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The wood charcoal from Beechbrook Wood, Hothfield, Kent

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1 INTRODUCTION

A total of 14 samples were selected from the Beechbrook Wood excavations for charcoal identification and analysis. The samples were taken from a number of different features within a multi-period landscape that encompassed early Bronze Age through to Romano-British archaeology. The contexts chosen for analysis consisted of: late Iron Age / early Romano-British hearths associated with metalworking and a possible charcoal manufacturing pit; a series of enclosure ditches from the mid-late Iron Age and early Bronze Age; a late Iron Age cremation deposit within a ditch; and a number of cremation deposits ranging from the late Bronze Age to the Roman period.

Charcoal was examined with the aid of a low powered binocular microscope typically at x10 to x20 magnification, and with a high magnification metallurgical microscope at x200 and x400. The texts of Schweingruber (1990) and Jane (1970) were used as reference material for taxon identification. Plant nomenclature used in the text follows Stace (1997).

2 RESULTS

A full list of the identification results from this site is provided in the database (CHA_PHL.xls in ADS 2006). This data was used to produce summary Table 1 and Figure 1, which will be discussed in following sections. The 14 samples produced 4 distinctive genera and 2 that could not be separated confidently, plus 2 subfamily groups. These are considered below:

Fagaceae: *Quercus* (oak) tree heartwood and softwood were distinguished in the larger pieces, with heartwood dominating. Occasional pieces displayed vitrification, whilst others were very crumbly, perhaps indicative of exposure to high temperatures and prolonged use in metalworking hearths.

Oleaceae: *Fraxinus* (ash) tree, native of woods, scrubs and hedgerows and often the commonest tree on damp or base-rich soil. As with *Quercus* above, many pieces were crumbly and some vitrification was in evidence. One >10mm fragment was twisted and possibly knotwood.

Fabaceae: *Ulex*/*Cytisus* (gorse / broom) shrubs, native on heath and grassland, open woods, waste ground and roadsides, preference for acidic soils. Differentiation based on wood anatomy is problematic.

Betulaceae: A small amount of *Alnus* (alder) and *Betula* (birch) were recognised, both native, often in damp woods and river edges. Birch is often on acid soils and heathland. *Corylus* (hazel) wood from shrubs or small trees. No roundwood pieces were recovered from the samples.

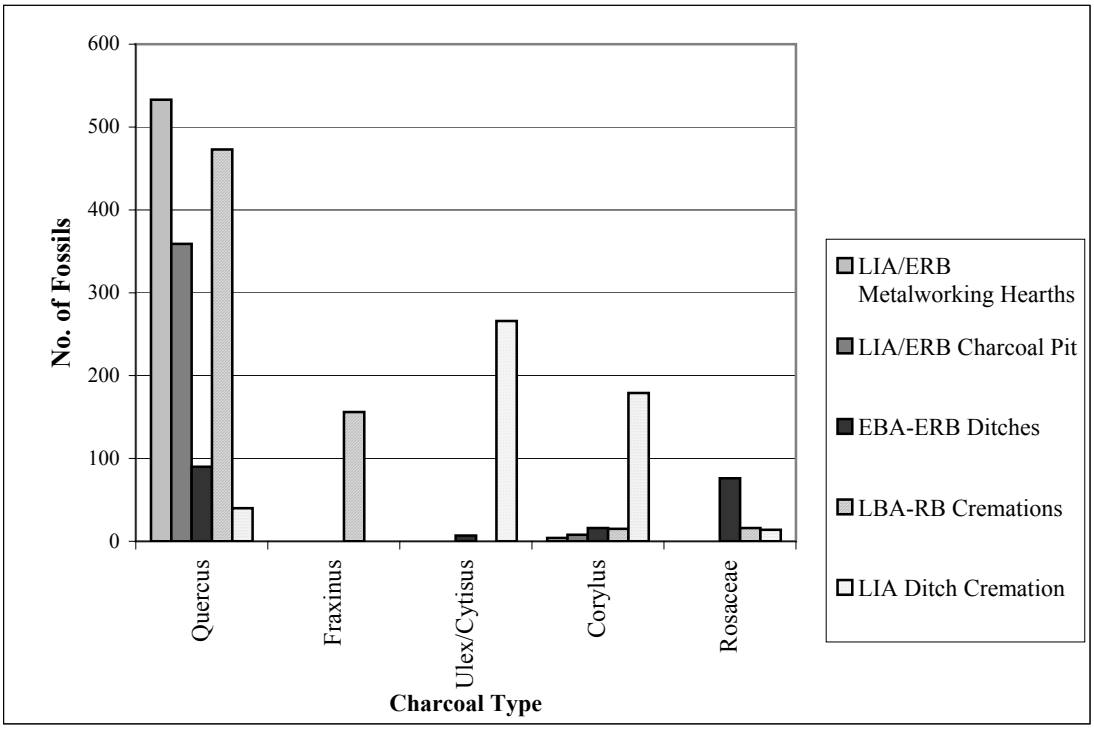
Roseaceae: Two Subfamilies of Roseaceae were present. Subfamily Pomoideae; shrubs or small trees, including *Pyrus* (pear), *Crataegus* (hawthorn), *Sorbus* (rowan / service /

whitebeam) and *Malus* (apple). Species rarely distinguishable based upon wood anatomy. Subfamily Prunoideae; shrubs or small trees of *Prunus* spp. (cherries), charcoal too poorly preserved to distinguish exact type. Where even the Subfamily was indistinct the charcoal has been listed as Rosaceae.

Table 1: Charcoal Identification and quantification by type of features and periods

	Period	**LIA / ERB**	**LIA / ERB**	**Multi-period EBA -ERB**	**Multi-period LBA-RB**	**LIA**
	Feature	**Metalworking Hearth**	**Charcoal Pit**	**Ditches**	**Cremations**	**Cremation in Ditch**
Charcoal Id.	**Common Name**					
Quercus	oak	533	359	90	473	40
Ulex / Cytisus	gorse / broom	0	0	7	0	266
Fraxinus	ash	0	0	0	156	0
Corylus	hazel	4	8	16	15	179
Alnus	alder	5	18	9	0	0
Betula	birch	0	0	0	0	5
cf. *Betula*	cf. birch	0	0	0	1	0
Salix / *Populus*	willow / poplar	0	0	10	0	0
Rosaceae		0	0	76	16	14
Indet.		0	0	197	8	57

Figure 1: Charcoal type by type of features and periods



3 DISCUSSION

The samples have been divided by period and structure type wherever possible in the following discussion.

3.1 Late Iron Age / early Romano-British metalworking hearths and charcoal pit

Samples: 205 (280); 211 (517); 218 (525); 220 (776):

These samples were dominated by oak charcoal, and this is clearly demonstrated in Fig. 1. The pit feature (525) was suggested as a charcoal manufacturing pit, and this is the most probable conclusion given the charcoal types recovered were identical to those found in the metalworking hearths. Three charcoal taxa were recovered from these deposits, primarily oak, but also alder and hazel. Oak was undoubtedly the main fuel used in the hearths, with branches and small twigs of hazel and alder probably used as kindling. Tylecote (1986) has indicated the importance of oak charcoal as a fuel resource, as it has a high calorific value, is resistant to crumbling, and can be transported over long distances without damage. However, it would appear that the charcoal was being manufactured on site at Beechbrook Wood, probably utilising locally available resources.

3.2 Charcoal from ditches

Early Bronze Age: sample 297 (1720)

Mid-late Iron Age: samples 382 (2342); 383 (2345); 384 (2346)

Late Iron Age / early Romano-British: sample 261 (277)

Ditch features from all periods produced a range of taxa, some of which may have been deposited as rubbish and some possibly having had a functional purpose for being there. General rubbish from activities around the settlement probably found its way into the ditches, such as sweepings from hearths and domestic activities. Charcoal types including hazel, oak, alder, gorse/broom and willow / poplar, were probably deposited in this way as rubbish. A large amount of Rosaceae types, including Prunoideae, were also recovered from these deposits, which may also be residual from domestic fuel.

3.3 Cremations

Late Bronze Age: sample 212 (550)

Late Iron Age: sample 281 (1479)

Romano-British: sample 274 (1346)

Undated: sample 272 (1293)

The cremation deposits produced a large amount of oak from the later period samples, and a similarly large amount of ash in the single late Bronze Age sample. Charcoal from these major trees dominated the cremation assemblages, indicating that they were the main source

of fuel used for cremation pyres. Other smaller, shrub or scrub woodland tree types, such as hazel and Rosaceae, were extremely rare in these deposits, and their trace occurrence may suggest accidental inclusion or use as kindling for large pyres constructed of oak or ash.

Late Iron Age cremation deposit in ditch

Sample: 380 (2210)

This single late Iron Age cremation was considered an important feature by the archaeologists and so has been singled out for separate discussion here. Gorse / broom charcoal formed a considerable element of this sample, with far lesser amounts of oak present than in the other cremations of this period analysed from Beechbrook Wood. Unusually, hazel also formed a large component of the cremation. Why these particular types should be chosen for this cremation is unclear, given that the other samples suggested that oak still formed a large component of the woodland resource at this time. The significant presence of hazel could be kindling, but is perhaps more indicative of the remains of a wicker structure, such as a bower onto which the corpse had been placed prior to cremation. It is not feasible to separate gorse from broom on the basis of wood anatomy alone (Schweingruber 1990), and both are regularly encountered in the south of England (Perring & Walters 1976). Nevertheless, it is still possible to consider the potential reasons for the incorporation of charcoal of either type into this cremation deposit. Gorse is an abundant shrub that burns with a very hot flame, and it could easily have been employed as an available source of fuel. Gorse type charcoal has been associated with Roman bread ovens (eg Miller & Ramsay forthcoming) as it burns with a high temperature and ashes well leaving little charcoal residue. Broom lacks the spiny thorns of gorse, but has been attributed magical properties, and, if taken in large doses, the seeds can cause hallucinations (Mabey 1996). Both shrubs have also been associated with the onset of Spring and re-birth in folklore, so perhaps the inclusion of either of them into a cremation deposit could have been ritual rather than merely accidental.

4 SUMMARY AND OVERVIEW

The 14 samples from Beechbrook Wood were dominated by oak charcoal, indicating the importance of this tree type throughout the late Iron Age and Roman periods as a fuel for industrial activities. In earlier periods and continuing into the Roman period, oak was also utilised as the ideal fuel for cremation pyres, and this was seen in 3 out of 5 cremation samples from the site. The late Bronze Age cremation was predominantly fuelled by ash, indicating the presence of this tree type in the local environment and the exploitation of it as a fuel source. The other cremation deposit, from the late Iron Age, was a little unusual in terms of charcoal content, in that although oak was present, it was not the only pyre fuel utilised. In this cremation, it is strongly suggested that either gorse or broom was cut for fuel. However,

whether this was purely as additional fuel for the pyre, resultant from convenience or burning properties, or due to the supposed magical properties attributed to them should not be overlooked, especially given their presence in a cremation context.

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