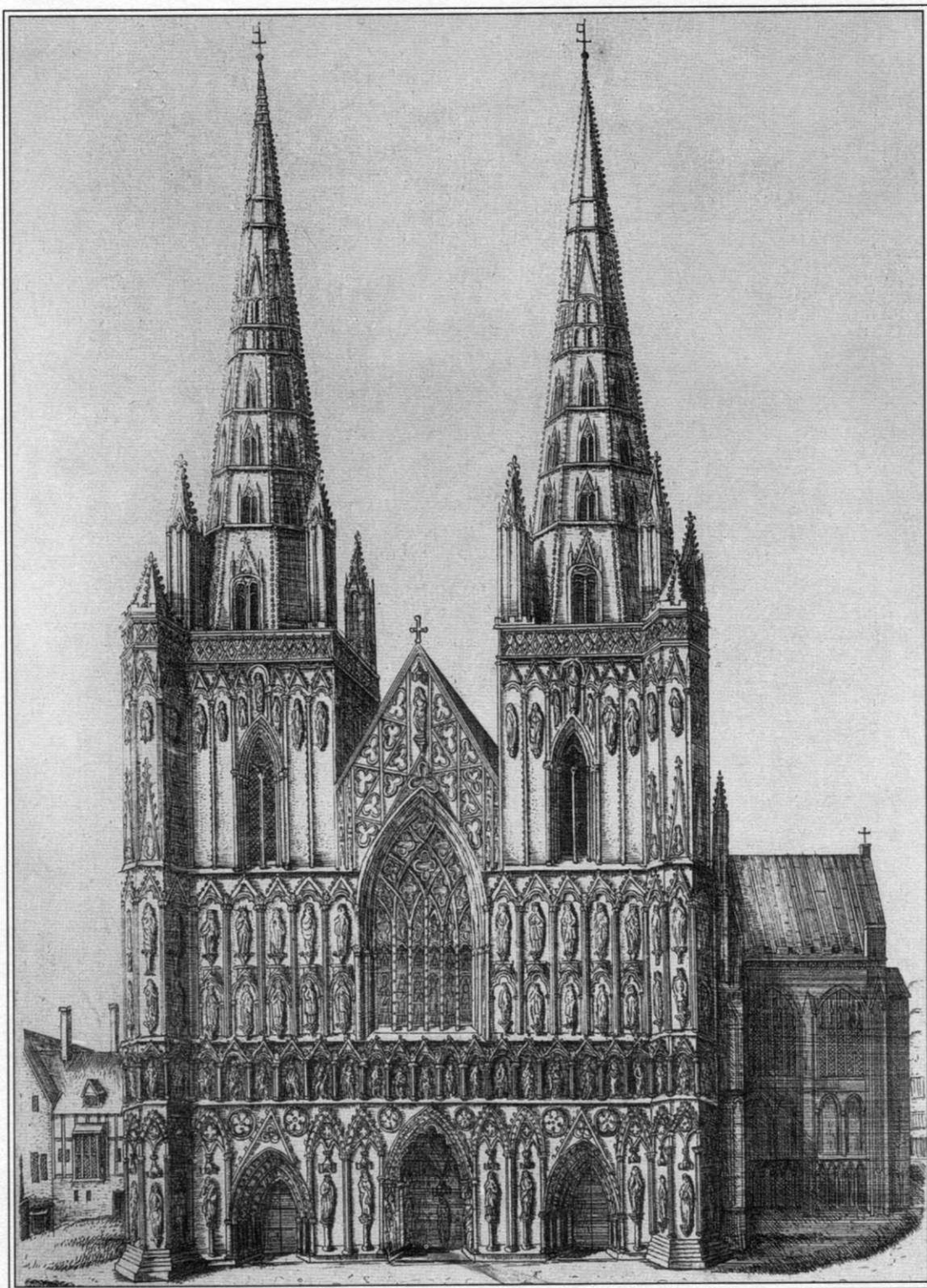




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STAFFORD MILL: AN ARCHAEOLOGICAL EXCAVATION 2003

MALCOLM HISLOP, ELEANOR RAMSEY AND MARTIN WATTS

with contributions by Erica Macey-Bracken, Stephanie Ratkai and Ian Tyers

SUMMARY

Excavation on the site of Stafford Mill, immediately to the south of the medieval town and close to the River Sow (NGR SK921229) revealed the well-preserved remains of a substantial timber-framed structure. This building comprised at least five phases, of which Phases 1 and 4 were dated by dendrochronology to the late 12th and mid-16th century respectively. The building, which was clearly part of the medieval and later mill, was aligned roughly east-west, along the line of the former mill stream. It was divided into two main elements by a substantial north-south barrier, identified as a head sill. This extended across the entire width of the trench, and was composed of three massive timber balks, one above another, the eastern faces of all three being stepped down towards the east. Inclined beams were tenoned into each side of this structure to form the basis of dependent blocks of framing that sloped away to the east and west. The mill probably housed two wheels. These were originally of the undershot, latterly of the low-breastshot type. The timber-framed structure was jointed almost exclusively with mortices and central tenons, though paired single tenons and barefaced soffit tenons were also found in Phase 3, which has been dated tentatively to the 14th/15th century. An unusual feature was that instead of pegs, most joints, both vertical and horizontal, were secured with wooden wedges. Some timbers bore hewing marks, suggesting that they had been scapped or squared by axe.

INTRODUCTION

In February 2003 Birmingham Archaeology began an archaeological watching brief for Jackson Civil Engineering Co. Ltd, on behalf of the Environment Agency in Mill Bank, Stafford, on the line of a new culvert extending from a landscape pool in Victoria Park to the River Sow through the site of a former mill (Williams 2003). As work progressed a stone wall was uncovered prompting Stafford Borough Council to advise that an archaeological evaluation be undertaken before work on the new culvert resumed. Four trial trenches were excavated along the proposed route of the culvert that extended between two 19th-century waterwheels, preserved from a mill demolished in 1957. In one of the evaluation trenches more of the stone structure was revealed, and, stratified beneath it, a number of timber beams. This discovery led to a more extensive excavation which uncovered the well-preserved remains of a multi-phase timber-framed structure, apparently part of an early water-mill. As the work progressed it became clear that the remains were of special archaeological importance, and that the excavation area represented only part of a much more extensive archaeological site. Following English Heritage advice, the decision was taken to preserve the remains *in situ*, rather than to excavate them completely. This report describes the results of this partial excavation.

LOCATION

The town of Stafford is sited on a tongue of Keuper marl and gravel surrounded by alluvium, the historic town centre being almost an island within a loop of the river Sow, which forms the boundary on the south and west, with streams and marshes to the east (VCH 1979, 185). The mill was located on south side of the medieval town (NGR SK921229) immediately south of Mill Bank, a road that follows the projected line of the medieval town walls (Figs 1 and 2).

HISTORICAL BACKGROUND *by Martin Watts*

Although the canons of St Mary's church at Stafford had a mill in 1086, its precise location is not known and it may not have been in the town (Morris 1976). The earliest reference to a mill in Stafford is in 1164-5, when one was held of the king for a rent of £1 2s. 6d. a year. The rent was then being remitted in favour of the town bailiff, which may suggest that it had been built only

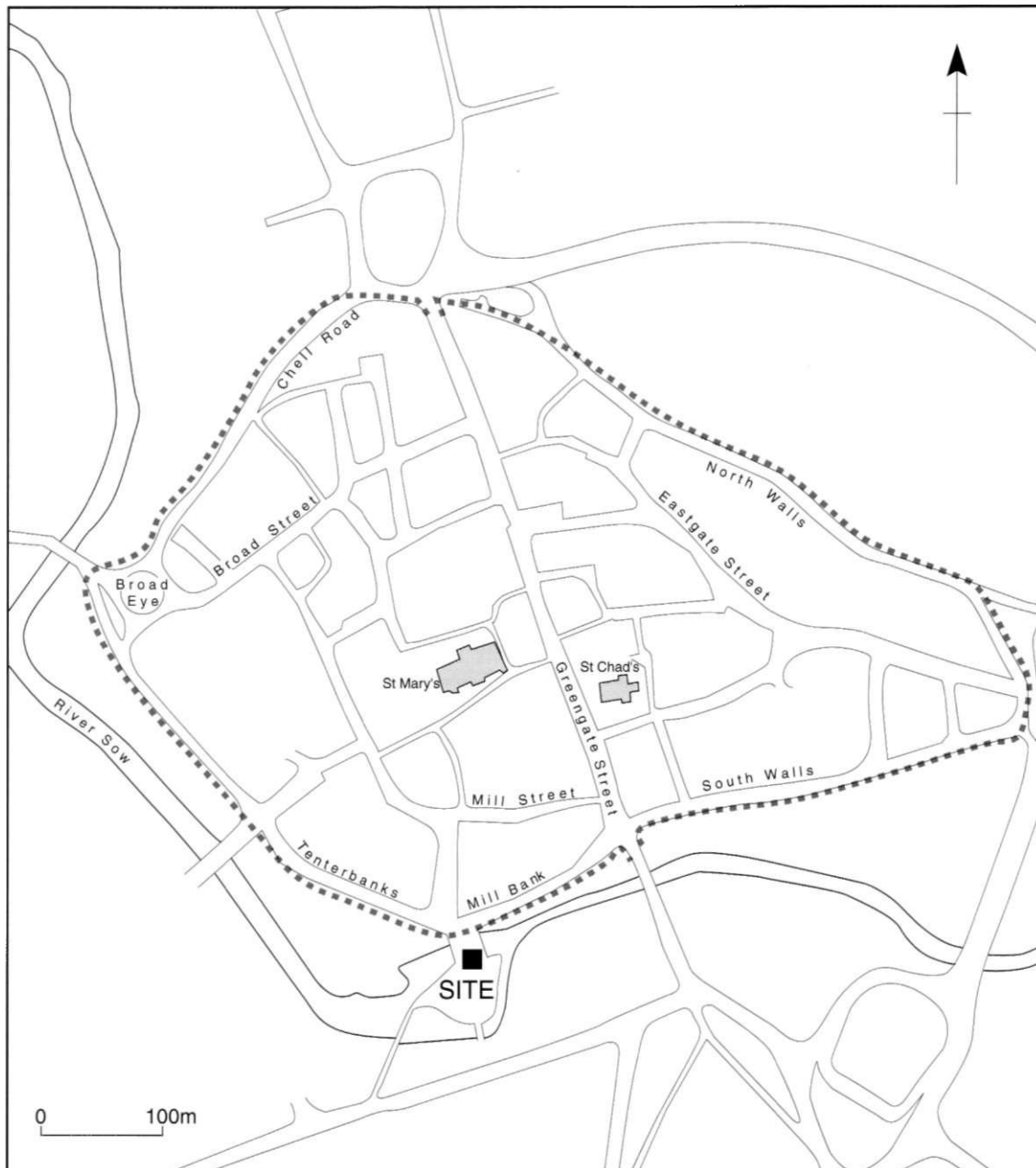


Fig. 1 Location map

recently by the burgesses and was not yet fully operational. By 1166-67 the mill was rendering £2 and from 1168-69 the rent was £2 5s., an increase that presumably indicates its success (SHC I 1880, 39, 41, 46, 52). The king's interest in the mill, however, expired at Easter 1173, when ownership evidently passed to Robert de Stafford, baron of Stafford. In 1193 Robert's heir (his sister's husband, Hervey Bagot) paid the king a fine to inherit the Stafford estate and the money included arrears of rent for Stafford mill, by then worth £6 13s. *Ad.* a year (*Ibid.* 68; SHC II 1881, 37-8).

In the 1190s Bagot and his wife, Millicent, confirmed William son of Wymer as the lessee of what were then described as the mills (plural) of Stafford, together with pools and the water up to the 'great bridge', presumably that carrying the road south from Stafford over the river Sow a short distance downstream from the mill. William was also granted the right to grind the corn of the tenants at Bradley, the Stafford family's paramount manor some 5 miles (8.5 kms) south-west of Stafford town; the tenants were also required to provide mill-stones and to repair the mill pools. Moreover, the renewed lease included the right to take timber from the wood of 'Grullie' at Bradley for repairs

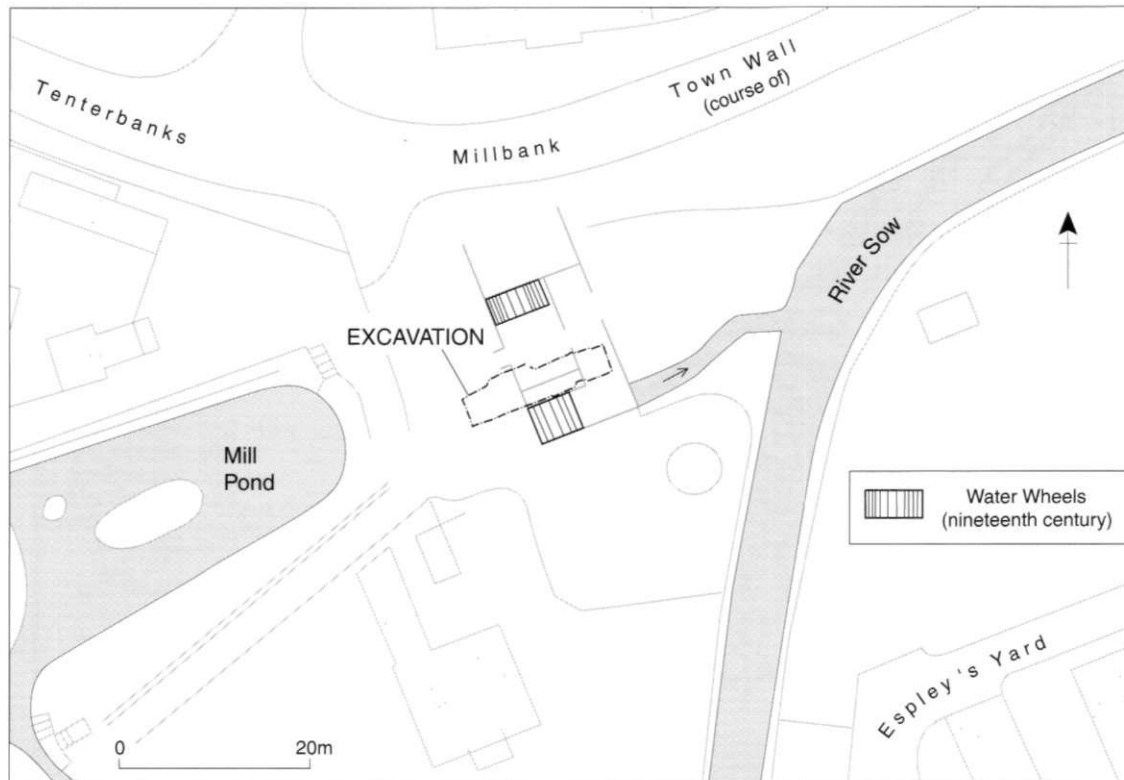


Fig. 2 Map of the mill and its surroundings

to the mills and the bays (SRO, D. (W.) 1721/1/1, f.28). The connection with Bradley raises the intriguing possibility that the reference to a mill in the Domesday Book entry for that estate in 1086 relates to a mill not at Bradley but to one at Stafford, where the Stafford family had property (Morris 1976).

The mill was evidently the chief (and probably the only) mill in the town, and in 1250 Robert de Stafford granted the canons of St Thomas's priory near Stafford a rent of 3 marks charged on the mill, apparently in order to dissuade them from taking com out of the town to be milled (VCH 1979, 211).

By 1400 most of the Stafford family's demesne was farmed out, and while many of the leases were for a standard twelve years, water mills were usually let for longer. With regard to the Stafford properties, it has been noted that mills in particular cost a great deal to maintain, and since they showed no profit whilst repairs were in progress, the landlord always covered himself by taking adequate security (Rawcliffe 1978, 53).

A copy of a lost plan of Stafford, which is considered to date from between 1593 and 1611 (Garbett 1924, 56), shows a small rectangular building on the site of Stafford mill with a water-wheel on one gable end. A second mill is shown outside the East Gate of the town, of slightly larger size and with a waterwheel on the side wall rather than the gable end. It is noted that the Eastgate mill was in ruins in about 1570 and was pulled down c.1600 (VCH 1979, 212), which would appear to indicate a slightly earlier date for the map. On John Speed's plan of the town of 1610 two mills are shown close together on the Stafford mill site, on the north bank of the Sow, just to the south of the town walls in Mill Gate (Fig. 3; reproduced in VCH 1979, 188). The map evidence is discussed further below.

A mid-17th century document refers to flooding problems caused at Tillington meadows, an area upstream and to the north-west of the town, by the raising of the head sills of the mills on two separate occasions, once by Mr Austin, the tenant, and the other by William Backhouse, bailiff. No further action appears to have been taken, however, as the land was sequestered when Stafford was made a garrison during the Civil War (Smith, pers. comm.). The significance of the head sill level is considered further below.

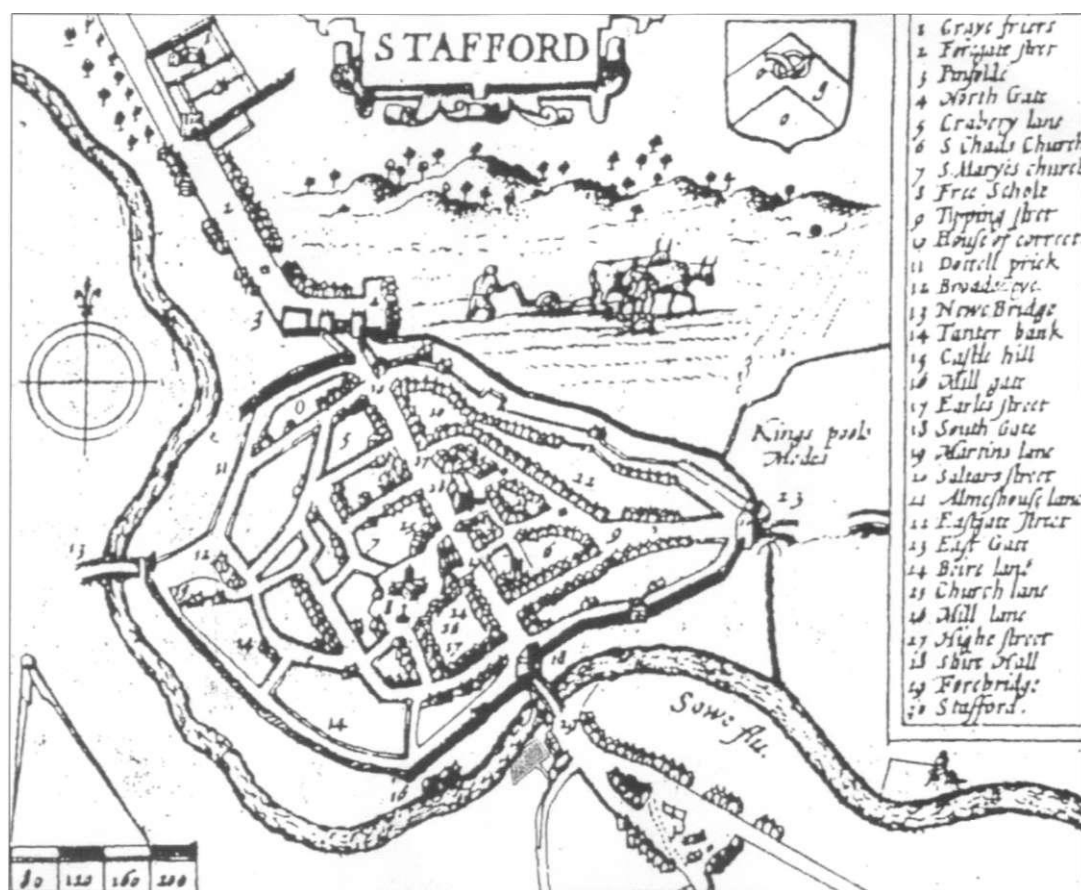


Fig. 3 Speed's map of Stafford (1610)

In 1780 the agent of Sir William Jemingham, the landlord, reported that the com mill at Stafford was in 'want of great repair' and it was considered that the value of the 21-year lease then under offer would not repay the expense of rebuilding it. A new tenant was found to take a 42-year lease, however, and the mill appears to have been repaired shortly afterwards (SRO, D.641/3/E/6/15).

In 1802 there were still problems with flooding and a meeting of those who held land upstream of the mill considered the possibility of improving the meadows by drainage and compensating the miller financially for drawing the gates 'whenever the occupiers shall think it necessary' between Old May Day and Old Michaelmas Day (SRO, D.1798/618/51). In 1812 £7 17s. 6d. was spent on timber for repairs to the mills, by order of Edward Jemingham (SRO, D.641/3/E/5/28/3).

In 1834 the mill was comprehensively rebuilt in brick by George Brewster, who also built a malt house nearby in 1837 (Sherlock 1976, 188-9). A stone tablet inscribed 'GB 1834' was rebuilt into the low stone walls supporting the north end of the northern waterwheel shaft when the site was landscaped after the demolition of the mill building in 1957. The tall building appears on a view of the town from the Newport Road, dated 1845 (reproduced in Roxburgh 1948), and there are several photographs of the building taken during its later working life (see, for example, VCH 1979, facing p. 193). John Brewster took over the mill by 1861 and ran it until his death in 1872 (Job 1981, 82).

In 1876 Stafford Corporation was empowered to purchase the mill, as it was considered that its complete removal would alleviate the periodic flooding of low-lying areas of the town by the River Sow. It was pointed out, however, that there would be no real advantage in demolishing the mill unless St Thomas's mill, further down the Sow, was also demolished (Roxburgh 1948, 17-18). A new 21-year lease of the mill, house and buildings at £95 per annum was proposed in 1878, and in 1879, after the mill had been purchased by the Corporation from Lord Stafford for £2000, a new weir was built and additional floodgates installed (VCH 1979, 212).

The mill continued to work into the 20th century, powered by two waterwheels. By 1937 auxiliary power had been introduced and the mill produced cattle and poultry feed, trading as J. Brookfield & Son until Charles Howell took it over in 1940 (Job 1981, 83). The mill was demolished in 1957, although both waterwheels were still operational and it was considered at the time that the mill 'could be put into good repair for about £800'. Some tentative proposals to use the waterwheels for generating electricity were also put forward at this time (SRO, 4420/G/4). The two iron waterwheels and their pit wheels were retained and parapet walls were added to the stone- and brick-lined pits that housed them, to form a feature in an extension to Victoria Park (Sherlock 1976, 188).

THE EXCAVATION *by Malcolm Hislop and Eleanor Ramsey*

METHODOLOGY

Removal of the overburden was undertaken by mechanical excavator under archaeological supervision. Once stone foundations were located the excavation area was cleaned by hand and a site plan produced. The stone foundations were then removed and excavation proceeded by hand. During this latter phase much of the excavated area was found to be occupied by a series of timber structures, and the excavation strategy hinged on determining the character and extent of these structures, some of which survived up to 0.80m (2ft 7ins) in height. The decision, taken at a comparatively late stage in the excavation, to preserve the timbers *in situ* meant that the site could not be fully excavated, nor the full depth of archaeological stratigraphy ascertained.

RESULTS

After the removal of the stone structure, it was discovered that most of the trench was occupied by a timber-framed building aligned roughly east-west, along the line of the former mill stream. It was divided into two main elements by a substantial north-south barrier which extended across the entire width of the trench, and which was composed of three massive timber bunks, one above another, the eastern faces of all three being stepped down towards the east (Figs 4, 5 and 6; Plate 1). Inclined beams were tenoned into each side of this structure to form the basis of dependent blocks of framing that sloped away to the east and west.

A number of clearly defined stratigraphical phases were identified within this timber-framed structure, though a number of other timber elements were not easily related to the main building. Of the latter, some clearly belonged to an earlier phase, being deeply stratified and independently aligned. Others may have been contemporary with parts of the main structure, but because a decision was made to preserve the timber *in situ*, rather than to excavate the site in its entirety, not all elements could be phased, and it was only possible to establish the broad outlines of the structural sequence. The chronology was based partly on stratigraphical relationships and partly on tree-ring dates obtained from a number of structural components.

- Phase 1 - 12th century
- Phase 2 - 13th/14th century
- Phase 3 - 14th/15th century
- Phase 4 - 16th century
- Phase 5 - 17th century
- Phase 6 - 18th-19th century
- Phase 7 - 19th century

PHASE 1: LATE 12TH CENTURY (FIG. 7)

The evidence for Phase 1 was limited to four main timbers, two at the western end of the site and two at the eastern end, none of which formed part of the principal structure, but which nevertheless represent the earliest indications of a mill on the site. The absolute chronology is based on two tree-ring dated samples obtained from F105 and F172. Neither sample retained any sapwood, and the latest surviving rings dated from 1157 and 1077 respectively. The two timbers are believed, by the dendrochronologist, Ian Tyers, of the University of Sheffield, to be co-eval and to have been felled in the last third of the 12th century, no earlier than 1167 (see below, Tree Ring Dates).

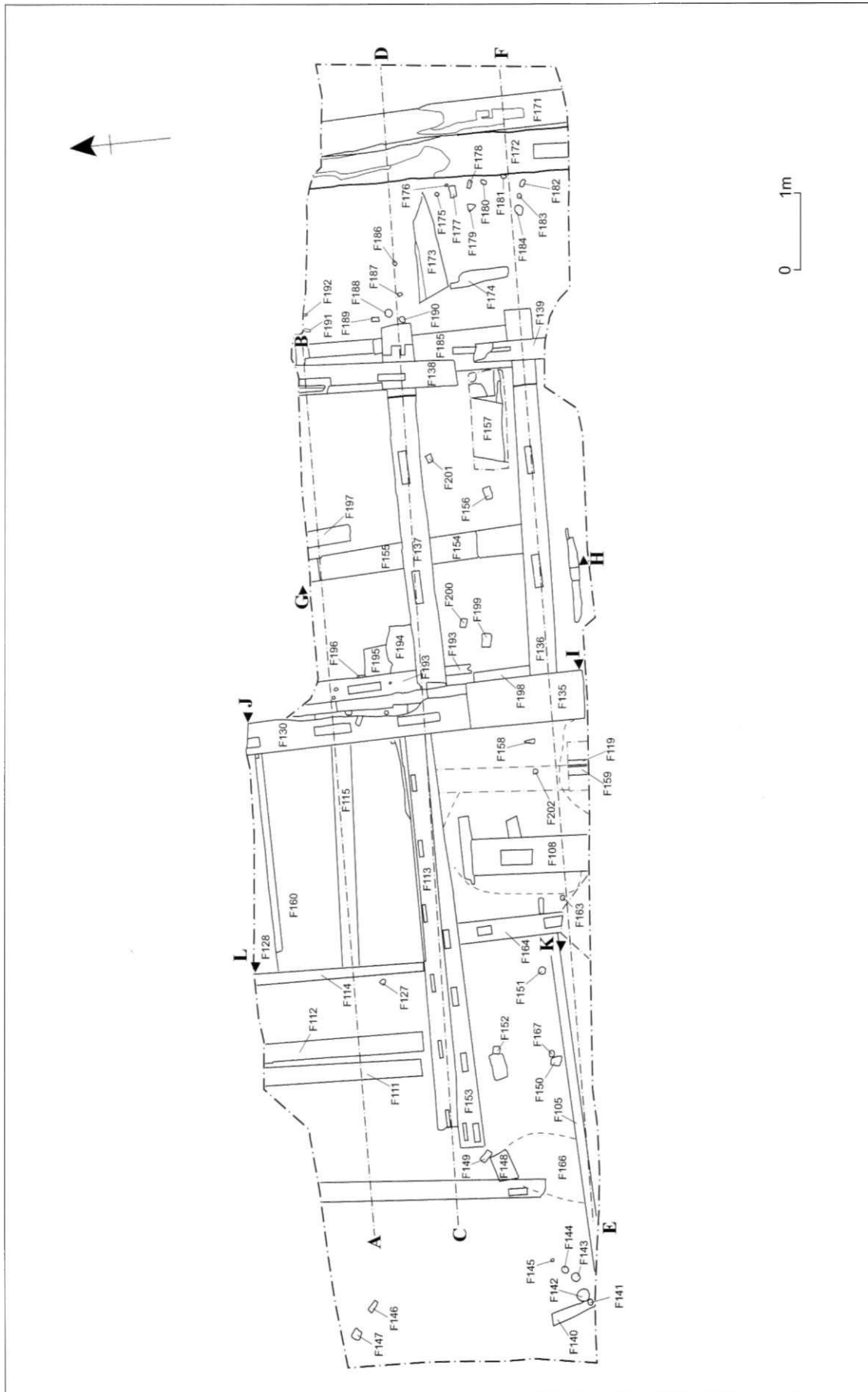


Fig. 4 Site plan after excavation

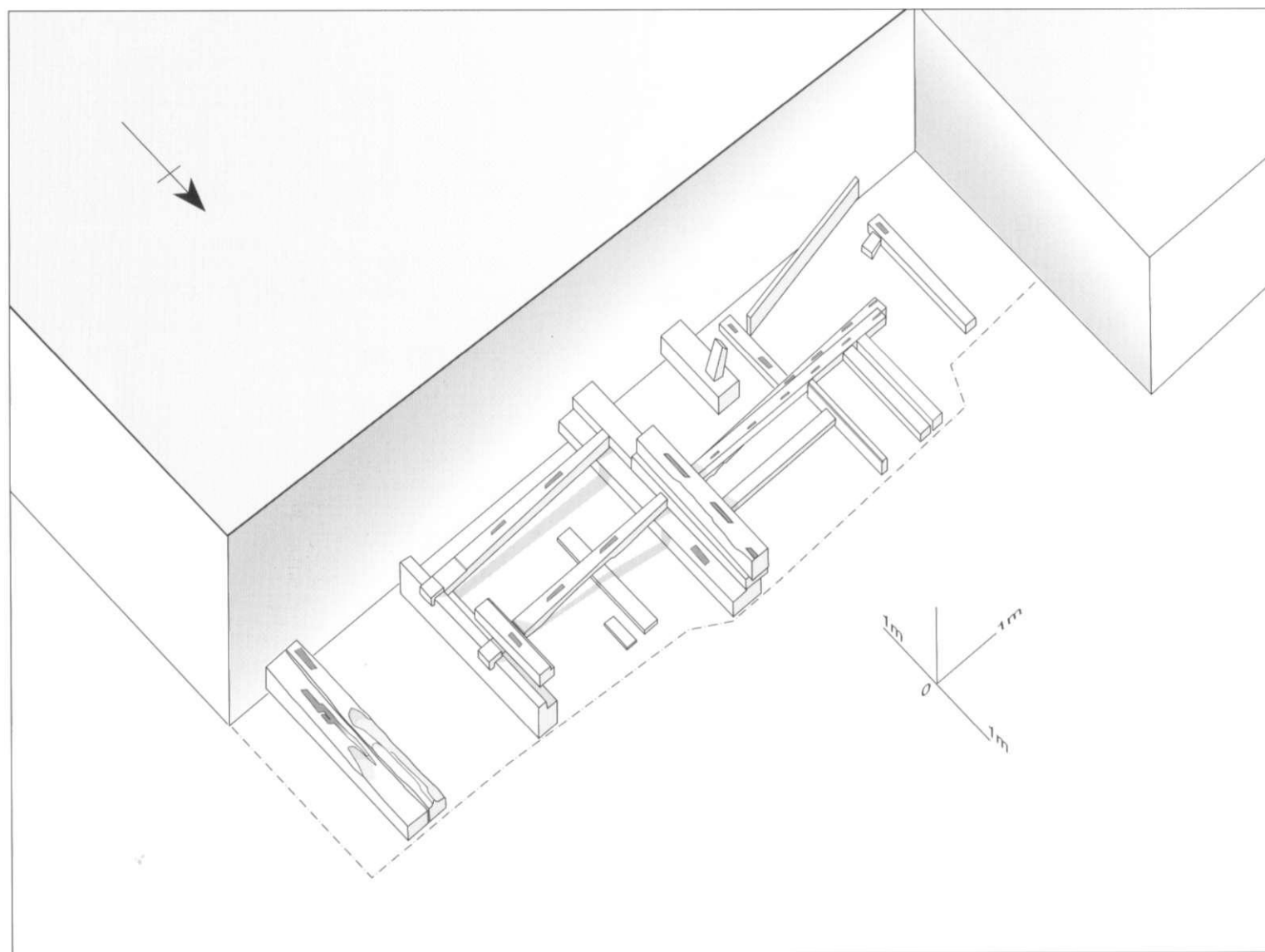


Fig. 5 Axonometric projection of the timber-framed structures

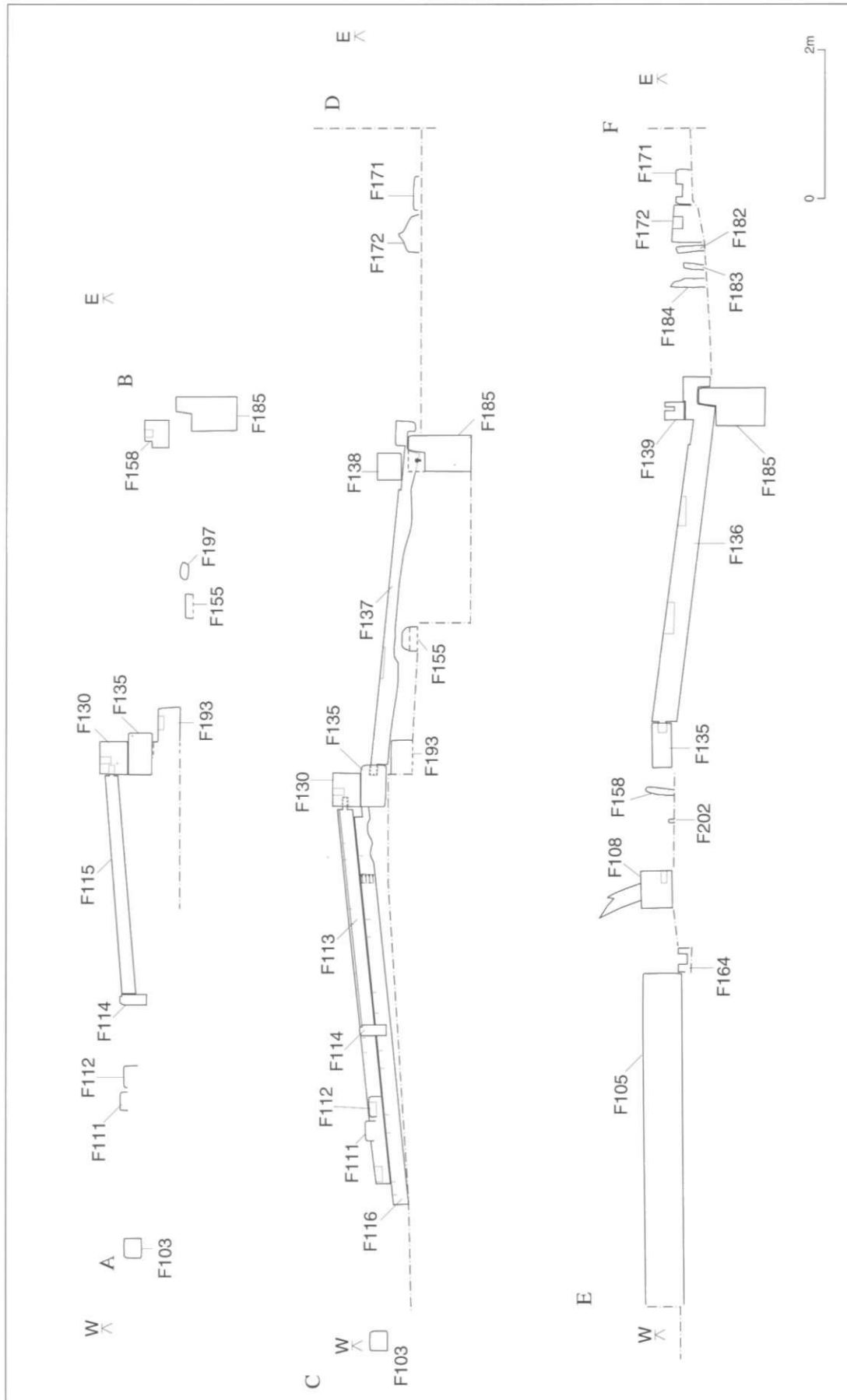


Fig. 6 Longitudinal sections

F172 was a 0.56m (2ft 2ins) wide sill beam, heavily water-eroded at its north end, that lay across the entire width of the trench (Plate 2). At the south end of the upper face was a mortice 0.18m (7ins) wide, a 0.46m (1ft 6ins) length of which was exposed within the trench. Immediately east of F172 was a second sill beam (F171), which also extended across the whole trench and which was also water-eroded at its north end. The two were so close together that it seems probable that they were either contemporary or that one served as a replacement or reinforcement for the other. Towards the south end of the upper face of F171, immediately north of the mortice in F172, was a complex mortice, or a series of staggered mortices.

F105, which was situated at the west end of the excavated area, just inside the southern section, comprised a long plank. Perhaps contemporary with this plank was a sill beam, F164, the upper face of which was exposed, and which was placed immediately beyond the east end of F105 and at right angles to it. F164 had a mortice in its upper face corresponding with the end of F105 and, 0.68m (2ft 3ins) to the north, a V-shaped slot 0.23m (9ins) long and 0.10m (4ins) deep. This slot retained in its base a timber peg (Fig. 8) which had evidently been used to secure the timber that had occupied the slot, which, judging from the character of the joint and the position of the peg, must have been a raking strut angled towards the north. To the north of the V-shaped slot, another beam (F168) 0.12m (4⁷/₄ins) wide was mortised into the west face of F164. This was not fully excavated but was found to be only 0.15m (6ins) long and appeared to be the sawn-off end of a longer beam.

PHASE 2: 13TH/14TH CENTURY (FIG. 9)

Phase 2 represents the earliest element of the main building, which later occupied much of the excavated area.

The Phase-2 timbers comprised F193, the lowest of the three main transverse beams that lay across the centre of the site, and two other transverse members (F154/F155 and F185) that lay to the east of it. None of the three beams was dated, and it is not impossible that they are contemporary with Phase 1, but in the absence of any stratigraphical relationship with Phase 1 they have been grouped separately.

F193 was 0.91m (3ft) wide by 0.30m (1ft) high. Beneath it was a plank (F196), apparently used in levelling the structure, and which appeared to mark the level from which the whole edifice had been built. The beam did not extend across the entire width of the trench, but fell short of the southern section by 1.48m (4ft 10ins), having been truncated so that the south end of a mortice in its upper face had been lost. This seems to have been of similar dimensions to a second mortice that survived intact towards the north end of F193, and which was 0.4m (1ft 3¹/₂ in) x 0.165m (6¹/₂ins) x 0.10m (4ins) deep.

F154/F155, the more westerly of the other two timbers allocated to this phase, was approximately 0.35m (1ft 2ins) at its widest point, but its height was not ascertained (Fig.10, Section G-H). The northern end of the beam was not recorded within the excavated area, but the southern end fell short of the southern section by approximately 0.50m. The upper face of F154/F155 had been cut back into three steps. The southernmost of the resultant tiers was 0.17m (6³/₄ins) deep. The next cut to the north was 0.13m (5ins) deep and provided a 0.70m (2ft 3¹/₂ins) long flat surface. The most northerly cut was 1.15m (3ft 9ins) long at the base, falling short of the north section by 0.10m (4ins).

The northern end of F185 was just within the area of excavation, whereas its southern end lay beyond the south section of the trench. At a distance of 0.10m (4ins) from the north end of the timber, a 1.02m (3ft 4ins) long by 0.28m (11ins) wide step, with a westward sloping east face, had been cut into the west side. The upper face of the timber immediately to the east of this step had a shallow 0.83m (2ft 9ins) long rebate. Further to the south a 0.28m (11in) length of a 0.08m (3in) wide mortice was visible in the upper face of F185, the rest of it being concealed beneath a later timber (F139).

Between beams F185 and F155, two posts or stakes of rectangular section (F156 and F201) and a large piece of timber (F157) were identified. To the west of F155 were two other timber posts or stakes of rectangular section (F199 and F200). The stratigraphical relationship between these features and the timber-framed structure was not ascertained.

At the western end of the trench Phase 1 timbers, F105 and F164, were abutted by a brownish grey sandy deposit containing animal bone, and pottery dated to the 13th/14th century (1062). A possible cut for a post (F165) was identified immediately to the north of timber F105, but was not excavated. This was filled with a blue-grey sandy gravel (1082) and contained an *in situ* post or later stake (F151) of circular section. Two other stakes, one of sub-rectangular section (F150), and one of

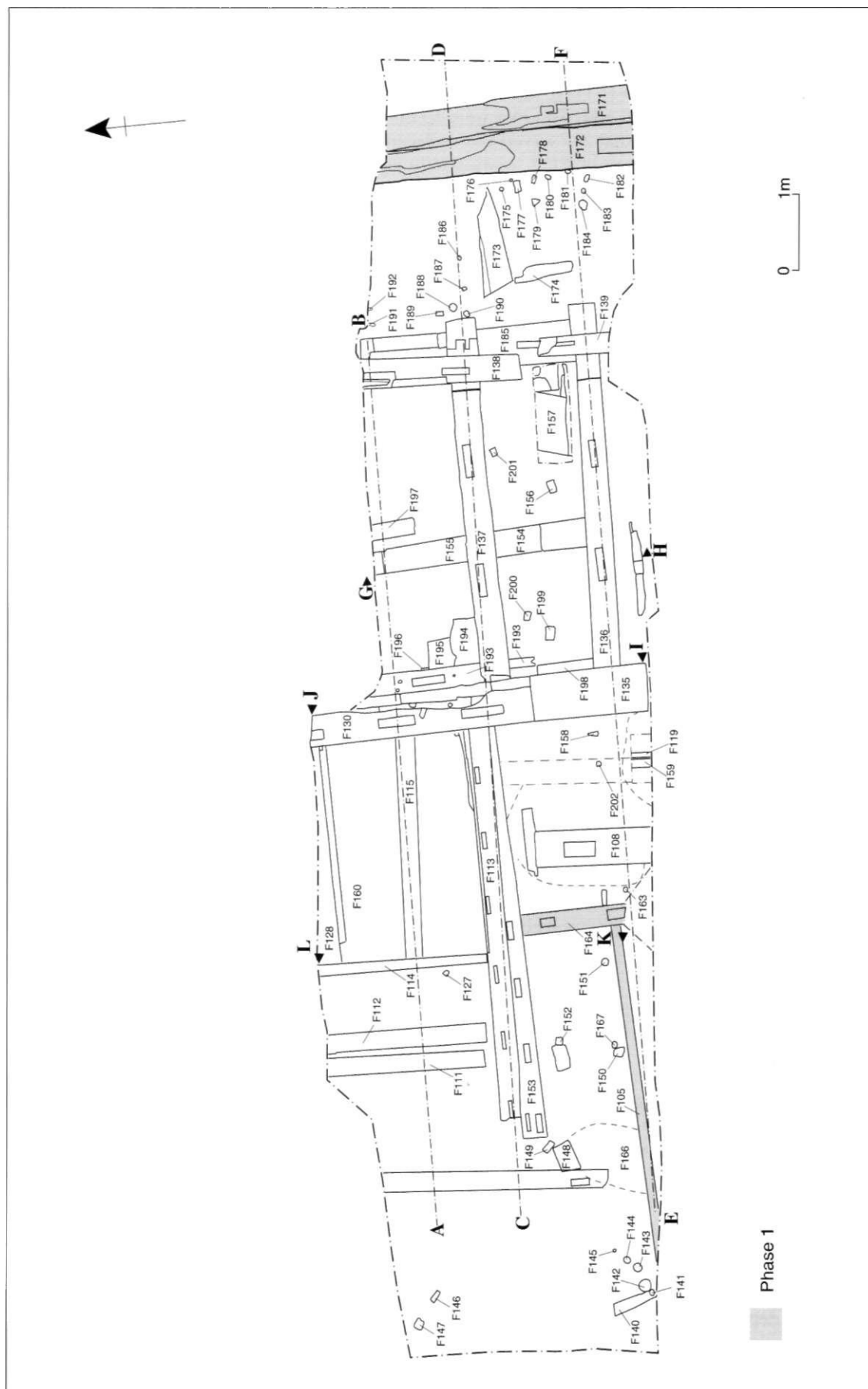
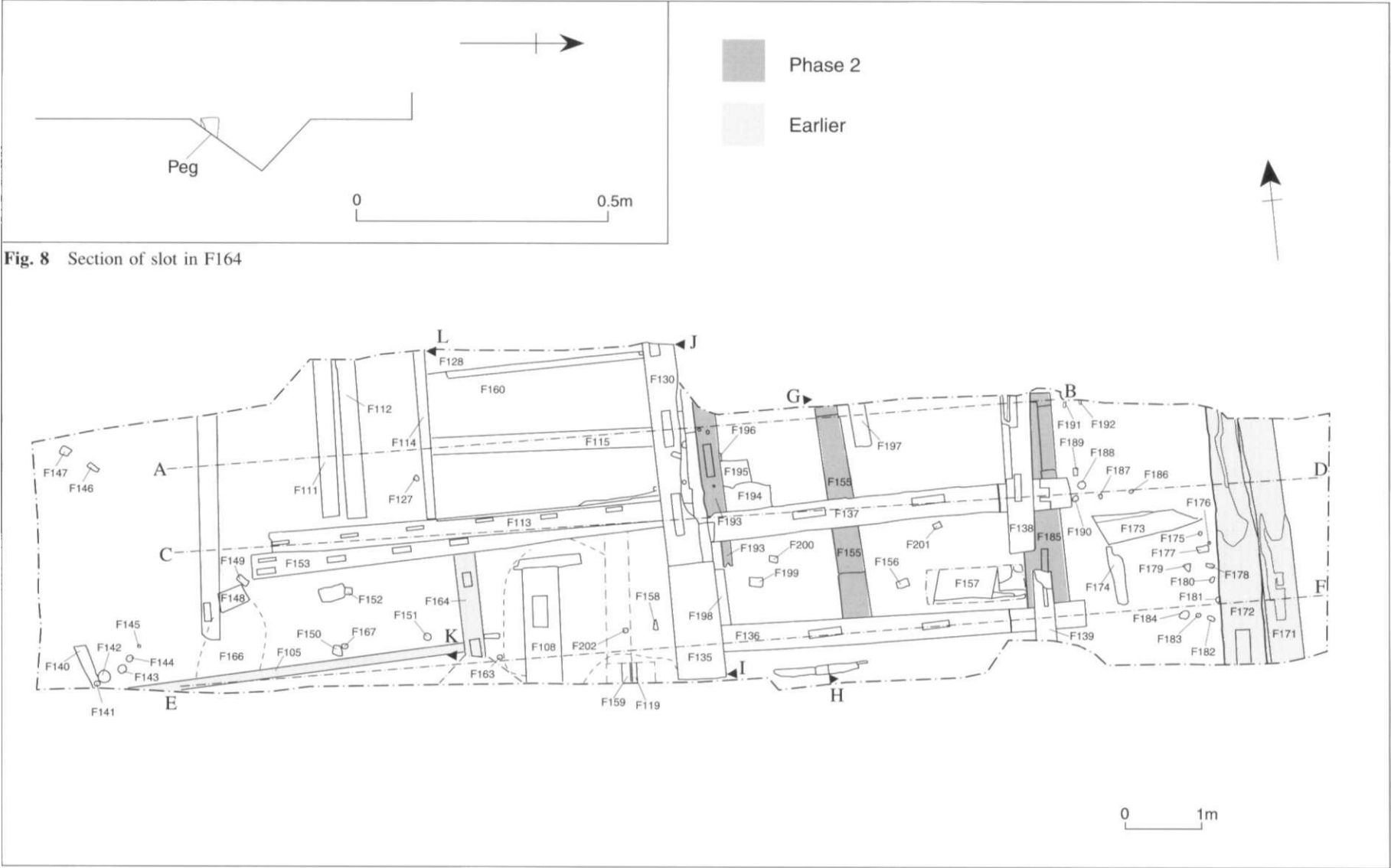


Fig. 7 Site plan, Phase 1



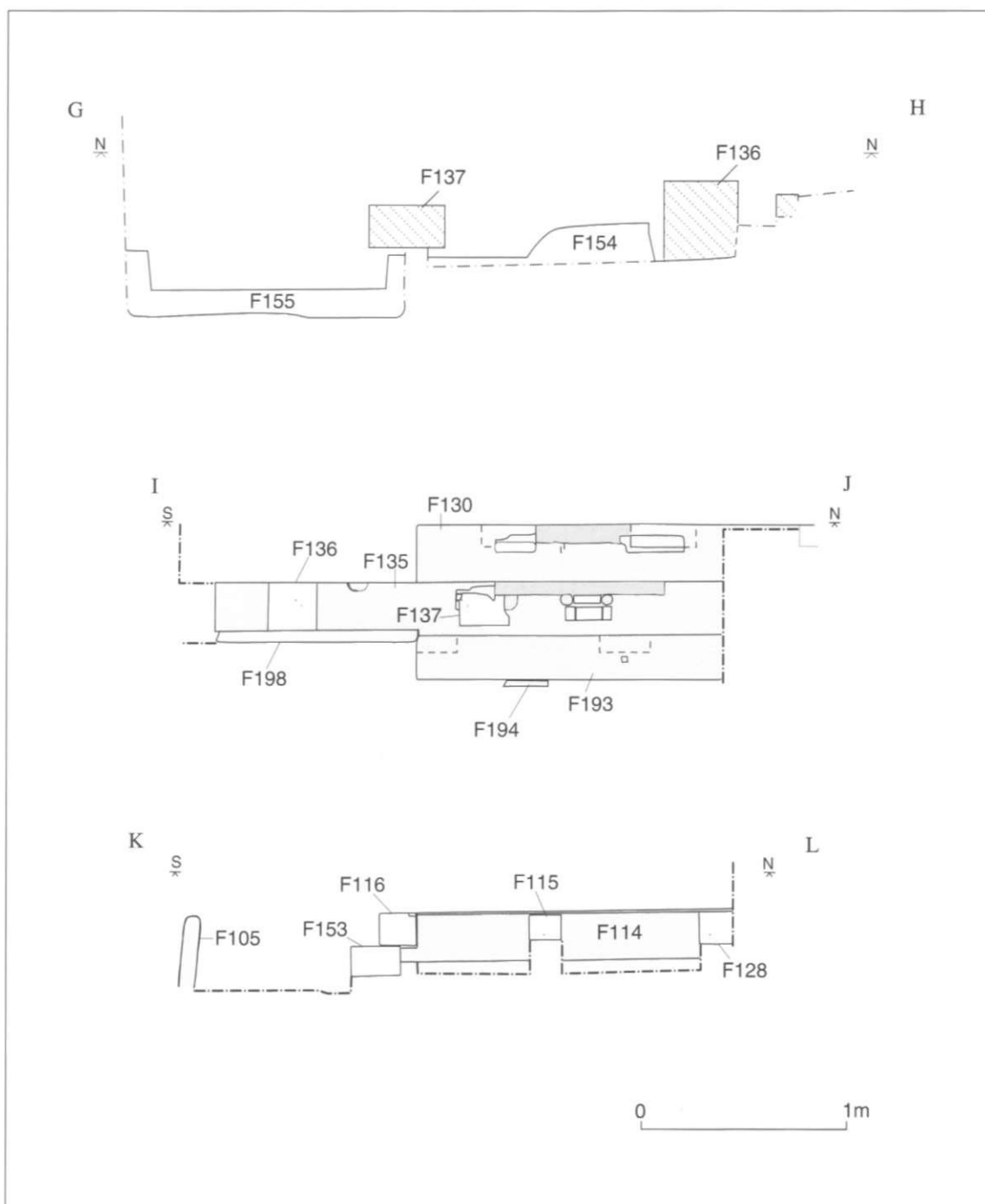


Fig. 10 Cross-sections

circular section (F167), also lay immediately north of F105. Further to the north were two more stakes of rectangular section (F149 and F152), and to the east of F164 one of circular section (F163).

Sealing layer 1062, cut F165 and posts F150, F151, F152 and F167 was an organic rich green brown sandy silt (1061). This layer contained animal bone and 13th/14th-century pottery, and was similar to layer 1071, which was situated at a similar level between timbers F108 and F135.

PHASE 3: 14TH/15TH CENTURY (FIG. 11)

Phase 3 seemed to represent a reconstruction, and perhaps enlargement of the main building, so that from this time there was evidence for it having extended through most of the length of the excavated area.

A second transverse timber (F135) was laid on top of F193 (Fig. 10, Section I-J). It was 0.61m (2ft) wide x 0.36m (1ft 2ins) high, and its east face, which was set back 0.30m (1ft) from that of F193 below, contained three mortices. Beams F136 and F137, both of which sloped down towards the east, were tenoned into the southern (F136) and central (F137) joints, which were wedged.

The missing south end of F193 was replaced by a 0.10m (4 in) thick plank (F198), the express purpose of which seems to have been to act as a levelling piece for F136. Assuming that F193 was intact when it was placed in position, its replacement by F198 argues that it had previously been in use for a considerable period as part of a structure that predated Phase 3.

F136 was housed in the southernmost of the tiered cuts in Phase 2 timber F154/F155, suggesting that the cut may have been a Phase 3 alteration. The central cut in F154/F155 was partially occupied by Phase 3 beam, F137, which also overlapped the most northerly cut. The only recognisable function of F154/F155 was to support the F136 and F137, but the fact that F137 overlapped two of the cuts tended to suggest that it predated Phase 3.

Both F136 and F137 had two mortices in their upper faces, and at their east ends the soffits were halved and dropped over the stepped top of Phase 2 timber, F185 to form coggled joints. The upper faces of both F136 and F137 were halved close to their eastern ends, in each case the halving being partially occupied by a later transverse timber (F139 and F138 respectively). There were continuations of the halvings towards the east as notches, one in F136 and two in F137 (Plate 3). It is probable that these halvings were intended to accommodate a transverse member, and that the notches at their eastern ends were to be used as mortices once the cross pieces were in position.

Beams F136 and F137 were 1.08m (3ft 6½ins) apart at the west end and 1.24m (4ft 1½ins) apart at the east end. There was formerly a third timber 0.40m (1ft 3½ins) to the north of F137, as indicated by the surviving mortice and tenon joint in F135. The joint retained a pair of single tenons, one above another, both of which had been wedged on either side, though only the lower wedges survived (Plate 4). Above it, a 1.22m (4ft) length of wood appeared to have been spliced into the top of the beam, its southern edge overlapping beam F137 by 0.07m (2½ins) so that it was in line with the northern sides of the two mortices in the upper face of F137. This splicing may represent the infilling of a rebate.

There were also two longitudinal beams (F153 and F160) tenoned into the west face of F135 (Plate 5). One of them (F153) was situated immediately to the north of F137, and overlay Phase 2 layer 1061. It was 5.36m (17ft 7ins) long, and generally 0.30m (1ft) wide x 0.165m (6½ ins) deep, but at its east end it thickened out towards the north to a width of 0.41m (1 ft 4 ins) in the manner of a jowelled post. Here it was jointed into F135 by a barefaced soffit tenon, the tenon carried back to create a rebate, which was packed with moss (Plates 6 and 7). It also had a line of mortices in its upper face, ranging in size from 0.28m (11 ins) x 0.07m (2½ ins) to 0.19m (7½ ins) x 0.06m (2½ ins); at the west end was a pair of mortices, probably designed to take a more substantial post cut with a pair of single tenons. F153 was stratified above Phase 1 timber F164 but lay parallel with Phase 1 timber F105, and the two may have been in simultaneous use. Significantly, perhaps, one of the mortices in the upper face of F153 corresponds with the position of F164.

The other longitudinal beam (F160) was at the northern extremity of the trench and partially obscured by a Phase 4 timber (F128). It was 2.58m (8ft 5½ins) long and, in common with F153, its west end was not jointed into anything, though the east end was secured to F135 with a barefaced soffit tenon. The upper face of F160 was at a higher level than F135, and, like its counterpart, F153, the tenon was carried back from the joint to create a rebate, which was also packed with moss. Immediately to the south of F160 was a layer of silty sand with small stones (1077) that was dated to the 13th/14th centuries.

PHASE 4: 16TH CENTURY (FIG. 12)

In Phase 4 the timber-framed mill was subjected to a comprehensive reconstruction so that only the lowest Phase 3 components were left *in situ*. The design seems to have followed closely that of the Phase 3 mill, with the later timbers being placed directly on top of their Phase 3 counterparts.

The Phase 4 timberwork was dated by dendrochronology to the mid-16th century. Samples from timbers F130 and F138 produced respective dates of AD 1524 and AD 1548 for the latest rings in their sequences. The F130 sequence included no sapwood, but ended at the possible heartwood/sapwood boundary. The F138 sequence ended at the possible bark edge, so it is suggested that both timbers were felled in 1548 (see Appendix).

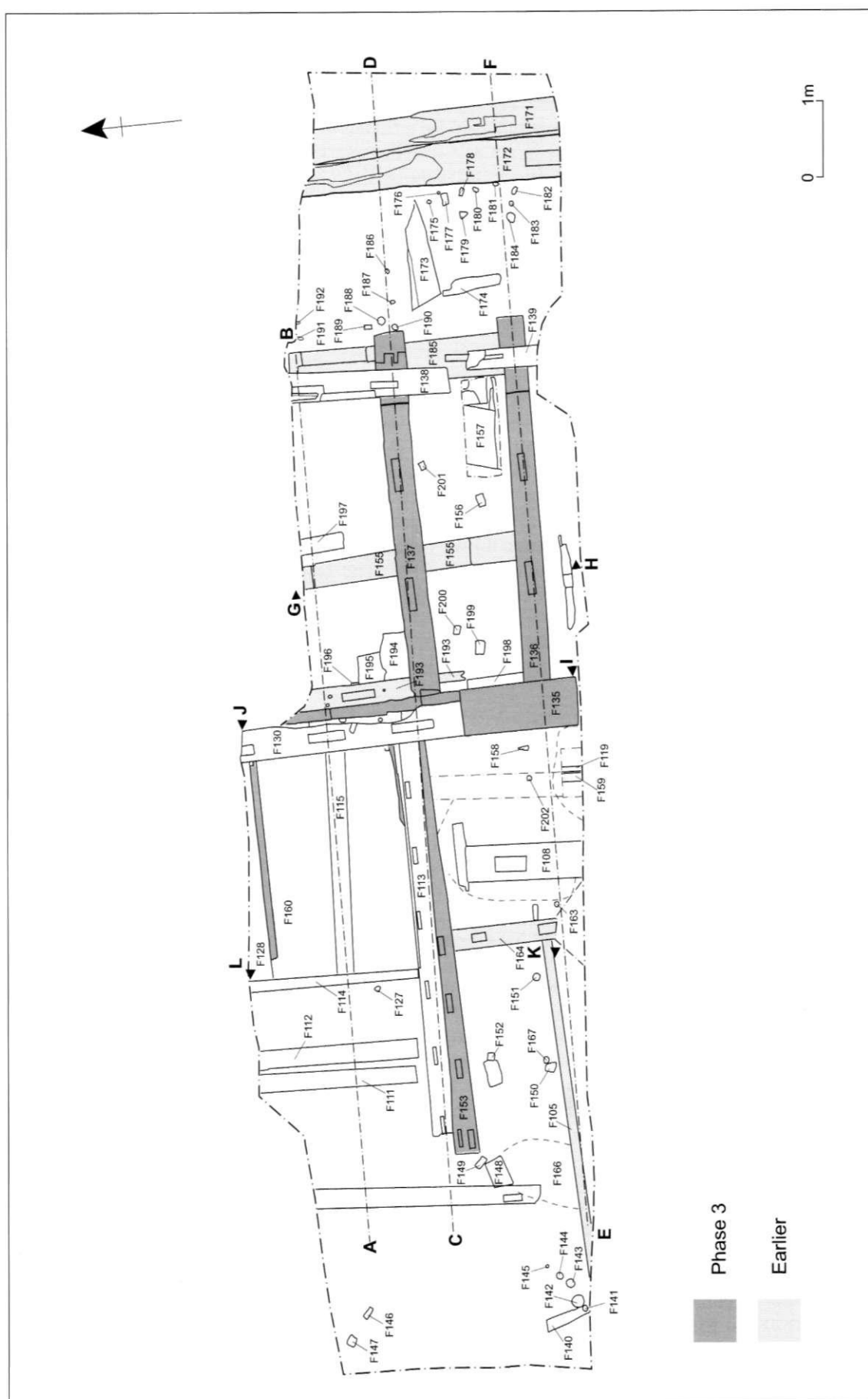


Fig. 11 Site plan, Phase 3

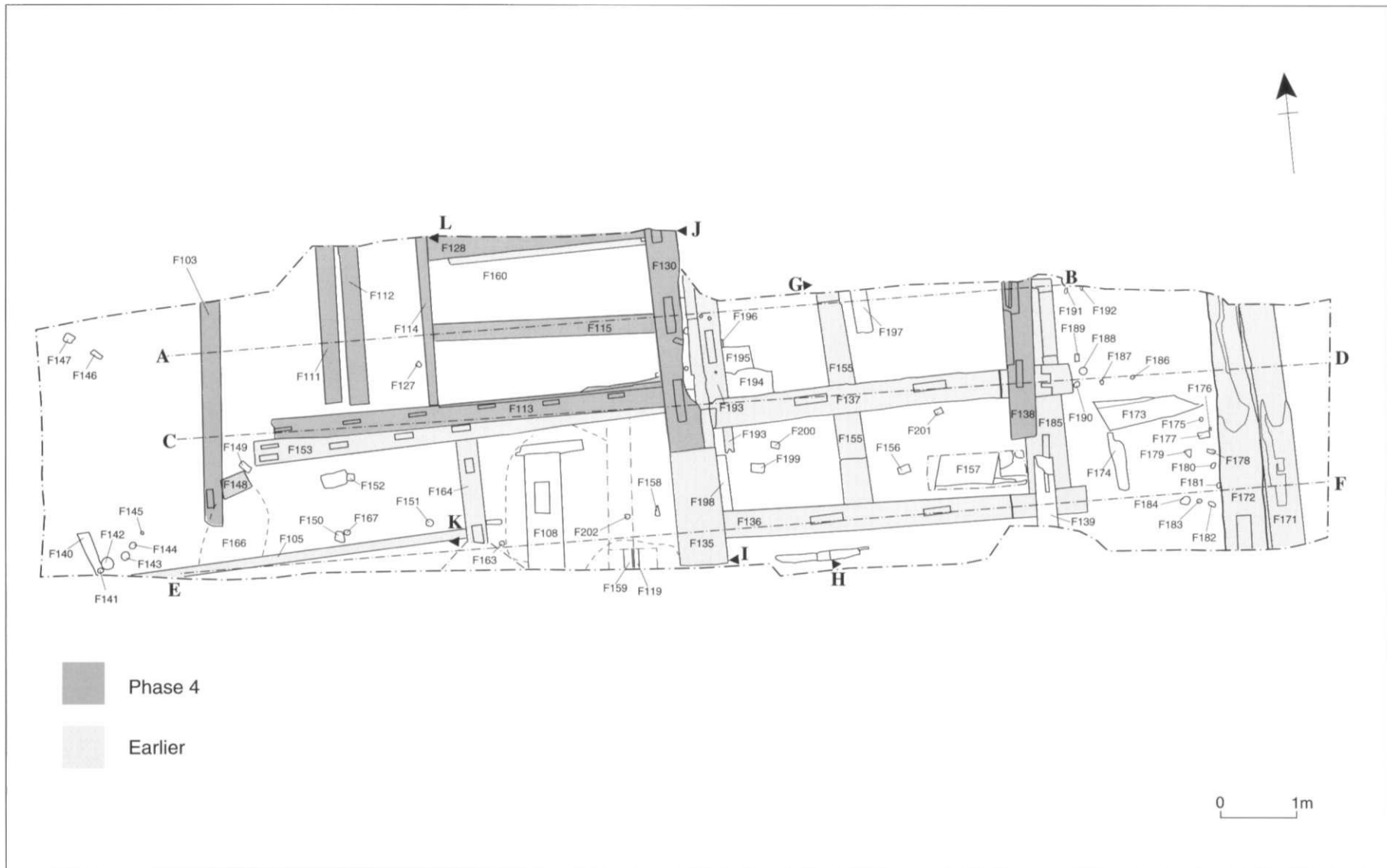


Fig. 12 Site plan, Phase 4

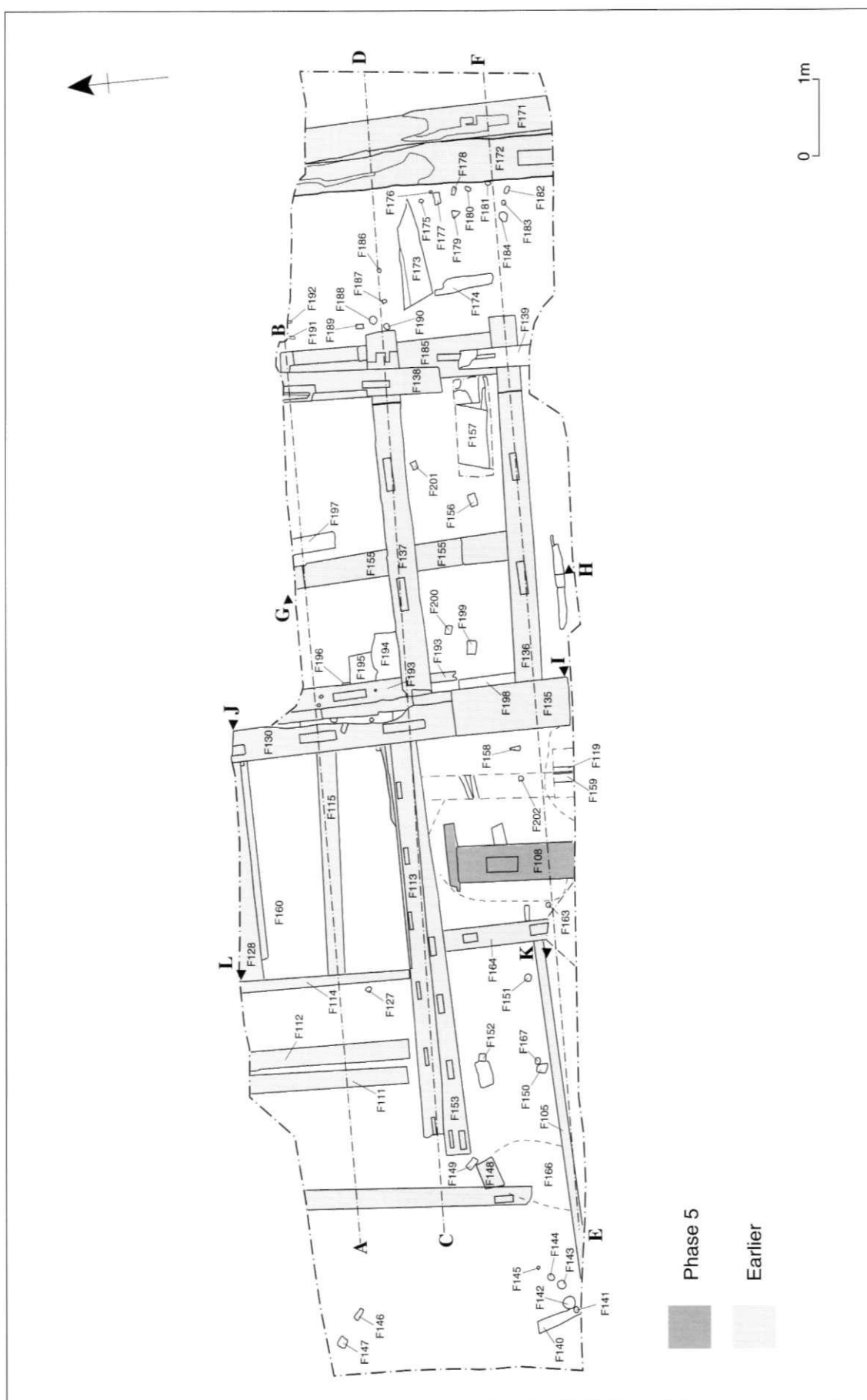


Fig. 13 Site plan, Phase 5

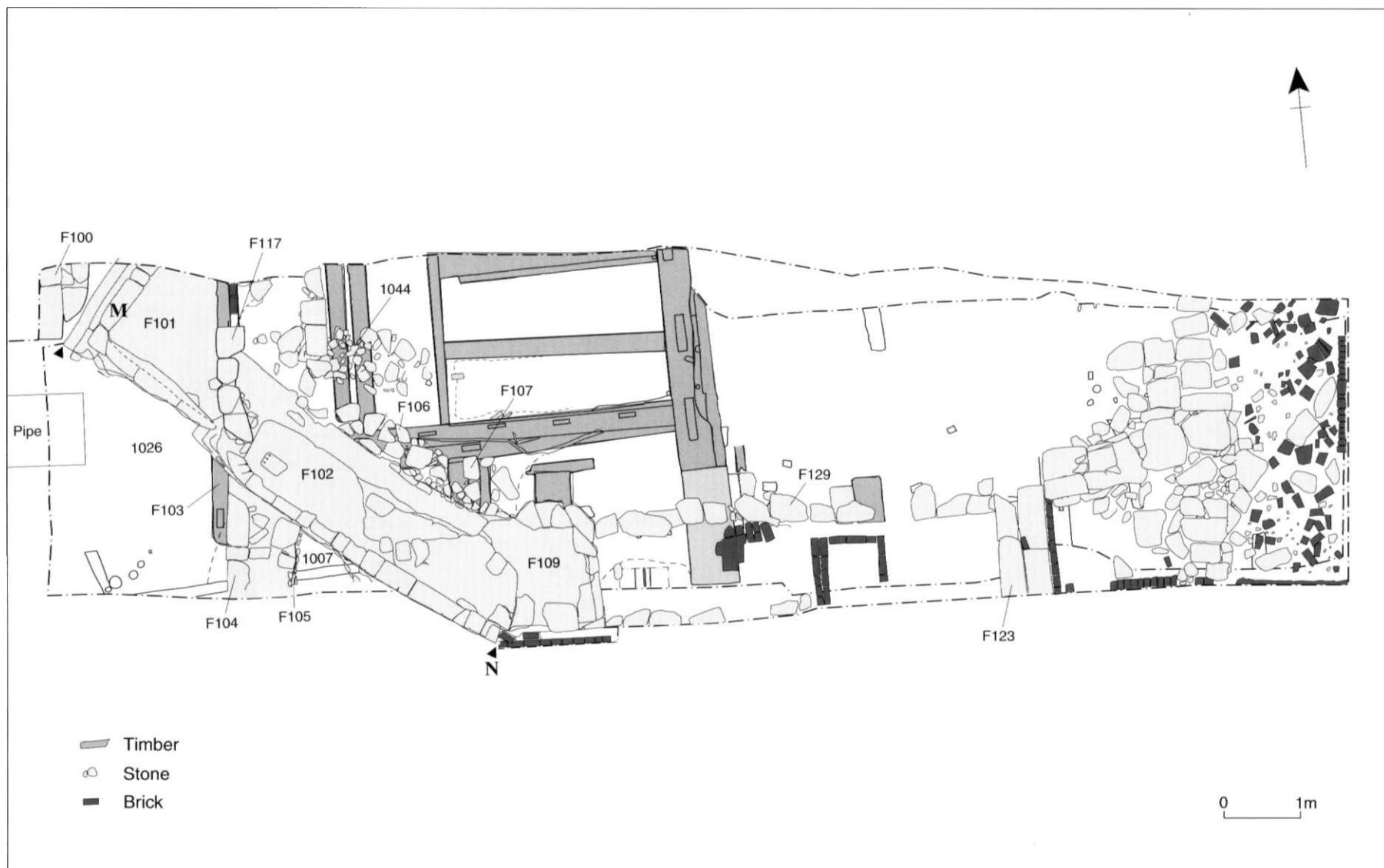


Fig. 14 Site plan, Phase 6

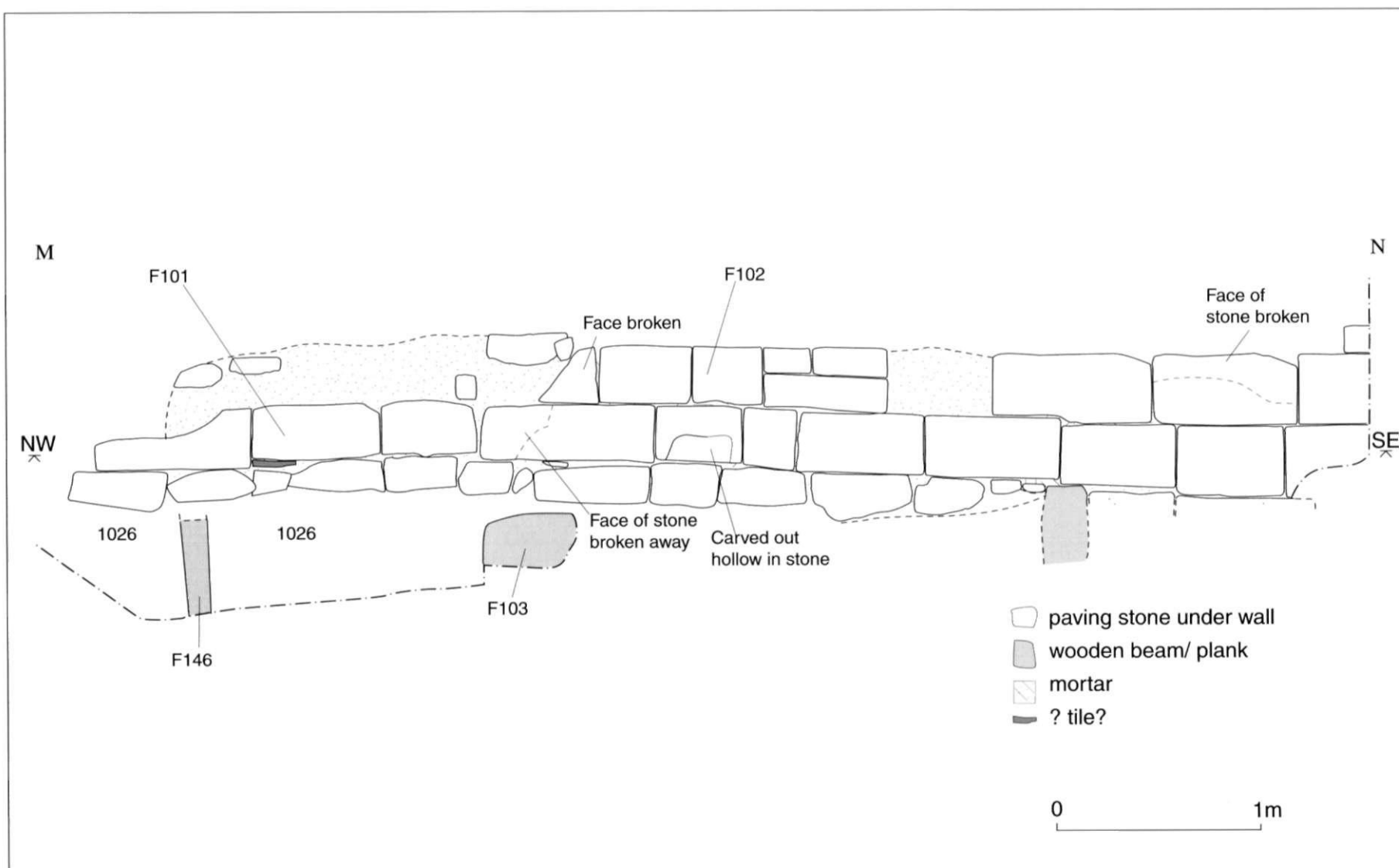


Fig. 15 Section M-N

F130, was laid on top of the central transverse baulk, (F135) flush with its western face but set back 0.075m (3ins) from the eastern face. F130 was 0.43m (1ft 5ins) wide x 0.38m (1ft 3ins) high, and had been cut short of the south end of F135 by 1.50m. That its existing length was the result of a modification was suggested by the presence of a saw cut in the upper face of F135 aligned with the end of F130 (Plate 8).

There were also three mortices in the upper face of F130. The southern one measured 0.39m (1ft 3⁷/₈ ins) x 0.09m (3⁷/₈ ins) and the centre one 0.46m (1ft 6ins) x 0.10m (4 ins), the northern one was 0.10m (4 ins) wide but only 0.23m (9 ins) of its length was exposed within the trench. All three were 0.13m (5ins) deep.

West End of Trench

These three mortices corresponded with the positions of three longitudinal timbers tenoned into the west face of the beam (F113, F115 and F128). The southernmost of these timbers (F113) lay on top of Phase 3 timber F153 on a slightly different alignment, and, in contrast to the Phase 3 examples, the joint had a central (rather than bare-faced) tenon (Plate 6). The timber was 5m (16ft 5ins) long x 0.25m (10 ins) square, and along the upper face at 0.86m (2ft 10in) centres, was a series of six 0.20m (8in) x 0.05m (2in) x 0.13m (5in) deep mortices. This timber was not jointed into anything at the west end but it had clearly been truncated so that the west end of the most westerly of the mortices was missing.

At a distance of 2.03m (6ft 8ins) from the west end of this beam a 0.33m (1ft 1in) x 0.15m (6ins) cross-member (F114) was tenoned into its northern side, and secured with a single peg (Fig. 10, Section K-L; Plate 9). Along the east side of F114 and the north side of F113 was a rebate, probably to accommodate a plank floor. This interpretation is supported by two further east-west beams (F115 and F128), which lay to the north of F113 and which were jointed with central tenons into both F130 (east) and F114 (west). The upper faces of both beams were level with the rebate of F114. It seems then that the whole of the exposed area to the north of F113, between F114 and F130, was floored, and demarcated towards the south by a series of timber studs.

The stratigraphy was generally supportive of a 16th-century date. Phase 3 layer (1077) was sealed by one of grey silty sand, containing animal bone and 16th-century pottery (1073). 1073 overlay Phase 3 timber F160 and abutted the Phase 4 timber beams F113, F114, F115, F128 and F130 in most places. There was a similar layer to 1073 to the south of F115 (1078). A cut within layers 1073 and 1078 beneath Phase 4 timber F115 at its eastern end where it joined F130, was packed with clay (1087 and 1088), apparently designed for the express purpose of supporting F115 (Plate 10).

Between timbers F114, F115, F128 and F130 was a deposit of pink clay (1005). This layer, which sealed layer 1073 and the clay deposit 1088, appeared to be deliberately packed round the timbers. To the south of Phase 4 timber F115, a similar deposit of pink clay was encountered (1006), which in turn sealed layer 1078 and clay deposit 1087.

To the west of timber F114, a deposit of blue clay (1004) was identified, which appeared to be deliberately packed round timber F114 and two parallel timbers, F111 and F112 which lay to the west of F114. Two further deposits of clay (1045 and 1046) were also packed around F114 and a stake that lay immediately to the west (F127). It is possible that these clay deposits are contemporary.

Sand and blue gravel river deposits (1026), which were exposed at the western end of the site, were dated to the 15th/16th century. They were cut, at the south-west corner of the trench, by a series of small sub-circular posts or stakes (F141-F145). In the north-west corner of the site, two sub-rectangular posts or stakes were identified (F146 and F147), each approximately 0.1m x 0.17m, and excavated to a depth of 0.3m.

Apparently overlying these river deposits (1026), was a 2.9m (9ft 6ins) long transverse timber (F103), the north end of which was not recorded within the excavated area. There was a 1072in x 3in x 4in deep mortice in its upper face 0.30m (1ft) from its south end, as well as a truncated longitudinal timber (F148) tenoned into its east face in a position corresponding with the upper mortice. An interesting feature of F148 was a rebate cut along its south edge, which suggested that it may have supported a plank floor towards the south. It is difficult to relate these timbers to any of the other structures in the trench, though alignment seems to be with the Phase 4 building. If F148 continued to the east it would have created a c. 0.9m-wide channel with Phase 1 timber F105.

East End of Trench

There were two mortices in the east face of F130 (Fig. 10, Section I-J), the southern one 0.28m (11ins) x 0.10m (4ins) and the northern 0.41m (1ft 4ins) x 0.10m (4ins). The southern mortice retained a tenon suggesting that a former beam had been sawn off. At a depth of 0.10m (4ins) from the top of the timber, and extending between the two mortices, a length of 0.67m (2ft 2V4ins), was a 0.13m (5ins) wide rebate. In the base of the rebate, 0.20m (8ins) from the southern mortice, was a 0.025m (1 in) diameter peg hole, possibly for securing a former plank.

The second dated timber (F138) lay towards the eastern end of the trench. It too was a transverse member which extended for some 2.40m (7ft 1074ns) from the north section and rested on the rebate in Phase 3 timber F137. In the upper face were two mortices, 0.31m (1ft) x 0.07m (3ins) x 0.14m (572ins) deep. These joints corresponded with mortices in the west face of the timber, both of which retained wedged tenons. The northernmost of these had a timber wedge to the north and an iron wedge to the south (Plate 11)

Again, the stratigraphy was supportive of the 16th-century tree-ring date. Overlying Phase 3 timber F137 was a pocket of organic brown sandy silt (1070). Sealing this deposit, and overlying timbers F135 and F137 was a silty sand deposit (1069) which contained 16th-century pottery. Sealing 1069 in turn was a clean pink clay layer (1068) which covered the whole area between F137 and the southern edge of the excavation. Pottery recovered from 1068 was dated to the 16th/17th century. Abutting the beams F172 and F185 at the eastern end of the site was a deposit of brown grey silty sand (1114) that contained 17th-century pottery. Neither the beams nor the deposit were excavated fully.

PHASE 5: 17TH CENTURY (FIG. 13)

Phase 5 comprises a modification to the design of the Phase 4 mill and is represented by a north-south aligned sill beam (F108) situated to the west of the main transverse balk and extending 1.53m from the south section.

This beam was 0.53m (1ft 9ins) wide and was exposed to a depth of 0.42m (1ft 472ins). It lay immediately above a clay-filled feature (F134, 1060) that cut Phase 2 layer 1061. Protruding from the upper face was the broken ended stump of a westward inclined timber, the joint being double-pegged from the east face of the sill beam. Also in the east face, immediately beneath the inclined timber, and 0.30m (1ft) below the upper face of the sill beam, was a 0.30m (1ft) x 0.06m (272ins) mortice. This construction was directly opposite the gap in the main transverse balk made by the truncation of Phase 4 timber F130 and is probably to be associated with it. In which case, F108 was probably built some time after 1548.

At the east end of the trench, overlying Phase 4 layer 1114 and abutting timber F172, was a deposit of greenish-grey clay sand with organic inclusions (1058), that was dated to the 17th century. Protruding from layers 1114 and 1058 was a series of small upright stakes (F175-F184, F186-F192), which varied in shape and diameter, and which were excavated to a depth of between 0.20 (8ins) and 0.80m (2ft 772ins). It could not be ascertained whether these features pre-dated or post-dated the layers.

A 0.50m (1ft 774ns) deep deposit of compact sandy silt with brick and tile rubble (1117), dated to the 17th century, sealed layer 1058, Phase 1 timbers F171 and F172, and the series of stakes in this area. This layer contained much shell, clay pipe and animal bone, and was in turn sealed by a dark grey organic silty clay (1034), similar to layer 1090 to the west, and which abutted the Phase 4 timber F138. 1034 was dated to the 16th/17th century.

Between Phase 2 timbers F185 and F155 was a deposit of grey sand with a very high organic content (1093) which was not excavated. Overlying this layer was a brown, undated peat-like deposit, approximately 0.30m (1ft) to 0.40m (1ft 374ns) deep (1092). Sealing 1092, and abutting all three Phase 2 timbers (F185, F155, and F193) and associated planks (F194, F195, and F196) was a grey sandy layer with a high concentration of gravel and some waterlogged wood fragments (1091). This deposit (1091) contained many finds, including metal pins (see below), leather and ceramic tile, and was dated to the early 17th century. 1091 was overlain by Phase 3 timber F137, and it is probable that it represents a river deposit washed in beneath the timber-framed structure.

PHASE 6: 18TH-19TH CENTURY (FIG. 14)

During Phase 6 the timber-framed mill was demolished, covered, and replaced with a brick-built mill of 1834, the main survival of which was the stone base that was constructed on top of the earlier timber-framing.

The date at which the timber-framed mill went out of use is unknown, but Phase 4 timbers F111 and F112 were overlain by a rubble spread (1044) containing mid to late 16th-century pottery, and by stone rubble wall foundations (F110). Overlying 1044 was a rubble base consisting of irregular sandstone blocks (F106) that represented the foundations for a large stone wall aligned north-west/south-east (F102/F109). This wall (F102/F109) survived to three courses in height and comprised faced stone blocks, with herringbone pattern tooling marks, on the south-western side (Fig. 15, Section M-N) and rubble on the north-eastern side. At its north-western extent F102/F109 was abutted by another length of stone wall (F101) that continued its line for another 2m before returning towards the north-east. The two eastern ends of this V-shaped arrangement of walling appeared to be connected to the two respective water wheel emplacements that survive from the brick mill of 1834. It is evident that the structure acted as a cutwater, splitting the stream into two channels in order to serve the two waterwheels (Plate 12).

Two smaller stone walls, on north-south alignments, abutted F102/F109 towards its western end (F104 and F117). F104, which abutted the southern face of F102, was roughly 0.9m (3ft) wide with dressed face on the western side and rubble on the eastern side. F117, which abutted the northern side of F102 and the eastern side of F101 and which was constructed of both brick and stone, was slightly narrower than F104 at 0.5m wide. Rough rubble blocks comprised the fragments of another wall, F107, which was approximately 0.35m (1ft 2ins) wide. It too abutted F102/F109, being situated towards its eastern end. In the extreme northwest corner of the trench was another, smaller, stone wall (F100) on a north-south alignment. Sealing all these walls were a number of rubble deposits (1002, 1003 and 1007). 1002 and 1007 were dated to the 17th and early 18th centuries respectively.

An east-west aligned possible foundation cut (F126) for stone wall F129 was identified cutting layer 1034. It was filled with a soft pink clay and grey sandy silt (1043). Wall (F129) survived two courses deep, was faced only on the southern side and was overlain by a deposit of grey silty sand with frequent fragments of brick and stone (1028) that was dated to the 17th/18th centuries.

Cutting Phase 3 layer 1062 was a sub-circular pit (F166). This pit was approximately 1.6m in diameter and 0.4m deep, the fill of which was a friable grey brown sandy silt (1083) that contained pottery and coins that were dated to the 18th century.

PHASE 7: 19TH CENTURY

Phase 7 comprised modifications to the mill structure of 1834.

Overlying Phase 5 layer 1058 was a compacted layer of silt and rubble containing brick fragments, stone and mortar (1057) that was spot-dated to the 19th century. Sealing this layer (1057) were similar layers of rubble (1032 and 1031). Overlying layer 1031 was a layer of grey sandy silt with occasional wood and brick fragments (1033). Also in this area were rubble deposits 1055 and 1030, both dated to the 19th century.

Two sandstone and brick walls (F123 and F122), aligned north-south and east-west respectively, cut layer 1032. F123 was abutted by a crudely constructed brick and sandstone wall that displayed evidence of an archway at its base (F124). Also abutting wall F123 was a layer of soft sticky pink clay mixed with occasional rubble (1052) and a series of brick walls (F118, F119, and F120) that formed the eastern and part of the southern limit of the excavation. A linear foundation wall comprising large sandstone blocks (F121) was identified overlying layer 1030, aligned north-south and abutting F119.

A drain cut (F125), a brick structure, likely to represent a drain (F131) and a second modern brick structure and associated stone foundation (F132 and F133) were also identified in the area cutting layer 1052.

Overlying the features and layers at the western end of the site was a deposit of sand and rubble (1001). Sealing this, and overlying the whole of the site was a mixed sand and rubble overburden that was removed by machine.

THE TIMBER TECHNOLOGY *by Malcolm Hislop*

Regarding the methods of timber conversion, there was no evidence that any of the main timbers had been prepared for use by sawing. Indeed the only saw marks recorded were those on the tenon at the east end of Phase 3 timber F153 (Plate 6) and on the upper face of F135, which had resulted from the truncation of the overlying F130 in Phase 5 (Plate 7). On the other hand, hewing marks

were noted in a number of cases, for instance on the Phase 4 timber F130, which formed part of the main north-south balk. These marks suggest that the tree from which this timber was formed was scapped or squared with an axe or adze (Munby 1991, 382). Not all timbers were so well finished. The Phase 2 beam F154/F155, for instance, appeared to represent an entire tree trunk, and there are other instances at this level in which only the most essential finishing had been carried out.

The joints used in the timber-framed construction were mostly of mortice and tenon type, examples being recorded from all the main timber phases. Of particular interest is the presence of the long mortice in the Phase 1 timber F172. Rigold's survey of excavated medieval bridges suggested that the long mortice, as opposed to the earlier square mortice, a technical detail that he regarded as fundamental to the development of timber-framing, was being used in bridge construction by the mid-12th century (Rigold 1975, 88). On the London waterfront Milne has identified the early 13th century as the point at which structures incorporating 'baseplates with long mortices penetrated by standard tenons cut on the feet of vertical posts' (Milne 1992, 83). The evidence from Stafford suggests that by the late 12th century, carpentry in the West Midlands was developing along similar lines, and that the first fully timber-framed buildings are likely to have evolved by c.1200.

In the case of Phase 3 and Phase 4, where the structures survived sufficiently well for the jointing details to be recognisable, the distinguishing characteristic of the joints was that the tenons were much smaller than the mortices, and therefore loose fitting. They were tightened with one or two wooden wedges, a technique that seems to have been used for the uprights as well as the horizontal joints, to judge from a wedge that survived in one of the otherwise empty mortices of Phase 3 timber F153. There was only limited evidence for the use of wooden pegs to secure joints, and, with a single exception, the few examples of this technique came from Phases 4 and 5. The anomaly was the peg at the edge of the V-shaped slot in the Phase 1 timber F164, though it is possible that this was a later insertion related to Phase 3.

In general, the use of wedges to tighten joints is unusual in timber-framed construction. Salzman refers to the documented 17th-century practice of using wedges to secure the joints between the sill and posts, of a timber-framed building in order to leave plenty of play, to facilitate assembly (Salzman 1952, 202), but this was a temporary expedient and the joints would have been pegged in their finished state. Otherwise parallels are elusive, though at a number of 13th-century Thames waterfront sites the riverside revetment braces were tenoned to baseplates with overlong mortices that were wedged once the construction had been positioned satisfactorily (Milne 1992, 17 and figs 20, 21c, 50, 118). These examples also appear to be related to facility of construction.

In millwrighting, however, as opposed to the less specialised carpentry, the use of wedges appears to have been widespread, particularly in aligning and holding timbers that carried bearings (Martin Watts, pers. comm.). During the excavation of the metal working mill at Bordesley Abbey, Worcestershire, for example, a number of wooden wedges were recovered from the area of the wheel pit and tail race, which were interpreted as coming from the waterwheel (Astill 1993, 225-8). It was probably the familiarity of millwrights with wedge technology that is the explanation for its wider use in the framing of Stafford mill. It is possible too that there might have been practical reasons, such as the undesirability of having rigid joints that might be prone to failure under the stress caused by the operation of heavy machinery. It is perhaps worth considering that a mill, as a working building, would have been subjected to considerable stresses and strains, and that the wedges might have been used to tighten joints that had worked loose. However, in the several examples where sufficient evidence survives, a marked disparity between the lengths of the mortises and the widths of the tenons leaves little doubt that the wedges formed an integral part of the joints from the outset, rather than having been inserted at a later date.

The Phase 3 structures contained two types of mortice and tenon joint, neither of which was recorded elsewhere within the building. One of these was the paired single mortice and tenon joint used for both vertical and horizontal timbers. The earliest example of this type recorded by Hewett was in the late 11th- or 12th-century tower of the church of St Peter and St Paul at West Mersea in Kent (Hewett 1980, 41-2). More useful, perhaps, for the purpose of dating is the barefaced soffit tenon, the introduction of which Hewett ascribed to the early years of the 14th century (Hewett 1980, 286), and which was employed in the jointing of floor joists. It was used in the construction of the choir stalls at Winchester Cathedral of c.1308 (*ibid.* 136) and in the floor of the court house at Battle Abbey in 1398, and it continued in use into the 15th century, being found in the rafters of Wells Cathedral chapter house of c.1425. Phase 3, then, may date from the 14th or 15th century.

The only other two categories of joint recorded on site were also confined to Phase 3, the cogged joints between F136 and F137 on the one hand and Phase 2 timber F185 on the other, and the halving of the upper faces of F136 and F137 for a cross beam.

There were no slots for planks or grooves for staves between the mortices in the upper faces of any of the beams. This may indicate that there was no infill between the timbers, and that they simply formed a framework. There was, however, evidence for flooring.

FUNCTION OF THE BUILDING *by Martin Watts*

WATER SUPPLY

From its position on the course of a river with a relatively small gradient, it is apparent that the waterwheel (or wheels) would have originally been of the undershot- type, driven by the impulse of the stream directed onto floats on the bottom of the wheel, which was controlled by sluice gates. The last working wheels were low-breastshot, utilising a head of about 0.90m (3ft) (SRO 4420/G/4). Both are 3.66m (12ft) in diameter, the southern wheel being the wider at about 3.50m (lift 6in) and the northern one about 2.10m (7ft) wide (SRO 4420/G/4; Watts, site notes, 25 Oct. 1986). It is also apparent, from the location and from documentary evidence, that from at least the early 17th century there were periodic problems with flooding upstream, caused by successive generations of millers impounding the water immediately upstream of the mill site.

The mill ponds (*stagna*) referred to in the 1190s confirmation lease (above, Historical Background) suggest a defined water-storage area, perhaps revetted to reduce erosion of the river banks, which needed to be maintained by clearing debris, organic growth, and silt. The earliest deposit found at the upstream end of the excavation was a blue organic sand and gravel river deposit, with occasional patches of clay, which appeared to pre-date both the timber and stone mill structures. The position of these deposits suggests that the earliest structure was located in a natural channel, which was presumably revetted and adapted to contain a waterwheel (or wheels). It appears that this channel was secondary to the main river, which loops around to the south of the mill site. The copy of the lost late 16th century plan of Stafford shows the mill sited on the northern river bank, with the waterwheel placed externally on its south-facing gable end. This would have necessitated a structure being built within the channel to contain the waterwheel, support the outer wheelshaft bearing and provide supports for a sluice or hatch on the upstream side to admit water onto the wheel. Some form of sill or low weir across the Sow would also have been necessary, in order to maintain a higher water level on the upstream side of the wheel, but there is no indication of a weir across the river on either the late 16th century map or Speed's map of 1610.

It is notable that the problem of flooding caused by raising the head sill of the mill is not identified until the early 17th century. The effect of raising the sill was to increase the depth of water impounded on the upstream side of the mill. This was presumably carried out to increase both the storage area of the mill pond and the power of the mill. By raising the head sill more power could be obtained from a waterwheel by increasing the working head or fall; it is also feasible that the diameter of the waterwheel was increased, to provide more power. Another reason for raising the head sill could have been the effect of silting downstream, perhaps aggravated by water backing up from St Thomas's mill.

A mill pond is shown on late 19th- and 20th- century maps and plans, with an island at its upstream (south-west) end. To the north of the island the water flow was controlled by sluice gates and to the south a weir is shown. The last mill and associated house were effectively on an island in the Sow. The loop of the river to the south, which acted as a spillway channel, is also shown as the line of a parish boundary, which would appear to confirm that this was the original course of the river (Fig. 16).

INTERPRETATION OF THE STRUCTURE

There is no evidence of a structure earlier than the 12th century within the area of the excavation and the site of the late Saxon mill recorded in Domesday Book remains uncertain. The excavation confirms the presence of timber structures connected with the site of the mill from the second half of the 12th century and the archaeological evidence corroborates recent historical research which indicates that, at this period, the mill had a vertical waterwheel (or wheels) (Holt 1988, 118-22; Langdon 2004, 72). The Phase 1 timbers may therefore be considered to relate to the mill that was

built by the burgesses of Stafford in the early 1160s. The beam F172 at the downstream (east) end of the excavation is orientated north-south, across the flow of the river. It has been dated by dendrochronology to after AD1087. F105, a board or plank set on edge, which is considered to date from no earlier than 1167 (see below, Tree Ring Dates), appears to have formed part of a revetment at the southern side of a watercourse, perhaps angled towards a wheel chamber or pit and, if the dating is precise, may have been a subsequent insertion shortly after the Phase 1 mill was built. If the 12th century mill was located between F164 and F171/172, it has been largely removed or obscured by later structures.

The Phase 2 timbers, which are assigned to the 12th–13th centuries, comprise three sill timbers (F185, F155, and F193) aligned parallel with each other, north-south across the water channel and reflecting the alignment of the Phase 1 sill beams at the downstream end of the excavation. It is possible that these timbers are also from the first-phase mill. It was noted that F154/F155, which was sampled but did not provide a date, was a fast-grown timber, probably from a managed woodland source (see below, Tree Ring Dates), which might plausibly be the wood at Bradley mentioned in the late 12th-/early 13th-century grant. These timbers appear to indicate the position of the first mill structure, although their exact functions are unclear. Any vertical structure connected with them has been removed. It is perhaps worth noting here that the removal of earlier mill structures prior to rebuilding on the same site appears to have been common in the medieval period. At Kingsland (Herefordshire), when the timberwork of *Oxenfordemulle* was renewed in 1389–90, 25 men were paid for one day clearing away the old timber of the mill and cleaning the foundation of rubbish for the new works (Cole 1958, 172), and other examples have been noted elsewhere. In the Kingsland bailiff's accounts there is also a reference to gathering moss and it is of interest to note the use of moss for caulking and packing between some of the timbers on the Stafford mill site.

There is evidence of clay having been deliberately packed around and under some of the timbers and both blue and pink clay were recorded at the west end of the site. The introduction of clay for levelling and waterproofing mill timbers is attested from at least the mid 9th century (Rahtz and Meeson 1992).

The Phase 3 (14th/15th century) structure appears to represent a departure from the earlier form of construction (although this is fragmentary), with the introduction of an elevated sill, a massive oak timber (F135) aligned north-south across the centre of the site. This can be identified with some confidence as a 'head sill'; in other words, that part of the substructure of a watermill that defined the upstream end of a waterwheel emplacement, over which water ran to work a wheel or wheels. In the early 16th century John Fitzherbert, in *The Boke of Surveying and Improvements*, one of the first English texts to provide details of the construction and working of mills, wrote: 'As upon the great rivers come mylnes that be called grounde mylnes and they be called grounde mylnes because the over side of the heed sylle lyeth evyn levell with the oversyde of the ground in the bottom of the water' (Fitzherbert 1523, folio li). The term ground, or ground-shot, mill is synonymous with undershot; that is, where water is directed on to floats at the bottom of a waterwheel and rotates it by impulse. By raising the head sill, the available head of water, and thus the power of the waterwheel, was increased. Associated with this timber are inclined longitudinal timbers on both the upstream and downstream sides. Those on the west (upstream) side, which are overlain by Phase 4 timbers, are inclined up to the sill, while those on the east side are inclined away from the top of the sill. Timber F153 has a series of regularly spaced mortices in its upper face, into which vertical timbers were tenoned, presumably supporting horizontal boards that defined a water channel, directing the flow towards the head sill. The two main timbers on the east side, F136 and 137, both have the remains of two mortices with level bottoms in their upper faces, which indicate the positions of vertical timber posts that, from their locations, appear to have been for supporting bearings for a waterwheel shaft or shafts. From the positions of these possible bearing points and the main head sill timber, it is likely that the waterwheel or wheels of this phase were about 3m (10ft) in diameter by no more than 1m (3ft 3in) wide, located in the chambers defined by F136 and F137. There is evidence in the east face of the head sill, F135, that there was originally another timber running parallel to F137, about 0.4m (1ft 3³/₄ns) from its north face, perhaps supporting boards that formed the floor of the race.

The dating of Phase 4 to the middle of the 16th century is based on tree-ring dates from two timbers, the uppermost head sill (F130) and a similarly aligned timber (F138) some 3m downstream. Both timbers are dated with confidence to 1548, which coincides with the date when William Shaw was the miller (SHC VIII (2) 1887, 114). The archaeological evidence indicates that the head sill

was raised significantly at this time, with a new inclined-floored structure on its upstream side. This timber structure bears good comparison with that illustrated in an early 18th century German text on mill construction (Leupold 1735, Tab. IV) (see Fig. 17), which shows a ramped floor on the upstream side of a waterwheel, a head sill (C) and beam and post construction (D) forming the sides and floor of a wheel chamber. In the Leupold illustration the frames supporting the outer bearings of the waterwheels are both independent structures located between the wheel chamber and the spillway channel (P). This illustration provides the closest known parallel to the excavated structure at Stafford, although it is acknowledged that what Leupold shows may not otherwise be representative of contemporary English practice. It appears that there may have been two waterwheels in parallel, occupying two channels side by side (defined by timbers F136 and F137), each perhaps serving a separate mill, one to the north, the other to the south. An alternative interpretation is that one channel contained a waterwheel and the other was a spillway. From their layout and position, the interpretation that these timbers are all associated with waterwheel emplacements and water channels is the most likely. No evidence of supports for bearings for vertical drive shafts, as would be expected in a com mill, was found. The width of the excavated area was such that the extent of the timber structures to the north and south of the channel remains unknown.

Several timber structures and remains of waterwheels dating from the late medieval and post-medieval periods have been excavated in England, although none provides a direct comparison with the structures found at Stafford. The wheelpits excavated at predominantly iron-working sites in the Weald and Yorkshire (summarised in Crossley 1997, 115-8), all contained overshot or, possibly, pitch-back waterwheels. The most complete sequence of timber structures connected with undershot waterwheels was excavated at Bordesley Abbey between 1980 and 1991 (Astill 1993, 66-85). These structures, which comprised a series of planked troughs dating from the late 12th to the mid-14th century, were generally less substantial than those found at Stafford and lacked the massive raised timber head sills. The term head sill is used in a number of mill building and repair accounts from the 15th century on, although the context is not always clear and there were other timbers similarly referred to, such as tail sills and meal sills (see, for example, Salzman 1952, 467, 509-10). The excavation of a late 17th-century mill at Bow Brickhill (Buckinghamshire) (Petchey and Giggins 1983) produced evidence of a similar arrangement to that found at Stafford, at least on plan, which was interpreted by its excavators as a double mill with two undershot waterwheels housed side by side in a central chamber. Only the lower sills survived, built into the floor of the wheel chamber, which was infilled with stone to prevent erosion.

Speed's plan of 1610 shows two mill buildings close together on the north bank of the Sow, each with a waterwheel on its gable end. While this may simply be a cartographic device used to indicate that there were two mills each with its own waterwheel in this location, and it is risky to base an interpretation on such slim evidence, it is also feasible that this was the arrangement in the early 17th century and it was only later that the mill building was orientated north-south, with a waterwheel at each end. The copy of the lost map of Stafford, already referred to, shows only a single building with a waterwheel on its gable end, which again may be a purely cartographic device, or may indicate that the mill was not enlarged until early in the 17th century.

There is also the possibility that in the late medieval/early post-medieval periods the mill (or mills) served two functions. The combination of the functions of com milling and fulling in the late medieval period has been commented on and, although fulling mills were generally less profitable, they were sometimes converted from or added to com mills, in an attempt to maintain viable mill profits, sometimes for a very brief period (Holt 1988; Langdon 2004). Speed's map of 1610 denotes an area to the west of the mills as 'Tanter bank', which is recorded on subsequent maps as 'Tenterbanks'. This appears to indicate where tenter frames stood, timber structures on which newly fullled or dyed cloth was stretched out on small iron hooks to shrink and dry it. It is unlikely that newly fullled or dyed cloth, being wet and heavy, would be carried any great distance from its place of processing, although no reference to a fulling mill in Stafford has been found in the documentary record. Daniel Defoe, writing a century or so after Speed's map, noted that 'the town [Stafford] is neat and well built, and is lately much increased; nay, some say, grown rich by the clothing trade' (Defoe 1724-6, 401). It should also be noted that fulling mills are remarkably enigmatic in the archaeological record.

The Phase 6 structure comprised a V-shaped wall constructed of well-dressed sandstone blocks that split the stream of water and directed it to two wheelpits in parallel. This arrangement appears to have survived in the final form of the mill, as rebuilt in the 1830s, where there were two water-

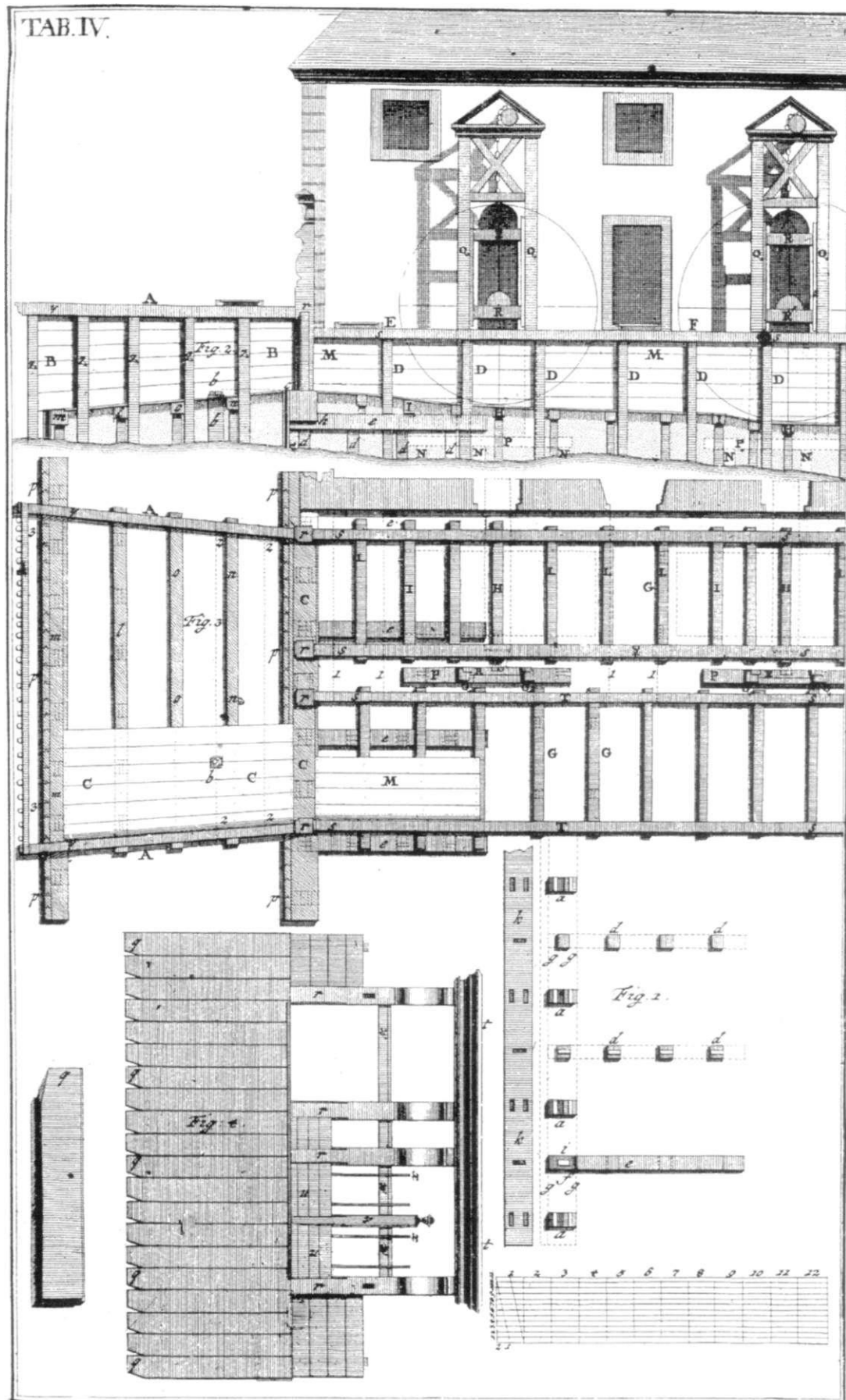


Fig. 17 An early 18th-century mill

wheels, one on each side of a brick building. The south wheelpit contained the wider wheel and was about 3.65m wide; the northern wheelpit appears to have been about 2.21m wide.

The timber structures on the site of the former Stafford Mill provide valuable information about the form and construction of head sills and chambers for undershot waterwheels that to date have not been recorded or published elsewhere. The correlation between the structures found by archaeological excavation and the documentary sources, which indicate that there were significant problems with flooding caused by raising the head sills, is also of considerable interest. Few urban watermill sites have been excavated and the extent of the remains found at Stafford is particularly important in that there is a sequence of timbers representing at least four phases of development of the mill between the mid 12th century and the mid 16th century. The continual reuse of established mill sites from the Middle Ages to the 20th century has been attested elsewhere, but the wholesale removal of earlier mill structures, as mentioned earlier, usually results in little physical evidence surviving from the medieval and early post-medieval periods. Many town mill sites have also been completely obliterated by 19th- and 20th- century redevelopment, as for example at the King's Mill in Leeds (Goodchild and Wrathmell 2002). The excavation of the Town Mill and St Giles's Mill sites in Reading by Oxford Archaeology in 1998 is the only other example known to the writer where timber structures connected with waterwheel emplacements and water control have been found and recorded, although they are different in character to those recorded at Stafford (Ford, pers. comm.). Stafford mill, therefore, represents a significant find and an important addition to the small number of watermill sites that have been excavated in England.

THE TREE RING DATES *by Ian Tyers*

A summary of the findings is presented in Table 1, and Figure 1, all the material was identified as oak (*Quercus* spp).

A total of ten samples from timbers from Stafford were submitted for spot-dating. A preliminary assessment concluded that six of the samples had some dendrochronological potential, whilst the remaining four contained insufficient rings for tree-ring analysis. Standard dendrochronological methods (see e.g. English Heritage 1998) were applied to the six suitable samples (Table 1). The tree-ring sequences from four of these were found to cross-match with each other (Tables 2 and 3) and with reference chronologies (Tables 4 and 5, Figure 18). It is important to appreciate that although the dendrochronological dates will not change in the future, any interpretations of these results are of necessity interim and liable to change, particularly as aspects of re-use and repair are revealed by post-excavation analyses. The other measured samples were not found to cross-match reference chronologies and are undated by the analysis reported here. The supplied archaeological information (Ciaraldi pers comm.) makes it clear that the samples were thought to derive from more than one phase of construction. The tree-ring results indicate that two separate phases of timbers are present. Samples 1 and 10 are probably co-eval and are probably from the last third of the

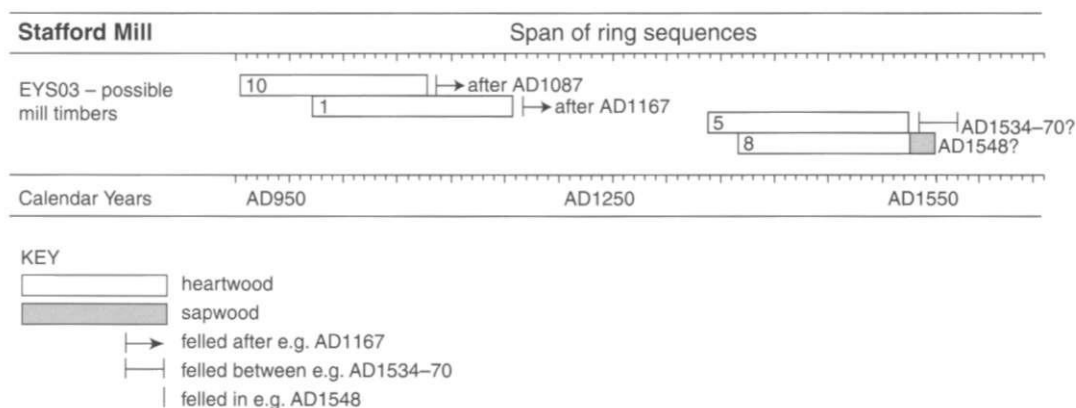


Fig. 18 Bar diagram showing the relative and absolute positions of the dated samples from the Stafford mill excavations. Each bar is annotated with an interpretation based on the date of the ring sequence and the presence or absence of sapwood and bark.

Sample	Species	Rings	Sapwood	Growth (mm/year)	Sequence date	Interpreted date
1	Oak	186	-	1.17	AD972-AD1157	after AD1167
2	Oak	c. 40	-	-	unmeasured	
3	Oak	128	20+Bs	2.12	undated	
4	Oak	c. 40	-	-	unmeasured	
5	Oak	185	?H/S	2.07	AD1340-AD1524	AD1534-70?
6	Oak	c. 40	-	-	unmeasured	
7	Oak	c. 25	-	-	unmeasured	
8	Oak	181	22+?B	1.76	AD1368-AD1548	AD1548?
9	Oak	88	-	2.91	undated	
10	Oak	174		0.95	AD904-AD1077	after AD 1087

Table 2 Correlation f-value (Baillie and Pilcher 1973) between the two early dated sequences

1 5.07

5 3.49

Nottinghamshire etc, East Midlands master (Laxton and Litton 1988)	6.43	5.25
Hertfordshire, Leverstock Green Westwick Row (Howard <i>et al</i> 1997)	5.48	5.43
Cambridgeshire, Peterborough Cathedral (Tyers 1999b)	8.22	6.47
Staffordshire, Stafford St Marys & Eastgate (Groves 1987b; a)	5.31	5.29
Worcestershire, Bordesley Abbey nr Redditch (Brown 1993)	6.07	4.41
Herefordshire, Hereford 14-19 Bridge St (Tyers 1999a)	5.97	5.30
Avon, Bristol Dundas Wharf (Nicholson and Hillam 1987)	6.42	5.02
Lincolnshire N, Barton Coffins (Tyers 2001)	6.79	6.71
Yorkshire E, Beverley Eastgate (Groves 1992)	5.88	5.01
Yorkshire S, Whiston Barn Rotherham (Tvers and Groves 2002)	6.55	6.05

Derbyshire, Dronfield Church Street (Tyers in prep)	5.26	3.64
Greater Manchester, Chethams Library (Tyers 2002b)	5.52	4.99
Herefordshire, Wigmore Abbey (Tyers 2002a)	5.98	5.36
Nottinghamshire etc, East Midlands master (Laxton and Litton 1988)	6.55	4.58
Shropshire, Bedstone Manor Farm (Miles <i>et al</i> 1995)	4.64	4.21
Worcestershire, St Nicholas Church, Evesham (Miles <i>et al</i> 1995)	5.00	4.00
Worcestershire, St Nicholas Church, Evesham (Miles <i>et al</i> 2002)	5.00	4.00

twelfth century (Sample 1 can be no earlier than AD1167) whilst samples 5 and 8 are also probably co-eval and from the mid-16th century (if the tentative identification of surviving bark-edge on Sample 8 is correct a felling at the end of AD 1548 is indicated).

The dated timbers match each other fairly well (Tables 2 and 3). The sequences match well to contemporaneous reference sequences from across the English Midlands and neighbouring counties (Tables 4 and 5). In all probability the material was derived locally to Stafford.

The four samples rejected as unsuitable for dating were all timbers growing at 4.5mm to 7.5 mm/year average radial growth rates. This is unusually fast, and quite unlike the other 6 samples none of which are growing on average faster than 2.9mm/year. This makes it possible that these four timbers are derived from another phase of the structure, constructed from material probably obtained from a managed woodland source. If there are further opportunities to examine and sample the structure it would be sensible to include a further sampling programme on those elements of the structure that are currently undated.

THE POTTERY *by Stephanie Rdtkai*

The pottery from all the medieval and post-medieval contexts was quantified by sherd count. Pottery from 19th century contexts (1001, 1029, 1030, 1052, and 1055) was not quantified but a note was made of the fabrics present. Three hundred and three sherds were recovered from the contexts pre-dating the 19th century (see Table 6). All contexts were spot-dated.

Medieval pottery made up about 14.5% of the assemblage. Most of this was found residually. There was no late Saxon Stafford ware and the earliest medieval pottery probably dated to the 13th century. Contexts 1061, 1062, 1071, and 1077 contained only medieval pottery of mid 13th-14th century date. Over half of the pottery could be dated to the 15th–17th centuries. The post-medieval vessel forms consisted for the most part of drinking vessels, although jars and jugs were present in small quantities.

Three groups stood out as being worthy of further study. These were 1007, 1044, and 1117, which dated to the early 18th century, mid to late 16th century and late 17th century respectively (see tables 7 and 8). They are discussed here in chronological order.

CONTEXT 1044

This group consisted primarily of Cistercian ware cup sherds and Midlands Purple jug, jar or cistern (bung-hole jar) sherds. A late red ware (fabric lmtir) flange-rim bowl was almost certainly contemporary with these. There were eight residual medieval sherds in the group.

The Cistercian ware sherds represented at least 11 drinking vessels. The majority of these were two-handled vessels with rounded profiles similar to other Cistercian ware recovered from Stafford (eg Ford 1995, Fig 22: 192, 202). One rim sherd had a narrow horizontal groove below the rim, suggesting that the complete vessel may have imitated German stoneware forms. An example of this type of imitation can be seen in Barker (1986 fig 1:8). There was a single blackware base sherd, probably from a mug.

Table 7 Pottery quantification by sherd count for selected groups

Context	1044	1117	1007
ir	1		1
ip	1		
wwg	3		
lmtir	1		
lmtip	3	1	
mp	23		
cist	17		
blw	1	9	7
yw		11	
gstw		1	
mpcw		5	2
slpwf		1	
slpwtr		1	5
mang			12
slipco			15
stwbr			1
Total	50	20	42

Table 8 Vessel forms by fabric from selected groups (quantification by sherd count)

Context 1044							Context 1117					Context 1007						
Fabric	bowl	cistern	cooking pot	drinking vessel	jar	jug	bowl	dish	drinking vessel	jar	jug	bowl	chamber pot	cooking pot	drinking vessel	jar	porringer	Total
ir			3											1				4
irg						1												
wwg						1												
Imtir	1																	
Imtip							1											
mp		1			8	2												11
cist				18														18
blw				1														16
yw							4	7	6		3		1		5			11
coign									1									
mpcw										5						1		6
slpwf									1									1
slpwtr							1					5						6
mang												1				1	1	3
slipco																	5	5
stwbr												1						1
Total	11	3		19	8	4	6	7	8	5	3	7	1	1	6	1	6	87

The absence of yellow ware from this group suggests a date before the last quarter of the 16th century. The presence of a blackware sherd suggests a date after c.1530 but the otherwise absence of blackware suggests a date before 1550.

The combination of drinking vessels and storage vessels (usually jars and cisterns) is by no means uncommon in late 15th-mid 16th century groups from urban sites in the Midlands and was noted, for example, at Sandford Street, Lichfield (Ratkai 2004; Ratkai forthcoming a).

CONTEXT 1117

This context contained a larger number of wares and a wider range of forms than (1044). Cistercian wares were replaced by larger blackware vessels. These comprised at least three jugs with slightly rounded profiles, similar in form to one illustrated by Barker (1986, Fig 8:82) and two conical (narrowing slightly from base to rim) mugs. The jugs had bands of rilling above the base. At least one jug had a band of rilling on the shoulder and another a shallow raised cordon at the neck-shoulder junction. These jugs also had partial internal 'dribbled' glazes. The direction of flow indicated that these vessels had been fired in an upright position. Of the two conical mugs, one had light external rilling, giving a shallow corrugated effect to the surface. This form is not illustrated in Barker (1986) and is presumably not part of the North Staffordshire blackware tradition. Similar vessels are known from the Whitefriars, Coventry (Ratkai 2005) and the Bull Ring Birmingham (Ratkai forthcoming b, Fig 7.8:203). Two further drinking vessels were found: a plain Cologne stoneware drinking jug and a feathered slipware cup (cf. Kelly and Greaves 1974 Fig 30: 133,134).

Yellow wares were slightly better represented than the blackwares. At least five vessels were represented: a shallow dish with external sooting, a flange-rim bowl or dish, with stamped decoration (similar to Greaves 1976, Fig 8:53), which was also sooted, and three hollow wares. One of the latter could have been the base of a cup and another a jar with rilling on the shoulder. A flange-rim bowl with light-on-dark trailed slip decoration was also present.

Sherds from two storage vessels occurred in a hard-fired, purplish coarseware (fabric mpcw).

The contrast between this context group and (1044) is marked. Table wares are still the dominant type but the range of forms has been extended to include dishes and bowls. Utilitarian coarseware sherds were very poorly represented. This is slightly unusual but not unknown in urban assemblages. The fairly equal quantities of blackware and yellow ware suggest that this group dates to the 17th century. The latest pottery from the group is the feathered slipware cup sherd. This has a date range of late 17th-early 18th century but the comparative frequency of yellow ware, which was in decline in the early 18th century, suggests that this context group dates to the late 17th century.

CONTEXT 1007

There is little in common between this context group and the pottery from (1117). A small amount of blackware, hard-fired coarseware, and trailed slipware is present, but the bulk of the group comprises mottled ware and slip-coated ware.

The blackware forms are late in style and were made up of three mugs, one similar to Barker (1986, Fig 4: 43), one with a rebated base (Ratkai forthcoming b, Fig 7.8:204) and a slightly waisted mug, possibly similar to Ratkai (forthcoming b, Fig 7.8:196). Two further drinking vessels were represented by two handle-sherds. A horizontal rim was probably from a chamber pot.

Three slipware vessels were represented. The most complete of these was a flange-rim dish with white trailed slip floral or foliate decoration. This vessel was almost certainly a Stoke product. The two other vessels were slightly different and had pale trailed decoration on a mid-dark brown ground. These may have been produced more locally. One vessel evidently had had a flange rim and was decorated on the interior with a sinuous vertical slip trail. The form of the second vessel could not be deduced, other than to say that it was a bowl of some sort. The interior had been decorated with pale slip dots.

Mottled ware forms consisted of a mug, a straight-sided bowl, and a porringer. At least two porringers were found in slip-coated ware, with a possible maximum of five. In addition there was a bowl and a handled bowl. The final identifiable forms were a brown salt-glazed stoneware base sherd, from a bowl, and a hard-fired coarseware jar sherd.

The make-up of this group is clearly very different from 1117. Although many of the sherds could be contemporary with those in 1117 the form of the blackware mugs was paralleled amongst

18th century material from the Bull Ring, Birmingham, and the absence of yellow ware suggests a date after the first decade or so of the 18th century. However, the slipware is unlikely to date much after *c.* 1725 and it is suggested that the pottery in 1007 was deposited about that time.

Similar Cistercian ware to that found in 1044 also occurred in contexts 1034, 1069, and 1091. In the latter context a straight sided two-handled 'corrugated' blackware mug (cf. Barker 1986, Fig 3: 28) and a small, thick-bodied fragment from a Cistercian ware or blackware pedestal ?salt, decorated with whit slip dots, were also found. The upper half of a well-potted Cistercian ware or blackware barrel-shaped mug with rilling on the shoulder (cf. Ford 1995, Fig 22: 204) was found in (1114).

Although the assemblage was small, it nevertheless produced a good collection of late 15th to early 18th century pottery, which provides useful comparanda for southern and central Staffordshire.

METALWORK *by Erica Macey-Bracken* (Fig. 19)

PINS

A total of 193 metal pins was recovered from the site. Almost all of the pins were complete, although in most cases they were covered with corrosion products. The assemblage was quantified by count, and examined macroscopically for the purposes of this report. The pins were concentrated in two layers of the site (128 in Context 1002 and 64 in Context 1091), with a further pin coming from an unstratified wall fill. This concentration suggests that the pins were lost in two distinct episodes, rather than being discarded over a long period of time

Most of the pins were around the same size, with a range of 21mm¹⁴mm noted across both of the contexts that yielded the pins. Only two pins outside of this range were noted, at 55mm (1002) and 60mm (1091). The majority of the complete pins also had rounded heads. The largest pin (1091) had a large rounded head, and may possibly have been used for more decorative purposes than the rest of the pins in the group.

The pins that were not completely covered by corrosion products had a golden appearance, suggesting that they were made of tinned brass. High quality pins began to be made in this metal in England in the 17th century (Costello, 2001), and as the contexts from which the pins were recovered also contain pottery dated to the 17th century (Ratkai, above), it is not unreasonable to suggest that this is the case.

THIMBLE

A small copper-alloy thimble was recovered from a layer of sandy silt clay rubble fill (1007). The thimble was complete, although it had been crushed on one edge of its base. A small pebble

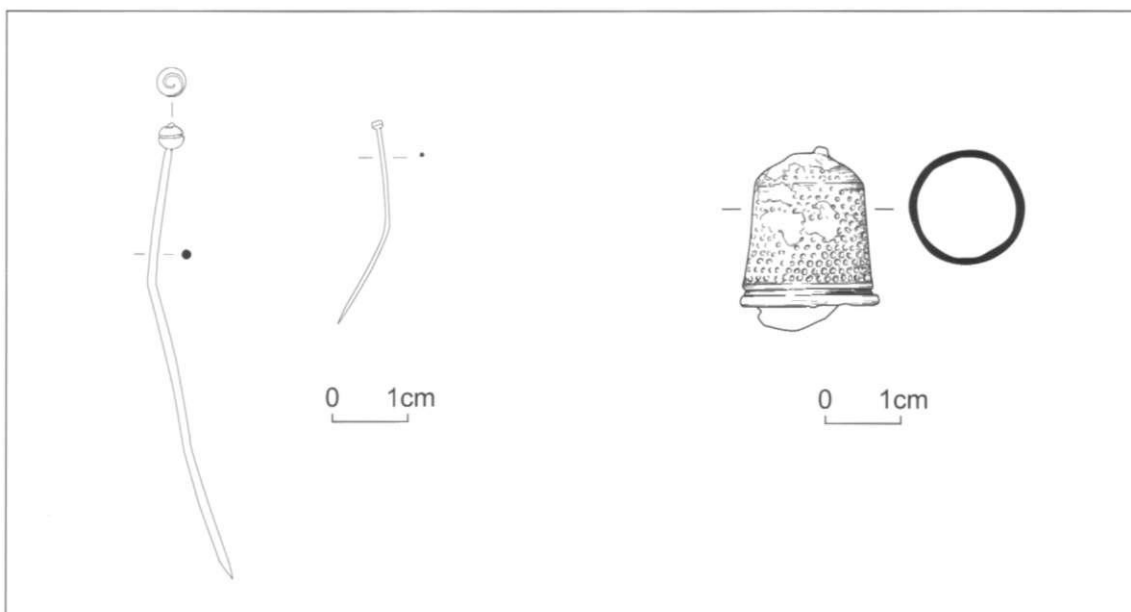


Fig. 19 Metalwork

was jammed into the inside of the thimble, trapped by the crushed edge. The thimble was quite small, at 19mm high, with a diameter of 17mm at its mouth. No decoration was noted beyond the customary pattern of indentations (or pounce marks) on the crown and sides. A narrow plain lip and band, with a combined width of 3mm, was visible at the base of the thimble.

The thimble was recovered from a layer that also yielded pottery dating to the early 18th century (Ratkai, above), so it is reasonable to assume that the thimble is of a similar date. Decorative thimbles were often given as tokens of affection at this time, although this plain example seems more likely to be a utilitarian piece, possibly bought from one of the salesmen who sold toys - small household items such as needlework equipment - like the London toy seller with a stock of 'steel tops and other thimbles' who is listed as living 'at the Green Parrot near Chancery Lane' in 1762 (Rath, 1979, 41). The West Midlands was a major centre of the toy manufacturing industry in the 18th century and thimble mills are known to have existed in Nechells, Birmingham by 1758 (VCH 1964, 259-60) and Smethwick, Staffordshire by 1775 (VCH 1967, 269). It is probable that the Stafford example came from a comparatively local manufactory like one of these.

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Plate 1 The site from the east, Phases 1-5



Plate 2 FI71 and F172 from the north



Plate 3 East end of F137



Plate 4 Single paired mortice joint in F135 from the east, each tenon double-wedged



Plate 5 The site from the west, Phases 1-5



Plate 6 Joints between F113/F153 and F130/F135 from the north-west



Plate 7 Joints between F113/F153 and F130/F135 from the south

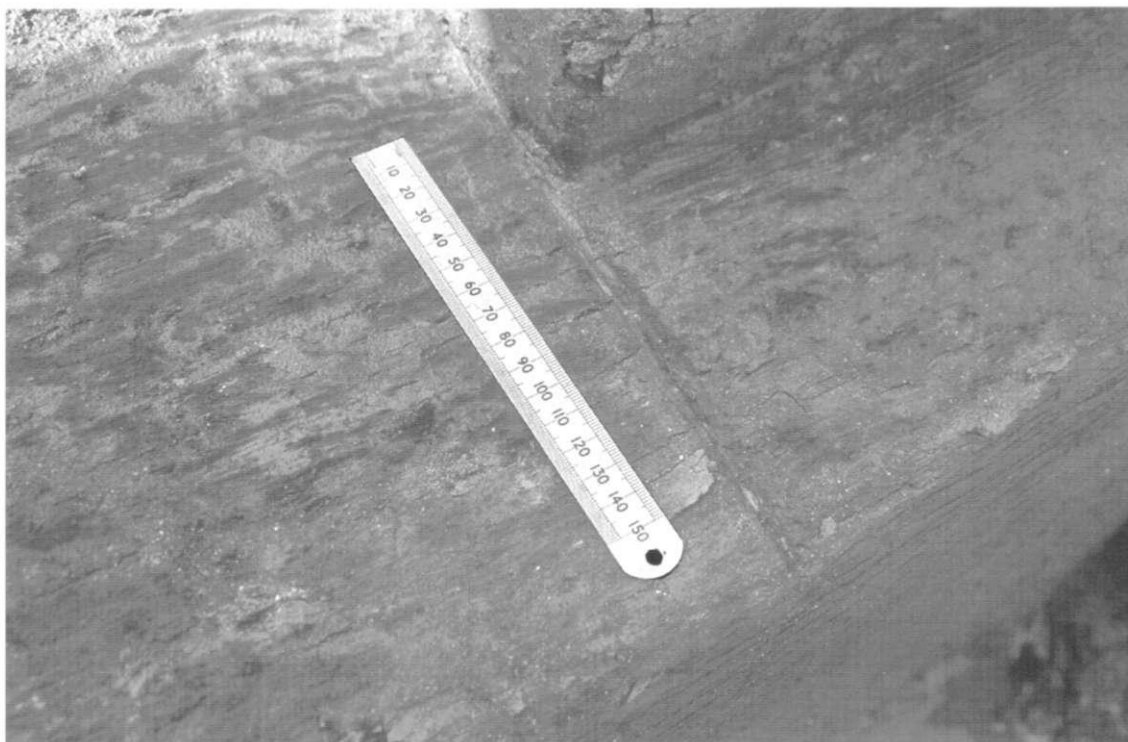


Plate 8 Saw cut on the upper face of F135



Plate 9 Junction of F115 (left) and F114 showing rebate to accommodate boards



Plate 10 Clay packing (1087/1088) beneath F115

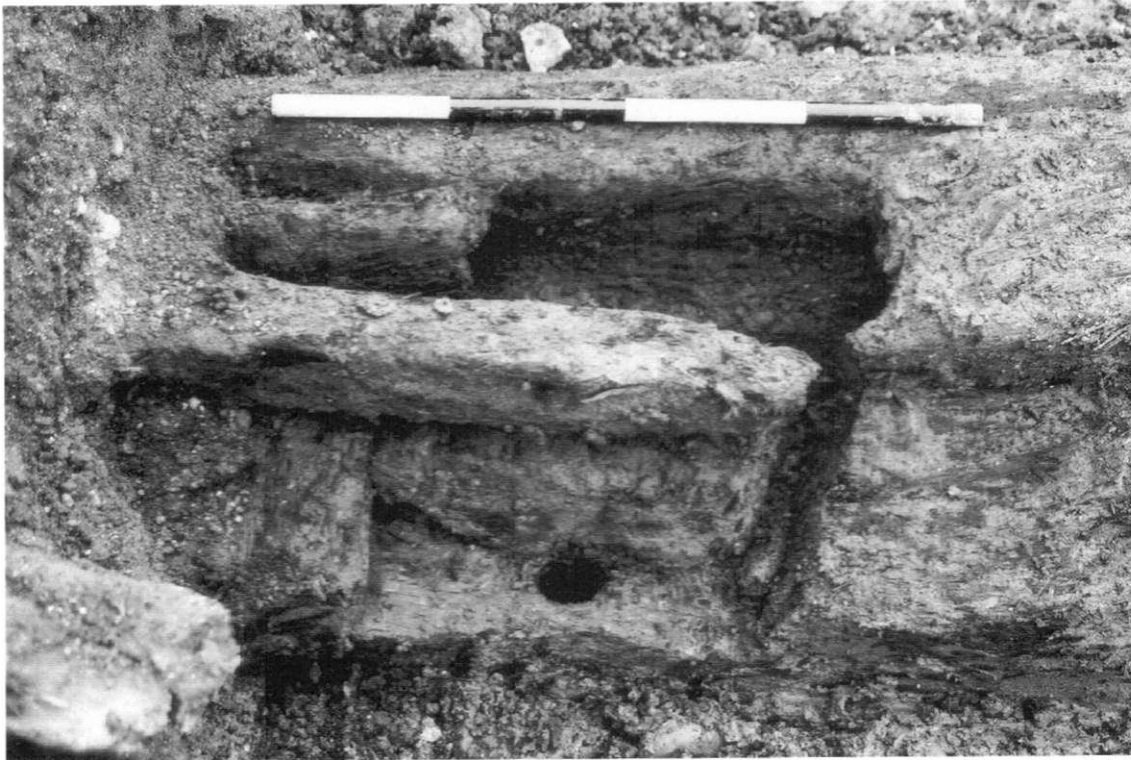


Plate 11 Mortice arrangement at the north end of F138



Plate 12 The site from the west, Phase 6

BILSTON: THE ARCHAEOLOGY OF A WEST MIDLANDS COMMUNITY

MALCOLM HISLOP

with contributions by S. Blake, R. Cuttler, M. Duncan, R. Lee, E. Macey, K. Nichol, and A. Rudge

SUMMARY

The following report summarises the results of three development-led excavations carried out in 2002 in Bilston, Wolverhampton, West Midlands. These investigations have added to our knowledge of the town's development and given an insight into its archaeological potential. Despite the intensive 19th-century development of Bilston, the results of these projects highlight the potential for earlier remains to survive. To the rear of a property in Bridge Street a possible medieval beam slot was recorded, and at Market Way residual 12th-13th-century pottery was recovered. At two sites along the principal medieval thoroughfare (High Street and Bridge Street) possible buried soil layers of post-medieval date may constitute evidence for a contraction of the settlement and the abandonment of previously occupied plots. At 1-3 High Street this hiatus appears to date from c. AD 1500 to the early 18th century, whereas at Bridge Street we have dating evidence from the 17th century only. By the early 19th century both these plots had been occupied by buildings again.

INTRODUCTION

Situated approximately 2½ miles south-east of Wolverhampton, but within the city boundaries, Bilston is a small industrial town of early medieval origins, once in Staffordshire, but now an inextricable component of the West Midlands conurbation (fig.1). In common with many West Midland communities, the archaeology of Bilston is little known, and fieldwork has been limited, but in 2002 Birmingham University Field Archaeology Unit (now Birmingham Archaeology) carried out a series of development-led archaeological projects within the historic core of the town, which have thrown some light upon its development (fig. 2). The results are described in this report.

HISTORICAL BACKGROUND

The origins of Bilston are obscure, though the name is Old English, and is thought to refer to the settlement of the Bilsaetan, the Anglian people that inhabited this part of the kingdom of Mercia (Watts 2004). There is no mention of such a folk in the Tribal Hidage, and it is probable that by the time the document was drawn up the Bilsaetan had been assimilated into the Mercian confederation and were no longer considered to be a distinct tribal group.

Bilston is first mentioned in a charter of Æthelred II dating from 985, which records a grant of land to the Lady Wulfrun (Sawyer 1968, no. 860), and it may have formed part of an early Anglo-Saxon royal estate centred on Wolverhampton (Hooke and Slater 1986, 25). A second charter, the text of which is said to date from 994, records Wulfrun's endowment of the monastery at Wolverhampton, and describes the boundaries of the vill (VCH III, 321; Sawyer 1968, no. 1380).

In 1086, when Bilston was recorded in the Domesday Book as belonging to the king, the settlement contained eight *villani* and three bordars. It has been estimated from these figures that the village supported about eleven households and a population of between fifty and one hundred (Brereton 1996, 3).

Bilston remained with the Crown, as part of Stowheath Manor, until 1265. During the reign of Edward III all Bilston men were granted freedom from tolls as a consequence of the vill having formerly been a demesne of the crown, though there is no evidence that a market was held here subsequently (Lawley 1893, 21). By 1378 there was a priest at Bilston (*Ibid.*), suggesting that a church was in existence by this time, and this was certainly so by 1452/8 when Sir Thomas Erdington founded a chantry chapel in the church of St Leonard at Bilston (Lawley 1893).

Industrial activity began early. There is reference to coal being mined at neighbouring Sedgley from the 13th century onwards, and at Bilston itself by 1401 (VCH II, 72). An association with the metal industries had already been formed by the 16th and 17th centuries, by which time Bilston had become known for the manufacture of locks, keys, and grindstones, and as the source of a

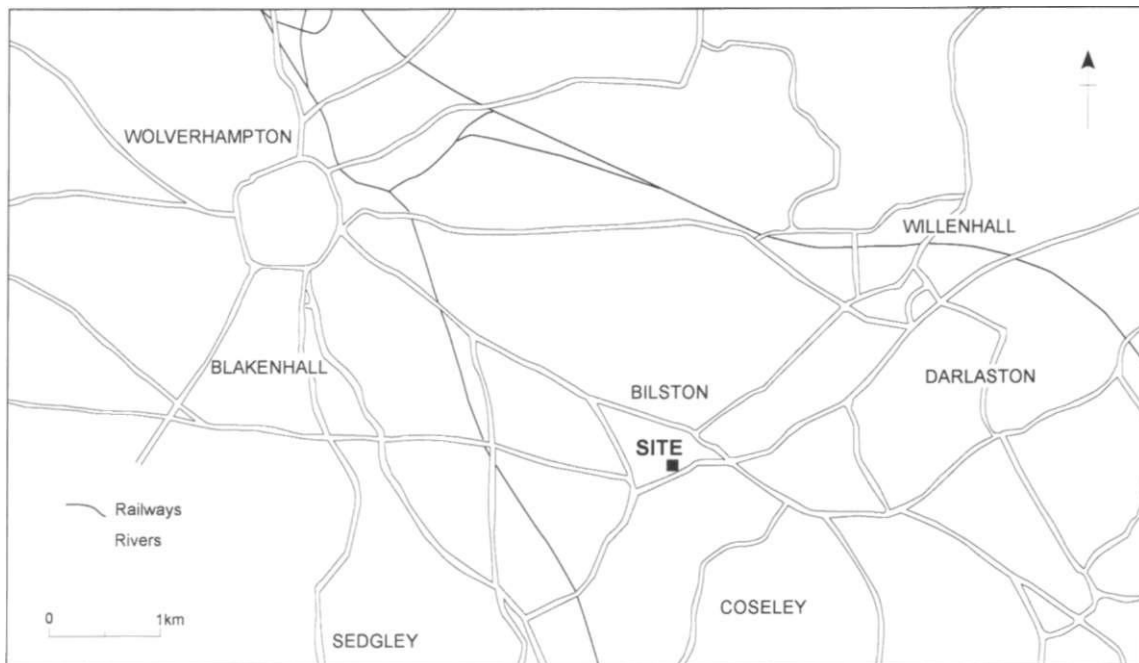


Fig. 1 Site Location

particularly fine sand used in metal casting (Collins 1991, 8-9). In 1756 John Wilkinson came to Bilston and opened an ironworks at Bradley, approximately 3/4 mile to the south of the town. Coal mining increased dramatically in scale toward the end of the 18th century. Thereafter, the industrialisation of the town proceeded apace, and the number of inhabitants increased from 3,875 in 1771 to 24,188 in 1851 (Collins 1991). This rapid expansion of Bilston and the consequent overcrowded and insanitary living conditions that accompanied the population increase contributed to an outbreak of cholera in 1832 resulting in 741 deaths (Price 1840). The consequence of this catastrophe was the Bilston Improvement Act of 1850, which established a body of Commissioners and a Local Board of Health for the purpose of paving, lighting, watching, cleansing, sewerage, and otherwise improving the town.

THE TOWN PLAN

The early layout of Bilston can be appreciated from a map of 1832 (fig.2). At that date the village was approached from the west along a turnpike road (now the A4039), being joined from the north-west by the Wolverhampton road (now Wolverhampton Street) at the western edge of the settlement. From here, the main village thoroughfare followed the route taken today by High Street and Church Street with the church of St Leonard at the east end of Church Street on its north side.

The area around the church may have been the centre of the medieval village. The church stood at a fork in the road, one branch turning south-east into what is now Bridge Street, and then south before crossing Bilston Brook on the way to Wednesbury. To the south of the church, the Walsall road (Walsall Street) branched off at a sharp angle to the north-west before turning abruptly north-east to cross Lichfield Street on the way to Willenhall. This sharp turn gives the impression of being a later interpolation, and the probability that the Walsall Road was originally a straightforward continuation of the High Street can be readily surmised. Here, the former line of the road is suggested by the alignment of properties to the north-east of Green Croft, an alignment that is also evident to the south-west of Green Croft on the 1887 map (fig. 3). The lower end of Walsall Street no doubt has its origins as a short cut between the Walsall and Wednesbury roads. On the north side of the church was a second link (now Lichfield Street) between the two routes.

The junction of High Street and Church Street formed a crossroads with what in 1832 was Middlefield Lane (now Broad Street) to the north-west and Pinfold Street to the south-east. Extending north-east and south-west from the end of Pinfold Street roughly parallel with High Street/Church Street, Market Street and its north-eastern continuation, Hall Street, were already in existence. It is possible that this arrangement represents an early example of town planning. Certainly, at least two

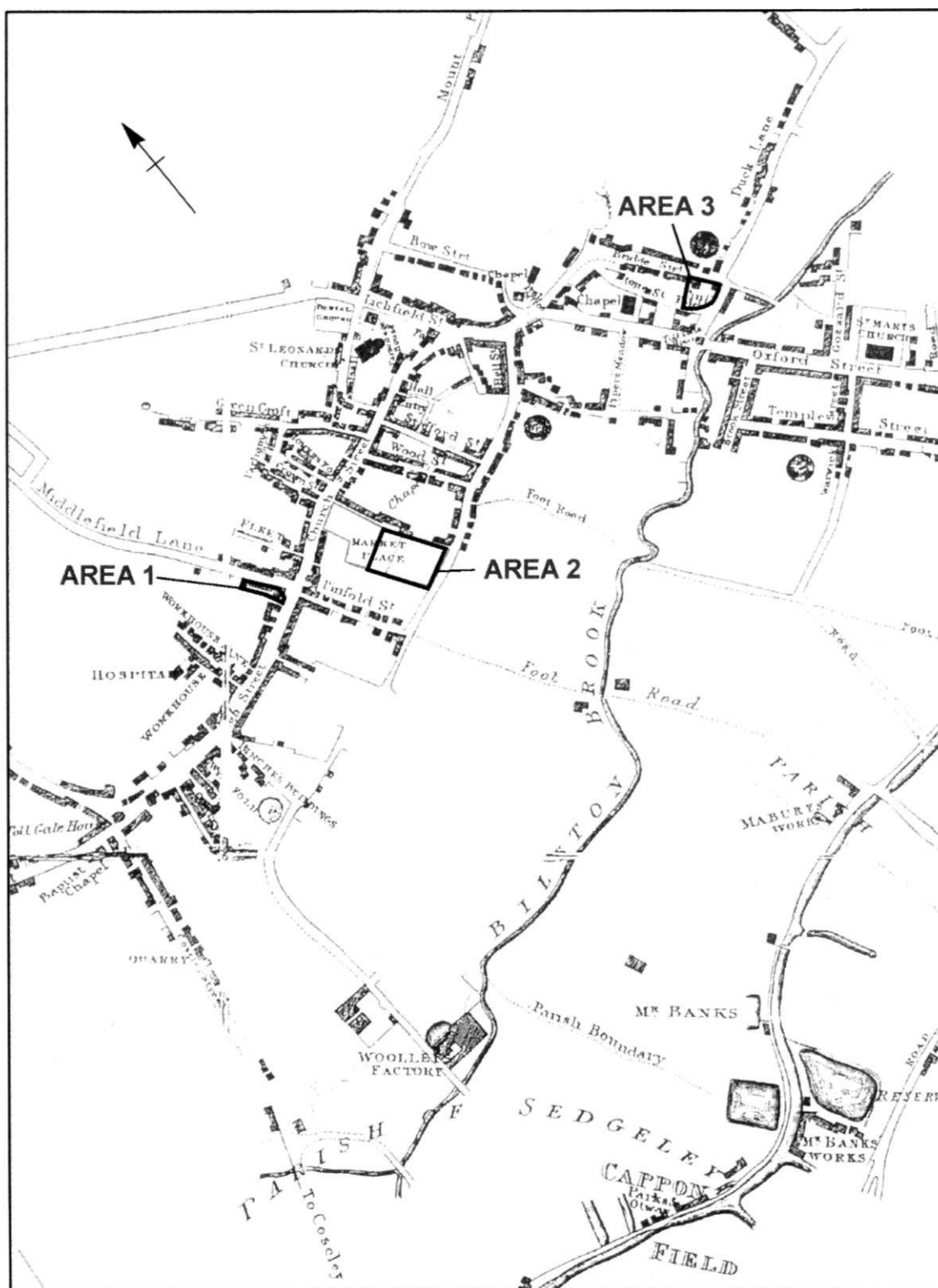


Fig. 2 Bilston in 1832 showing location of archaeological sites

of the fifteen customary tenements recorded by the Reverend Richard Ames between 1684 and 1730 were situated in this area (Hume's Tenement on the north-west side of Hall Street, and Robin's Tenement on the north-west side of Market Street) (Lawley 1893, 47-8). A number of properties along High Street and Church Street have the long and narrow shape characteristic of some medieval plots, though there is, as yet, no archaeological evidence to support or refute such an identification.

In 1809 the village was bypassed, and the High Street/ Church Street/ Bridge Street road superseded as the main route between Wednesbury and Wolverhampton by the construction of New Road at the north-east end of the settlement and its continuation Oxford Street; the two sections were linked by the older Lichfield Street. By 1832 a number of streets had been established to the south of Oxford Street, and when the 1st edition of the Ordnance Survey map appeared in 1887 the town had expanded far beyond its early nucleus (fig. 4).

DEVELOPMENT OF THE SITES

The archaeological work was undertaken in three main areas, all of which lay along the main medieval thoroughfare (fig. 2).

- Area 1: 1-3 High Street
- Area 2: Market Way
- Area 3: Broad Street/Queen Street

Area 1: 1-3 High Street (NGR SO 9477 9632)

Area 1 was situated at the east end of the High Street, at its junction with Broad Street, which forms its north-eastern boundary. It comprised a long narrow plot (approximately 35m x 10m) aligned north-west-south-east, with its south-east end fronting the High Street. The site appears to have been occupied by buildings since 1812 at the latest, but the earliest map detailed enough to distinguish something of the character of individual buildings is that of 1832 which shows an L-shaped building fronting the High Street with a short south-west wing set back from the road to accommodate a small forecourt (fig. 2). To the rear of this structure, extending along the side of Middlefield Lane (now Broad Street), was a long narrow range. The first accurate depiction of the plot is on the 1st edition of the Ordnance Survey map of 1887, which shows the L-shaped block, the south-west arm of which had been extended along the High Street and divided into four properties all fronting onto the High Street (fig. 3). To the rear there was again a long range along the Broad Street frontage. This arrangement survived at least until 1918 (fig. 5) but by 1938 the buildings had been demolished (fig. 6). It had been reoccupied by 1965, but was cleared of structures again in 1993.

Area 2: Market Way (NGR SO 9490 9630)

Market Way was a route of recent origin leading south-east from Church Street through the area of the former market place. The market was probably established on this site as a result of the Market Act passed in 1824, which allowed the establishment of a large market place in which markets could be held every Monday and Saturday. Certainly, the name Market Place first appears in the cartographic record in 1832 for a rectangular plot, narrowed at the north-west end, where it joined Church Street, apparently to accommodate a series of buildings to the south-west that may have been associated with the back plots of the Church Street properties. Vine Street was also in existence by this time with ranges of buildings along its north-eastern side overlooking the market place. Market Place itself was divided into eastern and western plots, a division that survived almost unaltered until the redevelopment of the site in the 1970s.

By 1839 four long rectangular structures had been built in the western half of the market place, though the eastern plot remained undeveloped, and to the south and south-east of the site was a large field, which by 1887 was occupied by Bilston Foundry, an iron and brass manufactory (fig. 3). By this date too, the area to the south-west of the market was built up with terraced houses and St Luke's church and vicarage. Bilston Market Hall, which was built on the north-western part of the site in 1892, appears on the 1902 Ordnance Survey map (fig. 4). It was demolished in the 1960s/early 1970s along with many other old buildings in the vicinity, preliminary to the construction of a new shopping centre.

Area 3: Queen Street/Bridge Street (NGR S095369638)

In 1832 the south-west side of Bridge Street was lined with buildings as far as Area 3 (fig. 2). To the south-west of Bridge Street, Stone Street had come into being probably as part of the development that took place after the construction of Oxford Street in 1809. It was a narrow lane that extended from the point at which Bridge Street turned south-east as far as an extended Queen Street. For most of its length it ran roughly parallel with Bridge Street, and there were at least two structures on its south-west side, and one or possibly two on the north-east side, though none within Area 3. Area 3 itself appears to have occupied an open area in the middle of 'Duck Lane' (now Queen Street). At its north-east corner was a square building, to the south-west of which there was a detached enclosure annotated 'Pin Fold', i.e. the village pound in which stray animals were penned.

By 1887 the south-west side of Bridge Street was lined with numerous closely packed buildings with occasional alleys between them leading to the back yards, in some cases communal (fig. 3). Some of these buildings were evidently terraced houses. Stone Street too was heavily built up; most of the properties appear to have comprised terraced housing, also with communal back yards. The pinfold appears to have remained in existence, an L-shaped building having been erected to the west that respected its north-west and south-east sides. To the north-west of this L-shaped block was a yard, and beyond the yard another L-shaped building fronting onto Stone Street. The size of these structures suggests that they might have been small industrial units. Immediately north-east of the pinfold at the corner of Bridge Street and Queen Street, on the site of the structure that appeared on the 1832 map, was a block of five attached properties. Three of the properties fronted onto Queen Street, whereas the other two were immediately behind them and were served by a narrow lane entered from Bridge Street. North-west of this lane a large public house, named on later maps as 'The Three Tuns', had been built with a yard at the rear.

Further changes had taken place by 1903 (fig. 4). A few properties had been demolished towards the north-west end of the study area, leaving gaps in the buildings from Bridge Street and Stone Street. At the corner of Bridge Street and Queen Street, the three Bridge Street properties had been demolished, as well as the south-western of the two to the rear. The pinfold was still undeveloped, and its north-west and south-west sides were still defined by the L-shaped building, to the north-west of which a covered entrance had been built leading to the yard behind it.

The only major change to have occurred by 1919 was that towards the north-west end of the study area a large square had been cleared from Bridge Street to Stone Street (fig. 5). By 1938 three new buildings had been erected on this site; they were set back from Bridge Street with their property boundaries extending as far as Stone Street (Fig. 6). At the north-west extremity of the study area a new building had been erected on Stone Street. At the south-east end of the study area the buildings on the Stone Street frontage had been demolished; so too had the building served by the narrow lane leading from Bridge Street, and the public house had expanded onto its site. The Queen Street frontage had been replaced by a widened pavement, and the pattern of the pinfold had finally disappeared, though its site remained vacant. At the redefined corner of Queen Street and Stone Street a new L-shaped structure had appeared.

By 1965 only the Three Tuns and the L-shaped building at the south-east corner survived within the study area. In recent years these too have been demolished and the site landscaped. The construction of the Black Country Route and Oxford Street Island to the south of the study area have resulted in the south-east end of Area 3 being cut back and the south corner being rounded off.

METHODS

Area 1: 1-3 High Street

An archaeological assessment and evaluation were carried out on this site in April 2002 (Lee and Nichol 2002) and in September and October a watching brief was undertaken during the stripping of the site and excavation of footings for a new building (Macey 2002). After the evaluation, the topsoil and modern overburden was removed mechanically to a depth of c.0.55m and subsequently foundation trenches were excavated, during which stage a watching brief was carried out.

Area 2: Market Way

A desk-based assessment (Rudge 2002) and evaluation (Blake and Cutler 2002) of the site of the outdoor market and associated car park were carried out respectively in March and April 2002. The evaluated area was immediately to the east of the covered market and north of the Black Country Route.

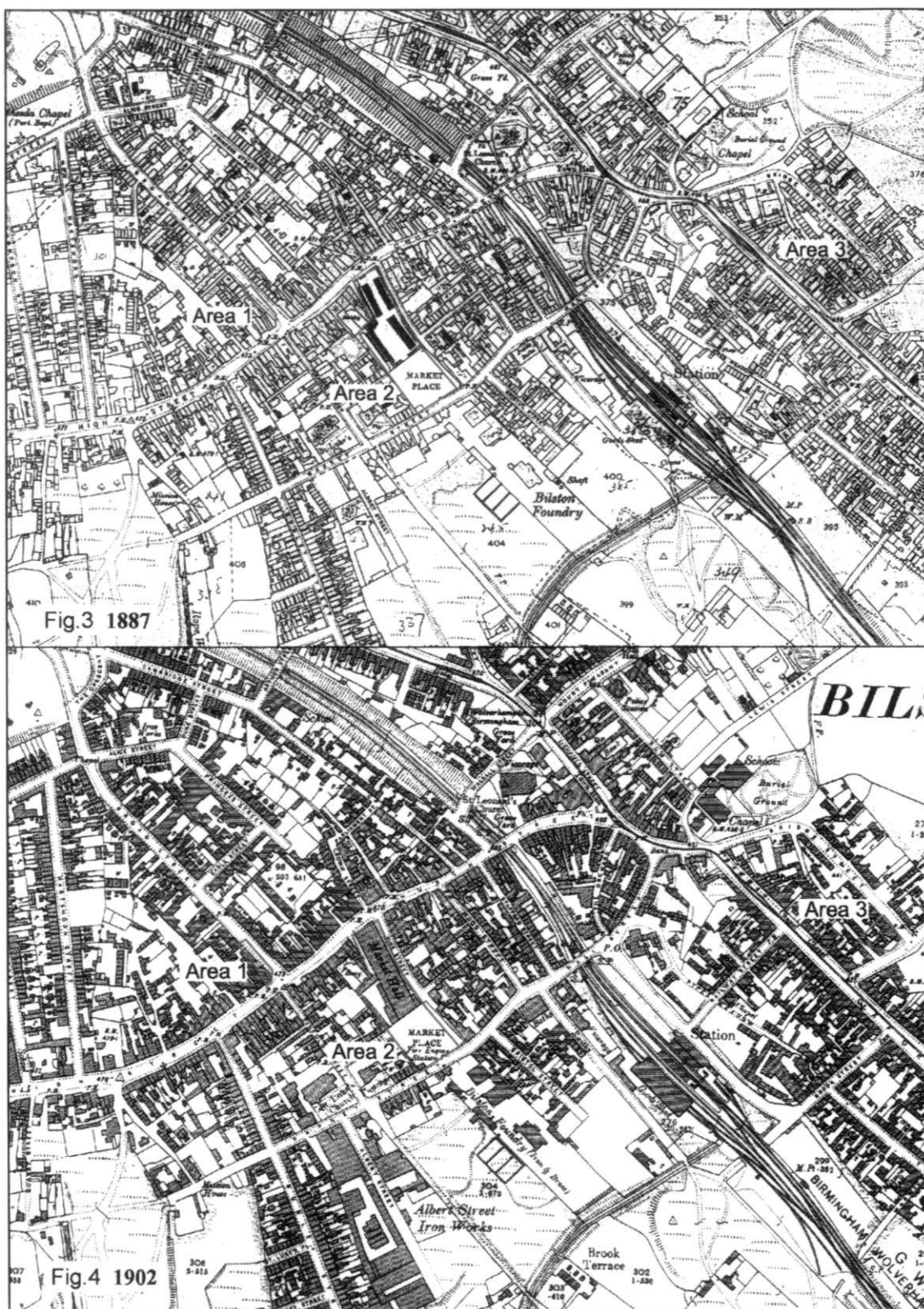


Fig. 3 1887

Fig. 4 1902



Fig. 5 1919

Fig. 6 1938

Area 3: Queen Street/Bridge Street

A desk-based assessment of this site was carried out in November, and trial trenching in December 2002 (Duncan and Hislop 2002). The study area lies at the eastern extremity of the street block bordered by Bridge Street to the north, Stone Street to the south and Queen Street to the east.

RESULTS

Area 1: 1-3 High Street (FIG. 8)

The natural subsoil was overlain by a buried soil layer (1001) containing pottery ranging in date from the late 15th to the 18th century. The pottery included Cistercian Ware (15th–16th century), 17th-century German Stone Wares, and sherds of late 17th-century Coarse Ware and Black Ware vessels.

At the south-western end of the site the natural subsoil was cut by the north-western side of a 0.9m deep ditch (F200) aligned south-west-north-east along the High Street. This ditch was filled by a black clay-rich silt (2005) identical to the buried soil, 17th-century pottery being recovered from it. The feature was partially revealed in section in a foundation trench, perpendicular to the frontage and parallel to the boundary of the neighbouring plot (no. 5 High Street).

The buried soil layer was cut by a number of features, the earliest of which was an 18th-century pit (F100) close to the street frontage, which was itself cut by a 19th-century cellar. Immediately above the north-western edge of the pit were the footings of a 19th-century wall (F102) that had been underpinned at this point by sandstone blocks. North-west of this area a 19th-century brick culvert was recorded along the south-western edge of the trench. It ran from the rear of no.3 to a soakaway delineated by shaped and faced sandstone blocks.

Overlying the buried soil was a black levelling layer (1000) containing a sherd of Flow Blue Ware, a small sherd of Painted Ware (both post-1840 in date), and several sherds of Willow Pattern. This layer (1000) and the earlier 1001 were cut by a north-east-south-west aligned drain (F101) discharging towards Broad Street, which replaced the earlier soakaway.

A sondage, excavated at the north-west end of the trench, revealed that the natural subsoil sloped away dramatically to the rear of the plot, indicating that the ground behind the High Street, in some areas at least, may have been quarried away. The ground had been made up and levelled with imported material comprising bands of ash and clinker layers of slag, and pockets of yellow clay (1004) c.2.1m deep. The made-up ground was cut by a 19th-century brick-lined well and later drains.

Discussion

The ditch discovered during the watching brief may have been associated with the turnpike road that once passed through Bilston (VCH 1967, 278). This route was replaced by the New Road/Lichfield Street/Oxford Street route in 1809.

The discovery of a large 18th-century pit, close to the High Street frontage, suggests that the plot may have been open and undeveloped prior to the 19th century. This possibility becomes a probability when considered in concert with the buried soil layer, which appears to have been built up over a considerable period. Dark buried soil layers of early post-medieval date have been noted on other sites across the Midlands overlying medieval occupation layers, a recently excavated example being a possible cultivated soil adjacent to Park Street, Birmingham (Burrows 2002, 9). The presence of such layers may point to a period of contraction involving the abandonment of areas that may have been occupied during the medieval period.

The footings overlying the 18th-century pit were probably those of the rear wall of the L-shaped building fronting the High Street that appears on the early 19th-century maps. The brick culvert and soakaway evidently relate to this building or to the rear service extension that was in existence by 1839.

Immediately to the north of the ditch a course of large sandstone blocks (F202), aligned north-west-southeast, which cut the natural subsoil, was possibly part of the foundations for the building that was here in the early 19th century. Further back from the frontage, the natural subsoil was cut by a number of 19th-century features, including cellars and a well (F201).

Area 2: Market Way (FIG. 8)

Initially, three 7m x 2m trial trenches were excavated, the natural clay subsoil being recorded at depths of between 2m and 2.3m below the existing ground surface. Trench 1 was located across a roughly east-west aligned ditch some 7-8m wide and 0.5m deep (F101, 1008, 1006), from which fragments of brick and tile were recovered. Trench 3 produced no evidence for medieval or early

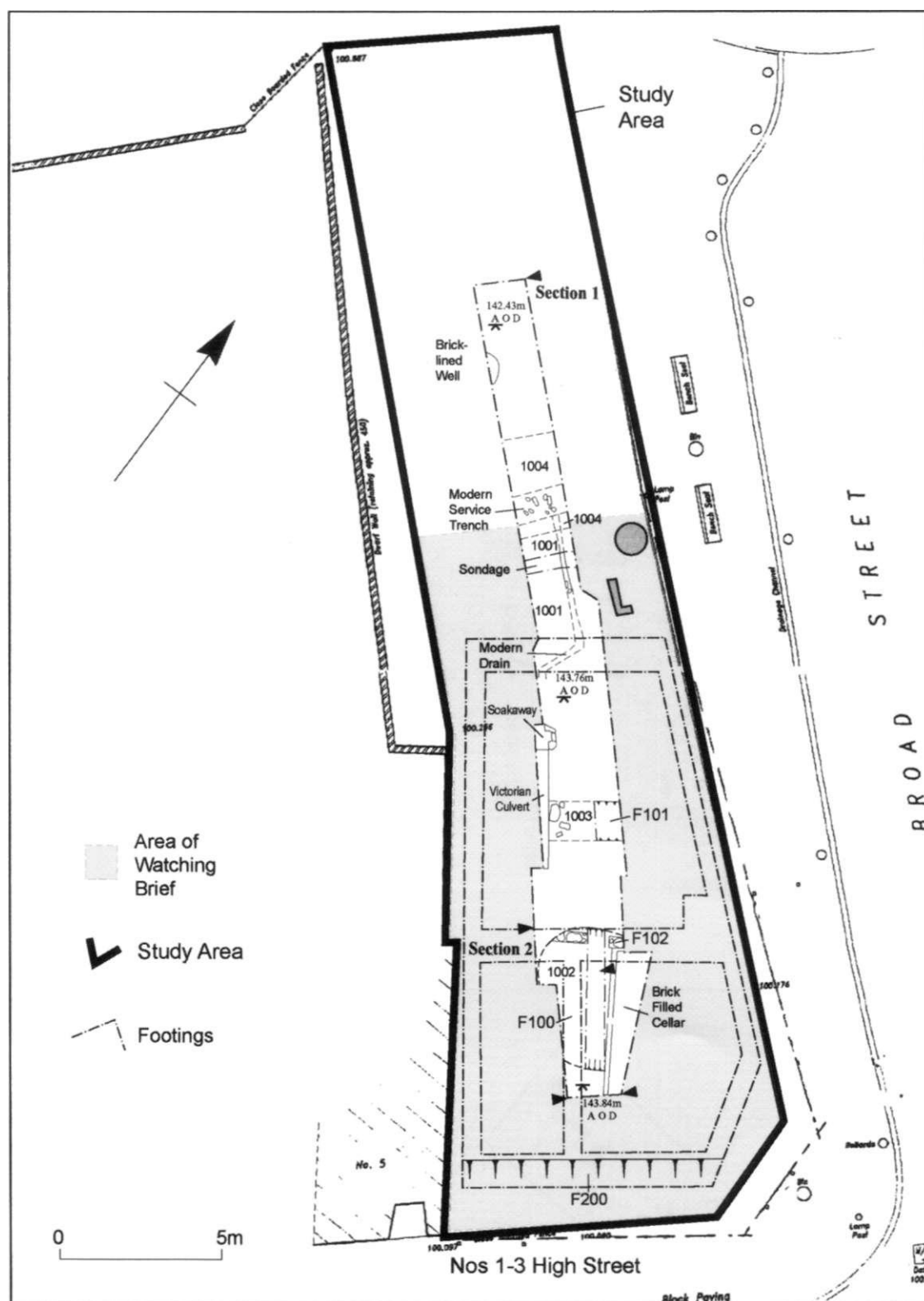


Fig. 7 Area 1

post-medieval activity and much of the material overlaying the natural subsoil appeared to represent the re-deposition of the natural clay, perhaps the result of the dumping of material after the excavation of cellars. Only in Trench 2 was the presence of pre-19th-century archaeological deposits confirmed. Consequently, Trench 2 was opened out into an area measuring 8m (east-west) x 5m (north-south). The results from Trench 2 and the larger excavation area are combined in the following account.

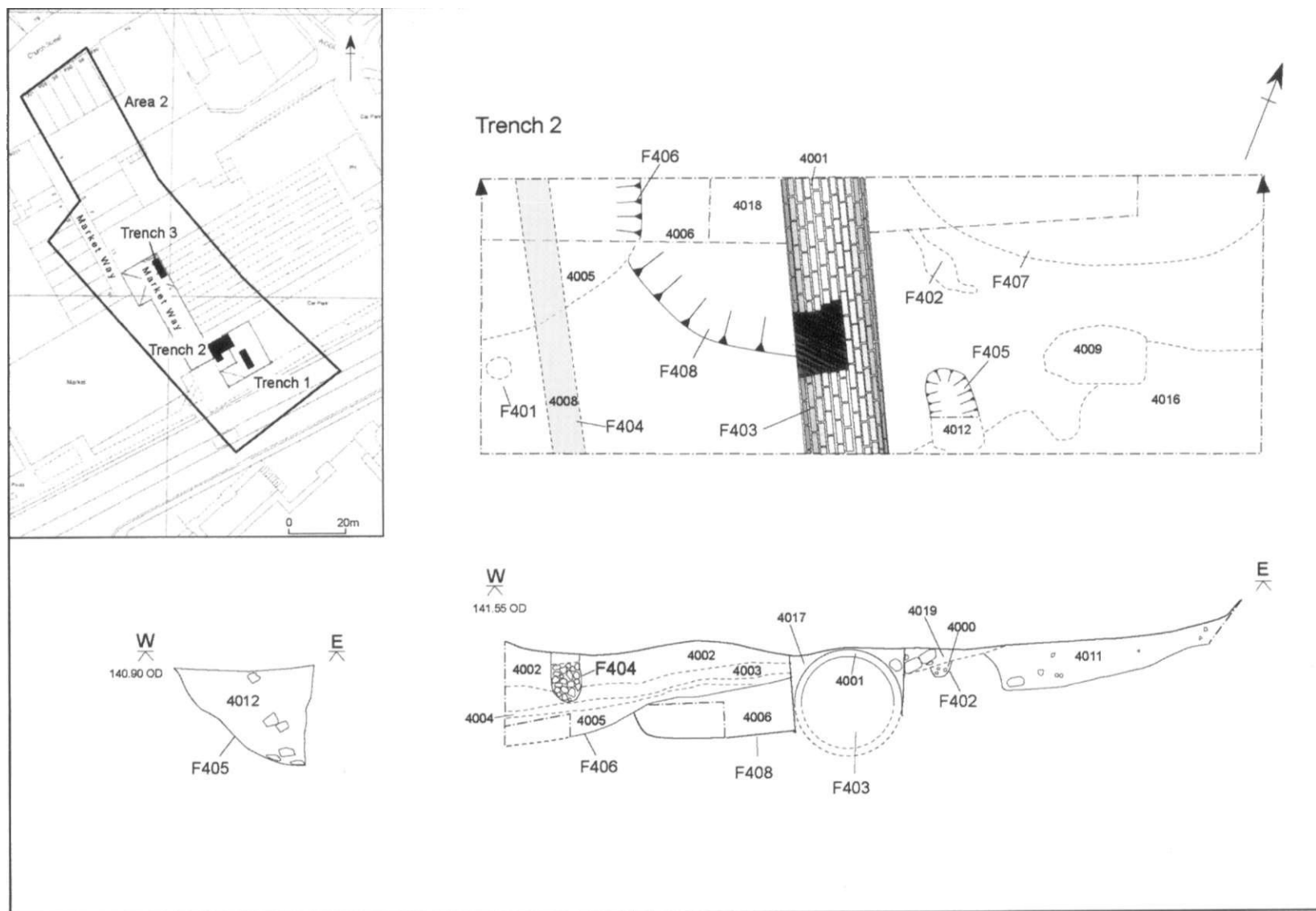


Fig. 8 Area 2 Excavated Area

Phase 1 (17th and 18th centuries)

A number of features had been cut into the natural subsoil. In the western half of the excavated area was a sub-circular pit (F408), 0.5m deep and at least 1.5m in diameter, although because the feature was only partially within the excavated area it was not possible to determine its full extent. Two sherds from a 12th- or 13th-century cooking pot were recovered from it, though these must be considered as residual as the feature also produced two 17th- or 18th-century bricks.

The western edge of F408 was cut by another sub-circular pit (F406), this one 0.35m deep and at least 1.65m in diameter, although in this case too it was not possible to determine its full extent. The pit produced tin-glazed earthenware pottery. A 0.3m diameter circular posthole (F401/F201), 0.1m deep, lay to the south of F406. Overlying both F401 and F406 was a 0.8m depth of succeeding layers, the uppermost of which, a brownish grey silty clay (4002/2016), contained fragments of a crucible, coarse ware and oblique black ware dating from the 17th and 18th centuries.

At the southern end of the original Trench 2 was a cut for a possible ditch (F204), aligned approximately east-west, and although the extent and depth of the feature could not be established, it was interpreted as a continuation of the ditch identified in Trench 1 (F101).

Within the eastern half of the excavated area the natural subsoil was sealed by a blue-grey clay (4016) which was cut by a sub-circular posthole (F405) 0.36m deep and 0.5m long containing a single dark grey blue silty clay fill (4012) packed with stone at the base. This feature was sealed by layers of redeposited natural clay. Layer 4009 sealed the blue-grey clay (4016) and contained stone and brick fragments, and sherds from a medieval bowl.

Phase 2 (18th and 19th centuries)

At the west end of the trench, aligned approximately north-south was a 0.30m wide x 0.45m deep gully (F404/F200), probably a drainage channel, with a primary fill of blast furnace slag waste (4008) and an upper fill of a dark brown-grey silty clay with charcoal inclusions (4007, 2004, and 2005).

At the east end of the trench was a possible pit (F407), at least 2m wide and 0.4m deep, with steep sides and a flat base. It was filled by a greyish-brown compact silty clay (4011) containing 18th-century coarse ware pottery. To the west of the pit (F407) was a linear feature (F402) with irregular shape and sides filled by a very mixed silt, clay, brick and charcoal (4000). Features F402 and F407 were sealed by a layer of dark brown charcoal-rich silt (4019).

Aligned north-south across the middle of the excavation was a 19th-century circular brick culvert 3ft (0.91m) in diameter (F403).

Discussion

The presence of residual medieval sherds in 4006 and 4009 suggests that the excavation area lies close to an area of medieval activity, and it is possible that post-medieval land use has removed the evidence of earlier occupation.

The earliest phase of activity is represented by two postholes (F401 and F405) and two large pits (F406 and F408), bricks from F408 suggesting a 17th- or 18th-century date. The finds recovered from these pits and pit F407 to the east included pottery dating from the mid to late 17th century through to the late 18th century. Fragments of tile and brick, clay pipe, glass, animal bone, iron nails, slag, and fragments of crucibles or moulds were also recovered. Clay layers sealing these features suggest that the area was subjected to levelling-up or dumping in the late 17th and 18th century.

The east-west ditch in Trench 1 may have formed the southern boundary of the settlement during the early post-medieval period, and if related to the cut at the southern end of Trench 2 (F101) is probably contemporary with the pits.

The gully (F404) filled with blast furnace slag waste was probably used to facilitate improved drainage, and may have drained into the ditch towards the south (F101). Blast furnace slag and fragments of crucible suggest that much of the activity was associated with industrial processing and manufacturing.

Area 3: Queen Street/Bridge Street (FIG 9)

Three trenches were excavated, Trench 1 at the northern corner of the site perpendicular to Bridge Street, Trench 2 along the south-western edge of the property, to investigate potential for archaeological preservation below a former yard surface, and Trench 3 at the southern corner of the site in order to evaluate the archaeological potential of a backyard plot.

Trench 1

Trench 1 was 12m long x 3.5m wide and was excavated to a maximum depth of 1.3m below the existing ground surface (131.45m AOD).

The earliest stratigraphic feature (F108) was linear in character and aligned north-west-south-east, parallel to Bridge Street. Only a 1m length of this 0.6m wide feature was revealed, it had a U-shaped profile with relatively steep sides. A lump of ferrous material was retrieved from the fill, but no specific dating evidence.

Both F108 and the natural subsoil were sealed by an extensive compact grey-brown clay and silt layer (1013) 0.15m deep. It was cut by a sub-circular pit (F106), 0.75m in diameter and 0.30m deep with a U-shaped profile, and by a 0.7m wide x 0.2m deep U-shaped linear feature (F101), filled with brick rubble and grey silt (1010), aligned north-east-south-west along the middle of the trench. Overlying 1010 was set a layer of squared sandstone blocks (1005), 0.25m high and 0.2m wide, cut on its north-western side by a brick-built culvert (F105).

None of these contexts contained dating evidence but they were sealed by a 0.45m deep compact green-grey clay and silt layer, containing a concentration of coal inclusions towards the north-eastern end of the trench (1002), from which 17th-century pottery was retrieved (S. Ratkai pers comm).

1002 was sealed by another clay and silt layer with building rubble and coal inclusions (1000). Cutting this layer were several truncated brick walls of 19th-century date that in turn were sealed beneath a more recent layer (1001) of friable brown sand with a capping of recent debris.

Discussion

Potentially the most interesting piece of archaeological evidence revealed by Trench 1 is the linear feature F108 that was cut into the natural subsoil. It is possible that the layer sealing this feature (1013) and the subsoil was the remains of a buried topsoil. As this layer was in turn sealed by a buried 17th-century layer (1002), possibly buried garden soil, it is probable that F108 was medieval or, at the latest, early post-medieval in date. Because F108 was aligned with Bridge Street, it probably represents the rear wall of an early, probably timber-framed structure that fronted the street. The slot was occupied either by a stone plinth that has since been robbed, or by a timber sill. In either case the evidence would suggest a date of later than c.1200, by which time the sill beam was in use in the West Midlands (Hislop, Ramsey and Watts 2005). It is possible, therefore, that occupation extended along Bridge Street as far as this site during the Middle Ages, but subsequently contracted only to be re-established in the 17th or 18th centuries.

Cutting 1013, but sealed by the possible 17th-century garden soil (1002), the linear feature (F101) aligned perpendicular to the Bridge Street frontage would appear to be a post-medieval property boundary. It is possible that F101 represents the re-colonisation of this part of Bridge Street after abandonment in the medieval period. The sandstone foundation (1005) was built over and on the same alignment as F101. It is contemporary with the 17th-century garden soil (1002), and, given its poor quality build, may represent a property boundary within the gardens, rather than a more substantial structure. It is also possible that these stones were reused from an earlier building as they shared the same bedding depth of 0.23m (9 ins).

Trench 2

Trench 2 was 15m long and was excavated to a maximum depth of 3.5m below the existing ground surface (129.14m AOD).

A 4m x 0.5m sondage within the trench was excavated down to a horizon of compact yellow clay (2005) that sloped dramatically from 131m AOD (east) down to 129m AOD (west). Above it was a layer of friable black cinders and rubble (2002), with a maximum depth of 2.88m, into which was cut a series of truncated brick walls, mostly 19th century in date. Sealing these walls and Context 2002 was a late 20th-century brick and masonry rubble layer (2001) which was present over the entire area of the trench.

Trench 2 revealed over 2m of 19th-century and later infill along the frontage of Stone Street, suggesting that there may have been a quarry, natural depression, or slope on this side, although today the land is relatively level.

Trench 3

Owing to difficulties of machine access Trench 3 was excavated in a rhomboidal shape, approx-

imately 6m long x 4m wide and to a maximum depth of 1.4m below the existing ground level (130.83m AOD).

The earliest stratigraphic feature in Trench 3 was part of a stone structure (F300) that was revealed in the south-east corner of the excavated area. The walls of this building were approximately 0.5m thick, survived to a height of 0.95m, and were faced with large squared sandstone blocks. Abutting the structure to the north (F300) was a series of 19th-century brick walls (F301 and F302), and to the west a brick yard surface (3010). The interior was filled by several layers of building rubble (3001-3007) mixed with coal and cinders, which produced substantial amounts of slag and crucible material. Above these features and contexts were layers of building rubble and topsoil.

The stone structure (F300) is roughly in the right position to be identified with the pinfold that first appeared in the cartographic record in 1832, and that survived as a property division into the 20th century. Certainly the structure pre-dated the 19th-century walls that abutted it, and it is possible that the latter represent the building that was extended to enclose the pinfold on the north side.

CONCLUSIONS

These three excavations have thrown some light on the development of Bilston and given an insight into the archaeological potential of the town. Archaeological evidence for the early settlement has generally proved elusive. However, the putative beam slot to the rear of the Bridge Street property suggests that medieval archaeology might survive in the town. The discovery on the two sites along the main street (1-3 High Street and Bridge Street) of possible buried soil layers of post-medieval date may provide evidence for a contraction of the settlement and the abandonment of previously occupied plots. At 1-3 High Street this hiatus appears to date from *c.* AD 1500 to the early 18th century, whereas at Broad Street we have dating evidence from the 17th century only. By the early 19th century both these plots had been occupied by buildings again.

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1-3 High Street Evaluation

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1-3 High Street Watching Brief

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Market Way

The evaluation fieldwork was undertaken by Chris Hewitson, Andy Rudge, Richard Cuttler, and Steve Graham. Andy Rudge and Suzy Blake supervised the excavation assisted by Steve Williams and Phil Mann. The illustrations were prepared by John Halsted. Mike Shaw, the Black Country Planning Archaeologist, monitored the excavations on behalf of Wolverhampton City Council. Thanks to Rex Davidson from Wolverhampton City Council Property Services for his help throughout the project.

Queen Street/Bridge Street

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NEEDWOOD FOREST AND CELTIC PHILOLOGY

ANDREW BREEZE

Needwood Forest (SK 1624) is in east Staffordshire, some four miles west of Burton-upon-Trent. Recorded between 1198 and 1248 as *Nedwode*, in about 1265 as *Neydwode*, and in 1540 as *Needwodde*, it has been explained from English *need* and *wood* as 'need wood, wood of distress or poverty', possibly because it was 'resorted to in need as a refuge by robbers'. This feeble explanation, for which no parallel is cited, has been repeated for generations by English place-name scholars.¹

Fortunately, it has been doubted by Dr Nigel Tringham of the Staffordshire Victoria County History. He not only thought it weak, but knew that many English forest-names are of Celtic origin. In the midlands we thus have Wrekin, Morfe, Kinver, and Cannock; in the south are Braden, Saver-nake, Chute, and Melchett (the last of these, given the existence of Welsh *mil* 'animal', probable points to a meaning 'game wood, wood of wildlife' and not 'bald-headed wood').² He thus asked the present writer if the element *Need-* might also be Celtic. Hence this note, which would never have been written but for Dr Tringham.

Need- at first appears unlikely as a Celtic wood-name. Yet a little thought offers an explanation that is unexpected but seems compelling. Evidence for it comes from three sources. First is the river Neath of Glamorgan. This is known from the Antonine Itinerary, which gives British-Latin *Nidum* as the name of the Roman fort there. (Two of its gates survive, in a housing estate on the edge of Neath town.) The second is Neden Brook, near Caerwent (ST 4690) in Monmouthshire. Third is the river Nidd of North Yorkshire, flowing some thirty-five miles past Knaresborough to join the Ouse near York. The writer has pointed out that the Neath, Neden Brook, and Nidd all cross limestone areas and disappear underground. They can thus all be explained as meaning 'dropper' from the root **ni-* 'down' found in English *nether* and Sanskrit *nitaram* 'further down'. This suggestion is not new. It was made for the Nidd by Eugene Aram (1704–59), murderer and pioneer philologist, who was bom in Nidderdale and knew the river well. It is, however, ignored by Dr Graham Isaac of Galway (who describes *Nidum* as an obscure Celtic form perhaps meaning 'flowing'; an explanation that may be dismissed).³ If, therefore, Needwood were also a region of vanishing streams, it would provide a fourth instance of this Celtic form, confirming *Need-* as of British origin and not English at all.

At this point we turn to ordnance survey maps. We there soon find streams in Needwood Forest that end in nothing. Their nature has been made clear to the writer by Dr Tringham, who consulted the British Geological Survey and passed on large-scale maps and aerial photographs supplied by them. One such swallow-hole (at SK 186245) occurs on the east side of the forest, north-east of New Inn Farm at a hamlet called Needwood (though the settlement itself is modem, as Dr Tringham points out). There is another (at SK 185224) to the south at Rangemore, where the valley south-east of the village is streamless. Yet why should streams be swallowed up in this way? Dr Tringham again comes to the rescue with an article provided by the Geological Survey, which mentions 'wash-holes' or swallow-holes in gypsum layers near Tutbury, north-east of the forest.⁴

Gypsum is soluble. It allegedly gives flavour to the water of Burton-upon-Trent, fostering its brewing industry. (So gypsum helps answer Housman's query, 'Say, for what were hop-yards meant, / Or why was Burton built on Trent?') Since Needwood Forest is located on marls with layers of gypsum, it cannot be doubted that the streams by Needwood hamlet and Rangemore sink below ground when they flow onto gypsum deposits. On this basis, we may deduce that one or more of the brooks in the forest (which now have English names) were known to the Britons as **Nida* 'one that drops' (where the asterisk shows a reconstructed term, not surviving in writing), and were name-sakes of the Neath of Glamorgan, the Nidd of Yorkshire, and so on.

1 *The Cambridge Dictionary of English Place-Names*, ed. V. E. Watts (Cambridge, 2004), 430.

2 A. L. Poole, *From Domesday Book to Magna Carta*, 2nd edn (Oxford, 1955), 28; Richard Coates and Andrew Breeze, *Celtic Voices, English Places* (Stamford, 2000), 302, 334, 339.

3 A. C. Breeze, 'The Names of Yorkshire's Cray Beck, River Balder, and River Nidd', *Transactions of the Yorkshire Dialect Society*, XIX/100 (2000), 27–33; G. R. Isaac, *Place-Names in Ptolemy's Geography* (CD-ROM, Aberystwyth, 2004). Cf. now Patrick Sims-Williams, *Ancient Celtic Place-Names in Europe and Asia Minor* (Oxford, 2006), 183.

4 T. Trafford Wynne, 'Gypsum, and its Occurrence in the Dove Valley', *Transactions of the Institute of Mining Engineering*, XXXII (1907), 171–92, at 189, 191–2.

Why, however, do we have Needwood Forest and not 'Nidwood'? The explanation lies in sound-changes of the British language in the fifth and sixth centuries, when the Anglo-Saxons were moving westwards across Britain. In the earlier fifth century the long *a* (later lost) of British **Nida* would have changed the preceding / to *e*. But this development (which linguists call *a*-affection) did not occur for the Yorkshire Nidd because the original British form there was **Nidos*, a masculine. When the Northumbrians reached York in the later fifth century, they learned a name that gives modern *Nidd*; but Mercians on the Upper Trent in the middle of the fifth century heard Celtic **Neda* for their river. But there are two problems. First, since the vowel of Welsh *Nedd* (Neath) is short, we should expect 'Nedwood' and not 'Needwood'. How do we get round this? The anonymous referee of this note, who pointed out this difficulty, also provided a solution, or solutions. Since early English spellings suggest the *e* may have been short, it may be that pronunciation with long *e* from the 16th century was due to folk-etymology, that is, association with 'need'. Against this is a spelling *Neidwode* of the 1120s, which points to a long vowel.⁵ So alternatively and more probable, the referee thinks the *e* may actually have been a long one, borrowing the long *e* of the new Brittonic quantity system which came into existence about 600. That would give the 'ee' of Modern English following the Great Vowel Shift of the 15th century. The second problem is simpler. Lenition of British *d* is dated to the later fifth century (as in Welsh *Nedd* 'Neath', with the *th* sound of English *breathe*). Why do Needwood and the Yorkshire Nidd not show this? The referee points out that this is due to sound-substitution by Old English, which lacked voiced *th*.⁶ Hence the *d* of present-day *Needwood*.

If this above explanation is correct, it has four implications. It shows Needwood has a name going back to pre-English times; we can reject outright the idea of the wood as 'resorted to in need as a refuge by robbers'. The borrowing of Celtic **Neda* (from **Nida* 'Dropper') by English also indicates British survival around the Trent when the Anglo-Saxons came to Repton, Tamworth, and Lichfield in the middle of the sixth century. Further, since the Celts revered water and attributed divine powers to rivers and lakes, the disappearing streams of Needwood may have been worshipped with awe. Their swallow-holes might thus offer finds for archaeologists. Finally, these humble Staffordshire streams may help with the names of greater rivers, including the Nidda, which meets the Main downstream from Frankfurt, and the Nied, which rises in France and flows into Germany to meet the Saar below Saarlouis. These Continental rivers likewise run across soluble rocks, and may similarly have been known as 'dropper', referring to a flow of water that inexplicably vanishes below ground.

5 British Library, Add. Charter 27313; for an edited text see Geoffrey of Burton, *Life and Miracles of St Modwenna*, ed. R. Bartlett (Oxford, 2002), p. liv.

6 K. H. Jackson, *Language and History in Early Britain* (Edinburgh, 1953), 208-9, 342-4, 558, 573-8, 560-1.

MARIAN HERETICS AT LICHFIELD

JIM GOULD

During the middle ages, the teaching of John Wycliffe and his followers (the Lollards) alarmed many who feared for the fabric of both church and society. Lollards and any persons holding somewhat similar views were considered to be heretics and were savagely (but legally) suppressed by Henry IV under the 1411 statute, *De Heretico Comburendo*: once determined by the church authorities to be heretics, they were handed over to the secular arm and burnt.

Heresy again came to the fore in the late 15th and the 16th centuries. In Coventry and Lichfield diocese Bishop John Hals (1459-90) and Bishop Geoffrey Blythe (1503-31) used their visitations to seek out heretics, and from 1512 Blythe also headed a royal commission to inquire into insurrections, rebellions, and Lollards in south Wales and the Marches. A transcript of Blythe's register and court book for 1511-12 has recently been published,¹ and most of the 158 alleged heretics recorded there came from Coventry and Birmingham; none came from Lichfield and none was burnt there. Exceptionally, John Shepherde of Bolton-on-the Moors (Lanes.) was interrogated in Lichfield cathedral by the dean, John Yotton, acting as the bishop's vicar general, but he was persuaded to abjure his beliefs and was absolved.² Most commissions sought to obtain such abjurations and so avoid compulsory live burnings, although a public penance was usually imposed. There were very few burnings nationally during the protestant reign of Edward VI (1547-53),³ but under his catholic sister Mary (1553-58) there was a dramatic change in policy.

MARIAN MARTYRS

It is not known with any certainty how many heretics were burnt during Mary's reign. Writing in 1583, Lord Burghley gave a figure of 400 (including those who had died whilst in prison or from torture), but Bishop Burnett later estimated the number as 284; and the historian John Strype, using contemporary documents found in Cecil's papers, put the total of those burnt as 288 'besides those that died of famine in sundry prisons'.⁴ According to Strype's analysis by counties, no Staffordshire heretics were burnt at Lichfield but two from Warwickshire were in 1555 and a further Warwickshire heretic in 1557. The number of burnings which took place at Coventry is low compared to the figure for London and other places in the south-east of the country, despite the hard-line reputation of Bishop Ralph Baynes (1554-58), who in 1558 declared his diocese of Coventry and Lichfield to be entirely free of heretics.

LAURENCE SAUNDERS

One of the first heretics to be condemned in Mary's reign, in February 1555, was Laurence Saunders.⁵ He had intended to be a merchant but turned to religion instead whilst a student at King's College, Cambridge, and under Edward VI he was a highly respected divinity lecturer at Lichfield cathedral. After a short spell as rector of Church Langton (Leics.), he became rector of All Hallows' church, Bread Street, London, and it was there that he claimed that in the eucharist there was not the true and natural body and blood of Jesus Christ. That declaration was sufficient for the bishop of London, Edmund Bonner, to have him denounced as a heretic, although he at first tried hard to get Saunders to recant. Handed over to the secular arm in London, Saunders was then dispatched to Coventry where he was burnt in a small park outside the city.⁶

1 S. McSheffrey and N. Tanner, *Lollards of Coventry, 1486-1512* (Camden Society, 5th ser. 2003).

2 Ibid. nos. 99-1012.

3 A. G. Dickens, *The English Reformation* (1964), 267.

4 J. Strype, *Ecclesiastical Memorials of the Reigns of King Henry VIII, King Edward VI, and Queen Mary I* (1816 edition), V, 292ff.; VII, 416-19.

5 *Oxford Dictionary of National Biography*, 49, 45.

6 Strype, *Ecclesiastical Memorials*, IV, 303, 343.

ROBERT GLOVER

A well-educated gentleman, having attended Eton and King's College, Cambridge, Glover lived with his wife and family in the manor house at Mancetter (Warws.),⁷ and was influenced by the teaching of Bishop Hugh Latimer, who retired to Warwickshire after he was deprived of his bishopric in 1553.⁸ Declared a heretic at a visitation by Bishop Ralph Baynes in 1555, Glover was sent to Lichfield for further examination and in a later letter to his wife he described how, with other prisoners, he was dispatched on horseback, arriving at Lichfield in the late afternoon. They stayed at the Swan Inn where they were 'entertained friendly and gently'. After supper Glover was handed over to a man named Jephcot, a servant of the diocesan chancellor, Dr Anthony Draycot, who like Baynes had a reputation for being hard on heretics. Jephcot put Glover in the 'church prison', a narrow strong room 'very cold [and] with little light'. Although given a bundle of straw, he was not at first allowed a bed or a chair but officials later relented and he was allowed a bed. Questioned by Draycot and then held until Baynes returned to Lichfield, Glover in due course appeared before the consistory court which met in a room near the prison cell. Pronounced by the court as 'a proud, arrogant heretic', he was returned to Coventry where he was burned alive at the stake along with another heretic, Cornelius Bonge, a Coventry capper.⁹

Latimer's Swiss servant Augustine Bernher helped prisoners such as Glover by providing relief, carrying letters, and overseeing the widows and children of the deceased, and in his last letter to his wife, Glover advised her to take Bernher's advice and flee.¹⁰

JOYCE LEWIS

Like Robert Glover, Joyce Lewis is celebrated in a 19th-century tablet in Mancetter church.¹¹ The daughter of Thomas Curzon of Croxall (Staffs.), she married secondly into the strongly Catholic Lewis family of Mancetter (Warws.) and was influenced not only by her neighbour John Glover but also by Bishop Latimer who was her uncle.¹² When interrogated for heresy in 1555, she refused to recant her beliefs and was sent to Lichfield for burning. The secular authorities there, however, seem to have been reluctant to carry out the order, and the sheriff (Nicholas Bird) and the two bailiffs (Simon Biddulph and Humphrey Lowe) arranged for their wives to comfort Lewis as best they could.¹³ Nevertheless she was duly burnt in 1557, the only 16th-century victim to suffer that fate at Lichfield.

THE PRISON

Alleged heretics needed to be held safely until they either abjured and had served a penance or were handed over to the secular arm for burning. Robert Glover's letter to his wife shows that the 'church prison' was close to the consistory court on the south side of the cathedral towards its east end: it was narrow, strong, cold, and dark. This confirms Thomas Harwood's report that three tiny vaults beneath the small chapels on the south side of the choir had been used as a prison, although at the time that he was writing in the early 19th century they were filled up with rubbish and an outside door was blocked.¹⁴ These vaults can still be seen below the level of the Lady Chapel and have stone floors with a pointed tunnel roof. High on the wall of each cell is a narrow, unglazed double window, 5 inches wide and 22 inches tall, although on the outside the bottom of each window is at ground level. It is probable that the cells used as a prison in the 16th century were the same as the 'lower vault of [the revestry of God's House] ... under the church', where about 1660 three women squatted with their illegitimate children when the cathedral and its close were in a ruined and desecrated condition following the civil war.¹⁵

7 *Oxford DNB*, 22, 498-9.

8 Strype, *Ecclesiastical Memorials*, IV, 397.

9 T. Harwood, *History and Antiquities of the Church and City of Lichfield* (Gloucester, 1806), 285ff.

10 Strype, *Ecclesiastical Memorials*, IV, 236.

11 *Oxford DNB*, 33, 633.

12 *VCH Staffs.* III, 46.

13 Bodleian Library, Oxford, Harleian MS. 421, f. 70v.

14 Harwood, *History and Antiquities of Lichfield*, 96.

15 N. J. Tringham, 'Two seventeenth-century surveys of Lichfield cathedral close', *Transactions of the South Staffordshire Archaeological and Historical Society*, XXV (1985), 49 (nos. 58-9).

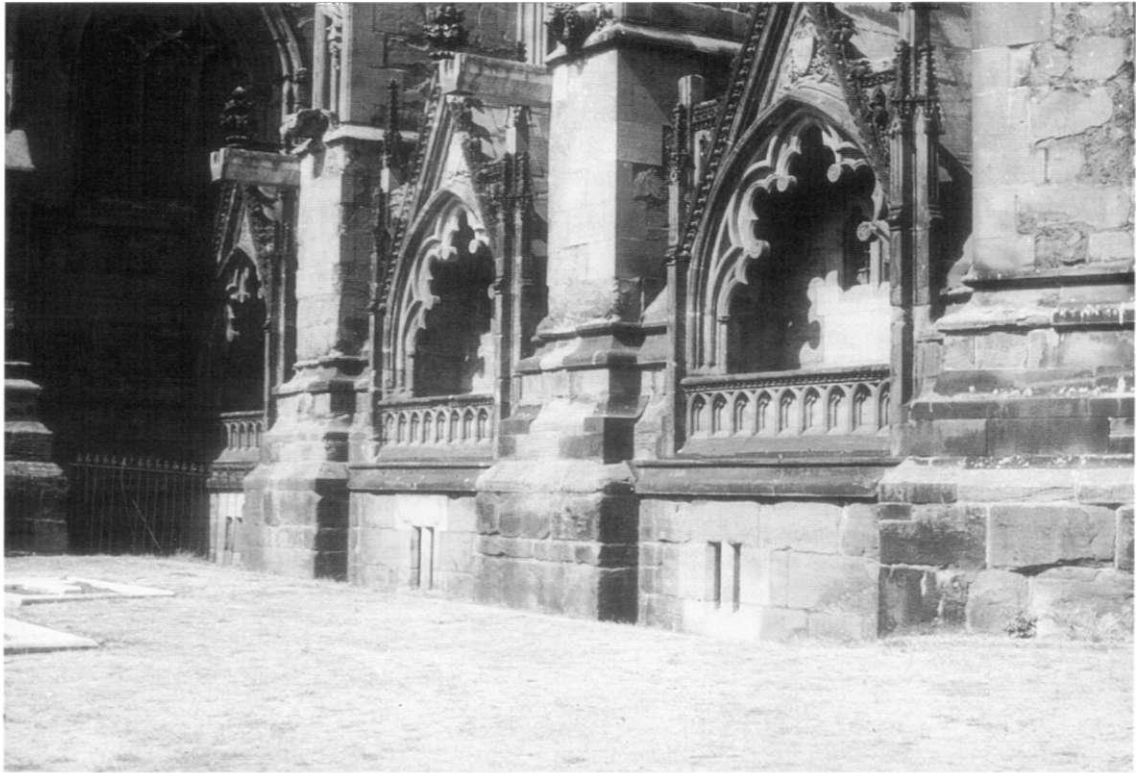


Plate 1 South wall of Lady Chapel, Lichfield cathedral from the south-east. (The prison windows are at ground level.)

The Lady Chapel is built on land which slopes steeply away to the south, so that the floor on its south side had to be raised in order to keep it level. This was done by constructing a tunnel crypt under the floor, piercing the footings which divided the crypt into three cells, each about 10 feet long and 6 feet wide.¹⁶ The ground on the outside (part of the graveyard for the cathedral close) has been raised, and from a distance partly obscures the view of the cell windows. The tombs were remodelled in the 19th century by John Oldrid Scott, and there is no longer any sign of the blocked doorway.

DISCUSSION

The contemporary document found amongst William Cecil's papers states that two unnamed Warwickshire heretics were burnt at Lichfield in 1555, and that one further Warwickshire heretic was burnt there in 1557.¹⁷ The latter is Joyce Lewis, but a search through Foxe's *Acts and Monuments* and Strype's *Ecclesiastical Memorials* has failed to identity the 1555 pair. It is possible, however, that the latter were Laurence Saunders (who had strong Lichfield connections) and Robert Glover (who spent much time in prison at Lichfield), and that Cecil was mistaken in believing that they were in fact burnt at Lichfield.

No burnings are known to have taken place at Lichfield under Elizabeth, but in 1612 the last burning of a heretic in England took place there, namely that of Edward Wightman of Burton-upon-Trent.¹⁸ Whether he was also detained in the prison cells under the Lady Chapel is unknown, but they ought to be preserved and recognised as a grim reminder of past horrors.

ACKNOWLEDGMENTS

The author is indebted to John Kwok for help in taking fig. 1, the vicar of Mancetter kindly provided details of monuments in her church, and the editor of the transactions for helpful comments.

16 J. Maddison, 'Building at Lichfield cathedral during the episcopate of Walter Langton', *Medieval Archaeology and Architecture at Lichfield* (1993), 71.

17 Strype, *Ecclesiastical Memorials*, V, 292ff.

18 I. Atherton and D. Como, 'The burning of Edward Wightman', *English Historical Review*, CXX (2005), 1216-1250.

PERRY BARR AND ITS WATER MILLS

P. W. KING

Now a district in the north of the City of Birmingham, Perry Barr was formerly in Staffordshire and lay on eastern edge of the Black Country. In the parish of Handsworth, but separated from the manor of Handsworth by the river Tame, Perry Barr was within the area where waterpower was intensively used for industrial purposes, particularly in connection with the iron manufacture.

The existing published accounts of water mills in the Perry Barr area (F. W. Hackwood's *Handsworth: Old and New*, the *Victoria County History*, and David Dilworth's *Tame Mills of Staffordshire*) were prepared before the Gough collection in Birmingham City Archives became available.² As a result, they are unsatisfactory. Dilworth's work may devote slightly more space to the mills than the *Victoria County History*, but actually adds little. The difficulty faced by the authors of the two latter works was that they were largely based on deeds in the Birmingham and Meath-Baker Collections in Birmingham City Archives, but not the Gough Collection.³ This meant that their accounts are based only on the documents of the Wyrley family, and without those of the Gough family and of the Stanford family who preceded the Goughs. This article relies on a wider range of archives. Its object is to provide a more satisfactory account, making use of the Gough Collection and certain other archives. The opportunity will also be taken to make remarks about the manor of Perry Barr and certain other matters.

Perry Barr was a manor that incorporated two Domesday manors: Perry and Little Barr (or Barr Parva). By the late medieval period both belonged to the earls of Warwick and were administered as a single manor known as Perry Barr,⁴ though passing references to Little Barr can be found later, usually as an alternative name for Perry Barr.⁵ A couple of 15th-century manor rolls survive, in which 'Parva Bar' and 'Pery' are named as if they are separate townships in the same manor.⁶ It is therefore probable that distinction between Little Barr and Perry was forgotten, rather than that Little Barr was deserted, as has been suggested.⁷ The manor passed from the earls of Warwick to the Crown in the late 15th century. Henry VIII sold it in 1544 to Sir Andrew Noel, who sold it two years later to William Staunford and William Wirley, each buying a half.⁸ In 1550 the two new lords of the manor partitioned most of the extensive demesne lands of the manor between them, but left undivided the manorial rights, a com mill in the tenure of Richard Eyton, a 'blome smythie' in the tenure of William Wirley, and certain other property.⁹ The Stanford share was sold in 1658 to Richard Best,¹⁰ and again in 1670 to Sir Henry Gough.¹¹ The Wyrley share passed down that family and through daughters into the Birch family, who retained their share of the manorial rights until 1849 when Wyrley Birch sold his share to the trustees of Sir John Gough's will, thus after three centuries re-uniting the manor in a single ownership.¹² However, stripped of the demesne lands partitioned in 1550, the manor itself was only of modest value. Before their acquisition of the manor, both William Staunford and William Wirley had property in the area. The Wyrleys had owned

1 F. W. Hackwood, *Handsworth: Old and New: a history of Birmingham's Staffordshire suburb* (1908), 21–3; *Victoria County History* [hereafter *VCH*], *Warwickshire*, VII (1964), 253–69; D. Dilworth, *Tame Mills of Staffordshire* (Phillimore, Chichester 1976). The 'Mills' section of *VCH* was completed in 1957, with minor additions up to 1961.

2 The Gough collection (now called MS 3145) was deposited with Birmingham City Archives [hereafter *BCA*] in 1959, but was not fully catalogued until 1974. It is cited here as 'Gough' without further prefix.

3 Deeds from the Birmingham Collection in Birmingham City Archives came to the City Library from a variety of sources. They usually have a six-digit number, and are cited by that number without further description.

4 *VCH Warws.* VII, 70.

5 For example in a mortgage dated 1658 and a settlement dated 1704 'Parry Barre' and 'Parva Barre' are treated as alternative names for the same manor: Gough 62/3 and 134.

6 Public Record Office [hereafter *PRO*], DL 30/111/1674 dated 26 March 1460; DL 30/111/1679 is another such court roll. The inclusion of these among the manor rolls of the Duchy of Lancaster is anomalous, as Perry Barr was never parcel of the Duchy. However, another membrane of DL 30/111/1674 concerns Newcastle-under-Lyme, which was part of the Duchy.

7 P. V. Bate and D. M. Palliser, 'Suspected Lost Village sites in Staffordshire', *TSSAHS*, XII (1971), 34. They place desertion as before 1377. Cf. *VCH Warws.* VH, 24 70.

8 *VCH Warws.* VTI, 70.

9 Gough 40/1.

10 Gough 62/3

11 Gough 62/5a-5b. The dates given here differ slightly from those given by *VCH*, being taken from the original deeds, whereas the *VCH* largely relied on fines and recoveries carried out subsequently to complete the title.

12 Gough 147.

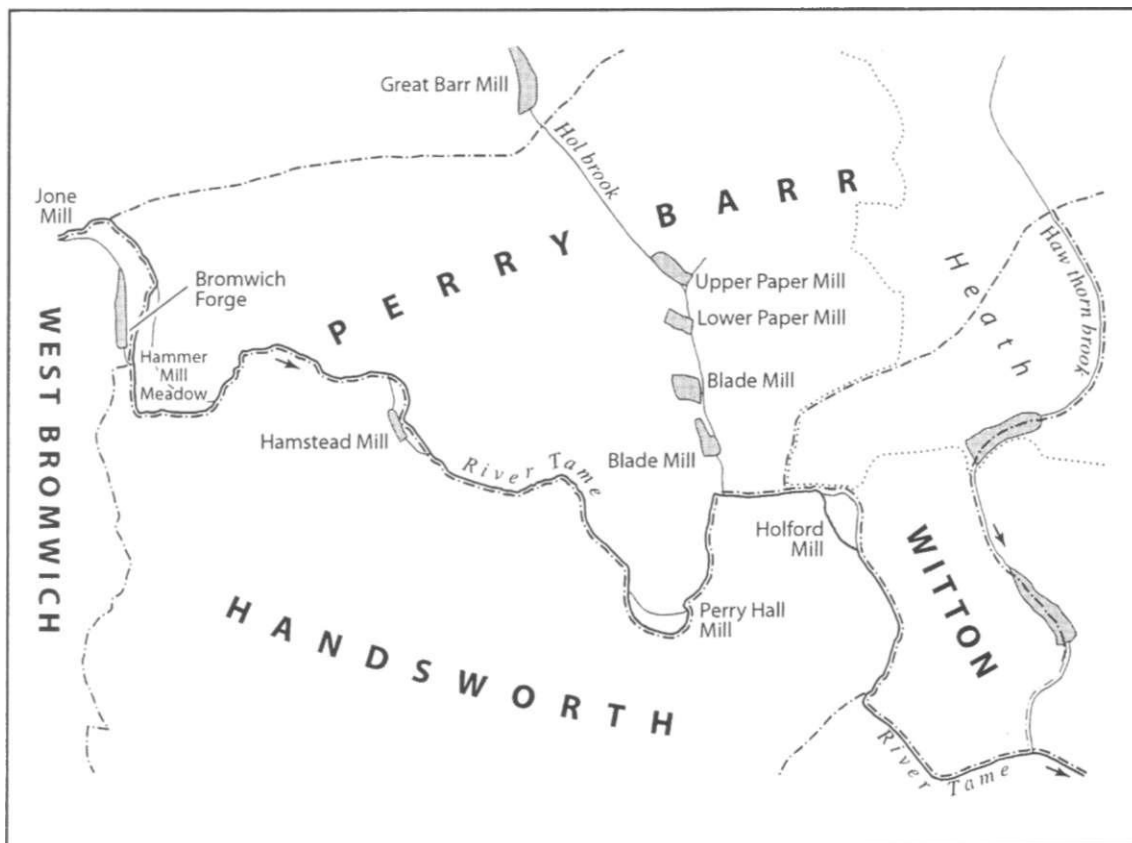


Figure 1 The locations of mills

Hamstead Hall since the 14th century,¹³ whereas a few months before his purchase of half the manor of Perry Barr, William Staunford had bought something called the manor of Pyrrey Hall [now Perry Hall], probably merely a freehold farm of 140 acres with a hall.¹⁴ It was probably not a manor in the strict sense of the term, in that there is no evidence of manorial tenants, nor for that matter was Hamstead Hall a manor house, though both halls became such (in effect) upon the 1546 purchase. There may well have been a medieval manor house or even two. One was perhaps 'the scite of the manor of Hamstead' where Thomas Wirley was directed to abate an encroachment in 1583,¹⁵ and the other perhaps at Mote Meadow, which was on the west of the Hoi brook between the second and third mills up it.¹⁶ One of these may have been occupied by John Lowe, who was the farmer (that is, the lessee) of the manor of Perry Barr in 1506.¹⁷ This was perhaps 'the scite of the manor called Purry Hall Garratts', which is mentioned in the 1704 Wyrley settlement.¹⁸

A major difficulty concerning the mills relates to the respective identities of the four mills on the Hoi brook, and none of the previous accounts adequately resolved this. The nomenclature is confusing, since the name Perry is used for no less than five mills (see fig. 1), the four on the Hoi brook and a fifth on the river Tame a little below Perry Hall. They were sometimes known by personal names, such as Harvey's mill, but these were usually those of current or recent occupiers, and occupiers change periodically. At other times, they were distinguished by names relating to their use, but these uses also changed occasionally, making the names obsolete. The difficulty is slightly alleviated by much later references to mills as having been formerly the Upper and Lower Paper Mills. (To avoid confusion they will here at times be referred to by numbering them upwards from the confluence of the Hoi brook with the river Tame.) The failure of previous authors to distinguish

¹³ *VCH Warns.* VII, 69.

¹⁴ Gough 62/1; *VCH Warn>s.* W, 71.

¹⁵ Gough 62/10a.

¹⁶ Staffordshire Record Office [hereafter SRO], D.1237/40, plan enclosed in deed (reproduced here as fig. 3).

¹⁷ PRO, SC 6/HenVn/1334 [minister's accounts].

¹⁸ Gough 134.

one mill from another has resulted in certain documents, which I believe to relate to one of the mills on the Hoi brook, being attributed to the mill on the river Tame (near Perry Hall), which I will refer to as Perry Hall Mill. Several of these misattributed documents refer to half a mill, and this has led to the erroneous conclusion that Perry Hall Mill was the manorial mill. However, Perry Hall Mill was the sole property of the Gough family in 1794,¹⁹ and earlier documents back to the 17th century confirm that they had a com mill near Perry Hall.²⁰ In addition, mention will be made of Holford Mill and Hamstead Mill. Both of these were on the south side of the river Tame, in Handsworth proper, and no confusion arises as to their identities. There were also mills on Hockley brook on the southern boundary of Handsworth (Matthew Boulton's Soho Works and Pigg Mill upstream from it), but these will hardly need to be mentioned.

The earliest reliable means of systematically identifying the owners of property is often by the use of the tithe awards and maps. Unfortunately the break-up of Wyrley Birch's estate had begun before the award's date. For this and other reasons, this source is not as helpful as it might have been for Perry Barr. Similar information is, however, available from Botham's 'Map of Perry Barr' (1794) and the related survey.²¹ Both maps identify the lowest mill as belonging (as freeholders) to successive members of the Webster family, but the significance of this was perhaps not apparent to the editors of the *Warwickshire Victoria County History* in 1964.²² The survey for Botham's map identifies the second mill and the adjoining Square Pond as belonging George Birch and Hon. Charles Finch.²³ This is confirmed by a lease of 1795 by them to James Woolley, a Birmingham swordcutter, which describes it as 'now or heretofore called Perry Blade Mill'.²⁴ In view of number of blade mills on the Hoi brook, this description appears unhelpful, but does in fact serve to distinguish it from the other two mills, because their leases consistently refer to them respectively as 'formerly called' the Lower Paper Mill and Upper Paper Mill. The two paper mills must therefore have been the third and fourth mills up the brook. Having thus distinguished the mills from one another, the following sections will provide a short history of each. After that, there will be a discussion of an earlier phase, when some of mills in the area were concerned in the production of iron from its ores.

THE MILLS

PERRY HALL MILL

No mill was mentioned when William Staunford bought Perry Hall in 1545, and it is thus probable that it did not then exist.²⁵ However, it was certainly in existence when Edward Stamford mortgaged his estate in 1650,²⁶ though neither then, nor upon the sale to Sir Henry Gough twenty years later, was the occupier named.²⁷ In 1694 he let it to Richard Gibbs.²⁸ Almost exactly a century later in 1794, John Gough let it to Charles Lebon.²⁹ Two years later John Gough used his estate as security in connection with the sale of property elsewhere. This described the mill as 'heretofore in the occupation of William Gibbs, then of John Gibbs (his son), since of Richard Gibbs (another son) and now of Charles Lebon'. The mill was occupied by Samuel Ellwell in the 1830s and by John Wilcox in 1851. So far as is known it remained a com mill throughout.

19 Botham's 'Map of Perry Barr' (1794): copy in Birmingham Central Library, Local Studies Department. The manuscript original was received by the library from Handsworth parish church 40 or so years ago (inf. from library staff). Being in very poor condition, the map was painstakingly copied by one of the librarians, and this is the copy used here.

20 Gough 62/3 (dated 14 July 1658). This deed distinguishes property 'reputed demesnes of Purry Hall' from other lands 'reputed parcel of the manor of Parva Barre', which were evidently derived from the 1550 partition.

21 Botham's 'Map of Perry Barr' (1794). It is necessary to use the original rather than the modern redrawn version, on which only three of the mills on the Hoi brook are obvious. Furthermore, the original map bears letters referring to ownership details.

22 Its editors (as stated) did not have access to the Gough Collection (which includes the deeds of this mill), and evidently failed to find Capt. P. C. G. Webster, *Notes, genealogical, historical ... concerning the Webster Family ...* (privately printed, Leamington Spa, 1880), which cited the same deeds.

23 Botham's 'Map of Perry Barr' (1794).

24 SRO, D. 1237/40, deeds of 1795.

25 Gough 62/1.

26 Gough 62/2.

27 Gough 62/5a-b; 258/39. The latter is undated 'particular of a moiety of the manor of Perry Barr'. It refers to 'chief rents due to Mr Best alone'. This suggests that it is particulars of the Perry Hall estate prepared in advance of the 1670 sale.

28 Gough 65.

29 Gough 68.

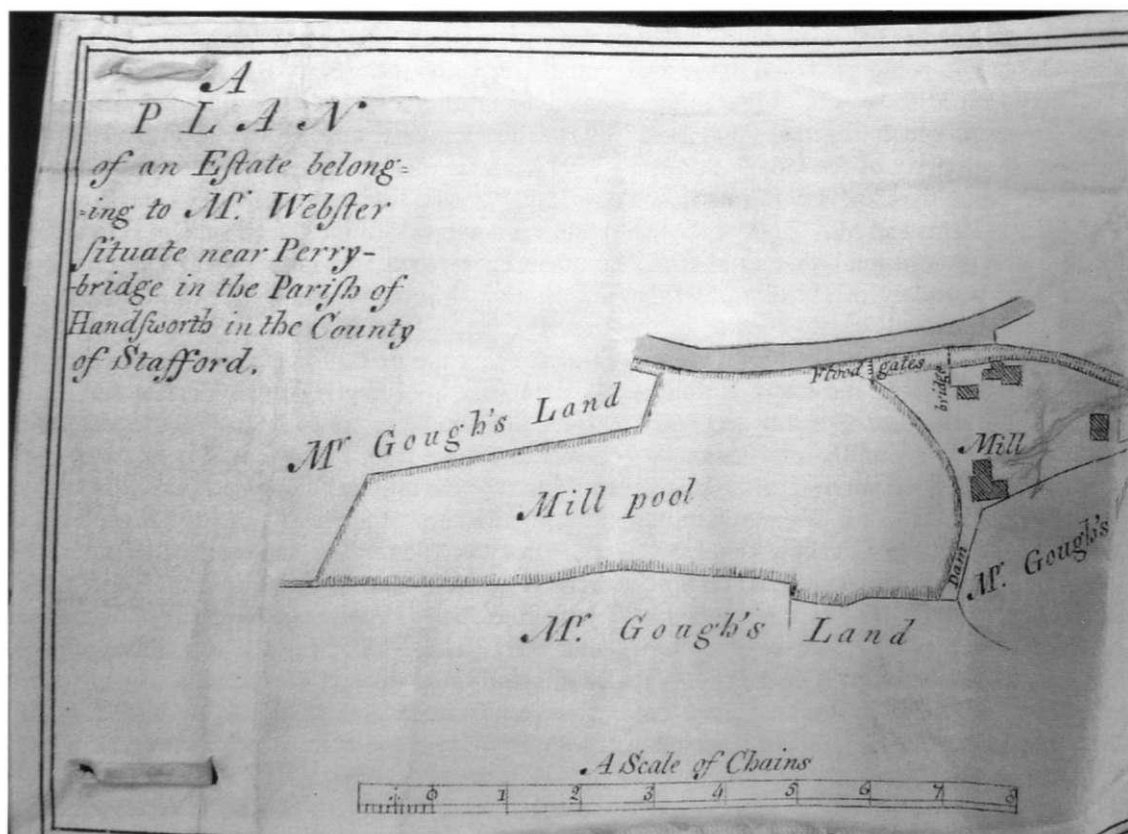


Figure 2 Perry Lower Wire Mill

This map was prepared in 1785 to settle a dispute between John Gough of Perry Hall and Joseph Webster over the extent of his property: *Reproduced by kind permission of Birmingham City Archives* (Gough 64/18).

PERRY LOWER WIRE MILL

The lowest mill on the Hoi brook (see fig. 2) long belonged to the Webster family, who have been the subject of two books.³⁰ The proximity of the mill to the river Tame is confirmed not only by the maps already mentioned, but also by the existence of a dispute in 1806 with Thomas Wilmore as occupier of Holford Mill. Wilmore had increased the height of his weir at Holford Mill, which was evidently backing water up into the tailrace of Webster & Crompton's mill, and he was required to lower it.³¹ Deeds in the Gough collection provide the history of this mill from 1670, when its owner was John Parks of Willingsworth (in Sedgley). His ancestor Richard Parkes had probably bought it from Thomas Lane and his wife Ann in 1614.³² Various members of the Lane family were bladesmiths with blade mills on the Hawthorn brook at Witton (the next manor to the east),³³ and it is therefore likely that it was already a blade mill in the early years of the 17th century. The implications of ownership by the Parkes family will be explored below. In 1670 John Parks conveyed a decayed blade mill and the ground where it stood, in the occupation of Richard Bonner, to Richard Heeley, a Birmingham cutler. In 1685 when Heeley's son Andrew leased it to Samuel White, another short cutler, it was in the occupation of John Greaves and John Benton. Six years later when John Doley bought the freehold, the occupiers were John Silvester and William Riddell. In 1710 when Doley's sister Elizabeth Fisher sold it to Sampson Lloyd, it was in the occupation of John Fulford.

Lloyd sold it in 1722 to John Webster of Candley in Stoneleigh, Warwickshire.³⁴ It has been claimed that he was not related to its subsequent occupier John Webster of Birmingham, but (if so) the coincidence of their surnames is surprising. It seems more likely that John Webster of Candley

30 Webster, *Notes*; J. Horsfall, *Ironmasters of Penns* (Roundwood, Kineton, 1976).

31 Gough 64/21.

32 *Staffordshire Historical Collections*, n.s. IV (1901), 65 (final concord).

33 *VCH Warws.* VII, 257-8.

34 Gough 64/1-12.

bought the mill specifically for John Webster of Birmingham to use. When John Webster of Candley sold the mill in 1726 to John Turton of the Brades in Rowley Regis, it was already in the occupation of John Webster of Birmingham.³⁵ Webster and Turton became partners and probably converted the mill to a wire mill shortly after. Certainly, they bought 17 tons of osmond iron (the kind from which wire was usually drawn) from Lydbrook Forges in the Forest of Dean and another 8% tons from the Foleys' Bewdley storehouse in the year and a quarter to Lady Day 1727. This compares with an average of 33 tons in the succeeding years until 1733, but they must have had another source of supply from 1735,³⁶ as they bought less from then on, despite by then having three wire mills, the other two being the former Lower Paper Mill (see below) and Halfcot (or Prestwood) wire mill in Kinver.³⁷ In 1739 they acquired a forge for themselves at Longnor in Shropshire, no doubt to supply themselves with osmond iron. This forge remained in the family until 1784,³⁸ after which successive members of the family occupied Hints Forge until about 1813.³⁹ John Webster bought his partner's interest in the mill at Perry Barr in 1744, and in 1748 he settled the mill on his son Joseph, also assigning all blocks, tongs, spindles, barrels, plates, hammers, gearing and tools there and his lease of another mill (of which more below). The mill descended in the Webster family, passing under the wills of Joseph Webster I (died 1780) and Joseph Webster II (died 1788). It was run by the latter's widow Phoebe during the minority of their son Joseph III and from about 1801 by her son and son-in-law J. W. Crompton as partners.⁴⁰ In 1819 the partnership was dissolved, and about the same time the mill was let to Bottley & Richards, presumably the firm described in 1821 as 'platers of metal' at 2 James Street, Birmingham. They were there until at least 1831.⁴¹ The occupier in 1837 was one John Gilbert.⁴² The tithe award indicates that it was a paper mill occupied by William Brindley,⁴³ probably William Brindley & Co., who were described in 1842 as of 60-61 Northwood Street, Birmingham, manufacturers of button boards, japan boards, gun wadding and papier machee trays, and paper manufacturers.⁴⁴ In 1844, however the mill was back in the hands of Joseph Webster III, and he sold it to the trustees of John Gough's will, as a blade mill lately a wire mill. The subsequent history of the mill is not clear, but it must have been deprived of its water supply in about 1860, when the mill above was acquired by Birmingham Water Works. The site of the mill is now occupied by the Church Tavern, behind which there are obvious remains of a wheelpit on the edge of the park, where the brook passes into a tunnel under the inn. The dam for the mill pool survives as a low bank in the adjacent Perry Park.

PERRY BLADE MILL

The next mill up the Hoi brook is the one that was jointly owned in 1794 by George Birch and Hon. Charles Finch and occupied by Wolley (sic).⁴⁵ George Birch had succeeded to the Wyrley estate, which included half the manor. Half of lands called 'Poole Tayle' (see fig. 3) were included in the sale of the Perry Hall estate to Sir Henry Gough in 1670, but a 'mill called Walke Mill' (i.e. fulling mill) was specifically excluded.⁴⁶ This must be a share of that mill, which passed to Hon. Charles Finch. The original deeds showing this devolution of title have not been traced, but are

35 Gough 64/11-13. Webster (*Notes*, 30-1) claimed that John Webster of Candley and John Webster of Birmingham were unrelated. This may indeed be the case, but the author may have failed to appreciate the extent to which people could move around during their lives. He certainly made that mistake in relation to Longnor Forge in Shropshire (see below).

36 Herefordshire Record Office, Foley Collection, E12/VI/DGf/1-12, sales from Lydbrook Forge and Bewdley store. I am grateful to Mr A. T. Foley of Stoke Edith for permission to refer to his family collection.

37 *VCH Staffs.* XX, 147; Webster *Notes*, 44n.

38 Shropshire Archives, 567/4, box 31, where a document specifically mentions Mr Turton's moiety and Mr Webster's moiety; *VCH Shrops.* VIII, 112. An agreement (dated 1739) preliminary to the lease (Shropshire Archives, 567/4, box 31, no. 31) renders the question beyond doubt by describing John Webster as a Birmingham wiredrawer. Horsfall (*Ironmasters*, 40 46-7) seems to have been unaware that the family were concerned with the forge before 1761. In this, he was following Webster (*Notes*, 44n), who assumed the 1739 (or 1737) lessee (a resident of Shrewsbury) was not a member of his family.

39 SRO, Land Tax assessments for Hints. This names Messrs Lloyds as occupiers in 1781, but 'Webster' in 1782. The occupier was Joseph Webster in 1812, the landlord in 1814 and Charles Proctor (probably a farmer) from 1815.

40 Gough 64/13-22; cf. Webster *Notes*, 30-1 and *passim*; Horsfall, *Ironmasters*, *passim*. Note also leases of the watercourse to the mill: BCA, 181860 and Gough 40/22.

41 SRO, Land Tax assessments for Perry Barr. These continue to specify the owners incorrectly as Webster & Crompton, when it was Joseph Webster only: *Wrightson's Triennial Directory of Birmingham* (1823 edn), 19; (1825 edn), 20.

42 BCA, CP/HW/Ratebook (1837) 661542, N35, no. 120.

43 Perry Barr tithe award and map: copy in Birmingham Central Library, Local Studies Department.

44 Pigot & Co., *Directory* (1842 edn), 20 (under Birmingham).

45 Botham's 'Map of Perry Barr' (1794).

46 Gough 62/5b.

referred to in other documents. The documents for the sale of Wellhead Farm in Handsworth by Finch and his son C. W. Griffith Wynne and their trustees, however, indicate that farm came to Finch as godson and devisee of Charles Jennens of Gopsall (Leics.), who was the son and heir of another Charles Jennens, in turn heir both of his father Humfrey Jennens of Erdington and of the elder Charles' brother John. A schedule in one of the sale deeds lists the earlier deeds (back to 1700).⁴⁷ An enrolment of a deed dated 1812 preparatory to the sale, and the foot of a fine dated 1700 (both in the Public Record Office), point to that mill and Wellhead Farm having the same title, and that they were both bought in 1700 by John Jennens from William Spencer of Handsworth, his wife, son, daughter and others.⁴⁸ This provides sufficient detail to link it with earlier references, including litigation prior to the 1700 sale.

The mill was presumably the ancient manorial corn mill of Perry Barr, which was in the tenure of Richard Eyton at the time of the partition of the demesne of Perry Barr in 1550, and also in 1557 when William Wyrley leased his share to his son Austen. That lease was surrendered by John Ward of Birmingham in 1572, but subject to a grant to Ann widow of Richard Eyton.⁴⁹ In 1616 half a mill was leased to John Curtler of Walsall, with a prohibition on the tenant keeping a horse at the mill or fetching or carrying grain except from Walsall or the mills at Wednesbury, which he held.⁵⁰ In 1650 Humfrey Wyrley leased half a 'milplace where a com mill stood ... formerly called Perry Mill' to William Spencer of Handsworth, who was authorised to build any mill except a com or paper mill.⁵¹ The exclusion of com mills suggests that the two lords of the manor had diverted any remaining obligation to grind at the manorial mill to Perry Hall Mill and Hamstead Mill, which they respectively owned individually. William Spencer leased the other half of the mill from Edward Stanford, presumably at the same time. Subsequently he bought the freehold of that share in the mill, as well as of a large farm, apparently Wellhead Farm in Handsworth, whose house was described as a capital messuage in 1698.⁵² The mill was thus excluded from the 1670 sale to Sir Henry Gough of the Perry Hall estate,⁵³ because it had recently been (or was then being) sold to some one else, apparently William Spencer. It was a 'Walke Mill' in 1667 when William Spencer settled his leases of it on the marriage of his son William to Anne Pensell,⁵⁴ and was still referred to as a fulling mill in 1700.⁵⁵ The mill was in the tenure of Samuel Porter by 1691 and that of George Fisher in 1706.⁵⁶ As Porter is known from other sources to have been a sword cutler, it is probable that the mill was converted to a blade mill to meet the demand for armaments during the Nine Years' War.⁵⁷ Accordingly, the 1700 description may be anachronistic.

Little is known of the tenure of the mill between 1700 and 1772, but it probably remained a blade mill.⁵⁸ In 1772 it was in the hands of Mr Harvey, evidently Samuel Harvey (swordcutler) who died about 1779. In 1780 John Gough sold a small strip of land containing 332 square yards to Samuel Harvey's sons Samuel and George, who were also swordcutlers and occupiers of this mill. When George died in 1782, his widow Dorothea assigned his share of three mills called Perry Blade Mills and Pig Mill to Samuel. Messrs Harveys were making swords in considerable numbers for the Board

47 Gough 75/1-2. C. W. Griffith Wynne had taken that surname in order to inherit property from a maternal uncle.

48 PRO, CP 43/915 [Common Pleas enrolments], deeds rot. 34-40; CP 25/2 [Feet of fines], 874/12 Wm. III Mich., m. 9.

49 BCA, 575876.

50 F. W. Hackwood, *Handsworth* (1908), 22. I have not identified his source, but he quotes the deed at length. However, he misdated it to 1632, probably due to having misread the 13th year of James I as his 30th year, which is an impossible date since James I died in 1625. The correct date is indicated by its being in James's 49th Scottish regnal year. As with all the references to half a mill, *VCH (Warws. VII, 255)* and Dilworth attributed this to Perry Hall Mill.

51 BCA, 181855.

52 PRO, C 5/245/25 [Chancery Proceedings]. The 1667 settlement is summarised in the Answer of William Spencer and others, and a mortgage of 1685 to Sir John Curzon in the Answer of Sir Nathaniel Curzon (his son). The main house was, however, merely called a 'messuage and farm [called] Wellhead', when mortgaged in 1685. Spencer considered it to be worth £4000 in 1698, and that was what John Jennens paid for it. Following this sale Jennens was to grant a lease for life of Birchfield House and some land to William Spencer and Anne in satisfaction of her jointure (PRO, C 10/535/39). The Finch property at Handsworth extended to some 250 acres in 1812, but it is not clear whether all this came from the 1700 purchase from Spencer: see PRO, CP 43/915, deeds rot. 34-40.

53 Gough 62/3.

54 PRO, C 5/245/25, answer of William Spencer and others.

55 Gough 62/5b; PRO, CP 25/2, 874/12 Wm. III Mich., m.9.

56 BCA, 181860; Gough 40/22. These are both leases of the watercourse to the mill below.

57 *E.g.* Herefs. RO, E12/VT/NC/13.

58 SRO, Land Tax assessments for Perry Barr. The entries for Mr Harvey in 1772 and Samuel and George Harvey in 1781 (despite being described as for Lower Mill in the latter year) seem to relate to two mills. However, this is not apparent from the assessments until 1789 after they were sold separately; Hon. Charles Finch is not named in them as an owner until 1803.

of Ordnance during the American War of Independence. For example, the Board ordered 2000 bayonets and 2000 sea service swords from them in March 1779, but with the end of the war orders ceased.⁵⁹ This may be why Samuel Harvey became bankrupt in 1788. He and his assignees sold the mill to James Woolley, another swordcutler, but his other mills passed into other hands. When Woolley renewed his lease in 1795, he passed the strip of land (purchased from John Gough in 1780) to his landlords, George Birch and the Hon. Charles Finch.⁶⁰

The mill was still occupied by James Woolley in 1812 when Finch and his son barred the entail created by the will of Charles Jennens II (d.1773).⁶¹ It seems this was followed by the sale of their Handsworth property. The sale deed for the mill has not been traced, but there is a lease of possession (to be followed by a release) dated 1819 relating to half a mill in Perry Barr in the tenure of James Woolley. This suggests that it was sold by Finch and his son with other property to Woolley (by then a banker) and John Welchman Whateley, who in turn sold the half mill to Wyrley Birch.⁶² The freehold in the whole mill and the Square Pool (and also half Square Pool Tail) were sold by Wyrley Birch to John Gough's trustees in 1832. At that time, the mill was in the hands of William Allen as tenant from year to year.⁶³ He seems to have taken possession of the property about 1818, probably initially in partnership with Charles Gallimore, but may have become sole occupier a few years later.⁶⁴ The tithe award called it a flour mill. As Charles Gallimore had been a miller at Perry Barr in 1818,⁶⁵ it is probable that the blade mill was rebuilt as a com mill shortly after the conclusion of the Napoleonic War. The com mill and pool was sold to Birmingham Waterworks in 1858, and the pool was used as a water supply reservoir.⁶⁶ The pool, which became known as Perry Reservoir, still exists as a feature of Perry Park. Alongside it a broad channel (now fenced off, probably for safety reasons) leads to the brick structure, which is obviously the wheelpit of the mill.

LOWER PAPER MILL

Access to the Lower Paper Mill was through Garrets Moors. This suggests that it was previously 'Garrettes Blade Myll', which was included in Humfrey Wyrley's 1614 marriage settlement. This was perhaps converted to a paper mill by 1648, as Sir John Wyrley reserved a watercourse to his paper mill and the right to enlarge it, when leasing a farm.⁶⁷ Both paper mills were occupied in 1670 by Roger Wyrley, who had lately occupied them in 1680. In that year they were let to Samuel Jerrom the elder for 11 years.⁶⁸ The paper mills were in the occupation of Humfrey Wyrley in 1704, but whether he was making paper or the mills were void is unclear.⁶⁹ In 1734 the mill formerly called Lower Paper Mill was in the occupation of John Stokes, and had been converted (perhaps recently) to a wire mill, when it was let that year to John Webster. In 1747 he had the term of his lease extended. The following year he settled it on his son, and it followed the same descent as the lowest mill on the brook until 1812. Joseph Webster renewed the lease in 1774 for a further 42 years,⁷⁰ but Webster & Crompton evidently disposed of it in 1812. The next occupier was Joseph Priest. Land tax assessments imply that he was followed by Timothy Tonks from 1819 and then Bottley & Richards from 1825,⁷¹ but they were in fact tenants of the Upper Paper Mill rather than this one. A new lease was granted to William Bedson in 1834. He was still occupying the wire mill at the time of the tithe award.⁷² The mill has been completely obliterated by 20th-century housing development.

59 PRO, WO 47/93, 222; WO 47/101, 158 [original pagination].

60 SRO, D. 1237/32 40-41; B.C.A., 329086. This assignment from Dorothea also related to the Upper Paper Mill (see below) and Pig Mill.

61 PRO, CP 43/915, deed m.34-40. This is also listed in the schedule to Gough 75/1, but I have not traced the original deed.

62 SRO, D. 1237/39, 1 Feb. 1819.

63 Gough 64/6. This deed is the assignment of a satisfied term in connection with the sale, not the conveyance itself. Cf. B.C.A., CP/HW/Ratebook (1837) 661542, N33, no.79; Pigot & Co., *Directory* (1842 edn), 102 (in Birmingham section).

64 SRO, Land Tax assessments, Perry Barr.

65 Perry Barr Tithe Award (as n. 42); *VCH Warws.* VII, 255 (attributed to Perry Hall Mill) and 257.

66 Gough 69.

67 BCA, 181865.

68 BCA, 181858; Gough 258/39. The latter lists Mr Roger Wyrley paying a sugar loaf as rent for watercourses.

69 Gough 134.

70 SRO, D. 1237/39, 1 Aug. 1774.

71 SRO, Land Tax assessments, Perry Barr. It would seem that confusion arose during the 1810s as to which assessment referred to which mill.

72 Perry Barr tithe award; the 1841 census called him a wiredrawer. Cf. BCA, CP/HW/Ratebook (1837) 661542, N33, no. 78.

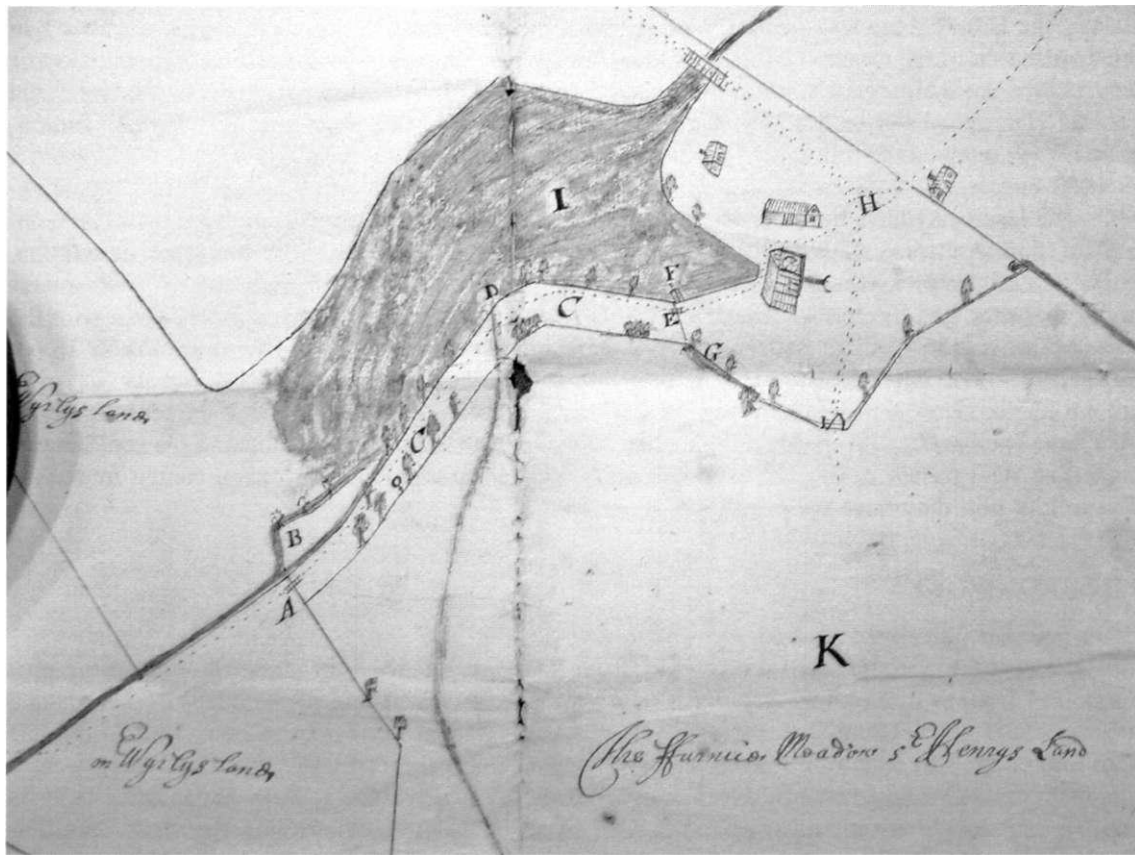


Figure 4 Perry Upper Paper Mill (later Upper Blade Mill)

This plan was probably prepared in about 1691 in connection with an arbitration concerning the ownership of trees growing on the dam: *Reproduced by kind permission of Birmingham City Archives* (Gough 40/23).

UPPER PAPER MILL

The northernmost mill on the Hoi brook in Perry Barr was another paper mill. There was a dispute in 1691 between Sir Henry Gough and Humfrey Wyrley as to who owned a tree growing on the dam of the Upper Paper Mill and other matters. This was resolved by awarding that the dam should lie open to Gough's field and that he should have the trees growing on it in future, but that Wyrley should have the right to repair the dam and fish the pool. A plan (see fig. 4) prepared in connection with this dispute shows that Sir Henry's meadow was called (significantly) 'Furnice Meadow', which suggests that the mill had previously been Perry Furnace (a matter that will be considered further below).⁷³ This mill like the other paper mill was occupied successively by Roger Wyrley and Samuel Jerrom the elder, but it is not clear what happened to it after Jerrom's lease expired in 1691.⁷⁴ Like the Lower Paper Mill, it was in the occupation of Humfrey Wyrley in 1704, which may mean that it was void.⁷⁵ It was occupied in 1735 by Richard Baddeley as an 'iron mill'.⁷⁶ Baddeley had been an ironmaster in 1723 and was a partner in Rushall Furnace.⁷⁷ He occasionally bought pig iron from Coalbrookdale between 1730 and 1734, perhaps when Rushall Furnace was out of blast.⁷⁸ This may indicate that he had an ironfoundry, probably in Birmingham. He was certainly in the iron trade, and was perhaps the person who converted the mill to a blade mill, possibly (in view of the date of the next lease) in 1723. In 1744 the mill, 'formerly called the Upper Paper Mill now used as a blade mill late in the holding of Richard Baddeley', was let to Samuel

⁷³ Gough 40/20-23.

⁷⁴ BCA, 181858.

⁷⁵ Gough 134.

⁷⁶ SRO, D. 1237/27; Gough 144, 18 Aug 1735.

⁷⁷ BCA, Galton 84.

⁷⁸ Ironbridge Gorge Museum, Coalbrookdale MS. 1, pp. 115-323 *passim*.

Harvey the Birmingham swordcutler.⁷⁹ He renewed his lease in 1778, but died soon afterwards.⁸⁰ In the distribution of his estate, the mill was to be assigned to his sons Samuel and George, but George died before the assignment could be completed and his widow passed her share to Samuel.⁸¹ On Samuel Harvey's 1788 bankruptcy, the lease was sold to Thomas Archer, a Birmingham button-maker.⁸² He retained the mill until 1816, when he may have been succeeded by Charles Gallimore.⁸³ In 1820 the mill, still described as a blade mill, was let to Timothy and Joseph Tonks wiredrawers.⁸⁴ The lease may have been deposited with Attwoods and Spooner (a Birmingham bank) as security in 1836. An associated valuation of machinery, which may result from the same transaction, refers to a mill late of Timothy Tonks but then of Bottley and Richards.⁸⁵ The land tax assessments imply that they had the former Lower Paper Mill, but the 1836 transaction is inconsistent with the lease of that mill to William Bedson in 1834; the valuation must therefore refer to the former Upper Paper Mill.⁸⁶ The mill had become a rolling mill by the date of the tithe award, but its occupiers are not named. However, William Bagnall (metal roller), who is named in the 1841 census returns, may have been concerned in this mill, as may John Spurrier of Paper Mill End and his son Samuel, named as steel rollers in the 1851 returns, and Timothy Bradley (metal roller), named in 1861.⁸⁷ The rolling mill may have operated until about 1865.⁸⁸

THE IRONWORKS

PERRY FURNACE AND FORGE

The foregoing account has steered away from addressing Perry Barr's contribution to the production of iron, as opposed to drawing it into wire and the sharpening of the edges of swords and tools in blade mills. There is ample evidence that there was an ironworks at Perry Barr in the late 16th and early 17th centuries, consisting of a furnace and a forge. Before that time, there were a bloomsmithy and a hammer mill (or even several). All these involved waterpower to drive bellows and lift hammers, and they must have preceded some of the mills, whose histories have been outlined above, unless, that is, some mill sites have gone out of use. However, it has not hitherto been wholly clear where these ironworks were.

The furnace and forge were among the works from which William Whorwood of Sandwell and Thomas Parkes of Wednesbury and their respective workmen riotously expelled each other in the summer of 1597.⁸⁹ This was in fact the second time they had fallen out. On the first occasion, slightly over a year earlier, the suit came before the court of Star Chamber. The precise cause of the dispute is not wholly clear. Parkes was apparently threatening to exclude Whorwood from the business (in which they were partners), because Whorwood had failed to comply with some condition whose nature was not explained. They had been partners for about 18 months, but their partnership agreement was still only in draught. Being thus threatened with being deprived of his share of the partnership property, Whorwood took pre-emptive action to secure part of it. On 15 March 1596 he sent John Twittie and George Knight to the forge in Handsworth, from which they removed 'divers bars of iron', a smith's stiddy (a small anvil) and other tools. They also took up some planks from the bridge, thus preventing access to the forge by wains. A month later, on 13 April, Whorwood sent George Knight and some others back to the forge, and they pulled down the 'great iron hammer' in the lower smithy and took it, certain cast iron plates, and various hammers, tongs, chisels and other tools to a nearby workman's house. Next day they came back with a wain and oxen and carried them to Sandwell (Whorwood's house), also visiting Perry Furnace and removing further tools and implements from there. On 16 April, Whorwood sent John Twittie to take possession of Bromwich Forge. Parkes then invoked the aid of Edward Leigh of Rushall as a Justice of the Peace,

79 SRO, D. 1237/39, 29 Aug. 1744.

80 Ibid. 22 July 1778.

81 Ibid. D. 1237/32 & 40; BCA, Edwards Son & Bigwood 68.

82 BCA, 330472. Cf. BCA, Meath-Baker 169.

83 SRO, Land tax assessments, Perry Barr.

84 BCA, Edwards Son & Bigwood 70; Gough 140.

85 BCA, Edwards Son & Bigwood 69.

86 See above.

87 Census returns form 1841, 1851, and 1861. The identification of these people with this mill, however, is not certain.

88 BCA, CP/HW/Ratebook (1866) 661544, Perry Barr section. This assessed certain properties, described as 'n[ea]r rolling mill', but this has been changed to 'The Moors', suggesting the mill had recently disappeared.

89 *Staffordshire Quarter Sessions Rolls*, ffl, ed. S. A. H. Burne (Staffordshire Historical Collections, 1932), 194, 297ff. See below.

but they refused to admit him. Leigh was 'forced to stay there for two days without any lodging or entertainment at all'. On 18 April, Leigh summoned to the forge 'a certain number of Her Majesty's loyal subjects'. A kinsman of Whorwood (perhaps Edward Field) persuaded those occupying the mill to let Leigh in, which they did after locking their weapons in the iron house, whose door Leigh and those 'with him did by strength brake open'. Warned of what was happening, Whorwood arrived (allegedly) 'in great haste and furious manner'. Leigh restored the *status quo* by directing that one person should be in possession for each party. Whorwood threatened to 'be revenged against [Thomas Parkes] by law' and challenged Richard Parkes (Thomas' son) to fight him. However, by the time Whorwood was examined in the course of the proceedings, he had restored some of the goods he had taken.

These proceedings also (incidentally) throw light on several ironworks. They indicate that there was a furnace as well as a forge at Wednesbury, and that Bromwich Forge and a long leat leading to it from the bridge at Grindersford was built by Parkes in 1593 or 1594, after his partnership with Whorwood began. The forge at Handsworth and half Perry Furnace had been let by John Wyrley to Robert Tomlins, until (during the partnership) Thomas Parkes bought Tomlins' interest and then employed Tomlins. Parkes was already renting the other half of Perry Furnace from Robert Stanford, and this was included in the partnership.⁹⁰ Tomlins also had ironworks elsewhere, probably at Tilsop on the southern flank of Titterstone Clee in south Shropshire.⁹¹

In July 1597, just over a year later, the dispute flared up again. The course of events appears from a series of indictments presented at Staffordshire Quarter Sessions:⁹²

- 8 July Ralph Willies, Thomas Willies, and Edward Ashmore break into a *moiety* (that is, half) of an iron mill or furnace for making iron of Robert Stamford and Humfrey Wyrley at Perry Barr and expelled William Whorwood its farmer (i.e. tenant)
- 14 July William Whorwood of Sandwell, Robert Staunforde and others including John Taylor assemble at Handsworth and break into the iron forge of Thomas Parkes and assault Edmund Tomlyns his servant
- 14 July Most of the same people (not including Whorwood) assemble at Handsworth and take the goods of Thomas Parkes including over a ton of iron and two pairs of finery bellows and one pair of chafery bellows
- 14 July The same party (including Whorwood) assemble at Perry Barr and break into a furnace for melting iron of Thomas Parkes and assault Ralph Willies his servant
- 14 July The same party assemble at Perry Barr and break into the house of Ralph Tomlyns and assault Edward Ashmore
- 14 July Edward Ashmore assaults John Taylor at Perry Barr
- 16 July Thomas Watkins of West Bromwich and others break into the forge of Robert Stanley at West Bromwich, and expel Thomas Parkes and disseise Robert
- 18 July Francis Best and others break into a moiety of a smithy of William Cumberford at Wednesbury, and expel William Whorwood farmer, and disseise William Cumberford
- 19 July Edward Ashmore, Ralph and Thomas Willies, and another break into a *moiety* of a close and of a mill for making iron of William Whorwood at Perry Barr and disturb his use of them. (Richard and Thomas Parkes were initially named in the indictments relating to the events of 8 and 18 July, but their names were deleted, presumably because the indictment was found not to be a 'true bill' against them.)

These events have been noticed by several historians, but it has only recently been realised that Whorwood and Parkes were partners. There was evidently an angry dispute between them (or at least between their workmen), which was evidently settled by Parkes buying Whorwood's share of the works. Thomas Parkes and then his son Richard continued to operate successfully as ironmasters until the latter's death in 1617. His son (and executor) Thomas sold all his father's ironworks to Middleton, Nye & Co., who in 1622 passed many of them to Thomas Nye, from whom in turn they passed to Richard Foley, probably as a result of a partnership. In the 1640s Richard Foley was

90 PRO, STAC 5/W27/22; STAC 5/P4/13; STAC 5/P36/12. These are the source for John Izons, 'A Handsworth case in Star Chamber', *Birmingham Post*, 19 June 1952, p. 6.

91 Robert Tomlins' address was given as Tilsop in the parish of Burford: PRO, STAC 5/W27/22; cf. PRO, REQ 2/393/12.

92 As note 89.

succeeded by his son Thomas. These matters have been dealt with elsewhere,⁹³ and do not need to be dealt with here on detail, beyond noting that the Perry ironworks was in this period part of a large enterprise. However, that does not explain where the furnace and forge respectively were.

The references to forges at West Bromwich and Wednesbury are obviously to the well-known Bromwich and Wednesbury (or Wedgbury) Forges, which remained part of the enterprise until sold by Philip Foley to Humfrey Jennens in 1676.⁹⁴ The furnace from which Whorwood was expelled on 8 July belonged to both lords of Perry Barr, and must therefore have been at or adjoining one of the two lowest mills on the Hoi brook. As the second mill was a com mill in 1616, with nothing to indicate that it was newly built (rather the reverse), Perry Furnace is likely to have succeeded a bloomsmithy at the lowest mill. However, as already shown, there was a blade mill on that site by 1614. As mentioned earlier, there was a dispute in 1806 when the tenant of Holford Mill (on the river Tame) raised his weir, thus backing up water into the tail of the Lower Wire Mill. The closeness of its tail to river level must have hindered its operation when the Tame flooded. For a wire mill, that would be a mere temporary inconvenience, but for a blast furnace it would be much worse. A blast furnace operates continuously for a campaign lasting not less than several months, during which time the furnace must continuously receive blast from its bellows.⁹⁵ Instances can be found of men being employed to tread the waterwheel in dry summers to keep the blast going; the iron-master no doubt hoped that this expensive expedient would be a temporary one, pending the arrival of rain to refill the furnace pond.⁹⁶ The problem of a flood of the Tame preventing waste-water from escaping the tail would be much less easily solved, and provides an explanation for the furnace being closed and replaced by a blade mill before 1614.

There are other candidates for furnace sites, but neither fits the description of the 1597 ownership of Perry Furnace. When Holford Mill was let in 1654, the tenants were granted the 'appurtenances, which it had had when a furnace or ironwork in the holding of Thomas Foley'.⁹⁷ However, this site is on the river Tame, where it is likely to have been subject to flooding. This makes it an improbable site for a furnace. The flooding of a furnace is extremely dangerous, as any water entering the hearth of a furnace immediately turns to steam, and this causes the furnace to explode. Furthermore, Holford Mill was described as a hammer mill at various dates between 1591 and 1614,⁹⁸ and (though not strictly in Perry Barr) was evidently Perry Forge and probably remained a forge until the 1650s. Indeed, Whorwood had to amend his proceedings, having evidently mistakenly thought that it was in Perry Barr.⁹⁹ Such a site on the main river would be quite suitable for a forge, such as Perry Forge, which had two fineries, a chafery (with a total of three sets of bellows), and a hammer, and would have required at least four waterwheels. The reference to Holford Mill as a furnace has caused considerable confusion among historians, and, it is suggested here, was a contemporary mistake.¹⁰⁰ The third site with indications of the presence of a furnace is that of the Upper Paper Mill. The reference to a 'Furnice Meadow' adjoining this has already been cited.¹⁰¹ It is suggested that a furnace was built there to replace the unsatisfactory one at the lower mill. If this was so, it probably only enjoyed a relatively short life, as the practice grew up in the succeeding period of having the furnace and forge some miles apart, and of having two forges per furnace, rather than the same number of each.¹⁰² This fits with the chronology of the paper mills, at least one of which

93 P. W. King, 'The Development of the Iron Industry in south Staffordshire in the 17th century: history and myth', *TSaHS*, XXXVIII (1999), 65-8.

94 Herefs. RO, E12/VI/KG/1-22 etc.; R.G. Schafer, 'Structure and Genesis of the Foley "Ironworks in Partnership" of 1692', *Business History*, 13(1) (1971), 29.

95 For details of blast furnace operation, see H. R. Schubert, *History of the British Iron and Steel Industry from c. 450 B.C. to A.D. 1775* (1957), especially 231-15.

96 For an example of treading the waterwheel see D. Crossley and R. Savile (eds.), *The Fuller Letters: Guns, Slaves, and Finance* (Sussex Rec. Soc. 76, for 1988 and 1989), nos. 513, 516.

97 BCA, 252214.

98 BCA, 276768; 276767.

99 PRO, STAC 5/W27/22.

100 The use of the name Perry for something that was not in Perry Barr might seem anomalous, but I have come across several cases where the name used for an ironworks was not quite appropriate to its actual location. This happens where a furnace and forge share a name which is strictly appropriate only to one of them. In this case, the presence of Perry Bridge on the road between them may have encouraged the use of that name. For example, Chartley Forge was actually in Gratwich: William Yates, *Map of Staffordshire* (1773), but it belonged to the owner of Chartley Castle: Herefs. RO, E12/VI/MCc/1.

101 See note 72.

102 P. W. King, 'The Iron Trade in England and Wales 1500-1815: the Charcoal Iron Industry and its Transition to Coke' (unpublished Ph.D. thesis, Wolverhampton University, 2003), 93-7.

existed about 1648.¹⁰³ Bromwich Furnace similarly closed in the 1630s, leaving Bromwich Forge to continue in use until the early 19th century. The ironworks at Holford Mill (probably Perry Forge) also closed in this period. It was let to William Edwards and John Crooley, grinders, as a blade mill of two bays of buildings 'erected and erecting'. Edwards was still in the occupation in 1667, but the mill's history for the next century and more is unclear.¹⁰⁴

BLOOMS MITHIES

Before the furnace and forge, there was a bloomsmithy. This (along with the com mill) was left undivided in the 1550 partition. It was in the tenure of William Wirley in 1550. As a 'brannes-methe', it had been operated for him in 1543 by Henry Grove. Grove was to 'serve [Wyrley] at the smethye in the office of a brennier and well and sufficiently to work all such iron as [Wyrley] shuld have ther to be wrought made blomyd or forgyd for one hole yere', and was to be paid *Ad* for every 'branne'; but Grove allowed it to bum down one night.¹⁰⁵ This was certainly a predecessor of one of the two lower mills on the Hoi brook. Of the two, the lowest mill is perhaps the most likely, but it is not clear when it was replaced by a furnace.

The hammer mill at Holford was, however, not the only one in the area. There was a Hammer Mill Meadow in Perry Barr upstream of Hamstead Mill (and Bridge). Although not far downstream of Bromwich Forge in West Bromwich, it was probably too far from it for the reference to be to that forge. The leat to Bromwich Forge seems to have begun life by supplying a com mill (Jone Mill), further upstream. The new leat to Bromwich Forge (made in 1593 or 1594) was apparently an extension of this, and Jone Mill was closed.¹⁰⁶ Maps show a leat running across the meadows towards Hammer Mill Meadow, but the intake for this must have been upstream of where the tail-race from Bromwich Forge joined the Tame, though below Jone Mill. Bromwich Forge and that hammer mill cannot therefore have co-existed. It is conceivable that this was the bloomsmithy belonging to the two lords of Perry Barr in 1550, but it is more likely to have belonged to some one else. Unfortunately the site was covered by colliery waste and has since been landscaped as part of the Sandwell Valley Nature Reserve of the Royal Society for the Protection of Birds. The site is now covered by a lake, and it is not clear whether there may be any archaeological remains.

Another hammer mill was mentioned in complicated proceedings following the death in 1548 of William Cokes of Handsworth and these give its history. It was part of messuage and over 200 acres of land which John Botetourt of Weoley Castle had granted (as lord of Handsworth) to John Cokes in 1351. This estate allegedly descended successively to Richard, Thomas, and William Cokes until the death of the latter in 1548, though this seems to be too few generations. William built two cottages and two mills, a com mill, and an iron mill called a hammer myll. Richard Cokes had in 1454 given a messuage called Boyshall and other property to Thomas Cokes and Gillian his wife. William had granted this property to feoffees in 1495, and there was a further feoffment in 1514, granting it after his death to his son Thomas; but Thomas predeceased his father leaving a son William who was aged 4 years 22 weeks and 2 days at his grandfather's death. Thomas' widow Ellen claimed that there had been a further settlement in favour of Thomas and herself in 1532 and that she and her new husband Henry Grove should have the property in her right, but this was still in dispute in 1553.¹⁰⁷ From this information, it appears probable that the hammer mill was built at the end of the 15th or in the early 16th century. It was in Handsworth not Perry Barr, as indicated by the 1351 grant by John Botetourt as lord of Handsworth. Its location is not known, but it is unlikely to have preceded any later mills on the river Tame.¹⁰⁸ This suggests that it was on Hockley brook, perhaps being a predecessor of Pig Mill.¹⁰⁹

103 BCA, 181865.

104 BCA, Meath-Baker 144.

105 PRO, C 1/1170/101.

106 Dilworth, *Tame Mills*, 41; John Izon, 'A Handsworth case'; PRO, STAC 5/P4/13.

107 PRO, C 43/4/27 [Common law proceedings in Chancery]; cf. C 43/4/9.

108 Hamstead and Holford Mills belonged to the Wyrley family. Perry Hall Mill was in the manor of Perry Hall (see above). Stanton's Mill was in Witton in 1737: Hackwood, *Handsworth*, 23-4.

109 *VCH Warws.* VII, 258 implies that the Soho Manufactory was built on a previously unused site. However, this might be a candidate for the mill of 'Huriford' or 'Hurfford' (belonging to the lord of the manor), which is referred to in 1227/8 and 1393/4: Gough 16/3-4. The latter is after John de Botetourt's grant to Roger of Wyrley of licence to make sluices for a fulling mill at Holford: *VCH Warws.* VII, 255.

CONCLUSION

The careful use of deeds and other documents has enabled the identities and histories of about five mills in Perry Barr to be sorted out. It has also thrown light on a number of other matters, notably the probable location of several ironworks, including a late 16th century forge and a blast furnace (or even two). These were preceded by hammer mills, used in connection with an earlier ironmaking process. Nevertheless, gaps remain in what is known, both in the occupation of some of the mills in the 17th century and in the precise dates of the various 15th- and 16th-century ironworks. However, the documents that would enable these gaps to be filled do not survive.

In the 16th and 17th centuries Perry Barr was essentially a rural community, with a variety of different industrial mills. The ironworks disappeared due to rationalisation in that industry. They were followed by a fulling mill and paper mills. In the 18th century these were altered to blade mills and wire mills to serve the expanding metal manufacturing industries of Birmingham and the Black Country. In addition, there was a change in the trades using the blade mills between the 17th and 18th centuries; this reflects the decline of the Birmingham's old cutlery industry (in the face of competition from Sheffield), and the rise of armament production, so that swordcutlers dominated among occupiers in the late 18th century. Com mills were still needed to make flour to feed people; Hamstead Mill and Perry Hall Mill remained com mills throughout, and two of the Hoi brook mills were converted to com mills after the Napoleonic War. The final demise of the mills has not always been traced. Most seem to have remained in use until the mid 19th century, but they eventually went out of use due to availability of new sources of power and the need of the people of Birmingham for water.

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