear wheels of windmills.]

25th February Wages for the quarter ending 25th March 1709 included
John Kerfoot, Miller at his own Bord. £2 5s 0d

26th February† I sent a load of Barly to be Malted at Sefton, this being

the first I sent thither and I fetched a Load of Malt from Mr Houghtons kill at Leverpoole; it being the first I have had made there.

23rd March From Nicholas's disbursement book, (selected items).

Mill-rights 4½		3s	0d
Weaving Sail Cloth at 1d per yard		2s	6d
Making two Kill-full of Malt		9s	0d
Duty for two Killfull of Malt	£1	7s	7½d
Sale Cloth at 4¾ per yard		8s	7½d
Sale Cloth 60 yards at 5d per yard	£1	5s	0d
A Sive and Ridle for the Mill		2s	6d

28th March† I took William Ainsworth with me to the Mill & took up tole Corn it being the first time I or he had done anything in that nature since Thelwall left my service..............then I came home & sent Henry Sumner with a Cart to buy a Load of Seed Oats at the Grange which he did, when he came hom I sent him to Mr Smiths with a Load of Barly to be Malted & to fetch a Load of Malt from thence. I helped to prepare a Bed in the Servants Chamber for William Ainsworth to lye in.

30th March† William Ainsworth cut down the Spreding Crab tree that grew over the Lous trap.

20th April† William Ainsworth tryalled some Barly and made some addition to the Tole Corn* and made some other alterations in the Granery, he & I took some Corne to the Mill and brought something from the Mill, we also removed my 3 youngest colts into the Pick.

[*Orig. Ed. Note.* *Corn taken as payment for grinding corn at Blundell's Windmill in Little Crosby. It was stipulated in leases that tenants must grind their corn at the lord's mill, and usually every sixteenth measure of corn was taken as toll or payment for such grinding. It is this corn which Nicholas calls the tole corn. It was also stated in most leases made by Nicholas that the tenant *"and all who live on the premises must grind at my Mill or pay 2s-6d per Busshell."* (DDB1/54/42, Lancashire Record Office)]

9th May† John Blundell & his Prentice worked here in mending & macking Secks, Swill-sheets and such like.

14th May† I bought a new half Busshell and saw it Cut & sealed in the Exchange. [at Leverpoole]

[*Orig. Ed. Note.* This had to bear a seal to show it was a correct measure.]

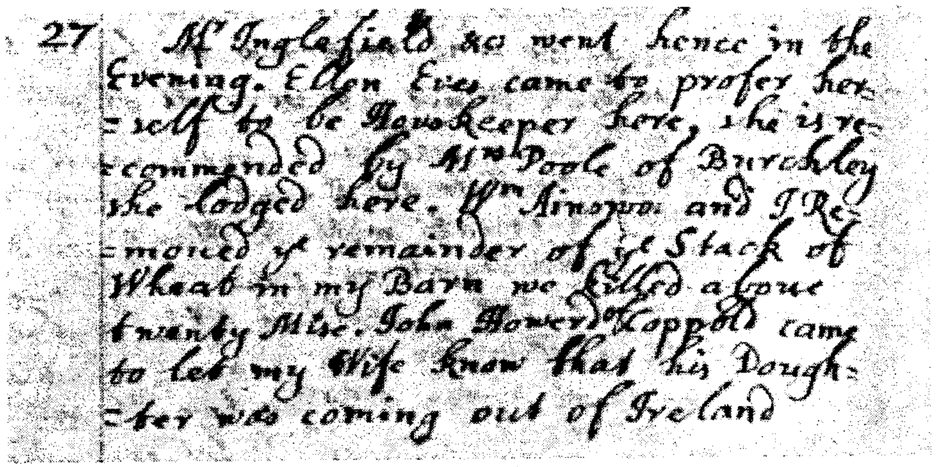

27 Mr Inglefield &c went hence in the Evening. Ellen Eves came to profer her=self to be Housekeeper here, she is re=commended by Mrs Poole of Birchley she lodged here. Wm Ainsworth and I Re=moved ye remainder of ye Stack of Wheat in my Barn we filled above twenty Mise. John Howerd of Coppold came to let my Wife know that his Dough=ter was coming out of Ireland

Figure 4. An example of Nicholas Blundell's handwriting from a page of the Great Diurnal showing the entry for 27th July, 1709.

20th May† I marked my Sacks.

2nd August† I sent my Miller to Leverpoole to buy Pole Davy for Mill Sales.

[*Orig. Ed. Note.* Poledavy or pole davy - a coarse canvas or sacking, originally woven in a town in Brittany from which it derived its name.]

[*Ed. Note.* Pouldavid is now a southern suburb of Douarnenez (23 km NW of Quimper) in Finistère. The sailcloth was woven 10 km to the east at Locronan, which "From 1469 through to the seventeenth century Locronan was a hugely successful centre for woven linen, supplying sails to the French, English and Spanish navies. It was first rivalled by Vitré and Rennes before suffering the "agony and ruin" of the nineteenth century so graphically described in its small museum." Douarnenez is an important fish canning centre (tuna, sardines). There is a scaled down 18th century crane operated by a wooden treadmill. See Greg Ward, *Brittany & Normandy, The Rough Guide*, 6th ed., 1999, p.270/1.]

13th August Pole Davy for Sail Cloth for the Mill, 'tis so good, that 'tis supposed it would have serv'd for two more Voyages, it cost per yard about 8½d in all £1-15s-8d.

[*Orig. Ed. Note.* Nicholas apparently bought second-hand material here.
From Nicholas's Disbursment Book

17th August

Spent in buying the Pole-Davy	2s	0d
Cording for Mill Sails	2s	0d]

13th August I discoursed William Sumner the Miller of Bootle about removing him out of this Town.

[*Orig. Ed. Note.* Although William Sumner was the miller at Bootle, 3 to 4 miles away, he lived in Little Crosby. He was a most unsatisfactory tenant, and was frequently fined by the manor court for not clearing his ditches, for not looking after his fences or for allowing his cattle to stray. He had also been in serious trouble with Nicholas. See 20th March, 1707.]

23rd August† The Miller & I consulted how to shape the Pole Davy to the best advantage for Mill-sailes.

10th September† The Miller played here after Supper & some of the Servants &c danced.

20th September† Henry Dauber came to see what was a miss with my Mill Shaft.

19th October† I helped John Tickley to naile the Sailes upon the Fan for Winnowing Corn, when we had done it we tryed it.

7th November† Henry Dauber the Millwrit came to work here.

11th November† I brought home a Tree which Henry Dauber bought for me to be a Mill Shaft.

[*Orig. Ed. Note.* Great care was taken in choosing a tree to make a millshaft. Generally an oak tree about one hundred years old was used; and the best time for cutting down the tree was October. Before this the bark of the chosen tree was stripped off, so the sap was practically dried out by October.]

22nd November† I sent William Ainsworth to Leverpoole to borrow some Pullys to help me up with my New Mill Shaft.....I payd the two Sawers Richard Sefton & Joseph Carter who had been working for me chiefly about the Mill Shaft & Sailes.

23rd November† The New Shaft was put up, 'tis the first I ever had with six Sailes.

24th November† I was a good while in the after-noone at the Mill & helped them to fix the Cogg Wheele.

28th November† I stated accounts with Henry Dauber and payed him in full of all Accounts. I winnowed both Oats & Wheat.

30th November† Henry Dauber went hence, he having set my six sale Mill agate.

28th November From Nicholas's Disbursement Book

Mill Wrights at 8d per day when they put up my Shaft with six sailes	£1	14s	8d
A Tree for a Mill-Shaft	£2	1s	0d
Spent in buying the Tree & for Victualls		2s	6d
Given the Millwrights when they had Finished		1s	10d

[*Orig. Ed. Note.* The introduction of six sails on the windmill at Little Crosby was a striking innovation, for out of the many thousands of windmills built in England only about sixty or seventy had more than four sails. It is possible that Nicholas was a pioneer in the use of more than four sails. John Smeaton (1724-1792), builder of Eddystone Lighthouse and an expert in mill mechanics, is generally considered as the man who did much to encourage the use of more than four sails in windmills. The first mill he built of this type was a mill with five sails at Leeds in 1774, some 65 years after Blundell had first used six sails. How long the Little Crosby mill continued with six sails is not certain. A chart of the sea-coast of South Lancashire in 1737 shows the mill with six sails (see below). But on another chart of the entrance to the Port of Liverpool, 1764, the mill is shown with four sails. (DDB1/24/25 and DDX/99/5, Lancashire Record Office)]

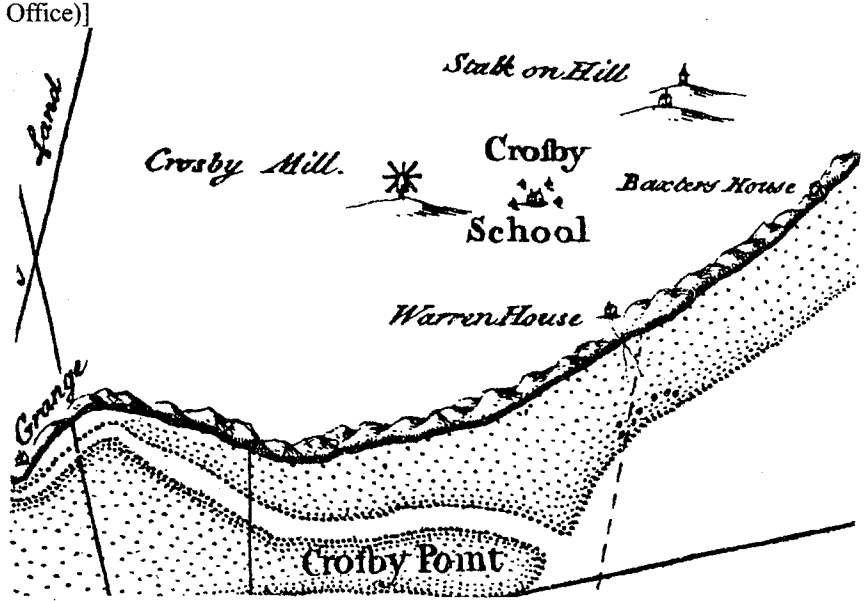


Figure 5. Part of the *Chart of the Sea Coast* by S. Fearon & J. Eyes, 1736-7, showing the six sail mill at Little Crosby belonging to Nicholas Blundell.

16th December Further entries from Nicholas's Disbursement Book.

Sale Thread		1s	10d
Timber for a Saddle for the Mill		2s	0d
Hogs Grace at 4d per pound		4s	0d

23rd December Selected items (Not entered until 3rd March 1710).

Making 2 Kilfull of Malt		9s	0d
Duty for 2 Kilfull of Malt	£1	6s	10d
Smiths Work for the Mill, Cheefly about the Shaft.	£1	9s	6d

28th December Selected items.

Total Charg for Feying, Delving, Wheeling and Dressing 365 Loads of Turf for my own use for Hous, Kill & Mill £4 18s 8½d

6th December† I sold 12 Busshells of Wheat to Parson Richmonds Man for 6s-8d per Busshell & he is to fetch it from hence.

7th December† John Blundell maid & mended Sacks.

1710

27th February† Henry Dauber and his Nephew came to work here and to make a Brake for my Mill. Richard Hewit was here, I sold him 60 Busshells of Oats.

28th February †Henry Dauber and my Miller went to Leverpoole to look at the Breaks that are in some of the Mills about that Town.

9th March† The Millrights finished here & went hence.

22nd March† I layed up a Melder of Meale in the Storehous.

[*Orig. Ed. Note.* A melder - a quantity of meal ground at one time.]

6th April† The Higher Bark Gate was hung to a Stub made of a Mill Shaft.

25th April† I pay'd Mr Smith for making me four killfull of Malt & for duty for it.

28th April I set a good while in the Mill talking with the Miller. I brought home with me a young Rabet which the Miller told me had been suckled or at least layen with his Kat and kitlings ever since the 25th. I put it to a Kat of mine that has kitlings and she takes well to it.

1st May† The Young Rabet dyed that was suckled or at least nurished by my Kat.

22nd June I Stated Accounts with William Ainsworth. William Athertons Wife and Henry Heys Wife Lodged here [Wives of two of his tenants at Ditton] I walked with them through the Town, and showed them the Gardens, Mill and Hous.

5th August† Henry Trustrom bought home two Peeses of Sail-Cloth he had woven for me. I payed him for it & we cleared of all Accounts between us.

Weaving Flaxon Cloath	2s	2d
Winding Hempen Yarn both Teer and heards at one Farthing per Pound	1s	6d
Weaving Sail Cloath some 3 Quarters broad, other one yard broad at 1½d per yard	6s	3d

7th August† Thomas Marrow began to make me new Sail-Cloaths of the Cloth I had got Woven on Purpose.

7th September† William Blacklidge brought me a Mill Stone from Whitle Hills.

14th September† I took William Ainsworths Accounts of Corne Uesed in the House, got by the Mill Ec. I booked my Receipts for August. William Ainsworth took possession of the Gatehous Chamber to keep his Writings, Ec. in.

13th November† Henry Dauber the Mill-right came to put me up an other Lyer.

[*Ed. Note.* In all probability the *"lyer"* referred to the lower millstone or bedstone.]

15th November† Henry Dauber put me up a New Lyer in my Mill.

18th November† I took William Ainsworths Accounts of Corne got by the Mill, uesed in the Hous, Ec.

3rd December I sent my Miller for the Mill rights my Mill having sufferd very great Damage in the Sailes & Shaft Ec. this last night by the Winde.

5th December† Richard Dauber came to Repair the great loss I have sufferd in my Mill.

6th December† Henry Dauber the Millright & his Nephew James came to mend my Mill and the two Sawers Richard and Joseph came to doe the Sawing Work for it. I went a coursing and found a Hare set & sent for John Farer to see it coursed, it led us such a Round that I lost both Men & Dogs so came home and helped Henry Dauber to see whether I had any Tree growing about the Hous proper for a Mill Shaft.

7th December† I felled an Oak Tree between the New Orcherd & the New Grounds for a Mill Shafft.

8th December† I got the Tree to the Saw Pit as is to be a Mill Shaft.

11th December† Charles Howerd got me some Malt gran at Leverpoole & brought me home two Fir Baulks for my Mill from Thomas Hurst.

13th December† Whilst I was with the Millrights at the Mill, Parson Wairing came to us and he came home with me and stayed a while.

20th December† Whilst I was at the Mill with my Workmen, Yeamond of the Gore Houses came to speake to Henry Dauber, he came home with me & stayed some time. I killed a fat Little Cow.

21st December† I put up a New Mill Shaft.

22nd December† I sent William Ainsworth to Leverpoole for some Nailes for the Mill.

28th December† Edward Clifton came hither to agree with me about painting part of my Mill, but we made no bargan.

1711

9th January† My Mill was set a going, it being the first time it went since it was so ill Brocken. I payed what I ought to the Mill Rights they having done working for me.

19th December From Nicholas's disbursement book.

For Balks at 18d per foot for Whips for the Mill Sailes	£3	1s	0d
Tarr		1s	7½d
Wading for peesing [piecing] the Mill Sailes		1s	0d
Smiths work done at the Mill since it was brocken by the Storme		19s	0d

Also from Nicholas's disbursement book.

9th January

Mill rights at 8d per day	£2	3s	4d
Given the three Mill Rights		1s	6d
Carpinders work at the Mill		8s	0d
Nailes for the Mill at 4d per Pound		11s	4d

27th January

Taylors Work Cheefly for maiking Sailes		8s	6d

20th January† I book William Ainsworths Accounts of Corne uesed in the House, got at the Mill &c.

30th January† I paid Mr Smith for making one killfull of Malt for me & duly for it.

9th February† Speed [one of Nicholas's greyhounds] was ill hurt by the Mill Sailes.

17th February† Thomas Blundell turned the tail end of my Mill Shaft with his turning Tooles that I might order it so with Iron that it could not be blown out of the Mill.

6th March† I had six hands very busy all day winnowing Oats & Barly, with a good Wind they Winnowed 196 Bussheils & ½ but had not time to clense the Barne.

22nd March† I went with Richard Webster our Smith to the Mill to shew him a Modell that the Miller had made of wood for him to make some Iron work after to put to the Taile of the Shaft to keep it from going out of the Mill.

From Nicholas's disbursement book.

Rich: Webster the Smith his first bill of work done for me since Christmas

Shoeing Horses at 14d per four new Shoes and the Smith has the old ones		16s	5d
Plough Irons new laying & Claping Ploughs		13s	7d
Coach, Carts, Harrows & other Husbandry		12s	5d
Gates & Doars out of the Hous		1s	11d
Work done within the Hous		4s	5d
Iron work at the Small End of the Mill Shaft at 4d per Pound	£1	1s	8d

5th April† I walked out with Cozen Scarisbrick to Look at his Plantations of Oaks Ec and to his large Mill-damb.

23rd April† John Webster the Bayly came to beg Corn, I gave him some. I went to the Mill & stayed a good while there & proposed to the Miller to take his Son into my Service.

[*Orig. Ed. Note.* John Kerfoot or Carefoot was miller from 1702 to Michaelmas 1715. His son, Henry, eventually became coachman in March 1713.]

22nd May† The Miller played on his Fiddle to the Young People on the Green.

28th May† John Lidiat & his two men came to make me a new pair of Cart-wheeles. Henry Dauber & His Brother Richard came to put me up a New Mill-Stone.

4th June† Henry Dauber put me up a New Millstone.

6th June† The Mill Rights went hence having Finished their Work.

13th June† I took Account of William Ainsworth of Corne uesed in the House, got by the Mill Ec. and Finished the Accounts of his Receipts & disbursments. I began to sow Frensh Wheat* and Barly in the Slip. I began to weed my Flax. The Servants killed 19 Adders about the Swinehouses

[*Orig. Ed. Note.* *French Wheat or buckwheat.]

1st August† The Miller Fidled to the Children i'th Hall.

13th September† I sold some Timber to Mr Shepard for the repare of Formby Mill.

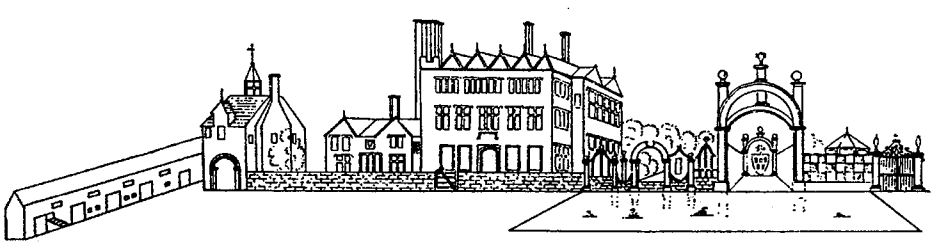


Figure 6. Crosby Hall in 1738. The Tudor Hall and Gatehouse on the left were demolished in 1748-6. The 17th century stables on the extreme left still exist.

27th October† Henry Trustrom brought me home from Weaving two Small Webs of Flaxon Cloth.

15th December† I stated Accounts with William Ainsworth for his Receipts & Disbursments for my use and took his Accounts of Corne got by the Mill, uesed in the House, Ec.

26th December† I payed my Miller half a years Wages, he dined here & then designed to goe home.

30th December† I shewed my Mill to Cozen Thomas Gelibrond, he and I walked to Ince, our Wives and Mrs Howet went in the Coach, we all came home from thence together in the Coach.

1712

8th January† Charles Howerd brought me a Cart Load of Skilling dust from Sefton Mill.

[*Orig. Ed. Note.* Skilling - shilling, sheeling, or shilly - the husk and dust of grain left after winnowing. It was used as a fertiliser.]

6th March† James Davy the Slator began to paint my Mill.

13th March† James Davy Finished painting my Mill.

25th March One Quarter's Wages paid to

William Ainsworth, in nature of a steward	£1	0s	0d
John Banister, Butler and Gardiner		18s	9d
Charles Howerd, Head-Hind, Groom and Coachman		15s	0d
Robert Tompson, Ploughman		15s	0d
William Weedow, Cowman	£1	0s	0d
John Kerfoot, Miller at his own Board	£2	5s	0d
Ellen Eves, Wives Maid and Nursry Maid		15s	0d
Betty Harrison, Chamber Maid & Dary Maid		10s	0d
Catherin Howerd, Cook		10s	0d
Mr Aldreds Sallery	£2	0s	0d

23rd April My Miller was at Leverpoole but came not home with us.

31st May† I stated my Accounts with William Ainsworth for his Receipts & Disbursments for my use since March the 12th and I took his Accounts of Corne ues'd in the hous, got by the Mill Ec. since Christmass last.

3rd June† I went to the Snigary [eel-traps]..... thence I went to Thomas Ridings & advised with him about making Lincy Wolcy Saile-Cloths.

28th August† My Wife, Mall Butler and I etc went after Supper to the Mill, we dansed in the Kill.

29th August† I stated Accounts with William Ainsworth for his Receipts and Disbursments for my use since the last of May & for the Corn got by the Mill, uesed in the Hous Ec.

6th September† Being indisposed I walked to the Mill and sat there some time.

22nd September† This being Mallys Birthday the Miller played to the Servants after Supper, Mally began to Joyn in Writing.
[*Ed. Note.* Mally was Nicholas's elder daughter Mary]

27th October† Henry Trustrom brought me home a Webb of Lincy Wolcy doble Twill Sale-Cloth. (See entry for 3rd November 1712)

30th October† My Miller bought me at Leverpoole some very good Cloth for Mill Sailes viz. Hollan Duck and English Cloth.

3rd November† Thomas Marrow began to make very good Saile cloaths for my Mill of Holland Duck, Lincy Wolcy, Ec.
[*Orig. Ed. Note.* Blundell was experimenting with a new material for the sails of his windmill, which at this time had six sails, and not the usual four. The material was linsey-wolsey, a mixture of linen and wool, See June 3rd, October 27th and 30th, and the following entries in his Disbursement Book:-

21st September
Spinning Wool at 3½d per Pound for Sale-Cloths
for the Mill 4s 9½d]

[*Orig. Ed. Note.* Nicholas sometimes had the cloth for the windmill sails woven locally; sometimes he used slip-sails. On the whole, however, he seems to have bought material which had been made for use on the sails of windmills. He gave his custom to various people in Liverpool and Meols (now Churchtown, Southport), and to some person called "The Quaker" who appears to have carried on his business at Ormskirk. It would seem that the cloth was renewed every June when the mill was not busy.]

12th November I made one half of a new sail Cloth for each of my six Sailes & put them upon the driving or following sides, some of it was Lincy-Wolcy woven Twill-way & a full yard broad, it lay me in 18d per yard viz:

7d per Pound for the Wool when it was Spun;
Teer of Hemp Spun fine at 10½d per Pound.
Weaving 26 yards at 4d per yard & all out cast was paid for;
Winding the Teer of hemp at ½d per Pound. Total Lincy Wolcy when woven lay me in - £1-19s-0d.
Holland Duck 2 feet 6 inches wide at 21d per yard - £1 0s 1½d.
Rushton Yarne supposed to be woven licke Pole Davy, some of it was above 2 foot wide at 9d per yard, some Not so wide at 9¼d - 15s 10½d.
Hare Cording at 8d per Pound, Tarr Cording at 4½d per Pound, the Cording cost - 11s 5d.
Holland Thread two Pound - 1s 8d,
Making the six half Sailes at 6d per day and Meat to the Taylor- 4s.
Part of some of the above mensioned was left so that the six half sailes lay me in - £4 7s 1d.

17th November† Ned Hawkseye & his partner mended the Kill at the Mill & did some other work.

3rd December† I took Account of William Ainsworth of Corn got by the Mill, uesed in the Hous, Ec.

1713

13th April† I finished my Accounts of Receipts & disbursments with William Ainsworth which we began on upon the 9th instant, I took his Accounts of Corn got by the Mill, uesed in the House, Ec.

1st June† Henry Dauber & his Man came to put up another Lyer and a set of new Coggs and Rongs.

5th June† The Millwrits put me up an other Lyer.

4th July† I cleer'd off all Accounts between my Miller and me Except what I owe him for Wages.

20th August† I took William Ainsworths Accounts of Corne got by my Mill uesed in the Hous Ec. and of Turves and Fleas sold.

28th October† Henry Dauber came to put me up a New Sale Rod to my Mill.

29th October† I bought some Haire-Cloth of the Quaker for Cloaths for Mill Sailes.

From Nicholas's disbursement book

Hair-Cloath 12 yards for Mill-Sailes 14s 0d

31st October† I fetched home a Pole from Leverpoole for a Sale Rod for my Mill.

5th November† Henry Dauber put me up a New Sale-Rod to my Mill.

6th November† The Milrights went hence having done working for me at present.

18th November† I put on my first half Sale-Cloath of Hair on my Mill.

2nd December† I began to fix a Wooden Chimney upon my Kill at the Mill.

1714

11th January† I sent 60 Busshells of Oats to Athertons Kill, Oliver Brownbill was here & saw them mesured.

26th May† Henry Dauber having raised the Lyer & turned the Rongs and done some other work at my Mill went hence.

3rd June† Hugh Tootall brought me a Millstone from Whitley Hills, I paid him for it.

From Nicholas's disbursement book

A Mill-Stone £4 5s 0d

[*Orig. Ed. Note.* The mill-stone was obtained from Whittle-le-Woods, near Chorley.]

9th June† H. Simkins brought me some Saile Clothe for my Mill at 4½d per yard.

22nd October† Richard Dauber came to new Cogg & Rong my Mill.

27th October† Richard Dauber went hence, he having put me up a New Set of Coggs & Rongs.

11th November† I fetched 400 of Brick from Mr Rigmadens to mend my Oat Kill with.

16th November† Ned Hawkseye took up some Tiles Ec in my Oat Kill in order to mend it.

1st December† Henry Simpkins brought me some Sale Cloth and Hair Cording for my Mill.

From Nicholas's disbursement book

Sale Cloth at 5d per yard £1 10s 0d

Haire Cording for Sale Cloathts 5s 0d

1715

21st February† Henry Dauber came to put me up a New Millstone.

26th February† Henry Dauber put me up a New Mill-Stone.

1st March The Millwrits went hence they having put me up a New Millstone. I paid them for their Work. The Miller played of his Fiddle to the Servants Ec after Supper till pritty late.

From Nicholas's disbursement book

24th February

Mending Iron Geer of my Mill 14s 6d

Spent on Man & Hors when the Iron Geere was mended 2s 0d

1st March

Mill Rits at 8d per day 9s 6d

[*Orig. Ed. Note.* The millwrights also repaired some damage which must have been done during the great storm of February 1st.]

23rd April† Towards Evening I walked to the Mill, Dr Only came thither whilst I was there, I got him to walk hither with me, we took a glass together and I shewed him my Reel and Bottle and my Little Calf & some other of my Curiossitiss.

28th June† Thomas Syer made me a Handsome present of Fish, I set my Mill to him.

29th August† I gave my Miller warning to goe at Michalmas.

[*Orig. Ed. Note.* No indication is given why John Kerfoot, who had served as miller for over thirteen years was dismissed. He does not appear to have been dismissed in anger, for not only was he paid the £2-5s-0d quarterly wage owing to him, but was also given a gift of 5s-0d extra. Neither does it appear he was dismissed because of his age; he was probably still very active for he was not buried till March 1st, 1742, at Sefton Church. Another curious fact about his being asked to leave was that at the time the windmill had been rented to Thomas Syer. One would have thought that the dismissal and appointment of a new miller would have been the business of Syer and not Blundell.]

1st October† I paid John Kerfoot what I ought him for Waiges, he now leaves my Service, he has been Miller here thirteen years & almost a half. John Rigby is comne in his place. My Wife took a Sweat from Betty Morris. I sold Thomas Syer all my Barly as grew in the Little-Morehey.

[*Orig. Ed. Note.* John Rigby, a Formby man, was paid £2-10s-0d a quarter. He remained miller at Little Crosby till Christmas 1725.]

25th October I took three of my Work Horses into the Hous to lye inn in the Nights. Mr Robert Fazakerley Junior of Leverpoole made a Viset here, so did Mr Shepheard and Thomas Syer. Leverpoole Men cut my Milstone.

[Ed. Note. Nicholas Blundell and family left for London on 24th November 1715 and sailed to Flanders on 12th March 1716 where he remained until the 5th August 1717.Whilst in Flanders Nicholas and his family initially stayed at the Abbey of the Poor Clares in Gravelines but later moved to an apartment in Dunkirk. Nicholas moved around frequently visiting neighbouring towns such as Bruges, Nieuport and Ghent. He also made journeys further afield to Antwerp, Brussels, Louvain and Aachen. He and his wife also visited Spa in the hope that taking the waters would help to produce a male heir.]

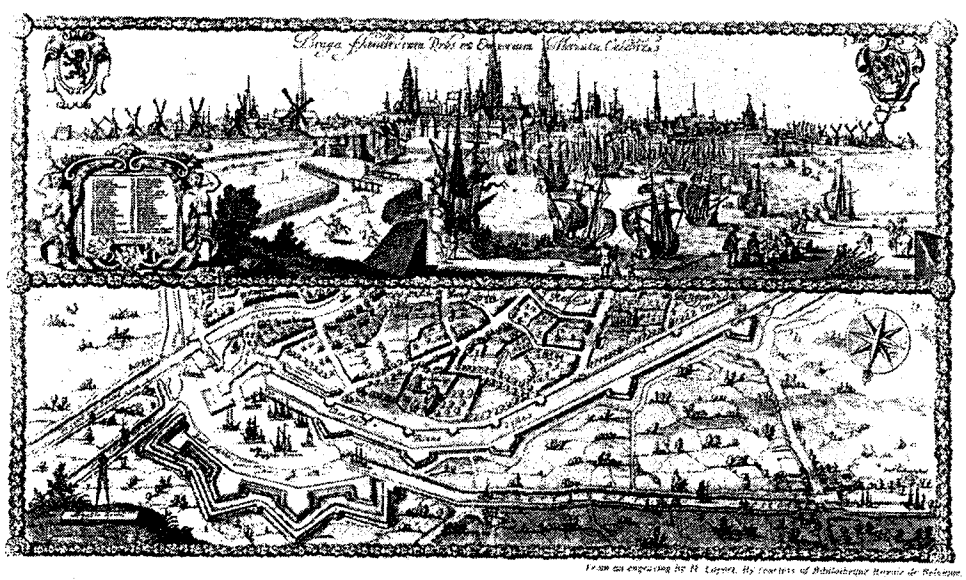


Figure 7. Bruges in the 17th century, similar to that seen by Nicholas Blundell and his family during their stay in Flanders between 1715 and 1717. Note the twelve windmills shown on the town ramparts.

1716

The following list of Titles and Fees is taken from a Terrier for Sefton parish dated 20th June 1716. (DRL/3/SEF.TER 1716 - Lancashire Record Office)

"The custome of tythes in our parish consist in corn, hay, hemp, flax, milke, caulves, Lamb, wool, coults, Gees, bees, Piggs, Eggs, Milne, Webster for his trade, Mortuaries beside Easter offerings.

As to the custome of payeing and Receveinge of the Afforesaid tythes in there particulars as followeth:-

And first of Corn the tenth is due except otherwise compounded.

2ly, Hay, the tenth is due it be except otherwise compounded;only in Great crosbie some pay 2d, some 1½d, some 1d, some ½d by old coustome.

3ly, Hemp and flax After twelve pence. A mesure sowinge whether it be more or less through the whole parish Except Ince Blundell and there is but three shillings and four pence a year paid for that Lordship in Lieu of hemp and flax by the Hall of Ince Blundell.

4ly, Cows. Every Cowe a penie for her Milke and every calfe a halfe penie Except there be five then in such case five shillings for halfe a calfe, and so on to the Greater Number that is to saye if there be nine or ten a whole calfe to its vallew.

5ly, Lambe and wool, A halfe penie a lambe Except there be five then halfe a lambe to its vallew and so on to the Greater number, eight nine or ten, then a whole Lambe. Wool, A penie a fleece Except there to be five Then halfe a fleece and so on to the Greater number According to the Lambs.

6ly, Coults - a penie a Coult.

7ly, Gees, Except there be five nothing but if five then half a Goos and so on to the Greater number as afforesaid Eight nine or ten then a whole Goos and so to the number of the Flock.

8ly, Bees, a halfe penie a swarm.

9ly, Piggs, Except five nothinge, but if five halfe a pigg and so on to the Greater number as Aforesaid.

10ly, Eggs, Every house in the paris[h] *Rich or poor is to* [pay] *twelve eggs otherwise two pence in money, and due and payable in Lent Every year if they be demanded.*

11ly, Milnes. a water Milne two shillings a year; & Every wind Milne twelve pence and payable at Easter.

12ly, The webster for his trade four pence a year.

13ly, Mortuarys. If ten pound of debtless Good[s]*. Three shillings and four pence.If forty Marks, six shillings and eight pence, if forty pounds, ten shillings.*

14ly, Easter offerings. Man and wife three pence. Smoke a penie; Garden, halfe penie;and for every Person they keep in there house that [is] *above sixteen years of age, a half penie.*

Certified by me Wm. Latus, Curate; John Brisko, Wm. Ruson Churchwardens.

10th March Mr Dod & I walked up to the Wind Mill [at Gravesend], it was a fine prospect, he and I dined together in my Roome, then we went to his Roome where we played at Cards, I lay in his roome in an other Bed.

[*Orig. Ed. Note.* Dodd was probably the Rev. Hugh Tootell, alias Charles Dodd, author of The Church History of England, was on his way to France from Mossborough Hall, Lancashire, where he had been chaplain to Robert Molyneux.]

1717

4th January† I saw the Shrine of St. Ursula & other things belonging to the Sodality [at St. Omer]. I was in most of the Sellers at the Collage, and went to look at the Mill, the Cogg-wheel is about seven yards or more in Diamiture, the Mill-stones I think a little above four Foot. One Hors will grind six hours per day and do some other little work besids, he will grind near 3 Busshells of Wheat in an Hour. In Bruing they Burn 300 Larg Fagots before the Water is rightly set on Boyling. They Boyl their Beer 14 Hours, and at Gravling [Gravelines] their Beer is boyled Twenty two Hours.

7th January Mr Lacy and I walked out and went into a Wind-Mill [near Dunkirk], there were 25 Steps up into it, the Coggs were of Ash, the Weather end & top was covered with small Peeces of Oak Bords about three Inshes broad & twice as long & Nailed on in imitation of Slaits.

11th April† We went from Lisley [Lille] in the Dilligance, going out of Town I counted (looking out of the Dilligance on one side) I think 36 Wind Mills at once and had I then ben out, I question not but I could have counted above dubble that Number. I was told there were 120 Wind-Mills or thereabouts belonging to that Town, a great many of them were for making Rape of Oyle.

[*Orig. Ed. Note.* Up to 1855, there were still 36 mills belonging to the community of Lille, but none of these exist now.]

27th July I walked to Mardike [from Dunkirk] and walked over one of the Demings as is made in order to destroy the Work at the Sluses, there are to be 8 Mills or Water Engins with 5 or 6 Horses each to drain the Water, I was told that the Brass Poynts at the Bottom of the Great Flud-Gates are about 20 English Inshes in Diamiture, from thence I walk'd to the Caraba where I met my Wife & came in it with her to Graveling [Gravelines].

Nicholas Blundell returned to England on the 5th August and reached Crosby on the 7th September, 1717.

6th October It being near Full Moon I cut my Wives Hair off. About 10 of the Clock at Night there were very great and unusuall Cracks of Thunder for these parts and Litoning with Raine; The Wind being very high Thomas Syer and I got up about Mid-Night and went to see if the Mill was Standing.

1718

28th January My Wife & I went to the New-Hous to pray for Mr Tasburgh, we dined there with Mrs Blundell Ec. I was in my Mill when Mr Tasburgh was carried past to be buried.

[*Orig. Ed. Note.* Rev. Henry Tasburgh SJ, a native of Suffolk, born 1641, entered the Society of Jesus 1664/5 and was sent on the Lancashire Mission in 1673. Died at the New House in Ince Blundell on January 27th, 1718, and was buried in the Harkirk, Little Crosby.]

7th April† James Worrall the Mill-Write laid me a Barr of Iron upon the Mill-Shaft where it was falty.

1719

25th May John Sumner of this Town began to Delve Turves this year in Thomas Marrows Moss, I went to him, we mesured the Feying of the Pit he is now Delving. Some of my Boons as led Sleck for me today came past the Hous to shew me their Loads. My Wife made a Viset to the Car Side.

Charg of Delving Fleas at 5d per Rood & something given for his selling some of them & his Care	£1	4s	0d
Charg of getting Turves for Sale	£5	7s	7d
Charg of geting Turves for my own use & for the Mill	£1	19s	11d
Charg of Dressing my Turves		5s	0d

[*Orig. Ed. Note.* Carrside - a small hamlet and part of Ince Blundell.]

6th June† I shot the Millers Hen as was grown wild and lay in the New Orchard.

26th September Being very ill in my Eye I did little but walk about. I went to the Mill where I stayed a good while and Smoked a Pipe.

30th September† I took my Mill into my own Hands, it being according to the Agreement made yesterday between Thomas Syer and me. Mrs Blundell came to see me being I was ill of my Eyes.

[*Ed. Note.* During the period Nicholas was away from Crosby he leased his windmill to

Thomas Syer. This lease contined until Michaelmas 1718 (i.e. 28th September), after which Nicholas operated the mill himself, taking his payment in toll corn.]

7th October I went the first time to take up Tole Corne since I had the Mill in my own Hands. I discoursed the Miller about serving me. William Anderton played on his Pips and Fiddle at Thomas Syers.

11th October This being Gooсefeast Sunday my Wife & I stayed at home & kept the Hous. I sent William Carefoot to see if he could harken me out a Miller but he could not.

[*Orig. Ed. Note.* John Rigby agreed to stay on and remained as miller until January 11th, 1726. He was paid quarterly - £2-15s-0d plus 2s-6d "for finding Light & Licker".]

25th November† Thomas Gill came to mend my Kill.

17th December I was in my Oat Kill a good while with Thomas Gill whilst he was rebuilding the Cundit. I took measure to know how much would be sufficient for a pair of Sail Cloths for my Mill.

19th December† I bought some Cloath of Thomas Cliff for one Pair of Sail-Cloths.

24th December Thomas Gill having finished my Kill yesterday, went hence, I payed him for his Work.

[*Orig. Ed. Note.* An important factor in the grinding of corn was its state of dryness; the drier the corn the easier it was to grind. Clearly an important adjunct of the mill was, therefore, the kiln where the grain was suitably dried preparatory to grinding. In the kiln the heated air from a furnace passed beneath a floor of perforated tiles by which the corn was gently warmed. The drying kiln required constant repairing; most of the damage being done by over-heating. Indeed, the danger from fire was quite a real one and at one time it was stipulated that the kiln was to be built not less than nine paces from the nearest cottage. Such fires must have been responsible for much of the repair work that had to be done at the Little Crosby windmill.

On this occasion it must have been quite a major repair job which Thomas Gill carried out and the cost was rather high:-

New Laying & Mending the Kill	£1 5s 3d
Tile for the Kill	£1 1s 0d
Iron for the Kill Grate	14s 8½d
Smiths Work for the Mill & Kill	2s 8d

On January 14th, 1720, the drying kiln was once more in use.]

1720

11th January Thomas Marrow began to make me a Pair of new Saile Cloths for my Mill, I went to the Mill and tryed one & stayed there a good while.

[*Orig. Ed. Note.* The material bought on December 19th, 1719, was now being made into mill sails by the village tailor.]

14th January Robert Tompson began to dry for me, 'tis the first time he ever dryed and the first time any Oates were dryed on my Kill since it was so well mended.

27th April† James Worrall the Millright came to work here.

[*Orig. Ed. Note.* From Nicholas's letter book." Worrall James Millwrite at the Grange in Chesshire to be left with Samuall Truman the ower End of Water Street, Leverpoole"]

14th May I bought two peeces of Saile-Cloath at Leverpoole of William Ball. I drank at the Wool-pack with Joseph Bolton and with Thomas Hurst, Mr Whittle, &c.

15th May William Ball was here I paid him for the Saile Cloath as I bought of him yesterday.

Sale Cloath for the Mil at 4½d per yard	18s 6d
Haire Cord for the Mill	2s 0d

1st June† William Iwotall brought me a Mill-Stone from Whittle-Hills.

[*Orig. Ed. Note.* Suitable stone was only obtainable from a limited number of quarries in this country. Nicholas Blundell obtained his from Whittle-le-Woods, near Chorley, Lancashire. Between 1660 and 1675 a new millstone cost £4 to £4-2s-0d. In 1702, the price was £4 but by 1714 it had risen to £4-5s-0d. When Nicholas bought the stone mentioned on June 1st, 1720, he grumbled at the price, and made a note about it in his Disbursement Book:-

Mill-stone, (shold onely have been - - -)	£4 10s 0d

In 1723 he again had to pay £4-10s-0d, but perhaps he objected more strongly about this for the next stone he bought was cheaper - £4-5s-0d in 1726. Alas, in 1731 he had to pay £5. In 1769 his successor had to pay £7 for a new millstone, while in 1823 the price had increased substantially to £42.

We gain some idea of how long a millstone lasted when we note that he put a new millstone in his mill in 1702, 1705, 1707, 1710, 1711, 1720, 1721, 1724, 1716 and 1731]

2nd June I put a New paire of Saile Cloaths on my Mill, they cost 4½d per yard and about foure Months since I put on an other new pare as I think cost 8d per yard. (See May 15th, 1720.)

1721

14th May I went to the Mill with John Tickley and agreed with him for a part of his Ground by the Mill to window [winnow] on.

28th April I Took measure at the Mill to see how much would be suffisient for a Pair of Sale Cloths.

31st May James Worroll came to put me up a New Mill-Stone, he brought an other Man with him

3rd June† James Worroll put me up a New Mill-Stone, I was at the Mill then, so was Thomas Hesketh the Miller of Ince Mill, the Miller of Sefton etc.

9th June† William Ball of the Meales [Meols] brought me some Twill for Saile Cloaths for my Mill.

28th June† I put on a New pair of Sail-Cloths upon my Mill about this time.

13th September† Humphrey Blundell came to supply the Millers place awhile being he went ill home on Sunday.

19th September† I went to see the Sick in the More-houses thence to Formby to see my Miller.

5th October† I went to Formby to see when my Miller John Rigby would be able to come to me againe. I gave him a Pint of Ale at Henry Norrises. I smoaked a Pipe there.

7th October† I was with Humphrey Blundell a good part of the time whilst he was laying down and hanging the Mill-Stone.

14th October† I payed Humphrey Blundell for supplying the Millers place for above a Month.

16th October† John Rigby being now pritty well recovered he came again to tend my Mill.

6th December Sedon began to make me some Half-Sale-Cloths for my Mill of an old Ship-Sale, it was pritty good and Cost about 8d per Yard Squaire. Old John Sumner brought me a Seck of Oats.

1722

22nd January James Worall came towards Evening to cut some Coggs & Rongs of old Apple Trees, but it being too late he did not begin to work.

23nd January† James Worroll Rid up a Pear Tree which is designed for Coggs and Rongs.

26th January† The Mill Writes went hence, they have made me five Sets of Coggs & Rongs of Apple Trees and Pear Tree Wood.

2nd February I payed the Miller half a years Waiges the Last Quarter will not be due till the 25th of next Month. Margarit Massy payed me Rent for her Hous.

29th March† I sent Richard New-Hous a pece of Mill-Stone to be a Harth-Stone.

11th May From New-Castle [under Lyme] I came to Warington, I dined at the Agle & Child and then to William Athertons in Ditton where I Lodged; I was at the Ball with Joseph Bolton, William Welshman &c where we had a Consultation about a Millor & his Famoly as are lickley to be Chargeable to the Township of Ditton.

30th July† William Ball from the Meales [Meols] was here with a Peece of Sail-Cloth, I bought it from him.

12th November James Worall & his Man came to new Cogg & Rong my Mill.

17th November† James Worrall finished new Cogging my Mill. I sowed Dwarf Beans in the Stone Garden.

25th December We went in the Morning to Mr Aldreds and againe at tenn of the Clock. The Miller & Elizabeth Swift din'd here.

1723

Nicholas Blundell and his wife Frances left Little Crosby on the 26th May to go to Flanders to bring home their two daughters. They arrived in St. Omer on the 11th June and returned to Little Crosby on 5th August.

19th July Pat: Rector shewed the Sodality Refectory &c to my Wife, my Doughters and me, &c. I looked at the Mill belonging to the Collage, I think the Diamiter of the Cogg Wheele is eight yards and the Stone four Foot. (See also 4th January 1717)

13th November† Disbursed by William Carefoot (hind & coachman) whilst Nicholas was in Flanders including:-

Tayloring at the Mill		2s	6d
Mill Stone	£4	10s	0d
Sail Cloth, Hair Cording, Thread	£1	5s	8d
Daile Bords		10s	0d

1724

15th February I went in the Evening to the Mill and Smoaked a Pipe.

8th June† I went to Leverpoole & barganed for a Pair of Mill Sailes to be made of Pole davy. Pat: Aldred and I came home together from Leverpoole.

Millsailes 4 half Cloths of good Canvas & making them £2 11s 6d

[Orig. Ed. Note. New sails were put up every June. Sometimes all four sails were renewed and sometimes only two. These particular sails did not last the full year. They had to be replaced early the following February, due to the heavy rain and strong winds of 1724.]

15th June I put a New Pair of Pole Davy Saile Cloths upon my Mill.

9th July James Worrall sent a Man to work at my Mill, he began to dress the New-Millstone.

18th July The Millwrits took both the Mill-stones down out of the Mill in Order to put up two others.

21st July Pat: Turbervill made a Viset here, but I was gon to the Mill to see them put up a New Stone so he went to Mr Aldreds. I followed him thither where I also found Mr Blundell and his Brother; before we Parted Mr Eckleston came to us, he Lodged here.

23rd July The Millwrits finished working here. Mr Eckleston and I made a Viset to Ince, we Suped there.

1725

1st February† I told Thomas Davy what I demanded for ading his Life to his Mothers.

[*Orig. Ed. Note*. The lease granted to Thomas Davy on 1st February 1725 included the clauses

"....not only He but all who live upon the premisses must grind at my Mill or pay 2s-6d per Busshell" and "Must not destroy any of my Rabbets"

Lease for 3 lives: Thomas Davy, his mother Margaret, died 5th January 1730/1, and John Sumner, or for 99 years.]

(Tenants Book DDBl/54/42, pg 60 & 107, Lancashire Record Office)

8th May† My Miller lent John Tickley Thirty Pound upon Interest in Presence of me.

26th May† John Tickley gave my Miller an Assignment for fourty Pounds.

6th August I not being very well I walked to the Mill and Smoaked a Pipe there.

25th October James Worrall & his Man are come to work here, they are to new Cogg and Rong my Mill and to put up a New-Shaft

29th October† I cut down a Tree at the End of the Canall by the Brick wall for a Mill Shaft.

[*Orig. Ed. Note.* During his time as lord of the manor, Nicholas had to put in a new mill shaft on three occasions: November 1709; December 1710; and on this occasion, November 1725. On each occasion a newly cut down tree was used; one he bought and two came from trees growing on his own demesne. Generally an oak tree about one hundred years old was used as oak at that age was considered to be at its best. The best time for cutting down the tree was October, and, except in an emergency, the tree was prepared the previous spring by stripping the bark. By doing this the sap was practically dried out of the tree when it was cut down in October. (See 17th & 26th November 1725)]

2nd November†, Being Mr Greene kept Crosby Court at Jacksons, I went thither & Order'd Robert Johnson in Presence of Edward Hatton, John Banister &c to open me a Bridle Rode thorrow the Bottom of his New Inclosed Field viz: to make me a Rode to ride from the Scab Laine, thorrow his said Field along the Water-cource which runs between it and the Wheat Hey, I claiming a Hors rode that way for my Customers to my Mill;

According to my Command Robert Johnson himself & his Tenants Son Joseph Newhous made me a Rode, so I, Young Mr Standish & his Servant James Hill Rode that way home from Great Crosby.

17th November Cozen Gillibrond went hence. I put up an Extaordinary good Mill Shaft.

26th November† The Millwrits went hence having New Cogg'd and Rong'd my Mill and put up an Extra-ordinary good Shaft

Mill-writs work	£2	4s	0d
Smith: Iron work for the Mill		14s	0d
Lead for the Mill Shaft		1s	6½d
Smith: Iron work for the Mill		1s	3d
Timber for the Mill		12s	0d

4th December The Miller being uneasy upon some things which he heard were said of him told me he would leave my Service unless I would come upon a New Bargan with him.

[*Orig. Ed. Note.* John Rigby, a Formby man, was appointed miller on October 1st 1715 at £10 a year. In 1719 this was increased to £11-10s-0d paid quarterly as £2-15s-0d for wage and 2s-6d for "Light and Licker". The miller was always the highest paid servant, receiving more than the salary of the Chaplain, £8-0s-0d a year. (See December 29th and 31st, 1725; January 10th and 11th, 1726)]

29th December George Cottom came and acquainted me where I might hear of a Miller.

30th December Mr Plumpton came to buy an Old Milstone of me, but we did not then bargan though afterwards he bought it, Mr Kolsold of Walton was with him.

31st December I Hir'd Richard Prescot to be my Millor, am to give him £11-5s-0d per Annum and he to find Lite and Licker. James Swift came by James Worrols Recommendation to be my Millor but he came too late. Mrs Par, Mrs Crisp and Mrs Knight Suped here.

1726

3rd January I went to the Bank in Ditton where I Lodged, there should have ben a Meeting about the damage done to the Meddowing which is Occationed as supposed by Henry Heys Water Mill, but no body came. We hunted the Whistle at the Bank after Supper.

10th January Richard Prescot came to be my Millor in the place of John Rigby.

[*Orig. Ed. Note.* Richard Prescot, of Great Crosby, served as miller until Nicholas Blundell died in April 1737. Throughout this period he was paid quarterly, £2-15s-0d plus 1s-3d for "lite and licker" which amounted to the annual sum agreed upon, £11 5s 0d. During the thirty five years Nicholas was lord of the manor the rate of pay of the miller increased from £2-5s-0d a quarter to £2-16s-3d. The rate remained steady at £2-5s-0d until the 1715 Jacobite Rebellion.]

18th January Mr Plumbe sent one to see if I had any Marble Stone as would fit for cuting into Milstones, but I had not. My Wife and Doughters made a Viset to Mrs Parr.

31st January I took a second Purging Posion according to Dr Cawoods Direction. Mr Plumpton fetched away an old Milstone he had bought of me.

20th February The Millor of Sephton desir'd I would let him have some Tiles for Repairing the Kill.

16th April I walked with cozen Butler and shewed him my Mill.

27th May† Tootall brought me a New Millstone.

16th July† I brought Fanny Home [daughter from Ormskirk]. I went to Crosby to see my Millor who was very ill.

4th September† The Wind being very high in the Night. I got up towards Morning & went to look at my Mill.

18th October John Harefoot brought me my Winters Provision of Candles. I payed him for them. I and severall Hands helped the Millor to fix the Mill-Stone it being got out of his Power to Mannage it.

30th December† Mr William Nelson and John Chaddock came to the Bank & discours'd me concerning Dammage to Meadowing occasion'd by Henry Heys Water Mill.

31st December† William Sumner Millor pay'd me his whole years Rent & for Boones. I stated Accounts with some of my Workfolks.

1727

28th February† James Worrall came to turne the Mill Rongs & to do some other Work.

4th March James Worrall has don working for me at the Present, he has turned the Trundle of my Mill & put in a good New Spurne to the West Side of the Mill.

[*Orig. Ed. Note.* The sails of the windmill turned the main-shaft or wind-shaft. This turned the wooden cog-wheel or brake-wheel in the cap of the mill. The teeth of the brake-wheel engaged the wooden rungs of the trundle or wallower at the top of a vertical shaft running down through the mill. Thus power from the sails was transmitted to the mill-stones. The windmill at Little Crosby was a Tripod Post Windmill, in which the whole of the mill was supported by three huge timber baulks or spurnes in the form of a tripod.]

14th March I put a Paire of Whole - New Saile - Cloths on my Mill, it cost 6½d per yard.

3rd July† One of the Sailes of my Mill was brock off.

10th October John Tickley made me a very good Hacking Stock for cutting Beef on. James Worrall came to mend my Mill one of the Sale Rods being broke.

11th October I cut down a Tree at the Side of the Bleaching Yard for the Repaire of the Mill Sailes. Mr Luis made a Viset here.

6th December Cozen Gillibrond went hence. John Craine came to put up a Pair of Mill Sailes which were begun by Jasmes Worrall but Worrall not being well could not finish his Work.

9th December John Craine put me up a Saile Rod which was begun by James Worrall who was not able to finish it.

15th December One of John Craines Apprentises cut me a Thorn Tree into Mill Coggs.

1728

26th January John Craine was here I pay'd for Work done at my Mill.

5th February I went to Leverpoole with Henry Atherton & demanded from Mrs Hargrave £15 upon a Note which her Husband had given to

Sera Atherton. I drank at the Mill-Stone with Atturney Smarley &c as I went to Leverpoole I met Mr Cottom coming hither. I gave Mr Green Fifteen Pound upon Account of Knoctorum Sute.

20th February A millwrit came for som Rongs for Sephton Mill, I let him have som.

Nicholas Blundell died on 21st April 1737 at the age of 68. Unfortunately, no will of Nicholas Blundell has ever been found although various versions of a will are mentioned in the Great Diurnal. Fortunately, "An Inventory of the Goods, Chatles & belonging to Nicholas Blundell of Little Crosby, Esquire." (DDB1/54/24, Lancashire Record Office), made at the time of his death has survived, includes the following entry.:-

"To his Miller & each of his Meniall Servants who have lived with him one year - half a Guinea is paid."

Comments and Queries

When Nicholas Blundell inherited his estate he had a map produced showing his holdings including Little Crosby Windmill which is depicted as having four sails. In 1709 the windmill was rebuilt to have six sails, a most unusual configuration at that time. Unfortunately the Diurnal gives no clues as to why this was done, at a time long before Smeaton's experiments on the efficiency of windmill sails showed that more than four sails was the optimum. This is a very early date for a multi-sail windmill i.e. having more than four sails, and may be the earliest one recorded in England. Could Nicholas have been influenced by seeing a multi-sail windmill in Flanders, when he lived there as a student at St. Omer, in the 1680s?

Another early multi-sail windmill was built at Upholland, about 12 miles east of Crosby, which was seen and recorded in 1754 by a Swedish traveller called R. R. Angerstein. This mill had eight sails and was a fully regulated windmill, having a fan tail to keep the sails turned into the wind and shutters on the sail that would open and close according to the speed of the wind. The village of Upholland is also next to the township of Orrell where Nicholas Blundell also owned property. Was it just coincidence that possibly the first two multi-sail windmills in England were built in the same region of south-west Lancashire?

The comprehensiveness of the entries concerning the mill for the period of time covered by the Diurnal allow for a certain amount of analysis of the costs, reliability and lifespan of some parts of the mill. The Diurnal entries show that Nicholas was purchasing a new millstone approximately every two years. In 1702 a millstone cost Nicholas £4 but by 1714 this had risen to £4-5s-0d and by 1720-23 he was paying £4-10s-0d per millstone. These prices and durability

correspond closely to the millstones supplied from Mow Cop to Congleton Town Corn Mill during the same period in the 18th century.

The gearing in Nicholas Blundell's windmill consisted of "coggs and rongs", which were the constituent parts of lantern pinion style gears. There would have been only one pair of millstones, driven via a single pair of gears, in a simple windmill like the one at Little Crosby in the early 18th century. The gearing would have consisted of a gear wheel mounted on the windshaft connected with a wallower (or stone nut) on the millstone spindle. The Diurnal shows that these gears were made from a fruit wood such as applewood. This type of gearing was not very precise, which caused considerable wear to occur. The Diurnal entries show that Nicholas had eight sets of new gears in 22 years, a set lasting just over 2¾ years on average.

It is obvious from the Diurnal that Nicholas had a strong interest in the mill. He always employed a miller rather than leasing the mill, as many landowners did, except when he was out of the country in the uncertain time after the 1715 rebellion. He carried on experiments into the qualities of various types of sail cloths and was one of the first persons in the country to use six sails on his windmill. He also found that the mill was a place where he could visit for a quiet smoke of his pipe or as a refuge when not feeling too well. Certainly, to dance with his wife in the mill kiln shows that visiting the mill could be a joyous event, as molinologists since then can readily confirm.

References

Berg, T. & P., *R R Angerstein's Illustratyed Travel Diary, 1753-1755,* Science Museum, 2001.

Bonson, T., *Driven by the Dane*, Midland Wind & Water Mills Group, 2003.

Tyrer, F. (ed.), *The Great Diurnal of Nicholas Blundell of Little Crosby, Lancashire, 1702-28,* Vols. 1, 2, & 3, Record Society of Lancashire and Cheshire, Vols 110, 112, 114, 1968, 1970, & 1972.

Acknowledgements

The author would like to thank the Record Society of Lancashire & Cheshire for their kind permission to reproduce the entries from their publication of Nicholas Blundell's Diurnal. Thanks are also due to the editor for providing the introduction and comments.

Midland Wind and Water Mills Group Publications

The following publications are available from:-

Dr. B. Job,
Meadowside, Clayton Road,
Newcastle-under-Lyme,
Staffordshire, ST5 3ET

WIND AND WATER MILLS
The Journal of the Midland Wind and Water Mills Group

A miscellany of articles on a variety of mill related topics. Each volume is between 48 and 80 pages including photographs, maps and drawings.

Numbers 1 - 4, 9, 10, 12, 14, 16, 18, 19, 22	SOLD OUT
Numbers 5 - 8, 11, 13, 15	£1.00 each + £0.65 postage
Numbers 17, 20	£2.50 each + £0.65 postage
Numbers 21, 23, 24	£3.00 each + £0.65 postage
Number 25	£3.50 each + £0.75 postage

Standing orders for future editions of the Journal are readily accepted, each new edition will be automatically sent, with an invoice, when published. For details contact Barry Job at the address above.

DERBYSHIRE WATERMILLS - CORN MILLS
By Alan Gifford

A5 softback, 136 page, including 49 photographs and 26 maps and drawings.
Price £5.50 including p & p.

MILLSTONES TO MEGAWATTS: A Bibliography for Industrial Historians, The Publications of Dr. D. G. Tucker

A5 booklet, 68 pages, details of over 300 published items by Gordon Tucker. Each publication on an industrial archaeological topic has a paragraph describing its contents.
Price £5.95 + £0.65 p & p.