

WOODEN REMAINS AS AN ARCHAEOLOGICAL RESOURCE: SOME INSIGHTS FROM THE LONDON 'WETLANDS'

By Damian Goodburn

Although prehistoric worked wood has been excavated in recent years in London, it is the structural woodwork of the historic periods that has received most attention over the last 3 decades. Much of this work was initially lead by G. Milne and was concerned with waterfront installations such as quays, warehouses, river walls, jetties and bridges. Work on the nautical finds made along the upper estuary of the Thames was lead by P. Marsden until the late 1980s. Much of this earlier work has been published relatively fully and set standards for waterfront archaeology in historic port towns.

During the last 12 years much new material has been excavated and some new lines of inquiry taken up by this writer and coworkers at the Museum of London. Details of woodworking practice indicated by features such as toolmarks have been examined in detail and a series of new insights gained. Methods of timber conversion have been reconstructed in detail for several periods and also explored through experimental work. Aspects of early sawing technology are considered here. Attempts have also been made to reconstruct the raw materials used by early woodworkers and changes in the treescapes harvested are now becoming apparent. Some of these general trends are discussed below. All of this work has been greatly aided by the use of tree-ring studies not just for dating but also examining issues of trade and woodland management in timber supply.

The background to the study of historic worked wood in the London region

In a short paper such as this it is not possible to provide a detailed history of archaeological research on the buried waterlogged historic woodwork of the Greater London region although the key features of relevance can be summarized as follows. Whilst antiquarian and early archaeological observations alongside the upper Thames estuary in London occasionally contain useful details on the nature of waterlogged woodwork found there, it was not until the early 1970s that systematic recording was carried out. This phase of work on the waterfront installations of the Roman, Saxon and medieval port was carried out by Museum of London teams lead by G. Milne and others. Work such as that at medieval Trig Lane and the Roman quays at Pudding Lane, set standards for the excavation of waterfront sites in historic port towns (Milne and Milne 1982, Milne 1985). Dated examples of timber river and dock walls, jetties, bridges and parts of warehouse complexes were revealed and analysed. T. Brigham then brought together much of the evidence relating to the later Roman port installations (Brigham 1990). In the more strictly nautical sphere P. Marsden had

been investigating the remains of relatively intact hulked and wrecked vessels from the Roman and later periods. Latterly this work also included the study of fragmentary ship and boat timbers which are common finds in all waterfront zones (Marsden 1994,1996).

The key thrust of much of this early systematic work was to record the general structural layout of the carpentry and shipwrightry found and establish clear stratigraphic, topographic and historic contexts for their construction and use. Dating, initially by associated finds and later by tree-ring studies, was also a focus as were such issues as sea level change. Additionally, some detailed observations of evidence for early woodworking practices were occasionally made such as records of sequences of surviving 'carpenters marks' on medieval timber river walls or details of the forms of joints used in them. However, it was not until the late 1980s that evidence was sought which could reveal all the stages of woodworking from tree felling to construction, and the concept of the 'woodworking process' (a phrase coined by Steve Allen) was gradually developed to provide a framework for targeted recording of essential information in a methodical way.

New developments from the late 1980s in taping the resource of waterlogged woodwork in the London area

Developing recording procedures

From 1988 several changes took place in the approach used by the Museum of London towards the recording, study and sampling of excavated woodwork, largely under the wing of G. Milne. A new specialist post was created of Ancient Woodwork Specialist which this writer has filled on a full or part-time basis since that date. Revisions were made to the Archaeological Site Manual (Westman 1994) concerning the recording and sampling of woodwork found on excavations. The changes were broadly in line with those now promoted by the English Heritage Guidelines on Waterlogged wood (Brunning 1996). Introductory training sessions were set up both in the basic recording of waterlogged woodwork and approaches to sampling for tree-ring studies and species identification. Specialist guidance notes were also provided on particular aspects such as the recording and sampling of cooperage or wattle work. In practice, the Ancient Woodwork Specialist's role was to provide on-site advice from the early phases of larger excavations and assist with or carry out the recording of woodwork found, particularly the more complexly-worked or reused material exhibiting two or more phases of working. We were attempting 'preservation through record' as very little of the vast corpus of material could be kept by the Museum of London or other potential receiving bodies.

The role of serious archaeology-lead experiments in early woodworking

At the same time serious experiments in aspects of early woodworking were carried out in ancient woodland, mainly on the fringes of London. Working with green logs of oak and other native species in that environment, following the processes from the selection of standing trees through felling, bucking and conversion, helped to develop our understanding of how certain forms of trees were used in the past. The experimental work also helped us to visualize the original form of the parent logs, and sometimes the parent trees or even treescapes used by woodworkers in London's hinterland (Figure 1; Goodburn 1991a, 1992 etc). Here we were developing the pioneering work of O. Rackham in analysing timbers in standing buildings by combining detailed recording with practical

experience and more thorough approaches to tree-ring sampling and analysis (Rackham 1972, Goodburn 1991a). The tentative graphic reconstruction of parent trees in studies of early wood work is gradually being adopted by others including specialists working in the Severn Estuary region as for elements of the medieval Magor Pill 1 Boat (Nayling *et al.* 1998).

Experimental projects have included a reconstruction of an Anglo-Saxon dugout boat from the river Lea, experiments in Roman sawing methods and timber framing, controlled cleaving of large oak logs, hewing timbers in different period styles and early joint cutting (Figure 2). Many field archaeologists and students from London helped with these projects and gained new insights into technical features such as the recognition of tool marks as well as broader issues such as the human dimension of implied logistics and woodworking practice. A scale drawing of a log is one thing: the reality of a two tonne irregular green oak log is another. In this writer's opinion the importance of serious practical work with appropriate tools and materials for training field workers recording early woodwork can not be over estimated.

Changes in the treeland resources used by historic woodworkers in the London region: some trends in the evidence

It is not possible in a short review paper to provide detailed references to all the recorded structural woodwork exhibiting evidence of changes in the use of timber and wood through time nor to summarize other forms of evidence such as pollen analysis, and so several case studies must suffice. The first study to include a detailed reconstruction of the nature of the parent trees used for an ancient structure was that of a group of reused timbers from a framed building of the late first century AD (Goodburn 1991b). That study was greatly aided by a detailed tree-ring analysis by N. Nayling now such a major contributor to work in the Severn Estuary region. This work showed that old oak coppice was a likely source for the small logs used for the buildings studs and braces. Even clearer evidence of the use of this possibly surprising woodmanship practice, was found during detailed studies of the well-preserved timber framed sunken warehouse of the mid 2nd century AD from the Courage Brewery site in Southwark (Brigham and Goodburn *et al.*, 1995). Here the quality of the site records coupled with post-conservation recording and targeted tree-ring study

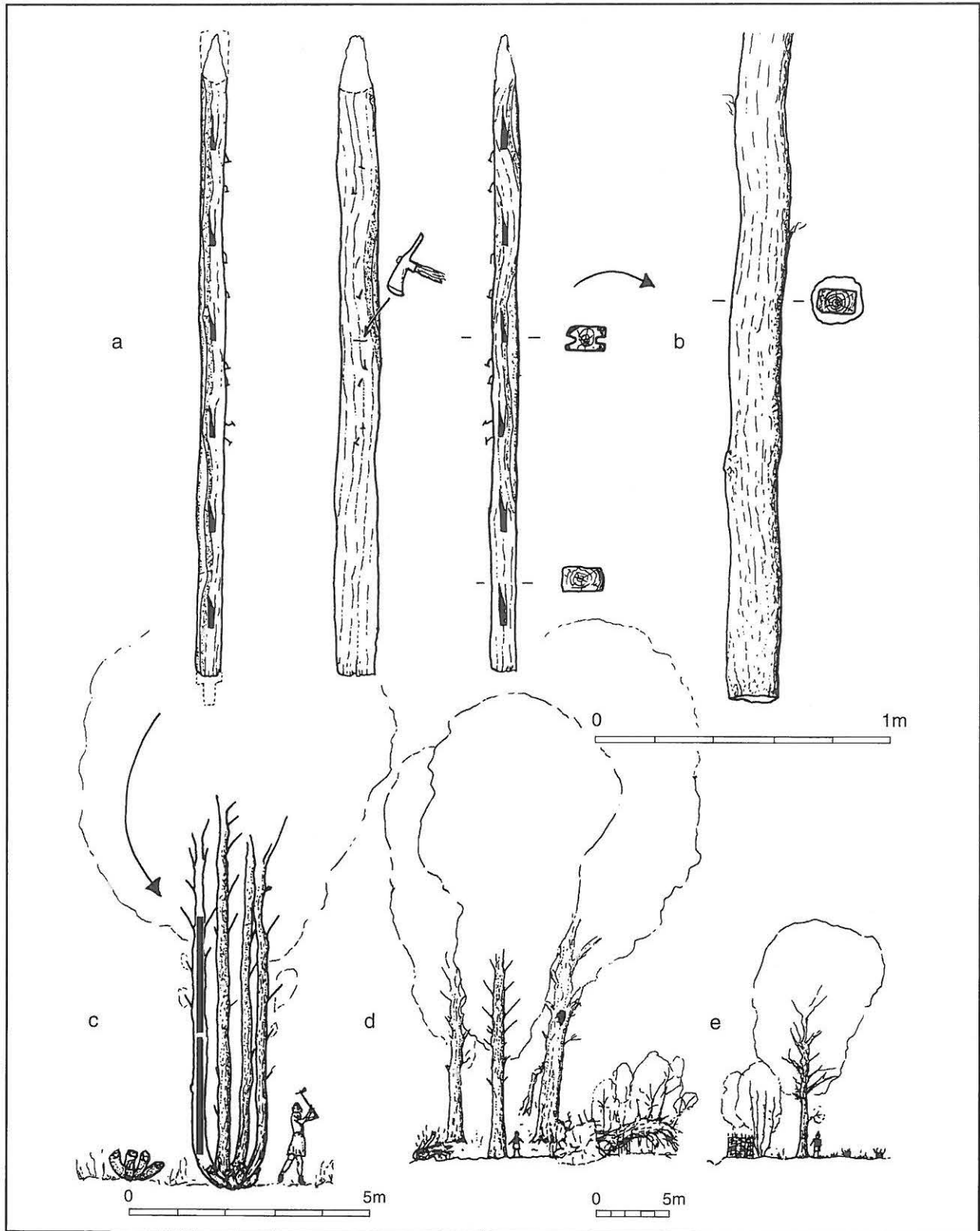


Figure 1: The step by step reconstruction of the parent tree(s) for a typical Roman London building timber. a) A virtually complete wall stud from a 1st century AD timber framed building reused as a pile (from Cannon Street Station). b) The reconstructed small, slightly crooked, fast-grown oak log from which the stud was hewn. c) The old oak coppice stool that was probably the parent-tree, as can still be seen in London, e.g. Barnet Wood, Bromley. d) Late Iron Age–Roman wildwood type oaks also used by Roman Londoners. e) A possible form of Roman managed woodland with coppiced underwood and moderate sized timber trees, probably common in the London hinterland from the 2nd century AD.

by I. Tyers enabled a particularly complete picture of the parent trees and likely treescapes used to be recreated (Figure 1 draws on this work). The small floor joists of the warehouse floor frame all appear to be derived from old oak coppice poles, whilst the floorboards and sills were cut from larger, moderately open grown oaks. By contrast, the massively constructed major Roman quays of baulk gridworks were often built out of very large, straight, old oaks which must have grown in dark wildwood-type conditions as well as some timbers deriving from more open managed landscapes.

Characteristics of wildwood-type trees reflected in the London waterlogged timbers

The concept of temperate ‘wildwood’ as a broad category of land with trees was developed by O. Rackham in the 1970s and further defined by G. Peterken more recently (Rackham 1976, 39, Peterken 1996). Peterken’s observation that temperate broad leafed wildwood-type woodland normally includes a considerable number of trees around 1m diameter at chest height and around 200

years or more old (Peterken 1996, 149) coincides neatly with this writer’s working hypothesis developed in about 1990. After examining several thousand waterlogged timbers from London excavations felled between the late 1st century AD and *c.* AD 1600 it appeared that there was a distinct category of oak timber being harvested at certain times and for certain purposes (Goodburn 1992, 118). The parent trees reconstructed for this category of timbers were typically *c.*0.9–1.2 m in diameter at chest height straight grained, and fairly slow growing being felled at around 180–250 years old. A qualification of Peterken’s rule of thumb for typical broadleafed wildwood concerns the oaks of the eastern USA wildwood-type woodland of the river flood plains, where the oaks (not totally dissimilar to those native in Britain) grow relatively quickly and rarely live much longer than *c.*200 years. Perhaps most of the London wildwood type oaks derive from similar floodplain woodlands where they would be particularly accessible to carriage by water? It is also clear that the ages attained by broad leafed trees in Britain varies considerably with latitude being a key factor, trees in the north generally



Figure 2: Archaeologists experimenting with early methods of timber conversion in ancient woodland in London (Barnet Wood, Bromley). Radially cleaving oak down to 1/32nd sections with wooden wedges and mauls, followed by trimming with axes similar to Roman examples. (Photo V. Fenwick).

growing slower and living longer than those in the south. As the evidence outside the London region is collected regional differences are likely to become more apparent.

An increasingly varied picture of Roman woodland in the SE emerges

In the last five years we have found that wildwood-type trees were also used to make small building stud timbers like those of coppice origin described above. In some groups of Roman building timbers a mixed origin in both small diameter fast grown trees from managed woodland and large wildwood oaks has been found, such as during the No1 Poultry excavations (Goodburn in prep.). It is clear that the large easily split wildwood oak logs were split radially into thick slices from which regular rectangular section building timbers, foundation piles and water pipes were shaped by further cleaving and hewing. The small young oak logs were simply hewn boxed heart as indicated in Figure 1. Hopefully the potential of this line of inquiry for creating quite subtle pictures of Roman and even late Iron Age cultural landscapes has been shown. Indeed, we can now show that the hinterland of Londinium was a complex mosaic of landscapes including areas of intensively managed woodland, open land trees and areas with dense wildwood-type conditions (Goodburn 1995). Little well-preserved, small roundwood has been excavated in Roman London but recently some wattle infill from a late 1st century timber framed building at No.1 Poultry was examined and found to have been mainly three year old hazel (L. Gray-Lees unpublished).

Timber trees reflecting an increasingly managed landscape

In the later Roman period there is some evidence of a decline in the age and size of trees used for heavy engineering such as quay building. This seems to suggest a shrinkage of the wildwood-type woodland and its conversion to more open frequently cut, managed woodland, and presumably pasture, although a few large old oaks were also still being used.

Timber trees reflecting a regrowth of wildwood type conditions during the Post-Roman period

It has now become a matter of standard procedure in the study of well-preserved waterlogged wood and timber found in the London region, to attempt some degree of reconstruction of the characteristics of trees used by the original woodworkers. For the sake of

contrast we might very briefly cite a typical example of a common class of Anglo-Saxon worked timber, a reused, radially cleft and hewn, building weatherboard. This board was cleft from a large, slow-grown, wildwood type oak well over 200 years old and around 1m at chest height (Figure 3). In general it is apparent that wildwood type conditions were again relatively commonplace in the London hinterland in the late Saxon and Norman periods as oak and sometimes beech timber of wildwood type is commonly found until the beginning of the 13th century. However, we also have clear evidence of the harvesting of a range of other types of treeland including coppice and areas of pollarded or shredded trees at the same time. The picture was clearly a complex one and the inevitable effect of cultural

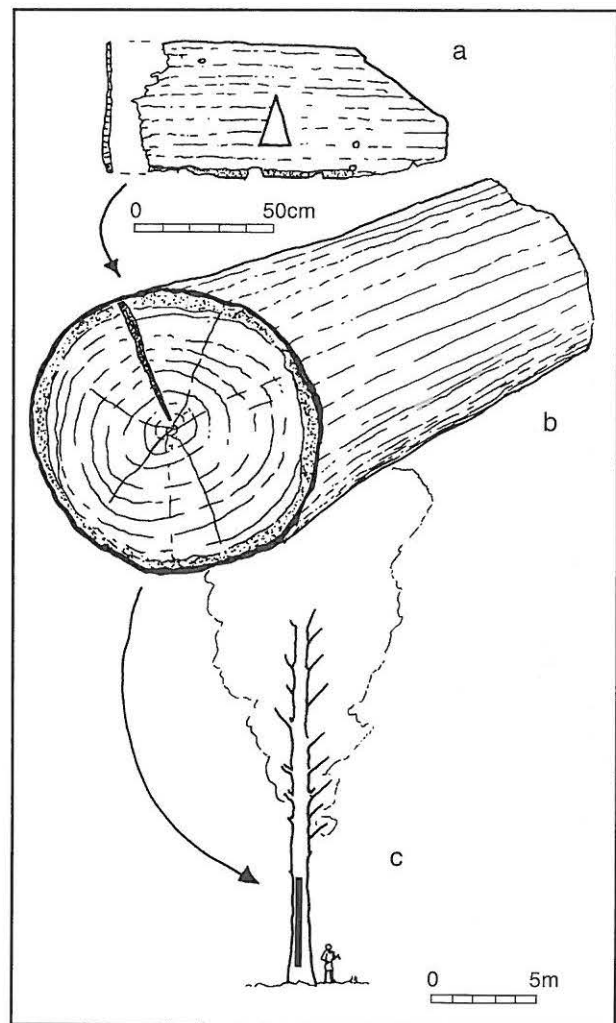


Figure 3: A slice of the Late-Saxon wildwood from the London hinterland.

a) A 10th century AD radially cleft oak weatherboard with a 'windeye' (from Bull Wharf, London. b) The c.1 m diameter, straight-grained, slow grown parent log necessary to make the board. c) The hypothetical, tall, straight wildwood oak over 250 years old from which the parent log was cut.

preferences for the use of particular species for structural timber is bound to distort any view reconstructed from the structural woodwork alone. It is hoped that targeted studies of other more traditional sources of evidence for landscape history such as pollen or charcoal analysis, will help to qualify the emerging picture of changes in early historic treeland derived from the study of structural woodwork.

The demise of wildwood type conditions in the London hinterland by c. 1250

After about AD 1200 there was a sharp decline in the deposition of timbers derived from large straight-grained old trees typical of wildwood conditions (Goodburn 1992, 1994) as the medieval carpenters of the London region used fast grown oaks derived from managed woodland and openland settings. Wildwood type material found after the mid 13th century, usually in the form of fine cleft boards, has been shown to be of foreign origin by tree-ring analysis. In the 13th century much of this wildwood oak took the form of radially cleft boards derived from the remaining Irish wildwood (e.g. Tyers unpublished). Samples from excavations and early standing building analysis in other parts of the country are also starting to track the use of the great temperate Irish wildwood in the 13th century (M. Worthington pers. comm., and I. Tyers pers. comm.). By the 14th century the focus of wildwood exploitation, leading to consumption in the London region, shifted to the great wildwoods of the South East Baltic lands as is now well known from both tree-rings studies and documentary sources. Further changes took place in the types of treeland used by large-scale woodworkers in London from the 16th century such as the vastly increased use of elm and oak of open land or hedgerow origin (Goodburn

1992). Currently fieldwork in the London region on the Thames foreshore and in adjacent urban 'wetlands' is providing much new information in this field for the post-medieval and prehistoric periods in particular. Hopefully in the next ten years a much fuller picture covering a longer period in time can be synthesized.

New light on aspects of early historic timber conversion practices

The accumulating archive in London of evidence for changes in the ways early and later historic woodworkers converted logs into useable timbers for structural work is vast. Changes in the precise methods used to hew beams for buildings and waterfront carpentry from Roman to medieval times can be distinguished (Goodburn 1992, 1997). Developments in the practice of the controlled cleaving of timber are also recorded. However, it is only relatively recently that detailed evidence for the methods used by early sawyers has been recorded and is beginning to be more clearly understood. A great number of sawing methods were in use all over the world until the mid 20th century other than the pit-sawing method so well known from England. Even in England several distinct early methods can now be reconstructed through the detailed analysis of archaeological evidence from London starting as early as the Roman period. Indeed, a crucial part of the revolution in woodworking that we know the Romans introduced to Britain was the use of large saws to cut along or across the grain of timber (ripping or cross-cut saws respectively: Goodburn 1991, 1995). Initially it was not realized just how varied the methods used during the Romano-British period in the London region were, but since 1995 it has become apparent that there were at least three

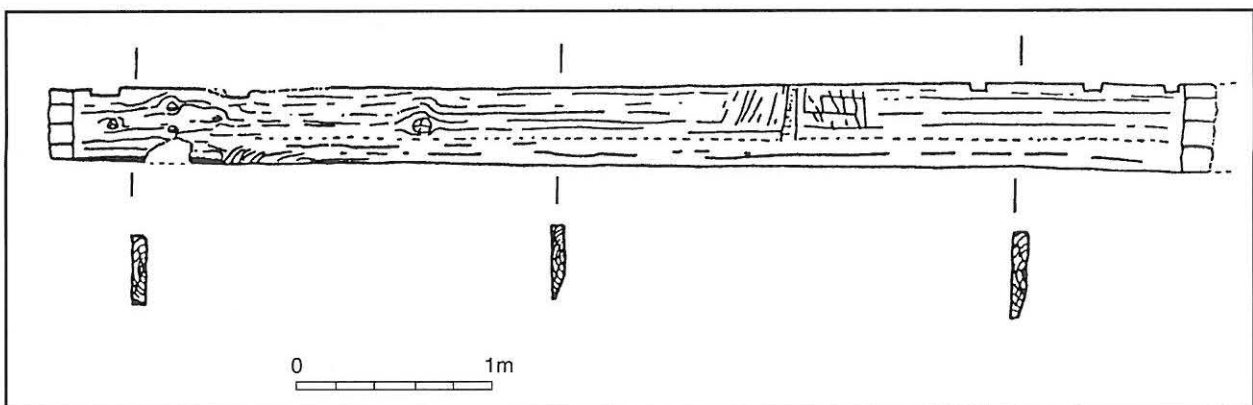


Figure 4: A virtually complete Roman 'double trestle sawn' drain plank of the standard cubit width (from the Fleet Valley Project, London).

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