Channel Tunnel Rail Link London and Continental Railways Oxford Wessex Archaeology Joint Venture

The wood charcoal from Leda Cottages, Westwell, Kent (ARC 430/83+200)

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1 INTRODUCTION

Five samples were selected for analysis from metalworking furnaces from the Leda Cottages site (ARC430/83+200/01). The features were all furnaces, broadly dated to the late Iron Age/early Roman period, with the exception of furnace 8014, for which no dating evidence was recovered. It is thought likely that this feature would have been contemporary with the others. The aims of the charcoal analysis were to determine the taxonomic composition of deposits relating to metalworking processes and to investigate the evidence for the selection of fuelwood. The standard analytical methodology was applied.

2 RESULTS

The results of the analysis, by fragment count, are presented in Table 1. Seven taxa were positively identified. The taxonomic level of identification varied according to the biogeography and anatomy of the taxa:

- Fagaceae: *Quercus* sp. (oak), tree, two native species not distinguishable anatomically.
- Betulaceae: Corylus avellana (hazel), shrub or small tree, sole native species. Alnus glutinosa (alder), tree, sole native species.
- Salicaceae: the genera *Salix* sp. (willow) and *Populus* sp. (poplar) are not distinguishable anatomically.
- Rosaceae: Maloideae, subfamily of various shrubs/small trees including *Pyrus* sp. (pear), *Malus* sp. (apple), *Sorbus* spp. (rowan/service/whitebeam) and *Crataegus* sp. (hawthorn), rarely distinguishable by anatomical characteristics.
- Rhamnaceae: *Rhamnus cathartica* (purging buckthorn), shrub, sole native species.
- Oleaceae: *Fraxinus excelsior* (ash), tree, sole native species.

Table 1: 1	Results of t	the charcoal	analysis	(r=roundwood;	<i>s</i> = <i>sapwood</i> ;	h=heartwood)
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Phase	Unphased	AD70-150	150BC-AD100			
Cut number	8014	8018	8021		8335	
Context number	8012	8017	8022	8023	8337	
Sample number	803	806	809	808	846	
Volume floated (litres)	40	3	30	2	15	
% flot identified	12.5	100	50	25	6.25	
<i>Quercus</i> sp.	oak	178h	89h	126h	180sh	2
Corylus avellana L.	hazel	-	-	3	4	-
Alnus glutinosa Gaertn.	alder	11	-	12		155r
Salicaceae	willow family	-	-	47	4	-
Maloideae	hawthorn, apple, pear etc	-	5	2	6	-
Rhamnus cathartica L.	buckthorn	-	-	-	-	2

Phase	Unphased	AD70-150	150BC-AD100			
Cut number	8014	8018	8021		8335	
Context number	8012	8017	8022	8023	8337	
Fraxinus excelsior L.	ash	-	-	-	-	1
Indeterminate		8	2	7	10	51
Total		197	96	197	204	211

Four of the samples were dominated by oak heartwood, with sapwood confirmed in only one sample (context 8023), though preservation was not always good enough to determine the maturity. The sample (846) from context 8337 was distinct from the others by the presence of a large quantity of alder, including several narrow roundwood fragments (<20mm in diameter). The preservation of the charcoal was generally good although the fragments tended to be quite small, with a large proportion <4mm in transverse section. The fragments categorised as indeterminate were not identifiable because of poor preservation but it is likely that they represent additional specimens of taxa positively identified at the site.

3 DISCUSSION

The dominance of oak heartwood in fuels associated with metalworking is consistent with both traditional methods of iron-working (Edlin 1949) and the archaeological evidence from other sites (Murphy 2001; Smith 2001). The prolonged high temperatures required for smelting would have necessitated the use of charcoal as fuel and oak provides a good quality charcoal, capable of achieving the high temperatures necessary. Although it is not possible to confirm from archaeological material whether charcoal or wood fuel was used, it is notable that both the Salicaceae (willow and poplar) and *Alnus* (alder) make much better charcoal than wood fuel. Traditional methods for making charcoal utilise shallow pits with layers of straw/grass or clamps of roundwood to shut out the air (Edlin 1949, 160), which may explain the presence of roundwood fragments in context 8337 (sample 846). This deposit is unusual, anyway, with a marked absence of the oak which characterises the other assemblages (Fig. 1).

Figure 1: Taxonomic composition of the charcoal samples (based upon fragment count)



The presence of alder indicates damp conditions, close to rivers/lakes; a preference shared by willow, although poplar is more wide-ranging in its choice of habitat. The occurrence of small quantities of other taxa (typical of scrub/hedgerows) may be explained by their use as an aid to ignition or as an accidental inclusion. Although there are very few comparative publications on the analysis of charcoal from metal-working deposits in Kent, most of the evidence from Iron Age/Roman sites in England suggests a dominance of oak, with a range of other, variable, taxa (e.g. Challinor forthcoming; Cleere & Crossley 1985, 37; Figueiral 1992, 189; Gale 1999, 378). In the analysis of charcoal from a metalworking pit at Southfleet (Campbell 1998, 37), it is suggested that a variety of wood fuels were used in metal-working. The charcoal from the furnaces at Leda Cottages corresponds with this general picture.

4 **REFERENCES**

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