

CALVER MILL

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Abstract: The site was a smelting mill from at least 1616 to 1773, and in the mid- or late 19th century was rebuilt for cornmilling, ceasing work probably before 1914. Water from two mine soughs fed the cornmill dam. Rebuilding for domestic use in mid-1987 has destroyed many features but gave opportunity for a rapid survey.

Calver Mill (SK 244744 - not the better known former cotton mill) is located in the hollow on the southwest side of the road from Calver Bridge to Calver Cross Roads, in the village of Calver Sough. Much of the dam site has in recent years been built on, and the mill itself (July 1987) underwent conversion to a house, and the mill yard for new houses.

According to Kiernan (1985) its first recorded use as a mill was 1616, when it was in possession of Thomas Eyre as an ore-hearth smelting mill. Probably it was one of the first of this type of smelting mill, since Paul Tracy, an associate of the Earl of Shrewsbury, had a mill at Calver in 1580, and was then opposed by the lessees of William Humphrey's smelting patent. The Eyre family still had the mill in 1673, when the succession, for the time being, is lost. It was used by them as early as 1731 and came into the full possession of George and Thomas Barker about 1747-48, and was used by the Barkers until May 1773. In 1772 there was a payment to a mason "to support ye mill which was tumbling down" (Willies 1976). By 1773 the ore-hearth technology was distinctly dated, in favour of the cupola, but the hearth could be adapted for slag or low-grade ore smelting and it is possible this was done, continuing into the 19th century, by Isaac Morton who began smelting about 1781 and later by "Cook" (about 1801) at an unlocated site in the Chatsworth area. A large lump of grey "ore-hearth" slag was found in the wall of the wheel pit, and more has previously been reported by George Fletcher, which reasonably confirms the site.

The date of construction of the corn mill is not known and it has certainly undergone much modification as a building. It is unlikely that any part of the existing building was the lead-smelter - so an early 19th century or mid-century date is most probable, with a mid- to late century rebuilding possibly to use sough water from Calver Mill Sough. It is not mentioned in the usual gazetteers - Glover (1829), Bagshawe (1846) and White (1857), but in 1881 Kelly's Directory of Derbyshire indicates Edward Byron, farmer and miller, as the owner. This suggests a rebuilding, or possibly earlier directories were unaware of the mill which is, figuratively, overshadowed by the larger cotton mill nearby, since in the 1841 Census Enumerators Returns (DCL), George Hodgkinson is listed as corn miller. In 1851 William Kitchen is listed as miller, and in 1871 as miller and farmer. Thomas Sharman, listed in 1861 as miller, is shown in 1871 as a journeyman (ie. an employee). In 1881, Kelly's Directory has Edward Byron, and 1887 Peter Richardson as "farmer and corn miller", and Bulmer's 1895 Directory had Thomas Marples. Kelly in 1904 showed Marples as draper and miller, and in 1908 no mill or miller is mentioned. Local verbal evidence suggests the mill finished work about the First World War - possibly it was earlier, and the changes of miller, and the dual occupations certainly suggest it was a marginal concern in the late 19th century.

The water supply to the mill is unusual and was complex. Probably the original mill used water derived from surface, or springs on the limestone/shale boundary uphill of the site, near Calver cross-roads today, and in the valley rising towards Hassop. The bulk of this was probably diverted by soughing - certainly no surface supply exists today. A stream is shown on Burdett's map of 1767-1791.

Calver New Sough (Brightside Sough) probably began about 1730 (Rieuwerts 1987 p.35). This was driven southerly in the shale from a tail above the site millpond, under the shale valley towards Hassop. Its position, well above the lowest point possible, suggests it was so located to avoid diverting the mill supply - and subsequent legal action. Today it delivers into stone troughs and leads by a channel above road and valley bottom level, into an artificial channel cut in the former millpond, now a housing estate. Finally it enters a culvert, which must previously have run under the dam, discharging into a newly made cut in the millyard, then down the former open cut to the River Derwent.

Calver Mill Sough supplies the water passing through the wheelpit today, but it is most unlikely to have done so prior to 1863, when large scale mining finished at the nearby North Derbyshire United (Willies 1982). This sough was begun (Rieuwerts 1987 p. 34) in 1756, and runs from a tail next to the open cut near the Derwent noted above, under the

present mill (into which the tail water was and is discharged, to the site of a Newcomen Engine of c1762 and the Cornish Engine of North Derbyshire United of 1858 at Calver Cross-roads - both used the sough as a pumpway. From here the sough passes into Peakstone Rake and possibly Wren Park Mine. It is highly unlikely that the miners would have tolerated blocking of the sough, so that its diversion into the milldam is presumably post-1863 when North Derbyshire United closed, suggesting a major rebuilding of the mill soon after to accommodate the improved water supply. The water now emerges from a shaft, the top of which is some five or six metres higher than the original sough, about 20 metres from the wheelpit: a recent channel replaces the former dam. Compared to surface water, which has large variations, and is subject to both drying-up and freezing, sough water is more reliable, and would enable year-round use, encouraging possibly an enlargement of the dam and a new larger wheelpit.

The survey of the mill was carried out in a very rudimentary manner, due to lack of time personally, and because of pressing demolition and rebuilding work above and alongside. Indeed gratitude is expressed for permission by the builders to actually carry out the survey during working hours and in the evening. Some features will remain, albeit modified, such as the wheelpit, the sough, or tail from it, and possibly the main vertical shaft and gearwheel of the mill. The latter, in its sunken pit, will form a dining room feature.

Construction of the main mill building was mainly in coursed rubble limestone, formed, rather unusually, into bow-arched lintels over the windows. The wall adjacent to the wheelpit and around the gearing shaft from the wheel was, however, made of massive blocks of ashlar gritstone. The building is roughly square in plan, of 7-8 metres internally, and was originally three storeys high, extended by the later addition of a fourth. On the south side a two storey addition was built, cutting across an earlier window, presumably used for storage, since chutes connected it to the mill on both levels. This had been demolished at the time of the survey. Another smaller domestic building of at least three phases of construction was placed about three metres to the west of the main building, directly above the sough/tailrace, which turns to run below it. This has subsequently been linked by an infill building, blocking accesses to the main mill at ground and first floor levels.

The domestic premises have an older appearance, and could precede the main mill building. The upper storeys of the main building had been demolished internally, and the roof had been removed before the survey started. The domestic and infill building have tiles and gritstone slates.

The windows of the mill building are nearly square, or horizontally wider, rather than the more common vertically elongated windows common in the area and time. The door is double, split horizontally. A flue indicates a fireplace on the south wall and the external chimney is of gritstone.

The walls are of variable thickness: thickest on the wheelpit side, at 80 cm. and about 70 cm elsewhere, but thinned above the wheelpit opening in sympathy with a cut-away portion of the gritstone lintel to the wheel opening.

The wheelpit indicates a wheel of about five metres (16 feet) diameter, and with an opening two metres (six feet, six inches) wide, the wheel must have been about 1.7 m (six feet) breadth. It was pitchback type with the water fed high, but below the top, at the rear. The lower part of the rear wall has steps, forming a curve. Water discharged by the wheel passes under an arch at the end of the mill building, continues two metres high and similar width under the northwest extension, then turns through a right angle to the south, under the domestic premises. From here it is about 1.8 m high, and 0.80 metres wide, of arched rubble limestone. After about 20 metres (unsurveyed) it enters a much lower section with only about 0.6 m air above some 0.6 m of fast-running water.

The wall of the pit and mill building is extremely massive, of ashlar gritstone blocks up to 1.5 metres long and 0.8 metres thick. The bearing stone may be somewhat larger. The wheel opening is formed of similarly massive blocks and lintel. The opposite and end walls are of mortared rubble limestone but with a very large gritstone block for the wheel bearing. The opposite wall has a platform for access to the wheel bearing, and an opening constructed in the wall above, possibly to make it possible to withdraw the axle with the wheel in position. A slot has been cut back longitudinally towards the head in the wall from the platform - purpose unknown.

The axle of the wheel survives. It is of wrought iron of hexagonal section, turned down to enter the bearings from about 0.25 m to 0.20 m section. The top of each bearing is missing, and there is no sign of hub and spokes. The axle does not extend beyond the bearings, suggesting the wheel had the power taken off at the rim. Details of the linking gears and shaft from rim to the vertical shaft inside the mill have however not survived.

The penstock and headrace is incomplete: any box and sluice arrangements have gone (but

two opposed holes above the wheel rim may relate to some mechanism for this). Gritstone slabs line the channel beyond the immediate head, linked by a short stretch of rubble limestone to a wider section. This last has massive gritstone blocks with a slot for timbers or some form of sluice, and leads out directly to the dam. A rectangular trough formed of glazed earthenware leads any overflow or seepage from this section of dam to the top of the wheelpit.

The ground floor of the mill is divided by a wood partition into two areas - an open area next the doorway, and an area with the gearing and shafts next to the wheelpit. The gearing area is defined by four stout posts running parallel to the wheelpit and two further posts on each side between the above and the wheelpit wall. The inside posts, four in all, are morticed at about a third of their height, and received four heavy timbers bracing the structure to the wheelpit wall, enclosing within the lattice the vertical main drive shaft of the mill: the timbers are in parallel pairs, but the two pairs are not at right angles, thus imposing a rigidity on the structure. The beams overhead supporting the first floor are arranged in a similar way, and achieve further bracing from the boarding. The vertical posts were also boarded.

The ground floor is of gritstone flags, with, in the gearing area, a depressed section to receive the vertical shaft of the main drive. There is a trench extending from the wheelpit opening at the level of the wheel-axle-bearings to the two posts mentioned above, and a broad step between this and the normal floor level on which the posts stand. Next to the wheelpit opening is a massive gritstone block, which from its size, and two notches cut in the heavy gritstone jambs of the opening, most likely carried a horizontal axle linking the wheel's motion to the vertical shaft. The block stands on two stone bearers, so as to leave a (water?) channel underneath. Next to it, and central to the gearing area is a heavy timber beam, spanning the trench, to which an iron bearing block is bolted supporting the vertical shaft. The shaft passes through the first floor, and was presumably originally bolted to the beams of the second floor, removed at the time of survey.

The vertical shaft has a central square section of 0.70 m across to receive the spokes of the wooden gears, but is rounded above and below. The square section has bolts to maintain strength and there is an iron hoop at the rounded base. The bearing is formed by a conical insert, running in the bearing block.

The large gear wheel is made of timber, formed by four heavy spokes at right angles enclosing the vertical shaft, with a rim of eight heavy wood felloes jointed to each other and reinforced by an iron plate. The whole is 3.3 metres (11 feet) across, and has 144 wooden teeth inserted into sockets on the inside rim by an iron pin. The gritstone lintel over the wheel opening is cut back to allow it to fit. A smaller spur wheel was probably also attached just below to receive the drive from the water wheel via a pinion: this has disappeared, perhaps suggesting it was of iron construction. The large gritstone block adjacent has been cut back probably to allow this to function. Like the larger wheel above, it would have been secured and positioned by wedges and by a block on each face held by coach bolts.

The first floor carried the mill-stones: four of these sat disposed about the periphery of the main gear wheel, supported on the two sets of parallel beams, and cross beams, which each had a shaft and gear working on the gear wheel, with some means of dis-engagement. A fifth and smaller set of stones was installed against the east wall of the mill, centrally, and may have been driven using a belt drive. Apart from the openings all detail had been removed before inspection.

The sets of millstones all had different sizes, and four different driving arrangements for the upper stones. Two of the peripheral sets were of the french burr-type, with a similar cage-like drive system secured with iron and wood wedges and bolted tapers. The other two were gritstone, as was also the third smaller set. It seems likely the gritstone wheels will form a feature in the refurbished premises - unfortunately one of the burr-stones had already been broken up, another partially so. They were originally thought of as "concrete" and were unappreciated by the builders. One burr-stone had cavities infilled by lead! Detail is shown in the photographs and descriptions.

Third and fourth floors, and the roof, had entirely been removed. Access between floors was by narrow wooden staircases, and chutes existed from the second floor to the extension, and for the first floor of the south extension to the ground floor of the mill. Trapdoors between floors must have existed, but were not apparent due to removal of floor boarding. Probably further chutes were located in the floor next to the sites of the millstones, the bottoms accessible on the outside of the posts of the ground floor gearing area.

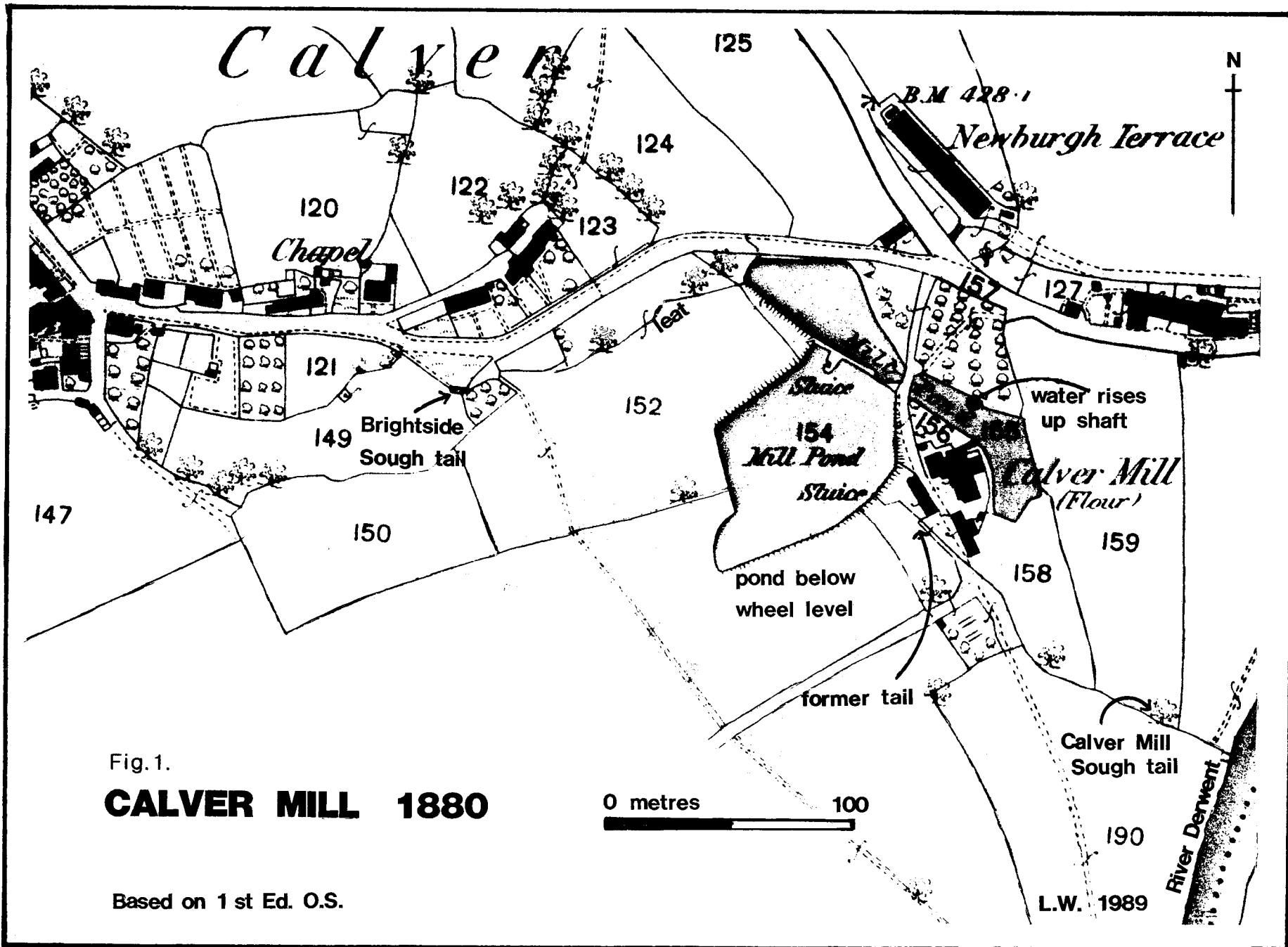
The mill-site has thus had a very varied and rather enigmatic history - two centuries of lead smelting, another of corn milling, with unusual adoption of mining soughs for its water supply. Assuming it was enlarged in or after the 1860s, this was a somewhat late

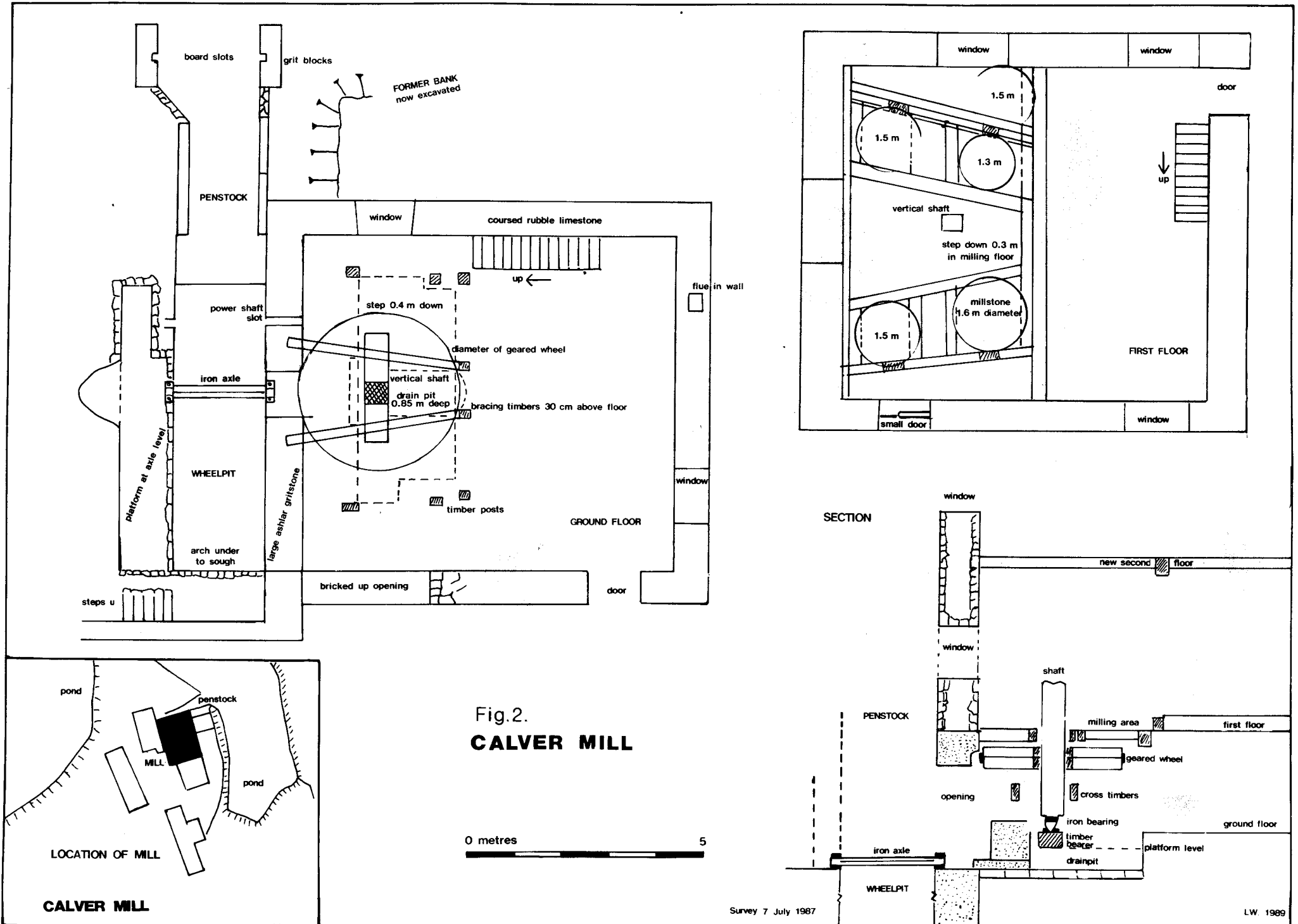
period, when corn milling was increasingly becoming railway located. Perhaps the two smaller grinding wheels were added then, increasing either versatility or output, but above all emphasising the reliable water supply.

I am grateful to Mr George Fletcher for notifying me of the work being carried out on the mill, to the builders, G.D. Rodgers (Buxton) Limited for permission to survey, and to libraries and trustees of the collections listed below.

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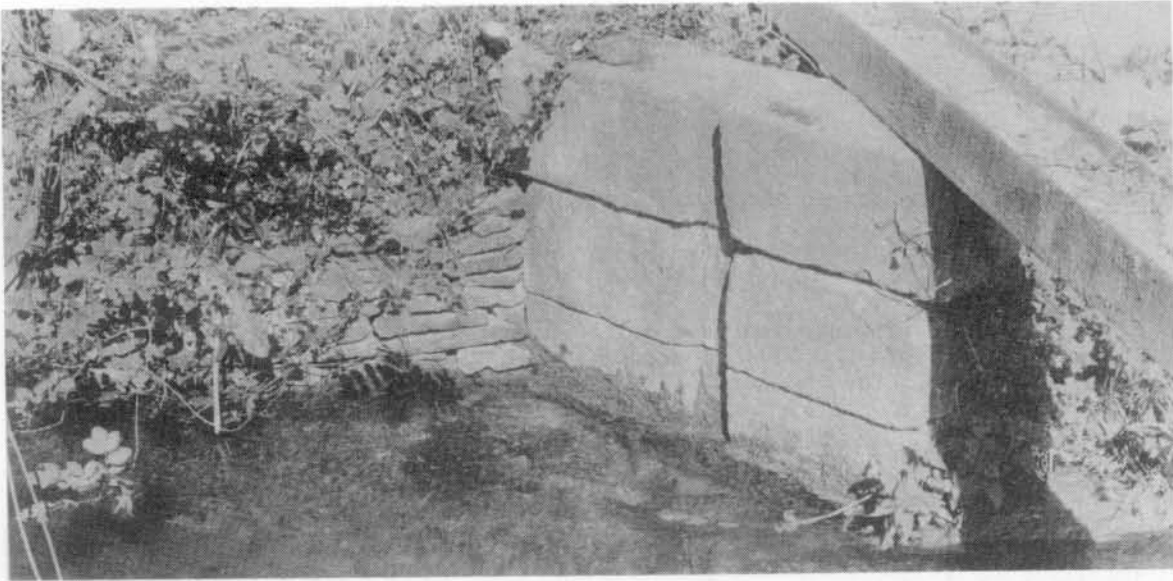
Calver Mill - the mill building is on the left, with the wheelpit protected by the chestnut paling. The centre building is later, linking the mill to the possibly older building, right.



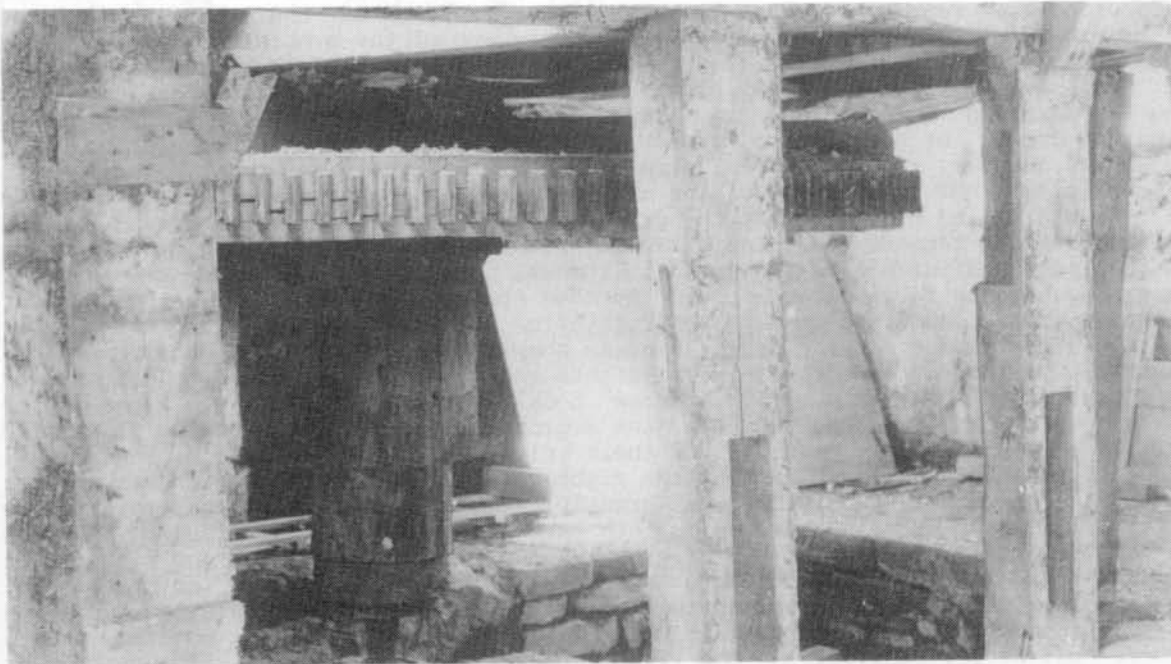
View from the opposing side, the mill building is to the right, following demolition of a later extension.



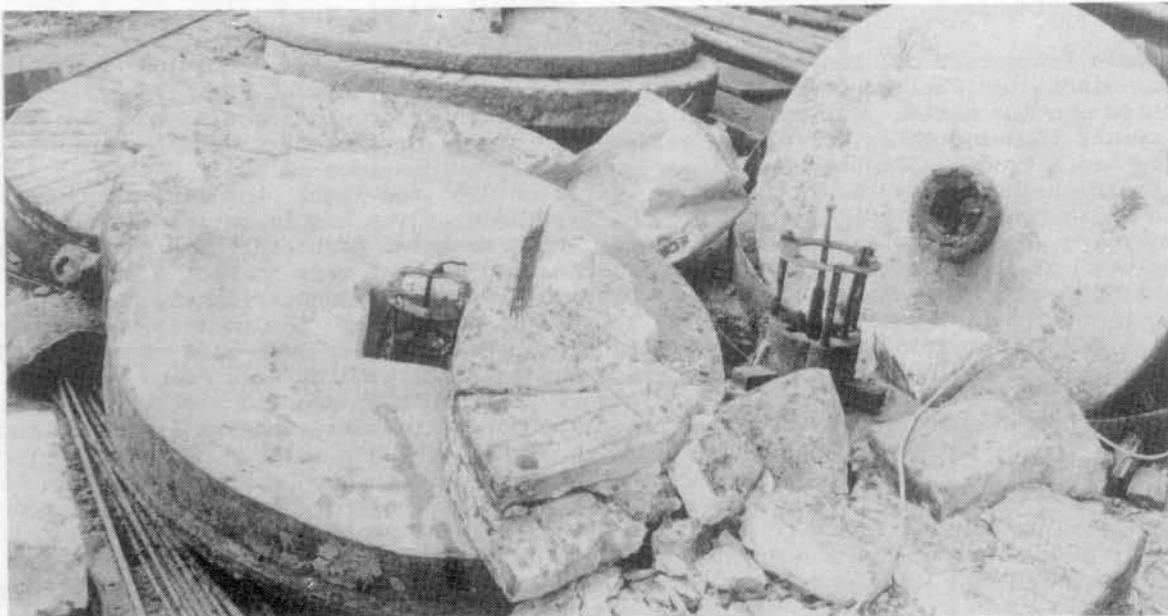
Unroofed section of a sough, which passes under the southerly, lower and older pond. The water in it flows from Brightside Sough, though its tail is today higher up the valley.



The penstock of the mill, with board-slots cut into gritstone blocks. Water emerges a few metres away up from a shaft on Calver Mill Sough, which has apparently been blocked off. After passing through the wheelpit, it rejoins the sough, to emerge near the river.



The main shaft of the mill passed up through the first floor to power the stones. Most of the machinery had gone, but the gear wheel with its wooden teeth shown here has been retained as a feature in the newly converted house.



Millstones - at rear the traditional type, with in the foreground a composite burr-type wheel, probably from France, using a siliceous rock bonded by plaster and bound by iron straps.