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The wood charcoal from Pepper Hill, Northfleet, Kent

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1 INTRODUCTION

Forty samples were selected for full analysis from a range of funerary contexts from the Pepper Hill sites (ARC PHL97 and ARC NBR98). The aim of the charcoal analysis was to determine the taxonomic composition of cremation-related deposits to identify any patterns or changes in fuelwood use, both spatially and over time. Samples were specifically selected from different grave types and pyre sites; 5 bustum pits, 14 pyre sites (of which 2 were reused), 6 urned cremation and 10 unurned cremation burials were examined. Many of the burials were sampled in spits, in most cases, a single spit was analysed, but some spatial analysis was carried out on the bustum burials and pyre sites. The standard analytical methodology was applied. The results from samples previously assessed (Challinor 2000) and some additional assessment are included in this report.

2 RESULTS

The results of the analysis, by fragment count, are presented in Tables 1-4 (where r=presence of roundwood; h=presence of heartwood; s=presence of sapwood). Eleven taxa were positively identified. The taxonomic level of identification varied according to the biogeography and anatomy of the taxa. Preservation was variable, often according to the feature type; some of the bustum samples produced abundant, large fragments, while the charcoal from urns tended to be small and sparse. Consequently, it was not always possible to determine maturity. There were very few fragments of roundwood stems recovered from the samples. The fragments categorised as indeterminate were not identifiable because of poor preservation/size but it is likely that they represent additional specimens of taxa positively identified at the site.

2.1 Bustum pits (Table 1)

Table 1: Results of the charcoal analysis from bustum pit burials by fragment count

Phase		LIA/ER	ER	LIA/ER		ER		LIA/ER	
Feature number		**10490**	**10503**	**10587**		**10603**		**10622**	
Context number		10561	10502	10586	10593	10604	10604	10623	10629
Sample number		**75**	**64**	**96**	**108**	**320**	**320**	**82**	**85**
Spit number		-	-	7	-	1 & 2	3 & 4	-	-
Volume/Weight floated		7L	8L	8L	7L	3L	4.4kg	45L	1.4kg
% flot identified		3.12	0.78	12.5	0.78	100	100	25	50
Quercus sp.	oak	104hs	101hs	170h	105hs	57h	100h	194hs	125hs
Betula sp.	birch							1	
Fraxinus excelsior	ash					1			
Indeterminate		7	23	1r	4	2	1	1	
Total		**111**	**124**	**171**	**109**	**60**	**101**	**196**	**125**

The bustum burials were almost exclusively dominated by *Quercus* sp. (oak), of which most fragments (for which maturity could be determined) were from heartwood. Sapwood was only confirmed in a couple of samples, but several indeterminate fragments were from charred bark. Only 3 fragments, out of a total of 1158, were identified as other species; two were *Fraxinus excelsior* (ash) from burial 10603 and one was *Betula* sp. (birch) from 10622. Many of the fragments were highly vitrified, indicating burning at high temperatures. The non-analysed charcoal from other spit samples in the bustum burials were also assessed; without exception these samples were also dominated by oak.

2.2 Pyre sites (Table 2)

Samples from 14 pyre sites were examined. All of these were dominated by *Quercus* sp. (oak), with the exception of context 10868 from pit 10857, which produced a mixed assemblage of *Fraxinus excelsior* (ash), *Quercus* and *Acer campestre* (field maple). In general, the quantities of other taxa, which included *Acer* (maple), *Betula* sp. (birch), *Corylus avellana* (hazel), *Fraxinus excelsior* (ash), Maloideae (hawthorn, apple, pear etc) and *Prunus spinosa* (blackthorn) were low, which is consistent with the assessed samples from these features. This suggests that the non-oak taxa were not a significant component of the pyre structure or fuelwood. The fragments of *Corylus* in context 11824 from pit 11823 were more numerous and some of these were from narrow roundwood stems, which may have related to the pyre structure.

It is interesting to note, that while one might expect a mixed assemblage from a pyre site that may have resulted from several cremations, the samples from pyre sites known to have been reused (11703 and 11753) were almost entirely dominated by oak. Moreover, the assessment of other spits in these pits gave a consistent picture of fuelwood use.

Table 2: Results of the charcoal analysis from pyre sites (by fragment count)

Feature type		pyre site												reused pyre site	
Phase		R	ER	ER	ER	ER	E-MR	MR	LIA/ER	LIA/ER	LIA/ER	LIA/ER	R	ER	ER
Feature number		**1036**	**1012**	**11009**	**11182**	**11823**	**10954**	**10424**	**10596**	**10857**	**11504**	**11708**	**10699**	**11702**	**11755**
Context number		1013	1014	11010	11181	11824	10959	10425	10597	10868	11503	11709	10651	11703	11753
Sample number		**273**	**274**	**222**	**253**	**406**	**188**	**34**	**114**	**154**	**360**	**408**	**132**	**402**	**397**
Spit number			1			3		7							
Volume/Weight floated		15L	12L	12L	23L	10L	1.6kg	8L	12L	20L	20L	12L	34L	40L	20L
% flot identified		6.25	25	0.78	12.5	25	100	3.125	25	1.56	12.5	3.12	6.25	25	0.78
Quercus sp.	oak	113hs	180hs	85hs	193h	151rh	127hs	108hs	248h	35h	207h	123hs	152h	225hs	112hs
Corylus avellana	hazel					33r						2			
Betula sp.	birch					6									
Prunus spinosa	blackthorn										2				
Maloideae	hawthorn, apple etc.						2				7	3r			
Acer campestre	field maple					1				10					
Fraxinus excelsior	ash							4		57					1
Indeterminate		7		17	1	2		4		16	2	17	5	3	16
Total		**120**	**180**	**102**	**194**	**193**	**129**	**116**	**248**	**118**	**218**	**145**	**157**	**228**	**129**

2.3 Urned cremation burials (Table 3)

Samples from six urned burials were examined and in some cases it was necessary to amalgamate all of the spits to provide an adequate assemblage. The assemblages were dominated by *Quercus,* with rare fragments of Betulaceae (birch family), *Fagus* sp. (beech), *Fraxinus excelsior* (ash) and Maloideae (hawthorn, apple, pear etc.). One sample (burial 159) produced about 30% *Alnus glutinosa* (alder); the only confirmed identification of this species in all of the burial samples.

2.4 Unurned cremation burials (Table 4)

This type of burial produced the greatest variation in assemblages. *Quercus* remained a significant component (if not the dominant one) in most assemblages, but there tended to be both more taxa per feature and greater quantities of non-oak taxa than in the other burial types. Three burial pits were dominated by *Fraxinus excelsior* (ash) and four pits produced four or more taxa, including *Acer campestre* (field maple), *Betula* sp. (birch), *Corylus avellana* (hazel), Maloideae (hawthorn, apple, pear etc) and *Prunus* sp. (cherry type).

Table 3: Results of the charcoal analysis from urned burials (by fragment count

Phase		MR					R	MR
Feature number		**89**	**159**	**590**	**590**	**590**	**800**	**11638**
Context number		90	158	428	425	445	801	11639
Sample number		**7**	**34**	**111**	**129**	**138**	**325**	**379**
Spit number					ALL		ALL	
Volume/Weight floated		3L	1.3kg	5L	5.6kg	3.4kg	15L	11L
% flot identified		50	25	25	100	100	100	12.5
Fagus sp.	beech				1			
Quercus sp.	oak	168h	104hs	215h	88h	188h	67h	211h
Alnus glutinosa	alder		33					
Betulaceae	birch family	1					1	
Maloideae	hawthorn, apple etc.						2	
Fraxinus excelsior	ash						3	
Indeterminate		2	5	5	2	5	5	
Total		**171**	**142**	**220**	**91**	**193**	**78**	**211**

Table 4: Results of the charcoal analysis from unurned burials (by fragment count)

Phase		LIA/ER		ER							E-MR	R
Feature number		**10167**	**10555**	**135**	**10567**	**10870**	**10937**	**10999**	**11739**	**11801**	**744**	**11321**
Context number		10168	10556	134	10564	10869	10938	11000	11738	11728	741	11322
Sample number		**15**	**65**	**46**	**69**	**180**	**173**	**205**	**393**	**399**	**200**	**323**
Spit number		6	2			4			3A		1	
Volume/Weight floated		2.5L	8L	4L	40L	10L	14L	14L	1.5kg	15L	4L	34L
% flot identified		50	6.25	50	6.25	100	12.5	50	50	12.5	25	3.125
Quercus sp.	oak	37h	35	165rh	40hs	75hs	160	182h	113hs	193h	159h	106rh
Corylus avellana	hazel					3						
Betula sp.	birch				1							
Betulaceae	birch family									3		
Prunus sp.	cherry type	15r			1	17				12r		
Maloideae	hawthorn, apple etc.	5r		3	2					1		
Acer campestre	field maple				3	3						
Fraxinus excelsior	ash	78	95h		49	2		2				
Indeterminate		4r	8	9	14	4	4	4	4	7		1
Total		**139**	**138**	**177**	**110**	**104**	**164**	**188**	**117**	**216**	**159**	**107**

3 DISCUSSION

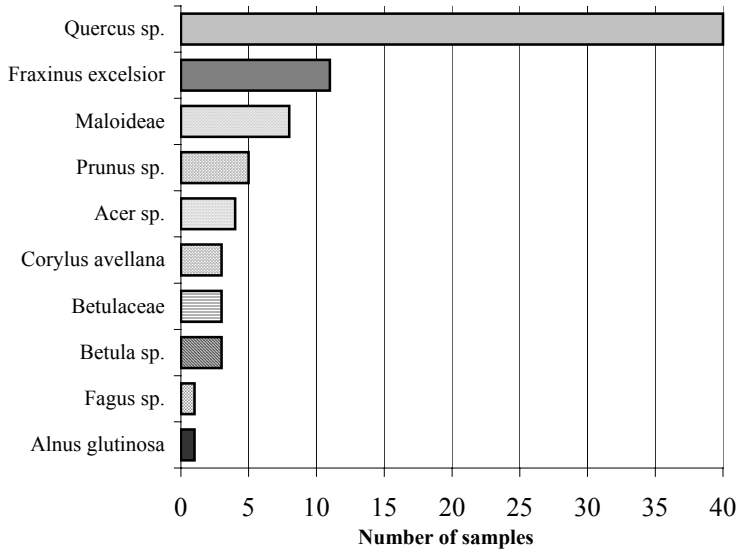
It is clearly demonstrated by Figure 1 that the main fuelwood used for cremation purposes at Pepper Hill was oak. This Figure is based upon ubiquity analysis, showing the number of samples in which a taxon appears, but analysis by fragment count is also overwhelmingly dominated by oak (5321 out of a total 5999 fragments). The fact that heartwood fragments are common indicates the use of mature trees and the presence of sapwood and bark suggests that, at least in some instances, the whole tree may have been felled for the cremation purpose. The use of oak as a fuelwood is not unusual at other sites (Smith 2001), particularly in the prehistoric period (Straker 1988; Thompson 1999), but there has been little publication on cremation cemeteries of the Roman period, or indeed on this scale.

3.1 Pyre structure and pyre goods

The abundance of oak or ash in cremation deposits, compared to other species, may relate to the pyre structure. If the timber from these trees were providing the supports in a central position they would be less likely to have been totally reduced to ash (Gale 1997). However, the examination of the spatial distribution of the pyre debris within the bustum burials and pyre sites did not demonstrate any significant patterns or use of other taxa. Of the analysed samples from graves containing the remains of funeral biers, three were composed of oak (10490, 10587 and 11702), which must have formed both the structure and the fuelwood, and three produced four or more other taxa (10567, 10870 and 11801). Burial 10567 comprised almost equal quantities of oak and ash, either or both of which could have formed the funeral bier. A recent study of Roman cremation burials in Essex showed that the taxa used for both the fuelwood and pyre structures were commonly oak and ash (Challinor, forthcoming).

The occasional fragments of other taxa (hawthorn-type, blackthorn/cherry) are likely to be from kindling, although it is also possible that some do not represent fuel and were included in the pyre either accidentally or as pyre goods. Certainly alder from urn 159 may have originated from a wooden artefact since this species does not burn well (Edlin 1949) but was used for domestic items (Pliny XIV.LXXXIV). Incidentally, Pliny (XVI.LXXVII) particularly comments on the use of birch for shields and one of the burials (10567) from which this taxon was recovered was an adult male burial (the other 2 were unsexed).

Figure 1: Charcoal taxa presence by number of samples



Given the nature of the funerary contexts, it is difficult to infer environmental reconstruction from the charcoal assemblage. However, it is worth highlighting that oak was widely available throughout the period of the cemetery's use. This, and the fact that in some cases mature trees seem to have been used, indicates that there was no pressure on woodland resources in Kent at this time. Since studies of other Roman sites also show a preponderance of oak in non-funerary contexts, such as the metalworking site at West Hawk Farm, Ashford (Challinor, forthcoming), it does not appear that oak was generally reserved for ritual purposes.

In conclusion, this report has demonstrated that there was consistent use of fuelwood for cremation purposes throughout the Roman period at Pepper Hill. This shows that the wood used was deliberately selected and that there were no apparent pressures on the availability of woodland resources.

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