A SELECTIVE ANALYSIS OF KEY EVIDENCE FOR ROMAN TIMBER BUILDING CONSTRUCTION AND WOODWORKING FOUND ON THE SITE OF THE DLR SHAFT IN BUCKLERSBURY CITY OF LONDON. (DUA. Site BUC87)

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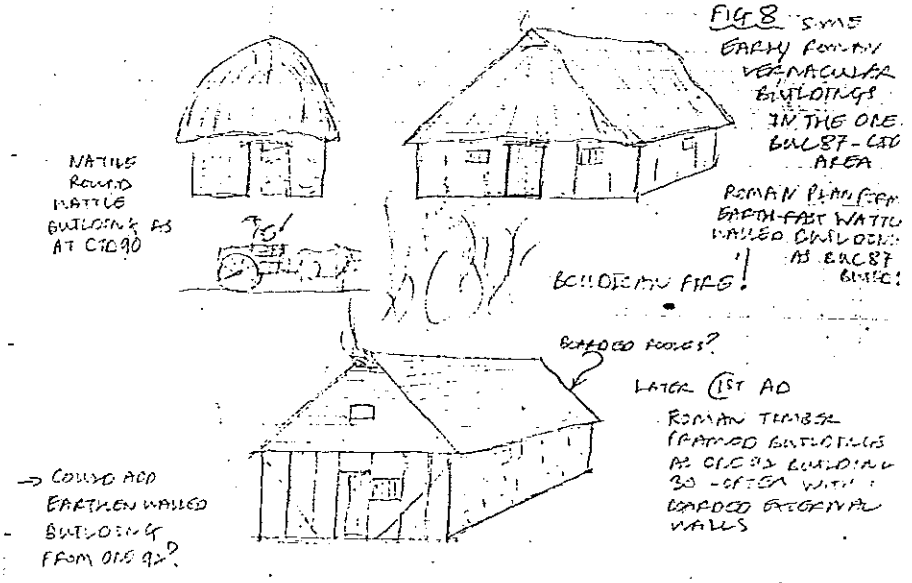
[N/B Most sections of this text and the draft figures are also intended to serve as a draft contribution to the publication on the Roman phases of the adjacent No.1 Poultry excavations (MoLAS site ONE94), to which many references are made. See both, analysis reports on that project (by J. Hill et al. MOLAS) and the archive report on the DUA BUC 87 site (J. Hill Un Pub. 1989). Reference should be made to the author of this report before finalising publication texts and figures.]



*? Poss central fig of buildings in vernacular building of early Roman London in vicinity. Of Not Poultry (+ BUC87 - C1090). Not too simple.

A SELECTIVE ANALYSIS OF THE EVIDENCE FOR ROMAN TIMBER BUILDING CONSTRUCTION AND WOODWORKING FOUND ON THE SITE OF THE DLR SHAFT IN BUCKLERSBURY , CITY OF LONDON. (DUA site BUC 87)

BACKGROUND

During post excavation work on the MOLAS No. 1 Poultry project it became clear that some further study of the detailed records held of Roman structures found on adjacent excavations would be highly productive and set the Poultry evidence in a clearer context. A particularly important set of largely unpublished records cover the rescue excavations at the Docklands Light Railway shaft site in Bucklersbury , City of London (See DUA BUC 87 Archive Report , J. Hill 1989). This site just to the south of the No. 1 Poultry excavations, lay on the west bank of the main Walbrook channel south of the Roman main road the Via Decumana. Excavations close by carried out in the 1950's by Grimes, found the remains of Roman timber structures thought to be wattle fences of some type. Thus it was clear structural and portable woodwork was likely to be found during excavations in 1987-8 at the BUC87 site. This site was particularly difficult to excavate and record due to the circular limits and depth of the shaft , but many useful in situ and off-site records were made of the Roman woodwork found. This brief analysis concentrates on the best preserved and arguably most important evidence relating to only four of the many Roman structures found. These comprise parts of three buildings and a timber boardwalk to the south of the Via Decumana. The overall pattern of evidence for timber building and woodworking from earlier Roman London particularly west of the Walbrook is also briefly discussed to set the Bucklersbury and Poultry evidence in context and highlight its quality. The details of the stratigraphic summary of the sequence revealed at BUC 87 and the precise place of these structures in that sequence will not be discussed here , readers are referred to the revised summary by J. Hill in preparation (May 2001). Readers would also find it useful to refer to the Selective Summary of the Roman Period Woodwork Found at No. 1 Poultry (Goodburn Un Pub. 2000, * In the final editing some sections of this report might be combined with sections of the a fore mentioned report particularly the discussion of the development of the study of Roman timber buildings and structural woodwork in London and elsewhere *).

THE NATURE OF THE ARCHIVE STUDIED FOR THIS SELECTIVE ANALYSIS

The field records of the woodwork dealt with here from the BUC87 site were compiled just before the appointment of this author as the then Dept. of Urban Archaeology Ancient Woodwork Specialist and also the detailed up grading of the Museums' approach to recording in this specialised field (Museum of London Archaeological site manual 2nd edition). Thus, despite the relatively thorough nature of the records made for the time there are some areas, such as the recording of toolmark evidence or the type and method of timber conversion used, where there are gaps. However, other sources of information listed below, were combined effectively filling in many of the gaps in the data.

Despite some difficulties of access due to substantial building works at the Museum of London Stores at Eagle Wharf and the unavoidable dislocation of elements of the archive it has been possible to collect together the key records relatively quickly (thanks are due to C. Maloney et al.). The principal records used for this study comprise;

1) many timber drawings at a scale of 1:10 (mainly made by T. Mackinder alongside the excavation as it progressed.).

2) fairly detailed descriptions of the individual timbers provided in the extensive BUC 87 Archive Report, these contain all the key data such as dimensions, jointing presence of fastenings etc.

3) the Tree-ring study by N. Nayling is of a particularly high standard, with the important inclusion of detailed sketch cross sections showing the 'type of conversion' of (section of the log used) each sample examined (Nayling Un Pub. 1990). As a great many of the timbers were sampled this record has served to fill this gap in the drawn record, and on occasion this is of

considerable importance in understanding the nature of the building system used (See below building 1 discussion).

4) other sources of information, include the first hand experience of handling a small number of the lifted timbers from BUC87 and recording tool mark evidence on some of them which were cleaned and sections cut for the MoL Woodwork Reference Collection in 1989. A small number of photographs have also been examined.

The evidence contained in all the above sources has been combined and compared with the pattern of evidence obtained for the Roman period structural woodwork found on other recently excavated London sites where the woodwork has been recorded in considerable detail (eg. Goodburn 1991a, and Brigham and Goodburn et al. 1995). This comparative corpus of detailed and reliable evidence is very large relating to over 3,000 individually recorded items of structural woodwork. For example the near by No1. Poultry site archive includes records of approximately 1,200 items of Roman structural woodwork (Goodburn Un Pub. 2000). Most of the comparative evidence is closely dated with the help of dendrochronology. Carbonised and otherwise particularly well preserved evidence from small number of London 's 'dry' sites is also of relevance when setting the BUC87 material in context eg. that for early Roman building in timber and earthy materials recorded at Newgate St, and Watling Court, and Leadenhall (Perring and Roskams et al 1991, Milne and Wardle 1993). Familiarity with this corpus allows us to reinterpret some of the evidence in a way that would have been quite impossible when the initial post excavation work was carried out over 12 years ago.

THE DEVELOPMENT OF THE STUDY OF ROMAN PERIOD TIMBER OR PARTLY TIMBER BUILDINGS OF LONDON IN RELATION TO THE BUCKLERSBURY STRUCTURES

This discussion is in addition to notes, provided in the discussion of Building 30 ONE94 on the historical development of the study Roman timber (and earthen) building in London (Goodburn Un Pub. 2000:8- perhaps sections of text could be combined in the publication?). The approach to the earlier studies is different in this case because we are obliged to consider separate themes to those most relevant to Building 30 ONE94. Here we must consider , different building styles and specifically very early evidence from the AD 50's. The importance of the waterlogging that preserved the timber and roundwood of the wall bases at Bucklersbury and Poultry can not be over estimated. As Perring and Roskhams pointed out in their study of the evidence for timber and earth buildings west of Walbrook;

' In no case had the timber survived well enough to permit a study of the carpentry involved'

(Perring and Roskhams et al . 1991:67).

The first of the buildings discussed (BUC87 B1) is part of a group of small structures which are clearly pre-Boudican fire in date probably being built in the mid AD 50s' (See J. Hill in prep.). Such an early dating invites an investigation of to what extent its construction is 'Roman' and to what extent it is 'native' in style. It is suggested here that Building 1 BUC87 exhibits features of both approaches to building which may reflect both the traditions and origins of the builders as well as the structures status in economic and social terms. It is now clear that native-style round wooden buildings with thin lightly made wattle and daub walls were features of very early settlement in the Poultry area along side more complicated and generally much larger rectangular plan buildings of more 'Roman' appearance (Perring and Roskhams et al. 1991:80, and Hill and Woodger 1999:10). In the AD 50's both approaches to building in the new town were practised side by side but only a few years later both the native round plan form and many of the pre-Roman approaches to woodworking were dropped and the built environment was entirely Romanized.

PART OF A WATERLOGGED 'NATIVE –STYLE' ROUND HUT FROM JUST TO THE NW OF THE BUC 87 AND 0NE 94 SITES (MOLAS site code CID 90)

Part of the waterlogged base of a c. 5m diameter roundhouse was excavated just to the west of the Poultry site in 1991 at MOLAS site CID 90 (Hill and Woodger 1999). Although it was not recorded or sampled in great detail due to conditions on site, the basic wall construction style was recorded.

The wall was made of wattle rods, used whole, woven horizontally round light roundwood stakes and smeared with a brick earth based daub. The weave appears to have been of a 'waleing type' where the rods are worked in groups of three or more and woven round each other as they are woven in and out around the uprights (for illustration see photo, as used in CID90 monograph p10). The total wall thickness can only have been c. 100mm, and no trace of any larger uprights were found, neither were they found in two 'dry' round houses at Newgate Street (Buildings D and E in Perring and Roskhams 1991:74).

Speculations on the overall form of native round buildings in Early Roman London

Space does not permit a full discussion of the current evidence for native, late prehistoric, round house construction in SE England, but it is reasonable to suggest that the approach to wall construction was generally one of heavy duty basketry. Perhaps this was similar to the ancient Irish traditions of basket making where 'creels' and larger basket framed boats 'curraghs' are built upside down set in the earth resembling 'bender' type dwellings in minature. This basic tradition of building construction continued in modified form until at least the early 17th century when panoramas were made during military campaigns showing rounded, wattle-walled structures with rather domed thatched roofs (O'Sullivan 1998:173). This continuing Celtic tradition of building without an angular junction of the walls with the roof is taken here as a possible form for reconstructing the small wattle round houses found in early Roman London. The conical roofed form so popular with reconstructors of Iron Age buildings is rejected because it seems to have been born of observations made during colonial activities by 19th century English archaeologists in Africa. For example, traditional Kikuyu conical roofed round houses were seen as almost exact models of what British late Iron Age round houses would have looked like (see discussion in 'Shelter' 1973, where a drawing of a roundhouse is East African on one side and identical on the other but labelled " ...suggested form of Glastonbury lake village hut" I am attempting to track down original reference,). This distant African derived form is dropped here in favour of one related to the much closer historic Celtic Irish tradition of construction generally ignored by English archaeologists until very recently. For comparative purposes figure 8 provides a tentative alternative view of what the earliest timber and earth building forms of early Roman London might have looked like in general terms, which fits the limited archaeological evidence and with the continuing traditions of vernacular building in the British Isles region.

The longevity of light wattle walled buildings

A key problem with this general approach to building in roundwood is the decay prone nature of the material, and likely short life of the building. The tree-ring dated stratigraphy suggests that the round house at CID90 was only in use for a maximum of 5 years. For brevity here it seems reasonable to consider that this light, quick and cheap style of wall construction was typical of native building in roundwood and earth in the London region and parts of the new Roman town itself, at least for modest buildings. In the turbulent times of the first few years of Roman London longevity was not a key issue.

Wattle and daub walls ; possible markers of change to more solid, explicitly Roman styles of construction, and issues of permanence

This important issue for students of the built environment was first examined by Perring and Roskhams et al. for London and although the quality of their evidence was limited to that of several 'dry' sites insightful suggestions were made. It is clear that wattle and daub walls were despised by many Romans such as Vitruvius, as short lived and prone to fire (discussion in Perring and Roskhams et al. 1991:81). However, the very cheapness and speed of construction possible may have suited the ' frontier' town like environment of early Roman London. Perring and Roskhams also noted evidence of the slightly later adoption of a more elaborate form of wattle and daub wall in which 'ground beams' (sills, 'baseplates') probably associated with 'box framing' were used (Perring and Roskhams et al. 1991:81). Since that study we have found sets of waterlogged reused timbers and at Poultry some in situ wall bases, dating to the later 1st century where such sill beams were widely used. More importantly we have been able to show that the use of sill beams with studs and posts with wattle infill and or boarded coverings was part of a broad repertoire of woodworking techniques that involved considerable prefabrication, truly a form of 'timber framing'. Here the term

'timber framing', which is often used inaccurately by archaeologists to refer to any building with a timber based structure, is used to describe a system of building where a timber structure is conceived of as a set of two dimensional frames largely or wholly prefabricated to join accurately forming a three dimensional structure (Goodburn 1991a, and Brigham and Goodburn 1995:47). There are many other ways of building in timber or roundwood , such as log building , or earth–fast post-stake with wattle and daub as at CID90 building 1, which involve no prefabrication at all. The production of modular rectangular buildings with relatively elaborate stable, braced timber frames seems to fit with our generalised conception of things Roman, dominated by careful planning, straight lines, regularity and relative solidity. However the evidence from some very early Roman sites in London such as BUC 87, shows that in early Roman London the picture was far complex. The predominant timber and earth architecture would have been a dynamic mixture of styles (see Poultry area reconstruction figure as on p. 19 Heart of the City but add a few round houses and some more rustic rectangular buildings with lower walls and probably thatched roofs as suggested for Building 1 BUC87 below? And Fig. 8 here)

CONSTRUCTIONAL AND WOODWORKING FEATURES OF BUILDING 1 BUC 87 (SGs. 1.2, 1.3 etc.) ARGUABLY AN AMALGAM OF ROMAN AND NATIVE STYLES OF WORK

The general layout and form of the structure

Figure 1, has been compiled by cross checking and amalgamating the various sources of evidence noted above and represents an amended version of earlier plans including some wall posts probably excavated slightly out of phase in the difficult conditions (originally these uprights were ascribed to SG. 1:08). The uprights concerned perfectly fill the implied gaps in the walls of room A, and included some stakes set in the middle of the floor of room A of rather uncertain function. The type of conversion of the small wall posts is shown where it can be reconstructed. The overall impression is of a slightly built building constructed with somewhat 'rustic' posts but having a typically modular, straight walled rectangle based Roman plan form. The building appears to face gable on to the street and have at least four, probably more, rooms. Room A is the best preserved about 3.02 by 2.64m and quite rectangular. The SE wall of this room appears to be external and the NW wall internal. Two lightly built partially preserved thresholds can be seen (Fig.1).

The walls were skilfully excavated and recorded and their fragile intricate details can be largely reconstructed. The irregular small uprights had horizontal lath-like battens set between them , which were originally wedged into recesses in the sides of the uprights. Small whole rods were then woven vertically around the battens. These rods were identified as hazel where they were sampled (Sp. Ids. cited in the BUC87 archive report but I have not found the original Sp. Id. report). This general approach to infill with vertical weaving, is well known from many forms of Roman timber framed building, where the studs or posts are hewn to regular rectangular sections (eg. In the Cannon St Station reused timbers (Goodburn 1991a) or the in situ wall bases of Building 30 ONE94 and many reused timbers from the same site (Goodburn 2000 Un Pub).

The wattlework and studs in BUC Building 1 were then covered in a brick earth based daub, producing an overall wall thickness of about 150mm, where best preserved, in the external wall; and some of the internal walls. In places the wattle work stood as much as 170mm high above the original ground surface. Readers unfamiliar with buried brick earth daub should note that it is a remarkably plastic material when wet and under over burden pressure such that walls made of it can distort greatly. A peculiarity of the internal W wall of Room A was that it only appears to have had one line of vertical wattle rods and a total thickness of only 100mm. It may be that this very thin internal wall was made with the vertical rods lashed to cross battens rather than woven round them . Such an infill system using various organic ties can be seen in some medieval and post-medieval Essex and Suffolk buildings today, but it has not been clearly recorded on other Roman sites known to this author. Other variations in the weaving of wattlework in Roman buildings from London are also known such as the use of vertically woven laths with lath cross pieces as recently found in collapsed panels at MOLAS 8-10 Throgmorton Av. Site (MOLAS 2000: 54).

It has been suggested that the wattle infill panels might have been prefabricated and then slid down into place with the cross battens engaging in the pre-cut sloping recesses used in typical Roman wall

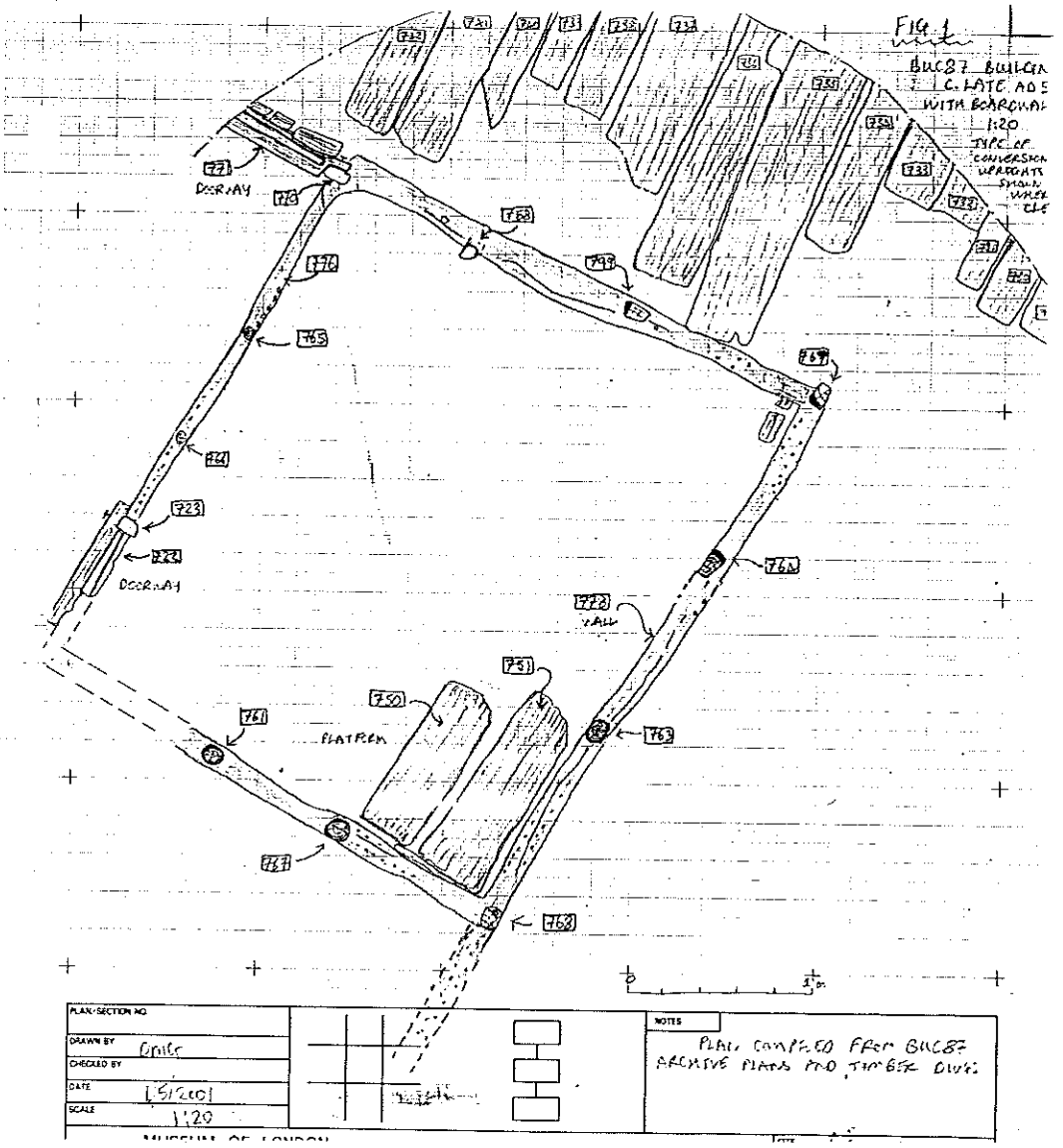


FIG 1
BUC87 BUILDIN
C. LATE AD
WITH BOARDWA
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PLAN COMPILED FROM BUC87
ARCHIVE PLANS AND TIMBER DWGS

uprights (Perring and Roskhams et al. 1991:76). However, it seems to this author that that would have been most impractical. Practical experience of the building of a short replica section of Roman timber framed wall with this infill system (on display in the MoL Roman Gallery, photo available) and the irregularity of the spacing of the recesses suggests to this author that the panels were woven in situ. The problem with this approach l is that horizontal beams such as the wall plate or any rails would have got in the way to some extent. The use of small green rods c. 10 to 20mm diameter (as recorded in detail for building B12 at No.1 Poultry) would have made such in situ weaving possible. In the case of Building 1 BUC87 the size of the panels would also have varied in any case making prefabrication even less likely.

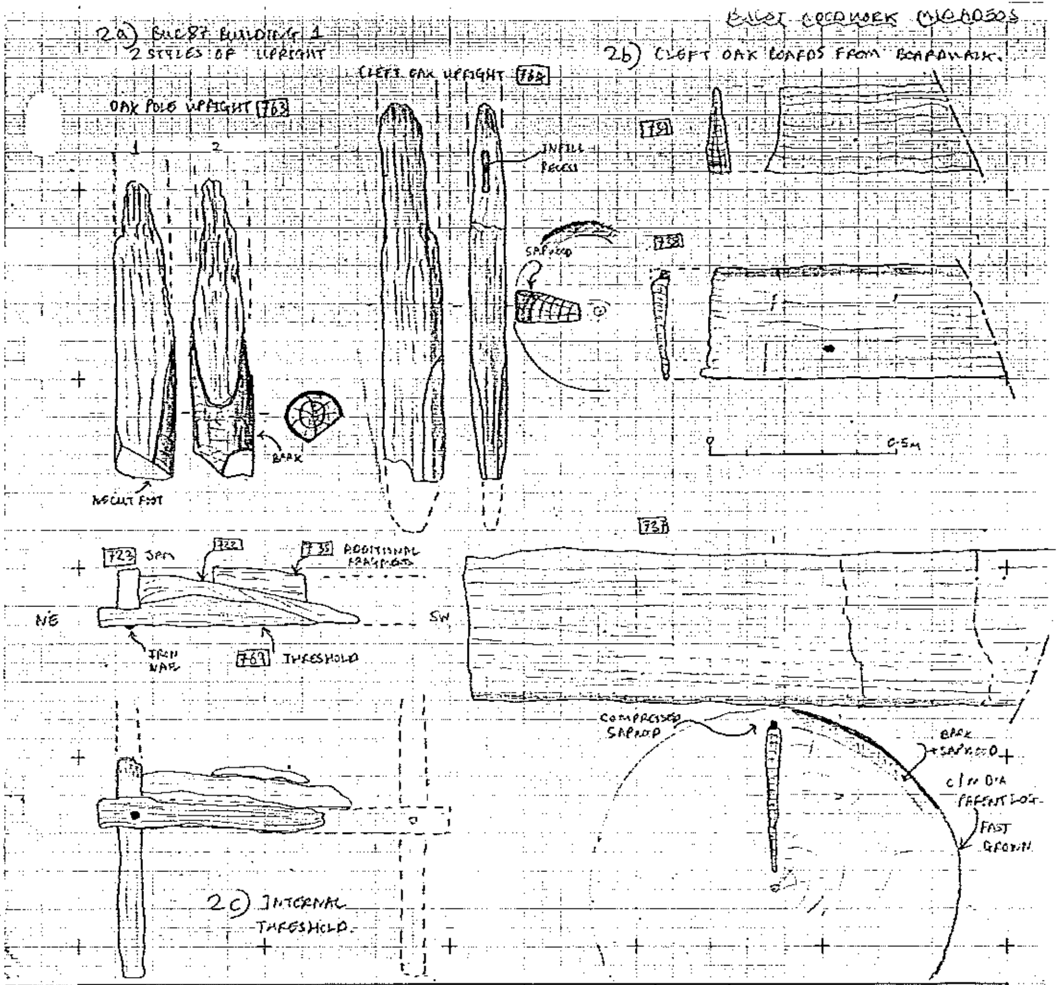
Units of measurement used in the lay out of the building

It is established practice to look for regular units of measurement in Roman timber buildings (eg. Brigham and Goodburn et al 1995: 24). However, a prerequisite of this approach is that the timbers are fairly regular in cross section and long axis, this was not really the case with the uprights of BUC87 Building 1. The builders clearly had the intention of a fairly even spacing of the uprights which must have been set out following guide lines to form a moderately neat structures in plan based on rectangular modules. The building also had fairly straight walls when excavated despite some distortion and subsidence. In the initial post excavation work J. Hill found that a unit of approximately 1.11m might have been used to space the centres of the uprights in the apparently external SE wall (Hill Un Pub. 1989:13). As the uprights appear to have been daubed over this regularity must reflect none aesthetic requirements such as the need for a regular jointing of the timbers to some form of wall plate.

The uprights: posts or stakes ?

The conditions of the excavation and the fragile nature of the lower ends of some of the wall up-rights, prevented their full excavation in some cases. It was very difficult to be certain wether some of the uprights were driven ie. stakes, or wether they were posts set in cuts. Even the bases of uprights that were clearly small earth fast posts were axe cross cut resulting in a blunt wedge point (eg. [768] and [763], Fig. 2a.). It appears that most of the uprights were indeed posts although some such as [764] were stakes with clearly elongated hewn points and designed to be driven (Fig. 2a). This irregularity of treatment is curious to modern eyes and does not fit with notions of Roman systematic building. The posts and stakes were also quite irregular in form although the Sp. identification work done shows that most, or more likely all, were of oak, some were radially cleft and hewn such as [767], [764] and [768] whilst others were used in the round with only very minimal flattening of the sides and with much bark left on eg. [761], [762] and [763]. In the case of upright [761] which was tree-ring sampled we can see that it was cut from a fast grown pole with 30 rings to the bark. Although the variations in types of upright were not systematically spread the uprights at corners and jams were cleft, possibly selected because they would have flatter sides and rather more durable heartwood than the less solid, rot-prone pole uprights with a much higher proportion of sapwood.

All of the uprights, even those in the apparently load bearing walls were relatively slight. Although only a little less bulky than the wall studs in framed Building 30 at No 1 Poultry, they were set much further apart. For example cleft corner post [767] was approximately 120x 100mm, whilst the cleft stake to the SE [764], was wedge shaped in cross section and about 170mm x 90mm. Round upright [761] was 100mm in diameter and to the SE pole upright [762] was 130mm diameter. In the extremely slight, clearly none load bearing wall [776] the probably driven roundwood stake [765] was only 50mm diameter. Such earth fast timbers must have had a relatively short intended life which was cut short in any case by the Boudican fire after around five years. The use of such varied wall uprights is well known from pre-Roman buildings such as the remarkably preserved and very well recorded rectangular buildings found recently in the Welsh Severn estuary levels at Goldcliff (Bell and Caseldine et al. 2000:106). There both round and cleft wall uprights were used for example in building 6 of 273 BC but they were rather more closely spaced than in Bucklersbury building 1.



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MUSEUM OF LONDON

SITE

Two thresholds

The clear remains of the bases of two lightly built thresholds (doorways) were found in the NW external wall of building 1 and also the SE end of the light partition wall [776]. Both were of broadly similar construction involving the use of a thick plank set on its face as the threshold which was simply lap jointed and nailed to the earth-fast jams (verticals either side of the door, and Fig. 2c). In both cases thin battens had been added to the upper faces of the threshold, presumably to provided ridges for the bottom of the door to close against and to accommodate small changes in the levels of the earthen floors. It was unclear how these battens were fixed in place and they were charred and slightly decayed in any case. The main threshold member [769] in the internal door way was clearly cut from a reused timber as it had a redundant mortice in it.

Unfortunately one side of each doorway was not found although we can reconstruct the approximate width of the southern example ([723] etc) at approximately 0.75 – 0.80m internally as the straight wall line to the SE can be projected. This width is slightly less than the reconstructed width of the almost complete plank and ledge door of the late 1st century AD found in the floor of a corridor of Building 30 at No. 1 Poultry. However, the probable doorway of BUC87 Building 1 is moderately wide for an internal door of such a modest structure. It was about 0.3m wider than the preserved internal doorway at the end of the corridor that survived in building Building 30 at Poultry by comparison, although that doorway was surprisingly narrow. For further comparison we might note that the authors Victorian cottage doorways are about 0.75m wide internally.

The lack of one side of the door assembly means that we are uncertain as to wether a larger post may have been fitted on one side to better support the weight of the door. The small probably cleft and hewn oak post [723] was only approximately 110x 60mm but was firmly set about 0.4m into the ground and braced by the threshold and no doubt a similar lap jointed and nailed lintel (Fig,. These dimensions are slightly larger scantling than similar elements of this writers Victorian cottage internal doorways. Thus, although appearing slight the assembly would have been quite adequate for several years before rot really set in even if [723] had functioned as the jam on which the door was hung.

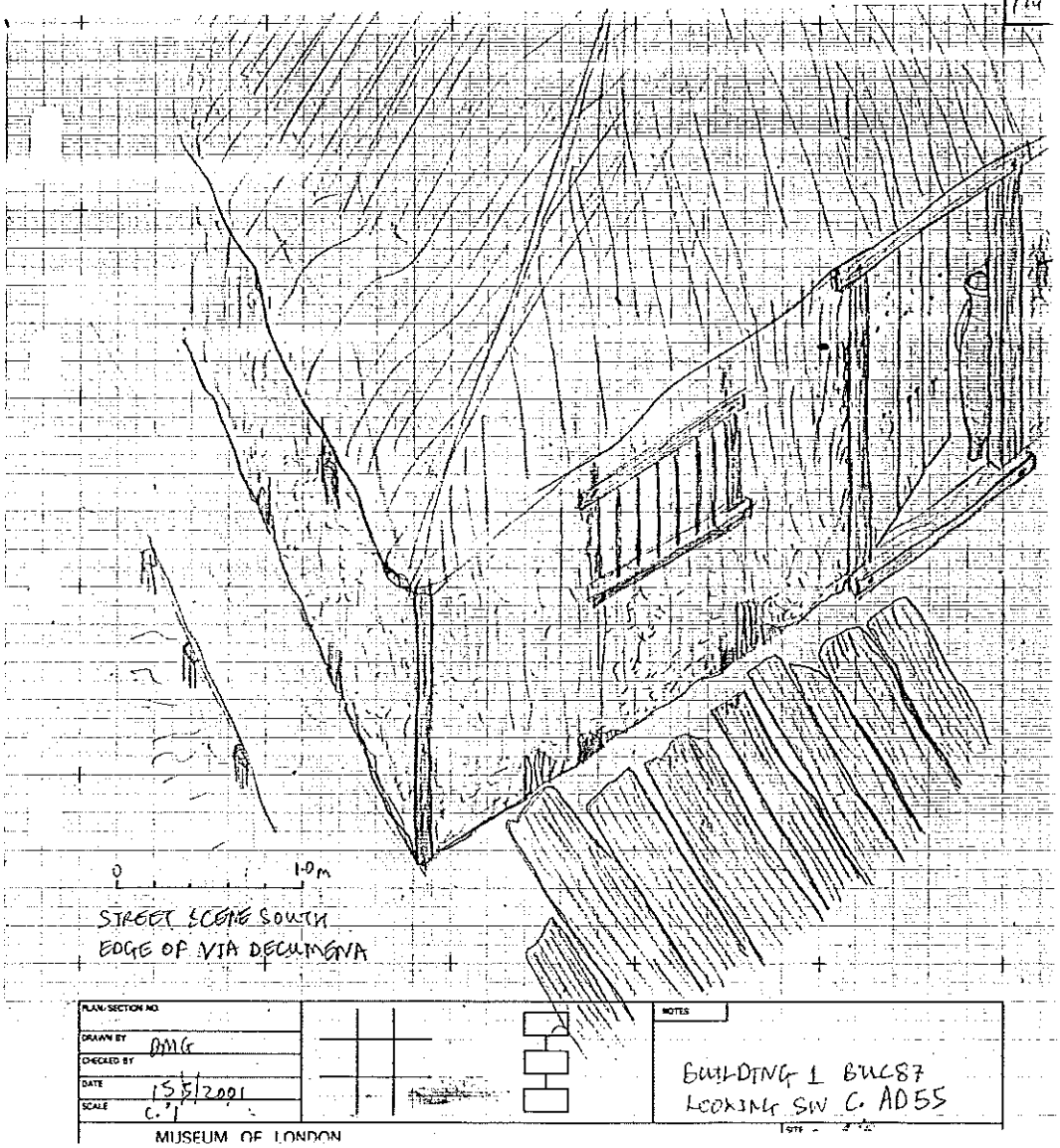
The platform in the SE corner of Room A building 1 ([750], [751])

Two irregular, radially cleft oak planks between 45 and 50mm thick were laid on the floor in the SE corner of Room A together with some other small fragments of timber (Fig.1). There is no evidence that they formed part of a complete rough timber floor but must have functioned to raise something off the floor in what was probably a particularly damp corner. This may have been something like a chest containing vulnerable materials such as meal or clothing?

THE SYSTEM AND ORDER OF CONSTRUCTION OF BUC87 BUILDING 1

There is no evidence of any complex level of prefabrication in BUC87 Building 1, the timbers were of very irregular form and scantling, with some driven and some set in holes. How exactly they articulated with a wall plate at the junction of the wall and roof is quite unclear. It is hard to see how a neat tenon could have been cut at the correct place to support a regular straight wall plate. Perhaps some form of rather slack tusk tenon or even a lap joint was used? The first stage in the building work after agreeing the plan of the structure, would have been to source the timber. In this case the materials were clearly very cheap and widely available. The posts were cleft out of oak logs around 0.4m in diameter probably where the trees were felled. The poles used for uprights would have been easy to transport, but we must also envisage longer poles required for rafters, and some form of collars or tie beams, and almost certainly wall plates of some form.

It appears that a small trench was then made, at least along the lines of the external walls, and the uprights, cut to length, were then set in holes and some were also driven. In Roman timber framed buildings with sills the small sloping recesses cut to hold the infill cross battens can be easily cut ahead of time as the position of the upright is known. But in this earth fast system of construction it is hard to see how that could have been done. It is probably more likely that the uprights were trimmed and fitted to the wall plates and the basic structure of the building including the rafters etc, was then added a section at a time. With the uprights stabilised, by earth at their feet and the wall plate and roof



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BUILDING 1 BUC87
LOOKING SW C. AD55

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weight at their tops, the small recesses could then have been cut with chisels. This would have been easy enough in the apparently green timbers (fresh and soft) . The cross pieces could then have been slid and sprung into place between the uprights. These battens would have been cut for the slightly varied spacing required. Then followed the weaving of the small vertical wattle rods, alternately in front and behind the cross battens. The wattlework was then daubed inside and out probably after the roof was covered to give it some protection from the rain and sun. No sheathing of boards or planks was apparently used as has some times been found on the external walls of Roman timber and earth buildings such as Building 30 ONE94, or as evidenced by the reused timbers found at Cannon Street Station (Goodburn 1991a). It is likely that some form of window opening was left in the gable walls at least, but we have no evidence as to exactly where they lay.

The roof covering and wall height

The nature of the roof structure and covering has to remain highly conjectural, but the relative lightness of the structure and clear tendency towards low cost , would probably have precluded the use of tile, boards or shingles. No evidence in the form of charred roof timbers, concentrations of nails or tile fragments were found that would have been left by the burning and levelling of a building with one of these more robust and costly roof coverings. The likely material is some form of thatch, probably over a light wattle and pole rafter superstructure (for examples of roofs built of such materials see Moir and Letts 1999:179). The lack of any evidence for buttresses, often seen in wattle walled, rectangular, post Roman buildings (eg. Some of those of the 11th century at Guildhall Yard, Bateman 2000:54) suggests that that the building had some form of effective bracing resisting roof thrust. This probably took the form of multiple, low set, collars or tie beams. The relatively slight wall construction indicates that the building was single storey, indeed that it probably had, relatively low walls perhaps in the region of 1.6m or so to the eaves, with some loft storage space above. Surprisingly tall walls of c. 2.2- 2.3m are indicated by some finds of studs from 1st century timber framed buildings from London (Perring and Roskhams 1991:74, Goodburn 1991a: 194). However, the framed structures were built using stable sills, and often with diagonal bracing and extra bracing provided by sheathing on external walls. Figure 3a is a tentative attempt at a graphic reconstruction of the part of BUC87 Building 1, in the middle phases of its use a little before the Boudican destruction.

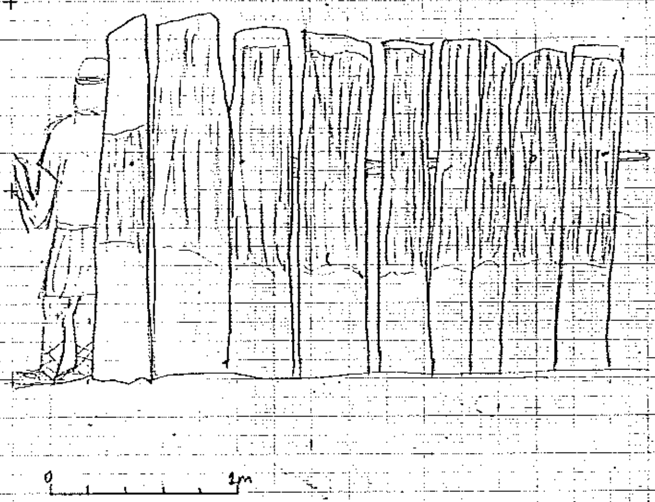
Some conclusions, BUC87 Building 1a transitional structure?

Bucklersbury Building 1 might fairly be described as in some ways a transitional structure. It exhibits features of both the local, long established , earth-fast, wattle walled house tradition and the Roman, modular, rectangular timber and earth building technology with prefabricated framing. The building clearly had a Roman -type plan form . The occupants divided up their spaces in a way close to our traditions of today , section of the building could be closed off from others, within a room areas could be easily compartmentalised and fitted with rectangular furniture. However, the details of the woodworking and methods of wall construction would have not been unfamiliar to builders of the Iron or even Bronze Ages of Britain. The exception to this would have been the form of the wattle infill with the vertical weaving system which seems to be an imported Roman techniqnc. This writer would suggest that this approach to building in the first few years of the Roman town was probably both economically and also reflected the practice and knowledge of local people. Perhaps the owner wished to achieve some of the features of Roman building and living without, the typically Roman investment in labour and materials?

THE CORDUROY BOARD WALK (SG. 1.23)

To the NE of BUC87 Building 1 a simple external surface of irregular, radially cleft oak timbers was found. The timbers were set edge to edge directly on the earth to form a rough corduroy type boardwalk which must have lain along the southern side of the Via Decumena (Fig.1). It was initially thought that most of the timbers had rebates along their edges but it is clear from the cross sectional drawings that this was decayed sapwood that had been compressed. This is a typical feature of the sapwood along the edges of most waterlogged oak timbers buried horizontally, where the weight of

FIG 3 POSSIBLE PALISADE TYPE FENCE TIMBERS BEFORE REUSE? EARLY AD 50's BUC87 [730] - [742]



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NOTES

ROUGH CLEFT PALES IN A PALISADE EARLY AD50's

the overburden compresses the more degraded sapwood far more than the more rot resistant heartwood, creating a rebate-like appearance. It was also thought that the boards may have functioned as building weather boards first and were then reused. However, the irregularity of the boards in terms of thickness and width, and the almost total lack of fastening holes suggests that this was not the case (Fig. 2b). The full lengths of the boards could not be seen as they projected outside the limits of the excavation but the cross sections were recorded in detail. The dimensions of the boards varied from wide thin examples such as [737] at 420 x 27mm to thicker beam-like pieces such as [740] at 200x 85mm. A thin cleft timber batten [724] was also found nailed to board [730] cross wise. It seems most likely to this writer that the cleft timbers were originally part of a crude pallisade or fence of some kind. Evidence of cleft oak pale fencing has come from a range of recent excavations on waterlogged sites in London , such as those at Regis House and No.1 Poultry. The pales found on these sites were all of oak but vary from halved and pointed oak poles from pre-Boudican contexts at Regis House to very regular , thin , flat topped pales at ONE 94 (Goodburn 2000: 23, and Fig. 3b. here).

The tree-ring study of these timbers throws up some interesting possibilities. It shows that the pales came from rather varied types of oak trees, some medium to fast-grown (2.4- 4.2mm av. ring width) deriving from open grown trees whilst others were cleft from large slow growing parent oaks where the average ring width was between 1.2 and 1.8mm. Only two of the pales [732] and [733] seem likely to derive from the same tree, even though radial cleaving of this type should produce at least 16 (possibly up to 32) cleft sections from the same log. This seems to suggest that a large palisade was dismantled and the pales recycled from a stock pile for the rough and ready board walk that was probably never intended to last long. The fact that the batten [724] and pale [730] were still articulated suggests that the putative palisade must have been close by.

Some of the boards were very wide and thick in comparison to the more regular standardized oak pales found at No 1 Poultry and Regis House, where pales were generally less that 200mm wide. The pales [735]-[737] would all have to have been cleft from a log approximately 0.9m in diameter. In this case the parent tree was moderately fast grown with annual rings about 3-4mm average width, probably indicating growth in a moderately open woodland. In most other cases of Roman period cleft timber from London excavations seen by this writer much slower grown material was typically used with rings widths of less than 2mm, deriving from large, straight old oaks growing in tall dark 'wildwood type' conditions.

Again the overall impression of the street frontage including this corduroy board walk and Building 1 must have been rather 'rustic' by Roman urban standards, walkers would have had to watch their step fairly carefully to avoid tripping up on the uneven boards. The use of irregular cleft oak timber is closely paralleled in the low river bank revetment of AD 52 excavated at Regis House, which also contained reused pales and had a distinctly 'native' appearance (Goodburn in Brigham et al forthcoming) .

Notes on the tree-ring dating the palisade and associated timbers

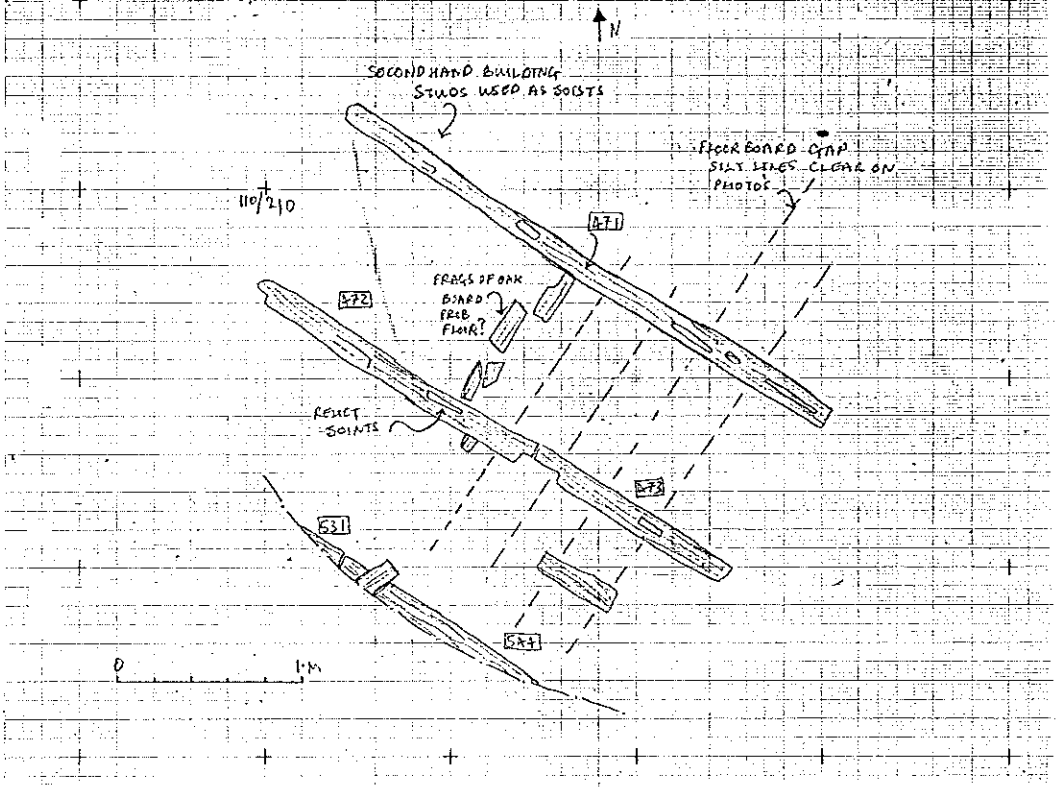
The tree-ring date range for pale [729] of 49 AD with 16 sapwood rings but no clear bark edge is not incompatible with a mid AD 50's date for the construction of the board walk. One of the stakes from the lining of a small water filled feature to the E. of building 1 cleft oak stake [800] has a last ring date of 55 AD with 22 sapwood rings and no evidence of reuse. Unfortunately the fragile compressed sapwood on most of the board walk pales did not survive lifting, but an approximate dating for the use of Building 1 and the board walk of the mid 50's AD is very likely.

A PARTIALLY PRESERVED TIMBER FLOOR STRUCTURE OF POST BOUDICAN BUILDING (BUC87 -SG. 3.32)

Many modest buildings in Roman London had earthen floors, whilst more expensive structures, particularly in the later periods, might have floors of opus signinum, tesserae, or even mosaics.

HGA REMAINS OF ROMAN TIMBER FLOOR

(BUL87 SG32) POST-BOUDICAN 1:20



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NOTES: PARTIALLY DISMANTLED ROMAN TIMBER FLOOR - POST-BOUDICAN. GHOSTS OF MISSING PLANKS CLEAR AS SILT LINES. TRACED OFF PRINTED PLANS.

However , a relatively large number of buildings appear to have had some form of planked floor supported on joists laid on or very close to the ground. These were perhaps a floors of middling status and expense? On dry sites the evidence for timber floors usually takes the form of joist impressions in the floor make up or charred traces in burnt buildings. Only very rarely do the actual timbers of the floor survive, such as at the Courage Brewery sunken timber framed warehouse (Brigham and Goodburn et al. 1995). Thus, the partially preserved floor structure described as Sub Group 3.32 in the archive report is worth further investigation (Fig. 4) . Although there are several ways of interpreting the stratigraphy and structural woodwork of this part of the BUC87 sequence this writer would suggest the following based on the nature of the woodworking evidence.

The surviving timbers of the floor structure that lay with in the trench comprise three parallel joists laid on the ground approximately 1m apart centre to centre, and a few small fragments of oak planking, lying on or slightly proud of the joist upper faces. The two south western joists were made up of two pieces of timber in each case the northernmost joist was one timber [471] 3.3m long. The joists were slight only perhaps 70-80mm thick by 110-130mm wide prior to slight decay and compression. This scantling would have lifted the floor planking only perhaps 60mm off the damp ground. Whilst this might have resulted in a moderately dry floor for a few years decay would have been bound to start after a fairly short time in the earth-fast elements. There was no sign of the ends of the joists articulating with a plate or sill timber as in the floor of the One 94 cistern or Courage Brewery sunken building. Indeed the plan evidence may possibly suggest that the associated walls were of some form of earthen mass wall, with out timber elements. The large squared oak piles ([400] etc.) that surrounded the floor on the northern and south eastern sides do not articulate with the joists in any way although they follow a similar alignment. It appears to this writer that the large oak piles probably relate to the construction of a later building on the same property (below)

Ghosts of the floor planking

The fragments of oak timber such as [456] planking probably derive from the largely demolished floor surface, but they were not intact enough to give us a clear idea of what the floor planks looked like. However, very clear silt lines were left where material had fallen through gaps between the boards. These silt lines are clear in site photographs (see p. 26 in 'Heart of the City ' , Rowsome 2000). The distance between these lines was c. 350mm centres , the planking must have been slightly less wide. Occasional iron nails were found in the upper faces of the joists showing that some of the planks were nailed down, probably just where they distorted on drying . A similar erratic pattern of nailing was found in the floor planking of the Courage Brewery warehouse, suggesting a saving of nails was a continuing practice even in the mid 2nd century AD.

Evidence for the original use and making of the joist timbers

It was immediately obvious to the excavation team that the joists were second hand timbers as they had many redundant joints in them, in the form of lap joints, sloping grooves or recesses and parts of either edge halved scarfs or simple bare-faced tenons (butting ends of [472] and [473]). G. Milne visited the site during excavation and suggested that the timbers had originally been light wall posts or studs, which seems correct in the light of numerous recent finds of such building elements. The key diagnostic features being the sloping recesses cut originally to hold infill cross battens similar to those discussed above for BUC87 Building 1 and ONE 94 Building 30 (Fig.5). The length or originally height, of stud [471] at 3.03m+ suggests an origin in rather a tall wall, perhaps a gable end? The proportions of other Roman timber framed building studs from London indicate a lower wall height of c2.2m- 2.3 (Goodburn 1991a:185). Interestingly the orientation of the wall studs with in the thickness of the walls was quite different to that generally found in the in situ wall bases or reused studs. That is the widest dimension of the studs was placed across the wall rather than in line with it as is more commonly the case (as in ONE94 Building 30, and the reused timbers from that site and Cannon Street Station Goodburn 1991:194, 2000:11-14 Un pub.) . Timber [471] Figure 5 had sloping recesses for infill cross battens set on adjacent faces showing that it must have been a corner post. The scantling of these studs (c. 120- 145mmx 63-80mm) is also a little less than that typically encountered such as in the Cannon Street Station studs of the late 1st century which were c. 140mm x 100mm as they were in Building 30 One 94 of the same period. However, the cross-wise orientation

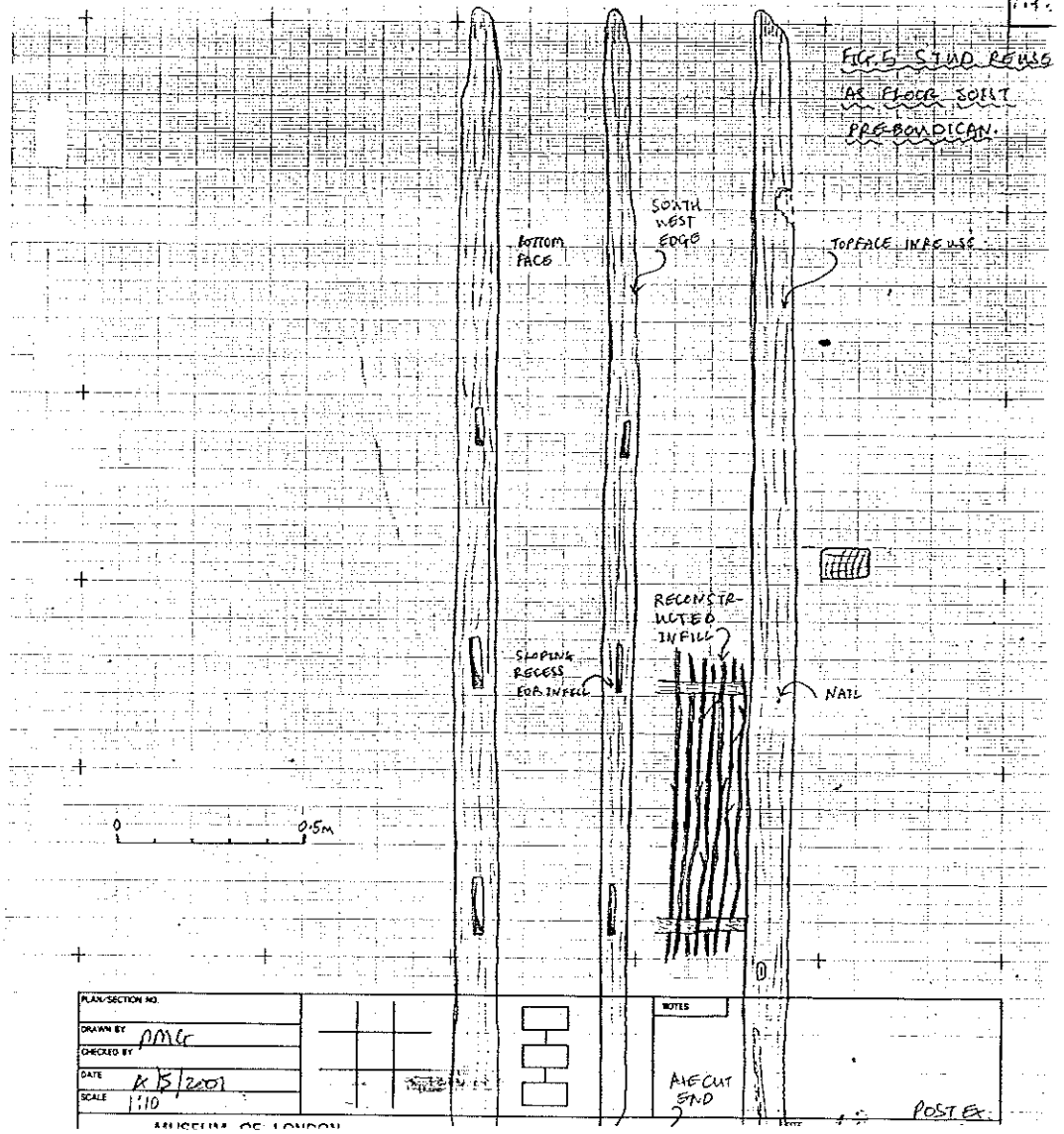
FIG. 5 STUD RENUS
AT FLOOR JOIST
PRE-BOUDICAN.
BOTTOM FACE
SOUTH WEST EDGE
TOP FACE INFILLED
RECONSTRUCTED INFILL
SLOPING RECESS FOR INFILL
NAIL
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AXE CUT END
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of the studs widest dimension , as in modern studing , would have compensated for the smaller scantling. No clear evidence of the original attachment of sheathing boards was found.

The joist timbers examined in detail were made by radially cleaving sections from large old parent logs. The cleft sections were then hewn to a nearly rectangular cross section following guidelines, and most of the sapwood was removed.

Dating the second hand joists

Whilst it is clear that the building floor post dates the Boudican revolt on stratigraphic grounds., these timbers appear to predate it. They are clearly weathered and probably derive from pre-revolt buildings. The tree-ring study provides a last ring date of AD 52 for joist [544] with 7 sapwood rings. This suggests a felling date range of c. late AD 50s' to AD90. The pottery dating and stratighraphy shows that the early post-Boudican period is the most likely for their reuse.

A PARTLY PILE FOUNDED BUILDING OF 'GRANARY TYPE' ? (BUC87 SGs. 33.3 and 3.42)

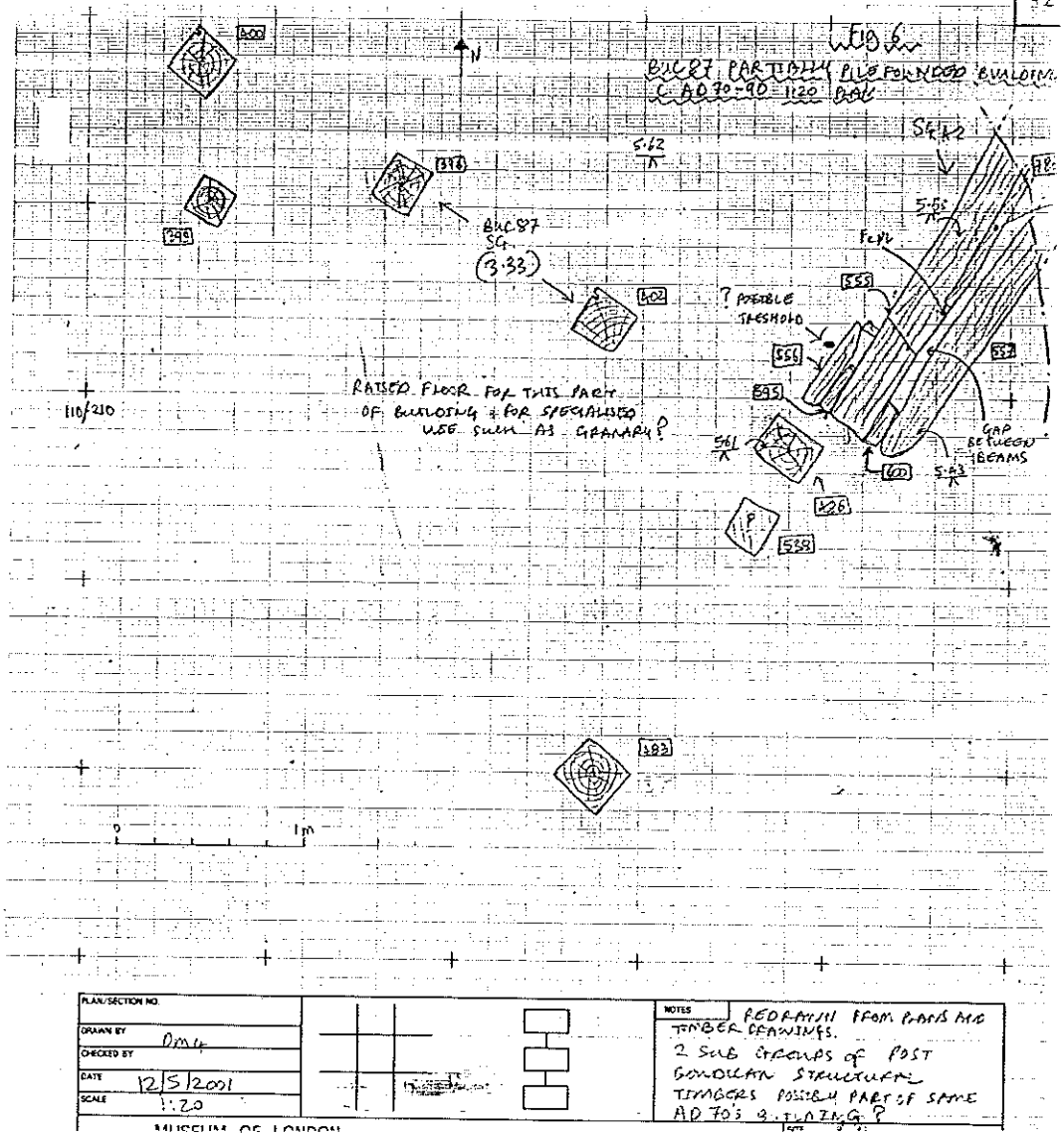
The Roman tradition of building some specialised buildings such as granaries, raised up above ground on piles or the masonry equivalent is well known. It is believed that the floors were raised to protect perishable materials such as grain from decay and pests. Horizontal sill beams must have been placed on top of the piles, which would as a consequence have to have been driven in fairly straight lines. A neatly arranged group of large squared oak piles was found surrounding the floor assembly discussed above (BUC87, SGs 3.33) but here it is interpreted as part of a later building on the same alignment (Fig. 6). The room to the north appears to have been without a raised floor structure and may have had a different function with its eastern edge defined by a paired line of squared oak beams BUC87 [555] and [557] and smaller timbers laid horizontally. Beam [555] had a wide recess cut in the south end and a batten nailed along its eastern edge. Several other small pieces of timber lay near this recessed area which hints at the possibility it was some form of opening or doorway. If the area was a doorway the large squared pile [486] might have extended upward to form a jam on which a door could have been hung.

Although the gap between the beams might possibly have once contained timbers set on edge or end forming a wall this would have been a very unusual system of construction. Another possibility might be that the gap served to hold the feet of removable vertical planks that served as shutters? Alternatively it could have been part of a rough raft foundation of second hand timbers for some form of earthen mass wall similar to the walls set on the pile and baulk foundation raft found at No. 1 Poultry (Goodburn 2000:7, and 16 Un Pub.). Another point of similarity with that structure is that many (probably all) of the piles were second hand having been taken from a substantial structure which required the use of carefully hewn and grooved large beams. The No. 1 Poultry structure has a tree-ring date range of AD73-90, broadly contemporary with the reuse of these similar timbers at BUC87. The parent structure for these grooved beams is hard to visualise and its function is obscure, although it may have been some form of large tank.

The remains of this building are not easy to interpret coherently but it would appear to have been a rectangular modular building including one specialised storage room for perishable goods. Perhaps it was a private warehouse storing a variety of materials lying conveniently in the heart of the early post-Boudican town?

THE SECOND HAND OAK PILES AND NEWLIGHT ON ASPECTS OF ROMAN JOINT CUTTING WITH SPECIALISED PLANES

The piles were made with axe hewn tips from neatly hewn , squared oak beams. They varied in scantling between 200mm square ([398]) and 300x295mm (1', [483]), but most were c. 275mm x 250mm. All were cut from beams that had been hewn boxed heart from moderately large trees except [402] which was made from a ¼ of a large log. A great deal of labour had been invested in



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NOTES: REDRAWN FROM PLANS AND TIMBER DRAWINGS.
2 SUB GROUPS OF POST GONDOLAN STRUCTURE
TIMBERS POSSIBLY PART OF SAME AD 70's BUILDING?

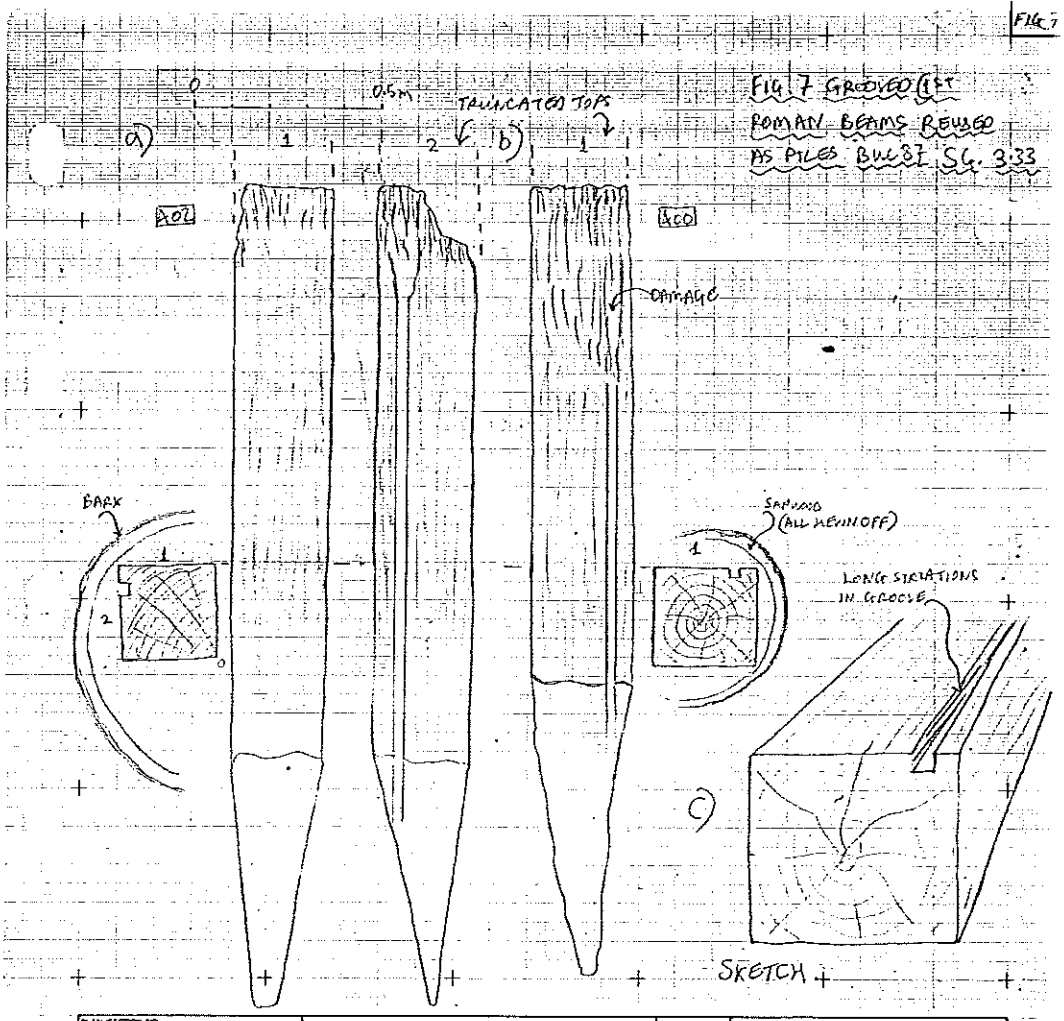

FIG 7 GROOVED (1ST ROMAN BEAMS REUSED AS PILES BULST SG. 3.33

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NOTES

REUSED GROOVED ROMAN BEAMS

hewing the beams as none had any substantial traces of sapwood. Figure 7 shows two of the examples that could be extracted and recorded.

In many of the piles one face had a neatly worked straight groove cut in it. In timber [400] the groove could be measured accurately some time after the excavation but before the timber had dried out and it was found to be 25mm wide by 25mm deep. These groove joints were clearly redundant. A sample length of timber [400] was saved for the Museum of London Ancient Woodwork Technology Collection (Fig.7c.). The grooves had square cross sections and in timber [400] long straight sloping striations could be seen in the side of the groove. These striations show that the groove was made with a plane and that this was almost certainly some form of plough plane with a guiding fence attached to the side. The use of such a tool normally requires that the adjacent corner of the timber to be grooved is worked very straight and regular otherwise the fence will not ride along the edge smoothly and true. This may be why these beams were so carefully worked. This sort of joint cutting at the scale of structural woodwork (carpentry), is very rare in early historic material the technique is more commonly associated with joinery or furniture work. An example of the making of plough planed grooves was found on this typically smaller scale in the Roman jointed chest base found at No.1 Poultry (Goodburn 2000:25). The size of the groove in these structural timbers from Bucklersbury is so large that it must have been a considerable effort to cut it in the tough oak heartwood.

FUTURE WORK ?

This text will need editing together with sections of that from the No 1 Poultry woodwork analysis report which will be the job of the principal authors of the project publication but it will be essential for this author to be able to examine early drafts of that work. The same would apply to the selection and drawing for publication of any of the draft figures referred to above and relevant photographs. There are also some areas of the tree-ring study work that might need some further checking. It may be useful to see if there can be any cross matching with samples from No1. Poultry to help to refine dating. It would also be normal practice to send a draft of the relevant section of the text to N Nayling who carried out the tree-ring work on the Bucklersbury material for him to check over.

ACKNOWLEDGE MENTS

Thanks are due to J. Hill who patiently guided this writer through parts of the BUC87 archive, and to C. Maloney who promptly retrieved the timber drawings form the temporary store.

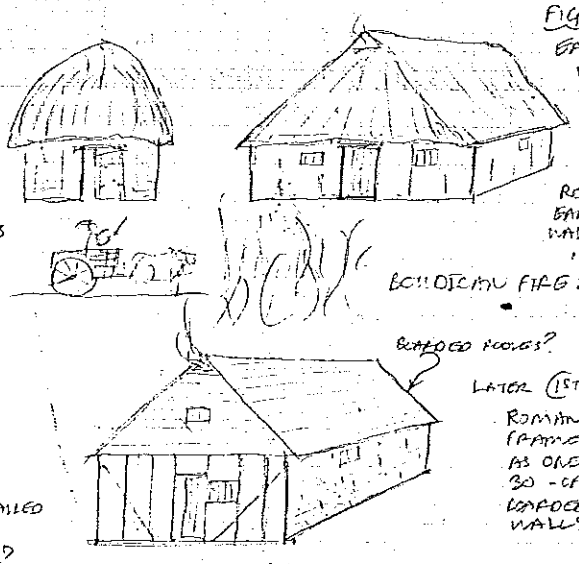

FIG 8 SOME EARLY ROMAN VERNACULAR BUILDINGS IN THE ONE: BUC87 - CID AREA

ROMAN PLAN FOR: EARTH-FAST WATTLE WALLED BUILDING AS BUC87 BUILD 01

*? POSS GENERAL FIG OF CHANGES IN VERNACULAR BUILDINGS IN EARLY ROMAN LONDON IN VICINITY OF No1 POULTRY (+ BUC87 + CID 90). NOT TOO SCALE.

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