Eskdale Mill, Boot, Cumbria

A history & guide to the watermill by Dave King

A special edition of *Mill Memories*
The Newsletter of the Friends of the Mills Archive

This booklet is the award-winning entry in the first
Mills Research Competition held by the Mills Archive Trust

Mills Archive Trust www.millsarchivetrust.org

From the Trustees of the Mills Archive

The Mills Archive Research Competition

The first Mills Archive Research Competition was held in 2012, with the winners being announced in July.

The Research Prize was awarded to Anna J Cook for her 25,000-word paper entitled *The Millers of Holgate: a Social History of Milling at Holgate Windmill*. She receives a cheque for £500 and her entry is being published shortly by the Mills Archive Trust. It will be available, price £5 (excl. p & p), from Holgate Windmill, York, and The Mills Archive, Reading.

The Mills Archive Research Award was won by Dave King for his short research paper of 5,000 words entitled *A History and Guide to Eskdale Watermill*. He receives a cheque for £50 and his entry is published here in this special edition of Mill Memories, December 2012.

The panel of judges was impressed by the scope and quality of the research presented in these and other contributions, which included studies of London millwrights, the tide mills of Maine, USA, and a wind-powered sawmill in Surrey. All of the contributors enlivened their work with individual insights into their subject rather than merely repeating extracts from their source material in previous publications.

The second such competition will be held in 2014: submission deadline 31 May 2014 (titles by 1 December 2013). The competition rules will be posted on the Mills Archive website and in the next issue of Mill Memories in Spring 2013. One important alteration to the rules will be the inclusion of presentation and illustrations within the criteria.

Mill Memories ~ special edition

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A brief history of the valley

Bronze & Iron Age stone circles and the discovery of stone implements in the valley are evidence of ancient settlements, and in later times the local inhabitants witnessed the arrival of the Roman invader, who was to stay for over 300 years and built the great fort at Hardknott (Mediobogdum) to defend the supply route from the port at Ravenglass (Glannoventa) to Ambleside (Galava) which traversed Eskdale. The remains of two stone buttressed granaries which could hold as much as 250 tons of grain still exist at the fort, which indicates the probability of cereal crops being grown in the fertile valley during their occupation, if not much earlier.

Norse settlers, 500 years later, also left their marks; extracting the mineral wealth from the hills, to which, as well as the valleys and rivers, they gave the names that are still in use today ~ the local surname of Tyson is of Nordic origin and Viking crosses still survive in churchyards. To these people, unlike the shivering Roman infantryman, Eskdale must have seemed like home from home. It is possible that a Cumberland farmer could discuss the events of the day with his Scandinavian counterpart; and, of course, the Herdwick sheep are also descended from Norwegian stock.

The mill yard, buildings and bridge, with the mill in the centre of the photo

For many centuries the valley was a hive of industry; when Birmingham, Leeds and Manchester were sleepy villages, the mineral wealth, water power, forests and proximity to the coast, as well as the fertile valley bottom and the woollen products, meant employment for many. The Ravenglass & Eskdale Railway, laid down in the 1870s is a later indication of this activity, conveying the iron ore from the Nab Ghyll mines to the main line.

A brief history of the mill (continued)

A watermill has stood on these grounds for over 1,000 years, possibly nearer 2,000; the Romans brought new technologies, and Roman watermills are known to have operated along Hadrian's Wall, notably at Willow Ford and Chesters. The floods of November 2009, which caused much damage at Cockermouth, also revealed the site of a Roman watermill within the town, and excavations are in progress. As yet, no evidence has emerged to link Eskdale Mill with our Latin visitors, but the internal workings are of a Roman design, conforming to a description of a watermill by Vitruvius in 79 BC. An epigram from the pen of Antipater of Thessalonika, in the 1st.century BC is worth including:

'Ye maids who toiled so faithfully at the mill,
Now cease your work and from these toils be still:
For what your hands performed so long and true,
Ceres has charged the water-nymphs to do.'
(Ceres being the Roman Goddess of cereal crops)

The Domesday Book of AD1086 records the existence of watermills in every town or village which had the advantage of a passing stream; however, the tax inspectors did not venture north of the rivers Ribble and Tees, and so the earliest written record of a mill dates from 1294:

'.....all the mill of Eskedale which renders 19s 6d yearly'

Later, the 14th Century Eskdale property of Lord Egremont included

'.....rent from 31 tenements and a mill.'

"Watermills in every town or village"

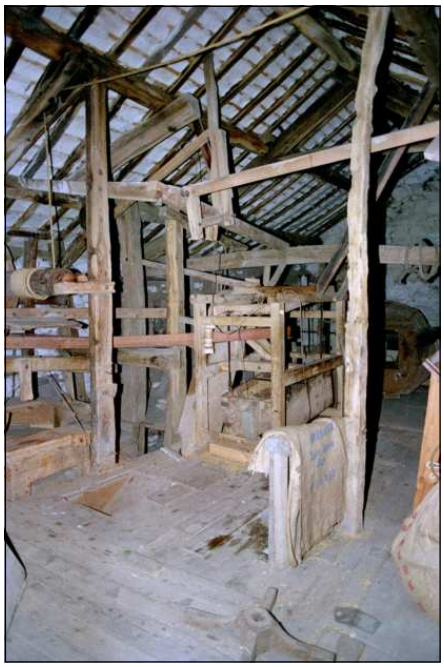
In 1547, the mill paid a death duty on the demise of Henry VIII, and was recorded as *'mollarium et fullarium'*, indicating that the mill was operating as a 'fulling' mill in addition to grinding corn. Fulling mills (or walkmills) processed the woven wool by pounding it in a bath to 'full' the cloth. The water would contain potash, probably the ash of burnt bracken; urine or 'fuller's earth' were also often used. The waterwheel would lift and release vertical beams to 'work' the material which was then stretched on 'tenterhooks' outside. There is still evidence of this activity within the building and the cottage garden carries the name of 'Tentergarth'.

The tenants at that time were Robert & Henry Viccars, brothers who would probably each concentrate on one particular trade. It is possible that surviving parts of the mill's structure date from this time, or even earlier. In 2008, I persuaded English Heritage to fund a dendrochronologist, Ian Tyers from

A brief history of the mill (continued)

Sheffield University, to take core samples from 37 of the oak timbers, in the hopes of providing some specific dates. With no other local records to compare to as yet, we still await results, but with the number of worn millstones set into the ground floor, there can be no doubt that the mill is medieval.

The Percy survey of 1578 reveals that the tenants were still the Viccars brothers, although there is no mention of any fulling; it is possible that nearby, Borrowdal mill had taken over that operation, with the waterwheel driven by Nab Ghyll. Much later, c.1820, a fulling mill was to be built at Gilbank, ½ mile upstream from Eskdale Mill, again managed by a Viccars.



Interior view of the upper machinery room

By 1633, the mill had come into the ownership of the Stanley family of Ponsonby Hall, distant cousins of the mighty earls of Derby, barons who ruled over much of the NW of England, infamous for their hesitation at the battle of Bosworth 1485, when King Richard III was killed and the wars of the Roses came to an end.

In 1737, Edward Stanley sold the mill to Edward Hartley, yeoman, who left his mark on the deeds. This document gives an insight into the customs that existed for many centuries; Ed. Stanley promised not to build any other water cornmill nearer than the mill at Linbeck (about 3 miles away); every mill had a 'Soke' area, usually the parish or manor, wherein every citizen was beholden to take their grain to that mill, the miller taking 1/16th of the grain in payment for his services ~ the miller's multure.

Ed. Stanley also promised oak trees and ash trees for the construction of a second wheel, required to drive a pair of German millstones ~ Cologne or 'Cullin' stones ~ still to be stepped on as you leave by the lower door. The installation of

A brief history of the mill (continued)

these better-quality stones is an indication that wheat was being grown in the valley as farming methods improved, and the miller had to improve milling techniques to produce finer-quality flour.

However, the main cereal crop continued to be oats, with barley also grown. West Cumberland estate accounts of the 17th century show three times the acreage put to oats compared to barley. The Viking names of 'haver' and 'bygg' (oats & barley) indicate the origins of place names such as Haverigg and Bigrigg, and many Cumberland farmers still refer to oats as haver. Within living memory wheatbread was considered a 'Sunday treat' in the valleys.

General view of the watermill from the track

The mill's busiest period would be over the next 150 years, and within the building there is much evidence of this prosperity. In 1752, Ed. Hartley died and the mill passed to his brother Henry, who in 1756 was granted permission by the lord to take ten oak trees to build a cottage and a stable at Eskdale Mill. He was also allowed two trees for repair work to the launder (mill race). 1818 saw the installation of 7ft. (2.1m) diameter cast iron internal gear wheels, replacing all-wooden gears (although the actual cogs were, and still are, made from applewood). The German stones were replaced by French burrs, probably during the same modification. The drying kiln was refurbished the following year, cast iron tiles replacing the old clay ones. However, a number of the bearings were still made of local stone ~ a volcanic andesite porphyry ~ some of which are still in use.

A brief history of the mill (continued)

In the late 1830s, the mill was leased to John Hartley, son of the yeoman farmer at nearby Bridge End farm, and the mill accounts book of 1842 survives, giving a detailed insight into the daily workings of a busy concern. John had married and moved into the cottage by 1851, and purchased both mill and cottage in 1867. The Hartleys had two daughters, Jane and Elizabeth; there were very few lady millers, usually widows taking over from their late husbands, and so, in the 1880s, a young Edward Bibby, son of the miller at Muncaster Mill, was taken on as assistant. In 1885 he married Jane Hartley, and by this time was the miller.

Hard times were just round the corner as huge steel roller mills were being built in the 1890s, often in the larger ports such as Silloth, as much grain was being imported, and improved transport made for easier distribution. By the turn of the century, 'Ned' Bibby was feeling the effects of this progress, and the need to replace the worn French stones was beyond his meagre resources, so the lower waterwheel fell into disrepair.

WWI saw an upturn in trade as grain imports suffered, and the valley once again relied on the mill for flour and animal feed ~ rationing was in operation, so Ned was milling on the 'QT'! By the 1920s, however, he was reduced to milling animal feed, and one by one, farmers were installing their own roller mills. Eskdale Mill ground to a halt in the 1930s; Ned Bibby died in 1937, aged 78.

The same year, Ned's daughter, Hannah, had a small generator installed, driven by the upper wheel to provide the cottage with electrical power; it was not until the 1960s that the national grid came into the valley. Hannah and husband John Dawson died within 6 months of each other in 1971, and the mill's uncertain future was saved by Cumberland County Council who bought it at the resulting auction. This decision owed much to the foresight of the late Ron Jackson, who had visited and photographed the outside in the 1960s, accompanied by Alistair Herd. According to Alistair, Ron had called at the cottage for permission to record the inner workings, but Hannah and John had chased him away ~ not easy for a man with one leg and a woman with one eye! The mill is now owned by The Eskdale Mill & Heritage Trust.

A brief history of the mill (continued)

An old postcard view of the mill complex from the west

A brief history of the mill (continued)

Milling customs

Most mills were owned by the church, manorial lord or the monarch; Eskdale Mill, like many, has been in the possession of all three. The mill would serve the local community, the parish, village or part of the town. Everyone was 'obliged' to take their grain to that mill, the use of the cottage hand quern was forbidden. The miller, renting the mill, took a percentage of the farmer's grain, usually 1/16th, the miller's 'multure'.

"...unaware that the miller had sold the flour to him twice..."

However, history has branded the miller as a thief who stole more than his share ~ read the Reeve's tale by Chaucer or in song, 'The miller of Dee', *"I Care for nobody, no not I, and nobody cares for me!"* In the Canterbury Tales, *'He hath a thumb of gold pardie, well could he steal and tollen thrice!'*, a reference not only to his ability to judge a fine flour by rubbing a palmful with his thumb, but also that this skill gave him a good living when much poverty existed. In the Reeve's tale, he manages to outwit a couple of young students sent from the town hall to test his honesty; however, they succeed in cuckolding him later that night! The miller's thumb was said to grow to an impressive digit with this continuous exercise; the small Bullhead fish is also called a Miller's Thumb.

An old miller adjusts the grain feed to his millstones

An ancient quote from the Countess of Southampton, *"All the nues I can send you that I think will make you merry is that I read in a letter from London that Sir John Falstaff is made father of a godly miller's thumb, a boye that is all head and very litel bodye, but this is a secrit!"* Occasionally, the mill would be swept thoroughly, the sweepings bagged up, not because the miller feared a visit from Kim & Aggie, but the sack could be sold to the farmer as cowstuff; the farmer unaware that the miller had sold the flour to him twice!

The miller would be responsible for general repairs, although replacement of expensive millstones was funded by successive millers paying for the wear of the stones during their tenure. The deeds for Goosenargh Mill record that in 1836 when a new miller took over, the stones were measured, and that the miller would have to pay 10/- per inch for the subsequent wear of the grits and £4/10/- for the French stones. Usually, the existing top (runner) stone would replace the

Milling customs (continued)

lower (bed) stone, where it could operate at a reduced thickness without detriment to the milling process, and the new stone would become the top or runner stone, where its extra weight would work on the grain more effectively. The miller at Eskdale had turbary rights and dug peat on Eskdale Moor, common land where he could also graze 50 sheep. The ancient peat huts, one of which belongs to the mill, can still be seen if you venture up the peat track behind the mill.

Although the farmer would bring the grain to the mill, it was customary for the miller to deliver the flour back to the farms by horse and cart. According to the late Sally Bulman (nee Armstrong), Ned would be the worse for wear by the time he reached his last port of call, the Woolpack Inn, having been invited to 'partake' at each farm. Sally and her sister Nelly would heave the helpless miller onto the cart and 'Prince' would trot home with his master fast asleep behind.

Some old sayings are worthy of note: *"It must be true, I heard it at the mill!"*, a central point for village gossip; *"Mills and wives ever want!"*, perhaps an indication of the miller's devotion to both. It was said that an honest miller had a tuft of hair in the middle of his palm, to which the miller replied that it took an honest man to see it!

Watermills would close on St. Catherine's Day, November 25th. She was the patron saint of waterwheels, having been tied to a chariot wheel as a form of torture.

View of the stone bridge over the mill stream showing a small stone building on the mill's downstream side.

Millstones

A rich history of milling is abundantly evident in the mill by the quantity and variation of used millstones. Ancient hand querns found in West Cumberland and made from suitable local stone are on display, courtesy of Mr. J. Hughes; hand querns were used before the advent of water power and are still used in various parts of the world.

Local stones were also used in watermills, mainly Lazonby sandstone, two of which can be seen around the mill, probably grindstones for sharpening chisels and millstone picks. Nearby, the aforementioned Linbeck Mill had a pair of white granite, possibly from Waberthwaite quarry or SW Scotland. These are now in a private house in Seascale.

As you exit the mill downstairs, just outside is a pair of Cologne stones, a blue/black lava from the mountainous region of Andernach in the Rhine valley and shipped through Cologne via that river to the outside world. Cologne or 'Cullen' stones are a basalt rock, the first ones to be driven by the second waterwheel, and of a good enough quality to mill fine wheat flour. The Romans bought German millstones into Britain, and according to one expert, a German archaeologist who visited Eskdale Mill in 2009, they were imported into this country long before 54BC.

The French burrs that replaced them are still in situ; a Freshwater chert, a flint-like quartz or hornstone, quarried from the Marne valley basin. These were shipped over in manageable blocks and made up in the port of arrival by local millwrights, who would cement the blocks together and shrink steel hoops around the rim, wheelwright-style. Considered to be the finest of millstones, they were exported throughout the world, making useful ballast. A treaty signed during the Napoleonic Wars enabled Britain to procure these valuable items from the enemy!

A gritstone from the Peak District

But in Cumberland the overwhelming majority of millstones were the famous Grits, a hard form of sandstone, riven in one piece to the required diameter from various quarries along the Pennines, notably Hathersage in the Peak District, but even as near as Kellet Moor, Lancaster, hence nearby Quernmoor.

Millstones were usually 4ft. diameter, but the grits in Eskdale Mill are all 5ft.; manhandled to Lancaster port using waterways where possible, and sailed round the Irish Sea to Whitehaven, from where they would be hauled to their final

Millstones (continued)

destination. The installation of a new millstone seems to have been an occasion in the village; it was possible that there was no-one left alive who had witnessed the previous event.

A document of 1683 describes the carriage of millstones over Whillimoor for 8 miles, where there were no roads, to Lamplugh Mill, with horses, oxen and men to perform the task, '*eased only by lubrication with soap and beer for the axles and men respectively*'. These stones can last up to 200 years in a village mill, I have counted ten used Grits around the mill (and there may be more), not including the ones in present use; a reasonable estimate would date the runner stone to c.1850 and the bedstone to the late 1700s.

A French burr runner stone upturned for re-dressing, showing the millwright's stone-dressing tools

Millstones had to be 'dressed', part of the millwright's craft: sharp edges cut into the working surfaces of both stones in a regular pattern of 'lands' and 'furrows', using specially hardened picks and bills, tempered at the blacksmith's forge, heated to a straw colour and quenched in oil or water. John Moffat, apprentice to Jack Lightfoot, millwright at Calderbridge Mill, tells how a passing tramp, treated to a cup of tea, suggested creosote as a quenching agent, which was found to be a great improvement. The pick would then be tapped against the anvil and the resulting ring would be long if the pick was too hard, or abrupt if the pick was too soft.

Millwrights would be in charge of a number of mills in their vicinity, dressing each pair of stones 2 or 3 times a year, or more, depending on their use. A pair of sharp millstones can reduce one grain to 20,000 particles of flour. The top stone also has to be balanced ~ notice the lead weight attached to our runner stone ~ as contact between the stones must be avoided. Millstone dressers were expected to have small fragments of steel (from the mill bills) or grit (from the stones) embedded in their forearms, a sign of experience, otherwise millers would ask them to practice elsewhere! The top stone was said to run with or against the sun ~ *'widdershins'* ~ the direction of their rotation would determine the angle of the furrows when dressing.

Oats (Avena Sateva)

'Four seeds in a row, one for the rook, one for the crow, one to rot and one to grow'. Cultivated extensively in the north west, being a crop more suited to the higher rainfall areas, and the main food for the population, grown almost solely for animal feed in the south, as noted famously and sarcastically in Dr. Johnson's Dictionary. Lesser known is the reply that he received extolling the benefits of an oatmeal diet from an anonymous Scotsman who signed himself *'A two-legged Oat Eater'.*

Oats were sometimes sown at the back end of the year as a winter crop; three bushels sown per acre would produce up to 40 bushels yield. They would be cut before fully ripe as the stalk, which is used for animal feed, begins to absorb nutriment from the grain. A light yellow shade of a field of oats indicates the time for harvest. The crop was cut, sheaved and 'stooked' the same as wheat, except there would be fewer sheaves per stook to facilitate improved drying. One old farmer told me that he was taught to stack in 10s as opposed to 12s for wheat. Once dried, the sheaves were built into stacks, often outdoors for want of space; a sight to behold in the fields of Cumberland, no longer seen, alas. Grain has a longer shelf life than flour, so the stacks, virtually waterproof, would be taken down, one by one, as kitchen, stable, sty and byre needed replenishment. This meant that the village mill was busy throughout the year. When the oats were too green, or wet, the stack builder would create an 'apartment', or space, with an opening exposed to the wind; this he called a 'Fause-house'.

Varieties of oats included Potato, Black & Grey Winter, Abundance and the beautifully named Golden Rain.

Time for 'Robbie' Burns: in Cumberland, also Dumfries & Galloway, at Hallowe'en, lads and lasses would venture into the farmer's barn, where each lass had to pull out 3 stalks of oats, one at a time. If the third one had the top 'pickle' missing, ie. the grain at the very end of the stalk, then she would come to the marriage bed anything but a Maid! The adventures which might follow this custom are recorded by Robbie in his poem, 'Hallowe'en' ~

The Lasses staw frae' 'mang them a' to pou their stalks o' corn,
But Rab slips out, and jinks about, behint the muckle thorn,
He grippet Nellie hard and fast, loud skirl'd a' the lasses,
But her tap pickle maist was lost when kiutlin' in th' Fause-house*
Wi' him that night.

Oats, of course, are famous as porridge, which was made from oatmeal in former times, not rolled oats; also haver bread which was the staple diet of Dalesfolk.

Ancient weights and measures

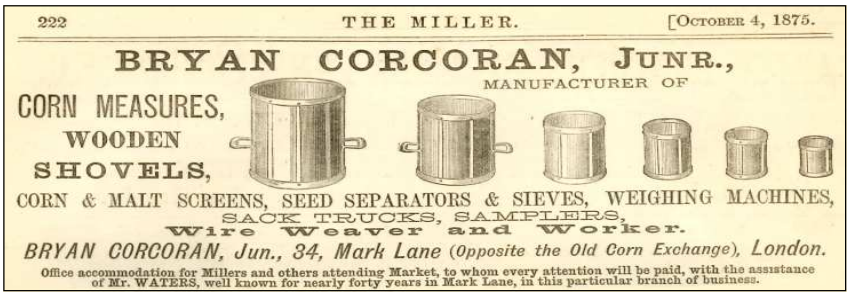
IMPERIAL 12, METRIC 10! A victory for the old methods: sorry, teachers and kids! However, a brief foray into some of the now defunct measures may be of interest.

First and foremost the bushel (sometimes called a fou in Scotland), a measurement by volume of eight dry gallons at 60°.F, although this will have varied from area to area. Four pecks made up a bushel, four bushels a coomb and two coombs a quarter. In Scotland, Cumberland and Westmorland, 6 bushels made up a boll, ¼ of a boll was a firlot. A bushel would hold about 40 lb of oats, 50 lb of barley or 60 lb of wheat, and the miller had a 'strike', a straight stick to wipe across the metal rim of the bushel box, which had the crown stamp burnt on and would be regularly checked for correct volume by the Customs Officer.

A cylindrical wooden bushel measure

The old sacks were often used as unofficial measures, and would hold 14 stone of oats, 16 of barley, 18 of wheat, never forgotten by the farmers and labourers who bore them on their shoulders! Lincolnshire farmers reckoned 20 stone of beans, but bragging rights go to an East Anglian farmer who weighed in with 22 stone of mustard seed!

A wonderful tale comes from an elderly Scotsman, who, as a 14 year old was roped in to help with the bountiful barley harvest; his task was to feed the sheaves into the barn thresher. After several hours, with the barley awns ripping into his bare arms, he begged to be moved to another job, and was sent down the ladder where two men lifted a 14 stone sack onto his shoulders, with the order to ascend the ladder. After one step, he collapsed in a heap. The foreman told him to return to his previous task and stop complaining!



Water Power

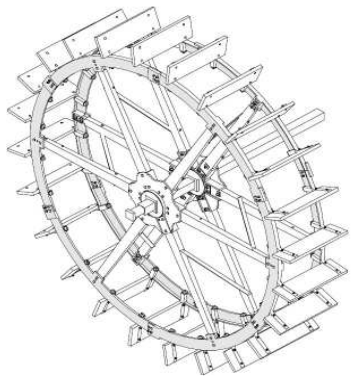
From the letters pages of the Daily Telegraph, with thanks to the author:

"Sir, There is an old saying, "No one ever built a windmill if he could build a watermill". The wind is an unreliable source of power. It seldom blows steadily and sometimes not at all. The power generated by the wind varies with the cube of the wind speed, which means that if the wind speed drops from 40mph to 20mph, the power output drops by 87.5%. At 10mph, the wind produces only 1.56% of the power. The wind can never become a major source of power."

Norman Plastow, Hon. Curator, Wimbledon Windmill Museum

Put that in your pipe and smoke it! Water power has been harnessed for many centuries, certainly pre-Roman; the earliest application was by placing horizontal paddles in the stream ~ an early turbine ~ the vertical shaft driving the millstone, a direct drive with no gearing. These mills, which are still in use in many parts of the world, are variously named Greek, Norse, Clack or Click mills. A restored Click mill operates in the Shetlands.

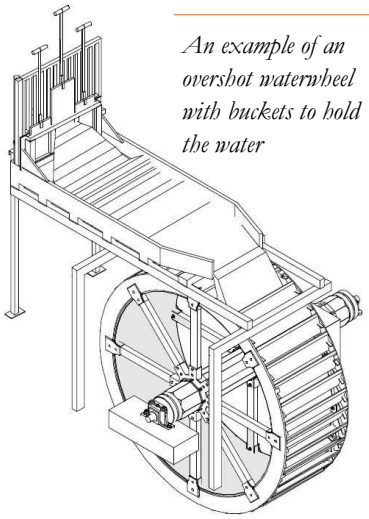
The 4 main types of waterwheel are Overshot, Undershot, Breastshot and Pitchback. Overshots and Pitchbacks require a head of water to be fed to the top of the wheel and fill buckets, the weight of the water causing the wheel to rotate; Eskdale Mill has 2 overshot wheels, both 12 ft. (3.66m) diameter and 3ft. (0.92m) wide. Undershots are used where a head of water is not available and rely on a strong current forcing the wheel to move by hitting floats. The remains of an undershot wheel can be seen at Santon Bridge, if you follow the path by the Inn. Breastshot wheels take incoming water between 1 o'clock and 5 o'clock. If the entry is at 3 o'clock or higher, buckets rather than floats are usually used to contain the water. Gilbank Mill, ½ mile upstream, has a wheel of this type.



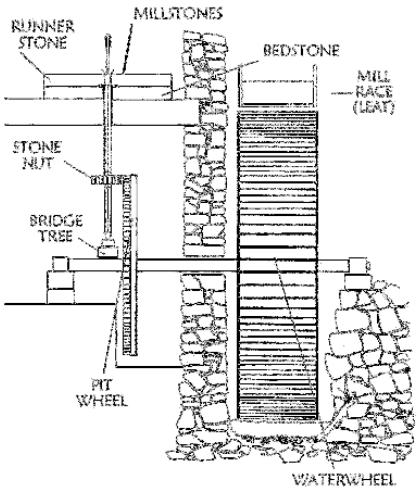
A breastshot waterwheel with floats

A skilled millwright would be able to estimate the maximum horsepower available, using the correct type and dimension of wheel for that particular site. Part of the equation, of course was the amount of power required in the mill. The most famous millwright was James Brindley, who designed the canal system which began the Industrial Revolution in 18th century England. Waterwheels were the first industrial engines, driving sawmills, forges, gunpowder mills, fulling mills, flint-grinding mills in the Potteries, and many other uses.

Water power (continued)



An example of an overshot waterwheel with buckets to hold the water



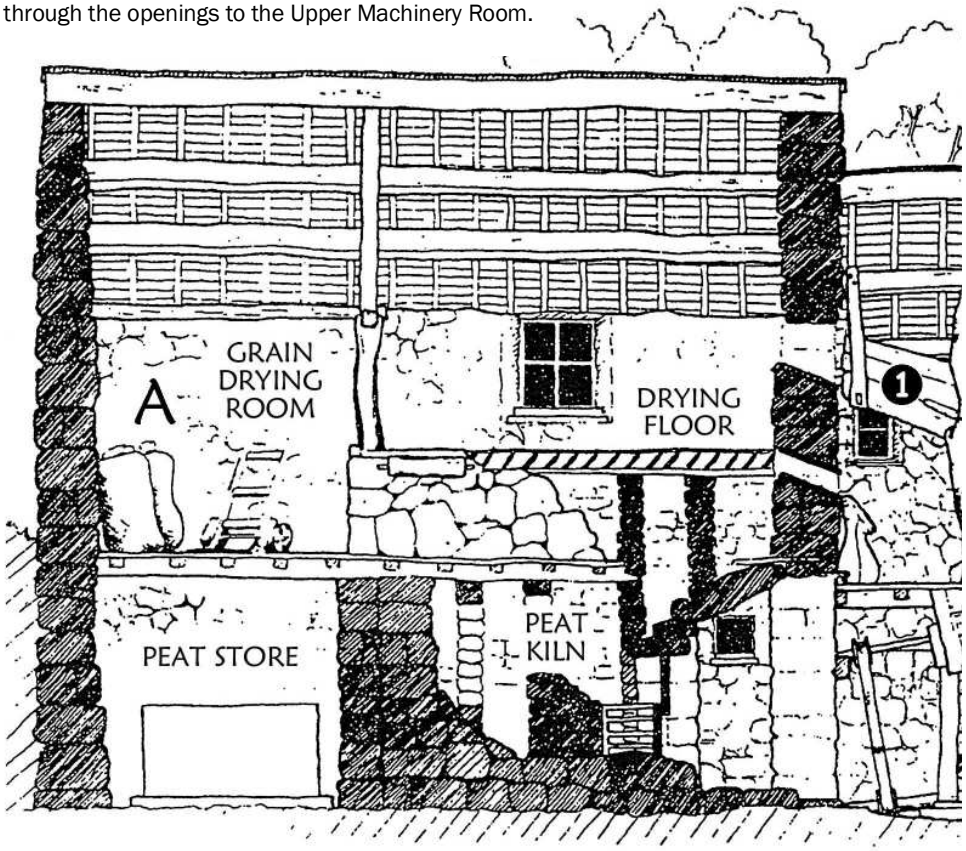
Section drawing showing the transfer of water power from waterwheel to millstones

Eskdale Mill's two restored overshot waterwheels, showing the cast iron shrouds and arms and the wooden buckets. A wooden trough (launder) directs water onto the wheels

A tour of the mill

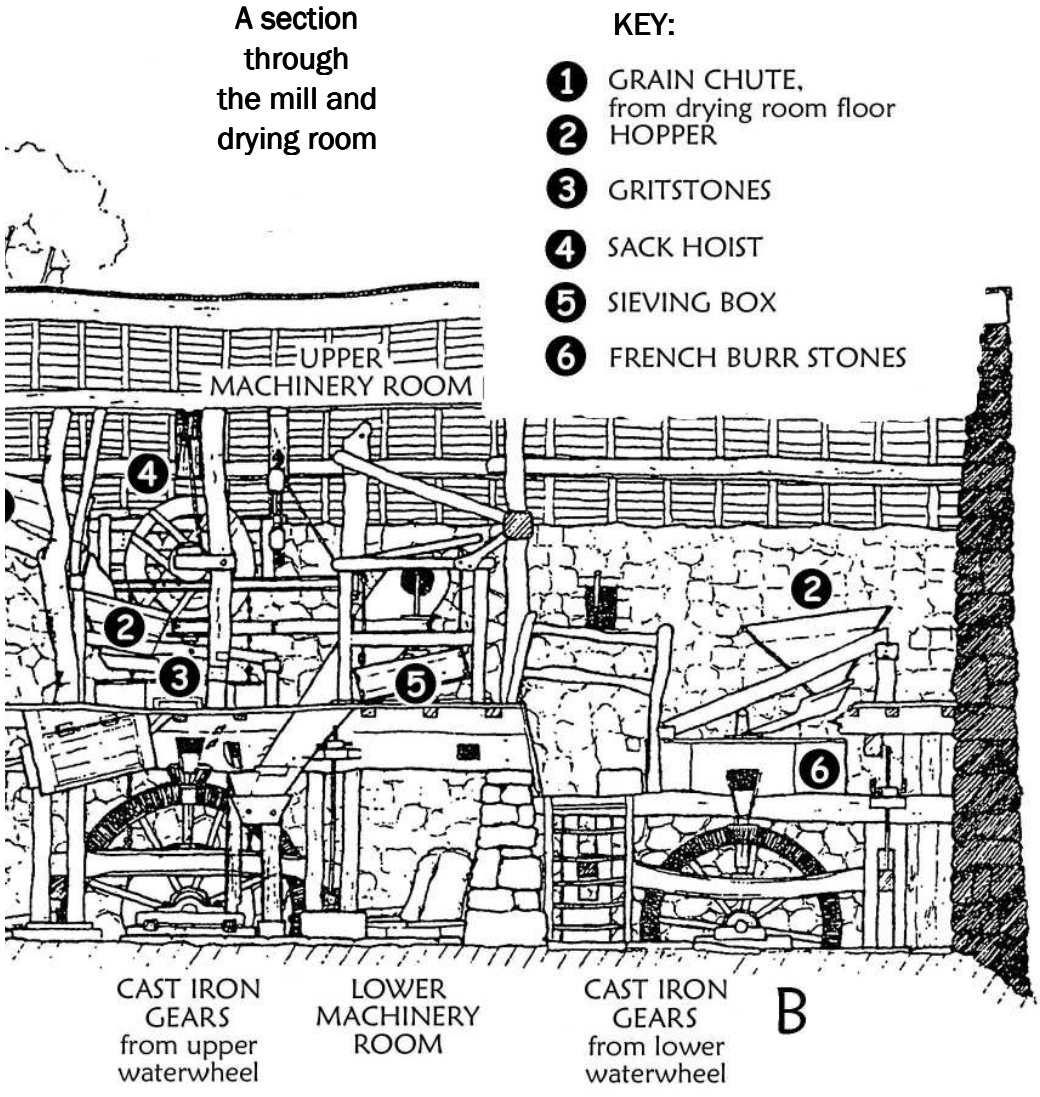
1. Drying Room

Oats, unlike wheat and barley, needed to be kiln dried on the drying floor, the raised platform of cast iron plates being heated by means of a peat fire below, where Ned's last load of peat still lies. Notice the oak roller to assist the miller when lifting the heavy sacks, and also the wooden shovel to transfer the oats through the openings to the Upper Machinery Room.



The miller would have a wooden 'plough' to turn the oats in order to maintain a even temperature, a smoky task as there is no exit for the fumes. The kiln is an impressive construction, buttressed and having stone lintels to support slate 'T' pieces.

A section through the mill and drying room

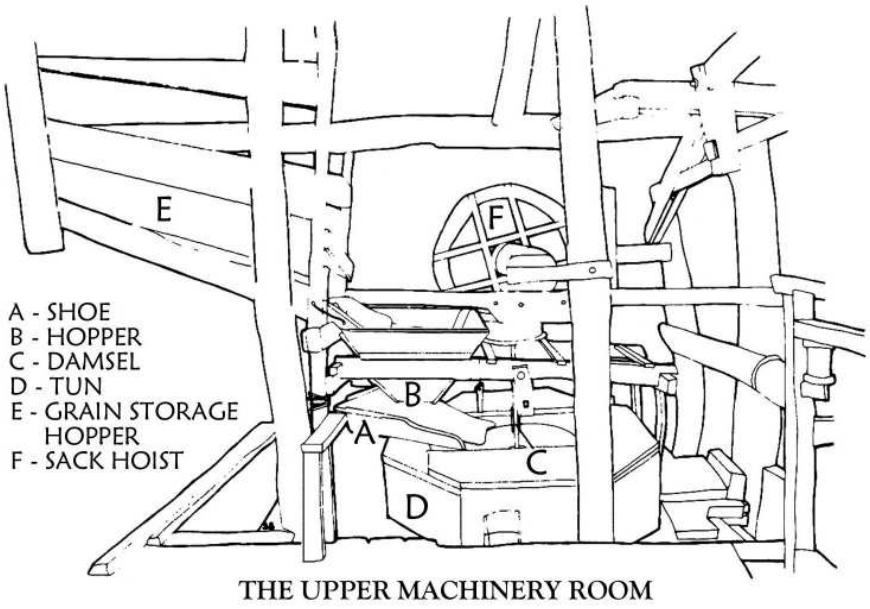


A tour of the mill (continued)

2. Upper Machinery Room

The grain coming through from the Drying Room goes down a chute into an oak hopper, from where it can be fed into the 'eye', or centre of the runner stone via a height adjustable 'shoe'. A 'damsel' attached to the iron spindle agitates the shoe as the spindle rotates to ensure a steady and constant flow of grain. As the grain travels from the centre to the edge of the pair of stones ~ only the top stone rotates ~ they are sheared by the cutting action between the stones. A pitch pine tun or box surrounds the stones, so the oatmeal exits via a meal spout to the floor below.

When milling oatmeal for the kitchen, an elevator returns the meal to pass it through the eccentrically rotating sieving box to separate the bran ~ which was mainly used for fattening pigs ~ from the oatmeal, which can also be graded into fine, medium and pinhead, which then pass down chutes into sacks below. Sacks could be returned to this floor level by the sack hoist (with the unique cut-out mechanism ~ pure Wallace & Gromit!). Notice the collection of millwrights' bills, used for 'dressing' the faces of both stones (see the photos of the finished pattern) and the lewis key for lifting the runner stone.



THE UPPER MACHINERY ROOM

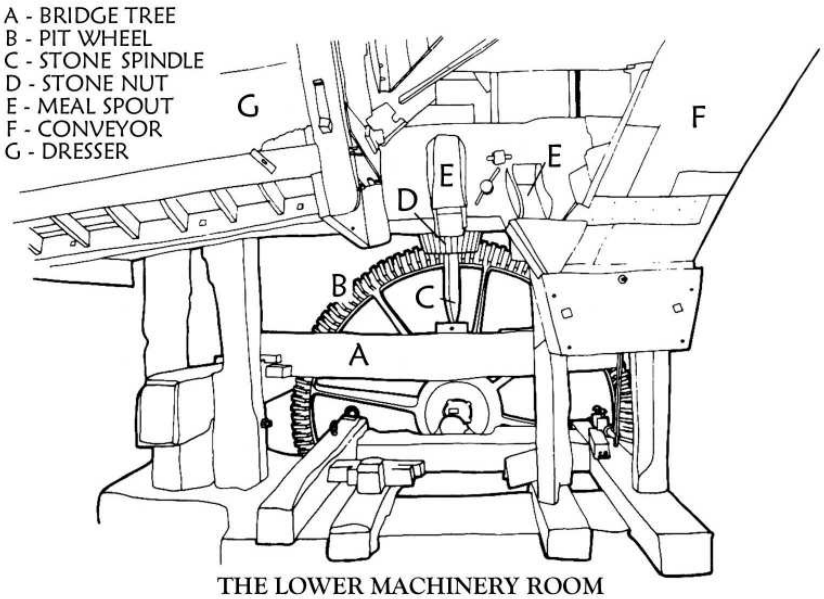
A tour of the mill (continued)

3. Lower Machinery Room

This is the miller's workplace, where he can test the fineness of the meal as it descends from the spouts ~ see *Customs* above ~ and from here, control the flow of grain into the stones, and shut off the water to the wheel outside. He can also adjust the gap between the stones by means of the 'tentering screw'. A bell upstairs will ring if the hopper is almost empty; it is ultimately the constant flow of grain that keeps the stones from coming into contact. The full sacks would be tied with a 'miller's knot' to the sack hoist.

Oats for human consumption needed to be 'shelled' on their initial passage through the stones to remove the husk. A cylindrical drum with rotating blades and a winnower would separate the husk from the 'groats' (groats are oats without their coats!)

The 7ft. (2.13m) diameter cast-iron 'pit wheel' drives the vertical 'stone spindle' by meshing with the apple-wood cogs on the 'stone nut', giving a 7:1 ratio from waterwheel to millstone.



THE LOWER MACHINERY ROOM

A tour of the mill (continued)

The internal workings of the second wheel can also be seen, now restored and historically correct with oak shaft and stone bearings, with dates of 1740 and 1818 engraved. A display board shows the work involved, a tribute to local skills. This wheel drove the French stones.

The worn 5ft. (1.53m) diameter gritstones set in the floor give an indication to the age of the mill, each one probably lasting a generation or more.

Interior view of the lower machinery room, showing the cylinder of the grain cleaner suspended from the floor above. A large horizontal beam carries the lower bearing of the millstone spindle. The small nut on the spindle is driven by the large pit wheel, visible in the background, which is mounted on the waterwheel shaft

A barley drum for the production of pearl barley can be seen, next to a barley stone which is used as a roof support; also a Bamford roller mill, which produced animal feed.

An internal doorway leads to the kiln; to the left of the firebox is a date of 1819, with the names of M. Tyson & D.T. (probably Daniel Tyson, the miller) carved into the stone.

From the Chairman of the Mills Archive Trust

Thank you for your support

Our tenth year has shown just how many people support The Mills Archive and how highly they value what we are doing. The number of Friends continues to increase and so do the number of volunteers. Receiving the MBE for Services to Heritage is a national recognition of how much we have achieved as a team.

In preparation for next year we conducted a survey that was circulated among Friends and users of the Archive. We were very heartened by the results. The report is available on our website, but my favourite comment is:

"I think you folk do a great job. I wish I lived a bit closer and had the time to support what you do. Here we have dozens of boxes of archive material which one day I will get round to sorting and archiving. If all else fails it is reassuring to know that the material can be deposited in your care where it will be valued, rather than end up in the dungeon of some County archive, never to be seen again!!"

In just the last few months we have received the collections of two important millwrights, David Nicholls of Reading and Christopher Wallis of High Wycombe, as well as the late Geoff Holman's papers on the Holmans, millwrights of Canterbury.

Archive staff at work scanning and cstaloguing our collections

Recently, a visiting researcher was overawed by how much material we had relating to her mill in Derek Ogden's millwrighting files. When you come to the Archive, the excitement is palpable - you never know what else you will find! It is all due to your efforts, so thank you once again for your support - and keep an eye on what we have planned for the next ten years.

The Friends of the Mills Archive
www.millsarchivetrust.org
Part of The Mills Archive Trust
Registered Charity no 1091534

Watlington House
44 Watlington Street
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The Friends of the Mills Archive are dedicated to supporting the work of the Mills Archive Trust and we value new members. We extend a warm welcome to family, local and national historians as well as to those who simply want to find out more about our milling heritage.

The Mills Archive is one of the world's great mill collections. It is an Aladdin's cave filled with memories, free to users and run by volunteers. The collections show the rich and diverse crafts, people, buildings, machinery and equipment involved with mills in the UK and around the world.

Friends enjoy a number of benefits as well as knowing they are helping to protect an unrivalled world-class resource.

Please help us to save the memories!

For more information write to the address above or email us:
friends@millsarchivetrust.org

Held over to the next issue of Mill Memories

Milling by muscle power

A remarkable variety of mills were powered by the muscles of humans and animals. Examples of innovative muscle–powered mills come from the Mildred Cookson Foundation Collection