Suburban life in Roman *Durnovaria*

Additional specialist report

Environmental
Wood charcoal

By Catherine Barnett (neé Chisham)

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A number of the samples from Romano-British features contained substantial quantities of wood charcoal. In some this was mixed with lumps of amorphous charred material that had no obvious structure hence its source could not be identified.. This amorphous material was sometimes associated with hammerscale (e.g. pit 2202), and possibly metalworking. Other large charcoal deposits (e.g. oven 1470) were associated with large numbers of fish bones and may have been associated with fish processing. Notably, the remains included *otic bullae* from herrings, leading to the suggestion that garum, a type of fish sauce, was being made (see Bateman and Locker 1982). The aim of this charcoal analysis was to establish the differences in fuel being used for different activities and within particular features.

Method
Samples were processed by flotation with flots retained on 0.5mm mesh and residues on 1mm. Five of the 13 assessed samples were selected for analysis. Randomly selected fragments were taken from each flots and the residues; the whole of small flots and a sub-sample of up to 1/3rd, or a representative portion, was taken from the larger flot assemblages. Fragments were prepared for identification according to the standard methodology of Leney and Casteel (1975, see also Gale and Cutler 2000). Each was fractured with a razor blade so that three planes could be seen: transverse section (TS), radial longitudinal section (RL) and tangential longitudinal section (TL), and were examined under bi-focal epi-illuminated microscopy at magnifications of x50, x100 and x400. Identification was undertaken according to the anatomical characteristics described by Schweingruber (1990) and Butterfield and Meylan (1980). Identification was to the highest taxonomic level possible, usually that of genus and nomenclature is according to Stace (1997). The unidentified remainder of large samples were scanned at x50 to comment on the assemblage composition (archive). The results are given in Table WC1.

Results
The largest charcoal sample examined was from a layer at the base of oven 1470, associated with numerous fish remains. The very rich sample included a mixture of large and small wood charcoal fragments, and several fragments >20mm, many of which were highly fissured and a few of which were glassy and vitrified. Nearly 1kg of charred material, including a substantial quantity of wood charcoal was recovered. All samples proved rich except that from possible kiln 4063, which contained only 22 wood charcoal fragments along with puffed and conglomerated charred matter of probable mixed origin. Most of the material examined was fragmentary but in good condition, firm and fresh indicating *in situ* deposition without rolling, transport or reworking. Some, however, were friable and a large number were glassy and vitrified in specific contexts, notably the oak from pit 2202 (context 2204), a sample heavily dominated by roundwood. While occasional fragments of roundwood were noted in other samples, twigwood was rare and mature wood dominated.

Table WC1: Wood charcoal identifications

Feature (context)	**1470 Oven (1418)**	**1439 Pit (1465)**	**2202 Pit (2204)**	**4063 kiln (4064)**	**4162 layer (4180)**
Sample no **Identification**	**3014**	**3018**	**3058**	**3076**	**3098**
Acer campestre	-	-	-	3	-
Alnus glutinosa	-	-	10**	-	9*
Corylus avellana	-	2	18*	-	-
Twigwood *Corylus avellana*	-	1	-		-
Fraxinus excelsior	8	-	-	12	-
Pomoideae	-	-	2		-
Quercus sp.	69* + 3 sapwood	*57	21***	6	31
Cf. *Quercus* sp.	1	-	-	-	-
Quercus sp. juvenile	-	-	-	-	2**
unidentifiable	2 twisted roundwood	1 friable	-	-	1 branching wood
Unidentifiable twigwood	-	-	-	1	-
Total no. (and proportion of flot examined)	83 (1/3rd)	61 (1/8th)	51 (*c.* 1/20th)	22 (all)	43 (1/3rd)
Comments on sample	*3 v narrow rings (quick grown?). Scan of remaining sample shows all dom mature ring porous	*2 v narrow rings (quick grown?). Scan of remaining sample shows all dom mature ring porous	*at least 7 15-16yr 25mm Ø . roundwood, narrow rings, 1 5yr 10mm Ø., 1 10yr 20mm Ø. Occ. vitrified. ** all roundwood *** most hard, glassy vitrified, some roundwood		*incl at least 1 large roundwood **roundwood

The charcoal assemblage from oven 1470 (context 1418) was very restricted in the range of taxa, comprising mature oak (*Quercus* sp.) with lesser (*c.*10%) ash (*Fraxinus excelsior*). Many fragments were highly fissured and only a few were glassy/ vitrified. No roundwood or twigwood was noted.

The sample from a charcoal dump in pit 1439 (context 1465) contained almost solely oak wood with a small quantity of hazel (*Corylus avellana*). Pit 2202 within the western building (context 2204) contained substantial quantities of hazel and alder (*Alnus glutinosa*) roundwood, some identifiable as having been cut at *c*. 5, 10 and 15 years old. The sample also contained a small quantity of pomaceaous fruit (Pomoideae) wood. About 40% of the sample was oak (some of it roundwood), most of it hard, glassy and vitrified, as was an appreciable amount of the hazel and alder.

Pit 4063 (context 4064) contained a very small wood charcoal assemblage mixed with puffed and conglomerated charred material. The sample comprised three taxa: oak, ash and the only representation of field maple (*Acer campestre*), the latter commonly found in hedgerows and open woodland. Layer 4162 (context 4180) contained a moderately large charcoal assemblage including large fragments of wood, dominated by oak but with 25% alder roundwood.

Discussion

The fissuring and lack of vitrification of the oak and ash wood used as fuel in oven 1470 (context 1418), suggests that damp wood was used, probably deliberately, to keep the temperature relatively low and increase smoke to act as a flavouring during the fish processing and possible manufacture of garum.

In contrast, the vitrified charcoal and use of roundwood in pit 2202 (context 2204), suggest high temperatures were maintained in this feature seemingly associated with metalworking. The large-scale use of roundwood clearly suggests the use of managed woodlands, indeed one well-preserved fragment of complete diameter, showed evidence a possible coppice-heel at its base.

Pit 1439 (context 1464) was queried on-site as possibly industrial. The charcoal dump identified, being almost wholly mature oak, is not indicative of any particular process and could equally derive from burning of a structural timber or from industrial fuel. The nature and purpose of feature 4063 was not clearly established on-site but was proposed as a possible kiln or oven. The sample contained conglomerated material which proved unidentifiable but may originate from the mixing of ash and waste from processing including possible metal waste. Wood charcoal was sparse, though in good condition, and it may be that the nature of the processing undertaken allowed complete burning to ash or that the feature was cleaned out. Layer 4162 (context 4180) contained fish remains with a moderately large charcoal assemblage including large fragments of wood, This possible dump was dominated by oak but again use had been made of alder roundwood, given the association with fish remains, it may represent cleaning out of a food processing feature.

Overall the range of taxa identified in this analysis was very restricted despite the large volume of charcoal recovered. This and the evidence for use of coppiced wood indicates larger scale processing and industrial manufacture and provides little or no evidence of small scale domestic activity. Certain taxa (oak, ash, alder and hazel) were clearly targeted as fuel and are suggested to derive from managed stands/ woodland, so no comment can be made on the nature of the wider landscape and trees within it. No published charcoal analyses exist for nearby sites (such as Greyhound Yard or the Dorchester by-pass sites, Woodward *et al.* 1993; Smith *et al.* 1997) so enhancing the contribution this analysis makes to the understanding of local exploitation of wood resources at Roman Dorchester.

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