

MYERS HEAD LEAD MINE
ARCHAEOLOGICAL SURVEY REPORT
NMR nos: NY 41 SW 18-22



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A Field Survey of Myers Head Lead Mine (Low Hartsop Mine), Cumbria, NY 4156 1265

INTRODUCTION

In November 1996 the RCHME undertook a detailed earthwork survey of Myers Head Mine, a small, 19th-century lead mine situated in the Hartsop Valley, Patterdale, about 0.9km south-east of the village of Hartsop and 4.5km to the south of Ullswater. The remains of the mine are to be found in the bottom of the valley, around the confluence of Hayeswater Gill and Pasture Beck, surrounded by enclosed pasture fields. To the north, east and south, the valley sides rise steeply to Brock Crag, Gray Crag and Hartsop Dodd, respectively. The ground beside the eastern bank of the two streams is marshy and gives rise to a number of small run-off channels which flow into the main watercourse. The well-preserved remains consist of a single shaft, spoil heaps, processing remains, a weir, leat and most conspicuously, a wheel pit and stone aqueduct piers.

The site lies within the Grove Farm estate which is owned by the National Trust and which was the subject of a rapid survey by the RCHME in 1993. The detailed survey of the Myers Head Mine, which is likely to be scheduled as an ancient monument, was requested by the Trust for management purposes. Most of the features were recorded using a Wild TC-1610 total station although fine detail was surveyed graphically. A number of black and white photographs were also taken.

History

The mine has come to be known as Myers Head but was originally called Low Hartsop Mine (Dakyns *et al* 1897, 104). The site is mentioned by Postlethwaite (1913, 127) but the two principal published sources for the history of Myers Head are Shaw (1975, 98-100) and Tyler (1992, 125-30) although they differ slightly in detail. What is certain is that the mining operations, which began *c.* 1870, were short-lived and finally unsuccessful.

The main vein runs approximately from NNW - SSE (Eastwood 1921, 48) and contains galena and sphalerite associated with copper pyrites and zinc blende although it is likely that commercial interests were restricted to the galena. A number of other metalliferous minerals occur in the vein, some of which are rare (Brian Young, *pers comm*). The vein is visible in the bottom of Pasture Beck, close by the shaft, but then deviates to the east. Over a mile upstream it is said to reappear as a strong vein of calc-spar although its course northwards is uncertain (Dakyns *et al* 1897, 104).

The shaft, on the south side of Pasture Beck, was sunk to a depth of 30 fathoms, then a crosscut was driven eastwards to the main vein which was worked in both directions, the level eventually extending 150 fathoms in length (Dakyns *et al*, *loc cit*). The vein to the NNW was apparently very loose, allowing in water from the beck and thus the workings were dammed and continued in the opposite direction. Not surprisingly, drainage was a continual problem and precipitated the construction of the water wheel which drove a Cornish pump inside the shaft. Water was brought to the wheel

via a raised aqueduct supported on 11 stone piers. The power from the wheel was carried to the shaft by a series of rods, the horizontal motion being converted to vertical motion by an angle bob at the head of the shaft.

Some ore from the mine was sold - records show that 3 tons were sold in 1870 and there are eyewitness accounts of ore leaving the site (Shaw 1975, 99) but despite these anecdotes the historical records do not suggest that the mine was ever very productive. The mine was eventually completely flooded accidentally when a cavity in the vein was cut through in 1877 or 1878. The waterwheel was taken to Thornthwaite mine where it was in use until 1920.

Both sources are in general agreement on the history of the mine but Tyler (op cit) states that the mine was opened c.1866 by the Low Hartsop Mining Company who were also responsible for installing the wheel and pumping gear in 1868. He further states that the mine was temporarily abandoned in 1869 due to drainage problems but was almost immediately taken over by the Patterdale Mining Company until its abandonment in 1878. Shaw (op cit) on the other hand, suggests that the Patterdale Mining Company (who operated the nearby Eagle Crag mine) were the sole operators, sinking the shaft in 1870.

There are two adjacent levels (National Monuments Record (NMR) No. NY 41 SW 44) situated 150m south-east of Myers Head which were evidently exploiting the same vein but which the 1st Ed 25-inch map (1863) show had already gone out of use when Myers Head opened. These remains were not surveyed.

ARCHAEOLOGICAL REMAINS

The archaeological remains mostly fall into two categories; those concerned with the drainage of the mine and those concerned with processing the ore. The former are described first.

The Leat System, Wheel Pit and Mineshaft

The take-off point for the leat is on the eastern side of Hayeswater Gill, 150m north of its junction with Pasture Beck. Here, the level of the stream has been raised slightly by the construction of a weir, 7.5m wide, at the head of a slight natural waterfall. The eastern side of the weir, adjacent to the leat, is quite crudely built of medium-sized boulders while on the western side there is a carefully cobbled overflow channel. At the head of the weir, spanning the stream, a single timber beam survives which is still held in place by two iron pegs.

Initially the leat consists of a terrace cut into the natural slope, between 1.3m and 2.3m wide, which would have carried a wooden water trough. The western, downslope side of the terrace is revetted by dry stone walling about 1m high on average and which has collapsed in one place. Part of the leat has been blasted through a rock

outcrop; a shot hole is visible in the quarried face. Immediately to the south-west of this rock-cut section of the leat there is a short length of revetment wall at right angles to the bed of the leat; it is up to 1.1m high and may be supporting a particularly marshy patch of ground.

About 28m from its start, the course of the leat meets the end of the natural slope; situated at this point is the first of 11 evenly-spaced, stone piers which would have brought the water trough to the waterwheel. The first pier is built into the natural slope so that its top is level with the end of the terrace; it is a maximum of 1.8m high, on its southern side. The piers are positioned in a straight line and gradually increase in length from north to south, the smallest being 3.1m and the longest 6.0m. This presumably was to allow for an increasingly tall wooden superstructure to reach the overshot wheel. Their width remains constant at about 1m. The piers are rubble built and were capped with stone flags and, although these only survive in two cases, most of the piers appear to survive close to their full height. The height of the piers varies considerably since there has been no attempt to level the ground they are built on. One puzzling aspect of the construction of the piers is that each has three beam slots in its southern side, in a horizontal row close to its base; how these may have contributed to the overall structure is a matter for conjecture. Detailed measurements of individual piers are given in Appendix 1.

Six of the piers stand on an island in the Hayeswater Gill which the 1st Ed 25-inch map (1863) shows was the original course of the stream. In later editions of the map only the eastern channel is shown since the head of the western channel was blocked off when the leat was constructed; now the stream has reverted back to its former course but the remains of the dam, composed of boulders and river stones are still visible. The stones were probably packed with earth which has since been eroded. This diversion protected most of the piers and waterwheel from the potentially destructive effects of the Hayeswater Gill. As a further precaution particularly vulnerable parts of the river bank, beside the southern piers and where the river passes between the second and third piers, are revetted with stone walls up to 1.1m high.

The wheel pit sits on a triangle of land which has evidently tended to flood when the river is in spate; it is bounded on its western side by a curving river-worn scarp which is partly overlain by the current field wall. The main body of the wheel pit measures 11.7m by 2.1m internally, within walls 1.5m thick; Shaw (1975, 99) mentions a 30ft (9.1m) diameter wheel which is probably correct given these dimensions. The walls appear to be largely rubble-built of undressed boulders with some quarried stone, only small amounts of lime mortar being visible in the core. The walls, which supported the wheel, are 2.5m high externally, and on the whole survive to their original height, as the presence of one or two capstones testifies, although they have both collapsed slightly at each end. Rust staining from the wheel axle is still visible down the centre of the eastern wall. The ends of the wheel pit were probably open since the stonework there does not survive to any great height. There is some debris inside the wheel pit - a tree was also recently removed by the National Trust - nevertheless the overall depth from top of wall to bottom of pit is 5m, indicating that the true bottom cannot be too far below the present level. Inside the wheel pit each

long wall displays 6 evenly spaced beam slots arranged horizontally across the centre of the wall and a single horizontal timber spans each of the short walls approximately half way up their height.

Adjoining the north-eastern corner of the wheel pit is a second, smaller pit, 6.3m by 1.2m internally. Its walls are 1.2m thick and are also capped by flags. The southernmost leat pier overlies the north-western corner of the pit, its foundations sitting on top of the flagging. The interior of the pit is choked with household rubbish but measures at least 1.4m in depth; externally its walls are 1.1m high. The western internal face of the wall is recessed by 0.2m along its northern half. The pit will have housed a mechanism to counter the forces of the pump rods, probably a balance bob, although it has been suggested that it housed a gear wheel (Higgins 1985, plan).

The tail race is carried underground but exits into Pasture Beck 37m downstream of the river confluence. The channel is stone-lined and stone-capped with a mouth 0.7m wide and 0.6m deep. Water is still draining from it into a shallow ditch with a low bank of upcast material on its north-western side, from where it flows into the stream.

The 1st Ed 25-inch map (1863) shows a subsidiary stream channel flowing to the west of the wheel pit and joining the stream at the same point as the tail race. From this evidence it seems likely that the course of the tail race was at least partly inserted into the old stream channel before being covered over.

The ground to the east of the tail race is characterised by stony scarps which are probably largely natural, having been formed by river action. However, immediately to the north-east of the point where the tail race comes to the surface, is a semi-circular scarp, 1.5m high, which has the appearance of a spoil heap but is composed entirely of fist sized river cobbles; this earthwork may be the product of earth moving during the construction of the wheel pit or tail race.

The pump rods from the wheel to the mine shaft were supported on four stone piers of almost identical construction to the leat piers, and on one other pier attached to the south-eastern corner of the wheel pit. This latter pier is 1.9m wide and 4.8m long and has collapsed towards its southern end.

The northernmost freestanding pier has been removed - probably because it obstructed the ford which crosses the Hayeswater Gill at this point - and all that remains are one or two foundation stones and a small scarp on its northern side. The second pier is being partly undermined by the stream but as yet is well-preserved, measuring 5.2m by 1.2m, and is up to 1.6m in height.

Only the western end of the third pier survives, perched on a bank of shingle in the river. On the other side of the river the final pier is built into the river bank, its top level with the ground surface but 2.2m in height overall. It is 6m long which suggests that like the leat piers the rod way piers gradually increased in length. Another detail of construction that they share with the leat piers is the presence of three beam slots in the southern side. Protruding from the top of the last pier, on its eastern side is an iron rod. The pattern of collapse suggests that there was at least one other iron rod at the

western end although Higgins' report (1986) suggests that two more have disappeared since 1986.

Although the 25-inch County Series maps only show four complete piers there are the remains of two other possible fixings situated between the fourth pier and the shaft head. The first of these is 5m south of the fourth pier and appears to be the eastern side of another stone pier, 1.6m wide and surviving to 1.8m in length. Immediately to its west some stonework protrudes from the ground which at first sight appears to represent the other end of the pier but is in fact more likely to be the collapsed remains of a drain. Some 7m south of the centre of the above remains, and directly aligned with the centre of the other piers and the centre of the shaft head is an iron bolt fixed into the ground. Another is fixed into the ground 1.5m to the west. Further evidence that these remains were part of the rod way is that the iron bolts, stone platform and four complete piers are all equidistant at 7m.

The axis of the centre of each pier is aligned with what is almost certainly the housing for an angle bob on the north side of the shaft head. The rectangular structure is 1.6m wide internally, within walls 0.95m thick along the western side but up to 1.5m thick at the northern end. There is an opening in the northern end, 0.5m wide, which would have allowed movement of the rods. The walls survive to a height of 0.8m but probing beneath the debris in the interior suggests there may be at least another 0.7m of walling below the present bottom.

Adjoining the western side of the angle bob housing is a square room or enclosure which, like the rest of the structure, is terraced into the natural slope. Internally it is 3.5m by 4.5m, its walls about 0.8m thick. The course of the southern wall is visible as a scarp from which protrude a number of facing stones. There is no evidence of any roofing material and the present height of the walls does not confirm that the structure was ever roofed. There is no definite entrance; the northern wall is level with the interior along its eastern half but since there is a drop to the natural slope below of at least 1m this may be insignificant.

Study of the 1st Ed 25-inch map (1863) shows that the shaft occupies the northern end of a small former enclosure, the boundaries of which had to be moved to accommodate the mine shaft. No traces of the earlier field walls were discovered during the course of the survey. The same 1st Ed 25-inch map also shows that the enclosure walls flanking Hayeswater Gill predate the mine; these walls are now in a rather ruinous state, especially the southern half of the boundary wall on the eastern bank of the Gill although the symbols on the map suggest that this section may have been primarily a hedged boundary.

The shaft itself is surrounded by a dry stone wall, much of which is in a ruinous state, that adjoins the other structures. Although it is shown as early as the 2nd Ed 25-inch (1898), the wall overlies one of the adjacent earthworks suggesting that it was built when the mine was abandoned to seal off the shaft head.

The shaft itself is about 7.5m in diameter and is partly filled with rubbish. It can be

seen in the sides of the shaft that the soil overburden is not of any great depth.

Remains of Spoil Heaps and Processing

It is clear from the earthworks that although the historical records indicate a relatively unproductive mine, some ore processing was carried out.

Immediately to the east of the shaft head is the main spoil heap, a finger dump extending along the river bank. Overall it measures 41m by 16m and is 4.4m high at its eastern end. Most of the top of the spoil heap is lumpy, covered by small amorphous scarps and hollows, not more than 0.6m high. A linear depression, 1.2m wide and about 0.2m deep, extending from the centre to the end of the spoil heap is probably the remains of a tram way or barrow run. The spoil heap is composed of a mixture of material including slate and vein material between 30cm and 2m in diameter. Most of the tip is turf-covered although some erosion has occurred, most noticeably on the northern side. On the northern side of the spoil heap short sections of rough revetment wall survive which have been built to prevent the spoil from falling into and blocking the stream.

On top of the western end of the spoil heap is a gin circle, 9.5m in diameter, presumably the remains of a whim gin since it is situated at the side of the shaft (Cranstone 1994, 145). It consists of a level circular area partly defined by a scarp 0.1m high; the western half of the circular scarp is missing, apparently overlain by the stone wall surrounding the shaft. Tyler (1994) suggests that the whim gin was only in use prior to the installation of the water wheel. However, it is unlikely that the wheel also powered winding gear; this and the good condition of the gin circle seems to indicate that a whim gin was the preferred way of getting spoil to the surface for the duration of the mining operation.

On the south-eastern side of the gin circle is an oval hollow measuring 5m by 6m overall, the bottom of which is 0.8m below the base of the spoil heap. From its base protrude 2 iron pegs, 4cm in diameter, 1.3m apart and 0.25m above the bottom, which is covered by stones of differing sizes. Its southern scarp is higher than the others because the feature is cut into the natural slope; on this side it is partly stone revetted. Its function is uncertain although a partial explanation may be that the hole was excavated to find bedrock to fix the iron pegs into.

On the western side of the shaft is a sinuous scarp at the head of the natural slope which is partly revetted by stone walling up to 0.5m high. At its base is a small platform, partly cut into the slope which is revetted at its southern end. The platform measures 2.3m by 4.3m. Its function is uncertain.

Twenty-five metres north-west of the shaft, adjacent to the field wall, is a small tip of hand picked galena, composed of pieces 5-7cm in diameter. Although the tip covers an area 11m by 10m, it does not contain much material and is mainly spread across the ground surface. There is a similar tip 17m to the east, beside the main spoil heap,

composed of the same type and size of material. At such a small site all crushing was probably done by hand.

Situated between these two tips, on the crest of the natural slope are the earthwork remains of two rectangular tanks, possibly trunk buddles. The smaller of the two, to the east, measures 4.2m by 0.9m within banks about 1.3m wide overall and is 0.25m deep. At its northern end a channel about 0.4m wide is cut through either side, one drains down the slope, the other into the second tank which is deeper.

The second tank is 2.8m wide and about 5.1m long and contains some fine silty material in its base. Its southern end is stone built, the masonry being up to 0.5m high. Part of a wooden trough, 1.2m long and 0.1m wide, which carried water to the tank, still survives, embedded in the ground surface. The northern end of the tank is open suggesting that the complex relied on wooden tanks and troughs; they probably used water pumped from the mine.

Between the tanks and Pasture Beck the largely natural slope has been cut by a narrow semi-circular track.

On the eastern side of the fourth rod pier is a stone-lined drain, 0.4m wide, which exits from the base of the smaller of the two tips of galena. Its source is unknown.

A second leat survives, partly as a groove, partly as a terrace cut into the hillside, extending for 67m in a south-easterly direction from the main spoil heap to Pasture Beck. (It is the most north-easterly of the three linear features in this area). The leat is about 0.7m wide although for part of its length an inner scarp survives, not more than 0.2m high, indicating the position of the wooden trough. Part of the lower side of the leat is revetted to a height of 0.7m, although this appears to have been to rectify a localised problem of unstable ground rather than extending for the full length of the leat. The height difference between the two ends is approximately 1m, the leat draining from the mine into the stream. Why this leat should have been taken so far upstream is something of a mystery and it seems reasonable to assume that factors beyond the expediency of drainage played a part in its design.

Parallel with the leat, a little above it and to the south-west, is a track, 1.5m wide; since it fades out where the leat ends it may have been made to serve the leat. The end of another trackway leading to the main area of working runs between the latter track and the field wall at the southern end of the site. It is narrower, being about 0.6m wide.

At the base of the main spoil heap is a small plateau between river and hillside containing some minor earthworks. Cut into the bottom of the natural slope is a small scoop 1.1m deep; the resulting spoil has been deposited below it. Adjacent to this is a small platform, 2.4m by 2.2m, which is defined by an L-shaped scarp, 0.4m high, with a slightly stony interior.

On the northern side of the latter features, beside the river, is a short length of hollow

way, 3.1m wide, 0.6m deep which marks the fording point of Pasture Beck. Cutting across the natural slope which lies between the north-western end of the leat and the main spoil heap, is a somewhat ephemeral length of track which evidently heads towards the hollow way. There may have been a wooden bridge across the beck at this point although if this was the case nothing remains now. On the other side of the beck the track resumes, then merges with another coming along the valley side from the south-east. It is between 1.8m and 2.5m wide and is defined by scarps about 0.4m high. Where the track meets the fording point across Hayeswater Gill, opposite the southern end of the wheel pit, part of the track has been revetted with river stones.

On the eastern side of Pasture Beck and Hayeswater Gill are further processing remains. The most south-easterly feature is a circular hollow, defined by a spoil heap on its north-western side which also partly overlies it. The hollow is 4.1m by 5.3m at its widest points; its base is 1.9m across. It is a maximum of 1.3m deep but since it is set into the natural slope it levels out at the front.

The adjoining spoil heap is composed of crushed material varying from the size of a pea up to 15cm diameter pieces. It is 2.1m high and its base is partly revetted by boulders.

A second circular hollow is set on the other side of the spoil heap. It measures 4.3m by 5.7m and like the other hollow is 1.3m deep and 1.9m across its base. The top of the scarp has been revetted with river stones but at the front of the hollow, where there is a lowering of the scarp, the walling has eroded away. In the bottom of the hollow is a sludgy sediment. On the south-eastern side of the hollow is a shallow trench, 1.3m wide and approximately 2.5m long and not more than 0.5m deep.

Both of these features probably represent the remains of some form of settling tubs and it is likely that water was being brought to them via a ditch which crosses a spur on the other side of the track. It is only 0.6m wide overall and 0.1m deep and appears to be taking water from a marshy patch of ground; since the area is already partly drained by a natural stream it seems unlikely that this feature is the result of a more recent attempt to facilitate drainage.

Fifteen metres to the north-west of the latter hollow is a rectangular platform cut into the slope. It measures 7m by 2.4m and is bounded by scarps between 1m and 0.1m in height. The platform is extremely wet and a natural run-off channel flows past its north-western end.

The remaining spoil heaps are composed of very fine material on top but in the exposed section larger rocks are visible nearer the base. There is an interrupted length of revetment walling, only one course high, 13m west-north-west of the second hollow. This may have been in preparation for the extension of the nearby spoil heaps or it may have defined a further processing area, the ground being extremely level.

Beside the main track, opposite the second hollow, is a rectangular depression cut into the slope, 3.3m square and defined by a scarp 0.4m high. On the 2nd Ed 25-inch (1898)

map a small building or enclosure is shown but nothing appears on any other map before or since.

Other Features

Beside the weir, on the western bank of Hayeswater Gill, is the remains of a rectangular two-roomed building. Its northern and eastern sides form part of the field boundary and are well-preserved, although the other walls have been robbed to varying degrees. The walls are rubble-built and 0.7m wide. The foundations of the north-eastern corner of the building are exposed by the stream; composed of boulders about 1m in length, they are 1.1m high.

The eastern room is 3.0m by 2.8m, the only opening being a doorway 1m wide. The northern wall is 3.1m high, the southern 0.8m; the profile of the walls shows it to have had a gabled, single pitch roof. The other room is about 3.0m by 3.3m and is defined on its western side by a stony scarp. In the centre of the northern wall is a window 0.7m wide. There is no indication of the roofing material.

The function of the building is uncertain; its form is rather different from other field barns in the immediate area. Tyler (1992, 126) identifies it as a smithy, which is suggested by a small quantity of iron slag outside it. The structure is shown on the 1st Ed 25-inch map (1863) and also in subsequent maps, although in the 2nd Ed 25-inch map (1898) it is not shown as roofed. If the structure was used as a smithy for the mine it was probably a secondary use of a barn or hogg house.

On the western side of the building is a farm track, the south-western end of which has recently been levelled using brick and stone.

On the eastern bank of the Hayeswater Gill are two short sections of drainage channel which take the form of ditches dug into the natural slope and embanked by the upcast soil on the downslope side. One of them is 16m south-east of the weir, the other is opposite the wheel pit.

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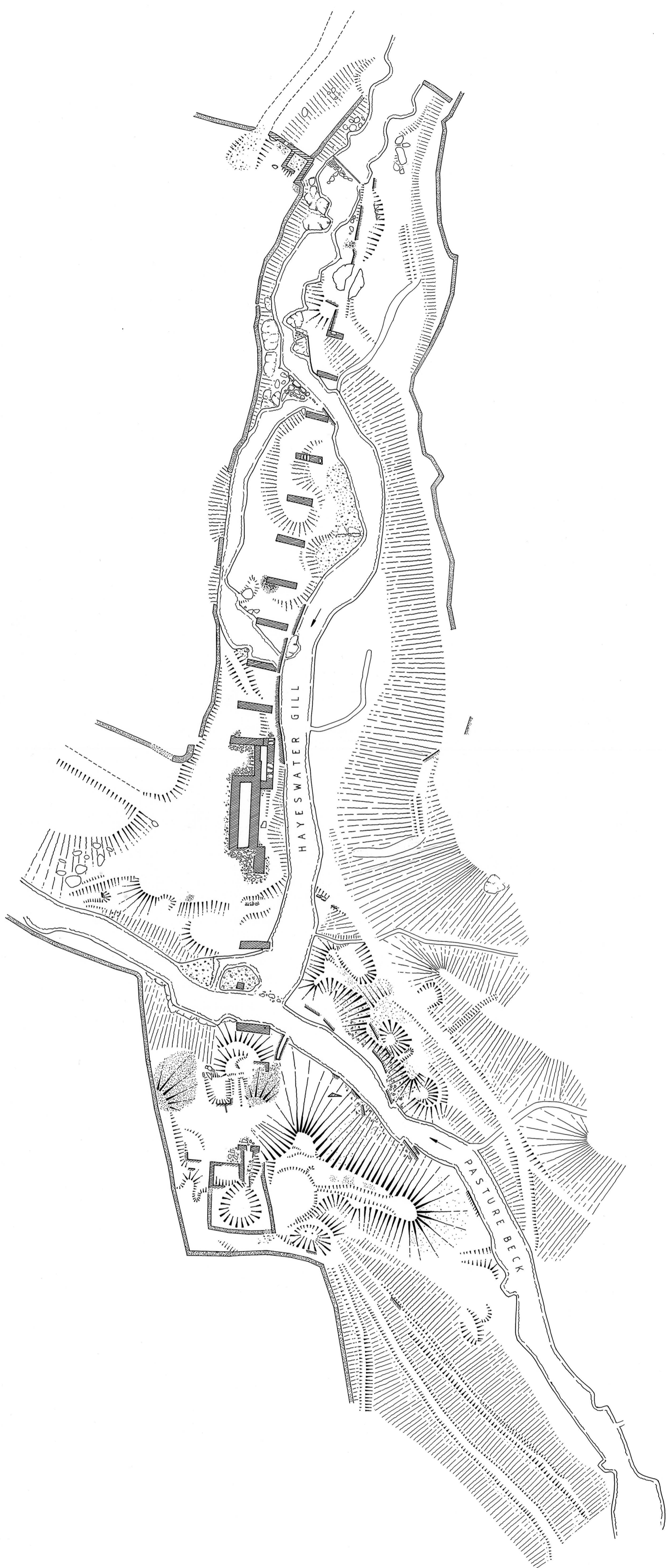
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


Edition of 1915 Revised 1913

APPENDIX

Measurements of aqueduct piers, from north to south:

1. 2.9m x 1.0m
2. 3.1m x 1.0m
3. 4.1m x 1.0m
4. 4.7m x 0.9m
5. 4.8m x 1.0m
6. 5.1m x 1.0m
7. 5.5m x 1.0m
8. 5.7m x 1.5m
9. 5.5m x 1.0m
10. 6.0m x 1.0m
11. 6.0m x 1.2m



-  Stone structure
-  Field Wall
-  Revetment
-  Outcrop
-  Tumbled masonry
-  Shingle
-  Stream

Reduced from original survey at 1:500
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