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The wood charcoal from Thurnham Roman Villa, Kent (ARC THM 98)

by Dana Challinor

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1 INTRODUCTION

Five samples were selected for charcoal analysis from Thurnham Roman Villa. The aims of the analysis were to examine the selection of different woodland species for use in industrial processes, such as metalworking, and to compare this with wood utilisation in domestic and structural activities. In addition to samples from the metalworking room (20000) within the villa, the charcoal-rich fills of two domestic ovens (20036 and 15280), the corndrier 10340 and a ditch deposit containing burnt structural timbers were examined. During the excavation, multiple samples were taken from some features (e.g. the corndrier and metalworking room) to allow spatial analysis, but the assessment indicated that the charcoal assemblages tended to be similar in character. Consequently, only one sample from these features has been analysed in full, but the assessment results from other relevant samples are included in this report (Pelling 2001). 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. The preservation of the charcoal was generally very good. Fragments categorised as indeterminate were not identifiable because of size and/or distorted anatomy (e.g. vitrification due to high temperatures) but it is likely that they represent additional specimens of taxa positively identified.

2.1 Ditch 20400

Sample 10368 was selected for analysis as the deposit included charred timbers, suggesting that burnt structural remains had been dumped into the ditch in the final proto-villa phase. The flot contained abundant wood charcoal and only a small fraction of the flot was actually examined. 191 fragments of *Quercus* (oak), were identified. Most of the fragments that were large enough to determine maturity were heartwood, although a few sapwood fragments were also noted. No other taxa were present. Other samples from this ditch (10380, 10381, 10383) were also, according to the assessment, dominated by oak, which is clearly the wood used for the structure.

2.2 Oven 15280

This oven was located in the aisled building and sample 10414 from the fuel rake-out debris was analysed. The assemblage was mixed; with *Quercus* and *Fraxinus* (ash) forming the main fuel, and small quantities of other taxa, *Prunus spinosa* (blackthorn) and *Betula* sp. (birch).

The identification of *P. spinosa* was made on the basis of the average width and height of the multiseriate rays. Several fragments of roundwood were noted.

2.3 Metalworking hearth (room 20000)

The sample analysed (10276) was from the primary charcoal fill of a metalworking hearth. The assemblage was composed entirely of oak, predominately heartwood. Other samples from this room also appear to have been dominated by oak, but there were also occasional fragments of other taxa, such as Maloideae (hawthorn type) and *Corylus* (hazel) which were presumably used as kindling.

2.4 Oven 20036

Sample 10342 represents the fuel remains from the *in situ* burning in this oven. The assemblage was very mixed; although oak remains the primary fuel, five other taxa were identified, including Salicaceae (willow/poplar), *Acer* (maple) and *Prunus* cf. *avium* (wild cherry). *P. avium* and *P. padus* (bird cherry) can be difficult to distinguish anatomically, although the charcoal from this sample has been tentatively identified as *P.* cf. *avium* on the basis of average ray width. The native status of *P. avium* is uncertain and it may be a Roman introduction to Britain (see discussion in Moffet *et al.* 1989).

2.5 Corndrier 10340

Sample 10030 was taken from the hearth area of the southern flue of the structure and probably represents the fuel debris. A range of taxa were identified, with large quantities of *Fraxinus*, Maloideae (hawthorn, apple, pear etc) and *Quercus* and small amounts of *Acer* (maple) and *Corylus avellana* (hazel). Many of the fragments were roundwood, although the pieces were not entire and no bark edges were noted. Generally, the corndrier samples were not rich in charcoal and the assessment does not note any additional taxa.

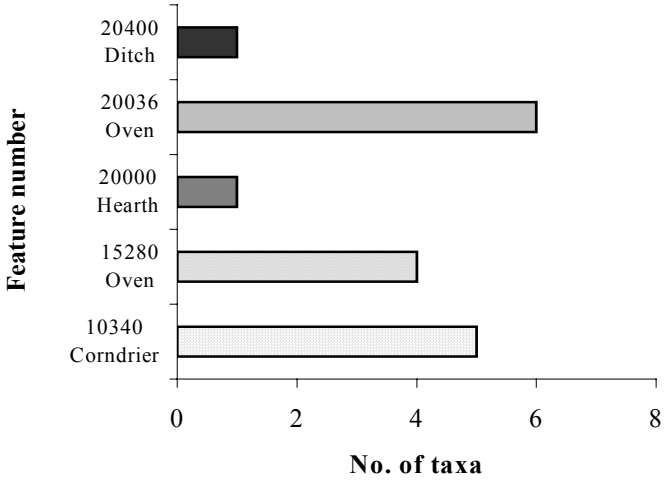
Table 1: Results of the charcoal analysis (r=roundwood; s=sapwood; h=heartwood)

Feature type		**Ditch**	**Oven**	**Hearth**	**Corndrier**	**Oven**
Date		**late 1st/ early 2nd C**	**late 2nd C**	**late 3rd C**	**late 4th C**	**AD 370+**
Feature number		**20400**	**15280**	**20000**	**10340**	**20036**
Context number		**20179**	**15214**	**20139**	**11087**	**20071**
Sample number		**10368**	**10414**	**10276**	**10030**	**10342**
% flot identified		**1.56**	**100**	**6.25**	**50**	**6.25**
Quercus sp.	oak	191sh	35rh	96h	22	57sh
Corylus avellana L.	hazel				8	6
Betula sp.	birch		1			
Salicaceae	willow family					5
Prunus spinosa L.	blackthorn		4			
Prunus cf. *avium* L.	wild cherry					15
Maloideae	hawthorn, apple, pear etc				26r	
Acer campestre L.	field maple				6	7
Fraxinus excelsior L.	ash		21rh		50r	4
Indeterminate		3	6	5		4
Total		197	194	67	112	98

3 DISCUSSION

Unlike the analysis from other sites examined along the CTRL, the metalworking evidence from Room 20000 in the Thurnham villa indicates that smithing, rather than smelting, was taking place. It is interesting, therefore, that the charcoal assemblage, dominated by oak heartwood, is entirely consistent with both traditional methods of iron-working (Edlin 1949) and the archaeological evidence from other sites, in Kent (e.g. Leda Cottages, White Horse Stone) and elsewhere (Murphy 2001; Smith 2001). An analysis of the frequency of taxa per sample (Figure 1) demonstrates that a range of fuelwood was utilised in domestic contexts, compared to the structural and industrial activities. This is not so surprising when the contexts are considered. Firstly, smithing would also have required the use of charcoal as fuel, as it is produces less smoke than wood fuels yet can provide the necessary heat. The high calorific value of oak heartwood makes it an extremely suitable fuel (Tylecote 1986).

Figure 1: Frequency of taxa per sample



Secondly, oak has very good structural properties, so it is also suitable for use in construction. Perhaps what is most interesting is that oak continues at Thurnham to form a large component of the domestic assemblages into the late 4th century - indicating that woodland resources and/or management regimes were ensuring a ready supply of wood - both for construction and fuel. Indeed, ash is also well represented in the fuelwood assemblage; given its suitability for artefactual purposes, the fact that it is being burned indicates a plentiful supply.

The range of taxa present in the domestic oven samples may be the result of multiple burning events rather than the remains of a single fire. In any case, the evidence suggests that the fuelwood used for domestic purposes was not deliberately or carefully selected. Trees like willow, poplar (Salicaceae) and birch (*Betula*) do not burn well as wood fuel (Edlin 1949) so their inclusion in domestic fires indicates that the burning properties of the fuelwood was not considered.

The evidence from Thurnham both corresponds to and contrasts with the evidence from Saltwood Tunnel. At the latter site, there is an abundance of ash in the Roman samples, comparable to the species' occurrence at Thurnham, but the range of taxa in use was apparently greatly reduced by the late Roman period. This is not the case at Thurnham, where there continues to be a wide range of taxa utilised and oak remains a significant component of all assemblages.

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