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London and Continental Railways
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**Wood charcoal from Northumberland Bottom,
Southfleet, Kent**

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1 INTRODUCTION

Nine samples were selected for analysis from three of the Northumberland Bottom group sites (ARC 330 98; ARC WNB 98; ARC HRD 99). The aims of the charcoal analysis were to determine the taxonomic composition of deposits relating to cremation or industrial processes and to investigate the evidence for the selection of fuelwood over time. The selection of comparable samples was limited by the lack of identifiable charcoal in samples of appropriate date. Two cremation deposits (one late Iron Age and other undated) were examined, along with samples from three pits, (ranging from the early Iron Age to early Roman), a late Roman corn dryer and a Medieval oven. The standard analytical methodology was applied.

2 RESULTS

The results of the analysis, by fragment count, are presented in Table 1. Nine taxa were positively identified. The taxonomic level of identification varied according to the biogeography and anatomy of the taxa. Preservation was fair, although the fragments tended to be quite small, with a large proportion <4mm in transverse section and it was not always possible to determine maturity. 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.

Table 1: Results of the charcoal analysis

(r=presence of roundwood fragments; h=presence of heartwood fragments)

Sitecode		ARC 330 98		ARCWNB 98			ARCHRD 99			
Phase		LBA/ EIA	300BC- 50BC	50BC- 70BC	-	AD70- 120	AD200- 400	AD250- 400	1200- 1250	1200- 1250
Feature type		Pit	Pit	Cremat'n	Cremat'n	Pit	Corn dryer	Corn dryer	Oven	Oven
Feature number		156	147	232	2164	1035	229	229	202	202
Context number		149	264	518	2163	1036	218	219	184	187
Sample number		23	53	16	81	14	59	61	49	50
Volume floated		7	20	10	10	30	5	5	10	10
% flot identified		100	14	100	6.25	100	100	100	50	100
<i>Pinus</i> sp.	pine							1		
cf. <i>Clematis vitalba</i>	traveller's joy				2r					
<i>Fagus</i> sp.	beech								10	14
<i>Quercus</i> sp.	oak	73h	105h	90h	95h	20	26	55	6	10
<i>Corylus avellana</i> L.	hazel						88			8
<i>Corylus/Alnus</i>	hazel/alder								11r	
<i>Betula</i> sp.	birch						1			
<i>Prunus</i> sp.	blackthorn, cherry	4				54				
Maloideae	hawthorn,	2		1		4			64r	26r

Sitecode	ARC 330 98		ARCWNB 98			ARCHRD 99				
Phase	LBA/ EIA	300BC- 50BC	50BC- 70BC	-	AD70- 120	AD200- 400	AD250- 400	1200- 1250	1200- 1250	
Feature type	Pit	Pit	Cremat'n	Cremat'n	Pit	Corn dryer	Corn dryer	Oven	Oven	
Feature number	156	147	232	2164	1035	229	229	202	202	
Context number	149	264	518	2163	1036	218	219	184	187	
	apple, pear etc									
<i>Acer</i> sp.	maple							8	8	
Indeterminate		31	1	2	5	24	7	5	11	46
TOTAL		110	106	93	102	102	122	61	110	112

ARC 330 98

The two pit samples were dominated by oak, with reasonable quantities of heartwood present. Pit 156 (sample 23) also produced a few fragments of Maloideae (hawthorn type) and *Prunus* (blackthorn/cherry), which were probably used as kindling. The indeterminate category was quite high in this sample, as the charcoal was fragmented and had a tarry appearance, indicative of high temperatures.

ARC WNB 98

The two cremation samples were almost entirely composed of oak, again with a large component of heartwood. There was a single fragment of Maloideae in cremation 232 (sample 16) and 2 cf. *Clematis vitalba* (Traveller's joy) twigs in cremation 2164. The early Roman pit 1035, in contrast produced a mixed assemblage dominated by *Prunus* (probably *P. spinosa*, blackthorn, since the rays tended to be quite large), with lesser quantities of oak and Maloideae.

ARC HRD 99

Samples 59 and 61 were from two different locations within late Roman corn dryer 229; sample 61 was from the stoking pit, and sample 59 was from the interior hypocaust system. The stoking pit sample (61) was full of *Quercus* (oak) with a single fragment of *Pinus* (pine); sample 59 was dominated by *Corylus avellana* (hazel), although there was still a quantity of oak and a single fragment of *Betula* (birch).

Samples 49 and 50 were both from Medieval oven 202. They produced similar assemblages with a range of taxa, including *Fagus* (beech), *Quercus* (oak), *Acer* (maple) and large quantities of Maloideae.

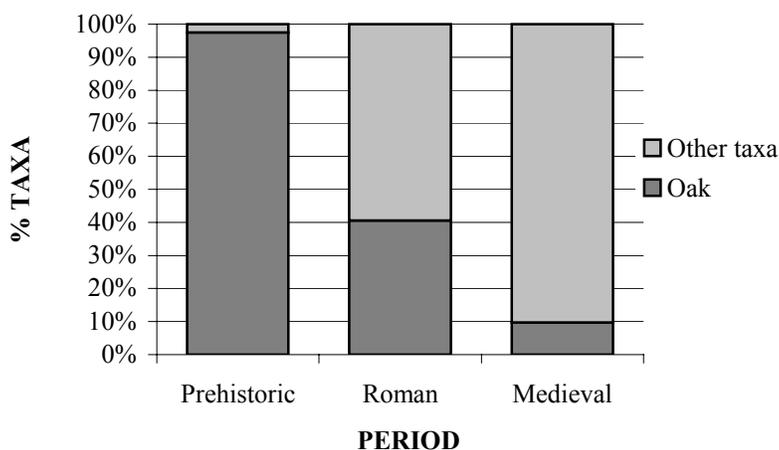
3 DISCUSSION

3.1 Prehistoric (and unphased cremation burial)

The cremation assemblages are consistent with those from other mid-late Iron Age/Roman cremation burials, given that they are dominated by a single taxon (e.g. Challinor forthcoming). The predominance of a single taxon in prehistoric cremation burials has been noted at various sites and taken as evidence of deliberate ritual selection (Thompson 1999; Straker 1988). Oak is the most common fuelwood used (Smith 2001), although other taxa are sometimes dominant, and often included in the assemblages as a minor component. Since *Clematis* is a climber, it is likely to have entered the cremation pyre attached to the oak tree which formed the main fuelwood. It is also possibly a remnant of rope used for tying bundles of faggots.

It is interesting to note that all of the prehistoric assemblages from Northumberland Bottom are dominated by oak (Figure 1). Indeed, the Iron Age pit 147 contained no other taxa. Assuming that these pit deposits are rubbish dumps from domestic fires, this suggests that the same fuelwood was selected for both ritual and domestic activities. It also indicates that woodland resources were plentiful; oak is a valuable wood for structural and artefactual purposes and would not have been wasted on domestic fires when supplies were low. Of course, it is not possible to be conclusive when discussing so few samples, but it is worth noting, since this pattern appears to change in later periods.

Figure 1: Presence of oak and non-oak taxa by period



3.2 Romano-British Period

There is a marked decrease in the dominance of oak in this period (Figure 1), which may relate to changes in woodland resources or management regimes. The corn dryer samples are notable in that the stoke-hole (context 219) and the interior of the hypocaust system (context 218) produced different assemblages. Context 219 is dominated by oak, while 218 contained a large component of hazel. Since there is no hazel in the stoke-hole sample, it is likely that these samples represent different burning events and that the stoke hole was cleaned out prior to the final firing episode. This latter point would also explain the paucity of charcoal in the stoking pit. It is likely that both oak and hazel were coppiced as part of a woodland management regime and consequently available for fuel use in the corn dryer, but it is not possible to determine this from the charcoal.

3.3 Medieval

The samples from the medieval oven 202 produced assemblages composed of beech, oak, hazel, hawthorn type and maple. The hawthorn type charcoal included many roundwood fragments. Although it is not possible to establish the use of coppiced wood from this charcoal, managed woodland is the most likely source for fuelwood in the Medieval period. Indeed, pressure on woodland resources meant that almost all woods were under management by local manorial or religious estates by AD1250 (Rackham 1996). Whether the function of the oven was domestic or industrial, the fuel was probably supplied from local mixed deciduous woodland.

3.4 Conclusion

The evidence for deliberate selection of wood for ritual purposes is inconclusive since all of the earlier samples are dominated by oak, with few other taxa recorded. There is a marked decrease in the use of oak over time, indicating increasing pressure on woodland resources.

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