ANALYSIS ON THE ROMAN PERIOD WOODWORK RECOVERED IN 2014

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Key background information relating to the Roman woodwork found at Bridge Farm, Trench 5, and aims of this specialist woodwork analysis report

The site location, limited water logging for the small sample of lifted timbers and possible reasons for further excavation of potentially valuable timbers from closely associated features

The 2014 excavation lies in low lying land close to the flood plain of the River Ouse, but waterlogged horizons preserving the ancient woodwork discussed in this report, were now only found in deep cut features c. 0.8m or more down from the modern field surface. This modern field surface has been ploughed and lies at c. + 4.6m OD, the nature of the decay of the timber elements found suggest to this writer that relatively recent drainage during agricultural improvement works may be the cause of some of the decay. However, several of the very lowest timbers found and also lifted for detailed recording and study were still fairly well preserved, though this level of survival is likely to be gradually deteriorating.

The surviving timbers include some material that is very rare nationally and are from a county with little surviving woodwork of the Roman period. Given a larger sample of preserved timbers from associated deep cut features close dating using tree-ring study may be possible. Therefore the reasons for further, closely targeted, excavation of timber bearing, deep features are strong, if resources for the work can be found at some point in the future.

Evidence of a large Roman period building supported by substantial earth-fast posts; the source of the unusual reused timbers and informative off cuts

Excavations in 2014 at Bridge Farm, by the CAP revealed evidence of a moderately large rectangular building in Trench 5. This took the form of 13 large postholes or 'post pits', some over 1m across and around 1.0m deep (Fig. 1). They were arranged in two parallel rows of 6 running c. NE –SW, spaced c. 6.4m apart, centre to centre, with one centrally placed in what appears to have been a southern, end wall. The decayed traces of post pipes up to c. 0.45m across were partially exposed in these deep features and then reburied in most cases. A post pipe 0.45m across may be a relict of a timber once approaching 0.45m or c.1 'cubit' square, a common size for larger oak structural timbers found on waterlogged Roman sites in SE England (eg. Goodburn 2008, 48-52; Stephenson 2008, 45). It is fairly clear that the recurrence of this cubit width dimension, also common in planking sawn from squared baulks, would fit well with lists of common standard dimensions for timber given in Diocletian's maximum price edict (Meiggs 1982, 366). Worked oak timbers of greater width of the Roman period found in Britain are relatively rare.

Just under 1.0m to the west of the western line of posts pits, a less regular series of 4 smaller post holes were found running parallel on a possible NE–SW line (Fig. 15). It appears possible that the large posts implied were aisle posts of a large aisled building and it might just be the case that the smaller outlying, parallel post holes were relicts of the external side walls of the F4 building. The existence of any equivalent external wall posts on the east side is uncertain as the area appears to have lain just outside the excavation trench or on its very edge. If the symmetrical narrow side aisles truly existed then they would imply a building in total of c. 8.4m wide externally. The length of the building implied from the post pit layout is c. 15.5 to 16.0m. However, in practice these tentative reconstructed dimensions do not take account of any possible overhanging timber elements such as roof eaves or jetties. The suggested dimensions only give a very general impression of the possible size of structure F4.

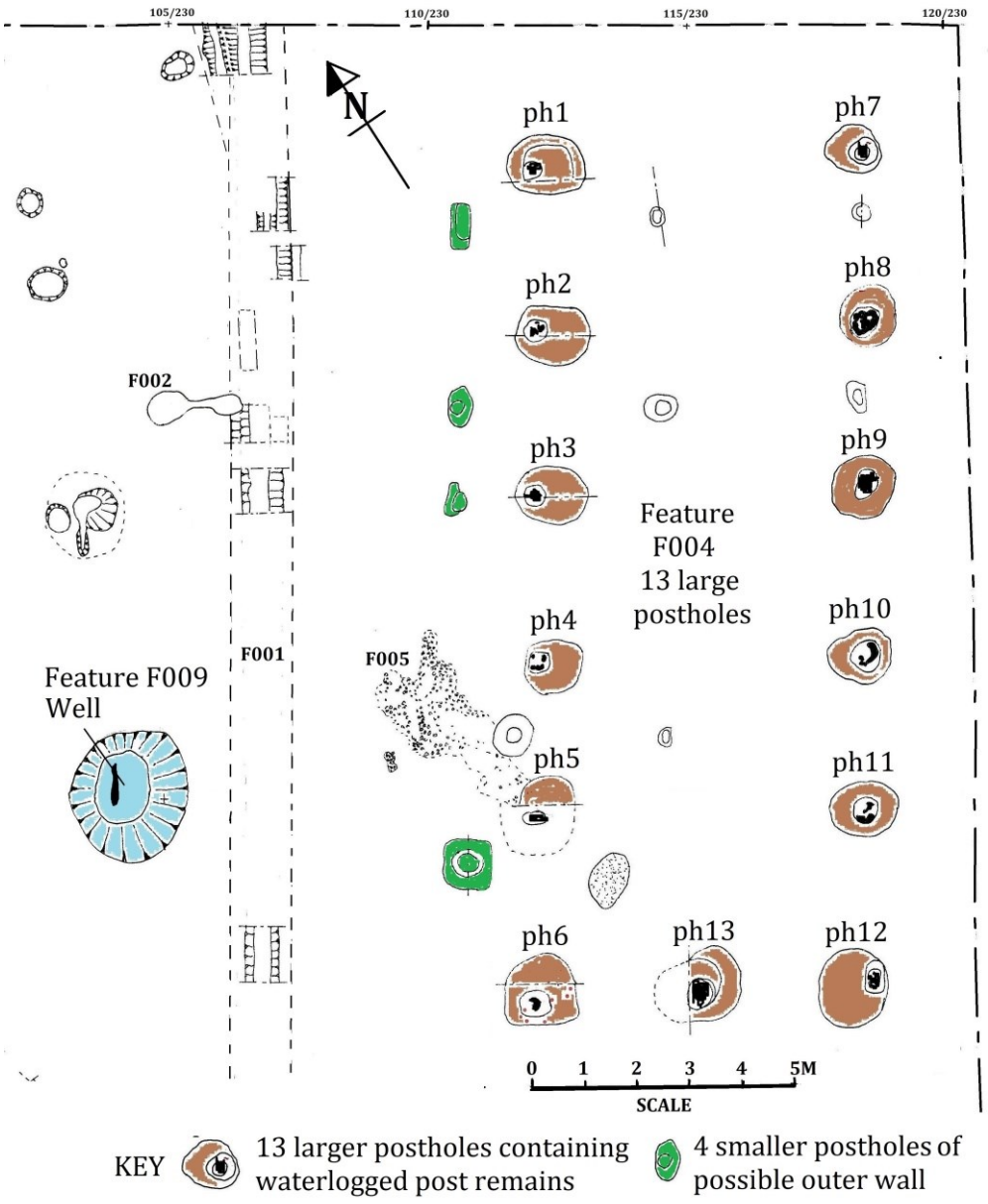

Fig. 1. Plan showing postholes and well with in situ timbers

Other contexts yielding waterlogged Roman period timber

Just to the west of the building F004, a little ancient waterlogged wood also survived in an oval well cut F009 (Fig. 15). The other cut features did not produce waterlogged woodwork, though some were not bottomed due to problems of access, localised iron panning and limited resources. Full excavation of some of the deeper features, might yield more important early woodwork but considerable targeted effort and resources would be needed to revisit these features.

The large, more intact, lifted waterlogged woodwork - the focus of this report

This report sets out to summarise and assess the woodworking aspects of the waterlogged woodwork excavated and lifted from three sample post pits Post Holes 1, 9 and 11 of Feature 4 (Fig. 15). It also covers fragments from the well, Feature 9. The larger, more diagnostic, pieces of woodwork are the focus of this report as many of the smaller fragments lifted from the post holes are very decayed and thus provide

relatively little information. Indeed, as some of the post bases clearly broke into many fragments along the natural planes of weakness, the medullary rays, a meaningful count of the lifted material is not possible.
For wider stratigraphic and other site information readers must consult the main body of this report.

Roman structural woodworking in the NW section of the empire: and the range of the comparative archaeological material,

For the public and even many archaeologists, Roman buildings and other structures are assumed to have been generally of stone and, or tile, and only rarely of timber. As structures of timber, roundwood and earthy materials do not survive well from the period on most sites, the use of timber in Roman construction is still relatively little studied or presented in regions of Britain, so any finds that shed light on these themes are disproportionately important. However, excavation in the waterlogged zones of Roman towns such as London and Carlisle and the fort site of Vindolanda, indicate how dominant construction in perishable materials actually was, particularly in the earlier part of the occupation. From both those large settlements and several smaller sites, we have quite a large sample of published Roman period structural woodwork recorded in detail systematically analysed and closely dated, with which to compare the assemblage from Bridge Farm. It is also clear that even masonry buildings had many timber elements, in roofs, floors, partitions and other features.

For London this corpus of comparative evidence includes many detailed published studies of large assemblages of structural woodwork and others at the grey literature stage or 'In Prep', covering several thousand structural timbers, not including woodwork directly involved in waterfront construction (e.g. Goodburn 1991; Brigham and Goodburn et al 1995; Goodburn and Goffin *et al* 2011). The range and volume of surviving structural woodwork from rural Roman sites is very much smaller, but some of this material also helps to set the Bridge Farm assemblage in context, both published and archived material (e.g. Biddulph and Stansbie *et al* 2012; Goodburn 2019a; 2019b; 2019c and In Prep).

In any attempt to sum up what is known in general about Roman period woodworking in Britain of relevance to this particular project from archaeological finds, it must be clearly noted that the decorative moulding of woodwork is atypical, though it is known in some smaller scale works of joinery and furniture making. Carved and planed mouldings are known in non-structural woodwork though it is rare even there, e.g. a moulded couch or bed end rail (Ridgeway, 2009, 33) and there are also well known wall painting images of moulded furniture from Herculaneum and Pompeii.

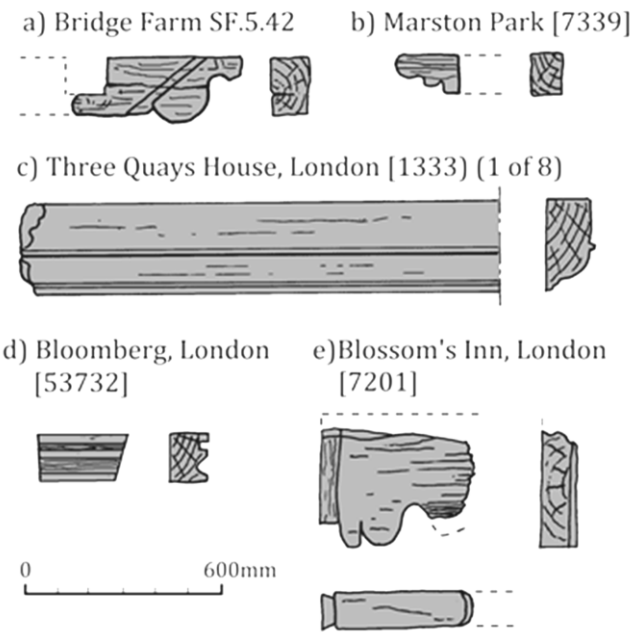

Fig. 2 Graphic outline summary of moulded Roman-period timber beam forms discovered in Britain

By contrast in structural scale woodwork, loosely 'carpentry', only three London-region sites have yielded a small sample of Roman period, moulded larger timbers, where all but one example were moulded length wise on their edges (Fig. 2). The nearest parallel to the two end-moulded structural timbers from Bridge Farm is a solitary example found by Albion Archaeology in a

Roman well at the Marston Park site in Bedfordshire (H. Duncan, pers. comm. and Goodburn, In Prep.) *Figure 2* attempts a graphic outline summary of the key features of this comparative material, which was all wrought in oak.

Practical experimentation in aspects of Roman structural woodworking has also furthered our understanding in several areas, such as the recognition of typical tool marks of the period and an appreciation of the logistics and varied nature of woodland resources, i.e. treescapes, used (Goodburn 2000). The varied nature of the treescapes reconstructed from woodwork found, from tall, dark 'wildwood' to hedgerows and various types of managed woodland and orchards has also been helped by the work of archaeobotanists and tree-ring specialists. Finally, recent work in this field is beginning to show that there are indeed marked regional variations in both treescapes and working practices across Roman Britain, even over relatively short distances. For example, we can definitely see this in the marked contrasts in the woodwork excavated from Greater London and the Cambridge area (Goodburn 2019b & c). As yet Sussex has produced very little woodwork of the Roman period, highlighting the value of even small assemblages, such as the assemblage from this project.

The general range of the woodwork found in trench 5 At Bridge Farm

The general range of woodwork found included, the decayed bases of substantial earth-fast oak posts originally up to c. 0.45m across ('a cubit') and set at least 1m into the earth. These imply that the 13 post pits found were part of a substantially built moderately tall timber building over c 6.5m wide and c.15.5-16m long (Fig. 1). The surviving timbers in PH1 and PH9 were carefully lifted and found to include the very decayed post bases with often better preserved remains of supporting post pad and post chocking timbers. These included a surprising assortment of sizes and forms of oak timber including two jointed and moulded beam ends SF.5.42 and 5.78 (Figs. 3, 4 & 6). These timbers had decorative ogival shapes cut into their ends and the remains of a deep lap joint, or less likely a tenon, truncated by their reuse at the other. The presence of the major joint would have made it easier to cross cut the timbers at that point.

Fig. 3. Photographs of the 2 timbers with ogival carved ends

Currently these timbers are without exact parallels from other sites in Roman Britain, although a small number of moulded Roman structural timbers have been recorded from other sites. It currently seems possible that these rare reused elements were originally the decorative ends of rafters in a large building

local to the site prior to the building of F4 *(see figure 5)* The two moulded timbers are likely to have come from a building relatively close by as oak timber is heavy to transport even when dry and seasoned.
Other key timbers from PH9 included the obliquely sawn end of a large, rectangular hewn (axe-shaped) oak beam SF.5.79. This item was cut from the very knotty, crown end of a medium sized oak which was clearly barely tall enough for the job and thus this large off cut sheds light on local woodmanship and timber conversion practice at the time.
PH1 yielded the moderately well preserved end of a thick plank of oak also cut obliquely, timber SF.5.65, the original purpose of which is not certain.
Although the assemblage of lifted Roman period timbers from the Bridge Farm project is, by national standards, very small it does shed important light on the form of otherwise unknown, timber architectural details, local treescapes and heavy woodworking practises. None of the timber examined was straight grained and narrow ringed with an origin in large 'wildwood-type' trees that are often evidenced in other assemblages of Roman structural woodwork from SE England. Therefore the local treescapes implied are of various forms of more open managed woodland and they probably included many oaks growing in hedges, and possibly wood pasture. This runs parallel to similar evidence from the London region where large wildwood timber is much less common from the mid second century as the landscape was more intensively managed (Goodburn 2000).

Methodology of the recording the lifted woodwork

After the planning of the partially exposed timber remaining in situ, timbers from PH 1, PH9, PH11 and well F9 were lifted for further recording and sampling in due course. Some of the detailed recording was delayed until after the washing and conservation of the lifted timbers. Before and during the conservation of the timbers a variety of photographs and sketches were made by CAP team members and the Durham Conservation team. These included 1:1 scale drawings made by C. Gonzalez-Hernandez of post pad timbers SF.5.78, SF.5.42, and decayed post base SF.5.41 from PH9 (see Appendix).
Following conservation, this writer was commissioned to examine the timbers first hand, to add any missing technological information and assess their value for possible tree ring dating in July 2019. Additional notes were appended to copies of the various records provided and one additional scale timber drawing was made of timber SF.5.79 also from PH9.
The examination showed that all the lifted timbers seen were of 'oak' (i.e. our two, closely similar native species, or their many very similar hybrids, not distinguishable as waterlogged ancient timber). Very little sapwood survived on the edges of the rot resistant heartwood and unfortunately none of the timbers were found suitable for tree ring study. This was due to the 'parent trees' being of moderate size and medium to fast grown, with less than the required 50 annual rings surviving, or greatly distorted grain from multiple knots. This situation is often the case with mid or later Roman structural woodwork as many of the accessible wildwood-type, high woodland had been converted into rather open manage woodland or even farmland with hedges and pasture trees. The more open growing conditions, with more light and nutrients for many parent trees, typically produces comparatively fast-grown, wide ringed and 'branchy' (i.e. knotty) timber, compared to the wildwood -type woodland more commonly harvested for larger structural timber in the early Roman period as indicated in the large London and Carlisle assemblages.
The sample of lifted woodwork from the Bridge Farm Trench 5 excavation has been recorded to a standard broadly in keeping with that set out in Heritage England Guidelines on waterlogged wood (Brunning, 1996).

Quantification

Any count of timbers or fragments there-of, listed here is bound to be highly approximate and very inflated for reasons outlined above. The final count of significant lifted material is c.11 items from, PHs 1, 9 and 11 of building F4 and well feature F9.

THE KEY WOODWORK FOUND AND LIFTED FOR FURTHER RECORDING DISCUSSED IN GROUPS ASSOCIATED WITHIN CUT FEATURES

A forensic approach

Where the quality of survival warrants it the timbers are discussed below in 'forensic' detail as their rarity demands. All surviving evidence is considered, but where the material was highly decayed it has been treated briefly.

Woodwork found in Post Hole 1, Building F004

A decayed post base SF.5.56

This post pit in the NE corner of building F4 included the very decayed heartwood core of an oak post in several fragments, SF.5.56, with no original surfaces and a largest fragment dimension of 158mm. This was all that survived from what would have once been a very substantial upright timber.

A section of planking SF.5.65

A fragment of thick, tangentially-faced, oak planking SF.5.65 was also found in this post pit. This item was very decayed and survives c.340mm long by 155mm wide and 55mm thick. It is clear that its original length, thickness and width would have been greater when it was placed in the post pit. Though one end was irregularly decayed the other was deliberately cut at an angle of c.70 degrees, but for what purpose is uncertain. No tool mark traces survived but it is likely that this timber was sawn out originally, as most better preserved Roman planking has been found to be (e.g. Goodburn 1995, 42-45). It is also just possible that such a timber offcut might have been used to skid the base of a long heavy post into position as it was reared in the deep post hole.

Woodwork found in Post Hole 9, Building F004

SF.5.41: a decayed post base

This large post pit on the east side of the rectangular building, contained the bulk of the most interesting sections of worked timber found and lifted. The very rot-eroded oak heartwood core of a post baseSF.5.41 was found towards the bottom of the post pit with none of its original surfaces surviving. It was clearly very much smaller than when it was originally installed, with no dimension now exceeding 175mm. Beneath the post a series of post-pad or 'levelling-up' chocks of oak timber were found of considerable interest worth describing and discussing individually here.

SF.5.42: a very rare reused post pad timber with a decorative ogival end and relict joints

Timber SF.5.42 was the reused end of a rectangular section oak beam. It had one original end carved to an ogival terminal whilst the other had been cross cut for reuse in antiquity and was very weathered. It measured 460mm long by 185mm width and 105mm thick after conservation. Opposite the carved ogival end the remains of a truncated, deep cross halving joint, or less likely a 'bare faced tenon', survived; the former being a well-known joint in Roman woodworking. The halving would have accommodated a beam running at 90 degrees to timber in its primary use. The original function of the beam end has been considered with repeated sketching of possible joining timbers for some time by this writer and others. Initially its use as a joist in some form of jetty was considered but is now thought unlikely due to its form and the oblique housing joint discussed below (Fig. 4).

Whilst too little of the timber survives for an absolutely definite reconstruction of its original function, the strongest candidate may well be that it was a decorative principal rafter end from the roof of a large high status building with walls of stone, earthy materials such as pise or mud brick (known from Roman London and elsewhere), and/or various forms of heavy timber frame. Even in relatively recent timber roofs the bottom ends of the rafters visible externally under the eaves were often scalloped to a semi- decorative form. The key indicative feature suggesting probable rafter end use is a curious c. 25mm deep diagonal slot or 'housing joint' that survives on one face (Fig. 4). A plausible interpretation of this diagonal feature is that it may have been used to locate a lintel plank for a window opening, or a high door, just under the eaves of the parent building (Fig. 5).

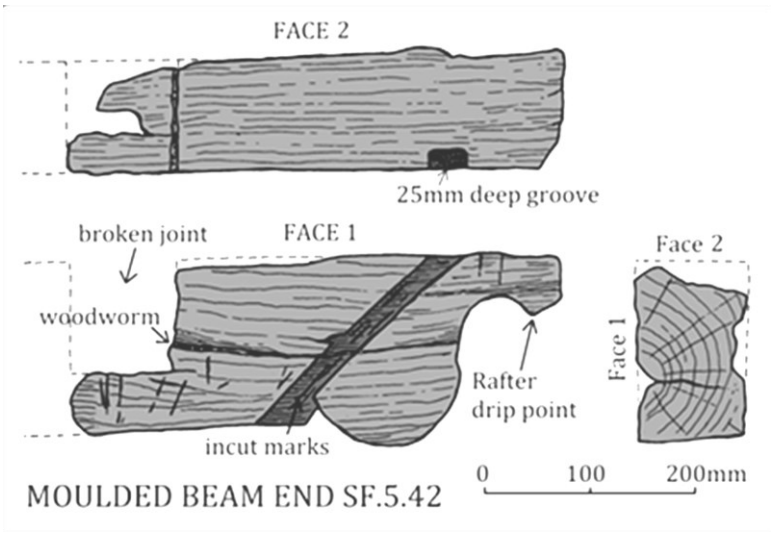

Fig. 4. Ogival moulded timber SF.5.42

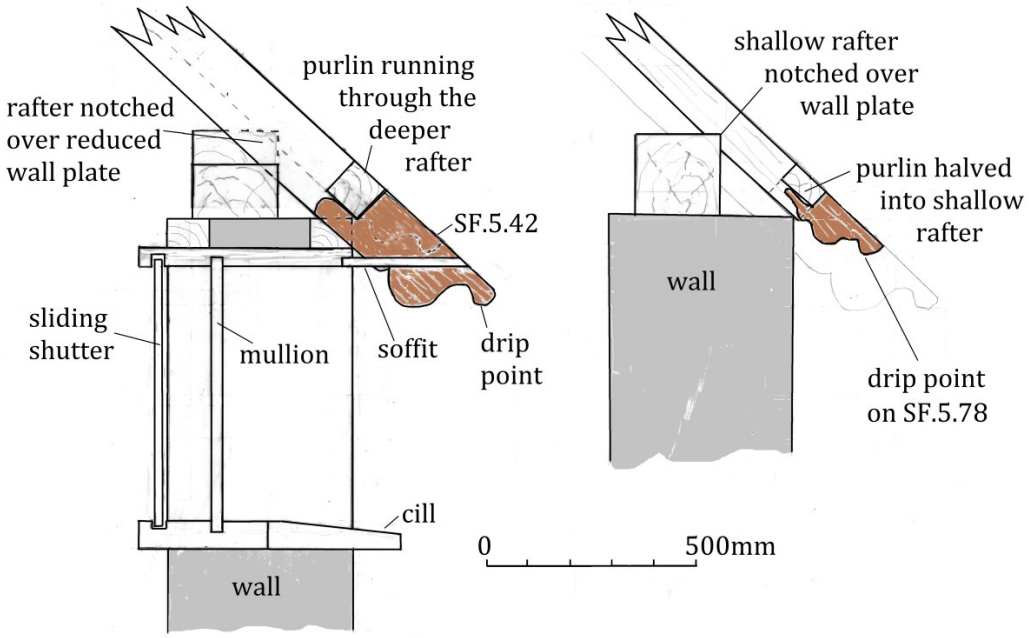

Fig. 5. Conjectural sketch of the 2 ogee moulded timbers as rafter ends

If the housing joint was the location of a horizontal window opening then the implied roof pitch for the principal rafter would have been c.40 degrees or just a little over. This roof pitch would be suited to many forms of roof covering including tegulae and imbrex tiles, stone slates, timber shingles or weather boards or various forms of thatch. However, measuring the exact angle is difficult due to the ancient weathering of the timber but just over 40 degrees seems to be the 'best fit' approximation. This pitch might be a little on the steep side for tegulae or stone slab roof coverings and perhaps a less durable organic covering is slightly more likely. Over hanging thatch would have obscured the decorative beam ends to some degree which

might tend to support the use of a thinner, more rigid covering such as, weatherboarding, shingles or tile? The form of the moulding provides a sharp 'drip point' for any rain getting on to the rafter end towards what was probably the outside end.

Clearly this interpretation is very speculative but such elaborate and laborious working of a structural beam end has to be explored and compared with other evidence for the use of decorative moulding, of carpentry scale timbers in Roman Britain. Currently the only really close parallels known to this writer are the smaller beam end, timber SF 5.78 from the same post hole and a smaller, slightly more crudely worked, ogival beam end from a Roman well fill at Marston Park Bedfordshire (Goodburn, In Prep) (Figs. 2 & 6).

Although somewhat weathered and eroded it could be seen in 2019, that this beam end was cut to a 'boxed-half' section, probably by manual sawing from a rectangular section hewn (axe-shaped) baulk. This suggests that it had been made as part of a pair of similar beams, which might also support an origin in a principal roof truss of some kind. The cross halving joint may have housed some form of longitudinal roof beam or one of several purlin-type timbers set close to the eaves.

Even the more durable heart-face bore evidence of woodworm holes. For these to have developed in oak heartwood, the timber must have been exposed to some damp and in use for some time before reuse where it was totally waterlogged at the base of PH9. This may imply that it was part of a building which had lost part of its roof and/or been neglected. It also implies that its first use was somewhat earlier than the building of the F4 building. Incut marks from a large chisel, or possibly an adze, lay inside the diagonal housing joint. Other partial incut marks were also visible on the heart-face that may have been created by cutting another timber on it. The parent oak tree this beam was cut from was of medium growth rate with no more than 40 annual rings surviving, rendering the timber unsuitable for tree ring dating where 50 annual rings are the minimum needed.

SF.5.78: a similar, rare reused post pad timber with an ogival decorative end and relict joint

Timber SF.5.78 was rather similar to timber SF.5.42, with essentially the same decorative ogival cut end, and partially surviving truncated halving joint at the other end. However, it was of smaller over all cross sectional dimensions and its length was also more truncated, measuring 250mm long by 90mm wide by 150mm thick after conservation (Fig 6). It seems likely that this timber was once also a decorative lower end of a rafter from a fairly high status building, quite possibly a 'common rafter' from either a more lightly built roof area of the same building as yielded timber SF.5.42, or a smaller building within the same complex (Fig. 5).

The beam from which the timber was shaped was weathered and slightly decayed but on one face faint manual saw marks could still be seen in 2019, post-conservation. The timber was box quartered, probably by sawing an axe-

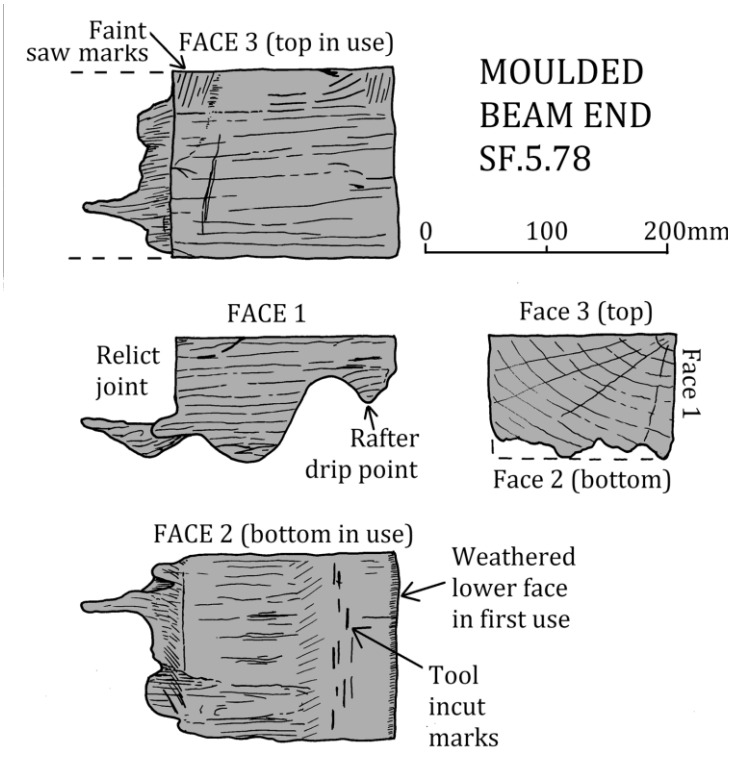

Fig. 6. Ogival moulded timber SF.5.78

squared baulk in half and then each half being divided by re-sawing to make four small beams in total. This method of timber conversion by sawing and re-sawing, common in post-medieval times, is very rare in the large London corpus of Roman structural timber, though was used to make the Marston Park example of a parallel find. It has also recently been found in the area NW of Cambridge on two recent archaeological projects. That area seems to have been very 'timber hungry' in the mid Roman period compared with the Greater London region (Goodburn 2019b & c). Very knotty, open-grown oak, often of modest size, was widely used there and much of it might have been of open farmland origin from hedgerows, riverside land and pasture. There may be some parallels here for the general nature of the oaks available in the area of the Bridge Farm site, though more evidence would be needed for clarity *(see below re off cut SF.5.79).* The parent oak used for this beam was medium sized, of moderate growth rate and again only had c.40 annual rings. Although this decorative beam end did not have the diagonal housing joint of timber SF 5.42 it is still likely to have been from the same building roof (Fig. 5).

SF.5.79: an off cut from the end of a rectangular hewn baulk that sheds light on local woodmanship, treescapes and timber supply

Another informative timber found in the stack of post pad timbers in PH 9 was timber SF.5.79, the obliquely sawn-off end of a hewn oak baulk (Fig. 7). This oak baulk end survived 380mm long by 250mm wide and 225mm thick. The obliquely cut end was cut with a cross-cut saw or serrata, whilst the other end was rapidly axe cut as at the felling site. The axe cut end bore clear marks of a 75mm wide axe blade used to cross-cut or 'buck', the felled tree at the highest possible point in the crown where four major branches met (i.e. a little above what we would consider the 'timber point' today in good quality oak in SE England). The axe marks fit a common axe blade size for the Roman period recorded on many timbers excavated in Greater London and

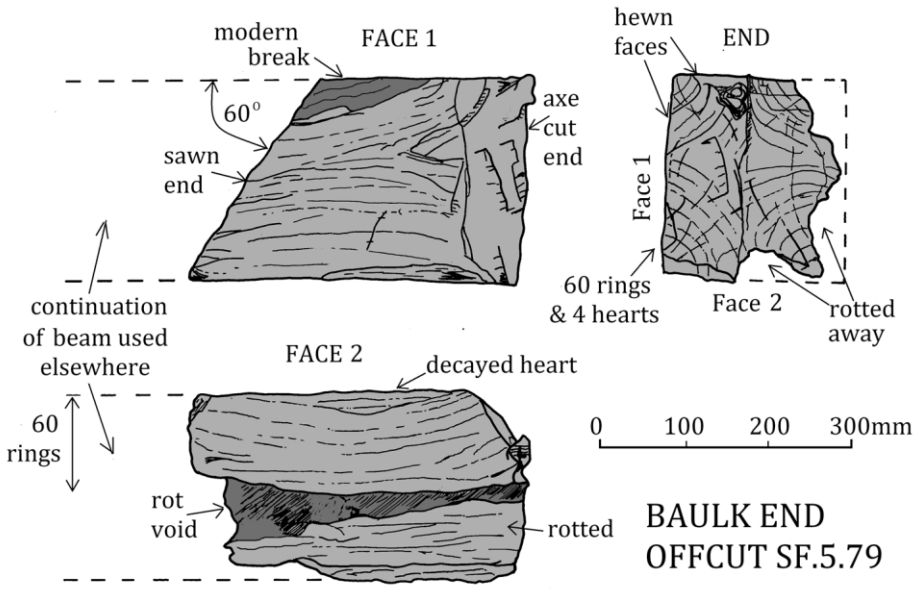

Fig. 7. Baulk end offcut SF.5.79 found in Posthole 9

elsewhere.

The evidence of four hearts (i.e. large knots) at one end means the woodworkers at the felling site were struggling to cut the longest timber possible out of the parent oak (Fig. 8), probably implying that it was a fairly open grown tree and that long timber was generally not very available locally. Similar apparent multiple hearts are quite often seen in later medieval timbers in the SE of England but are rare in the large

Roman London corpus. Although this timber had 60 annual rings the grain was so distorted that a tree ring sample would be impossible to measure, so slice sampling was not suggested.

Interestingly, the sawn end was cut to an angle of c.60 degrees which, possibly coincidentally, would be roughly the angle at which principal rafters might join in a simple roof truss of c.35 to 40 degrees slope (*see above re timber SF.5.42*). We may be getting indirect information on Roman roof construction here, in addition to information about local treescapes and woodmanship.

SF5.80 plus one other:

SF.5.80 included three decayed fragments of oak. Another item labelled to the same context (5215) was an eroded section of oak roughly 45mm square and 290mm long and roughly box quartered. This appears to have been another packing timber from this post hole.

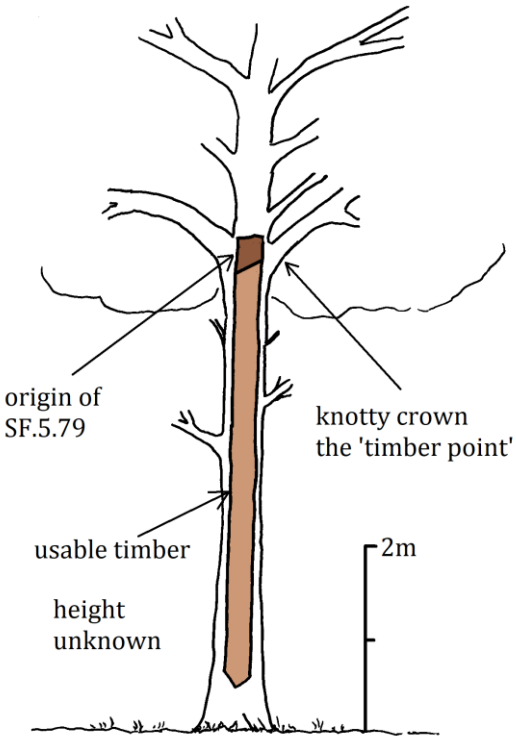

Fig. 8. Conjectural sketch of the beam SF.5.79 within an open-ground parent oak tree

Woodwork found in Post Hole 11, building F4, timber SF.5.40'

The woodwork found at the very base of this post pit was limited to amorphous fragments of oak which can tell us little except that the lowest timbers in the post pit were of oak, with a maximum dimension 200mm.

Woodwork from well feature F9, timber SF 5.36

The waterlogged basal fills of this well yielded up a very decayed amorphous piece of oak. The maximum length is now c.920mm by 200mm wide by 60mm thick. Curiously when the timber was examined one section was fast grown oak and the other very slow grown! This might indicate that it was in fact two separate pieces before being sculpted by decay?

The significance of the small but rare Roman woodwork assemblage from Bridge Farm

This small assemblage of Roman period woodwork from Bridge Farm in the Ouse Valley of East Sussex, is important as it is a rare example of the survival of Roman woodwork from Sussex. It also provides a snap shot of aspects of the local woodmanship practices, carpentry and treescapes to add to that derived from the charcoal and pollen studies.

Of wider, national importance are the decorative moulded timber beam ends, as material evidence of timber architectural features which have not survived elsewhere in Roman Britain, apart, perhaps for one small rough example from a Bedfordshire well. Various characteristics of the moulded timbers indicate a possible origin as rafter ends from a moderately high status building. Timber elements of the upper parts of Roman buildings very rarely survive, in contrast to elements of walls, floors and foundations found in situ or reused in London, Carlisle, Vindolanda and more rarely, at a few other locations.

Acknowledgements

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