

The Ancient Woodwork

Site code: ONE94, BUC87

Undated

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Number 1 Poultry: The Ancient Woodwork

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Introduction

This report should be used with reference to the Number 1 Poultry site sequence assessment, and the dendrochronology assessment. A very brief outline of the nature of the site and the principal sequences of preserved woodwork is presented here.

The site lies near the centre of the historic core of the City of London on the west bank of the now infilled and culverted Walbrook stream. The area was cut across by many small watercourses in antiquity and despite being many metres above sea level nearly all the lower levels have become waterlogged. The presence of waterlogged deposits in this area has been known for many years, and recent work on the neighbouring sites of CID90 and BUC87 showed that much waterlogged timber and roundwood could be expected of Roman to high-medieval date.

The 1994 evaluation trenches at Number 1 Poultry showed that a large amount of Roman woodwork was preserved there, and during the following excavations in 1995-6 a very large amount of Roman woodwork was excavated and recorded. Alongside this a small amount of early and later medieval woodwork was also found and recorded. The nature of the woodwork recorded was varied and differed substantially from that typically found on sites along the main Thames river frontage. The range of Roman material included timber piled and rafted foundations, well linings, timber lined drains, water pipes, sumps, a large well preserved timber framed cistern, substantial parts of the above ground parts of a timber framed building, fences of various types, and a large log-cabin style ('lafted') building platform and terrace revetment. A large amount of reused or abandoned Roman woodwork was also recorded including softwood casks, building timbers of varied types, a dugout trough, hewn dishes, a spade, a wheel spoke, a largely complete plank and batten door, and an elaborately joined chest base.

The woodwork of Saxo-Norman date included the partially preserved remains of a sunken-floored building, a unique hollowed log well, pit linings, wattle fencing and several reused or dumped timbers including a boat plank. The high medieval woodwork included foundation piles, jointed masonry well support frames, and some stave built vessel elements. Small finds of wood of all periods were also found, (and will presumably be summarised by the finds section).

In addition much information about the nature of Roman, and late Iron Age trees, 'treeland' and 'woodmanship' was also recovered, and will be touched upon below.

Recording and sampling methodology and the resultant field record

The standard approach used in the recording of woodwork during excavations is detailed in the Museum of London Site Manual 2nd edition, and follows the guidelines set down in the recently up-dated English Heritage 'Waterlogged Wood' document. However, within the standard approach there is room for some variation in methodology to suit particular conditions. Four special conditions applied to the Poultry project:

1 The first was that MoLAS had three large wet site excavations in progress during much of the excavation. This meant that the MoLAS Ancient Woodwork Specialist could not be on hand every day (as would normally be the case with a large wet site) but could visit to advise frequently, and work on-site or off-site to record particularly complex reused woodwork, as required. To deal with this particularly busy period an in-house training course was set up for several MoLAS site staff in ancient woodwork recording. These field workers then provided day to day cover in this subject, dealing with the more straightforward material,

and asking for assistance where necessary. This method generally worked well. The trained field worker for the Poultry project was Tony Mackinder. John Minkin also took part in the course and went on to work on other specialist field and assessment projects. His systematic and methodical work scanning most of the specialist field records from the Poultry project essentially forms much of the basis of this summary report.

2 The second variation to standard procedure concerned the sampling of woodwork possibly suitable for tree-ring analysis. It was known from the evaluation work and excavations from just to the west and south of the site (CID90 and BUC87) that very large numbers of piles would be encountered. Whilst some of these were reused and effectively contained rare information about Roman woodwork such as building 'carpentry', many were not, and were therefore most interesting from a dating point of view. The MoLAS dendrochronologist recommended that material should be sampled and 'assessed' on site as the recording progressed and only the potentially datable samples would be retained for study. Assessment in this particular context involved production of written notes and a computerised list of the nature of all the samples, approximate annual ring counts, and comments. A record was made of the samples later discarded, for general comparative purposes. Tony Mackinder carried out this work, which resulted in the retention of a smaller number of samples with a greater potential for dendrochronological dating. One drawback of the selective strategy is that dendrochronological study designed to investigate some aspects of early 'woodmanship' applied to young trees is not possible. Such work has been particularly fruitful in some studies of Roman woodwork recently published by MoLAS.

3 The third variation specific to the Poultry project was localised heavy metal contamination which affected one area of the site which contained woodwork associated with Roman roadside drains, and prevented their detailed recording and sampling. However, it was possible to record and sample timbers from the same drain sequence to both the east and west of the contaminated area.

4 The fourth special circumstance at Poultry was that the main excavation work took place during top-down construction, which involved working beneath the concrete floor slab of the new building and using artificial lighting. This sometimes made the recognition of detailed features such as toolmarks difficult, although much of the recording was carried out in natural light at the loading-bay area of the site offices.

Character and quantification of the assemblage

The specialised part of the timber field record for this project comprises written pro-format timber sheets, and sketches, several hundred measured timber drawings on gridded film, detailed annotated elevations and plans of timber structures in situ, photographs, and general descriptions on context sheets of groups of worked timbers and wattle work. Objectively, the quality of the record varies from the extremely detailed to rather abbreviated, but on the whole the records are clear and useful for assessment and analysis purposes. There are a few cases where the standard MoL method of recording or numbering was not followed which has made quantification difficult, but this has all been documented. The total numbers of recorded timbers in various categories are given below:

The total number of individually recorded structural timbers:	1,363
The total number of wattle structures:	23*
The total number of clearly reused timbers:	134+*
The total number of casks and other coopered vessels:	5
Total number of nautical timbers:	1

* NB the wattle infill panels of building B12R [18192] are considered as one, the remainder are pit or well linings, or fences)

*NB in many cases the reuse status of timbers was not absolutely clear and a considerable additional number of timbers were therefore classified as of 'unknown' reuse. Together the reused and unknown timbers amount to roughly one third of the total number recorded.

The main difference between the proportional character of the assemblage of worked roundwood and timber recorded at Poultry and assemblages from Thames side excavations such as Regis House or Bull Wharf is that more of the woodwork at Poultry was reused or possibly reused, and almost none of it is of nautical origin.

The aims of the Ancient Woodwork Assessment

The assessment of the Poultry woodwork assemblage involved scanning through all the relevant records and site notes and completing the following tasks:

- 1 *Compile a checked timbers list and transfer to the computer database.* One of the key tasks was to note any evidence of reuse in the woodwork so as to qualify the value of any tree-ring spot dates already obtained and/or to inform the selection process for future dating attempts. The key words 'Naut' (for boat or ship timbers), 'Build' (for building or other terrestrial carpentry, quayfronts etc), 'Cask' (for elements of stave built vessels) and 'Other' for any other type of reused timber were applied to the timbers. The format of the timber index was based on that used for similar work on the records of woodwork from other large wet sites, and was designed to be compatible with a new worked timbers and sample list for ORACLE. The index will give access to simplified descriptions of individual timbers, any associated structures, whether it was drawn in detail, and the nature of any samples taken.
- 2 *Compile simple, long-hand, condensed 'aide memoir' notes and sketches,* to contribute to the project assessment. The notes will also aid future work during the analysis stage, and will serve as a point of quick reference. During the compilation of these notes those groups of worked timbers, structures and worked roundwood with particular potential for further analysis were identified, briefly described, and given a statement of potential (see below). Some of the material from Poultry is clearly unique and of national importance, such as the *in situ* remains of the Roman timber framed building B12R, the almost complete Roman plank and batten door from the same building [51137], and the well preserved Saxo-Norman jointed dugout well lining [50002].
- 3 *Outline proposals for future work* leading to the publication of key aspects of the material, and including consideration of the appropriate amount of text and numbers of illustrations.

The Roman woodwork assemblage

Foundations

More than half the individually recorded timbers from Poultry were foundation piles. Many of the piles had not been reused, and their principal value was as a dating-tool. In the case of each pile, the type of conversion used was noted. Stratigraphic analysis of pile arrangements, correlated with similarities of conversion, may make it possible to identify groups of piles related by building phases. All of the piles were oak but a variety of conversion types were recorded: radially cleft, whole round, and or squared.

Some of the piles were reused building timbers and these are briefly discussed below.

Crossed timber foundation elements

Evidence of a method of supporting the chalk foundations of the unusual late Roman building B25R with timber substructures is believed to be unparalleled. Short lengths of oak building timbers (mainly plate timbers with mortices) were joined with a cross halving joint and laid in

the bottom of the foundation trench. The function was apparently to spread the load of the masonry in the soft ground in the manner of a 'snow shoe'. It seems unlikely to have been particularly effective but it had the advantage that no pile driver was required. The timbers had been recut too short to be very useful as samples of Roman building carpentry. They were found with other timbers, including some reused piles.

An oak baulk foundation raft and terrace revetment (fig. 1)

Another form of foundation-like structure found at Poultry, and with few parallels was a late 1st-century building platform of large hewn oak baulks lap jointed to form a quay-like structure. The oak baulks varied in size, with some being as large as the middle sized baulks used for the massive riverside quays. Timber [50594] was over 400mm square and 7.4m long, and only the largest of quay baulks and some elements from Roman ships and boats tend to be larger. The timbers did not carry clear evidence of reuse and provided a tree ring date range of AD73-90. The gridded arrangement of baulks was supported on a number of short baulk offcuts set in shallow pits, and a small number of erratically placed piles. Many of the chocks were of considerable interest (see below).

The gridded structure was clearly intended as a foundation raft for the buildings (B10R *et al*) sited above it. This approach to founding Roman buildings has also been recorded on the Thames frontage at Regis House, where it was integral to the landward side of an early quay, and the Poultry example can be seen as a cruder version of the same principle. The structure at Poultry also had a revetting function as the ground surface sloped downwards to the east and north, towards the Walbrook.

In the case of the Poultry baulks, the shoulders of the lap joints were sawn out whilst the along grain cuts were split and hewn, and the joints were unsecured. The baulk offcuts generally had one axe cut and one saw cut end. Recent work at Guildhall and Regis House has shown that similar hewn ends sometimes carry stamped inscriptions. Each hewn end was examined carefully on site at Poultry but no inscriptions were found.

In situ Roman building timbers

Timbers from Roman timber or partially timber built buildings are very rarely found preserved in situ, thus any such material can be taken as important.

Building B12R (figs. 2 and 3)

For a discussion of the layout of building B12R and its stratigraphic details refer to the summary of the site sequence. The building was at least 4.85m wide and well over 5m in length, extending eastwards beyond the limit of excavation. The building was extremely well preserved, and it is quite rare to find anything more than decayed baseplates *in situ*. The remains of timber-framed building B12R included the bases of the wall infill panels of distinctive wattle and daub. The wall studs had either been pulled out in antiquity, leaving gaps in the infill and some broken tenons, or intentionally cut off *in situ*. Large slabs of wall infill had collapsed close to the wall-line so that the wattle work remained intact within them. The wattle rods, which were sub-sampled systematically, were between 10mm and 20mm in diameter and whole rather than split. They were woven vertically around cleft oak cross battens about 40-60mm wide and 25mm thick. The studs were set about 0.6m edge to edge (a common Roman carpentry proportion) and the cross battens must have fitted into the typical sloping recesses in those studs.

Brickearth-based daub had been applied to the wattle infill of the panels after the frame of the building was assembled, followed by a plaster finish applied over the daub and most or all of the wall studs. At the northwestern corner of the building (plates [51124] and [51123]) the rectangular-section hewn oak plates were cross halved over each other and pierced by the mortice for the corner post in typical Roman manner. Interestingly, part of a radially cleft oak

clapboard was found roughly *in situ* outside the wattle and daub infill of the external wall. This would have provided a more weather-proof exterior to the building than rendered daub alone.

It was immediately realised that the degree of preservation of the building was exceptional and warranted very detailed recording. Details such as the use of an edge halved scarf over a pile in the wall line [51134]-[51178] and the wall infill surviving above the plates were all recorded *in situ*.

Adding to the potential of the building as a source of information about Roman woodworking was an almost complete door which had been reused during the repair of an area where the floor had subsided in the corridor between plates [51135] and [51166].

There is some evidence from the woodworking itself that the building may have been modified several times. Some of the jointing is rather erratic, such as the lap dovetailing of baseplate [51134] into plate [51136]. There is additionally some reuse of timber for the plate elements, for example [51178], which has at least one relict sloping recess.

Other less well preserved remains

Fragmentary, decayed, or charred remains of other building timbers were also found *in situ*, and may be worthy of more consideration at analysis. The focus for the study of wood working evidence from buildings will certainly be Building B12R.

Reused building timbers

The studs (fig. 4)

About 16 reused vertical timbers from Roman buildings were found at Poultry. Typically they have recesses for the cross battens around which the vertical rods were woven to form the infill support. Some of the studs may have been taken from building B12R.

There were several subtle variations in the raw material worthy of note. Although all the studs were oak there were two quite different types of conversion used. Some had been carefully hewn from small radially cleft sections taken from large straight, slow growing trees that must have grown in wildwood eg. [50780] or [50782]. Some examples of this type still had a slightly wedged shaped cross section. Other studs were hewn from young fast growing oaks from more open woodland managed to produce small timber quickly eg. [50779] or [50781]. Some may even have grown on coppiced stools as appears to have been the case with some small Roman building timbers studied in detail from London. It may be that a proportion of the timbers were cut from pre-Roman managed woods and some from woods managed after the Roman invasion.

There were also some variations in the scantling of the timbers, as might be expected. It is presumed that the slighter examples (eg. [51027]) derive from partition walls or more slightly built structures. Some of the studs had three faces cut to accept infill staves, indicating that they were from points in a structure where a partition wall joined a main wall line (eg. [50781] or [50782]). Other studs had small mortice joints cut into them in addition to the sloping recesses, indicating either two phases of use or perhaps the location of fittings such as small windows (eg. [50559]).

There was also a category of timbers that may have been derived from a building wall or other open frame. These small rectangular section hewn oak timbers often had occasional nails in one face and diagonal halvings for some form of brace.

Evidence for how the stud and plate type elements were hewn

Both types of stud were clearly brought to a fairly regular rectangular cross section by hewing using the 'notch and chop' method. The finishing was carried out using a medium sized, thin-

bladed axe. No trace of the use of adzes was clearly recorded, as is sometimes found with very large Roman timbers and boat elements. The same basic approach was clearly used to 'square up' the plate type elements found.

Evidence for plaster keying

The surface finish of most of the studs was fairly smooth but in some cases an axe or adze had clearly been used to cut a series of deep nicks in the surfaces to key-in a plaster covering to the wall faces. These studs were not designed to be seen.

Grooved stud or plate elements?

A system of walling employing a different method of infilling, where the infill materials are located in continuous grooves in the edges of the studs, is indicated by some Roman reused timbers from Winchester Palace. Some of the smaller grooved reused timbers from Poultry might be from buildings built in that style.

The plate type timbers

Plate type timbers were the most numerous class of reused building timber. They varied from rectangular section beams a little larger than the studs, with typical squarish Roman mortices in (eg.[50532]) to less easily recognised timbers that may have derived from a machine of some type (eg.[50123]). The conversion types also varied from the typical boxed heart to boxed halved or even radially cleft and hewn rectangular.

It is likely that many of the plate timbers were top plates, as they would be more readily retrieved for re-use. Top plates would not be sealed under the wall infill and were also less likely to have decayed in use. However, little is known of Roman roof carpentry, such as the design of rafter seating joints, and this means that it is hard to identify top plates with any certainty. Some of the elements initially considered as possible top plate sections are somewhat decayed and can not be unreservedly described as such.

A probable window sill or lintel beam for a mullion window (fig. 5)

One particularly interesting reused building beam may be part of a window sill or lintel ([50563]). This beam was punctured by a line of shallow rectangular mortices, parallel to a groove, with a fairly large square blind mortice at one end. The line of small mortices is interpreted as evidence of a line of mullions, the groove as a shutter groove, and the mortice for a window jamb, as with medieval parallels. The lack of mortices for wall uprights suggests that the timbers may have been set in a mass wall of masonry, mudbrick, or pise. The use of beams set within earthen walls was also recorded at Regis House in situ and is well known in the vernacular architecture of southeastern Europe today. A few other fragments of similar timbers were also found at Poultry, reused as piles.

Baulk off-cuts

A large number of offcuts were found reused as chocks in building and drain foundations. They varied from stacked planks to short lengths of hewn oak baulks around 400mm square. Several groups could be distinguished, and the two most common are briefly discussed below.

Offcuts from large grooved beams

Several large baulk offcuts were found that had one axe cross cut and one saw cut end. These also had two large grooves cut into them (eg. [50714]), and may derive from a nearby building, as very similar large grooved timbers were also found at the DLR Bucklersbury site BUC87. The function of the double grooved timbers is unknown. The timbers do provide another example of the Roman pattern of creating axe cut ends (top and bottom as the tree

grew) which were sawn off at the building site - the workers at the felling sites did not use saws but the town-based carpenters did.

Plain baulk offcuts

Several other large oak baulk offcuts did not have any joints cut in them but instead provide rare evidence of Roman felling techniques. Timber [50652] carries a particularly clear example of an axe felling cut with sloping ends and a clear torn hinge. The axe used cleft marks 80-90mm wide. It is clear from the way the saw marks run that they were made from both sides, and this implies the use of a framed cross-cut saw with a cross bar that obstructed deep cutting. No evidence for 'hauling notches' were found, suggesting that the timbers were moved by another method.

Woodwork for drainage and water management

Roman woodwork associated with water management and drainage was comparatively more common than some of the material summarised above. Some of the timber drainage structures at Poultry were either unusual or spectacularly well preserved, and these are worthy of particular note here. Included in this category are drains, wells, water pipes, and related features.

A well preserved timber framed tank (figs. 6 and 7)

A late 1st-century timber-framed, plank-sheathed tank in Open Area OA15R survived intact to its original top ([18226]). The tank was equipped with a series of overflows or feeders constructed of either oak pipes or hewn troughs, and was sealed outside with sticky clay. The tank was apparently of open top design, with a relatively shallow depth, and clear (latterly boarded) access down the side. It may have functioned as a water reservoir or perhaps even some form of 'lavoir' - a type of washing tank common in many French villages and towns and still occasionally used.

In terms of preservation of Roman timber-framed structures in London, the Poultry tank is second only to the sunken floored building found at the Courage Brewery site in Southwark, and so far as the woodworking is concerned there are some similarities between the two. The tank structure was recorded in considerable detail and a summary of the woodworking used is given below.

All the timber was oak, of which some may have been reused. The basic frame consisted of four rectangular, boxed heart hewn, oak plates cross halved over each other at the corners. Into these plates three double rebated posts (the fourth did not lie within the trench but can be conjectured) were stub tenoned at the corners of the structure to receive the side planking. Four intermediate posts were also tenoned into the plates. All the uprights were also through tenoned into the top plate, which only survived at the NE corner of the structure. Three evenly spaced joists were half-lap dovetailed into the E-W plates and the N-S plates were rebated to receive the edges of the E-W sawn oak plank bottom lining. Although the bottom planking was regularly nailed to the underlying joists, the other joints were not fastened.

A line of small mortices was cut after the framing of the tank, and ran across the bottom of the tank through the plank sheathing but not the joists. These mortices may have been associated with vertical supports for a beam that in turn may have supported planks running over it at 90 degrees. This work may have supported boards or a walkway above the tank.

It is clear that particular areas of the structure are deserving of further analysis. There was much regularity in the structure as built, and the planking of the bottom, was nearly all of the 'cubit-square-girth size' known from other Roman structures and documentary sources. The tool mark evidence survived in protected places, such as the chisel marks in the mortices of plate [51179] and the saw overcuts in the half lap dovetails in the same timber. It should be possible to carry out a 'from the tree to the town' reconstruction of all the woodworking

processes that went into the building of this structure, such as the mode of its prefabrication off site, and the nature of the original oaks used.

Timber lined wells (fig. 8)

Several wells with plank linings were found at Poultry, and these were built in a number of different styles, each of which provides some new woodworking information of note. Even one of the simple pile and plank lined wells at Poultry is of interest as its retaining piles were carefully chamfered radially cleft timbers of unknown origin (eg.[50053], perhaps the reused parts of wagons or carriages).

More elaborate plank lined wells included structure [4913]. This well had a planked bottom but the side planking was notched to let in water. The corners were jointed using a form of bridge joint, and the planking was some of the narrowest Roman sawn plank yet recorded (eg. plank [4913] which was about 30mm thick and 220mm wide. More typical of Roman planked well linings were the two single dovetailed plank lined structures found near the eastern end of the site. The 'inner' linings of these were also braced across the corners with simple lap jointed offcuts of oak spiked into place (eg. plank [51101]).

Timber lined drains

Several forms of Roman drain were found at Poultry, ranging from unlined ditches to a variety of types revetted with assorted planks set on edge and held in place with driven stakes. These forms of structure barely qualify as woodwork but may contain interesting reused material. Some of the more elaborate forms are noted below.

Planked box

Several examples of planked box drains were recorded at Poultry. All the planking used was of sawn oak, and in some cases the planking survived well enough for the sawing method to be recorded. Some of the drains used wide clasping saddle timbers, and others had dovetailed spreader elements (eg. [51125]). Wider insights into Roman carpentry practice can be drawn from these relatively humble structures.

Dugout drains

Relatively simple dugout drains were also found at Poultry. In one case an example of this type of drain was sufficiently well preserved for tool marks from its shaping to survive (eg. [51119]). It had clearly been hollowed with axes by 'scoring and splitting' in a similar way to that used for medieval dugout drains.

A reused dugout trough (fig. 9)

A dugout trough, also located in Open Area OA15R, had clearly seen long service and repairs during its life. Iron strips had been nailed to the trough and it had finally been reused as a silt trap in a more extensive drainage system [51129]. The trough had originally been hewn from half an oak log almost 0.7m wide and 2.05m long. The sides were extended upward with thin nailed cleft oak boards (almost identical to a medieval example recovered from the Fleet Valley). Although much of the surface of the trough was worn away, tool marks did survive in places. The more pointed end of the trough was probably the original felled end of the log, and had marks from an axe about 110mm wide. A small oak roundwood bung was found *in situ* in the base of the trough. The trough may originally have been used in a craft or industry. In its reused form a narrow channel was hewn through the ends for water pipes or inflow and outflow points.

Waterpipes

Several examples of waterpipes were found during the evaluation and main excavation phases at Poultry, and particularly at the eastern apex of the area, adjacent to the Walbrook stream. The best preserved section of pipe ([51133]) is typical, and had been hewn at about 16mm square, from a section of radially cleft oak, bored out to a 50mm bore. The connector was a short length of sharpened iron tube.

During the evaluation work a section of similar pipe [1121] was recovered, but which appeared to have had a double function. In its upper face two simple axe or adze cut 'laft' type joints were present, indicating that two timbers had been pegged into the joints at right angles, suggesting that it may have functioned both as a bearer for a board walk and as a waterpipe.

Fencing

Surviving Roman fencing has rarely been found on London area sites, except as reused timbers or lines of small stakes or post holes. These structures would have played an important role in the town and would also have made a strong impact on the appearance of the town, particularly where wattle fenced property boundaries crossed open areas. The Poultry project produced examples of two distinct types of fencing, both briefly described below.

Pale fencing

The bases of radially cleft oak pale fences were found at several points within the Poultry sequence. Typical survival was a plank on edge, to which thin oak pales about 180mm wide were nailed vertically, overlapping along their edges. Because they had decayed *in situ* the pales were short and were initially confused with shingles (eg. [50118] rail, and [50069]=6 pales). In other cases the fences had been pushed over in antiquity and perhaps were used as crude duckboards (eg. [51195]). Analysis may allow a reconstruction of the methods used to build these structures and possibly determine their height. It is not known whether these fences had the spear shaped terminals that have been found on more robust cleft oak pales from other Roman London sites. The thinness and regularity of the pales suggests that they must have been cleft using some form of 'fro' or similar tool and break, a highly refined combination of a hafted wedge and lever used with a simple holding device. Some of the woodworking debris found on the neighbouring site at 72-5 Cheapside (CID90) may well have been derived from pale making.

Wattle

The fragmentary remains of several Roman wattle fences were also recovered.

Pile and plank revetments

Several low pile and plank revetments excavated at Poultry were apparently design to support the edges of shallow terraces on the sloping ground on the south and east parts of the area, but the woodworking used in these structures was minimal.

Joinery or furniture

Joinery and furniture are very rarely found on Roman waterlogged sites but the Poultry project has produced several examples of this branch of woodworking, which relies heavily on the use of specialised planes and intricate joints.

A simple plank and ledge door (fig. 3)

A simple 3 plank and batten door was found reused to cover a damp hollow in a corridor in building B12R. Although simple, the door was carefully made from slow grown radially cleft oak boards which had been planed and then rebated with a plane on alternate faces

([18213]). The boards were nailed with turned iron nails to neatly chamfered oak battens. Unfortunately no trace of the hinges or any lock were found. The door may be the most complete known from Britain. Several classical authors record the need to season timber for joinery work, and although radially faced oak is a stable material some seasoning must have taken place before the door was nailed together.

A burnt joined chest base (fig. 10)

Another rare find was the base of an elaborately joined chest. The chest base was about 660mm long by 400mm wide and survived to a height of 120mm. All of the timber used was oak, and this must have been carefully seasoned (see [3855]). The chest was worked in several different ways but in a somewhat similar manner to the way that oak was used in late medieval joinery. The panels of the base were radially cleft and planed, with the edges planed to a sloping rebate, and edges and ends planed to a bevel. The edges of the chest were made from planed sawn oak about 25mm thick, and a groove had been plough planed near the lower edge to receive the base panels. In one case the edge planking had clearly been widened by edge doweling it to another piece of plank. Finally the corners of the sides were joined with dovetails finishing in a mitre. The chest is the most elaborate piece of Roman joinery known from recent excavations in London and possibly from Britain, and may have been used for the storage of valued possessions or papers. The quality of the workmanship indicates that it would have been virtually watertight.

Treenwork

Wooden household items from Poultry included rare vessels and tools, and three of these are briefly discussed below.

Cleft oak dishes

Although many of the household vessels of Roman town dwellers were ceramic or metal, a proportion were made from wood, although the latter rarely survive. At Poultry the remains of 2 slightly charred and squashed oak dishes or platters were found (eg.<4323>). They had been carved out of sections of radially cleft oak about 45mm thick and cut to a sub-rectangular form about 550mm by 290mm. Although the dishes were worn and compressed a few toolmarks were still found.

An oak spade (fig. 11)

The broken lower half of an oak spade was found within a Roman roadside drain along the northern side of the Via Decumana (<3160>). The spade had been hewn from the whole width of half a fast grown oak log about 250mm in diameter, which surprisingly retained its sapwood. The tip of the spade was by an iron shoe which was nailed to it, and is all that normally survives of such tools. Some thick leather was apparently attached to the iron shoe and may have been part of a cowl over the tip of the blade. The tool may have resembled a more modern "mud scupit" and may have been used for clearing silt and semi-liquid mud from ditches. Some axe marks survived.

Imported softwood casks (figs. 11 and 12)

Parts of four articulated stave built casks of Roman date were found at Poultry. All had been reused as well linings. Other isolated fragments and fittings such as bungs were also recovered. Unlike amphora, wooden casks rarely survive in the archaeological record. They were clearly important to some trades, particularly the transport of wine in the northern part of the Empire. The quality of preservation of the Poultry casks was very high, and detailed recording of the material has taken place. As each cask was made up of 15 or more similar staves and hoops, not all of the elements have required recording. Following partial recording of the casks *in situ* all of the elements were lifted and washed, although it was not possible to retrieve much of the hooping. A selection of representative elements was then made, and

these were drawn in detail. Careful washing revealed several inscriptions on both the inside and out side of the staves and on the head piece of one of the casks ([51241]). Stamped inscriptions and other similar marks were recorded by 1:1 tracing and photography ([50592]).

The proportions of the casks and staves

The proportions of the best preserved casks such as [50592] indicate that the staves were about 1.96m long, often around 170mm wide, and 35mm thick. The proportions indicate that the casks would have been of a similar size and capacity as those found at Silchester and calculated to have contained about 240 gallon and weighed about 1 tonne.

The raw materials and tool marks (figs. 13 and 14)

Although the botanical identifications of the cask materials must await analysis, it is clear that they are imported softwood and are almost certainly either Silver Fir or Larch. Both of these trees are naturally central European montane species. All the timbers were radially cleft except for the probable head piece [51242], which had very clear saw marks. The parent trees were clearly tall straight grained wildwood trees and well over 300 years old, probably growing on the north slopes of the Alps.

The cleft blanks had been trimmed with axes worked along the grain, and some of these had blades as wide as 190mm, smaller than the medieval broad axe but much wider than any known to have been used in Roman carpentry. It is likely that the staves were bundled together at this point and some were marked on the side intended to become the inside face. The roughed out material may then have been taken by boat down to the Rhenish vineyards where coopers actually made up the casks.

The next stage of manufacture saw the rough staves trimmed, shaved on the outside, and planed along the butting edges. Once bent the ends would have been trimmed and the characteristic grooves for the heading cut with specialised tools. The bent roundwood (oak?) hoops would then have been fitted, apparently in 8 bands. The recorded sample of hoops differ from medieval examples in being thick 'D' section whole rods rather than halved rods. No clear evidence of how they were secured was found.

After constructing the cask warm resin (ID at analysis) was used to seal the inside of the cask and fill any minor gaps. This may also have resinated the wine subsequently put into the casks, perhaps being an early form of retsina. After filling, close fitting main bungs and breather hole bungs were driven. Stamps and branded inscriptions were added, possibly by the vinyard, the customs agent, or the shipper.

Other aspects of the Roman woodwork and treeland history

Other finds of Roman woodwork at Poultry include a probable wheel spoke. Woodworking debris from the site indicates that woodworking probably took place on or adjacent to the site at times. It is also noteworthy that some of the plate timbers had relict joints of strange form which are not understood but worthy of further study.

Cones of the stone pine were also found at Poultry. Other cones have come from Guildhall and include a bough, perhaps indicating that the trees were being grown locally, rather than the cones imported.

Analysis of the Roman assemblage, allied to dating which will result from the analysis of the dendrochronological and ID samples, is likely to broaden the understanding of what has been called the 'Dark Ages of Woodmanship'.

Saxo-Norman woodwork

A partially preserved sunken building

In general the quantity and quality of Saxo-Norman woodwork was disappointing compared to the Roman assemblage and to the Saxo-Norman assemblage recovered from the neighbouring site at 72-5 Cheapside. At Poultry the partially preserved remains of one sunken building (B1M) was found, and some of the post and plank timbers lining the sunken area survived (eg. post [5048]). These are broadly similar to examples from 72-5 Cheapside.

A reused boat plank

Fragments of a small section of thin radially cleft board found in building B1M may have been a piece of boat planking of 'New Fresh Wharf' type. Holes along the plank edge would have been used for fastening to the plank below, and a larger hole for a plank to frame fastening. The unusually large number of holes along the edge may imply re-fastening. The 9th-century, heartwood only, tree ring date may indicate that this is the earliest piece of Saxon boat material from the London area, although it is also possible that it was part of some other type of container.

A jointed dugout well lining (fig. 15)

The base of a unique form of early medieval timber well lining recorded at Poultry ([50002]) consisted of a hollowed cylinder of oak log about 0.8m diameter and surviving to about 0.8m in height, and surrounded by a crude ring of wattle work. After careful cleaning it became clear that the hollow cylinder of oak had been split into quarters in antiquity, and the inside split and chopped out. The edges had then been axe trimmed, fitted with pegs, and each quarter forced back together. The outside had had the bark and some of the sapwood trimmed off with an axe.

The tool marks survived particularly well and included the straight and distinctive marks of a very broad axe with a straight blade over 230mm wide. These marks are typical of the Saxo-Norman 'T' axe and so a Late-Saxon to Norman date was suggested, and correlates with the dating of pottery from the backfill of the well. The construction of the well is believed to be unique.

Other woodwork (fig. 16)

Other woodwork dating to the early medieval period included wattle pit linings, a wattle lane-side fence, and other reused or dumped timbers. A distinctive ash timber ([51087] of unknown function is of this period. It was clearly upright inside a building at one time, as shown by taper light burns on its surface. The function of the many holes in the timber remains obscure.

Later medieval woodwork

Very little woodwork of the later medieval period was found at Poultry, and what was recovered has little potential for further work. The range of woodwork included some wattle pit linings, masonry well support frames, piles from foundations, and a small amount of cooperage. A few summary comments are given below.

Well frames

The well frames included examples of jointed oak frames of square and rounded form ([50538] and [51102] are the best examples). An almost complete circular frame was quite elaborately jointed and pegged in typical medieval style.

Cooperage

The truncated remains of a small iron bound bucket were recovered in the backfill of a medieval well and may warrant further study ([51099]). As is typical of most medieval cooperage the staves were of radially cleft oak.