CTRL WOOD CHARCOAL SCHEME-WIDE REPORT

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INTRODUCTION

This scheme-wide report includes the data and interpretation from ten of the main CTRL excavation groups. Seven of these are based on the full analysis of the charcoal for which there are separate reports (Beechbrook Wood, Leda Cottages, Northumberland Bottom, Pepper Hill, Saltwood Tunnel, Thurnham Roman Villa and White Horse Stone). The results from three sites which were assessed, but not analysed, are also included where relevant (Boys Hall Balancing Pond, Chapel Mill, Tutt Hill).

AIMS

The main aim of the charcoal analysis was to examine context-related variation; in particular to identify the selection of wood for fuel in association with funerary activities and metal-working/industrial activities. Temporal comparison, to examine changes in fuelwood selection over time, was also considered but, in practice this was limited by the availability of suitable features/samples. Assessing the contribution of tree & shrub communities to the landscape and changes in the composition and availability of woodland resources has not been included in the main aims of the CTRL project. However, anything of particular interest/significance is noted in this report.

METHODOLOGY

The standard analytical methodology is given below, as followed by the authors of the individual site reports. Additional assistance with the identifications of the charcoal is gratefully acknowledged; in particular by Denise Druce (Oxford Archaeology North) who identified material from several sites, and Robert Francis (Bradford University), who assisted with Pepper Hill.

Identification: Fragments were fractured and sorted into groups based on the anatomical features observed in transverse section at X10 and X20 magnification. Representative fragments from each group were then selected for further examination, in all three anatomical sections, using a high magnification microscope up to X400. Identifications were made with reference to appropriate identification keys and reference material. The maturity of the wood was noted, where possible.

Quantification: Following Keepax's (1988) recommendation - that to recover the full range of taxa present in a given sample a minimum of 100 fragments per sample should be examined - priority was given to samples listed in the assessment as containing a minimum of 100 fragments of identifiable size (i.e. >2mm). Samples of this size were not always present and so samples containing 51-100 fragments were chosen where necessary. In some instances individual samples were small but judged to be worth examining because of the specific information they might provide. Rich samples (with significantly more than 100 fragments) were sub-sampled using a riffle box and the sub-samples were then divided into fractions using a set of sieves (>10mm; >4mm and >2mm) and all fragments identified.

Cremation spits: The assessments generally found that there were no significant differences in taxonomic composition between different spits. Samples from the same context, therefore, were either amalgamated (to produce enough material) or a single sample was chosen for analysis. For Pepper Hill, some spits were analysed separately to verify the accuracy of the assessment results.

Tables and graphs: Classification and nomenclature follow Stace (1997). Combined methods of ubiquity or presence analysis and quantification by fragment count have been used in the reports. It is acknowledged that there are differential rates of fragmentation in charcoal and that quantification by fragment count is not always reliable, but this method has been used to demonstrate relationships between individual taxa.

DISCUSSION

METALWORKING ACTIVITIES

Fifteen samples associated with metalworking activities were examined from furnaces, hearths and pits. Most of these were from Leda Cottages, Beechbrook Wood and White Horse Stone and were dated to the Iron Age and Late Iron Age/Roman periods. A single Late Roman metalworking hearth from Thurnham was also analysed.

It is clear that all features associated with metalworking are dominated by oak (*Quercus* sp.), with lesser quantities of other taxa (Figure 1). The only individual assemblage to differ from this trend was from a furnace at Leda Cottages which was dominated by alder (*Alnus glutinosa*) charcoal. There does not appear to be an explanation for this in terms of function or taxa availability, but alder does make a reasonable fuel as charcoal. Certainly both iron smelting and smithing would have required the use of charcoal as fuel and there is evidence from Beechbrook Wood that one of the pits was utilised for charcoal-making, with oak forming the main component. 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) and it is likely that the origin of the smaller amounts of other non-oak taxa in the metalworking samples are from such clamps of roundwood or kindling. The choice of kindling/roundwood seems to vary from sample to sample but the range of taxa is often the same between the different sites.

There are no discernible differences in the fuelwood selection for iron smelting activities (e.g. Leda Cottages, Beechbrook Wood) and smithing (Thurnham), nor indeed between the Iron Age and Roman periods. Oak would certainly have provided good quality charcoal, capable of achieving the high temperatures necessary for iron-working, and the industrial samples from the CTRL sites are consistent with the picture from other metalworking sites (e.g. Campbell 1998, 37; Cleere & Crossley 1985, 37; Figueiral 1992, 189; Gale 1999, 378). Interestingly, the Roman site of West Hawk Farm in Ashford (Challinor, forthcoming 1) produced almost the exact same range of species in the metalworking samples as those recovered from the Leda Cottages furnaces.

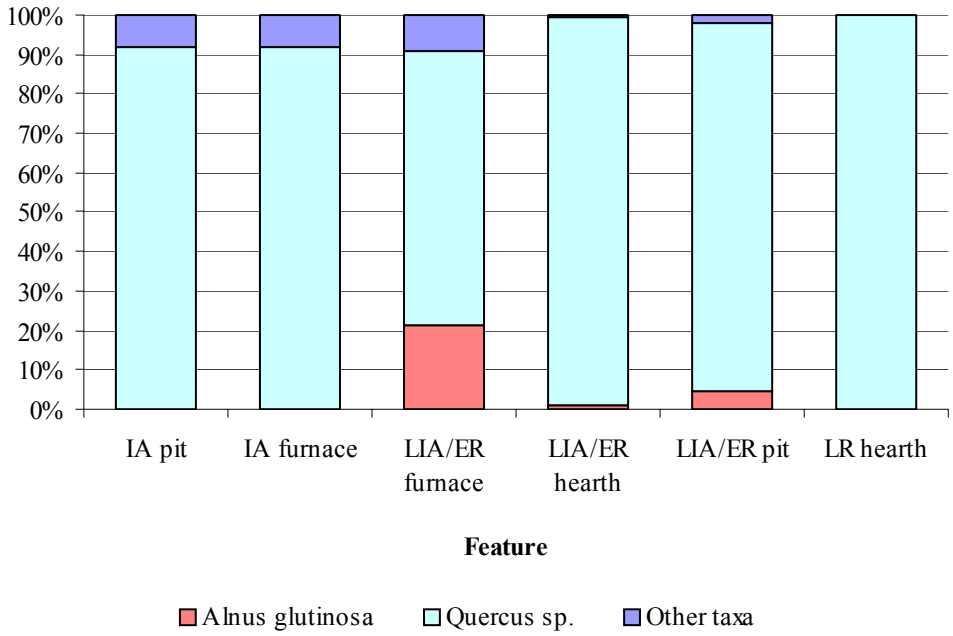

Figure 1: Taxonomic composition of charcoal samples from metalworking features

FUNERARY ACTIVITIES

The charcoals from three Iron Age inhumation burials from White Horse stone were examined. Oak, hazel and blackthorn were all represented in the samples but the quantities of charcoal were very low so it is difficult to make any comments on the likely composition of the associated fires. In any case, the provenance of the material is not certain - the charcoal could have originated from feasting activities associated with the burials, or from cremations. Samples from 56 features associated with cremation practices from a range of periods were analysed and the following discussion is based upon these, and the assessment, results.

Selection of fuelwood

Of the 56 cremation burials and related deposits analysed, 51 were dominated by a single taxon, which comprised more than 70% of the assemblage (Table *; predominant taxa are highlighted in bold). This is a strikingly high figure and notable also that this trend is consistent from the Late Bronze Age through to the Saxon period. Previous research on the charcoal from prehistoric cremation burials has indicated that such assemblages tend to be dominated by a single taxon and this has been attributed to ritual practices - even the use of a single tree to cremate one body (Thompson 1999). It is apparent, though, that the choice of tree can vary - it is commonly oak or ash but not always. Certainly, oak and ash have excellent burning properties and would provide the heat required for cremation purposes.

The single Saxon burial at Saltwood Tunnel is unusual in that 100% of the assemblage was alder, which does not make a good fuelwood (Edlin 1949). However, it does make a better charcoal fuel, and it is possible that this was used in the Saxon cremation. Interestingly, there are examples of charcoal being used in inhumation burials in the Saxon period, probably for a combination of religious and practical reasons (Challinor 2001). There may have been some similar significance in the use

of charcoal for cremations, but it is also possible that the use of alder at Saltwood reflects a reduction in the availability of oak resources by this period. The horse burial from White Horse Stone, which also dated to this period, did contain oak charcoal (with hazel and *Prunus*), but the quantities were quite small. In the absence of any further samples, the evidence is not definitive.

It is difficult to assess the significance of the few samples not dominated by a single taxon. They all date to the late Iron Age or Early Roman period, which might suggest pressure on woodland resources at this time, but for the numerous other burials dating to this period which were dominated by oak (Table *). The quantity of *Ulex/Cytisus* (gorse/broom) charcoal from the Late Iron Age cremation burial from Beechbrook Wood (2150) is worthy of mention. Both gorse and broom make reasonable fuelwoods and are known to have been used as such, particularly in bread ovens and when other woodland species are scarce (Gale and Cutler 2000; Mabey 1997). Since there is no evidence from the CTRL sites for any scarcity of woodland resources in Kent at this time, the use of gorse or broom in this cremation is something of an anomaly. Furthermore, the Iron Age charcoal assemblages (mostly from White Horse Stone pit deposits) which might be ascribed to a domestic source did not contain gorse or broom and do in fact also contain reasonable quantities of oak and ash.

Pyre construction

Recent experimental evidence for pyre construction indicates that an effective pyre structure would be of large logs infilled with brushwood to aid ignition and allow the circulation of air (McKinley 1994, 82). Ethnographic and historical sources indicate that a similar structure is used, regardless of geographical and temporal differences (McKinley 1997, 132). The abundance of oak and ash in the CTRL samples 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 fire ash (Gale 1997). However, the examination of the spatial distribution of the pyre debris within the different burial types at Pepper Hill did not demonstrate any significant patterns or use of other taxa. Consequently, even if large logs of oak and ash were used for the pyre construction, these species were also used for the primary fuel. 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 2).

Nevertheless, the frequency of scrub/hedgerow species in the cremation samples may also relate to the pyre structure, as members of the Maloideae and *Prunus* are ideal for kindling fires and using as brushwood packing. More than half of the analysed samples from CTRL contained some scrub/hedgerow type species which were found in much lesser quantities than the main fuelwood. However, the evidence from these sites clearly indicates that, in some of the prehistoric cremation pyres, Maloideae and *Prunus* wood was being used for the main pyre structure, not just as kindling.

Ritual selection

Since the choice of fuelwood for funerary purposes is unlikely to be due to chance, it is significant that most of the pyres were dominated by a single taxon. The fact that this pattern is repeated throughout all the periods represented in the CTRL sites, might suggest that the selection of fuelwood for cremation purposes is very much based upon practical considerations - the need for a high heat to cremate a human

body effectively and the need for an adequate structure to support the body on the pyre - rather than ritual ones. However, the dominance of other species (not oak or ash) in three of the Late Bronze Age and Late Iron Age samples is worthy of consideration since these species also form the primary fuelwood for prehistoric cremations at other sites in Southern Britain (e.g. Challinor forthcoming 3; Thompson 1999; Jones 1978). Moreover, the Bronze Age samples from Tutt Hill and the Late Iron Age samples from Chapel Mill, which were assessed previously, also exhibit a similar pattern; four cremation pits appeared to be dominated by oak or ash, while three were dominated by other species.

The burning properties of the Maloideae and *Prunus* would depend upon which species was selected but they are all moderately dense grained wood which make a reasonable fuel in enough quantity. It does seem a strange choice, however, when one considers that physical difficulties in felling a thorny hedgerow tree like *Crataegus* (hawthorn) or *Prunus spinosa* (blackthorn), particularly when the quantity of wood required is taken into account. At least in the Bronze Age it has been suggested that the significance of these species may relate to the fact that they provided vital foods (e.g. sloe, apple, pear, hazelnuts etc) or that the pleasant aroma when burning some of these logs (in particular apple and pear) was important in cremation rituals (Challinor forthcoming 3).

Pyre goods

The occasional fragments of other taxa 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, within the Roman cremations from Pepper Hill the only instance of alder (from urn 159) may have originated from a wooden artefact since, as commented above, this species does not burn well and was known to be 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). Of course, the presence of wooden pyre goods cannot be proven, but the possiblity for this as a provenance for the charcoal cannot be ruled out.

Conclusion

Almost all of the cremation deposits - whether urned, unurned, bustum burials or redeposited pyre debris - were dominated by a single taxon, throughout all the periods represented. This is notable different from the assemblages from domestic sources for which a wider range of taxa were utilised (on average a domestic sample produced double the number of taxa than a cremation deposit). Usually oak and occasionally ash are the dominant species. The use of other species in the prehistoric period may relate to ritual beliefs rather than purely practical considerations. Until the Saxon period (for which the evidence is not conclusive anyway), there is no indication that there were any restrictions on woodland resources.

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