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THE MILLS OF SAPPERTON

Stephen Mills

Introduction

The parish of Sapperton lies around 4 miles to the west of Cirencester and is perhaps best known for the presence within its boundaries of the Thames and Severn Canal, the Daneway Basin and the Sapperton canal tunnel. However, there are other "industrial" remains of interest that are less well known, some of which lie hidden in the depths of Dorvel Wood that covers a significant percentage of the parish. Here are the remains of the two water mills that once flourished at Sapperton. There was also a third, a steam-powered sawmill, situated near the Daneway Inn. These three largely forgotten mills are reviewed below.

The two water mills had fairly lengthy working lives. In all probability, these were largely uneventful and doubtless they ground grain throughout the centuries with little out of the ordinary happening. Perhaps as a consequence, there is only limited recorded history of the two sites. However, what is known is as follows.

Sapperton (Dorval) Mill [SO94700374]

This mill was first recorded in the early 1760s when it was described as a newly erected grist mill. At this time, it was leased to William Fowler by Earl Bathurst. Fowler died in 1792 at which point his lease was acquired by an agent for the Thames & Severn Canal Company. The Reverend John Disney took a further lease in 1802. Disney was described as "a distinguished divine and a wealthy man with many secular interests". He was involved with the Canal Company and often presided at committee meetings and both Disney and his son held shares in the Thames & Severn Canal Company. In 1810, Disney granted a sub-lease to Richard Hancox, a miller. The Hancox family had been resident in Sapperton for several centuries and were regarded as one of the more notable local families. The mill was destined to remain in the Hancox family for several generations with Richard's son, Thomas, being recorded as tenant of the mill in 1837, and Thomas's brother, William Walter, operating the mill in 1846.

However, all things eventually pass and by 1865, the mill was being worked by the miller James Habgood. In 1879, the miller still was recorded as James Habgood. Other members of the family were involved in the baking trade as Edward Habgood was a well-known baker of Cricklade Street in Cirencester (in 1879). In the same year, the millers at Sapperton Mill were listed as Robert Habgood and Richard William Hancox, of nearby Dorval House. Again, in 1885, 1889 and 1892, Robert Habgood was listed as the resident miller, with some sort of involvement with Mrs Hancox of Dorval. Interestingly, around the same period, a James Habgood, probably a relative, was working the water and steam-powered mill a few miles away at Edgeworth. At Sapperton, the last recorded miller was Richard William Walter Hancox of Dorval. The wheel had turned full circle and perhaps, fittingly, the mill came to the end of its working life in the hands of a Hancox. By 1901, if not a few years earlier, it had ceased work. During the next century, its fell into ruin and was gradually robbed of much of its stone and ironwork. What remained was quickly overwhelmed by nature, being relentlessly swallowed up by plants and trees.

Remains:
From the remaining stonework it is apparent that the mill was of modest size, the main block having been about 28ft x 35ft It was built into the bank of the valley that sloped down towards the infant River Frome, the source of its power. The outline of the mill pond can still be discerned, although heavily silted up. This was retained by a wall built of stone blocks that also served to carry the trackway over the river. A slot in the wall some 20 inches wide housed a sluice gate that controlled the level in the pond, allowing excess water to flow back into the river at the lower level. The leat feeding the mill supplied water into the building *via* a brick arch set into the pond wall, feeding what must have been an internal wheel that, judging by the respective levels, was probably of the low breast type. Inside the crumbling remains of the mill a large column of heavy stonework (about 2 ft x 3 ft) survives. It may have supported one end of the water wheel axle. There are no significant other remains surviving such as ironwork or any vestiges of the water wheel. Doubtless these were salvaged for scrap at some distant point in the past. It can only be speculated as to what else might survive beneath the rubble of the caved-in walls and the thick layer of undergrowth that has largely covered the mill.

Henwood Mill [SO95170426]

The upper mill was Henwood Mill, this having been built at some point prior to 1707 for in that year it was recorded as belonging to the Daneway Estate. It descended with the Estate until 1867 when it was sold to Earl Bathurst. Although normally associated with Sapperton, it actually lies just inside Bisley Parish. Little is known of the millers who worked the mill apart from Abraham Hathaway, also a baker, of North Cerney who was working the mill in 1707. The stone-built mill continued to operate as a corn mill, perhaps exclusively for the Bathurst Estate, and finally went out of use in the early 20th century. The VCH (*Victoria County History*) notes that the mill reputedly had medieval features and that a chimney was removed to Sapperton church. However, the mill's interest lies not so much in its history as in its mode of operation. Clearly, at some point after being acquired by Earl Bathurst, significant changes were made to the mechanical operation of the mill, its water wheel being replaced by a water turbine. This was quite unusual for such a small, remote country corn mill and doubtless entailed considerable expense on the part of the then owner. The reasons behind the change are not known although it could have been an attempt to minimise water usage, increase output or both. Whatever the reasons, a type of turbine that was then being produced by Gilbert Gilkes & Co. was installed in place of, as with Dorval Mill, what was probably a low breastshot water wheel. With this type of turbine arrangement, the top of the turbine inlet pipe (see Figure 1) was generally on a level with the bottom of the supply channel, and the top of the turbine case itself, on the level of the bottom of the tail race. This ensured that there was no loss in fall.

Remains:
The most notable non-structural remains are those of the turbine, although it is not possible to examine this in detail as it lies buried deep beneath a layer of fallen masonry, timbers and undergrowth. However, the inlet pipe is clearly visible, being made of rivetted iron sheet. The upper tapered section is 34 inches wide, tapering into the pipe section of 24 inches diameter (Figure 2). A total of about 9 feet of length is visible, the lower section connecting to the turbine being inaccessible. The iron output drive shaft from the turbine is also clearly visible, being about 2 inches in diameter with a 7 inch diameter bevel gear mounted on its upper end. A stone arch set into the remains of the downstream wall carried water away from the turbine outlet.

Although there is only a jumble of remains inside the mill, it appears that the drive from the turbine was utilised in an unusual manner. There are the remains of a large beam carrying an iron bearing housing that carried an iron shaft and a large iron belt wheel (6.5 inches deep, diameter 4 feet). At the other end of the shaft are the remains of a further bearing housing and below that, parts of a French burr millstone. This is supported on the shaft by a substantial iron mounting. The stone is about 6 inches deep although its overall diameter cannot be discerned. Various other millstone segments lie scattered in the dense undergrowth. It appears that power was taken from the turbine through a set of bevel gears. Then, in some manner, it was transferred, presumably *via* some form of shafting and belt wheel, to the large iron belt wheel noted above. This drove the millstones directly. As so much of the power transmission system is now missing, the mode of operation can only be based on conjecture. However, the millstones could have been over-driven (ie. from above, as often encountered in windmills) or possibly from underneath. The latter arrangement is not common, although similar under (belt) driven systems are not unknown (Plate 1). There are only the remains of a single setup, which seems unusual; it would be expected that at least two pairs of millstones would have been necessary to make the mill economically viable, especially after the capital expense of installing the turbine-powered system. However, it is quite conceivable that further components forming a second unit may have been removed for scrap or have simply decayed away. Whatever the details, this is a most unusual arrangement for a small country mill. The date of installation is not known, although the turbine-based system is very similar to those that were being supplied in the latter part of the 19th century by Gilkes. Although the horse power of the turbine remains a mystery, in 1898, and depending on the fall of water available, a Gilkes turbine generating between 5-8 HP would have cost in the region of £70-£125. Part of the iron tentering gear, the arrangement for altering the gap between the millstones, along with a number of substantial iron bearing housings, also survives amidst the general wreckage inside the mill.

Apart from the mechanical remnants, there are also significant remains of the building itself. Although seriously decayed, it appears to have comprised roughly an L-shaped structure, possibly of several phases. The main mill was approximately 30 ft x 40 ft in size (Figure 3), and was built partially into the heavy stone-built wall that formed part of the retaining wall of the millpond. The height of the surviving end wall of the mill is about 15 ft although it is impossible to tell if this was its full original height or if there was an upper story. At the other end of the mill were several rooms of unknown function although these may have been for storage or possibly of domestic origin. However, it is known that several of the millers lived at nearby Dorval rather than at the mill itself. Much of the stonework used in the mill's construction was of the random, rough type, although in several areas, ashlar blocks of excellent quality have been used, suggesting a later period of rebuilding. In several places, huge quoin stones remain in place. Use of ashlar blocks also extended to significant sections of the mill pond retaining wall.

The water supply to the mill was quite complex, part of which comprised a very long leat of considerable size. Although this is now silted up and overgrown, it is about 15 ft wide and 4 ft deep in places. It is now hard to imagine how this was adequately fed by the now meagre flow of the River Frome at this point. In fact, this may have influenced the decision to switch from a water wheel to a turbine. The leat fed water to both upper and lower millponds (Figure 4). The upper pond is a short distance from the mill and features substantial stone retaining walls punctured by an outlet arch and two level control sluices emptying into the Frome. Water flowed from this pond *via* an arch, into a further section of leat that ran into the lower

pond. The lower retaining wall of this pond formed part of the mill's structure and was about 35 ft wide. Again, an overflow sluice controlled the level in the pond. Water in the pond was fed to the turbine presumably through some form of trough, now long gone, into the top of the turbine inlet pipe. Having passed through the turbine, it exited the mill through a stone arch set in the downstream wall. Good ashlar blocks had been used in the construction of parts of the wall at this point, suggesting that this may have been associated with the conversion from water wheel to turbine.

Overall, although long abandoned and heavily overgrown, this is a fascinating site that still retains many remains of machinery, water courses and ponds, as well as the building itself.

Daneway Sawmill [SO93910337]

The third mill was something of a contrast, being situated close to the inhabited area of Daneway, to the north of the village. Unlike the other mills, it was never water powered, having being built specifically as a steam-powered mill. The date of its construction is unclear, but it was recorded as operating by 1849, when Edward Restall was listed as the mill's operator. In the 1851 census records he was listed as trading as a timber merchant. He was followed some years later by Job Gardiner who, by 1865, was trading as the proprietor of the "Daneway sawing mills" as well as trading as a timber and coal merchant. Not surprisingly, the supplies of coal came along the Thames & Severn Canal to the nearby Daneway basin. Job Gardiner was listed as operating the mill from at least 1863 up to 1889 and after this date, the executors of the late Job Gardiner continued to do likewise, at least up to 1897. Several members of the family were involved in the mill's operations, including Mark Gardiner who, in 1885 and 1889, was also working as a carpenter.

The eventual loss of the Thames and Severn Canal must have been a blow to the family, as it provided a lifeline to this relatively remote area and had for many years brought coal to the mill and the community in the mill's own barge. This brought coal from as far away as the Staffordshire coalfields. A regular supply of coal was clearly of particular importance to the sawmill in that it was steam-powered.

By the beginning of the First World War, the mill was being worked by Arthur Gardiner and his brother and still formed the centre of commercial activity around Daneway. By now, the sawmill comprised a large wooden building built partially into a hollow at the side of the River Frome. The power was provided by a portable steam engine used to drive a large circular saw (of 6 ft diameter) plus several smaller saws and other equipment. One wall of the building remained open to the elements, this allowing logs to be rolled directly down from the timber yard above, whereupon they were reduced in size on the main saw. They were then passed for further shaping on the smaller saws. The final profile produced depended on the end-user, and various shapes were produced for a variety of trades that included wheelwrights, furniture makers, barrel makers, wagon builders, etc. During this period, apart from the Gardiners, other workers included Walter and Rupert Bucknell, the latter being the mill's engine man, responsible for the operation and maintenance of the all-important steam engine. Not surprisingly, much of the timber processed in the mill was sourced locally from the surrounding woods, usually by the Cook brothers who spent most of their time in the woods. Once felled, trees were hauled to the mill by either a steam tractor operated by Charles Peart, or by his father, who looked after the mill's horses. The steam tractor was a small variant produced by the wonderfully-named Mann Patent Steam Cart & Wagon Company of

Hunslet, near Leeds, and was capable of hauling a load of up to 8 tons on a level road. When the tractor was not available, timber was sometimes moved by outside contractors, such as Hawkers of Stroud, who used a Fowler Road Locomotive.

Over the course of the years, it seems that the mill did not merely supply raw timber to various trades and industries but it also continued to provide local builders and craftsmen with wood, for several periods during its working life it seems to have switched, at least partially, to the actual manufacture of components for other uses. For instance, at one time the mill was producing countless barrel staves that were transported to Birmingham *via* barge. Doubtless coal made up much of the return cargo. At another time, the mill's manufactured output comprised wooden block planes, used by carpenters of the period, and wooden broom heads. Throughout this period, the more general day-to-day activities continued with, for instance, elm boards being produced for making coffins, always a "steady trade". Whilst the canal remained operational, it was sometimes used to transport timber to locations somewhat nearer to home, and supplies were loaded regularly at the Daneway basin for shipment to the furniture manufacturers and walking stick makers at Chalford and Brimscombe.

Timber played an important role in the little community at Daneway whose most famous sons included Ernest Gimson. Gimson had been taught the craft of chair-making by Philip Clisset of Bosbury in Herefordshire and set up a water-powered pole lathe at Daneway. The then-youthful Edward Gardiner turned the various components for him. Edward gradually learned the skills of the craft during the latter part of his career, made chairs for Gimson and Stanley Barnsley of Daneway House and their team of craftsmen on a profit-sharing basis. Gardiner eventually set up his own workshop near Leamington.

The Daneway sawmill soldiered on until around 1914-15, when it finally closed. The mill engine was sold and moved to a mill at Shipton Moyne near Tetbury. Its relocation was carried out in two loads, each pulled by nine horses struggling to ascend the steep hill out of Daneway. Remarkably, the engine was later again re-sold, this time going to a manufactory in the Chippenham-Warminster area.

Today, apart from undulations in the ground, there is little left to see at this once-important, at least locally, little hive of industry.

Please note that the mills are all on private property and permission should be obtained from the owners before making any visit. The mills are also dangerous.

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The Author is also indebted to The Earl Bathurst for his encouragement and interesting and useful communications during 1998-1999, and to Mr R Atkinson of the Bathurst Estate Office.

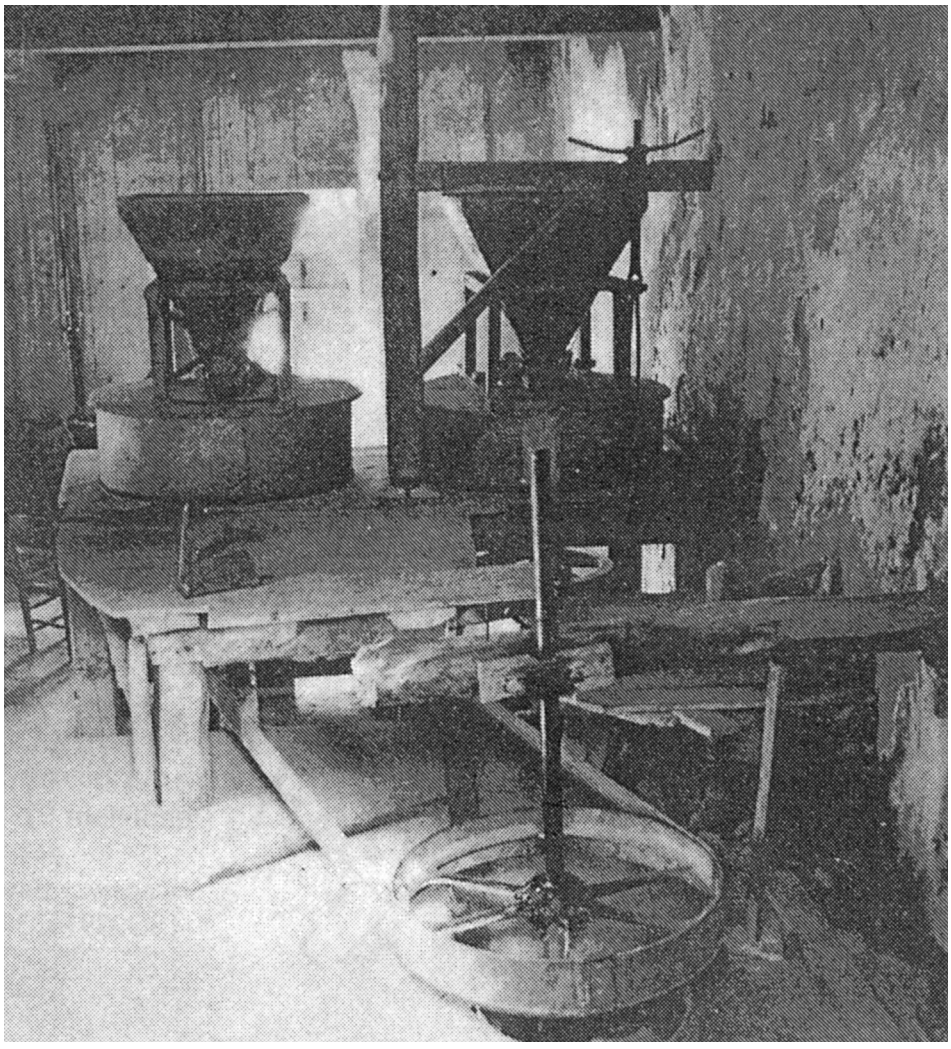
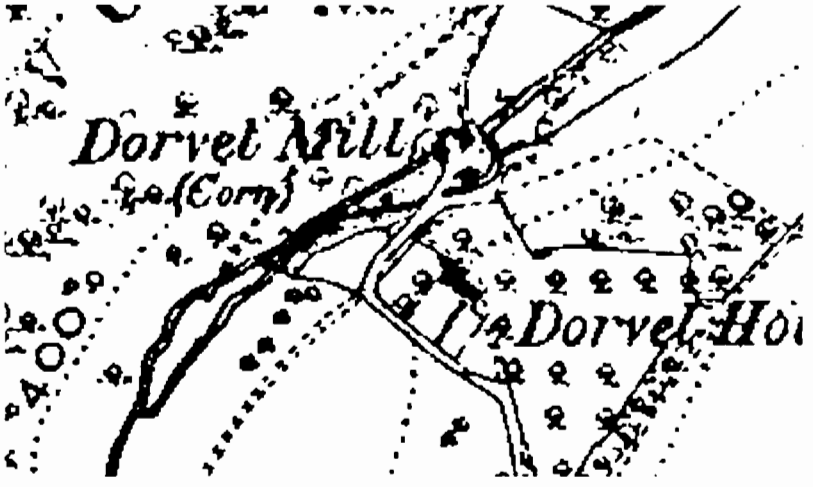


Plate 1 Example of belt (under) driven millstone configuration (in Cyprus)

Henwood Mill
[SO95170426]



Sapperton
(Dorvel) Mill
[SO94700374]

Daneway Sawmill
[SO93910337]

Figure 1 Location Maps for the Three Mills (from 1882 6in OS Map Glos 50 NE)

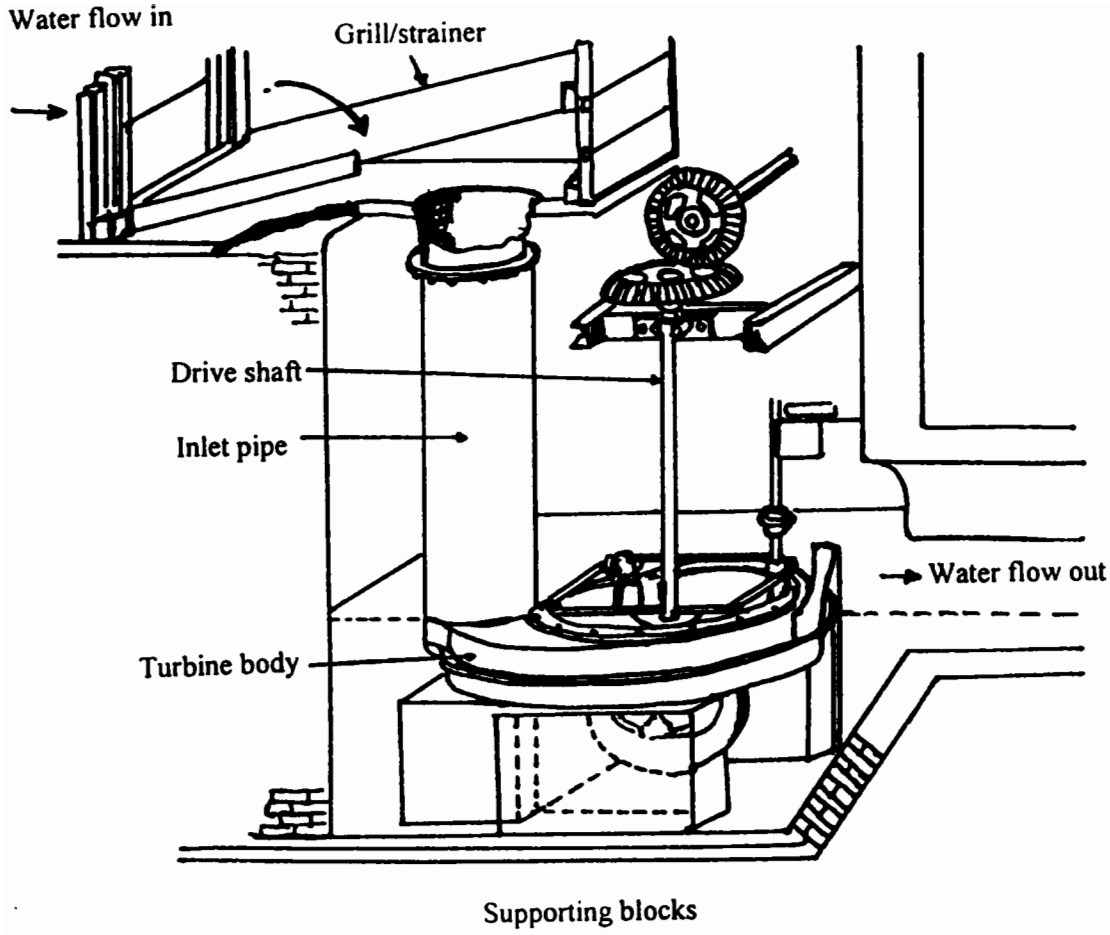


Figure 2. Gilkes Vortex turbine arranged horizontally, as in Henwood Mill

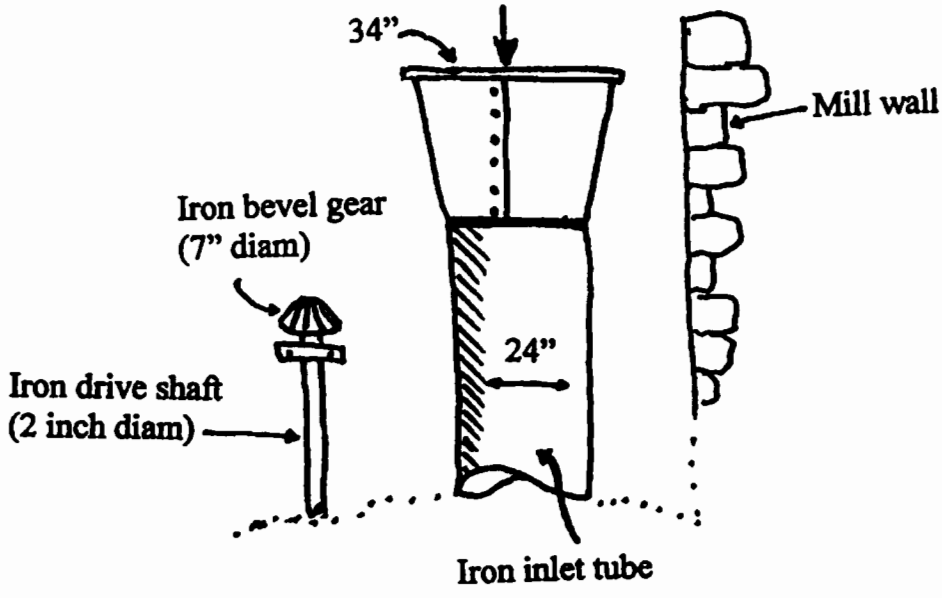


Figure 3. Turbine inlet arrangement

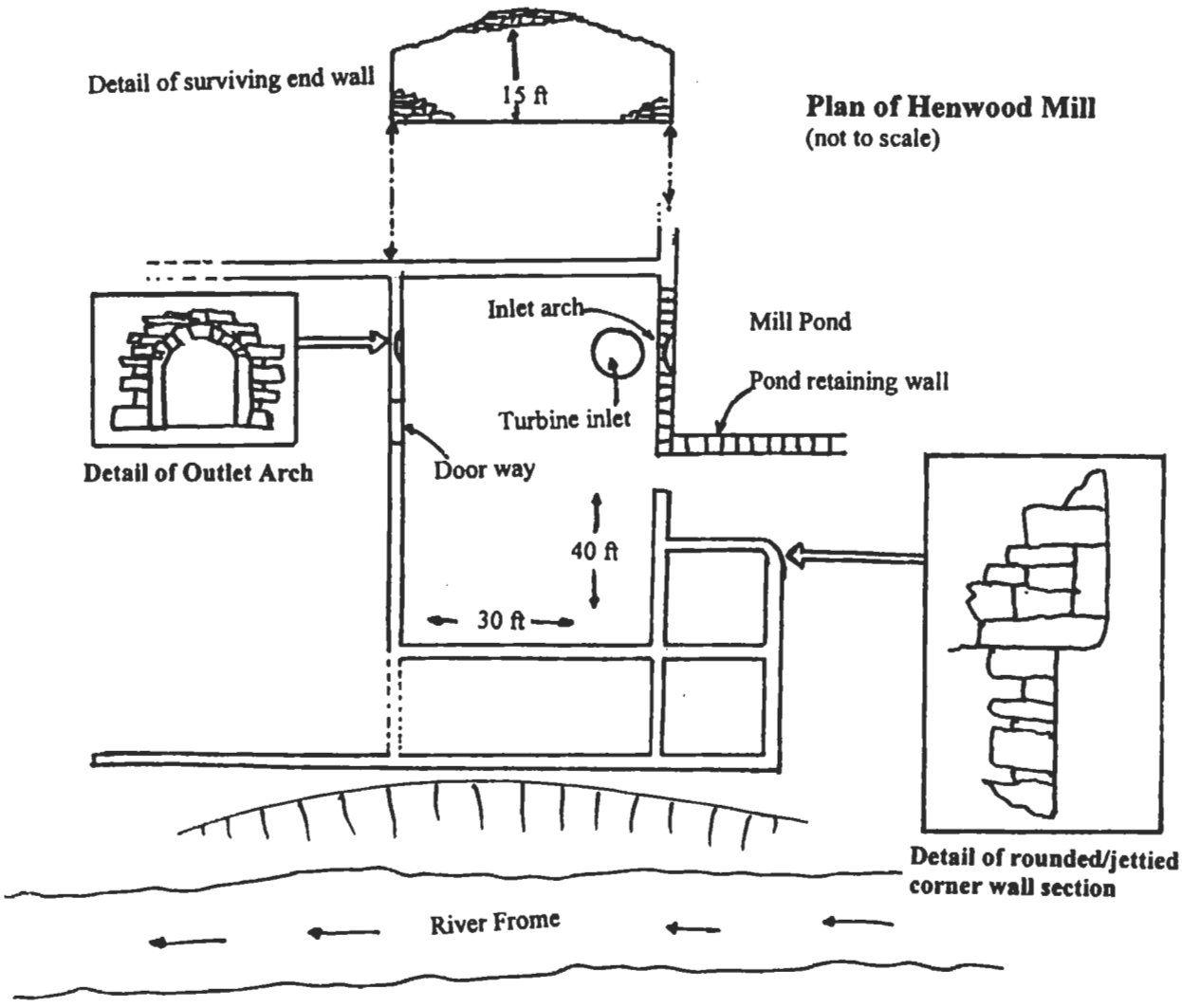


Figure 4. Layout of Henwood Mill

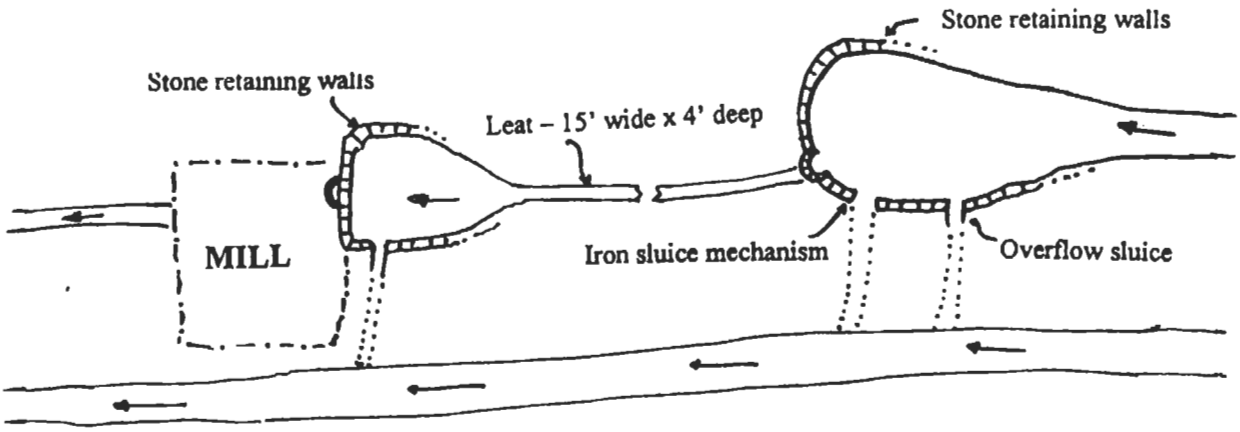


Figure 5. Water Supply System – Henwood Mill

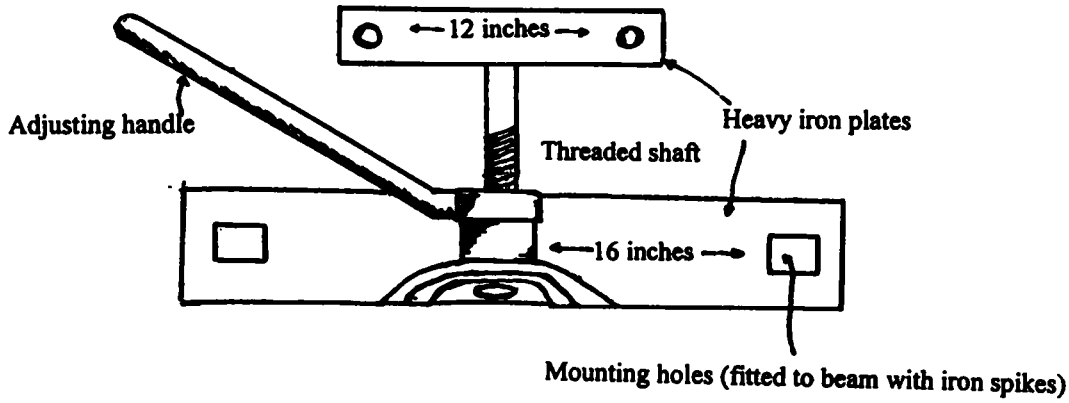


Figure 6. Tentering Arrangement

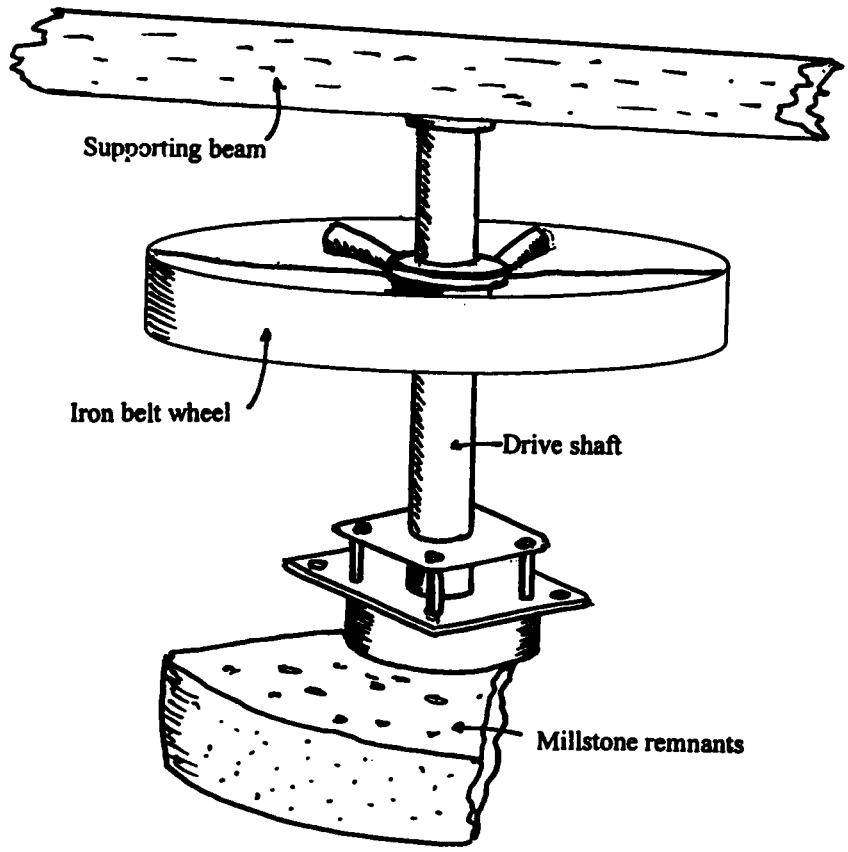


Figure 7. Millstone/Power Transmission Assembly