1. Another Mill Mystery: The Hole of Barr

Ian Brough

This article began life as a report for Gordon McCrae's Renfrewshire Local History course at the University of Paisley. It owes a great deal to Gordon for his energy, enthusiasm and help throughout - Ian Brough

INTRODUCTION

A walker or cyclist travelling on a winter's day along the cycle track from Lochwinnoch to Kilbirnie may see on the left of the track (just after it passes Hole farm, about 2km from Lochwinnoch), a tall chimney, striking in its isolation, standing near the edge of Barr Loch. What was the building? What was it used for? What remains today? This article tries to answer some of these questions.

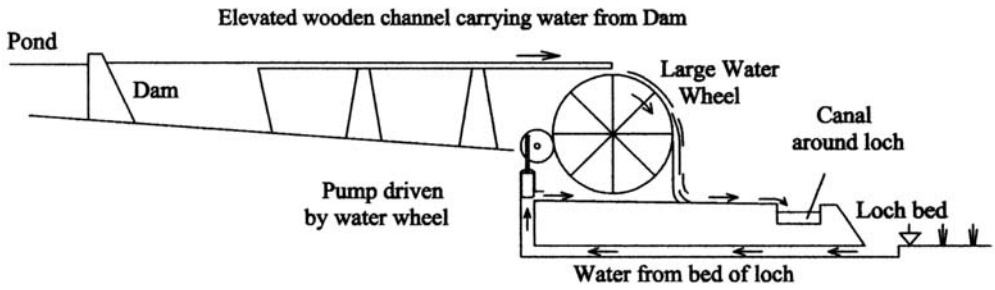
We start with the suggestion from maps that the use of the site revolved around the use of water power and latterly supported a sawmill. Following a description of the site, it discusses the probable history and development, highlighting some of the remaining questions.

DESCRIPTION

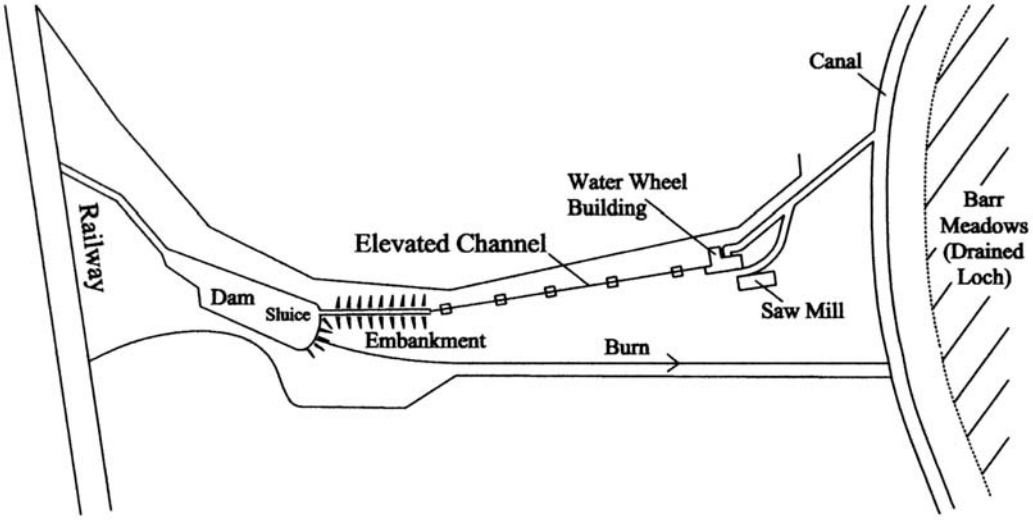
The site is located some thirty metres from Barr Loch and 175 metres from the Lochwinnoch-Kilbirnie section of the cycle track, in the lands of Hole Farm (NS 347 577). Access to the site is relatively easy in winter when the undergrowth is low. A path runs down from the south side of the cycle track to join the older path which runs from Hole Farm under the former railway (now cycletrack) down to the loch. The path from the cycletrack also led to a former bird-hide on the edge of the loch, so the access was improved in the mid-1990s. On walking down the path from the cycle track, the remains of a dam, with overflow channel and silted-up pond can be seen on the right of the path.

The site was visited twice in October 2003 and further documentary research has helped explain the surviving remains. It was recorded and photographed by John Hume in 1965 and some comment will also be made on his survey [1]. The building is located within a small wood and many of the features have been damaged or destroyed since then. The following sketches and description concentrate on the central buildings in the complex in their current condition and as shown on the Ordnance Surveys (Figure 1).

The most striking feature of the site is the square brick chimney, (A) some twelve metres high (Figure 3). The chimney is still intact, standing to its full height in its west corner, but otherwise having lost its top few courses of brick and the copes at its very top. The brick section of the chimney tapers slightly throughout its full length, with the exception of the dozen or so courses of brick above the upper decoration near the top. The chimney stands on a well-finished squared and dressed rubble base over four metres high. On the east side of the chimney base is the diagonal mark of a pitched roof. On the inside, the stones seem to have been re-used and the masonry work is of a much lower quality. At the present ground level on the north side of the chimney is a brick-lined flue which exits the chimney and runs towards room B.

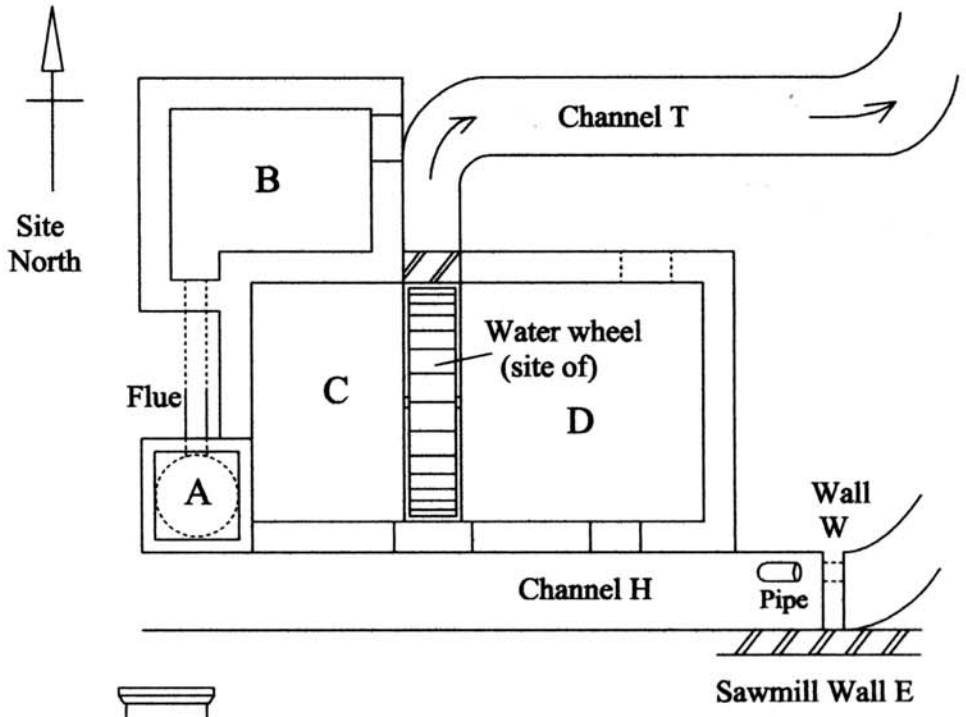


Hole of Barr: Elevation of Water Wheel and Channelc.1857

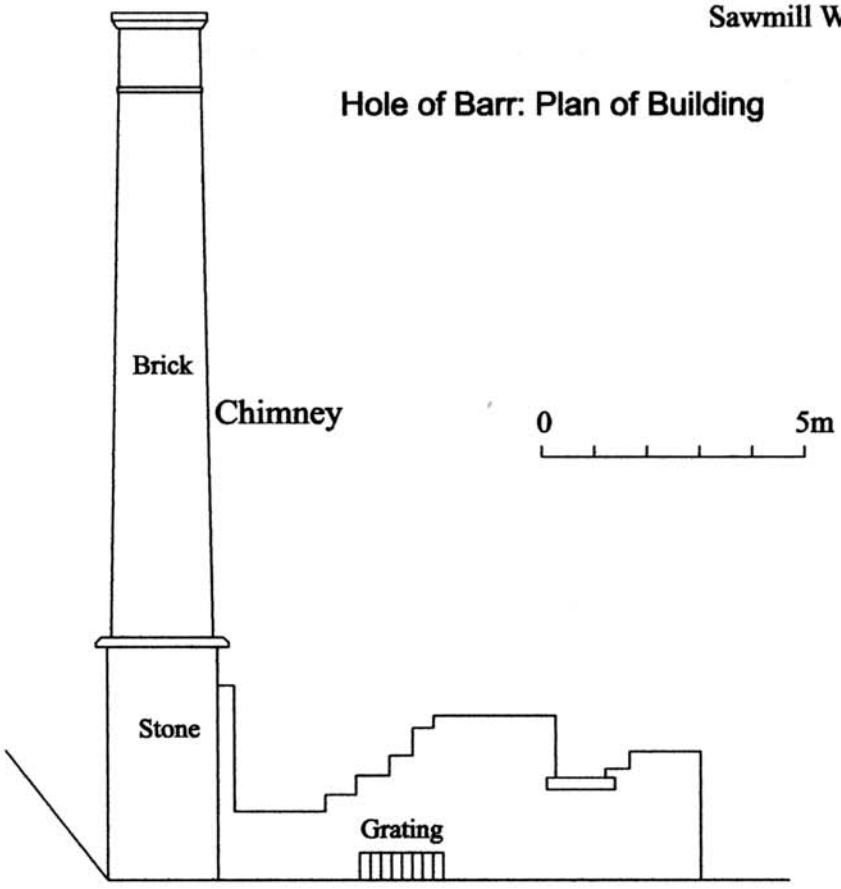


Hole of Barr: Location Plan

Figures 1 & 2



Hole of Barr: Plan of Building



Hole of Barr: Elevation from South

Figure 3

The main part of the structure is the rectangular building containing rooms C and D. Both are ruinous and filled with rubble. The only indication of machinery inside is a metal spike protruding from the rubble in building D. Between C and D is a transverse channel passing through the middle of the building. The exit at the northern end of the channel has been bricked up, but the southern entrance is still open and covered by a metal grating. Like the rooms, the transverse channel is full of rubble and its depth cannot be measured. At the north end are circular recesses in each side of the channel, marking the site of a water wheel.

The next section of the buildings is room D. This is the best preserved of the buildings other than the chimney, and is again constructed of dressed rubble with a high standard of finish. A window and a door aperture are both clearly visible. Although the south end of D and all three sides of the chimney except the south are built in dressed rubble, there are some signs of rebuilding indicated by the direction of the surface markings on the stone.

Finally, there are two water channels, one to the south (H) and one to the north (T), sometimes flooded depending on the water level in the adjacent loch. They join one another east of the main site and the joint outflow is then carried in a channel almost due east to a main canal which runs around the entire circumference of Barr Loch (see below). Of the two channels, the northerly one is very overgrown. The southern channel is clearer and is blocked by a concrete dam or wall (W) [2]. At the base of this wall is a metal-lined cylindrical hole about fifteen centimetres in diameter. There are signs of the edge of a brick building on the south side of the channel at the wall, which may form the edge of the saw mill building, indicated in Figure 1. The remainder of this building was much less permanent, and at the time of Hume's report, the only remaining traces were of a corrugated iron shed. These have all disappeared in the years since 1965. The sawframes would have been located on the south side and the shed extended along the south side of 'headrace' H for nearly five metres each way. [3]

The sawmill was latterly powered by a water turbine located in the channel H at the wall W. Here a large pipe emerges from the channel and curves through a right angle, seeming to protrude from the top of the turbine, which is possibly still hidden under mud and water [4].

HISTORY & DEVELOPMENT

The site has undergone a number of changes in its 150-year history, and each involved partial demolition and reconstruction. The sawmill and its power source are fairly evident, as recorded by Hume, but the purpose of the stone building with the chimney is puzzling. Developments on the site seem to have occurred in at least three phases: The first is illustrated by Figures 1 and 2, based on the First edition OS survey of 1857.

Phase 1: Late 1840s to later 19th Century

Before 1857, there is no mapped record of any building on the site. One of the earliest mention is of a tanworks at Hole of Barr in the period 1700-1720 [5]. The name 'Hole' first appears on John Watt's estate plans of the 1730s, and the farm itself is recorded on a 1796 Castle Semple estate map as 'Hole of Barr'. The presence of running water would have made the site attractive, but the source of water is another mystery. The adjacent burn is very small and the dam and pond were at least partly filled from a spring beside Hole farm. This is mentioned in several sources as originating from an outlet from some old coal workings [6].

The first known building appears on the 1857 OS Map, and the accompanying notes make clear its purpose:

> 'A strong stone building supports and protects a large waterwheel which is used to assist in the clearing of the water from Barr Loch. A stream of water brought from the dam turns the wheel. The stream, when it leaves the planting, flows along a wooden conduit which is supported by high and strong pillars of stone work, and at the end of the conduit the large wheel is fixed' [7].

This entry notes that the site was owned by the time by Colonel McDowall, which allows some closer dating of the original building to sometime between 1841 and 1857 [8]. The stated purpose of the wheel supplies further clues. The drainage of Barr Loch has already been well covered [9], but it is necessary to describe the position as it was when McDowall inherited Barr Loch.

BARR MEADOWS

Barr Loch is filled from two main sources: the many burns which flow into it around its perimeter, and the rainwater falling on the loch surface [10]. Successive landowners from the seventeenth century had attempted to drain the loch, but with patchy and often short-lived success. Perhaps the most elaborate scheme was that carried out by James Adam in 1813-15. Partly by developing the work of his predecessors and also by adding to it, he dealt with the burns by constructing an outer canal around the perimeter of the loch to catch the incoming burns (Figure 4). At the north end of the loch the north and south legs of the canal passed under the road at the two present arched bridges, passing into Castle Semple Loch.

So much for the burns, but what of the rainwater falling onto the drained Barr Loch (i.e. Barr meadows)? This was collected in a central spinal drain six metres wide which ran the length of Barr meadows, and as a succession of nine lateral drains, each two metres wide [11]. This system, unlike the higher level peripheral canal, was down at the level of the bed of the former loch. At the north end of the meadows the central channel ran though a tunnel close to the location of the southern bridge at 'Y' (Figure 4). It then continued as a canal, then a tunnel running alongside the south side of Castle Semple Loch, finally draining into the Black Cart just below the dam at Elliston.

Adam finished his drainage work in 1815 and with finances strained by his elaborate improvements, sold up in 1819-20. He had created 169 acres of cultivated meadows, about one third being oats, and the rest grass [12].

It was said that Barr meadows waved:

> 'with the most luxuriant crops of oats and hay, which would not have disgraced a more genial clime and southern latitude' though it had to be admitted that in a wet winter some of the ground was still under water. [13].

This points to a continuing problem with keeping Barr Loch free of water. The fall along the whole central spine of Barr Loch was estimated by Adam as only about one metre, and it would have required constant work to keep the lateral drains from silting up. It is significant that, of the nine lateral drains in Adams' original scheme, by 1857 only three were complete on both sides and two on one side only.

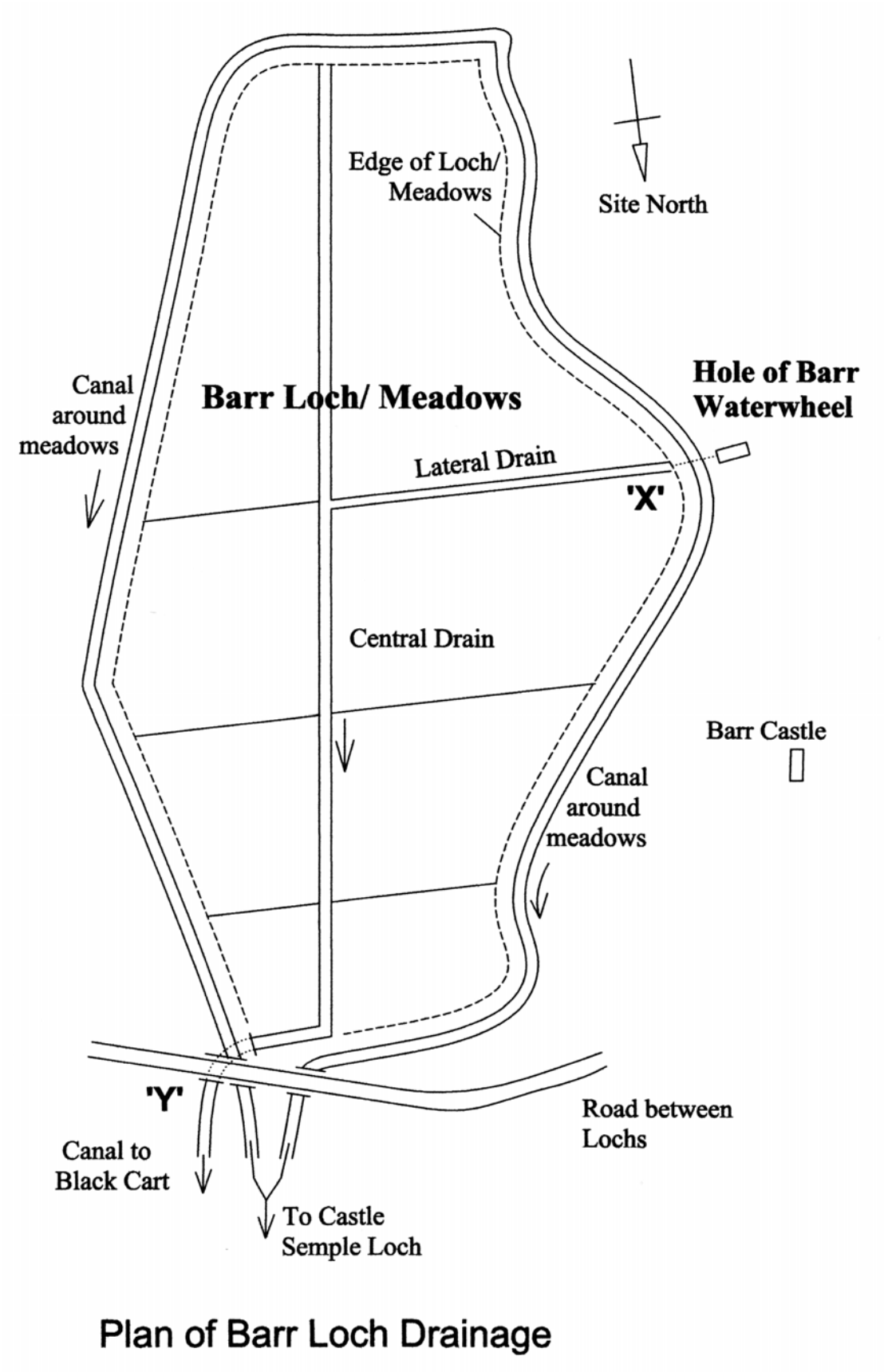


Figure 4

Our stone building coincides with the end of the longest of these lateral drains. It is the only such installation anywhere on the edge of Barr Loch/meadows in the 1857 map, so clearly it was a unique experiment. To drain the loch as described by the OS surveyors in 1857 the end of the longest channel at 'X' (Figure 4) continued in a tunnel under the perimeter canal to the site of the water wheel. The tunnel can still be located half way from the building to the loch, where it has partially collapsed [14]. The scheme is shown in section in Figure 2. The water from the spring collected in the dam and was carried, first on a narrow embankment, then by the elevated channel described by the OS surveyors to the large water wheel. The wheel drove a pump and raised the water by two or three metres to the level of the drain around the loch. The beauty of the system was that, at times when there was heavy rain or most surface water - when the need for drainage was at its most pressing - there would also be plenty of water to drive the waterwheel. From the evidence on site, the dam at the pond is c.6m high, and adding to this the fall from the dam to the site and the additional three metre fall at the site, the 'large wheel' described in 1857 was at least nine metres diameter.

Phase 2: Later 19th Century to Present.

The 1897 OS map indicates radical change in the forty years since 1857 and thereafter, from the large waterwheel to the present ruined building which held a second much smaller transverse waterwheel.

The evidence suggests that the purpose of the smaller water wheel is the opposite of the large wheel. The second wheel did not power a pump, but the wheel itself was the actual pump which drained Barr meadows. In effect this is the simplest type of pump, namely a water wheel **in reverse,** where the buckets raise the water upwards and discharge into a higher channel.

The main evidence for this is from the level of the second wheel. It is far too low to be a conventional waterwheel, in fact so low that it would need to discharge water into the meadows, thereby refilling the loch instead of draining it. The wheel is set at a level where its bottom would dip into the water in the tunnel from the Barr meadows drain. It would then lift the water and tip it into the channel shown on the north. The detail at the north end of the transverse channel with the curved recess for the wheel and bolts for a discharge chute fit this.

The evidence for the power source which drove this wheel pump is more difficult to unravel. All traces of machinery are gone, probably removed for scrap. However the chimney provides the necessary clue. The brick-lined flue heads north to Room B which would have held boilers feeding a steam engine in Room C. A square hole through the wall between the wheel channel and building C at the centre of the wheel axle, indicates the drive from the steam engine.

The reason for the change from water power to steam power may be the drying up of the spring, or simply that not enough power was available to drain the meadows properly. The coming of the railway to Lochwinnoch village in 1905 sliced off the narrow neck of the pond just below Hole farm, but the bulk remained. The spring which supplied the water was on the other side of the line from the mill: and the railway may have had some effect on water supply. This may have contributed to the final change in the development of the site.

The buildings have changed shape dramatically, with the sawmill appearing at the southern corner of the waterwheel building, and the waterwheel building being remodelled or rebuilt to include the rectangular feature of the present chimney at the eastern corner of the structure. The overhead water supply, the wooden conduit and

the stone pillars have all disappeared. The ground-plan of the building in the 1897 map is basically that which appears in later OS maps and is recognisable in the current ruins as recorded both by Hume in 1965 and the present survey.

The position of the building on both the 1857 and 1897 maps is roughly the same but the shape has changed. In the 1857 description, the large water wheel was contained within the building and the dimensions of the building match this, with the original reciprocal pump probably driven by rim gearing on the wheel, and located in the projection at the SW corner.

Phase 3: Sawmill

The sawmill was a completely separate building and made further use of the water power from the pond. The turbine was installed by the 1890s [15]. The water supply to the turbine was through an iron pipe from the dam, avoiding the need for the overhead channel. The pipe probably entered the turbine at the surviving pipe protruding from its top. The sawmill can never have been much more than an estate sawmill. Transport would have been a problem, since it would have been necessary to move all raw materials and the finished timber down the 200 metres of track from the main road by Hole farm. On the other hand, the finished timber may have found a ready market in the furniture-manufacturing firms of Lochwinnoch. The sawmill continued in use within living memory: the farmer at Hole as a boy remembers his father losing his thumb in the saw! The mill ceased operating around the time when the Barr meadows flooded permanently in 1946 [16].

It is no wonder that the history of the site has taken so long to unravel. It still contains secrets,+ some of which are lost under the flooded waters of the loch. It contained a unique mixture of power sources, using water power from disused mine workings to pump water from the loch, and also power a sawmill. The later use of a turbine and steam power to drive a waterwheel in reverse demonstrate further ingenuity. Overall it widens our knowledge of the elaborate methods of exploiting water in Renfrewshire.

Acknowledgements: The fieldwork section owes much to John McDonald, like the author a student on the course, and also to Stuart Nisbet for locating the site of the dam and the water conduit to the waterwheel and clearly explaining both how the water-powered system might have operated and lucidly explaining the complex drainage system for Barr Loch. Duncan Macintosh played a key role in helping to pin down the Day Hort McDowall who built the first waterwheel. Finally (but by no means least), the staff of Paisley Central libraries gave invaluable help in finding OS and estate maps and other references.

Sources

[1] John Hume's manuscript notes and photographs: Royal Commission on Ancient and Historical Monuments in Scotland ref.MS749/4772. His photographs are especially valuable as they show the site before it was so overgrown. They can be seen instantly at www.rcahms.gov.uk/canmore.
[2] Both N and S channels were observed by Hume: the southerly channel he recorded as "headrace" and the northerly one as "tailrace". At the time of the waterwheel, the southerly channel did not continue past the end of the grating covering its supply.
[3] The saw frames were also visible in 1965, but have disappeared since .
[4] The turbine is likely to have been a Francis-type reaction turbine which ran underwater.
[5] Cairn of Lochwinnoch Matters: 42 manuscript volumes in Paisley Central Library Vol. X, p.272.
[6] OS name books NAS RH/23/Reel 177 (Lochwinnoch Parish). Although the bore is shown on the OS plan, its precise purpose and location are disputed in the account. Also Semple, History of the Shire (1782) p.144: ...'a remarkable spring well… found when piercing some mineral veins which dried a coal pit; the water spouts up through a plug about a yard high'.
[7] OS name book as above, transcript by S. Nisbet.
[8] Col. Day Hort McDowall (later Lt. General) succeeded to the Garthland estate in Renfrewshire (inc. the lands of Barr and the drained Barr loch) on the death of his uncle in 1841. The waterwheel was thus erected sometime between 1841 (when he inherited the lands concerned) and 1857 (when it was recorded by the OS surveyors).
[9] Clark, S. (1993) 'Messing about with Water: Loch Management at Lochwinnoch' *Scottish Local History*, Vol.28 1993; Nisbet, S. 'A Loch in Sheep's Grazing? Early Drainage of Castle Semple Loch' *Renfrewshire Local History Forum Journal*, Vol.12, 2004, pp.26-32.
[10] Notable the Dubbs burn on the S. side of Barr Loch, and the Millbank Burn on the N. side. In addition, there is an overflow from Kilbirnie Loch in times of flood, but this loch drains mainly westward, into the River Garnock.
[11] Adam, James, 'Account of the Drainage of Barr Loch and Adjoining Lands, Situated in the Parish of Lochwinnoch, and County of Renfrew', *Transactions of the Highland Society* 1829, p.375.
[12] Adam.
[13] Paisley Advertiser 21st Nov 1831 (Quote from Clark, 1993).
[14] Due to the buried tunnel, former sumps, and deep water, the site is dangerous. Great care should be taken if visited, especially in summer when vegetation is high, concealing hazards.
[15] Hume assumed that the transverse wheel originally powered the sawmill.
[16] Described in Clark.

