Beyond the Post-hole: Notes on Stratigraphy  
and Timber Buildings from a London Perspective  
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Summary

This paper presents some new information on the nature of timber buildings in English towns during the periods c. AD50-300 and c. AD890-1250. The principal source for the generalisations presented below are recent excavations in waterlogged areas of the City of London and Southwark carried out by the Museum of London (since 1992 the Museum of London Archaeology Service or MoLAS). During these excavations much new evidence of the techniques of construction of early timber and timber-and-earth buildings were recorded in detail. Substantial work remains to be done on the post-excavation analysis of the records of these structures but a number of key facts are already apparent which are replicated in evidence from more than one site. A guiding assumption of this writer is that post-hole plans are plans of post-holes, not "buildings" as they seem to be thought of by some archaeologists. Therefore much of this summary of new information concerns the nature of buildings in three dimensions, that is, their above ground characteristics, beyond the post-hole. It is hoped that the paper may be of use to those interpreting the stratigraphy of "dry" sites as well as those dealing with "wet" site excavation.

Background

London’s historic core areas contain many waterlogged zones both along the natural watercourses, in land-fill areas and sometimes even in relatively elevated positions (Ayre et al forthcoming, Hill and Woodger forthcoming, Bateman 1994). Much has been published on the excavation of timber waterfront structures such as river walls or "revetments", river stairs, jetties and related structures (Milne and Milne 1982, Milne 1985 and Milne et al 1992). Summary publications have also appeared on the excavation of timber wells and similar structures (Wilmott 1991). It gradually became apparent to workers during the 1980s that these structures could tell us a great deal about structural woodworking techniques of the periods concerned. This pool of well-recorded, closely dated data was drawn upon to produce a hypothetical developmental scheme for early and later medieval timber building techniques as a whole (Milne et al, 1992, 131-137). By 1990 systematic work had also been carried out on the recording and interpretation of some groups of reused building timbers of Roman and Saxo-Norman date (Goodburn 1991, Brigham 1992). Following closely on the heels of this work excavation of timber, and timber-and-earth buildings, partially preserved in situ, took place on a number of London sites (Fig. 1). Important groups of reused timbers were also found, recorded in detail, and analysed (Goodburn 1993, Goodburn Museum of London unpublished Ancient Woodwork archive and assessment reports since 1988). Currently the results of some earlier excavations have been subjected to detailed re-analysis yielding substantial new information (Brigham and Goodburn et al forthcoming). All the preceding types of work have been drawn upon for this brief summary paper.

Space and time will not allow detailed descriptions of many of the groups of building timbers or the buildings in situ, but readers can obtain more information from the publications cited above and by written request from MoLAS. Some of what is discussed below also has to be seen as work in progress likely to be revised as research continues and particularly as more comparable material is published in detail.

The Roman Revolution in Structural Woodworking

First, it is essential to stress that the Romans introduced a range of new approaches to structural woodwork that revolutionized the built environment, even at the urban vernacular level. By the AD 50’s in the new town of Londinium, the new concepts of timber frame building, the dead straight line, all square and level were introduced (Goodburn CID90 unpublished Ancient Woodwork report). The radically new technologies of sawing along and across the grain appeared and an organised timber trade was established (Goodburn VAL88, VRY89, CO88, and GYE92 sites, Museum of London unpublished Ancient Woodwork archive and assessment reports).
Figure 1: Map of central London showing the line of the medieval City wall and recent sites with preserved Roman building remains, with site codes appended and symbols to indicate which yielded Roman material or clues.

Figures and site codes:
- WM68. CID90. BUC87. CO88. LHR90. VRF90. TX88. GFC92. FW84. PW88. LTED88. BRF90 and CO87.
It is important here to attempt a definition of the term "timber-framing"; timber-framing is a broad approach to structural woodwork which involves the prefabrication of solid, articulated, closely jointed and regularly planned two-dimensional frames which are then reassembled on site to form the main three-dimensional structure of a timber construction, building, bridge, jetty or whatever. Most forms of framing will stand independently of the site they occupy unlike the much more ancient forms of "earth-fast" buildings in which many of the building's key elements are set in the ground upon which it is built. It would appear that little prefabrication is carried out in earth-fast systems of building.

From recent excavations in London it is clear that earth-fast approaches to building continued, to some extent alongside the new-style, modular, Roman framed buildings (Goodburn CID90 site Museum of London unpublished Ancient Woodwork archive report). It is well known that in small rural settlements pre-Roman traditions of earth-fast round house construction continued.

A variety of approaches to timber-framing are documented in detail from recent London excavations and a reconstruction of one common system is shown in Figure 2 (see Goodburn 1991 for detailed discussion). Surprisingly, in many cases the baseplates of these timber-framed buildings were laid directly on the ground as at the COV87 site (Lees 1989 Museum of London unpublished archive report) or in some cases even just below it. Thus, the lower timbers of the walls were still exposed to the rot-inducing damp soil. Clearly these structures were not intended to last indefinitely. It is important to note here that we have often found clusters of short, cleft oak, piles under the baseplates of Roman timber and earth buildings in London. On dry sites these groups of pile holes on an interrupted linear axis are all that may remain to indicate the presence of such a timber-framed wall (Fig.3a). In other cases where piles were not used and a planked floor employed, as in the Courage Brewery building (Dillon 1989) little evidence of the ancient presence of a building might be found at all. However, it might be the case that some discontinuities in stratigraphy and finds distributions around the edges of the building and perhaps a few baseplate levelling chocks or stones could survive.

Along with timber-framing the Romans introduced the tightly cut mortise and tenon joint (where the tenon has a carefully cut shoulder), lap dovetails, complex scarf joints and the wide spread use of iron nails as building fastenings (Goodburn 1991). Whilst these joints were similar in very broad terms to those used in high medieval carpentry there are important differences. For example, Roman joints used in Britannia were only very occasionally locked with pegs in the manner of high medieval carpentry. From the excavated evidence so far published from later prehistoric sites in Britain it is clear that a rather different range of joints were used (eg. Coles and Orme 1982, Pryor 1992). The terms "mortise" and or "tenon" are often loosely used to describe prehistoric and pre-Norman Conquest joints, but they were of a very different form to those used later. Generally a whole tapered timber was passed through another by way of an axe cut hole rather than a neat mortise.

Those engaged in attempts to reconstruct ancient timber structures from dry site evidence such as post-holes, floors and beam slots would do well to examine the published data on structural woodwork. It is also important that those working in this field acquaint themselves with relevant studies of vernacular architecture and standing building research. Otherwise the often derogatory descriptions used by students of surviving architecture to characterise such archaeological reconstructions as "whimsical" will continue to be rightly applied. For example, one of the most important lessons of wet site excavations in Britain since the early 1970s is that the practice of lashing together of structural woodwork on land was not practised at any early period from which we have substantial remains in Britain. However, it is well known in some other forms of specialised woodwork such as prehistoric boatbuilding or ethnographically from Africa and the Americas. I would be very interested to hear from anyone with well documented material evidence to the contrary. This is not a trivial concern as currently the public is usually presented with a rather debased view of the woodworking abilities of our ancestors in most graphic, model or full-sized archaeological reconstructions of early buildings where the structures are held up by anachronistic joints and miles of twine!

**Important Advantages and Wider Implications of the New Timber Framing Technology**

One great advantage of the use of framing techniques is that framed buildings can be given greatly increased stability, enabling them to be supported above ground on pad stones, dwarf walls, or even masonry lower storeys. Given a sound roof and lack of fires such buildings, protected from timber-destroying damp soil, can survive for hundreds of years. A number of standing timber-framed buildings are known from...
Figure 2: A hypothetical reconstruction of a common system of Roman timber framing used in London and other parts of the NW provinces, redrawn from Goodburn 1991.

Figure 3: Diagram shows:
a) a common type of Roman timber-framed wall with a baseplate set on clusters of irregular piles, b) the base plate arrangement used in the timber framed, plank clad building from the CO88 site. Not to scale.
Figure 4: Hypothetical reconstruction drawing showing how the 10th century arcade post assembly from the VRY89 site may have looked in use. The articulated timbers found are stippled. Redrawn from Goodburn 1993.
England to have survived substantially intact for over
600 years. It is also important, when interpreting the
function and meaning of a Roman timber building, to
consider the issue of storeys. One and a half, two, two
and a half or even more storeys would have been
possible for all but the very slightest of framed
structures. This has important consequences for
reconstructing populations of settlements and the
functions of buildings on the basis of the ground floor
archaeological evidence.

Summary of New Evidence from London for the
Nature of Late Anglo-Saxon and Norman Timber-
and-Earth Buildings

Currently there is a gap in the systematically
documented wet site evidence from London from the
middle of the Roman period until the very end of the
9th century. It has been clear for many years that
Anglo-Saxon and Anglo-Scandinavian approaches to
structural woodwork were quite distinct from those of
the urbanised parts of Roman Britain. Indeed, recent
work in London and elsewhere has shown that in many
ways the work of Anglo-Saxon structural
woodworkers was rather more like that of prehistoric
woodworkers than their Romano-British forebears.
The Roman technology of sawing, timber-framing,
tight mortise and tenon joints and the preparing of
neatly squared timber was abandoned. The essentially
prehistoric techniques of controlled cleaving, working
roundwood, and cutting a variety of lap and tongue
and groove joints with axes held sway (Milne et al.
1992). The vast majority of buildings were also built
earth-fast once more. However, some new
 technological tendencies are clear. For example, the
use of face pegs or treenails was much more
 widespread than it was in prehistory, or Roman times.

Importantly, it is clear that in the period c. 890-1180
there was far less technological distance between land
structural woodwork and that of boatbuilding and
shipwrightry than there was in later medieval times.
This is indicated by such features as the use of
distinctive boat fastenings in buildings (Goodburn
1993, see below and Fig. 4). Thus the use of the Old
English term "trewright" meaning woodworker is
more appropriate than the later medieval, more
specialised term "carpenter".

It is also becoming clear that the timber and earth
buildings in London were built in a great variety of
ways (Fig. 5). There appears to have been far more
variety in wall construction and roof support methods
than have been found in Dublin or York for example.

Small and large surface laid buildings are known,
some with ailed structures, in others the walls were
the load bearing features. Slightly and deeply sunken
buildings are also known (Horsman, Milne and Milne
1985). There is also some tentative evidence for the
use of a form of "laft" or blockwork construction
involving the use of thick cleft oak planks. This form
of construction and stave building using baseplates
(Brigham 1992) may have been reserved for more
costly structures, because of the prodigious amounts of
timber used. Both systems share with timber-framing
the ability to be supported above ground level, and
may therefore leave comparatively little trace. Lines of
cross-wise baseplate levelling chocks of timber or
stone rubble are sometimes all that remains in situ on
the demolition of such a building. Some buildings
were also given raised timber floors, set on "D" section beams laid on the ground, in this case evidence
of external walls and internal supporting timbers may
survive without "floors" or hearths (Goodburn 1993,
and Figs. 4 & 5).

In some ways earth-fast systems of construction can be
more flexible than timber-framing systems in that it is
comparatively easy for different walls of the same
structure to be built or re-built rather differently.
Combinations of post and wattle, stave, and/or
"bulwark" (see below) walls have been found in the
same building, functioning with the same clearly
demarcated brick earth floors.

As for the Roman period we are able to deal with
vestigial evidence from dry sites, the in situ survival of
features such as lower walls, buttresses, internal post
bases and timber post pads on wet sites, and a large
number of reused timbers. Figure 5 attempts a
provisional, graphic summary of the types of wall
construction in timber, roundwood and earth buildings
c. 890-1200 for which we have evidence from London
excavations since 1988. The presentation of the phased
and dated building plan evidence from all of the
recently excavated sites is either still underway or
stalled by a lack of funding. It is hoped that the
information will be published in detail in due course.
The dating of sequences is being carried out with the
help of systematic tree-ring dating and woodwork
recording (see Watson and Tyers this volume).

A key problem in understanding early medieval town
buildings in London is the apparently commonplace
phenomenon of long-lived property boundaries. Larger
deepen later medieval foundations along early property
boundaries very often completely destroy the external
walls of the early medieval buildings leaving the
partition walls, floor and occupation deposits only.
Figure 5: Diagrammatic glossary of wall and roof support systems known from in situ or reused building timbers excavated since 1988 in London: a) earth-fast stave, b) stave in grooved baseplate, c) earth-fast stave and muntin, d) mock stave and muntin, e) aisled round post with stave external wall, f) aisled with wattle lined turf external walls, g) plank on edge baseplate for wattle walls, h) earth-fast post and clapboard, i) sunken; post and plank revetted, j) bulwark wall construction, k) post and wattle walls, often buttressed, l) "laftwork" or blockhouse. Note that many of the above wall forms may be supplemented by earth and or turf external walls, and none are "timber-framed".
Figure 6: a) 10th century building clapboard of radially cleft oak found reused on the UPT90 site, with the remains of willow or poplar treenails used to fasten it to wall posts. The triangular axe cut opening is a small peep-hole window. b) A new hypothetical reconstruction sketch to show how the board may have originally been used, in the gable end of a building.

Figure 7: A late-Saxon, radially cleft, axe cut roof shingle of oak from the UPT90 site. It was clearly fastened with a wooden peg or treenail rather than an iron nail, and was heavily charred on its external exposed surface, implying an origin in a building destroyed by fire spreading from a neighbouring property.
Some Fragments of the Built Environment of London c.890-1200

What can be presented very briefly here are just a few concrete examples of timber elements from the upper works of buildings of the period. That is, from the three-dimensional space actually built and lived in by early medieval townsfolk, well above the normal focus of archaeological attention - post-hole level. One important group of reused building timbers has been published in detail elsewhere but is so useful for illustrating the unexpected nature of the work of London treewrights that it is touched upon here (Goodburn 1993). Figure 4 shows the articulated timbers of what appears to be some form of arcade post assembly from a substantial aisled building of late 10th century date. The post was sculpted from the three-dimensional shape of an oak and had non-structural planking fastened to it with distinctive Anglo-Saxon style boat nails. The form of the arch employed between the arcade posts was quite unexpected and may have been inspired by contact with the Islamic world.

Of about the same period we have evidence of the earliest vernacular English window in a building clapboard, probably from a gable end, reused in a revetment (Fig.6). The triangular form of the small peephole window is easily cut with an axe through such a board and is known in staves from Hedehy (Elsner Undated), and in stone Anglo-Saxon churches. The quantity of clapboard found on some sites suggests that it may have been a common form of wall (and perhaps roof) covering for buildings with earth fast posts. However, radially clef oak shingles are also known (Fig.7). The rather oval shape being a function of being cross-cut with axes rather than saws such as are used in recent shingling.

Finally, evidence of what must have once been a relatively common form of timber wall construction has now been documented from a number of different types of in situ structure. The system of construction relies on the slotting of cleft boards, set on edge, into grooves in earth-fast posts to form the building wall (Fig.5). The system has been documented in early medieval contexts elsewhere in N. Europe particularly in Denmark where it is sometimes known as “bulværk” (or "bulhus") and has survived in a modified form until relatively recent times (Jorgensen et al 1986, Benzon 1984, and Elsner Undated). So far the London bulvark structures span the mid 11th to late 12th centuries. Unfortunately space does not allow the presentation of woodwork from post and wattle, stave or raftwork structures.

The Re-adoption of Roman Technology

As an end note it must be recorded that the earliest well dated post-Roman evidence we have of the use of timber-framing proper is in the 1180s. Within not much more than a generation modified forms of the old Roman technology, such as sawing, mortise and tenon joints and timber-framing were in wide spread use (Milne et al 1992:131-137).

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Bibliography

Ayre, J., et al forthcoming MoLAS Site Assessment Report for the Bull Wharf project

Bateman, N., 1994 'The London Amphitheatre', Current Archaeology 12,59-70

Benzon, G., 1984 Gammelt Dansk Bindings Vierk (Kobenhavn)


Brigham, T., and Goodburn, D., et al forthcoming

Coles, J., and Orme, B., 1982 Prehistory of the Somerset Levels (Exeter)

Dillon, J., 1989 'A Roman timber building from Southwark', Britannia 20,229-31
Elsner, H., Undated

Wiking Museum
Haithabu: Schaufenster einer fruhen stadt (Neumunster)

Goodburn, D., 1991

'A Roman timber-framed building tradition',
Archaeological Journal
148, 182-204

Goodburn, D., 1993

'Fragments of a 10th century timber arcade from Vintner's Place on the London Waterfront', Medieval Archaeology 37,78-92

Goodburn, D.,


Hill, J., and Woodger, A., forthcoming

MOLAS Site Assessment Report for the Cheapside Site (CID90)

Horsman, V., Milne, C., and Milne, G., 1988


Jorgensen, G., et al 1986

The archaeology of Svendborg (Odense University press)

Milne, C., and Milne, G., 1982

Medieval Waterfront Development at Trig Lane, London, London and Middlesex Archaeology Society Special Paper 5

Milne, G., 1985

The Port of Roman London (Batsford, London)

Pryor,F., 1992

Flag Fen Bronze Age Excavations (guide, Peterborough)

Wilmott,T., 1991

Excavations in the Middle Waltham Valley, London and Middlesex Archaeological Society Special Paper 13

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