

## **A water-powered industrial site on Coneyhurst Gill, Ewhurst and its possible relationship with Wealden timber production**

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*An industrial site on Coneyhurst Gill, Ewhurst was excavated by the late A J (Tony) Clark in 1962 and was supposed to have been a water-powered bloomery. However, analytical survey has shown a larger complex and documentary research has led to the alternative suggestion that the earthworks represent a series of water-powered sawmills for commercial timber production.*

### **Background**

After the death of Dr A J (Tony) Clark in 1997 a number of papers were recovered that related to his work at Coneyhurst Gill, Ewhurst; those relating to the Rowhook–Farley Heath Roman road have already been published (Hall & English 2004). The aim of this short article is to describe his excavation of a water-powered industrial site on the gill together with an analytical survey of the earthworks relating to that site.

In 1946 Tony Clark became involved, with R G Goodchild (1949), in investigating the line of the Rowhook–Farley Heath Roman road that had been suggested by S E Winbolt (1924). The following year a section was cut across the road at a point where the line crossed Coneyhurst Gill, and it is clear that the industrial site in the same area was then recognised – in a letter to Ivan Margary dated 27 August 1947 Tony Clark described ‘great oak timbers projecting from the stream bed’.

Clark returned in 1961 to excavate the site and it is this work that will be described here. In 1982 he recovered one of the large timbers intending to obtain dating by dendrochronology, but no results from this can now be traced, although the wood has been returned from the Ancient Monuments Laboratory by Dr Alex Bayliss. During one of these interventions samples of what was thought to be ironworking slag were submitted for chemical analysis and the results will be discussed below.

### **Location, geology, topography and present land use**

The site is centred at TQ 0831 4032, lying on Weald Clay at an elevation of 90m OD (fig 1). Coneyhurst Gill originates on the greensand ridge to the north, and the volume of water it carries varies greatly with the season. In the area of the site fast-running water has cut 2–3m deep into the clay. On the eastern side of the gill the ground rises quite steeply for a short distance to a plateau, but on the western side it rises more gently. The land is wooded on both sides of the gill and that to the east is now used by Sayers Croft Rural Centre for educational purposes.

### **Excavation by Tony Clark**

Excavation took place over three days during the Whitsun weekend in 1961 to investigate the launder (a wooden box conduit termed a ‘duct’ in the original record) and identify other features of the apparent mill site. A short note was published (Anon 1961) from which the following extract is taken:

[The excavation] showed the duct to have been at least 50 ft [15m] long with an average width of 18 ins [0.5m]. Constructed of oak, it was walled and floored with

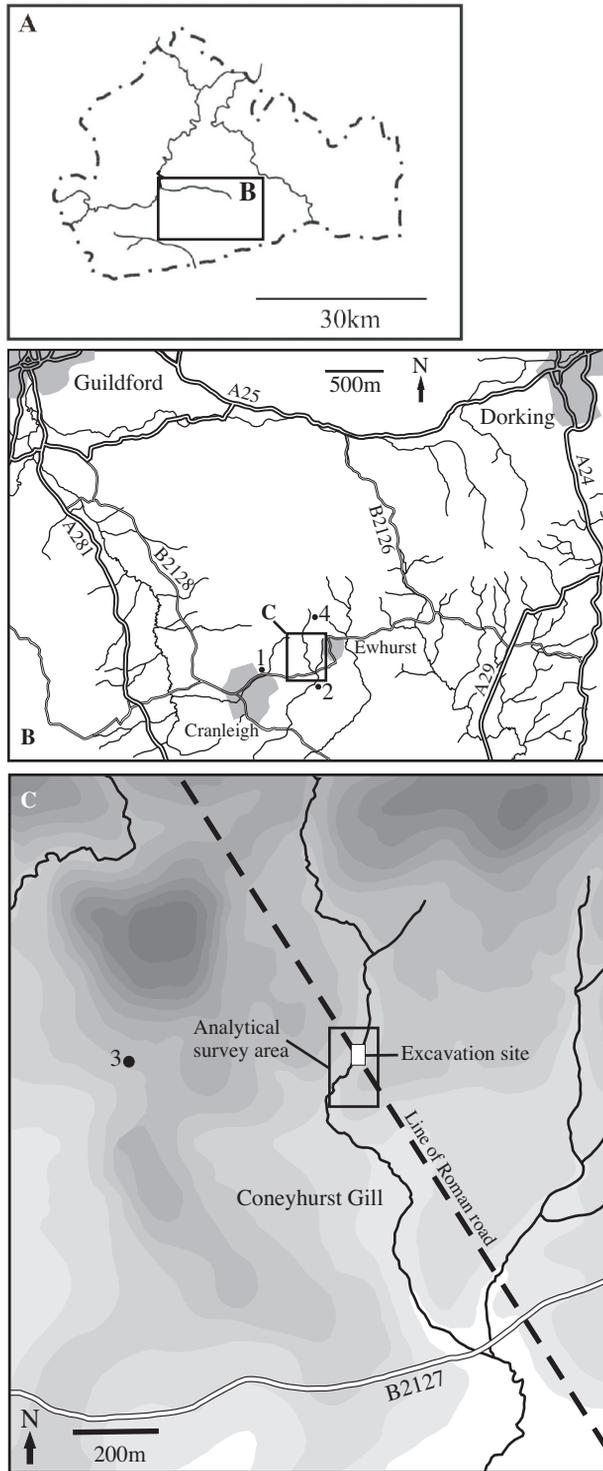


Fig 1 Coneyhurst Gill, Ewhurst. Location and topography with places mentioned in the text – 1: Parkhouse, 2: Slythurst, 3: Lemans, 4: Coneyhurst. The shaded contours are shown at 5m intervals from 125m OD (dark grey) to land below 75m OD (white). (© Crown copyright Ordnance Survey. All rights reserved)

planks upon frames with internal vertical members. The duct was finished off with an end board at the dam, where a sleeper beam presumably belonging to a revetment was also found. Trial trenches on either side of the stream showed no sign of a furnace, but a platform of burnt clay suggested that the establishment had been a forge. The position of the wheel could not be determined, and no traces of a building were detected. Remains of another dam upstream probably mark the site of an auxiliary supply pond. [...] No dating evidence for the ironworking was found, although it may have been an offshoot of the sixteenth century works at Vachery, two miles [3.2km] further down the same stream.

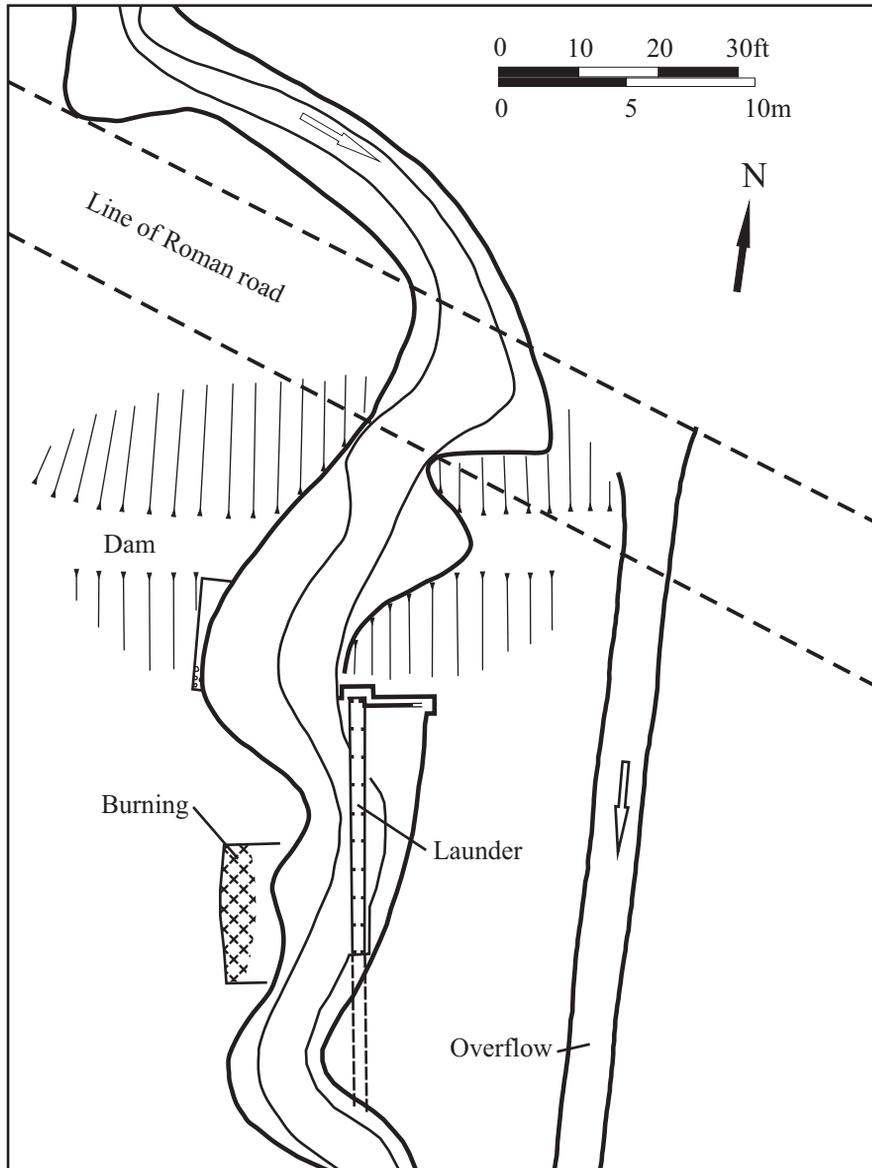


Fig 2 Coneyhurst Gill, Ewhurst. Plan of features exposed by Tony Clark in 1961 (derived from original in archive).



Fig 3 Coneyhurst Gill, Ewhurst. The site during excavation: top left, looking east along the sleeper beam at the base of the dam (NMR AV364); top right, looking north along the covered launder (NMR AV366); bottom, looking east across the end board at the base of the dam (NMR AV374) (photographs by Ken Gravett reproduced by kind permission of the National Monuments Record).

A drawing of the site found among Clark's papers (fig 2) indicates the position of the trenches relative to the gill and the dam, and the location of the timberwork and area of burnt clay. A number of photographs (taken by the late Ken Gravett), copies of which had been deposited with the National Monuments Record, were also recovered. Three of these are reproduced here (fig 3) and show the substantial oak supports for the launder and the planks used to floor and cover it. At the dam end a sleeper beam with mortices can be seen to the east, but not the west, of the launder. It is not clear that the full length of this beam was exposed, and it is not possible to judge whether this was likely to be, as Clark believed, the base of a revetment for the dam, or possibly a building relating to the use of the site.

The results of an analysis of 'slag' from Sayers Croft found among Clark's papers almost certainly relates to this work although it is unclear exactly where the sample came from or who undertook the analytical work. The main constituents of the sample were oxides of silicon (60.47%) and aluminium (20.04%) together with smaller amounts of oxides of iron (7.51%), calcium (3.76%), potassium (3.08%) and sodium (2.33%) with trace amounts of phosphorus, magnesium and titanium oxides. It is most unlikely that this represents slag or ore relating to iron production (Jeremy Hodgkinson, pers comm) but was probably either a natural greensand pebble with iron deposited on the surface or an iron-containing concretion – such pebbles, black in appearance, and concretions abound on the beds of streams originating in the Upper Greensand.

A single piece of bloomery slag was also found in the archive marked 'EWHURST 083404' – presumably TQ 083 404. This would place the find spot north of the excavation site; a recent visit failed to find any further examples at that point.

A visit by members of the Wealden Iron Research Group in 1982 noted the presence of a very small quantity of bloomery slag in the field to the east of the site excavated by Clark, close to the route of the Roman road. If the launder had been fully enclosed the opinion given was that only an under-shot wheel could have been in use (Wealden Iron Research Group Foray notes dated 2 October 1982). Searching the stream-bed for a considerable distance below this dam in 2014, and the two further examples noted during the survey described below, failed to find any further slag.

However, bloomery slag has been found further south at TQ 083 399 (David Quoroll, pers comm) and it is clear that either an iron production site existed in the vicinity or, despite none being located when sections have been excavated, slag was used during construction of the Roman road or later tracks.

## Analytical survey

A visit to the site in 2013 indicated that earthworks relating to water control exist over a wider area on both sides of Coneyhurst Gill than previously recognised and a level 3 analytical survey was undertaken using the tape and offset method (Bowden 1999, 62–3). Land boundaries were used as fixed points and were confirmed by global positioning system (Garmin eTrex 10). However, the density of vegetation, particularly to the west of the gill, means that some minor earthworks may not have been noticed.

The survey (fig 4) showed evidence of water management on both sides of Coneyhurst Gill with two dams on the east and a single, larger example associated with a ponded area to the west. Each appeared to be related to small working platforms downstream from the dam and close to water level.

In detail: to the east of the gill a hollow-way (a) runs down from the south-east marking the line of the Rowhook–Farley Heath Roman road, the route of which has yet to be proved north-west of a point to the west of Coneyhurst Gill (Hall & English 2004). North of the area excavated by Clark is a further small dam (b) and to its south a possible working area (c). Similar features are visible close to the excavation area although timbers still visible downstream from the working platform (d) in the 1990s have now been destroyed. Both the dams (b & e) have been breached; in neither case are continuations visible on the west side

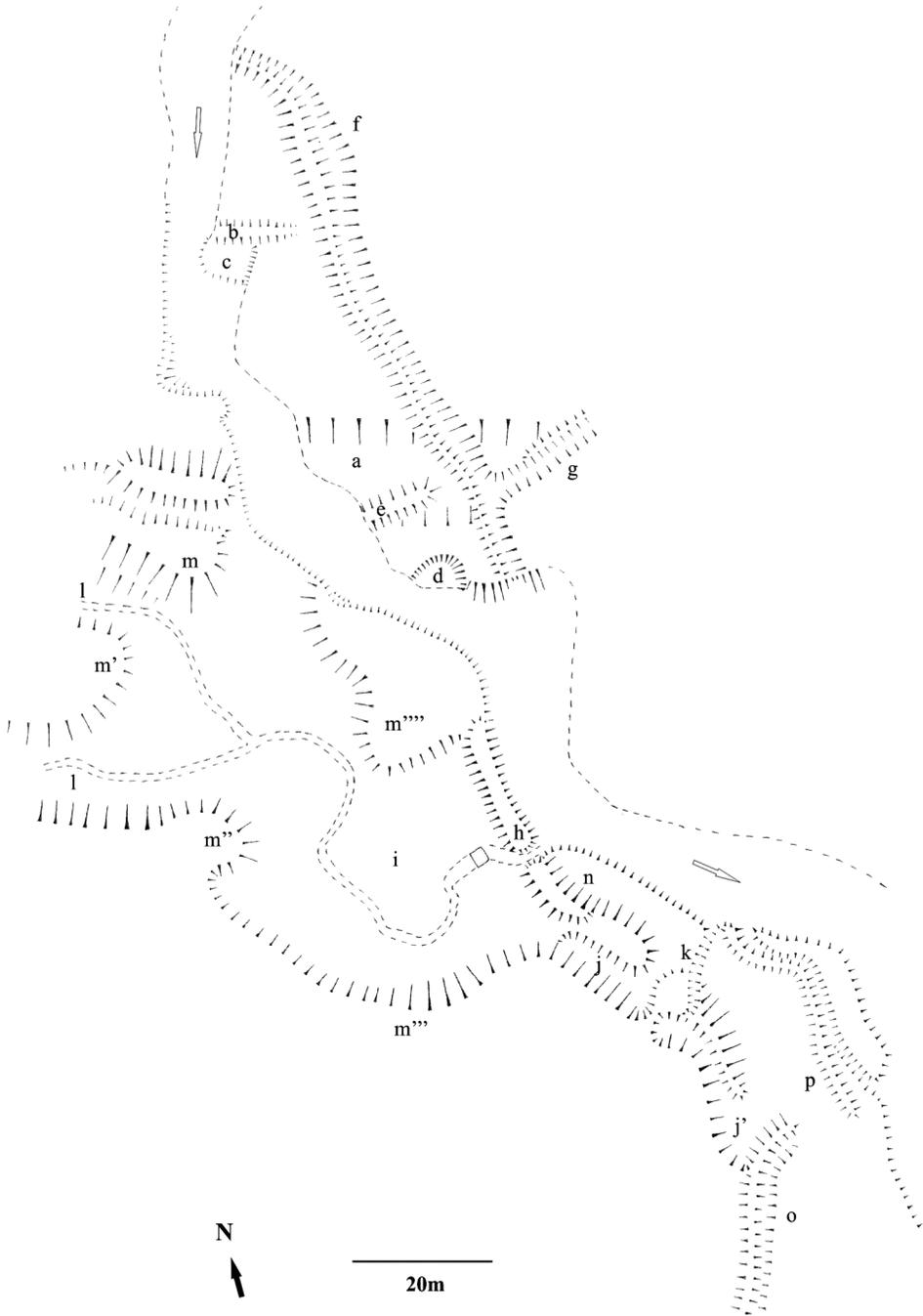


Fig 4 Coneyhurst Gill, Ewhurst. Analytical survey of earthworks, annotated as described in the text.

of the gill, nor is there any evidence of a ponded area behind them. A ditch, banked on its down-slope side (f), runs from upstream of the northern dam (b) to south of the excavated working platform (d), and is joined by a ditch with a slight bank on its northern side (g). Although sited to act as an overflow channel, at its highest point this feature lies c 4–5m above present water level in the gill and therefore appears to have been designed to keep water flowing from the fields to the east of the gill onto the working areas of the industrial complex.

To the west of the gill a further complex exists south of those on the east side. At the confluence with a small stream, now usually dry, a large dam (h), now breached, would have retained water from both sources within a ponded area (i). This pond was supplied with an overflow channel (j–j') that has been interrupted by the construction of a drainage channel, presumably after the site had gone out of use (k). Water for the pond came from two small streams (l–l') that run, now only after heavy rain, along natural valleys that have been enhanced by digging away the sides (m–m'''). Together with skilful use of natural contours water would have been stored behind the dam (h) for use in driving a wheel probably situated on a flat working platform (n) close to the water level in Coneyhurst Gill. A bank and ditch boundary (o) cuts the overflow channel (j–j') and may relate to land use by Little Canfold (South Canfold/Canville) Farm (now Upper Canfold Cottage). A further boundary (p) may also relate to that holding, although its phase relationship with the industrial site is unclear.

## Discussion

It is clear that the earthworks on Coneyhurst Gill relate to some form of water-powered industrial site, but the nature of that industry is uncertain, as is the relative chronology of the three working areas described (c, d and n). Although Clark considered it to have been a bloomery furnace for iron production there are reasons to cast doubt on this identification. The absence of any means of accumulating water creates difficulty in providing power over a sustained period for the two sites to the east of the gill, although water behind the upper dam could have been re-used by the lower site. More tellingly the timber recovered by Clark in 1982, which was either pit or machine sawn, was in very good condition, as were the planks flooring the channel seen by the present author (JE) in the 1990s. Although sawpits appear on high-status sites during the medieval period (eg Graham & Graham 2008), they were not in common use in this country until the 16th century (Goodburn 1992). Water-powered bloomeries were in decline by the middle of the 16th century, but may have remained in use into the 17th century (Cleere & Crossley 1985, 108). A water-powered bloomery using pit-sawn timber is thus unlikely but far from impossible; however, the condition of the surviving timber at Coneyhurst Gill encourages consideration of an alternative industrial process.

Identification as a series of water-powered corn mills would seem unlikely since the working areas appear too small to accommodate horizontal stones. There appears to have been a water-powered corn mill associated with the large estate of Baynards, some 4km to the south, by 1639 (SHC: 97/13/384) and still in operation in 1776 (SHC: 1186/2). This had probably re-used the water management systems originally created to supply a double moat and which had later also been used to power a blast furnace (English 1999). A further watermill site has been located on Coxlands estate, 2km south-east, but both were owned by estates with considerable areas of arable land in the 18th–early 20th centuries. In addition, and in contrast to the situation beside Coneyhurst Gill, both are situated on open, level ground with space for ancillary buildings and machinery. Windmills were available for grinding corn on Cranleigh Common and Ewhurst Hill, with both, particularly the latter, being easily accessible from the area in question.

One possibility is that the complex represents a series of water-powered sawmills. There is considerable documentary evidence for commercial timber production in this area of Cranleigh, to the west of Coneyhurst Gill, and Ewhurst to the east. The London Bridge accounts for 1501/2 include a reference to large amounts of prepared timber planks and

quarterboards purchased from Walter Tanworth (Harding & Wright 1995, 152–3). This may well be the Walter Tanworth who had purchased Parkhouse from Sir Edward Bray in 1517 (SHC: 125/1/1) and in 1539 also owned Canfold and Slythurst (SHC: 85/13/153), and whose son, John, in 1558 owned Parkhouse and Lemans (SHC: 85/13/178) (fig 1B). The next source of timber mentioned in the accounts involved Robert Butler of *Craneley* (Harding & Wright 1995, 153) who held land immediately north of Lemans (SHC: 85/13/178), and timber was being sourced from as far south as Wisborough Green in Sussex (Harding & Wright 1995, 153).

In 1537/8 *heartlaths* were sent to London Bridge by Thomas Dendye of Surrey and in his will proved in 1568 he was described as a wood broker; in 1552 a John Dendy bought Sares (Sayers) Croft from Sir Edward Bray (SHC: 85/13/170/1–2).

One of several examples from the late 17th century illustrates the scale and marketing area for timber products. Francis Browne, described as a carpenter, but also a middleman in terms of purchasing and transporting timber from a number of sources, had an account at Coneyhurst at the end of the 17th century. In 1697 he purchased timber – some prepared – and timber products to a total value of *c* £20,000 (modern value) from Edward Wood of Coneyhurst and Ifold as follows (SHC: 85/16/17/5b):

FRANCIS BROWNE'S ACCOUNT TO EDWARD WOOD FOR CONEYHURST AND IFOLD

51 loads and 28 yards of bark taken off Coneyhurst in '96 sold to Carter at Shere	£20 11s 8d
32 yards of bark at Ifold	£17 12s
7129 hundred sprays at Coneyhurst sold to several people	£18 17s 9d
For 35 stacks and a half of cord wood	£9 15s 3d
For 21 loads 31 feet of beech timber cut into plank wood count 4278 feet	£42 15s 6d
For 2½ loads oak timber for which he received money from Gilbert the carpenter at Sunbury	£5
For 81 trees of young timber taken to thin the wood	£23 14s 6d
Carriage of 8 loads of young timber tops to Sen Heath	£4 8s
For 18 loads 31 feet oak timber to him at Sen Heath for Chertsey Bridge	£39 4s 9d
For 2 loads and a quarter beech quarters	£4 6d
For 269 double beech fellars	£10 15s
For 69 single beech fellars	£1 14s 6d
For 138 loads stack wood at Coneyhurst	£38 3s 9d
For 6 loads 41 feet ash timber at Coneyhurst sold to Huntingford	£10 11s 3d

'Young timber taken to thin the wood' indicates that this does not represent an episode of clear felling but ongoing timber production. Reference to Sen(d) Heath, and to Guildford Wharf in a further purchase of wood by Francis Browne from Ralph Maidman in 1697 (SHC: 85/16/17/20) indicates use of the Wey Navigation for transport towards the Thames. However, the London Bridge accounts indicate transport to London prior to the opening of the canal in 1653 (Vine 1965, 11) and transporting timber from Ewhurst to wharves at either Guildford or Send would have been a considerable undertaking at that time. After 1680 trade from Guildford increased and included timber 'brought by "country carriages" in summer from the woody parts of Sussex and Hampshire' (*ibid.*, 14). Construction of the Wey and Arun Junction Canal, opened in 1816, further facilitated this trade.

Francis Browne's long-term involvement with repairs to Chertsey Bridge is confirmed by a claim for payment made to the Quarter Sessions in 1687 (SHC: QS 2/1/6, 167):

Upon complaint was now made to this Court by Francis Browne and William Saunders carpenters that repaired Chertsey Bridge in this County by order and diversion of Sir Matthew Andrews knight one of his Majesties Justices of the Peace in this County that

they the said Francis Browne and William Saunders had earned in repairing the said bridge and had expended and laid out for timber and other materials to repair the same the sum of £17 as by their Bills of the particulars now read in Court and by the report of the said Sir Matthew Andrews. It is now ordered by this Court that the said Francis Browne and William Saunders be paid the said sum of £17 by the Treasurers of this County in manner following (that is to say) £10 by the Treasurer of the East and the Middle Divisions of this County and £7 by the Treasurer of the West Divisions for the payment of which said sums the said Treasurers shall be allowed on their accounts.

In 1697 a report that the bridge was ‘very much decayed and out of repair’ necessitated the sending of inspectors to ‘view the same Bridge and see the state of the repair thereof and how much the charge will be to repair the same’ (SHC: QS 2/1/7, 287). The bridge was found to be ‘very ruinous and in great decay to the common annoyance and great danger of all persons passing over the same’ (*ibid*, 309). It is these repairs that appear to have used timber from Coneyhurst; Francis Brown was again mentioned as one of those receiving payment for ‘the stuff done and used in the repairing that part of Chertsey Bridge which is in this County and for gravel laid upon the same’ (SHC: QS 2/1/9, 274; Stratton & Pardoe 1982 for a wider view of repairs to Chertsey Bridge).

Large-scale timber production continued through the 18th century; in 1711 the sale of Parkhouse included no fewer than 9000 semi-mature oak, ash and elm (SHC: 85/13/758) and the value of standing timber at Lemans when, in 1790, the farm was sold to William Bray (SHC: 397/3) formed almost one-third of the purchase price of £482 5s (*c* £49,000 modern value):

120 ends of oak timber  
 25 ends of ash timber  
 895 ends of tallows of different sorts and sizes  
 Total value £146 5s (*c* £15,000 modern value)

The land on either side of Coneyhurst Gill, particularly to the west, remained a timber production area throughout the 19th and early 20th centuries. Clearly some preparation of the timber occurred prior to sale and reduction close to the felling site would have eased transport. Sawpits would have been unsuitable in this area of wet clay soils and sawing using trestles was probably still favoured in the post-medieval period. Water-powered sawmills, in widespread use on the Continent by the 13th century, were less common in England (Maskill 2008). However, the technology was being exported from England to the American colonies in Newfoundland by 1620 (Hutslar 1975) and a sawmill was sent to South Berwick in Massachusetts in 1631 (Edlin 1949 [1973, 18]). A picture of this mill, published in 1650 shows a water-wheel turning a flywheel to which were attached three vertical saws that could cut four planks at once (*ibid*). It is certainly possible that a similar technology could have been used by the end of the century on Coneyhurst Gill.

While there appears to have been iron production by the bloomery process in the area at some time, the site excavated by Tony Clark comes from a later period and seems most likely to have been a water-powered sawmill used in the local timber industry.

## ACKNOWLEDGEMENTS

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