CTRL Charred Plant Remains & Charcoal Reports

Mersham

ASSESSMENT OF THE PLANT REMAINS

Ruth Pelling

Summary

7.18.1 Excavation work included the sampling of deposits for charred plant remains. Nine standard samples of early medieval date were assessed for their potential for analysis and seven yielded such remains. 13 samples also provided loose seeds that were included in the assessment, some of these had been mineralised and were extracted from flotation residues, others were carbonised and collected from the flots of small samples. Generally, the concentration of remains was low although two samples produced more substantial remains. Cereal crops included bread-type wheat, spelt wheat, oats and barley. Pulses included broad bean and possible cultivated vetch (*Vicia sativa* subsp. s*ativa*). What may have been subsidiary crops, including flax, beet and plum or sloe, were also identified. Occasional mineralised seeds, particularly of brassica may be derived from sewage. Some further detailed analysis is recommended.

Introduction

7.18.2 Samples were collected from ditches, pits (including cess-pits) and post-holes during excavation and wet-sieved for the recovery of carbonised and mineralised material. The deposits examined were generally of early medieval date (Phase 3, *c.* 1050-1200). The samples were taken in order to address questions concerning the diet, cereal economy and environment of the site.

Methodology

7.18.3 Samples of 10 to 40 litres were processed by bucket flotation and the flots collected onto 0.5mm mesh sieves. Flots were air dried slowly prior to a rapid visual assessment of nine of them. Occasional seeds were picked out of residues or small flots from an additional 13 samples and were also submitted.

7.18.4 Each flot was assessed by scanning under a binocular microscope at x10 magnification. Any seeds or chaff noted were provisionally identified and an estimate of abundance made. Random fragments of charcoal were fractured and examined in transverse section at x10 and x20 magnification.

Quantification

7.18.5 Nine flots were assessed and the seeds extracted from a further 13 samples were provisionally identified. Flots were small to moderately sized (10 to 300 ml). Several samples contained frequent roots and two (samples 1009 and 1048) were rich in molluscan remains. The results of the examination are detailed below (Table One).

7.18.6 Seven of the nine flots produced charred cereal remains, generally in low numbers (up to 50 grains), although two samples (samples1022 and 1029) were slightly richer, with 51 to 100 grains. Species noted included *Hordeum vulgare* (barley), free-threshing *Triticum* sp. (bread or rivet wheat), possible *Triticum spelta* (spelt wheat) and *Avena* sp. (oats). Cereal chaff was very rare, being recorded in one sample only (1022). The chaff noted consisted of a single *Hordeum vulgare* rachis. Weeds were quite common in sample 1022, but were rare or absent from the remaining flots. Non-cereal items were found in six flots and included seeds of possible *Brassica* sp. (cabbage, mustard *etc.; mostly* preserved by calcium phosphate mineralisation), *Vicia faba* (broad bean), *Vicia* cf. *sativa* (fodder vetch), *Linum usitatissimum* (flax), *Corylus avellana* (hazel-nut), *Beta vulgaris* (beet) and *Prunus* sp. (sloe, plum *etc.*). Wood charcoal was present in eight samples and was common in sample 1064. The taxa was generally provisionally assigned as *Quercus* sp. (oak) or Pomoideae (hawthorn, apple *etc.*), with occasional *Corylus/Alnus* sp. (hazel/alder).

7.18.7 The loose material included occasional charred cereal grain and *Vicia/Pisum* sp. (pulses), mineralised seeds of *Brassica* sp. (cabbage, mustard *etc.*) and a *Prunus* sp. (plum, sloe etc) stone. Seeds of *Sambucus nigra* (elderberry) were recovered in quite large quantities from two samples (1067 and 1072). The *Sambucus* material was not charred; the seeds of this species tend to be particularly robust and resistant to decay, tending to survive where other remains do not (*e.g.*, in waterlogged deposits which have subsequently dried out).

7.18.8 Table One

Plant Remains

Sample	***Context***	***A. Feature***	***Phase***	***Type***	***Flot size (ml)***	***II. Grain***	***Chaff***	***Weed seeds***	***Other***	***Id-Other***	***Charcoal***	***Comments***
1007	347	Cess pit	3	Seeds	0							Modern rubus
1009	353	Ditch	5	Flot	100						+	Molluscrich
1016	374	Ditch	3	Seeds	0				+	Brassica		Mineral-ised
1017	366	Pit	3	Seeds	0	++			++	Brassica		Mineral

												ised
1019	383	Cess pit	3	Flot	100	++			+	Beta vulgaris, Corylus	++	Rooty
1022	403	Pit	3	Flot	200	+++	+	+++	++	Vic.faba Vic.sat Corylus Linum	++	2xflots
1023	414	Cess pit	3	Flor	200	++		++			++	Rooty, 2xflots
1024	419	Cess pit	3	Seeds					+	cf Prunus,		Mineral -ised
1028	440	Pit	3	Flot	300	++		+	+	Corylus Prunus Vic/lath Crataegus	++	Very rooty
1029	432	Pit - iron working?	3	Flot	200	+++		+	+	Corylus Vic/Pis	++	2xflots
1038	498	Cess pit	3	Seeds	0	+		+				
1048	519	Ditch	3	Flots	10	+						Moll-uscs
1064	567	Pits	3	Flots	50						+++	
1067	570	Pits	3	Flots	50	+		+	+	Corylus	++	Elder
1070	573	Pits	2	Seeds	0	+			+	Vic/Pis		
1072	575	Pits	3	Seeds	0			++				Elder
1075	584	Pit	3	Seeds	0	+						
1076	587	Pits	3	Seeds	0							Modern seeds
1078	595	Ditches	3	Seeds	0							Modern seeds
1082	605	Post-	3	Seeds	0							Modern

		holes										seeds
1087	610	Pots-holes	3	Seeds	0	+						
1090	618	Pits	2	Seeds	0				+	Vic/Pis		

Provenance

7.18.9 Those samples that contained moderate to good quantities of grain were all taken from pit fills (contexts 383, 403, 414, 440, 432). The mineralised brassica seeds recovered from pit fill 366 would suggest that this pit contained sewage material and therefore may have been be a cess-pit. Other than the brassica seeds, mineralised remains were not common although occasional items, including the *Prunus* stone in context 419, do confirm the interpretation of some features as cess-pits. The charred remains recovered from both cess-pits and other features are likely to represent small-scale cereal processing and food-preparation waste as well, perhaps, as waste from hearth or furnace fires.

Conservation

7.18.10 The flots are in a stable condition and can be archived for long-term storage.

Comparative material

7.18.11 Comparable sites of this period are infrequent in Kent. A tenth-century assemblage was recovered from the Graveney Boat (Wilson, 1978), which produced a range of esturine and salt marsh species, terrestrial trees and shrubs and herbaceous plants as well as the actual cargo of the boat which included, most notably, a large deposit of *Humulus lupulus* (hops). The Graveney deposits are, however, rather unusual. Slightly later (twelfth-/thirteenth-century) deposits from Ebbsfleet, and a possible Saxon grave at Chalk Hill, were examined as part of the Sandwich Bay archaeological project (Scaife 1995). The assemblages were limited, but the Ebbsfleet samples produced a comparable species list with free-threshing wheat, possible spelt wheat, *Hordeum vulgare*, oats, and rye rachis, broad bean and pea. Material from Northfleet (Pelling, unpubl.), dated to the eleventh/ twelfth century, again suggests a mixed cereal economy, producing free-threshing wheat, barley, oats and rye. The pulses at this site included cultivated vetch as well as beans and peas. The sites all suggest that *Tritcum turgidum* (rivet wheat) was not cultivated in Kent at this time, although it is known from eleventh and twelfth

century records elsewhere in the country (Moffett, 1991). They do suggest that cultivated vetch is present from at least the eleventh century, as the Mersham sample seems to support.

7.18.12 Outside of Kent, there is a growing body of archaeobotanical assemblages from this period, for example the large scale assemblages examined from West Cotton (Campbell 1994) which cover the late Anglo-Saxon and early medieval periods, although with many gaps in the record. While there are many references to medieval urban deposits (see Robinson and Wilson 1987), many are slightly later (thirteenth century onwards) and small-scale rural assemblages have been less frequently examined. This is a period of potential economic and agricultural change, with new introductions from Scandinavia and Norman France. It is, therefore, important to continue to develop the data-set for areas, like Kent, for which the data is still limited in order to trace the introduction of new species and to analyse developing agricultural and, perhaps, climatalogical trends throughout the country.

Potential for further work

7.18.13 Given the paucity of comparative material for this period in Kent and the importance of building up a national data-set for all potential periods of change, some further work on the material is recommended. To this end, it is suggested that the five samples that produced moderately sized deposits should be sorted and analysed in full (samples 1019, 1022, 1023, 1028 and 1029). In addition the loose grain and brassica seeds extracted from sample 1027 should be identified and discussed. Further work on this assemblage has the potential to address the following Landscape Zone priorities:

- changes to the organisation of the landscape through time;
- reliance on pastoralism versus arabalism;

And the following Fieldwork Event Aims:

- to recover environmental and other economic indicators present on the site;

- to determine the landscape setting of the site and its interaction with the contemporary local environment.

7.18.14 Bibliography

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North of Westenhanger Castle

ASSESSMENT OF PLANT REMAINS
Ruth Pelling and Enid Allison

1. Introduction

1.1 A total of 46 bulk samples with individual volumes of 2-70 litres were taken during the excavation phase. The total volume of soil processed was 878 litres, with 435 litres of this coming from the fills of a feature containing plant remains, which was initially thought to be a possible oven or corn drier (URS 1998, 13).

2 Methodology

2.1 Due to the high clay content of the soil, each sample was soaked in a weak hydrogen peroxide solution (<1%) prior to processing. After this, bucket flotation of remove lighter biological material was carried out to produce a washover onto 0.5mm mesh. The soil remaining in the bucket after this process was then sieved to 2mm. Washovers and residues from each sample were dried and examined briefly.

3 Quantification

3.1 A number of features, including ditches, gullies, pit fills and the fill of a post hole were sampled. These generally produced small washovers, of 20ml or less. Most of these contained only a few cereal grains (less than 10) and small amounts of charcoal, although there were several where charred remains were a little more common. These included the upper fill of a ditch (sub-group 45), several ditch fills (sub-groups 14 and 20), the fill of a burnt feature (sub-group 10). Most of these are features assigned to Phase 3 (Table 10).

3.2 The principal results of interest, however, came from the eleven samples taken of the pit fill (sub-group 21). Samples taken from this feature were very rich in charred cereal remains, some containing several thousand grains. The bulk of these are grains of oat (*Avena*). Lower numbers of grains of rye (*Secale cereale*) and free-threshing wheat (*Triticum*) and occasional grains of barley (*Hordeum vulgare*) were also present. Cereal chaff was present in one sample. Weed seeds, especially brome grass (*Bromus* subset *Eubromus*) were common, and possible pulses were also seen.

4 Conservation

4.1 The charred remains are in an excellent state of preservation. They are currently stored in sealtight plastic bags. No conservation work is required on them. They take up only a small amount of space and, given the rarity of plant remains of this period from East Kent, it is recommended that they are retained in long-term storage.

5 Comparative Material

5.1 There is little comparative material of early medieval date from rural sites in East Kent. The principal assemblages against which these remains can be compared are the much smaller assemblage from Mersham and the plant remains from Monkton on the Isle of Thanet (Wiltshire forthcoming). The plant remains from Townwall Street, Dover are contemporary, although they stem from an urban context (Campbell forthcoming). The earlier evaluation report noted also the presence of botanical remains from other CTRL sites at Boys Hall Road and East of Pluckley Road (URS 1998, 25).

6 Potential for further work

6.1 The potential for analysis of the principal assemblage here is very high and further work on the assemblage is strongly recommended. The site information is reasonable, allowing the assemblage to be placed within a dated framework. Relatively little is known of the crop history of East Kent and the composition of this assemblage is unusual by the standards of other areas of southern Britain. Further work should produce information on agricultural practices and crop processing techniques relating to the farmsteads, and also on the contemporary environment.

6.2 Detailed analysis of the plant remains from the pit may help to establish the function of the feature, or determine if the assemblages are redeposited burnt refuse. The large numbers of oat grains present may suggest that the feature is not a corn drier, as oats do not usually require drying. It will be particularly important to examine spatial differences within the feature for evidence of its use. Analysis of the charcoal will provide evidence of fuel types.

6.3 The plant remains are directly relevant to the Fieldwork Event Aim to:
Recover charred plant material and other economic indicators for palaeo-economic studies.

6.4 This assemblage, although centred on a single period, provides significant information relating to agricultural practices and crop processing techniques within a rural environment at that time.

Table Ten
Summary of Principal Excavated Contexts with Plant Remains

Site	*Context*	*Sub-Group*	*Group*	*Phase*	*Sample No.*

CAT Excavation	47	45	7	3	9
CAT Excavation	82	14	8	3	15
CAT Excavation	138	12	12	3	29
CAT Excavation	144	20	8	3	30
CAT Excavation	156	21	11	3	35,36
CAT Excavation	165	20	8	3	43

Whitehill Road Barrow

APPENDIX 9: ASSESSMENT OF CHARRED PLANT REMAINS & CHARCOAL

Lisa Gray-Rees

1. Introduction

1.1 This assessment reports on 21 environmental samples taken during the works in Area 3390 Zone 1 (ARC 330 98 and ARC WHR 99). These were processed by flotation in a Siraf type flotation tank. Seventeen samples produced botanical remains. These are recorded in the table below and are the samples.

2. Methodology

2.1 Each sample was processed using a Siraf type flotation tank. Residues were collected in a 1mm mesh and flots were collected in a 250-micron mesh. Flots and residues were dried prior to scanning. Residues were scanned by eye. Environmental remains and artefacts (such as burnt flint, brick or tile fragments) were collected and transferred to the relevant specialists. Flots and plant remains recovered from the residues were examined in more detail using a low powered stereo microscope.

2.2 The modes of preservation, species diversity and abundance of organic remains in each sample were recorded on sheets then entered into the Oracle MoLAS/MoLSS database. Full sample details are given in the table below.

3. Quantifications

3.1 Full details of these samples are given in the table below.

3.2 The quantities of remains were estimated and recorded in the following manner:

For charred remains
+ = 1-10
++ = 11-50
+++ = 51-100
++++ = 101-1000

1000+ = >1000.

For waterlogged remains
+ = 0-5
++= 6-10
+++=11+

4. Provenance

4.1 Most of these samples were provisionally dated as either Bronze Age or Roman. Three samples came from pits (<28>, <271>, and <272>). The remaining sample came from ditch features. All samples were botanically poor in terms of diversity and abundance of remains. The richest sample was from a pit provisionally dated as Late Iron Age – Roman at Fawkham Junction. This sample contained a charred mallow (*Malva* sp.) seed and an uncharred elder (*Sambucus nigra* L) seed.

5. Conservation

5.1 None necessary. These samples can be discarded.

6. Comparative material

6.1 The contents of these samples were sparse and will not fulfil the research aims.

7. Potential for further work

7.1 Due to the paucity of the plant remains in the samples they are not recommended for further analysis.

8. Bibliography

None

Table 19: Assessment of Charred Plant Remains & Charcoal

Sample Details					1. Flot Details						Residue
Event Code	**Context & type**	**Period**	**Sample no.**	**Sample size (1)**	**Flot size (ml)**	**Grain**	**Chaff**	**Weeds Seeds charred/ uncharred**	**Charcoal**	**Comments**	**Size (ml) proportion checked**
ARC WHR 99	76/ pit	Bronze age/ Iron age	28	30	-	-	-	-	+		?
ARC WHR 99	52/ ditch	Bronze age/ Iron age	20	3	-	-	-	-	+		?
ARC WHR 99	69/ ditch	Bronze age/ Iron age	18	3	-	-	-	-	+		500ml
ARC WHR 99	23/ ditch	Bronze age/ Iron age	16	10	-	-	-	-	+		?
ARC 330 98	158/ ditch	Roman	27	25	-	-	-	-	+	-	1000ml
ARC 330 98	159 ditch	Roman	26	25	-	-	+	-	+	modern moss	800ml
ARC 330 98	316/ ditch	?	62	10	-	-	-	-	+	-	3000ml
ARC 330 98	318/ ditch	?	63	10	-	-	-	-	-	-	2000ml
ARC 330 98	512/ ditch	Late Iron Age or Roman	229	10	-	-	+	-	+	root/ rhizome frags	3000ml
ARC 330 98	782/ ditch	Late Iron Age or Roman	278	10	-	-	+	-	+	-	2000ml
ARC 330 98	800/ ditch	Roman	234	30	-	-	+	-	+	-	1600ml

Sample Details					2. Flot Details						Residue
Event Code	**Context & type**	**Period**	**Sample no.**	**Sample size (1)**	**Flot size (ml)**	**Grain**	**Chaff**	**Weeds Seeds charred/ uncharred**	**Charcoal**	**Comments**	**Size (ml) proportion checked**
ARC 330 98	868/ ditch	Roman	261	30	-		+		+		4000ml
ARC 330 98	876/ ditch	Late Iron Age or Roman	264	30	-	-	-	-	+	-	3000ml
ARC 330 98	877/ ditch	Roman	265	20	10	-	-	-	+++	flecks of charred wood, moss fragments	4000ml
ARC 330 98	882/ ditch	Roman	268	30	-	-	-	-	+	-	5000ml
ARC 330 98	886/ pit	Late Iron Age or Roman	271	15	70	-	-	+/+	+++++	flecks of charred wood, moss fragments	1750ml
ARC 330 98	896/ pit	?	272	30	-	-	-	-	+	-	1500ml

APPENDIX 9: ASSESSMENT OF CHARRED PLANT REMAINS & CHARCOAL

Lisa Gray-Rees

9. Introduction

9.1 This assessment reports on environmental samples taken during excavations at ARC SSR 99, ARC STPP 99 and ARC 330 8. Fifty-three environmental samples were taken. Fifty samples were bulk samples and were processed by flotation. The remaining samples were column samples. Seven of the bulk samples produced flots. The purpose of the study of this material was to gain further information about the contemporary environment and landscape and possible economic activities, for example, crop processing.

10. Methodology

10.1 Fifty samples were processed using a Siraf type flotation tank. Residues were collected in a 1mm mesh and flots were collected in a 250-micron mesh. Flots and residues were dried prior to scanning. Residues were scanned by eye. Environmental remains and artefacts (such as burnt flint, brick or tile fragments) were collected and transferred to the relevant specialists. Flots and plant remains recovered from the residues were examined in more detail using a low powered stereo microscope.

10.2 The modes of preservation, species diversity and abundance of organic remains in each sample were recorded on sheets then entered into the Oracle MoLAS/MoLSS database and transferred to the RLE Datasets. Full sample details are given below.

11. Quantifications

Preservation

11.1 Charring or waterlogging preserved the plant remains in these samples. The quality of preservation was generally poor. Full details of these samples are given in the tables below. For ARC SSR 99 plant remains were present in eleven out of 23 samples with low numbers of poorly preserved grain present in seven samples. For ARC STP 99 plant remains were present in nine of the 25 bulk samples with seven of those sampled producing flots.

Recording

11.2 The quantities of remains were estimated and recorded in the following manner: -

For charred remains
+ = 1-10

++ = 11-50
+++ = 51-100
++++ = 101-1000
1000+ = >1000.

For waterlogged remains
+ = 0-5
++= 6-10
+++=11+

12. Provenance

South of Station Road (ARC SSR 99)

12.1 Ten of these samples were Roman and one was Iron Age/Roman. Identifiable fragments of charred wood were present in low numbers in four of the samples. These were Roman ditch fill samples <6>, <2> and <4>, and a Roman sample from a demolition layer, sample <19>. Seven of these samples were pot-dated as Romano-British; <7>, <8>, <16>, <17>, <19>, <20> and <21>. One was provisionally dated as Iron Age/Roman, sample <23>.

12.2 The richest sample was sample <7> ([35] sg 114) from the oven feature. This sample was pot dated as early Roman. The flot and residue contained moderate numbers of poorly preserved charred wheat (*Triticum* spp.) grains. The flot also contained low numbers of chaff fragments, glumes, charred seeds, campion (*Silene* sp.) and plantain (cf. *Plantago* sp.). In addition there were uncharred seeds including goosefoot (*Chenopodium* spp.) and sedge (*Carex* sp.).

Temple East of Springhead (ARC STP 99)

12.3 Of the 25 samples, 16 were dated as Neolithic to Early Bronze Age, eight samples were technically undated and one was modern. Identifiable fragments of charred wood were present in the residues of <2> <4> <9> <15> and the flots of <16> <17> and <23>. Samples <2> and <15> were undated and <23> was modern.

12.4 Low numbers of poorly preserved charred grain were present in the residues of <2>, <4> and <10>. A charred weed seed, bedstraw (*Galium* sp.) was recovered from sample <15>.

12.5 Uncharred root and moss fragments were present in the flots.

Watching brief - New Barn Road (ARC 330 98)

12.6 No flots were produced from these samples. The only plant remains were low to moderate quantities of charred wood fragments in samples <83> and <87>.

13. Conservation

13.1 Sample ARC SSR 99 <7> should be retained for further analysis. Sub-samples of identifiable charred wood fragments (larger than 5mm³ in size) from ARC STP 99 <2> <4> <9> <15> <16> <17> and ARC 330 98 <83> should be saved and stored dry prior to further analysis.

14. Comparative material

14.1 The richest remains in this zone came from an early Roman oven feature (<7> [35] sg 114 g 18) from ARC SSR 99. These may be compared with charred plant remains from Roman sites in along the CTRL route, particularly those at West of Northumberland Bottom (Area 330 Zone 3) but also with other samples in Kent such as Lullingstone near Orpington (Arthur 1974; Metcalf and Doherty 1974) and Keston in Bromley (Hillman 1991; Straker 1999).

15. Potential for further work

15.1 It is recommended that further work be carried out on sample <7> from ARC SRR 99. This sample has the most potential to provide detail information about cereal cultivation.

15.2 Identifiable fragments of charred wood were found in the following samples provisionally dated as pre-historic or undated:-

- ARC STP 99 <2> <4> <9> <15> <16> and <17>
- ARC 330 98 <83>

15.3 The wood samples which can be firmly dated as prehistoric should be identified for the information about landscape and fuel use.

15.4 The flot sample will be examined using a stereo-microscope with magnifications of between 10 and 40 times. Modern seed and cereal reference collections and reference manuals (eg Anderberg 1994, Berijinck 1947 and Berggren 1969,1981) will be used.

15.5 Charred wood will be examined using an epi-luminating microscope. Diagnostic features will be recorded and the wood identified using an atlas of microscopic wood anatomy (Schweingruber 1978).

15.6 Plant remains will be identified as closely as their level of preservation allows. Quantities of uncharred remains and charred wood fragments will

15.7 Additional work:

- Identification and recording of the contents in one dry flot
- Identification of charred wood in 7 samples
- Table creation and data analysis
- Report Writing
- Editing and Archiving

16. Bibliography

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Table 1: Assessment of Charred Plant Remains & Charcoal

3. Sample Details							4. Flot Details						Residue
Site	Group	Sub-group	Context & type	Period/ Pot-date	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Char-coal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ Proport-ion checked
ARC SSR 99	16	117	28/fill of ditch [014]	RO	3	20	-	-	-	-	-	-	3000/ yes
ARC SSR 99	16	118	30/fill of ditch [029]	PR	5	20	-	-	-	-	-	-	1000/ yes
ARC SSR 99	16	117	12/fill of ditch [014]	RO	6	20	-	-	-	-/+	+	-	5000/ yes
ARC SSR 99	17	116	13/fill of ditch [009]	RO	2	10	-	-	-	-	+	-	1500/ yes
ARC SSR 99	17	116	10/fill of ditch [009]	RO	4	10	-	-	-	-	+	-	1500/ yes
ARC SSR 99	17	116	39/fill of ditch [009]	RO	10	10	-	-	-	-	-	-	2000/ yes
ARC SSR 99	18	114	35/oven feature	RO	7	3	5	++	+	+/+	-	stem frags	500/ yes
ARC SSR 99	18	114	35/oven feature	RO	13	20	-	-	-	-	-	-	?/no

5. Sample Details							6. Flot Details						Residue
Site	Group	Sub-group	Context & type	Period/ Pot-date	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Char-coal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ Proport-ion checked
ARC SSR	18	114	40/oven	RO	14	20	-	-	-	-	-	-	2000/

99			feature										yes
ARC SSR 99	18	114	42/oven feature	RO	15	10	-	-	-	-	-	-	4000/ yes
ARC SSR 99	18	115	60/oven feature	RO	16	3	-	+	-	-	-	-	500/ yes
ARC SSR 99	18	115	49/oven feature	RO	17	10	-	+	-	-	-	-	1000/ yes
ARC SSR 99	18	115	59/oven feature	RO	18	10	-	-	-	-	-	-	500/yes
ARC SSR 99	18	115	60/oven feature	RO	19	10	-	+	-	-	+	-	1500/ yes
ARC SSR 99	18	115	62/oven feature-floor	RO	20	10	-	+	-	-	-	-	1000/ yes
ARC SSR 99	18	115	63/chalk floor of oven	RO	21	3	-	+	-	-	-	-	2000/ yes
ARC SSR 99	18	115	64/clay wall of oven	IA/RO	22	10	-	-	-	-	-	-	1000/ yes

7. Sample Details							8. Flot Details						Residue
Site	Group	Sub-group	Context & type	Period/ Pot-date	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Char-coal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ Proport-ion checked
ARC SSR 99	18	115	65/ charcoal floor of oven	IA/RO	23	6	-	+	-	-	-	-	2500/ yes
ARC SSR 99	19	103	24/fill of ditch [25]	RO	12	10	-	-	-	-	-	-	500/yes
ARC SSR 99	22	101	43/fill of ditch [44]	MO	11	10	-	-	-	-	-	-	1000/ yes
ARC SSR 99	23	108	1/fill of ditch [002]	RO	1	10	-	-	-	-	-	-	3000/ yes
ARC SSR 99	26	109	56/ lower fill of pit [32]	PR	9	30	-	-	-	-	-	-	3000/ yes
ARC SSR 99	26	109	31/ fill	RO	8	10	-	+	-	-	-	-	2000/ yes
ARC STP 99	3	2	86/ natural gravel and silt	?PR	24	-	-	-	-	-	-	-	column sample
ARC STP 99	3	2	2/ natural gravel and silt	?PR	26	-	-	-	-	-	-	-	column sample

9. Sample Details							10.Flot Details						Residue
Site	Group	Sub-group	Context & type	Period/ Pot-date	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Char-coal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ Proport-ion checked
ARC STP 99	4	21	46/posthol e-possible occup.	NE/EBA	6	2	10	-	-	-/+	++++	root and stem frags	?/no
ARC STP 99	4	22	61/ posthole-possible occup.	NE/EBA	9	2	2	-	-	-	++	root frags	500/yes
ARC STP 99	4	23	63/ posthole-possible occup.	UN	15	5	10	-	-	+/-	++++	root frags	400/yes
ARC STP 99	4	24	65/ posthole-possible occup.	NE/EBA	16	5	10	-	-	-	+++	root & moss frags	?/no
ARC STP 99	4	25	67/fill of post-hole[68]	NE/EBA	17	5	10	-	-	-	+++	root frags	?/no
ARC STP 99	4	26	69/ posthole-possible occup.	NE/EBA	18	2	-	-	-		-	-	?/no

11.Sample Details							12.Flot Details						Residue
Site	Group	Sub-group	Context & type	Period/ Pot-date	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Char-coal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ Proport-ion checked
ARC STP 99	4	27	71/ posthole-possible occup.	NE/EBA	19	2	5	-	-	-	+++	root, stem & moss frags	?/no
ARC STP 99	5	30	41/natural hollows	UN	5	10	-	-	-	-	-	-	100/yes
ARC STP 99	5	39	78/ natural hollows	UN	21	30	0.5	-	-	-	-	-	?/no
ARC STP 99	5	29	81/gully	?PR	22	20	-	-	-	-	-	-	100/no
ARC STP 99	6	34	50/fill of posthole	UN	8	3	-	-	-	-	-	-	?/no
ARC STP 99	6	35	52/fill of post-hole[	UN	11	10	-	-	-	-	-	-	300/yes
ARC STP 99	6	36	54/fill of post-hole	UN	12	?	-	-	-	-	-	-	?/no
ARC STP 99	7	38	60/pit	UN	7	10	-	-	-	-	-	-	100/no
ARC STP 99	7	37	56/pit	UN	13	10	-	-	-	-	-	-	100/no
ARC STP 99	7	37	57/pit	UN	14	?	-	-	-	-	-	-	?/no

13.Sample Details							14.Flot Details						Residue
Site	Group	Sub-group	Context & type	Period/ Pot-date	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Char-coal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ Proport-ion checked
ARC STP 99	8	18	36/ ?occup. deposit	NE/EBA	4	10	-	+	-	-	-	-	100/yes
ARC STP 99	9	3	4/fill of small pit containing burnt flint	UN	1	10	-	-	-	-	-	-	2000/ yes
ARC STP 99	9	4	6/pit	UN	2	5	-	+	-	-	+	-	200/yes
ARC STP 99	9	11	20/pit	UN	3	10	-	-	-	-	-	-	100/yes
ARC STP 99	9	32	45/pit	UN	10	10	-	+	-	-	-	-	500/yes
ARC STP 99	9	28	74/pit	UN	20	5	-	-	-	-	-	-	?/no
ARC STP 99	11	1	85/ hillwash, colluvium	?PR	24	-	-	-	-	-	-	-	column sample
ARC STP 99	11	1	84/ hillwash and colluvium	?PR	25	-	-	-	-	-	-	-	column sample

15.Sample Details							16.Flot Details						Residue
Site	Group	Sub-group	Context & type	Period/ Pot-date	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Char-coal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ Proport-ion checked
ARC STP 99	11	1	1/ hillwash and colluvium	?PR	26	-	-	-	-	-	-	-	column sample
ARC STP 99	12	42	87/ subsoil	?PR	24	-	-	-	-	-	-	-	column sample
ARC STP 99	12	42	87/subsoil	?PR	25	-	-	-	-	-	-	-	column sample
ARC STP 99	13	43	88/pit	MO	23	10	10	-	-	-/+	-	root frags	?/no
ARC STP 99	33	2	3/ natural silt	?PR	26	-	-	-	-	-	-	-	column sample
ARC 330 98	?	1049	368/ditch	UN	83	-	-	-	-	-	+++	-	3000/yes
ARC 330 98	?	1051	370/ditch	UN	84	-	-	-	-	-	-	-	1000/ yes
ARC 330 98	2004	2003	304/ditch	MO	78	-	-	-	-	-	-	-	1800/ yes
ARC 330 98	2002	2086	381/ditch	UN	87	-	-	-	-	-	++	-	600/yes

Northumberland Bottom

APPENDIX 14: ASSESSMENT OF CHARRED PLANT REMAINS & CHARCOAL
Anne Davis

Introduction

A total of 167 bulk soil samples were taken for environmental analysis during the excavation of the three sites in Zone 3; 64 came from ARC WNB 98, 51 from ARC HRD 99, and 52 from ARC 330 98. The sampled deposits came from a wide variety of features and ranged from late Bronze Age to medieval in date. Sample sizes ranged from 5 to 30 litres. An interim assessment report had been written previously on twelve of the samples from ARC WNB 98 (Giorgi 1997), and information from this has been included here.

The study of botanical material from this site should assist in determining the palaeo-economy of the settlement. This could include the functions of features and settlement areas, and the activities taking place there, in each of the periods represented.

Methodology

The samples were processed by flotation, using a Siraf flotation tank, with meshes of 0.25mm and 1.0mm to catch the flot and residue respectively. All flots and residues, were dried. The residues were fully sorted by eye for artefacts and biological material, except in a few cases, where substantial numbers of charred seeds and grains remained in the residue after processing. In these samples, the larger residue fraction (>2mm) was fully sorted, and the smaller retained for sorting at the post-assessment stage of the project. The flots were briefly scanned using a low-powered microscope, and the abundance, and general nature of plant macrofossils and any faunal remains were recorded, using the following scale for the number of charred items per sample:

+ = 1-10, ++ = 11-50, +++ = 51-100, ++++ = 101-1000, 1000+ = >1000.

Results were recorded on the MoLAS ORACLE CTRL botany database, subsequently translated onto RLE Datasets.

All samples with flots were included in the assessment. Most of the flots were less than 100ml in volume, but where they exceeded this, 100ml sub-samples were assessed. In a few cases, where samples were very rich and the plant remains quite uniform, these sub-samples were reduced to 50ml, but in all cases the estimated quantities are for the entire sample. Occasionally plant remains were recovered from the residues of samples with no flots, and these were also included.

Quantification

Of 167 samples processed, 81 produced flots and a total of 134 included charred plant material in flots and/or residues, although in many cases this consisted only of flecks of charcoal. Charred cereal grains were seen in 73 samples, and 23 of these contained over 50 grains, although many other samples had fewer than ten grains. Cereal chaff

was recorded from 30 samples (over 50 items in nine), and charred seeds from 58 samples (over 50 seeds in 11 samples). Preservation of the plant remains ranged from moderate to very poor. In the majority of samples charcoal was reduced to very small fragments, but pieces large enough for species identification were recorded from ten samples. No waterlogged plant remains were recovered from these sites. Assessment data for the more productive samples from each site are shown in the tables below.

In almost all samples wheat (*Triticum* spp.) seemed to be the predominant grain, with both glume wheats and free-threshing species present. Grains of barley (*Hordeum sativum*), rye (*Secale cereale*) and oats (*Avena* spp.) were also seen in some samples. Cereal chaff also came mainly from species of wheat and included glume bases, spikelet forks, and rachis fragments. The majority of charred weed seeds were from disturbed-ground species, with corn gromwell (*Lithospermum arvense*) seen in very great numbers in some samples from ARC WNB 98. Fragments of hazelnut (*Corylus avellana*) shell and stones of *Prunus* sp. were seen occasionally, and pulses, probably peas (*Pisum sativum*) or horse beans (*Vicia faba*) were quite abundant in some of the medieval samples.

The majority of samples included variable amounts of rootlets and/or moss, and sometimes uncharred seeds, presumably of modern origin. It is therefore possible that some of the charred plant remains are also intrusive. This is unlikely to be a problem where large and relatively uniform assemblages are concerned.

Provenance

Samples from late Bronze Age and Iron Age features in the area of Hazell's Farm on ARC 330 98 (Figure 5), and mid-late Iron Age deposits in Area A/B on ARC WNB 98 (Figure 6), were mostly devoid of any plant remains except charcoal flecks. Twelve samples from pit fills at the former site however, and five from ditch- and pit fills at the latter, contained very low numbers (less than 10) of charred cereal remains and/or weed seeds. A charred fruit of ?*Prunus* sp. was also found in a ARC WNB 98 pit fill. Four of the ARC 330 98 samples included a few identifiable fragments of charcoal.

Over 50 cereal grains, and smaller quantities of chaff and weed seeds were found in three samples from the late Iron Age/early Roman ovens/hearths/firepit fills in Area A/B on ARC WNB 98 (Figure 10). Six samples from ditch fills and other contemporary features in this area contained smaller charred assemblages, and a cremation sample included a little identifiable charcoal.

A number of very large assemblages of charred plant remains were recovered from Roman features in Area C, ARC WNB 98(Figure 16). Two of these, from the fill of a roadside ditch, and a pit fill at the eastern end of the area, consisted predominantly of cereal chaff and may represent local crop-processing activities. A further seven samples, from pit fills within a square enclosure to the north of the east to west droveway, each contained many hundreds of cereal grains, chaff and weed seeds. Varying amounts of charred material were found in four samples associated with clay oven (Plate 5), but one, possibly a rake-out deposit, contained very many chaff fragments, with a smaller number of cereal grains. Some of these remains are likely to

represent fuel used in the oven, but others may also provide clues as to its function. Samples from the enclosure ditches in this area contained very few plant remains.

Abundant charred plant remains were again found in samples associated with the partially excavated Roman malting oven or 'corn dryer' at ARC HRD 99 (Figure 7, Plate 6). Cereal grains predominated in the ten samples from this feature, and in four of these many hundreds or thousands of grains were estimated to be present. All these samples included very many weed seeds, and two also had many chaff fragments. Around 100 grains, and identifiable charcoal, were seen in a sample from a hearth or kiln on the same site, and there were occasional charred remains in samples from other features, including ditch and pit fills.

Two of the three samples from a tread deposit within a medieval sunken building in Area A/B, ARC WNB 98 (Figure 13), contained many charred cereal grains, mostly wheat. A substantial number of charred pulses were also seen, most of them probably peas, as well as occasional fruit stones.

At ARC HRD 99 five samples associated with a medieval malting oven or kiln contained very many charred cereal grains, rachis fragments and weed seeds (Figure7, Plate 7). Two of these samples also contained identifiable charcoal. Occasional charred plant remains were also present in medieval ditch fills from this area.

Conservation

The dried flots, and plant material from the residues, have no particular conservation requirements.

Comparative material

Very little comparative material has been found in the area. A few grains of spelt wheat and six-row, hulled barley were recovered from four Iron Age pits at Farningham Hill in the Darent Valley (Vaughan 1984), and similar remains were found in a late Roman ditch at the Keston Roman villa site. These also included several grains of spelt, as well as a few glume bases and spikelet forks from the same species, one oat grain, and a grass seed (Hillman 1991). While these remains are very limited, they are similar to those found from the same periods at the Zone 3 sites, and on other sites in southern England. A charcoal sample from Keston contained mostly pieces of probable hawthorn (*Crataegus* sp.) (Straker 1999).

Potential for further work

Few plant remains were recovered from the Bronze Age and Iron Age samples within Zone 3, so their value in answering the project aims is limited. Very little material of this date, and from this area of Kent, has been previously studied however, and analysis of the 12 samples will improve our knowledge of cereal use and cultivation

in these periods. Identification of the four charcoal samples will give an idea of the wood species being exploited.

Many of the samples from Roman (and possibly late Iron Age) features, in different parts of the study area, were very rich in charred plant remains, and have the potential to contribute substantially to our knowledge about the palaeo-economy of the settlements. Oven and hearth features in ARC WNB 98 Areas A/B, C, and on ARC HRD 99 all contain rich assemblages of charred plant remains, which can be used to investigate their functions, and to compare the nature of the materials used as fuel. Very large assemblages from ten pitfills inside the square enclosure in ARC WNB 98 Area C, and from a ditch fill and pit fill nearby will help to determine the nature and economy of this settlement, and also what crop-related activities were taking place. Samples with moderate-sized assemblages from Roman ditch and pit fills will provide extra background data on cereal use and processing.

Charred plant remains from the medieval sunken building in ARC WNB 98 Area A/B, which included pulses and fruit stones as well as cereal remains, may be useful in determining the function of the feature. These remains will also provide information on the economy of the site and, to a limited extent, the diet of its inhabitants. The function of the medieval oven/kiln in ARC HRD 99 may be revealed by analysis of the plant remains associated with it. Plant materials used as fuel in this feature can also reflect aspects of the site economy.

Comparisons should be made between the settlement areas, both within and between periods. In addition to exploring the importance of different cereals, and the implications of cereal chaff, to the functions of features and the economy of the site, assemblages of arable weed seeds should also be compared. Analysis of their soil and habitat preferences may indicate possible areas of origin for the crops, and may vary between periods or settlement areas.

Due to the very large assemblages in many samples, it may be desirable to select representative samples for analysis, where several samples have been taken from the same, or closely related contexts. It is suggested that all 17 of the prehistoric samples (which contain few plant remains) should be analysed, together with five from the late Iron Age/early Roman settlement (ARC WNB 98, Area A/B), ten from Roman levels in Area C, and six from ARC HRD 99. From medieval deposits it is suggested that two samples from area A/B and three from ARC HRD 99 should be analysed. Final selection should take place in consultation with stratigraphic specialists, prior to the commencement of analysis.

Flots from the selected samples will be sorted, and macrofossils from flots and residues identified and counted, using a low-powered microscope. Large flots and assemblages will be sub-sampled, and sufficient sub-samples sorted to produce at least 500 items. The remaining flot will then be rapidly scanned for any new species not seen in the sub-samples. Where partially sorted residues containing charred remains have been retained, these too will be sub-sampled if necessary, and the same proportions of flot and residue sorted. Analysis of the results will include calculating the relative abundance of each cereal, and of grains, chaff and weed seeds, in each sample and within features and areas. The environmental preferences and soil requirements of weed species will also be investigated. Charcoal samples would be identified to species where possible, using an epi-illuminating microscope.

The tasks may be itemised as the requirement to complete the recording and analysis of the 43 suggested samples, and preparation of the report:

Sorting and identification of charred remains from 43 flots and retained residues
data entry
preparation of tables
analysis
preparation of publication report

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Table 2: Assessment of Charred Plant Remains & Charcoal from ARC WNB 98

Key: gp: Group; SG: Subgroup

sample details						flot and residue details							residue	
gp	**SG**	**Context no.**	**sample no.**	**Feature type**	**sample vol (l)**	**flot vol (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**size (ml)**	**% sorted**
22	452	268	35	Ditch	10	10			+	+	+	Modern moss.	4000	100
22	452	269	34	Ditch	20	20			+	+	++	Modern moss.	3000	100
22	454	278	33	Ditch	5	2			+	+	++	Some rootlets.	2000	100
23	446	510	30	Pit	5	30	+		+	++	+	1 complete charred fruit - Prunus? Mostly unch'd roots, pods,stems, wheat rachis.	4000	100
23	447	451	28	Posthole	5	30	+		+	++	++	Mostly rootlets.	2000	100
38	167	2163	81	Grave	10	50			+		++++	Cremation? Flot all charcoal, few frags identifiable.	1500	100
74	57	818	72	Pit	5	5	+		+		++	Rootlets.	800	100
81	299	518	16	Grave	10	20	+		+		1000+	Lithospermum seeds, few grains.	200	100
81	309	372	2	Oven	10	20	+++	++	++	+	+++	>50 grains. Rootlets.	300	100
81	312	302	1	Oven	10	20	+++	++	++	+	++	C.50 grains, mostly wheat. Rootlets.	300	100
82	267	381	3	Ditch	20	20	++	+	+		+++	C. 12 grains, poor condition. Many rootlets.	5000	100
82	278	426	19	Ditch	?	10	+		+		++	Rootlets	2000	100
82	279	392	10	Ditch	20	10	++		++	+	+++	Grains mostly wheat. Few rootlets.	2000	100
82	286	526	59	Ditch	20	10	+	++	+		++	C.10 glume bases; grass & legume seeds.	4000	100

sample details						flot and residue details							residue	
gp	**SG**	**Context no.**	**sample no.**	**Feature type**	**sample vol (l)**	**flot vol (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**size (ml)**	**% sorted**
85	306	916	74	Pit	20	20	+++	++	++		++	C.70 grains-poor cond. Weeds eg Centaurea, Lathyrus/Vicia, Rumex spp. Rootlets.	1500	100
95	64	1051	54	Ditch	10	30	+	+	+		++	V. few wheat grains, glume bases, legumes. Many rootlets.	2000	100
97	102	1009	7	Pit	30	200	++	++	++	++	+++	Grain poorly preserved. Wheat glume bases, barley rachis. Rootlets. 3000		100
97	108	1008	6	Pit	30	25	++			++	++	10-20 grains. Rootlets.	300	100
97	111	1026	8	Pit	30	100	++	+	+	++	++	10-20 grains, poor preservation. Rootlets.	4000	100
97	114	1027	11	Pit	30	0	++++	++++	1000+	+	++++	Lithospermum &g rass seeds. Grain poor, most wheat.<4mm res. unsorted. Rootlets.	2000	85
97	114	1056	65	Pit	30	60	++++	++++	++++		++	Wheat. Lithospermum & grass seeds. Gl bases, sp forks, rachis. Rootlets.	1500	90
97	114	1032	12	Pit	30	150	++++	++++	++++		++++	Mainly wheat grains, glume bases. Lithospermum seeds. Rootlets. 3500		100
97	114	1033	13	Pit	30	100	++++	++++	++++		++++	Mainly wheat grains, glume bases. Lithospermum seeds. Rootlets. 1000		100

sample details						flot and residue details							residue	
gp	**SG**	**Context no.**	**sample no.**	**Feature type**	**sample vol (l)**	**flot vol (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**size (ml)**	**% sorted**
97	117	1036	14	Pit	30	200	++++	++++	++++	++		Mainly wheat grains, glume bases. Lithospermum seeds. Rootlets. 2000		100
97	117	1043	26	Pit	30	150	+++	++	+++		+++	Mainly wheat grains, glume bases. Weed seeds. Prunus sp. Rootlets. 4000		100
97	118	1046	27	Pit	30	50	++++	++	++	++	++	100+grain, most wheat, poor cond. Many mollsc.<4mm res unsorted. Rootlets.	3500	90
98	4	1262	69	Ditch	20	30	+++	1000+	++		++	>1000 chaff frags, c80 grains, mostly wheat. Rootlets.	500	100
111	8	1201	68	Pit	10	40	+++	1000+	++	+	++	1000s gl bases, sp forks. c100 grains, mostly wheat. Rootlets.	500	100
114	68	1281	78	Oven	10	20	++	+	++		+	C.20 grains, hazelnut, weed seeds. Rootlets.	500	100
114	69	1270	71	Oven	10	10	+	+	+	+		Rootlets.	2000	100
114	70	1279	70	Ditch	10	40	+++	++++	++	+	++	C.50 grains, >100 chaff. Weeds Lithospermum, Ranunculus, Rumex spp.	1000	100
	231	292	75	Floor	20	50	+++	++	+++	++	++	>50 ?peas, few ?beans, Prunus sp., weed seeds. Uncharred seeds.	1500	100
	231	292	76	Floor	20	2	+ +		+		++	Few pulse fragments. c.10 grain including rye.	1500	100
	231	292	77	Floor	20	30	++++		+++		++	Much wheat. C.40 ?peas, ?beans, Prunus sp.,weed seeds.	1000	100

Table 3: Assessment of Charred Plant Remains & Charcoal from ARC HRD 99

Sample details					flot and residue details							residue	
SG	**context no.**	**Sample no.**	**Feature type**	**Sample vol (l)**	**flot vol (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**vol (ml)**	**% sorted**
725	14	19	Demol-ition	20	40	+++		+++		>1000	c.50 grains -wheat, rye, oats. c.50 weeds. Few id ch'cl frags. Moss.	500	100
727	163	46	Layer	10	50	++++	+++	+++		>1000	c.800 grains+frags. Rachis frags. Arable weeds + *Prunus* sp. Moss.	4000	100
738	184	49	Occupati on	10	40	>100 0	+++	+++		>1000	>1000 grains, most ?bread wheat. Rachis frags. 400ml unsorted res. ?id ch'cl. Moss.	500	20
741	187	50	Occupati on	10	40	++++	+	++		>1000	c.200 grains, most ?bread wheat. Moss.	400	100
747	169	47	Oven	10	10	++++		++		>1000	c.150 grains, most ?rye & ?bread wheat.	1500	100
758	3	2	Hearth	5	2	+++				+++	c.100 grains, most wheat - poor cond. ID charcoal. Modern moss.	500	100
800	18	41	Pit	10		++		+		++	10-15 grains, 1 large legume.	1500	100
805	63	24	Layer	10		++					20-30 grains, most wheat & oats. Poor condition.	1000	100
809	102	29	Demoliti on	30	10	++		+		++	c.15 grains, few legume seeds. Rootlets.	2000	100
809	102	30	Demoliti on	20	20	+	+	+		+++	1 wheat rachis. Much moss.	1000	100
810	103	31	Layer	10	30	>100 0	+	++++		>1000	>300 grains + more in 300ml unsorted res.>300weeds,most legumes. Little moss.	800	60
810	103	32	Layer	10	10	++				++++	25-30 grains - poor condition. Moss.	500	100
810	132	42	Layer	10	15	++		+		+++	c.15 wheat & barley grains, fragmentary. Moss.	1000	100
810	132	44	Layer	10	5	+		+			Flot mainly clinker.	500	100
810	132	57	Layer	10	10	+++		++		+++	c.100 grains - most wheat. Frag of *Prunus* sp.	1000	100

sample details					flot and residue details							residue	
SG	**context no.**	**sample no.**	**Feature type**	**sample vol (l)**	**flot vol (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**vol (ml)**	**% sorted**
810	217	58	Layer	10	300	>1000	++++	++++		>1000	Flot 90% grain. Most ?spelt/emmer. Glume bases,sp forks. 600ml unsorted res.	3000	80
810	218	59	Layer	10	100	>1000	+++	+++		>1000	Flot 99% grain. Most wheat. Glume bases, sp forks. 600ml uns res. Id ch'cl. Moss.	2500	75
819	219	61	Oven	5	30	++++	++	+++		>1000	c.400 grains, mostly wheat. Glume bases.100ml unsorted res. Moss.	300	67

Table 4: Assessment of Charred Plant Remains & Charcoal from ARC 330 98

sample details					flot and residue details							residue	
SG	**context no.**	**sample no.**	**feature type**	**sample vol (l)**	**flot vol (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**vol. (ml)**	**% sorted**
	no.	**no.**		**vol. (l)**	**vol. (ml)**			**seeds**	**seeds**				**sorted**
3002	112	13	Pit	20						++	?id charcoal	1000	100
3004	110	9	Pit	20						+	Id charcoal	300	100
3008	121	20	Pit	10	10	+	+	+	+	++	Wheat grains	200	100
3009	141	21	Pit	8	10	+	+			+++	Few grains, glume base. Rootlets, moss.	500	100
3011	315	60	Pit	10	15	+			+	++	Few grains. Rootlets.	1000	100
3012	138	16	Pit	4		+				+	1 grain, 1 frag.	2000	100
3013	561	144	Pit	30				+		+++	Hazelnut shell frag.	500	100
3014	146	44	Pit	30	20	++		+		++++	C.6 grains. Charcoal sample. Roots & moss.	1000	100
3014	264	53	Pit	20	80	+	+			>1000	Few grains & glume base. Some id charcoal. Rootlets.	500	100
3015	148	22	Pit					+			2 frags hazelnut shell	300	100
3015	149	23	Pit	7	30	+	+	++	+	++++	Few wheat grains+glume bases. Moss & rootlets	1500	100
3036	325	65	Pit	10		+				+	3-4 grains	2000	100
3039	344	67	Ditch	10		+			+	+	2 grains	200	100
4162	225	54	Pit							+++	Id charcoal	200	100

Zone 4

APPENDIX 13: ASSESSMENT OF CHARRED PLANT REMAINS & CHARCOAL

Lisa Gray-Rees

1. Introduction

1.1 This report assesses the contents of 242 environmental bulk samples in Area 330 Zone 4 (sites ARC TLG 98 and contexts from ARC 330 98). These were processed by flotation in a Siraf type flotation tank. 149 samples, all from ARC 330 98, produced botanical remains. The environmental bulk samples from ARC TLG 98 were botanically sterile.

2. Methodology

2.1 Each sample was processed using a Siraf type flotation tank. Residues were collected in a 1mm mesh and flots were collected in a 250-micron mesh. Flots and residues were dried prior to scanning. Residues were scanned by eye. Environmental remains and artefacts (such as burnt flint, brick or tile fragments) were collected and transferred to the relevant specialists. Flots and plant remains recovered from the residues were scanned using a low powered stereo microscope. Charred wood fragments roughly larger than 5mm³ were sampled for identification.

2.2 The modes of preservation, species diversity and abundance of organic remains in each sample were recorded on sheets then entered into the MoLAS/MoLSS Oracle database and transferred to RLE Datasets. Full sample details are given in the table below.

3. Quantifications

3.1 Full details of these samples are given in the table below.

3.2 Charred wood was present in all but seven samples. Charred grain was present in 33 samples; five of these were rich. Charred chaff was present in three samples. Charred seeds were present in sixteen samples; four of these were rich. Uncharred seeds were present in twenty samples; two of these were rich. Uncharred root, stem or moss fragments were present in 55 samples.

3.3 The quantities of remains were estimated and recorded in the following manner:

3.4 For charred remains:

\+ = 1-10

++ = 11-50
+++ = 51-100
++++ = 101-1000
1000+ = >1000.

For waterlogged remains:

+ = 0-5
++= 6-10
+++=11+

4. Provenance

Bronze Age

4.1 Each sample contained flecks of charred wood. A low number of larger identifiable fragments of charred wood were present in the sample from context [352], a quarry pit [372] (Figure 7).

4.2 None of these samples were rich. A poorly preserved charred grain was found in context [384] (Pit [372]) along with moderate numbers of uncharred goosefoot (*Chenopodium sp*.) seeds. Samples from contexts [352] and [390] (Pit [387], Figure 7) contained abundant uncharred root fragments.

Late Bronze Age/ Early Iron Age (Figure 7)

4.3 These samples were taken from pit fills and one from a posthole fill. The following contexts contained identifiable charred wood:

- from pits: [389], [394], [412] (Pit [387]) (Figure 7), [681], [691] (Pit [679]), [693] (Pit [702]), [680] (Pit [704]) (Figure 5) [1176] (Pit [1174], [1186] (Pit [1172] (Figure 6)
- from posthole fill [399] (Posthole [396], Figure 7)

4.4 Low numbers of charred grains and seeds were present in several samples from pitfills. Poorly preserved grains were recovered from, contexts: [401], [1173], [1176] and [1187]. Other charred remains included low numbers of hazelnut (*Corylus avellana* L) shell fragments in context [373] and low numbers of cleavers (*Galium* spp.) seeds in samples from context [394] and [450].

4.5 Occasional uncharred seeds were present in pitfills from contexts [402], [412], [420] and [1188]. These included seeds of goosefoot (*Chenopodium* spp.) and elder (*Sambucus nigra* L).

4.6 Uncharred moss fragments were recovered from samples in contexts [389], [401], [394], [411], [412], [420], [450] and [458]. Uncharred fragments were present in samples [389], [401], [412], [420], [450], [680], [1176] and [1188]. Moderate amounts of uncharred wood fragments were present in the sample from context [693].

Iron Age

4.7 These samples contained very few plant remains; only flecks of charred wood in all but the sample from [425] (Pit [414], Figure 7), which contained moderate uncharred root fragments.

Late Iron Age/ Early Roman

4.8 Occasional fragments of charred identifiable wood were present in each sample. No other botanical remains were recovered.

Roman

4.9 Charred wood fragments were present in two pits, contexts [1193] (Pit 1172, Figure 6) and [196].

4.10 Occasional charred wheat (*Triticum* spp.) grains were present in two pits in contexts [1193] and [863]. Low numbers of poorly preserved grains were present in ditchfills, contexts [525] and [526] (Ditch 522, Figure 10) and pitfills, contexts [160], [677], [678]. Moderate numbers of poorly preserved grains were present the pitfill, context [609] (Pit [673], Figure 10).

4.11 Moderate amounts of cereal chaff, glume fragments, were present in the ditch fill in context [526]. This sample also contained occasional charred weed seeds. Occasional poorly preserved charred seeds were also present in two ditchfill samples from contexts [526] and [844] and from one pitfill sample from context [160].

4.12 Uncharred seeds were present in low numbers in samples from pitfills from contexts [160], [534], [863] and from a ditchfill from context [848]. These included seeds of goosefoot (*Chenopodium* spp.) and rush (*Juncus* spp.).

4.13 Uncharred, possibly modern fragments of roots, stems and moss were present in samples from pit fills in contexts [136], [534], [664], [863], [932] and from a layer interpreted as external metalling/cobbling, context [1232].

Medieval

4.14 Charred wood was present in each sample. Identifiable wood fragments were present in a ditchfill from context [809] (Ditch [806], Figure 8); a post-hole fill from context [786], associated with pit [1148] (Figure 8) and hearth layer, context [418] (Pit [419], Figure 11).

4.15 Occasional charred wheat grains were present in pitfill samples from context [771], pit [1148], and in poor condition in a sample from a hearth layer, context [418]. Moderate numbers of poorly preserved grains were present in samples from pitfills in contexts [162] and [1045] (a ploughsoil) and in a ditchfill sample from context [809]. Moderate numbers of well-preserved wheat grains were present in a pitfill, context [179].

4.16 Charred seeds were present in pitfills from contexts [162], [179] and [771]. These included seeds of cleavers (*Galium* sp.), vetch/tare

(*Lathyrus*/*Vicia*) and brome (*Bromus* sp.). Moderate numbers of poorly preserved uncharred seeds were present in the pitfill from context [162].

4.17 Uncharred, possibly modern fragments of moss, root and stem fragments were present in pitfill samples, contexts [162], [179], [769], [771]; hearth layer, context [418], and from a posthole fill, context [786].

Undated (no pot dates)

4.18 Each of these samples contained charred wood fragments. Four samples were particularly rich. These were a pitfill sample from contexts [225], an unspecified external deposit from context [805] a furnace/oven/kiln deposits from context [500] and a ditch fill sample from context [907].

4.19 The pitfill contained abundant charred seeds; mostly (over 700) those of dock (*Rumex* spp.). The external deposit produced abundant quantities of charred wheat and oat (*Avena* sp.) grains. The furnace/kiln sample contained abundant charred wheat (*Triticum* spp.) grains and charred hazelnut (*Corylus avellana* L) shell fragments. The ditch sample contained abundant and diverse uncharred seeds, including knotgrass (*Polygonum* spp.) and black nightshade (*Solanum nigrum* L).

5. Conservation

5.1 Twenty-one samples have been recommended for further analysis and are listed below. These should be stored and kept dry prior to examination. No further work is recommended on the remaining samples so they may be discarded.

6. Comparative material

6.1 Prehistoric archaeo-botanical remains are scarce and where present often poorly preserved, for example the charred grain deposit at the Iron Age farmstead in Farningham (Vaughan 1984).

6.2 The Romano-British remains may be compared with charred plant remains from Roman sites in Kent such as Lullingstone near Orpington (Arthur 1974; Metcalf and Doherty 1974) and Keston in Bromley (Hillman 1991; Straker

7. Potential for further work

17. Potential by period

Bronze Age:

7.1 Very few plant remains were recovered form this period but it is recommended that identifications are made of the wood and grain because so little archaeo-botanical work has been carried out for prehistoric Kent.

Late Bronze Age/ Early Iron Age:

7.2 The charred wood from the pits should be identified. If waste was deposited in the pits the identification of the wood would provide information about the types of wood used for fuel. These fragments are too small to provide information about woodland management or wood working.

7.3 Charred grains and seeds were present in several pitfill samples. These assemblages will provide information about cereal use and cultivation. The identification of the seeds will provide information about the environmental conditions in which the crop was grown.

Iron Age:

7.4 These samples were too poor to recommend any further work.

Late Iron Age/ Early Roman:

7.5 These samples were too poor to recommend any further work.

Romano-British:

7.6 The identification of charred wood fragments from pitfills, in contexts [196] and [1193], may reveal which species of wood were used as fuel. These fragments are too small to reveal information about woodland management or woodworking.

7.7 Identification of the charred grain, chaff and seed remains in the pit fills from contexts [526] and [609] will provide information about cereal processing, husbandry and the environmental conditions of the fields.

Medieval:

7.8 Identification of the charcoal form the hearth layer, context [418], would provide information about the species of wood used as fuel.

7.9 Occasional charred wheat grains were also present in this hearth layer. Examination of these and the larger number of grains and charred seeds in the pitfills, context [162] and [179] would provide information about crop husbandry, processing and the environmental conditions in the fields.

Undated (no pot dates):

7.10 These should only be analysed if reliable dates can be assigned.

7.11 The abundant charred seeds in the pitfill, context [225], may be cereal sieving waste. Full identification of the seeds in this sample may reveal whether this is a sieving waste deposit or a store of dock (*Rumex* spp.) seeds for a particular use. The seeds of some species of dock have medicinal uses. If the full assemblage seems to suggest that it is sieving waste then it may reveal information about the ecology of the cereal fields.

7.12 The analysis of abundant quantities of the charred assemblages from the external deposit, context [805], and the furnace/oven/kiln feature, context [500] may clarify the interpretation of each feature and produce information about cereal production.

7.13 The analysis may clarify the interpretation of the feature and will add information about cereal production

7.14 The analysis of abundant and diverse uncharred seeds in the ditch sample may reveal environmental information if it comes form the primary fill of the ditch.

7.15 List of samples recommended for further analysis

- Bronze Age: [352] <81>
- Late Bronze Age/ Early Iron Age: [389] <91>, [394] <98>, [412] <101>, [691] <190>, [693] <192>, [680] <195>, [681] <197>, [1176] <329>, [1186] <339>
- Romano-British: [1193] <340>, [196]<42>, [526] <133>, [609]<186>
- Medieval: [162]<29>, [179] <30>, [418] <102>
- Undated (no pot dates): [225] <54>, [500] <153>, [805] <233>, [907] <277>

7.16 These will be examined using a light microscope with magnifications of between 10 and 40 times. Modern seed and cereal reference collections and reference manuals (e.g. Anderberg 1994, Berijinck 1947 and Berggren 1969,1981) will be used

7.17 Charred wood will be identified by using an epi-luminating microscope to examine fragments of wood in transverse, radial longitudinal and tangential longitudinal sections. These sections will be examined for diagnostic features and identification made using an anatomical key (e.g. Schweingruber 1973).

7.18 Plant remains will be identified as closely as their level of preservation allows. Quantities of uncharred remains and charred wood fragments will be estimated and charred remains will be counted. This data will be recorded onto record sheets and transferred to the MoLAS/MoLSS Botanical ORACLE database.

7.19 Further work:

- Identification and recording of the contents in 21 dry flots

- Charcoal identifications
- Table creation and data analysis
- Report Writing
- Editing
- Archiving

8. Bibliography

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Table 5: Assessment of Charred Plant Remains & Charcoal

				(a) Sample Details				**(b) Flot Details**			**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
3031	377 / external unspecified	UN	85	30	0	-	-	-/-	+		800ml
4001	642 / pit	UN	179	10	0	-	-	-/-	+		500ml
4002	652 / furnace, oven, kiln	UN	147	20	10	-	-	-/-	+++	low numbers of uncharred root fragments	200ml
4004	656 / furnace, oven, kiln	UN	178	10	25	-	-	-/-	++	low numbers of uncharred moss fragments	2000ml
4016	619 / ditch	UN	166	c10	2	+	-	-/-	++	abundant uncharred root fragments	1000ml
4020	623 / ditch	UN	168	30	0	-	-	-/-	+		1500ml
4021	832 / pit	UN	248	30	2	-	-	-/-	+++	abundant uncharred root and moss fragments	500ml
4022	833 / pit	UN	249	30	0	-	-	-/-	++		500ml
4023	835 / pit	UN	255	20	10	+	-	-/-	++++	moderate numbers of uncharred root and moss fragments	0ml

			(c) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4023	836 / pit	UN	256	10	20	-	-	-/+	+++		100ml
4028	878 / pit	LBA/EIA	266	30	0	-	-	-/-	+++		400ml
4029	693 / pit	LBA/EIA	192	30	0	-	-	-/-	+		500ml
4030	692 / external unspecified	UN	191	30	0	-	-	-/-	+		800ml
4031	681 / pit	LBA/EIA	197	10	0	-	-	-/-	+		1000ml
4031	691 / pit	LBA/EIA	190	20	0	-	-	-/-	+		5000ml
4031	705 / pit	LBA/EIA	217	10	0	-	-	-/-	++		600ml
4032	680 / pit	LBA/EIA	195	30	0	-	-	-/-	+	occasional fragments of waterlogged wood/roots	2000ml
4033	710 / furnace, oven, kiln	UN	203	30	0	-	-	-/-	+		4000ml
4034	736 / pit	UN	207	30	10	-	-	-/+	+++	low numbers of uncharred root fragments	100ml
4034	737 / pit	UN	208	60	0	-	-	-/-	+		500ml
4035	742 / pit	UN	209	10	0	-	-	-/-	++		400ml
4035	751 / pit	UN	213	30	0	-	-	-/-	+		1000ml
4037	712 / furnace. oven, kiln	UN	216	20	10	-	-	+/-	+++++	abundant uncharred root and stem fragments	700ml

			(d) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4038	714 / posthole	UN	202	1	5	-	-	-/-	++	abundant uncharred root and moss fragments	0ml
4039	713 / posthole	UN	201	3	10	-	-	-/-	+++	low numbers of uncharred moss and root fragments	50ml
4040	684 / ditch	UN	183	10	5	-	-	-/-	-	occasional fragments of uncharred root and stem fragments	1000ml
4041	397 / posthole	UN	94	10	5	-	-	-/+	+++	uncharred modern moss and root fragments	600ml
4042	399 / posthole	LBA/EIA	95	6	0	-	-	-/-	+		2000ml
4055	431 / posthole	UN	117	10	0	-	-	-/-	++		800ml
4071	352/ quarry pit	BA	81	20	20	-	-	-/-	++++	abundant uncharred root fragments	4000ml
4071	384 / quarry pit	BA?	88	20	5	+	-	-/++	+++		5000ml
4071	386 / quarry pit	BA	89	30	20	-	-	-/-	+++		1500ml
4072	416 / pit	IA	99	30	0	-	-	-/-	++		500ml
4072	416 / pit	IA	99	30	0	-	-	-/-	++		500ml

			(e) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4072	417 / pit	IA?	105	20	0	-	-	-/-	+		5000ml
4072	425 / pit	IA?	106	30	5	-	-	-/-	-	very little, uncharred root fragments	1000ml
4073	552 / pit	LIA/RO	123	30	0	-	-	-/-	++		500ml
4073	553 / pit	LIA/RO	124	30	0	-	-	-/-	+		2000ml
4074	428 / pit	UN	107	10	0	-	-	-/-	+		500ml
4077	500 / furnace, oven, kiln	UN	153	20	20	++++	-	+++/-	+++	low uncharred moss fragments	1000ml
4078	509 / pit	LIA/RO	120	c10	0	-	-	-/-	+		2000ml
4080	480 / pit	UN	116	20	0	-	-	-/-	+		500ml
4081	436 / pit	UN	118	10	0	+	-	+/-	+++		800ml
4082	373 / pit	LBA/EIA	82	c10	?	-	-	+/-	+++		1000ml
4082	458 / pit	LBA/EIA	158	10	2	-	-	-/-	+	low numbers of moss fragments	1000ml
4083	401 / pit	LBA/EIA	96	20	5	+	-	-/+	++	uncharred moss and root fragments	5000ml
4083	402 / pit	?LBA/EIA	97	20	0	-	-	-/-	+		2100ml
4083	420 / pit	?LBA/EIA	103	20	5	-	-	-/-	++	moderate numbers of uncharred moss and root fragments	1000ml

				(f) Sample Details						(i) Flot Details	Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4083	430 / pit	LBA/EIA	109	c10	5	-	-	-/+	+++++	moderate numbers of uncharred moss and root fragments	1500ml
4083	450 / pit	LBA/EIA?	112	20	10	-	-	+/-	++++	abundant moss and root fragments	1000ml
4083	547 / pit	LBA/EIA?	119	20	0	-	-	-/-	++		1000ml
4083	566 / pit	LBA/EIA?	121	20	0	-	-	-/-	+++		1000ml
4084	388 / pit	LBA/EIA	90	20	0	-	-	-/-	+++		2000ml
4084	389 / pit	LBA/EIA	91	20	5	-	-	-/-	+++	uncharred moss and root fragments	2000ml
4084	390 / pit	BA	92	10	5	-	-	-/-	+++	modern root fragments	6000ml
4084	393 / pit	?LBA/EIA	93	10	0	-	-	-/-	+++		800ml
4084	394 / pit	LBA/EIA?	98	20	2	-	-	+/-	+	uncharred moss fragments	1500ml
4084	411 /	LBA/EIA?	100	20	5	-	-	-/-	+++	low numbers of uncharred moss fragments	600ml

			(g) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4084	412 / pit	LBA/EIA	101	20	2	-	-	-/-	+++	moderate numbers of uncharred moss and root fragments	5000ml
4085	741 / pit	IA	211	c10	0	-	-	-/-	+++++		4000ml
4085	743 / pit	IA?	212	10	0	-	-	-/-	+		500ml
4086	1175 / pit	LBA/EIA	328	30	0	-	-	-/-	+++		3000ml
4086	1176 / pit	LBA/EIA	329	20	5	+	-	-/-	++++	abundant root fragments	2000ml
4086	1187 / pit	LBA/EIA	334	30	0	+	-	-/-	++		500ml
4087	1173 / pit	LBA/EIA	327	c10	0	+	-	-/-	+++		5000ml
4087	1182 / pit	LBA/EIA	331	10	0	-	-	-/-	+		1000ml
4087	1186 / pit	LBA/EIA?	339	c10	0	-	-	-/-	+++		4000ml
4087	1188 / pit	LBA/EIA	336	c10	10	-	-	-/+	+++	abundant root fragments	2500ml
4087	1193 / pit	RO	340	c10	20	+	-	+/-	++++	abundant root fragments	2000ml
4091	611 / furnace, oven, kiln	UN	324	10	20	-	-	+/-	++++	abundant uncharred root fragments	500ml
4091	612 / furnace, oven, kiln	UN	325	10	10	-	-	-/-	+++	moderate numbers of uncharred root fragments	20ml

			(h) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4093	1169 / furnace, oven, kiln	UN	326	30	5	-	-	-/++	+++	moderate numbers of uncharred root and moss fragments	1000ml
4096	907 / ditch	UN	277	10	5	+	-	-/+++	+++	abundant uncharred stem and moss fragments	400ml
4099	777 / hearth	UN	227	10	10	-	-	-/-	+++++	abundant uncharred moss fragments	1000ml
4100	807 /ditch	UN	235	20	10	+	-	+/+	+	abundant uncharred root and moss fragments	2000ml
4101	809 / ditch	MD	236	30	0	+++	-	-/-	+		1000ml
4105	823 / ditch	UN	243	10	0	-	-	-/-	+		100ml
4107	805 / external unspecified	UN	233	20	10	+++	-	-/+	+	abundant uncharred modern root and moss fragments	2000ml
4108	462 / pit	MD	159	10	0	-	-	-/-	++		600ml
4113	583 / ditch	UN	145	10	0	-	-	-/-	++		300ml

			(i) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4114	433 / pit	UN	110	10	5	-	-	-/-	+++++	low numbers of uncharred modern moss fragments	2000ml
4115	448 / pit	UN	111	10	0	-	-	-/-	+		300ml
4117	615 / natural strata	UN	164	c10	0	-	-	-/-	-	occasional fragments of waterlogged wood	300ml
4120	614 / sump-waterhole	RO?	163	30	0	-	-	-/-	+		250ml
4120	631 / sump-waterhole	RO	170	30	0	-	-	-/-	+		1750ml
4120	633 / sump-waterhole	RO?	171	c10	0	-	-	-/-	+		250ml
4120	664 / pit	RO?	174	30	5	-	-	-/-	++	moderate numbers of moss and root fragments	500ml
4124	1164 / ditch	UN	322	30	0	-	-	-/-	+		100ml
4125	769 / pit	MD	231	30	10	-	-	-/-	++	abundant root and stem fragments	200ml
4125	771 / pit	MD	223	20	20	+	-	-/+	+++	abundant modern root fragments	800ml

			(j) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4125	773 / pit	MD	224	30	0	-	-	-/-	+		1500ml
4125	786 / posthole	MD	232	10	10	-	-	-/-	++++	abundant root and stem fragments	1000ml
4125	1149 / pit	RO	318	30	0	-	-	-/-	+		200ml
4130	1183 / pit	UN	333	10	0	-	-	-/-	+		200ml
4132	754 / hearth	UN	218	10	0	-	-	-/-	+++		1000ml
4133	669 / hearth	UN	221	10	0	-	-	+/-	+		1000ml
4137	1141 / ditch	UN	323	30	0	+	-	-/-	++		600ml
4140	1045 / pit	MD	311	10	0	++	-	-/-	+++		400ml
4148	152 / ditch	UN	24	20	0	-	-	-/-	+		1000ml
4151	196 / pit	RO	42	20	0	+	-	-/-	+++		200ml
4154	198 / ditch	UN	45	10	5	+	-	-/+	-	uncharred root fragments	500ml
4155	162 / pit	MD	29	10	10	++++	-	+++/+++	+++++	uncharred stem and root fragments	400ml
4155	179 / pit	MD?	30	10	10	++	-	+/+	+++	uncharred stem and moss fragments	200ml
4158	192 / pit	UN	35	c10	0	-	-	-/-	+		1000ml
4159	174 / external unspecified	RO	31	0	0	-	-	-/-	+		600ml
4162	225 / pit	UN	54	10	30	+	-	++++/-	+++++	some uncharred moss	200ml

			(k) Sample Details		(i) Flot Details						Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4163	418 / hearth	MD	102	20	30	+	-	-/-	+++	abundant uncharred root, stem and moss fragments	3000ml
4164	534 / pit	RO	136	10	5	-	-	-/+	++	uncharred moss and root fragments	300ml
4164	536 / pit	RO	138	10	10	-	-	-/-	+++		300ml
4165	525 / ditch	RO	132	10	0	+	-	-/-	+		200ml
4165	526 / ditch	RO?	133	10	5	+	++	+/-	-		150ml
4165	527 / ditch	RO?	134	10	0	-	-	-/-	+		400ml
4167	531 / ditch	UN	125	20	0	-	-	-/-	++		200ml
4168	523 / ditch	RO	108	10	0	-	-	-/-	+		100ml
4169	567 / ditch	UN	131	10	5	-	-	-/-	+	low numbers of uncharred moss and stem fragments	100ml
4171	570 / pit	UN	130	10	0	-	-	-/-	+		150ml
4172	572 / external unspecified	UN	141	10	0	+++	+	+++/-	+++		1000ml
4173	529 / pit	BA	140	10	0	-	-	-/-	++		1500ml
4176	575 / destruction debris	UN	204	30	5	-	-	-/-	+++		8000ml
4176	576 / destruction debris	UN	205	10	700	-	+	-/-	++++	low numbers of uncharred moss fragments	4000ml

				(l) Sample Details						(i) Flot Details	Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4176	686 / destruction debris	UN	184	30	15	-	-	-/-	+++		5000ml
4176	759 / destruction debris	UN	222	30	0	-	-	-/-	+		5000ml
4176	778 / destruction debris	UN	225	10	0	+	-	-/-	+++		1000ml
4176	781 / destruction debris	UN	226	10	5	-	-	-/-	+++	occasional uncharred moss fragments	1000ml
4177	160 / pit	RO	33	10	0	+	-	+/+	+		1000ml
4178	186 / pit	UN	34	10	0	-	-	-/-	+		500ml
4184	609 / pit	RO	186	30	0	++	-	-/-	++		600ml
4184	677 / pit	RO	198	20	0	+	-	-/-	-		2000ml
4184	678 / pit	RO	196	10	0	+	-	-/-	+		800ml
4193	984 / external metalling/ cobbles	UN	306	30	0	-	-	-/-	+		500ml
4197	955 / external metalling/ cobbles	UN	290	30	0	-	-	-/-	+		100ml
4200	941 / ditch	UN	281	30	0	-	-	-/-	++		0ml
4200	980 / ditch	UN	298	20	0	-	-	-/-	+		2000ml
4202	848 / ditch	RO	254	30	0	-	-	-/-	+		2000ml
4202	953 / layer	UN	289	30	0	-	-	-/-	+		

				(m) Sample Details						(i) Flot Details	Residue
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample Size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4203	840 / natural erosion feature	UN	251	30	2	-	-	-/+	-	occasional uncharred moss and root fragments	800ml
4203	841 / natural erosion feature	UN	252	30	0	-	-	-/-	++		800ml
4207	863 / pit	RO	258	30	5	+	-	-/+	++++	abundant moss and root fragments	1500ml
4207	932 / pit	RO?	279	10	10	-	-	-/-	++++	occasional root fragments	300ml
4208	816 / ditch	UN	239	10	0	-	-		+++		1500ml
4210	828 / pit	UN	245	30	0	-	-	-/-	+		2000ml
4211	844 / ditch	RO	253	c10	2	-	-	-/+	+++		600ml
4214	820 / pit	UN	242	10	0	-	-	-/-	+++		1000ml
4215	825 / pit	UN	244	10	10	+	-	-/-	++++	abundant uncharred root and moss fragments	1000ml
4226	1232 / external metalling/ cobbles	RO	355	c10	30	-	-	-/-	+	occasional moss fragments	100ml
4234	1212 / ditch	UN	343	c10	0	-	-	-/-	+		800ml
4235	1215 / ditch	UN	345	c10	0	-	-	-/-	+		500ml

Cobham Golf Course

APPENDIX 9: ASSESSMENT OF CHARRED PLANT REMAINS & CHARCOAL
Anne Davis

17. Introduction

17.1 A total of 26 bulk soil samples were taken for environmental analysis during the excavation of the two sites in Zone 5; 20 came from ARC CGC 98, and six from ARC 330 98. The sampled deposits came from mainly from fills of pits and ditches, with a few from post-holes and a possible furnace. Those which have been spot-dated so far are all from the middle to late Bronze Age, but the majority are currently undated. Sample sizes ranged from 3 to 40 litres. A report on two further samples was written as part of the evaluation (Campbell & Pelling 1997), and concluded that charred remains were poorly preserved on the site.

17.2 It was hoped that the study of botanical material from this site would provide information on economic activities, for example crop husbandry.

18. Methodology

18.1 The samples were processed by flotation, using a Siraf flotation tank, with meshes of 0.25mm and 1.0mm to catch the flot and residue respectively. All flots and residues, were dried, and the residues were fully sorted by eye for artefacts and biological material. The flots were briefly scanned using a low-powered microscope, and the abundance, and general nature of plant macrofossils and any faunal remains were recorded, using the following scale for the number of charred items per sample:

+ = 1-10
++ = 11-50
+++ = 51-100
+++ = 101-1000
1000+ = >1000.

18.2 Results were recorded on the MoLAS ORACLE CTRL botany database.

19. Quantifications

19.1 Charred material was recovered from 21 of the assessed samples, mainly in the form of wood charcoal. In many cases this was poorly preserved and highly fragmented, although pieces large enough for species identification were recovered from 11 samples. Occasional charred cereal grains were seen in four samples, and cereal chaff, in the form of wheat

glume bases and spikelet forks in two. Four samples contained very occasional weed seeds. The numbers of all these remains were very low, usually less than five items per sample.

19.2 Assessment data for the samples with identifiable charcoal or other remains is shown in tables 17 and 18.

20. Provenance

20.1 The charred cereal remains referred to above were found in four pitfills and a ditch fill, two of which were spot-dated to the late Bronze Age, while the remaining three are currently undated. Identifiable charcoal was recovered from a possible furnace, six pitfills, three ditch fills, and a post-hole, two of which have been dated to the middle or late Bronze Age.

20.2 The condition of the charred material was generally poor, and it may not be possible to identify all grains to species. Charcoal was mostly broken into very small fragments, but larger pieces were retrieved from some of the samples, as mentioned above, and may be identifiable. The majority of samples included rootlets, and sometimes uncharred seeds, of modern origin. It is therefore possible that some of the charred material could be intrusive.

21. Conservation

21.1 The dried flots, and plant material from the residues, have no particular conservation requirements.

22. Comparative material

22.1 No comparative material has been found from Bronze Age sites in this area of Kent. No Bronze Age environmental material was recovered from Area 330 Zones 1 to 4. There is a good sample from Area 350 Zone 6 (Cuxton ARC CXT 98 – sample <11>) but this is dated to the middle Iron Age. In addition there are good samples from White Horse Stone (ARC WHS 98) but these are dated to the Neolithic.

22.2 Further afield, similarly small assemblages of charred cereals and charcoal have been found from Bronze Age features at Cranford Lane, Heathrow (Giorgi 1995), and excavations at the Beddington Sewage Farm, Croydon (de Moulins forthcoming).

23. Potential for further work

23.1 Very few plant remains were recovered from the samples within the Zone 5 area, so their value in answering the project aims is limited. As there have been very few studies of plant remains from Bronze Age sites in this area of Kent, analysis of the five samples containing cereal remains may contribute to our knowledge of cereal use and cultivation in this period. Identification of the 11 charcoal samples will indicate the wood species being exploited, although it is unlikely that the small fragments found will reveal much about woodland management. This work would be justified as the deposits concerned can be securely dated.

23.2 There is potential for using the charcoal from the barrow ditch ([227] and [229]) for radiocarbon dating.

23.3 Four flots (samples <4>, <<10>, <11> and 12>, based on the grain, chaff, charred seeds and uncharred seeds contents), will be sorted, and charred cereal remains from these and from the sample residues, identified and counted, using a low-powered microscope. The environmental preferences and soil requirements of weed species will also be investigated. Charcoal samples will be identified to species where possible, using an epi-illuminating microscope.

23.4 The resources required to complete this work, and preparation of a publication report, are as follows:

- Sorting and identification of charred cereal remains
- charcoal identification
- data entry & preparation of table
- preparation of publication report

24. Bibliography

Campbell G. & Pelling R. 1997 'Environmental indicators' Cobham Park Golf Course (ARC CGC97) evaluation report.

Giorgi J. 1995 Assessments of plant remains from Cranford Lane (CFL94). Unpublished MoLAS assessment reports BOT/ASS/07/95, 24/95, 26/95, 28/95.

de Moulins D. forthcoming

Table 17: Assessment of Charred Plant Remains & Charcoal from ARC CGC 98

Key + = 1-10, ++ = 11-50, +++ = 51-100, +++ = 101-1000, 1000+ = >1000.

Sample Details					Flot & Residue Details							Residue	
context no.	**Sample no.**	**feature type**	**period**	**Sample vol. (l)**	**flot vol. (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**vol. (ml)**	**% sorted**
132	15	Ditch	LBA	10		+				+++	No flot. 5 grains (wheat?) in residue.	1000	100
136	4	Pit	LBA	10	200	++	+	+	+	>1000	C.10 grains. 5 glume base & sp forks. 5-10 seeds incl legume. Rootlets.	2000	100
140	12	Pit		10	250			+	+	>1000	V. few seeds. ?identifiable charcoal.	300	100
144	10	Pit		10	70		+	+	+	>1000	<5 charred seeds, chd stems. 1 glume base. ?identifiable charcoal. Rootlets.	500	100
150	11	Pit		10	80				++	>1000	?identifiable charcoal. Rootlets.	200	100
160	6	Pit	LBA	10						+	Few ?identifiable charcoal frags.	2000	100
176	9	Posthole	M/LBA	10	5	+				++	1 grain seen. Few ?identifiable charcoal frags. Rootlets.	1000	100
180	8	?hearth		10	100					>1000	Some identifiable charcoal frags.Rootlets.	1000	100
227	20	Ditch	?EBA	10	5			+		+++	1/2 large charred seed. ?identifiable charcoal. Rootlets.	1000	100
229	21	Ditch	?EBA	10	40					+	Few ?identifiable charcoal frags.	500	100

Table 18: Assessment of Charred Plant Remains & Charcoal from ARC 330 98 (Zone 5)

Sample Details				Flot & Residue Details							Residue	
context no.	**sample no.**	**feature type**	**sample vol. (l)**	**flot vol. (ml)**	**grain**	**chaff**	**charred seeds**	**unch'd seeds**	**charcoal**	**comments**	**vol. (ml)**	**% sorted**
361	70	Ditch	10	10				+	>1000	Few ?identifiable charcoal frags. Rootlets.	2000	100
605	161	Pit	10		+				+	No flot. 3 ?wheat grains in residue. Few ?identifiable charcoal frags.	1500	100
606	160	Pit	10						+	Few ?identifiable charcoal frags.	1000	100

Cuxton

APPENDIX 13: ASSESSMENT OF CHARRED PLANT REMAINS & CHARCOAL

Lisa Gray-Rees

25. Introduction

25.1 This assessment reports on 13 environmental samples taken during excavations at Cuxton (ARC CXT 98) on the northern side of the River Medway in Kent. Six samples were taken for molluscan analysis and were not processed. Seven samples were processed by flotation. Four of these samples produced flots. The purpose of the study of this material was to gain further information about the environment and possible economic activities, for example, crop processing.

26. Methodology

26.1 Each sample was processed using a Siraf type flotation tank. Residues were collected in a 1mm mesh and flots were collected in a 250-micron mesh. Flots and residues were dried prior to scanning. Residues were scanned by eye. Environmental remains and artefacts (such as burnt flint, brick or tile fragments) were collected and transferred to the relevant specialists. Flots and plant remains recovered from the residues were examined in more detail using a low powered stereo microscope.

26.2 The modes of preservation, species diversity and abundance of organic remains in each sample were recorded on sheets then entered into the Oracle MoLAS/MoLSS database. Full sample details are given in the table below.

27. Quantifications

27.1 Most of the samples were poor, dominated by modern plant fragments. Sample <11> contained moderate quantities of well-preserved charred cereal grains, wild plant seeds and chaff. Full details of these samples are given in Table 1.

27.2 The quantities of remains were estimated and recorded in the following manner:

For charred remains
+ = 1-10
++ = 11-50
+++ = 51-100
++++ = 101-1000

1000+ = >1000.

For waterlogged remains
+ = 0-5
++= 6-10
+++=11+

28. Provenance

28.1 One sample, sample <11>, came from a pit provisionally dated as Iron Age. This sample contained an interesting charred assemblage including wheat (*Triticum* sp.) grains, chaff and seeds of crop weeds, for example vetch (*Lathyrus/Vicia* sp.).

28.2 Two samples, sample <22> and <23>, came from the head or stomach areas of skeletons from the Anglo-Saxon cemetery. Unfortunately neither sample produced any useful information. They were dominated by modern plant material (fragments of roots and wood, low numbers of uncharred seeds). Low numbers of charred wood fragments were noted from the residue of sample <23>.

28.3 The last sample, sample <12>, from a pit or tree bole feature was not given a provisional date. Modern plant material and charred wood flecks also dominated this sample.

29. Conservation

29.1 All but sample <11> may be discarded.

30. Comparative material

30.1 Sample <11> is the only sample recommended for further analysis. It could help to fulfil the fieldwork event aim to provide information on Iron Age landuse and economy. It will be interesting to compare it with charred remains found at the Farningham Hill (Vaughan, 1984) where low numbers of charred wheat (*Triticum* spp.) and barley (*Hordeum* sp.) grains were recovered form four pits, but no chaff or seeds as in the Cuxton sample.

31. Potential for further work

31.1 A detailed study of sample <11> will give us further information about the cultivation and consumption of cereals during the Iron Age. Identification of the chaff may clarify the species of wheat and identification of the charred seeds may add information about crop husbandry, for example; were these seeds from wild plants gathered accidentally as field weeds or were they part of a mixed crop?

31.2 The sample will be examined using a light microscope with magnifications of between 10 and 40 times. Modern seed and cereal reference collections and reference manuals (e.g. Anderberg 1994, Berijinck 1947 and Berggren 1969,1981) will be used.

31.3 Plant remains will be identified as closely as their level of preservation allows. Quantities of uncharred remains and charred wood fragments will be estimated and charred remains will be counted. This data will be recorded onto record sheets and transferred to the MoLAS/MoLSS Botanical ORACLE database.

31.4 Further work:

- Identification and recording of the contents in one dry flot
- Table creation and data analysis
- Report Writing
- Editing and Archiving

32. Bibliography

Anderberg, A-L, 1994, *Atlas of Seeds Part 4: Resedaceae - Umbelliferae.* Swedish Museum of Natural History, Stockholm

Beijerinck, W., 1947, *Zadenatlas der Nederlandsche Flora.* Veenman and Zonen, Wageningen

Berggren, G, 1969, *Atlas of Seeds Part 2: Cyperaceae.* Swedish Museum of Natural History, Stockholm

Berggren, G., 1981, *Atlas of Seeds Part 3: Saliaceae- Crucifereae.* Swedish Museum of Natural History

Vaughan, D, 1984, 'The Charred Grains from Farningham Hill' Microfiche M7 and M8 in Philp, B, *Excavations in the Darent Valley*

Table 1: Assessment of Charred Plant Remains & Charcoal

Sample Details				**Flot Details**						**Residue**
Context & type	Period	Sample no.	Sample size (l)	Flot size (ml)	Grain	Chaff	Weeds Seeds charred/ uncharred	Charcoal	Comments [presence of rootlets, uncharred straw etc.]	Size (ml)/ proportion checked
154 / fill	?	26	c10	-	-	-	-	-	-	4900
156 / pit or tree bole	?	12	10	30	-	-	+/0	-	root and stem fragments	5000
180 / dry valley	?	1	10	-	-	-	-	-	mollusc sample	-
181 / dry valley	?	2	10	-	-	-	-	-	mollusc sample	-
182 / dry valley	?	3	10	-	-	-	-	-	mollusc sample	-
183 / dry valley	?	4	10	-	-	-	-	-	mollusc sample	-
184 / dry valley	?	5	10	-	-	-	-	-	mollusc sample	-
315 / skeleton	?	22	10	20	-	-	-	+	root and wood frags	3600
323 / fill	?	24	c10	-	-	-	-	-	-	900
342 / pit fill	Iron Age	11	30	40	++	+	++/0	+++++	uncharred stems/roots	4500
378 / skeleton	Early Medieval	23	2	40	-	-	0/+	+	uncharred seeds and root fragments	2400
246/fill	?	25	c10	-	-	-	-	-	-	3000

Parsonage Farm

APPENDIX 10: ASSESSMENT OF CHARRED AND WATERLOGGED PLANT REMAINS, & CHARCOAL

Anne Davis

33. Introduction

33.1 Thirty seven bulk samples were recovered during the excavation, for environmental analysis. Sample sizes ranged from 10 to 30 litres.

33.2 The study of botanical material from this site will assist two of the fieldwork event aims:

- *to investigate patterns of natural resource exploitation.*
- *to determine the landscape setting of the site, its interaction with the contemporary local environment, and recover palaeo-economic indicators from features including ditches and the moat.*

34. Methodology

34.1 The samples were processed by flotation, using a Siraf flotation tank, with meshes of 0.25mm and 1.0mm to catch the flot and residue respectively. Flots which appeared to contain organic material, were stored in industrial methylated spirits, while the remaining flots, and all residues, were dried. The residues were fully sorted by eye for artefacts and biological material, except in a few cases, where substantial numbers of charred seeds and grains remained in the residue after processing. In these samples, the larger residue fraction (>2mm) was fully sorted, and the smaller retained for sorting at the post-assessment stage of the project. The flots were briefly scanned using a low-powered microscope, and the abundance, and general nature of plant macrofossils and any faunal remains were recorded, using the following scale for the number of charred items per sample:

+ = 1-10, ++ = 11-50, +++ = 51-100, ++++ = 101-1000, 1000+ = >1000.
Waterlogged plant remains were recorded as follows:
+ = present (0-5 items), ++ some (6-10 items), +++ many (11+).

34.2 Results were recorded on the MoLAS ORACLE CTRL botany database. Assessment data for the more productive samples is shown below.

34.3 Most flots were less than 100ml in volume, but where they exceeded this, 100ml sub-samples were assessed. All processed samples were included in the assessment, including four which had been assessed at the earlier evaluation stage.

35. Quantification

35.1 Charred material was recovered from most of the assessed samples. Charcoal was present in the majority, usually in the form of small fragments, although pieces large enough for species identification were recovered from six samples.

35.2 Charred cereal grains were also widespread, but in most cases there were fewer than ten grains per sample. In seven samples (from contexts [101], [166], [236], [237], [426], [589], and [601]) larger quantities, ranging from approximately 60 to over 500 grains, were found. Wheat (*Triticum* sp.), barley (*Hordeum sativum*), rye (*Secale cereale*) and oat (*Avena* sp.) grains were all seen, but wheat generally seemed to be the most abundant cereal.

35.3 Cereal chaff was very rare, although a few rachis fragments were seen in two samples. Relatively few charred weed seeds were seen in most samples, but all those with abundant grain also contained seeds of leguminous plants (Fabaceae), some of which were comparable to cultivated peas (*Pisum sativum*) and beans (*Vicia faba*), while others were smaller, and more likely to be wild vetches or vetchlings (*Vicia/Lathyrus* spp.). Several small weed seeds were also present in most of these samples. Occasional fragments of hazelnut shell were also preserved by charring.

35.4 Waterlogged preservation of plant remains was rare, but three samples (from contexts [191], [210], and [242]) included many seeds preserved in this way, as well as abundant remains of roots, bark, moss, bud scales, and in some cases alder (*Alnus glutinosa*) catkins and complete hazelnuts (*Corylus avellana*). The majority of seeds from these samples were from wetland plants such as alder, sedges (*Carex* spp.), (*Potamogeton* sp.), (*Ranunculus* subgenus *Batrachium*), and *Polygonum hydropiper*, although a few taxa from drier, disturbed ground were also present. One more sample (from [1050]) had quite abundant seeds, but their condition was poor, and a further three contained occasional waterlogged seeds and other plant remains.

35.5 The majority of samples included variable amounts of rootlets, presumably of modern origin, and the waterlogged assemblages contained occasional seeds, and in one case wheat rachis, of obviously recent vintage. It is therefore quite likely that some of the uncharred plant

remains, and possibly also some of the charred material, are in fact intrusive. Further investigations into the relevant stratigraphy is necessary to assess the integrity of these deposits.

36. Provenance

36.1 Nearly half the samples came from pitfills, mostly of medieval date. The remaining samples were from a variety of features, including ditch and drain fills, hearths and ovens, and dumped deposits. Of those with spot-dating available, the majority of deposits were of 12th to 13th century date, with two peat layers dated to the mid 1st century, and an external dump dated to the 19th or 20th century. The seven best assemblages of charred material came exclusively from pitfills dating to the 12th to 13th centuries (groups 43, 64, 65, 96, and 216). The three samples with well-preserved waterlogged assemblages were recovered from a peat layer and two channel fills in the western part of the site (groups 52 and 53), while less well preserved remains came from a ditch fill and modern moat fill (groups 101 and 102). Other samples, from a variety of features contained too few surviving plant remains to contribute to the research objectives.

36.2 The condition of the charred material was generally poor, with many of the cereal grains distorted and/or fragmented. It may not be possible to identify all grains to species, but in the richer assemblages there should be sufficiently large numbers of identifiable grains. Charcoal was generally broken into fragments too small for species identification, but larger pieces were retrieved from a few samples. Waterlogged preservation was very poor in the majority of samples, but good in the three peat and channel samples mentioned above, and moderate in the ditch and moat fills. There is however, as mentioned above, a potential problem with distinguishing contemporary plant remains from intrusive material.

37. Conservation

37.1 The dried flots, and plant material from the residues, have no particular conservation requirements, but the flots stored in Industrial Methylated Spirit will need regular inspection and topping up of the fluid.

38. Comparative material

38.1 Medieval charred grain assemblages from the London area, for example those from St Mary Clerkenwell (Davis forthcoming) and 1 Poultry (Davis in prep), tend to be similar to those recovered at Parsonage Farm. Grains of free-threshing wheat were common on these sites, along with smaller quantities of barley, oats and rye. Charred seeds of wild and cultivated leguminous plants are also commonly found in this period, when they were grown for animal fodder as well as food for humans.

Comparative examples from sites in Kent may also include assemblages from Darenth, Fawkham, Otford, Old Soar and Wilmington Manor.

39. Potential for further work

39.1 Despite the rather limited range of plant materials recovered from this site, there is potential for several of the project aims to be addressed. The seven large charred assemblages (identified in 4.1) of cereal grains, cultivated pulses, occasional other food plant remains, and weed seeds, will provide evidence on the diet of the medieval inhabitants. The very low incidence of cereal chaff in these samples suggests that this was a consumer site, importing cereals grown and processed elsewhere. This aspect of the economy can be investigated more thoroughly with full analysis of the samples. Identification of the arable weeds from these samples, and study of their habitat requirements and preferences, may provide evidence for the type of soils on which the cereals were grown, enabling suggestions to be made about their area of origin. Study of the spatial distribution of charred cereals, along with other artefactual and faunal waste materials, will contribute information on the organisation of the site.

39.2 The three samples with good waterlogged preservation will provide information about the palaeo-environment. This material has very little potential to contribute to questions on the economy of the site.

39.3 All the samples which produced identifiable charcoal were from medieval pitfills, and it is not thought that their identification would contribute to the research aims of the site.

39.4 Flots from the samples selected for analysis of charred remains will be sorted, and macrofossils from flots and residues identified and counted, using a low-powered microscope. Large flots will be sub-sampled, and sufficient sub-samples sorted to produce approximately 500 grains. The remaining flot will then be rapidly scanned for any new species not seen in the sub-samples. Where partially sorted residues containing charred remains have been retained, these too will be sub-sampled if necessary, and the same proportions of flot and residue sorted. Analysis of the results will include calculating the relative abundance of each cereal, and of grains, chaff and weed seeds, in each sample and within features and areas. The environmental preferences and soil requirements of weed species will also be investigated. Waterlogged seeds will also be grouped according to habitat preference.

39.5 The resources required to complete the recording and analysis of the ten selected samples, and preparation of a publication report, are as follows:

- Sorting and identification of charred remains from 7 flots and retained residues
- sorting and identification of waterlogged remains from 3 samples
- data entry

- analysis of the assemblages, including comparison of wild and cultivated taxa within and between the samples, and interpretation of the assemblages with reference to the project aims.
- preparation of publication report.

40. Bibliography

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Table 1: Assessment of Charred and Uncharred Plant Remains, & Charcoal

Sample details				**flot and residue details**							**residue**	
Con-text	Con-text type	Samp no.	samp size (l)	flot size (ml)	grain	chaff	Charred seeds	Un-charred seeds	Charcoal	Comments	Size (ml)	% checked
101	Pit	1	20	100	++++	+	+++		1000+	Grain mostly wheat. Pulses + weeds. Some unsorted residue. Rootlets	1000ml	70%
166	Pit	8	20	10	+++		+++	+	1000+	Grain mostly wheat. Pulses + weeds. Few rootlets.	200ml	100%
183	Marsh deposit	11	30	250				++		Flot in IMS. Mostly rootlets. Many fine indet frags.	500ml	100%
184	Structural cut	4	20	350				+		Many roots, wood. Few hazelnut, alder catkins, weed seeds.	1000ml	100%
191	Ditch	5	15	400				+++		Flot & residue mainly plant material. Roots, moss etc. Some modern e.g. wheat rachis.	1500ml	100%
210	Ditch	6	20	200				+++		Flot & residue mainly plant material. Roots, moss etc. Some unsorted residue.	500ml	60%
236	Pit	16	20	30	++++		++	+	++++	Grain mostly wheat. Pulses + a few weeds. Some unsorted res. Rootlets, moss etc.	300ml	60%
237	Pit	13	30	50	+++	+	+++		++++	Grain mostly wheat. Pulses + a weeds. Few rootlets.	1000ml	100%
242	Marsh deposit	9	20	200				+++		Flot in IMS. Flot & residue mainly plant material. Roots, moss etc. Some unsorted res.	800ml	70%
253	Pit	23	30	20	++		+		1000+	c.10 grains, few pulses. Few rootlets.	1000ml	100%

sample details				**flot and residue details**							**residue**	
426	Pit	15	30	20	++++		++		1000+	Grain mostly wheat. Pulses + a few other weeds. Few rootlets.	200ml	100%

589	Pit	22	30	20	++++		+++		1000+	Grain mostly wheat. Pulses + a few other weeds. Few rootlets.	500ml	100%
601	Pit	24	30	20	+++		++		1000+	c.60 grains. Pulses + a few other weeds. Few rootlets.	2500ml	100%
1049	Ditch	40	10	30	+			++	++	Flot mostly rootlets. Some uncharred weed seeds.	500ml	100%
1050	Ditch	41	20	50				+++		Flot in IMS. Poor condition (mould). Weed seeds, many rootlets.	700ml	80%

Bower Road

MACROSCOPIC PLANT REMAINS AND CHARCOAL

Charred Plant Remains and Charcoal

by Dana Challinor

Introduction

Soil samples were taken during the excavation for the recovery of charred plant remains and charcoal. A range of features, dating to the Romano-British period, were sampled including ditches, pits, postholes and waterholes. The samples were taken in accordance with the Fieldwork Event Aims for the site, which are set out in section 2 of the main report, above. Soil samples were taken in order to provide environmental and economic data, and environmental remains have particular relevance to the general CTRL Research Aims in establishing regional patterns of cereal economy in the Roman period.

Methodology

A total of 55 samples were taken on site. 24 samples were processed by flotation in a modified Siraf-type machine, with the flots collected onto a 250μm mesh. The volume of soil processed varied (from 1 to 41 litres) according to the feature type. All 24 samples processed produced flots which were submitted for assessment. In addition to the samples which produced charred plant remains, there was one sample from pit 242 (context 250) which appeared to contain waterlogged preservation. With the exception of this flot which was retained wet, the flots were air-dried and divided into fractions using a set of sieves. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Any seeds or chaff noted were provisionally identified based on morphological characteristics, and an estimate of abundance was made. Fragments of charcoal were randomly extracted, fractured and examined in transverse section. Fragments caught in the >2mm sized sieves were quantified as identifiable.

Quantification

Twenty flots produced identifiable charred remains (Table 8.1). All of these produced cereal grain, predominantly *Triticum spelta/dicoccum* (spelt/emmer wheat), with occasional *Hordeum vulgare* (barley) and some short grained *Triticum* sp. (wheat) which may be either a free-threshing bread type wheat or a short grained spelt. Quantities of cereal grain varied considerably, from a few grains (1-10) to more than 1000. Large assemblages were present in several deposits (124, 125, 508, 559 and 891), spanning the Roman period from AD 70-150 to 270-400. Chaff was also abundant in these samples; mostly *Triticum spelta/dicoccum* glume bases, but *Hordeum* rachis, and charred awn fragments were also recognised. A range of weed seeds were also noted in most samples; these included *Rumex* (docks), small Gramineae (grasses) and Leguminoseae (legumes) but the majority of richer samples were dominated by *Bromus* subsect *Eubromus* (brome grass) seeds. A couple of nutshell fragments, thought to be *Corylus avellana* (hazel), were noted in contexts 124 and 162.

The samples were generally rich in wood charcoal, with a range of taxa - *Quercus* sp. (oak), *Fraxinus excelsior* (ash), *Alnus/Corylus* (alder/hazel), *Prunus* sp. (blackthorn, cherry) and Maloideae (hawthorn, apple, pear etc).

The waterlogged remains from pit 242 (context 250; sample 50) were examined by Dr Mark Robinson of the Oxford University Museum. Vast quantities of degraded *Rubus fruticosus* (blackberry) seeds were visible but other seeds were rare, with only a few *Juncus* (rush) seeds noted. The flot also contained some poorly preserved mineralised material; fragments of wood and other plant tissues, as well as insect larvae. The fine residue fraction from this sample was also examined. Mineralised small ungulate droppings were noted, as well as some twisted plant fibres, not inconsistent with spun wool. Small faunal remains, including a possible fish scale were present in both the flot and residue.

In general, the preservation of charred material was moderate, although many of the grains were infused with sediment. The quantity of cereal remains, found in a range of features, is indicative of crop processing activities on the site. The cereal remains at Bower Road, however, are not typical of processing waste which contains few grains but frequent glume bases and some weeds. At this site, the majority of samples were dominated by grain or grain-sized weeds, comparable to assemblages formed by accidental burning during spikelet processing or storage. The aisled barn at Thurnham Roman Villa, similar to the structure excavated at Bower Road, was associated with a corn dryer which produced similar assemblages. The wood charcoal is likely to represent the dumped remains of fuel, potentially from fires associated with the crop processing. The range of taxa present suggests that there was little deliberate selection of firewood, which was probably collected on an *ad hoc* basis according to availability.

The waterlogged remains from context 250 were very poorly preserved and limited to woody fragments and robust seeds. This indicates that the deposit was not permanently anaerobic. The mineralised remains, while not well-preserved, were not inconsistent with material usually found in cess pits. In any case, it is certainly an unusual deposit.

Provenance

The samples were from a range of features of all periods and from all areas of the site (see Table 8.1). Of the five particularly rich samples recommended for further analysis (see below), two are from ditches around the posthole building (contexts 508 and 559 from subgroups 171 and 181), and three are from discrete pits (contexts 124 and 125 from 2nd-century pit 123, and context 891 from 1st- to 2nd-century pit 886 immediately south of the main site). The waterlogged and mineralised remains from context 250 are from pit 242, which contains human and animal bone, pottery and glass suggestive of a special, possibly terminal, deposit.

Comparative Material

The range of species identified are appropriate for the Romano-British period. The cereal taxa, *Hordeum vulgare* and *Triticum spelta*, are the principal cereals recorded throughout southern Britain at this time (Greig 1991) and have been recorded from other contemporary sites within the CTRL project (eg. Thurnham Villa, Hockers Lane and East of Station Road). In addition, deposits from Thurnham Villa and Hockers Lane have produced *Triticum dicoccum*, which has not been recorded at Bower Road.

However, the presence or absence of *T. dicoccum* will need to be confirmed at the analysis stage. It is one of the research aims to establish how important this crop was in the region during the Roman period.

The mineralised material is very unusual for this period. Only two other sites (Silchester, Hampshire and Uley, Gloucester) have produced mineralised deposits of Roman date (Mark Robinson, pers. comm.).

Conservation

The flots are in a stable condition and can be archived for long term storage.

Potential for further work

The following section discusses potential for further work in the light of the Landscape Zone Priorities and Fieldwork Event Aims.

Five samples of charred plant remains are recommended for full analysis (samples 1, 4, 46, 47 and 67). These have the potential to provide economic information for the site as well as to aid understanding of regional agricultural patterns. Further analysis of the distribution of charred plant remains across the site may enhance understanding of the function of structures and areas of the site, and the nature and range of activities carried out there. Current knowledge of the agricultural activities of the area in the Iron Age and Romano-British periods is limited and the CTRL projects offer the opportunity to conduct a regional study.

Further work on the wood charcoal would increase the species list, but is not considered necessary, as it has little potential to add to the economic or environmental understanding of the site.

The presence of Roman mineralised remains is of regional as well as national interest. The provenance of this material enhances its value, as pit 242 contained possible special deposits of human and animal bone, pottery and glass and may represent a terminal deposit. Full analysis of the mineralised remains may add to the list of material associated with this special deposit and thus be of value for the analysis of ritual practice during the Roman period. Although the preservation at Bower Road is not very good, the material is rare enough to warrant further work

It is recommended that full analysis is carried out on the five richest charred samples and the mineralised material. The full analysis comprise standard procedures of sorting the material , identifying and counting it. The faunal remains should also be looked at by a specialist.

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Table 8.1: Samples with charred plant remains and charcoal

Sample	Context	Feature	Period	Sample size (l)	Flot size (ml)	Charcoal	Charcoal id	Grain	Chaff	Weed seeds	Notes
1	508	Ditch	270-400	41	70	+++	*Fraxinus* Maloideae	+++	+++	+++	Charred awn frags
2	515	Ditch	-	37	40	+	*Quercus* Maloideae	+	+	+	*Triticum spelta* spikelet fork.
4	559	Ditch	LIA-70	40	45	++	*Alnus /Corylus* Maloideae	+++	+++	+++	Small bones
5	419	Ditch	-	20	75	++++	*Quercus* Maloideae	+		+	
6	417	Postpipe	ERB	20	18	+	*Quercus*	+		+	
15	338	Posthole	ERB	12	45	++++	*Alnus/Corylus Prunus*	+		+	Lots snails
21	463	Ditch	200-270	40	60	+	*Quercus*	+	+	-	
22	464	Ditch	ERB	22	55	+	*Quercus*	+	-	-	
23	367	Ditch	100-150	38	80	+++	*Quercus Fraxinus*	++	+	+	Charred awn frags
26	215	Water hole	270-300	40	70	++	*Alnus/ Corylus Fraxinus*	++	++	+	*Hordeum* rachis
27	243	Pit	4th C	40	25	++++	Maloideae *Quercus Alnus/ Corylus*	+	-	+	
44	102	Water Hole	130-200	40	30	+	*Alnus/ Corylus Quercus*	+	+	-	
46	124	Pit	150-200	0	28	++	*Quercus* Maloideae	++++	+++	++++	*Corylus avellana* nutshell
47	125	Pit	150-200	35	35	+++	*Quercus* Maloideae	+++	++++	++++	
48	126	Pit	3rd C	22	28	++	*Quercus* Maloideae	++	++	++	
49	148	Pit	70-200	32	35	++	Maloideae *Alnus /Corylus*	++	+	++	
53	104	Water Hole	ERB	20	15	+	*Quercus Prunus*	+	-	-	Lots snails
54	162	Water Hole	70-150	40	40	+++	*Quercus* Maloideae	+	+	+	*Corylus avellana* nutshell
56	673	Posthole	RB	0	30	+++	*Quercus*	+	-	-	
67	891	Pit	70-150	0	800	+++	Maloideae *Alnus/ Corylus*	1000+	++++	+++	Charred awn fragments

+ = 1-10 items; ++ = 11-50 items; +++ = 51-100 items; ++++ = 101-1000; 1000+ = >1000

- MACROSCOPIC PLANT REMAINS AND CHARCOAL

Assessment of the Charred Plant Remains

By Ruth Pelling

Introduction

All of the samples taken during excavation (963) were processed for the recovery of charred plant remains from cremation urns, pits and associated features. Following a preliminary scan of all samples for presence/ absence of charred material, 320 were chosen for assessment of charred plant remains and charcoal. Samples were processed by flotation in a modified Siraf-type machine. The flots were collected onto a 250µm mesh and allowed to air dry slowly. The same samples, most of which were from Roman cremations, were assessed for identifiable charcoal by Dana Challinor (see below). Charred remains other than charcoal were observed in 23 samples. Of these 21 were submitted for detailed assessment.

The Fieldwork Event Aims which the assemblage can be expected to contribute to are as follows:

- Fieldwork Event Aim 5: To recover other palaeo-economic indicators known to be well preserved: (eg. animal bone, molluscs, charred plant remains) to establish the fullest possible picture of the urban economy.
- Fieldwork Event Aim 6: To recover palaeo-environmental indicators to elucidate the interaction of the town within the local environment.
- Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
- Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
- Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
- Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

All cremation deposits encountered during the excavations were sampled for the recovery of charred plant remains and cremated bone, with some cremation urns sampled in 20 mm spits, so producing multiple samples. The charred remains were dominated by charcoal hence initial assessment was carried out by a charcoal specialist. A total of 21 samples in which charred remains other than charcoal were noted were submitted for further assessment. Flots submitted were first put through a stack of sieves from 500µm to 2mm mesh size in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Any seeds or chaff noted were provisionally identified based on morphological characteristics and an estimate of abundance was made.

Quantification

Quantifiable grain was identified in 5 of the 21 samples assessed for charred seeds and chaff. In each case the number of items noted was less than 10. *Hordeum vulgare* (barley), *Triticum spelta* (spelt wheat) and a short grained *Triticum* sp. (wheat) were identified. The short grained *Triticum* is probably of a free-threshing species. Chaff was present in two samples, again in each case less than 10 items. The species identified in both samples was *Triticum spelta*. Weed seeds were also rare, and were present in small numbers in six samples. The species identified include *Rumex* sp. (docks), *Polygonum aviculare* (knotgrass), *Medicago/Trifolium* sp. (medick/clover) and *Bromus* sp. (brome grass). Occasional pulses were present in three samples (ARCPHL97 sample 35, ARCNBR98 samples 399 and 398). Preservation was poor, so identification is unlikely to be possible beyond the level of *Vicia/Pisum* sp. (bean/pea), with the exception of sample 399, in which two or more species appear to be present. A particularly interesting and unusual find from this sample were several (up to 50) seeds of *Vitis vinifera* (grape) including examples with some flesh still attached.

The preservation of cereal remains and the pulses was generally poor. The *Vitis vinifera* seeds tended to be very well preserved.

Provenance

The occasional cereal remains within the deposits are likely to represent occasional cereal processing debris which was present as background noise, or had perhaps entered the cremation pyres as kindling. Sample 399, context 11728 (ARCNBR98) is more curious however. The presence of grape flesh still attached to some of the seeds might indicate that whole grapes were placed on the funeral pyre, perhaps as a funerary offering. The pulses in this context may have derived from a similar origin. This sample was taken from a cremation pit. The remaining samples which produced seeds and chaff were from cremation pits, one grave and two cremation urns.

Conservation

The flots are in a stable condition and can be archived for long term storage.

Comparative Material

The range of species identified are appropriate for the Romano-British period. *Hordeum vulgare* and *Triticum spelta* have been recorded from the other contemporary sites within the rail link project (eg. Thurnham Villa and Hockers Lane). They are the principal cereals recorded throughout southern Britain at this time (Greig, 1991). Finds of grape seeds from the period are not common, although occasional seeds have been identified from several sites and a large assemblage was recovered from a 2nd century pit in Southwark, London (Willcox 1978). Viticulture has recently been demonstrated for Roman Britain. Bedding trenches excavated at Wollaston, near Northampton, were confirmed to be the remains of vineyards with the identification of *Vitis* pollen (Meadows, 1996). No other examples of deposits of grape within cremation deposits are known in either Kent or in southern Britain. Other

food products are known in ritual deposits, notably *Pinus pinea* (stone pine) which has been found associated with ritual or temple deposits (Kislev 1988). The choice of stone-pine cones is presumably partly because it emits a pleasant scent when burnt although it is possible that the relatively exotic nature of certain food items makes them a valuable offering.

Potential for Further Work

Generally the concentration of seeds and chaff is too low to offer any potential for detailed analysis. The one sample which produced grapes and pulses does merit closer examination. The aspect of possible funerary deposits deserves to be explored. A detailed search through the published literature for comparable deposits is also recommended. This work should take two days of technical time and up to three days of specialist time.

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Charcoal

By Dana Challinor

Introduction

All of the samples taken during excavation (963) were processed for the recovery of charred plant remains from cremation urns, pits and associated features. Of these, 320 were chosen for the assessment of the wood charcoal. The purpose in sampling was to examine the evidence for change and continuity in burial practice. The samples were processed by flotation in a modified Siraf-type machine, with the flots collected onto a 250µm mesh.

The Fieldwork Event Aims to which the assemblage can be expected to contribute are as follows:

- Fieldwork Event Aim 5: To recover other palaeo-economic indicators known to be well preserved: (eg. animal bone, molluscs, charred plant remains) to establish the fullest possible picture of the urban economy.
- Fieldwork Event Aim 6: To recover palaeo-environmental indicators to elucidate the interaction of the town within the local environment.

- Fieldwork Event Aim 7: To establish the chronology of the cemetery.
- Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
- Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
- Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
- Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

A total of 320 flots were assessed. The volume of soil processed varied considerably (from 0.05 kg to 100 litres) according to the feature type. All cremation deposits were sampled in entirety for the recovery of charred plant remains and cremated bone; however, some of the cremation urns were sampled in spits of 20 mm, with the result that the individual samples were very small. For the assessment, only one spit from a single cremation burial was assessed, although several spits may need to be amalgamated to provide enough material in any further work. The flots were air-dried and divided into fractions using a set of sieves. Fragments of charcoal were randomly extracted, fractured and examined in transverse section under a binocular microscope at x10 and x20 magnification. Fragments caught in the >2mm sized sieves were quantified as identifiable. In the case of large flots, a sample of *c.* 20% was examined, although any quantification given is based on estimates of the entire flot. The flots were also scanned for the presence of any other charred plant remains.

Quantification

A total of 213 flots produced identifiable wood charcoal (Table 1). Six taxa were provisionally identified - *Quercus* sp. (oak), *Alnus/Corylus* (alder/hazel), cf. Salicaceae (willow, poplar), *Prunus* sp. (blackthorn, cherry), Maloideae (hawthorn, apple, pear etc.) and *Fraxinus excelsior* (ash). Some of the ring-porous taxa were difficult to identify as many fragments, and particularly small twigs, exhibited very slow growth and the full range of anatomical characteristics were not always visible. Some of the identified *Quercus*, for example, did not have the characteristic large pores and rays and will require examination at high magnification in all three planes.

There was some variation in the taxonomic composition between cremation deposits. Cremation pits produced the best preserved and largest quantity of charcoal, including some very large fragments with more than ten years growth evident. In contrast, cremation urns and vessels produced much smaller quantities of material and preservation was poorer. This may be due to the smaller soil sample sizes of the spit samples, but this was not always the case, as some of the cremation pit deposits which produced large assemblages were only a couple of kilogrammes in size. A few grave and pit samples also produced good assemblages, with similar taxonomic composition to the cremation deposits. *Quercus* was the most common taxon, present in almost all feature types, followed by Maloideae and *Fraxinus.* Some of the assemblages appeared to be dominated by a single taxon; in most cases this was *Quercus* but

Fraxinus also predominated in some flots. No flot appeared to contain more than three taxa, but this will require confirmation through further analysis.

There was some cremated bone present in the cremation samples and one flot appeared to contain animal vertebrae (context 163). General charred amorphous material was present in most flots; some of this is likely to be carbonised liquid from the cremation process but it is also possible that other plant remains were present in the pyre. Coal was observed in most flots and modern seeds were common. The coal could be Roman in date although the very small quantities present suggest it is more likely to be modern. The presence of the modern seeds is probably due to contamination either when the site was first stripped or when some features were half sectioned. However, the integrity of the samples is unlikely to have been compromised. Small droplets of slag were noted in several cremation flots, suggesting that metallic objects may have been present on the cremation pyre, but these require examination by an appropriate specialist.

Provenance

The preservation of charcoal at this site was variable, with better preservation in the central part of the site. This may be due to local variations in soil type. The lower concentration of material is to be expected in the burial urns where the bone has been carefully removed from the pyre remains. Indeed, it is possible that more than a single burning event is represented in the composition of the cremation pits, although the lack of taxonomic diversity suggests either a single event or the deliberate selection of a species for fuelwood. Certainly, the evidence from the charcoal suggests continuity in burial practice and there is potential for a comparison between deliberately deposited pyre remains and the accidental inclusion of pyre debris in burial urns.

Conservation

The flots are in a stable condition and present no problems for long-term storage and archive.

Comparative material

It is interesting that the same limited range of taxa identified in the Waterloo Connection cremation deposits have been identified in cremation burials from Tutt Hill, Chapel Mill and Boys Hall Balancing Pond, despite a range in date from the Bronze Age to the Roman period. Since individual assemblages show a lack of taxonomic diversity, the fuelwood must have been deliberately selected. Indeed, the predominance of a single taxon in prehistoric cremation assemblages, indicating the use of a single tree or specifically selected species in ritual activities, has been noted at Radley Barrow Hills (Thompson 1999, 352) and at Rollright Stones (Straker 1988). However, it has also been suggested that the abundance of oak or ash in cremation deposits, compared to other species, is a result of the pyre structure; the timber from these trees providing the supports in a central position, less likely to have been totally reduced to ash (Gale 1997, 82). The choice of fuelwood may have been determined by the burning properties of the wood (oak and ash burn very well), rather than ritual concepts.

Potential for further work

Since there has been little publication on Iron Age and Roman charcoal from cremation deposits (Gale 1997, 77), the charcoal from Waterloo Connection will provide a valuable addition. Indeed, the charcoal from this site has high potential to add to our understanding of regional Roman cremation practices, and the continuity and change within burial practices over time by comparison with earlier burials. It is recommended that the remaining unassessed flots are scanned to determine if any variation or trends have been missed in the sample covered in this assessment. More detailed analysis should then be carried out on a selection of assemblages to confirm identifications, to establish the presence of any additional taxa, to consider the evidence for deliberate selection of fuelwood and to explore regional trends and the possibility for woodland management practices.

It is been proposed that a programme of radiocarbon dating is undertaken to improve the chronology of the site. Advice has been sought from the Scientific Dating Co-ordinator at English Heritage (A Bayliss). The programme would require both high precision dating and the AMS measurement of cremated bone and involves the application of newly developed statistical techniques (Bayesian modelling) to the results to substantially reduce the probable date range (Lanting and Brindley 1998).

It should be possible to establish the date of individual samples to within a century or so by using high-precision measurements which would require 10-50 g of identified short-lived charcoal per burial.

It is likely that by submitting approximately 20 samples it will be possible to confirm both the start date and the end date of the period of use of the cemetery. Some measurements would be taken on human bone and some on charcoal. If AMS measurements (on either bone or charcoal) are applied, this scale of programme would be required to counteract the effects of statistical scatter on the measurements. A similar number of further dates could be required to address specific questions, such as the chronological range of *bustum* burials within the cemetery, although samples will wherever possible be selected to address multiple aims. Dating might be desirable for discrete groups of graves, or to assess the chronology of identified ritual practices; dating may also be useful to date human bone from the well/shaft, and to confirm the date of suspected Iron Age features.

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Nashenden Valley

- PLANT REMAINS

Assessment of the Charred Plant Remains and Charcoal

by Ruth Pelling

Introduction

A sample was recovered during watching brief works for the recovery of charred plant remains and charcoal, in order to characterise the isolated Romano-British (late 2nd-4th century AD) feature from which the sample was recovered.

The recovery and study of the material was undertaken in accordance with the Fieldwork Event Aims (see section 2, main report), in particular 1-3 and 5.

Methodology

A sample of 40 litres was processed by bulk water flotation and the flot collected onto a 250 μm mesh sieve. The flot was air dried slowly before being submitted for assessment. It was hoped that the sample would give some indication about the cereal economy of the site. The flot was assessed by scanning under a binocular microscope at x10 magnification. Any seeds or chaff noted were provisionally identified and an estimate of abundance made. Random fragments of charcoal were fractured and examined in transverse section at x10 and x20 magnification. The results of the assessment are noted in Table 4.1.

Table 4.1: Charred remains noted in the sample

Sample	Cxt	Vol. Deposit (l)	Vol Flot (ml)	Feature	Grain	Chaff	Weeds	Charcoal	Notes
1	44	40	250	Pit	+	+	+	++	Rhizomes

Key: +=1-10, ++= 11-50

Quantification

The flot measured approximately 250 ml in volume.

Charred plant remains were present in low numbers, with less than 10 items each of grain, chaff and weeds. The grain identified includes *Hordeum vulgare* (barley) and *Triticum spelta* (spelt wheat). Occasional monocotyledon rhizomes were noted, which could be derived from a grass, including the cereals. Their presence might indicate the use of turf as fuel, although there is no other evidence for this. Alternatively they

might demonstrate the harvesting of cereals by uprooting. Two charcoal taxa were provisionally identified, Pomoideae (apple, pear, hawthorn etc) and *Quercus* sp. (oak).

Provenance

The sample is derived from the fill of a possible quarry pit which is likely to have been re-used for rubbish disposal. The cereal remains are likely to be derived from small-scale cereal processing, deposited with the charcoal, perhaps derived from the same burning episode, or fire.

Conservation

The flot is in a stable condition and can be archived for long-term storage.

Comparative Material

The cereal species recorded are well attested for Romano-British sites in southern Britain (see Greig 1991). Within the CTRL route, similar deposits representing small-scale cereal processing debris were also recorded at Hockers Lane. This is very different to the deposits sampled from Thurnham Villa for which much larger scale cereal processing is represented.

Potential for further work

Given the absence of good cereal remains and the limited charcoal, the sample offers no potential for further work. Spelt wheat and hulled barley, were the cereals most commonly cultivated during the Romano-British period in southern Britain. The samples provide no potential for extending this species list. The remains are characteristic of low levels of re-deposited remains of cereal processing activity.

Bibliography

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White Horse Stone

- ASSESSMENT OF CHARRED PLANT REMAINS AND CHARCOAL

Charred plant remains and charcoal

By Ruth Pelling

Introduction

Samples of deposit were taken during excavation works for the extraction of charred plant remains. A percentage of features of all types and phases were sampled with an emphasis on representative spatial distribution.

Bulk samples were processed by flotation using a modified Siraf type machine and flots collected onto 250µm mesh sieves. Dried flots were submitted for assessment of their potential for detailed analysis.

The purpose of the sampling was to address issues of environment and economy of the site and to examine aspects of ritual activity in terms of the special deposits (See Section 2.2 - specifically Fieldwork Event Aims: 1, 5, 7-8, 11-4).

Methodology

All samples processed were submitted for assessment. Flots were first put through a stack of sieves from 500µm to 2 mm mesh size in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Any seeds or chaff noted were provisionally identified based on morphological characteristics and an estimate of abundance was made. The results are recorded in an Access database on a sliding scale (+ = 1-10 items, ++ = 11-50, +++ = 51-100, ++++ = 101-1000, and >1000 items). Fragments of charcoal greater than 2mm were randomly fractured and examined in transverse section. Provisional identifications were made based on the distribution of pores.

Quantification

Details of the samples from each site are presented in the following tables.

Table 11.1.1: A Summary of Samples from White Horse Stone (ARCWHS98)

No. samples		Phase/Feature type												
	Phase	Phase 1	Phase 3 Neolithic	Phase 6 M-L Bronze Age			Phase 7 Late Bronze Age-Middle Iron Age							Phase 9 Roman
	Total	Holocene soil	Long house/ associated features	pits	gullies	Post-hole	Ditch	Graves	Cremation pits	Metal-working pits	Post-hole	pits	Pot-fill	Gullies/ ditch/pit
1-10	290	20	11	2	3	2	2	6	-	29	189	15	1	3
11-50	16	-	2	-	-	-	-	1	-	3	2	8	-	-
51-100	12	-	-	-	-	-	-	1	-	4	1	7	-	-
101-1000	9	-	-	-	-	-	-	-	-	1	3	4	-	-
>1000	5	-	-	-	-	-	-	-	3	-	-	2	-	-
Total	331	20	157	9	4	2	9	8	4	43	32	49	1	7

Table 11.1.1: cont.

No. samples		Phase/Feature Type				
	Phase	Unphased				
	Total	Gully/ditch	Metal working pit	pit	Post-hole	Tree-throw hole
1-10	14	-	-	5	9	-
11-50	8	-	-	1	6	1
51-100	2	-	-	1	1	-
101-1000	-	-	-	-	-	-
>1000	-	-	-	-	-	-
Total	55	5	7	12	29	2

Table 11.1.2: Summary of Samples from Pilgrims Way and West of Boarley Farm

No. samples		Phase/Feature type				
	Site	ARCPIL 98		ARCBFW98		
	Total	MBA	Undated	IA?	MSAX/Med	Undated
1-10	12	-	9	-	1	2
11-50	7	-	3	1	1	2
51-100	1	1	-	-	-	-
101-1000		-	-	-	-	-
>1000	1	-	-	-	1	-
Total	50	1	34	2	3	10

Table 11.1.3: Neolithic Samples for Further Analysis

Site code	Sample	Context	Fill of	Group	Feature	Period	Sample Volume (l)	Flot size (ml)	Grain	Chaff	Weed seeds	Other	Id-Other	Charcoal	Id-charcoal
ARCWHS	289	4876	4874	4806	Pit	Neolithic	28	5	+					+	
ARCWHS	691	5281	5280	5297	Post-hole	Neolithic	5	5	+						
ARCWHS	739	5310	5308	4806		Neolithic	32	5	+						
ARCWHS	637	5259	5256	4806	Post-hole	LN	10	5				+	Corylus	+	cf. Cor/Aln
ARCWHS	639	5258	5256	4806	Pit	LN	22	10				++	Corylus	+	
ARCWHS	673	5257	5256	4806	Pit	LN	40	60				+	Corylus	+	Que
ARCWHS	676	5259	5256	4806	Pit	LN	20	5				+	Corylus	+	Que
ARCWHS	634	4931	4929	5297	Pit	Neolithic	40	10				+	cf.Malus	+	flecks
ARCWHS	742	5316	5315	4806	Post-hole	Neolithic	15	10				+	Vicia faba?	+	

Table 11.1.4: Phase 7: Grave Samples for Further Analysis

Site	Sample	Context	Fill of	Sub-group	Description	Phase	Sample Volume (l)	Flot size (ml)	Grain	Chaff	Weed seeds	Other	Id-Other	Charcoal	Id-charcoal
ARCWHS	33	2291	2184	2184	Stomach area of skeleton 2291	7	26	50	+	+	++	+++	Brassica - min		
ARCWHS	704	8013	8012	8012		7	40	10	+	+		+	Vic/Pis	+	Que Pom
ARCWHS	705	8014	8012	8012		7	40	75	+			+	Cor	+	Pom Que

Table 11.1.5: Phase 7 Cremation pit samples for further analysis

Site	Sample	Context	Fill of	Sub-group	Feature	Type	Period	Sample Volume (l)	Flot size (ml)	Grain	Chaff	Weed seeds	Other	Id-Other	Charcoal	Id-charcoal
ARCWHS	491	6130	6132	6132	Pit	Cremation pit	E/MIA	12	1600	5000+	+++	+			+	Que
ARCWHS	492	6099	6132	6132	Pit	Cremation pit	E/MIA	40	200	1000+	++	+			+	
ARCWHS	517	6099	6132	6132	Pit	Cremation pit	E/MIA	40	250	++++	+	+	+	Brassica		

Table 11.1.6: Phase 7, Metal Working Pits

Site	Sample	Context	Fill of	Sub-group	Feature	Period	Sample Volume (l)	Flot size (ml)	Grain	Chaff	Weed seeds	Charcoal	Id-charcoal
ARCWHS	541	7015	7007	7007	Pit	IA	16	50	+	++	++	++	Pom Que
ARCWHS	733	7015	7007	7007	Pit			10	+	++			
ARCWHS	734	7015	7007	7007	Pit		2	10	+	++	+	+	
ARCWHS	736	7008	7007	7007	Pit	EIA?	2	60	+	++++	++	++	Que
ARCWHS	896	7202	7201	7201	Pit	EIA?	7	50	++	+++	+		
ARCWHS	901	7203	7201	7201	Pit		5	20	+	+++	+		
ARCWHS	902	7202	7201	7201	Pit	EIA?	7	20	++	+++	++		
ARCWHS	905	7202	7201	7201	Pit	EIA?	5	10	+	+++	+		

Table 11.1.7: posthole samples for further analysis

Site	Sample	Context	Fill of	Group	Feature	Type	Period	Sample Volume (l)	Flot size (ml)	Grain	Chaff	Weed seeds	Other	Id-Other	Charcoal	Id-charcoal
ARCWHS	152	4352	4350	4503	Post-hole	4 poster	EIA	25 ltr	50	+++					+	Que
ARCWHS	102	4335	4334	4503	Post-hole	4 poster	EIA	38 ltr	150	++++			+	Cor	++	Que Pom
ARCWHS	91	4127	4126		Post-hole	4 poster	EIA?	40 ltr	100	++++	+	+	+	Cor	+	
ARCWHS	151	4351	4350	4503	Post-hole	4 poster	EIA?	15 ltr	150	++++	+	+			++	Que

Table 11.1.8: Phase 7 pit samples for further analysis

Site	Sample	Context	Fill of	Group	Sub-group	feature	Period	Sample Volume (l)	Flot size (ml)	Grain	Chaff	Weed seeds	Other	Id-Other	Charcoal	Id-charcoal
ARCWHS	4	2108	2107		2107	Pit	EIA	40	100	+++					+	
ARCWHS	6	2111	2107		2107	Pit	EIA	20	300	1000+	++++	++++	++	silica awns		
ARCWHS	5	2109	2107		2107	Pit	EIA?	10	40	++++	++	+			++	Que
ARCWHS	9	2125	2130		2130	Pit	EIA	12	2000	5000+	+++	+++				
ARCWHS	495	6131	6132		6132	Pit	IA	2	10	+++	+					
ARCWHS	472	6122	6110		6110	Pit	EIA	40	50	+		+++	+	Vic/Lath	+	
ARCWHS	495	6131	6132		6132	Pit	IA	2	10	+++	+					
ARCWHS	1	2104	2155	2460	2155	Pit	EIA	40	150	+++	+	+			+++	Pru Que
ARCWHS	8	2154	2155	2460	2155	Pit	EIA	20	50	++	+	+	++	min - Brassica, sewage fly weeds	+	Pom Que
ARCWHS	9	2125	2130		2130	Pit	EIA	12	2000	5000+	+++	+++				

ARCWHS	16	2142	2214		2214	Pit	EIA	8	50	++++	+++	+++			+	
ARCWHS	31	2267	2276		2276	Pit	EIA	40	100	+++					+	Pom
ARCWHS	749	8076	8079		8079	Pit	EIA	40	200	+++	+	++	++	Cor	++	Pru Pom
ARCWHS	3	2106	2155	2460	2155	Pit	EIA	40	50	+++	+	++	+	min seeds	++	Pom
ARCWHS	7	2153	2155	2460	2155	Pit	EIA	40	200	+++	++	++			+	Pom

Table 11.1.9: Samples from Boarley Road West for further analysis

Site-code	ample	Context	Fill of	Feature	Spot date	Sample Volume (l)	Flot size (ml)	Grain	Id-Grain	Chaff	Weed seeds	Other	Charcoal	Notes
ARCBFW98	2	1021	1057	Pit	Med	40	200	++	T.nk Hor	+		+	++	roots
ARCBFW98	4	1037	1057	Pit	IA?	40	200	++	Hor		+		+++	root
ARCBFW98	46	1144	1143	Pit		25	300	++	T.nk Hor Av			+	+++	v.v. rooty
ARCBFW98	47	1137	1142	Pit	MSAX?	30	500	1000+	T.nk Hor		+	+	+++	organic
ARCBFW98	48	1138	1143	Pit		40	100	++	T.nk Hor			+	+	

Table 11.1.10: Middle Bronze Age sample from Pilgrims Way for further analysis

Site-Code	Sample	Context	Fill off	Feature	Spot date	Sample Volume (l)	Flot size (ml)	Grain	Id-Grain	Chaff	Weed seeds	Other	Charcoal	Notes
ARCPIL98	24	573		Post-hole	MBA	7	40	+++	Hor T.spt				+	moss

White Horse Stone

Phase 1: Late Glacial to Early Holocene

A total of 20 samples were assessed from the buried Holocene soil (context 4144), selected from samples taken on a grid system from the full surviving extent of the buried soil (in order to examine the indications of local variation in the mollusc evidence from the buried soil, suggested during the evaluation). Charred plant remains were very rare. Occasional cereal remains (<10 grains) were noted in 10 samples with a single glume base in one sample. *Avena* sp. (oats), *Triticum spelta* (spelt wheat) and *Triticum spelta/dicoccum* (spelt/emmer wheat) were all noted. Nut shell fragments of *Corylus avellana* (hazel) and a single *Vicia/Pisum* sp. (vetch/bean/pea) were recorded (sample 97) and occasional tubers or rhizomes including of *Arrhenatherum elatius* (false oat-grass). Charcoal flecks were present in 18 samples, although in small quantities. Pomoideae and *Quercus* sp. were provisionally identified.

Phase 3-4: Neolithic

A total of 157 samples, mostly from the longhouse and associated features were assessed. Charred remains were very rare in all samples. Cereal grain, including free-threshing *Triticum* sp. (bread/rivet wheat) was noted in low numbers in 3 samples, while no chaff was noted. Woodland resources were also present in only low numbers, noted in 9 samples. Only one sample produced more than 10 items *Corylus avellana* nut shell fragments, a *Malus sylvestris* (crab apple) pip and an indeterminate nut/fruit were noted. Charcoal was present in 55 samples, although in small amounts of small fragments. The majority of the charcoal was of indeterminate species although *Quercus* sp. (oak), *Corylus/Alnus* sp. (hazel/alder), Pomoideae and coniferous woods (5 samples) were provisionally identified.

Phase 6 Middle-Late Bronze Age

A total of 15 samples were assessed, nine from pit 5421, four from ditch 4014 (possible deliberately placed deposits in the terminal) and two from 4-post groups 6140 (sample 389) and 6058 (sample 6001). No cereal remains were recovered from pit 5421, although occasional *Corylus avellana* (hazel) nut shell fragments were noted in two samples and charcoal in 5 samples, including Pomoideae and *Quercus* sp. The ditch terminal did produce occasional cereal grains from 3 samples, including *Hordeum vulgare* and *Triticum spelta/dicoccum*. Charcoal was present in three samples, again only in small amounts, and only Pomoideae was identified. One posthole sample produced a single *Hordeum vulgare* grain and indeterminate charcoal flecks (sample 6001).

Phase 6/7: Late Bronze Age/Early Iron Age and Early-Middle Iron Age

A total of 137 samples were assessed from features of Late Bronze Age to Middle Iron Age date. Samples were taken from post-holes, a cremation pit, graves, storage/refuse pits and metal working pits.

Four samples were assessed from cremation pits. No remains were present in pit 2415. All three samples from cremation pit 6132 were rich in cereal remains, with over 5000 grains in sample 491. All three deposits are dominated by essentially clean, processed grain with some chaff and weeds although minimal in relation to the grain. Charcoal was very rare. One *Brassica/Sinapis* sp. seed may represent a crop or a weed. The grain includes *Triticum spelta*, *Triticum dicoccum* (emmer wheat) and *Hordeum vulgare*. A radiocarbon date from this deposit gave a calibrated date of 760-390BC (68% confidence) or 800-200BC (95% confidence), suggesting an early Iron Age origin.

Three graves were sampled. Grave pit 2184 produced three samples from three fills, two of which produced only low levels of cereal remains (*Avena* sp. and *Triticum spelta/dicoccum*) and a slightly greater but still modest number of weeds. The third sample, sample 33 taken from the stomach area of the skeleton produced a similar low level of cereal remains but also some 51 to 100 mineralised seeds, provisionally all identified as *Brassica* sp. (cabbage, turnip, mustard etc). Two samples from grave 2296 produced only one cereal grain between them. Three samples from grave 8012 contained occasional grain and chaff but also occasional woodland resources including *Corylus avellana* nut shell and a *Prunus spinosa* (sloe) stone, as well as a single *Vicia/Pisum* sp. (vetch/bean/pea) seed.

Some 27 samples were taken from post-holes the majority of which produced only occasional or no cereal remains. Three samples did produce exceptional deposits, samples 102 and 151 from 4-post group 4503, and sample 91. All three produced grain rich deposits with very rare chaff or weeds (less than 10 items). Charcoal was also rare in these samples. Occasional *Corylus avellena* fragments were noted. *Triticum dicoccum* dominates sample 151, while *Triticum spelta*, *Hordeum vulgare* and *Avena* sp. were all noted.

Five metal working pits (sub-groups 7011, 7007, 7009, 7201 and 7205) were sampled segmentally, producing 43 samples. Low levels of cereals were noted in 29 samples including occasional grain and glume bases of *Triticum spelta/dicoccum*, *Triticum spelta*, *Triticum dicoccum* and *Hordeum vulgare*. Occasional flecks of *Quercus* sp. charcoal were also present. Sample 736 (sub-group 7007) produced an assemblage which was dominated by large amounts of cereal chaff (>100 items) with occasional grain and weeds. The chaff was dominated by *Triticum dicoccum* but also included *Triticum spelta*, *Hordeum vulgare* and an *Avena* sp. floret base. Moderate quantities of *Quercus* sp. charcoal were also present. Four samples from pit 7201 produced lesser but still good quantities of *Triticum dicoccum* and *Triticum spelta* chaff. The density of chaff in these samples is actually quite high given the small size of original sample (2 to 7 litres). Charcoal was present in 38 samples and was abundant in six. *Quercus* sp. was the taxon most commonly identified although non-*Quercus* charcoal was also present.

A total of 49 samples were assessed from storage/refuse or other pits. Four storage pit samples produced very good cereal deposits (samples 5, 6, 9 and 16). In sample 6 grain outnumbers chaff, although the chaff is still fairly common. Some silica chaff was also noted. Samples 5 and 9 were more grain rich with chaff present. Sample 16 produced

abundant grain and *Bromus* sp. seeds but with no obvious glumes or rachis. This sample does however, contain a large amount of silica chaff (glume tips and awn fragments) which might suggest the absence of glumes is to do with preservation. The grain in all four samples is very well preserved. *Triticum spelta*, *Triticum dicoccum*, *Hordeum vulgare* and *Avena* sp. *Tritiucm dicoccum* dominates sample 9. A fifth sample (17, context 2215) produced no macroscopic seeds or chaff but did contain silica skeletons and phytoliths believed to derive from cereal remains. The presence of phytoliths might indicate that the absence of macroscopic remains is a result of preservation.

Another 10 pit samples produced useful assemblages of cereal or other plant remains. Generally these samples are dominated by grain, although there are some exceptions. Sample 472, an Early Iron Age deposit (pit 6110), produced very rare grain or chaff but numerous weed seeds. Sample 895 produced little grain but very frequent chaff and weeds. Two more samples of note are sample 3 (pit fill 2106) and 8 (pit fill 2154) both of which produced moderate quantities of *Hordeum vulgare* grain but also mineralised seeds, including of *Brassica/Sinapis* sp. Occasional sewage fly pupare were also noted in sample 8. Of the remaining pit samples, 22 produced low numbers of seeds and chaff while 13 contained no seeds or chaff.

Phase 9: Late Iron Age and Roman

Seven samples were assessed from Roman features, all from gullies and ditches. The gullies from part of a hollow way. Charred remains were very limited, with only 1 to 10 cereal grains noted from three samples, and no chaff or weeds. *Hordeum vulgare*, *Triticum spelta* and *Avena* sp. were provisionally identified. Occasional charcoal flecks included *Prunus spinosa*, Pomoideae and *Quercus* sp.

Undated

One additional metal working pit produced 7 samples, taken in segments (sub-group 7005). These samples are undated, although are presumably Iron Age. The samples produced indeterminate charcoal in one sample and no seeds or chaff.

A further 37 samples of unknown date were assessed from gullies, postholes and pits. Two samples from gullies produced occasional flecks of *Quercus* sp. charcoal. A total of 23 samples from postholes included three with occasional (1-50) cereal remains and one (sample 125) with more useful quantity of *Triticum spelta* grain. This sample produced no chaff and only occasional weed seeds. Of the ten pit samples, six contained no charred remains at all. Sample 74 produced a single *Avena* sp. grain. Three samples from pit 7222 produced low levels of grain chaff and weeds. *Hordeum vulgare*, *Triticum spelta* and *Triticum dioccum* were noted. Moderate quantities of *Quercus* sp. and Pomoideae charcoal were noted. Two tree-throw hole samples were assessed. Sample 383 produced a possible *Linum uisitatissimum* (flax) seed and *Corylus avellana* nut shell fragments. *Corylus/Alnus* sp. and Pomoideae charcoal were also identified. Finally, three ditch samples produced no charred remains. Samples from ditch/gully fills, and a pot fill produced only occasional grain and chaff.

Pilgrims Way

Thirty five samples from Neolithic, Bronze Age and medieval contexts were assessed from the Pilgrims Way site. Samples were taken from postholes, buried soils, cremation deposits, pits, a ditch fill and tree-throw holes. One posthole sample (context 573) is dated to the Middle Bronze Age. Charred seeds and chaff were noted in thirteen samples. Five samples (54, 55 60, 61 and 64) produced collected woodland resources including *Malus sylvestris* (crab apple) and *Corylus avellana* (hazel) nut shell fragments. One of those samples (54) also produced a possible bean or pea (*Vicia/Pisum* sp.). Cereal remains were noted in eight samples, generally very small amounts of grain. Sample 24 (context 573) produced a more noticeable amount of grain with 51 to 100 grains, including *Triticum spelta* and *Hordeum vulgare*. Chaff was not noted and weeds were limited to a single grass seed in sample 17. Charcoal was recorded in 24 samples, generally in very small amounts, with more frequent charcoal in six samples. Taxa provisionally identified include *Quercus* sp., Pomoideae, *Prunus spinosa* and coniferous charcoal in samples 54, 60 and 61.

West of Boarley Farm

A total of 15 samples were assessed from the West of Boarley Farm site. All the samples were taken from pits. Provisionally dated samples were of Iron Age, Middle Saxon and medieval date. Charred seeds and chaff were present in 9 samples. Generally remains consisted of low levels of cereal grain including of free-threshing *Triticum* sp. (bread/rivet type wheat), *Triticum spelta/dicoccum* (spelt/emmer wheat) from an Iron Age pit, *Hordeum vulgare* (barley) and *Avena* sp. (oats). One sample from a Middle Saxon pit (context 1137) was very rich with in excess of 1000 cereal grains amongst which free-threshing *Triticum* sp. *Hordeum vulgare* and *Avena* sp. were provisionally identified. Chaff was noted in only one sample (sample 2) and limited to a single hexaploid *Triticum* sp. (bread-type wheat) rachis. Weeds were also rare noted in very small numbers in three samples only. Additional possible food remains include a *Brassica* seed and mineralised *Vitis vinifera* (grape) pip (sample 2), *Vicia/Pisum* sp. (vetch/bean/pea), *Corylus avellana* nut-shell and a Prunus spinosa (sloe) stone. All samples produced charcoal, in abundant quantities in 5 samples. *Quercus* sp. and Pomoideae charcoal dominated while occasional *Corylus/Alnus* charcoal was also noted.

Provenance

The charred remains in the Holocene buried soil are likely to represent no more than redeposited material which has worked itself down the slope into the valley with the colluvial deposits. As *Triticum spelta* is not recorded prior to the Middle Bronze Age in the area, this material is likely to be intrusive and of Bronze Age or later date. Some Late Bronze Age artefacts are also present in the deposit. The charred remains recovered from the Neolithic long house and associated features and from the Bronze Age deposits are again likely to represent reworked re-deposited background deposits of cereal waste and woodland resources. The charcoal may be no more than the result of flecks present in the atmosphere from small-scale fires. There is no evidence for domestic activity on any

scale and no evidence of structural wood. There is no evidence of ritually placed remains from the Bronze Age ditch terminal.

The majority of Iron Age samples produced only low concentrations of cereal remains, which are likely to represent no more than reworked cereal processing debris. The smaller number of exceptionally rich samples are very well preserved. These samples appear to have derived from deliberately placed deposits of cereals or burning accidents of some scale. These rich deposits might suggest that the absence or paucity of material elsewhere might be a result of preservation biases. Alternatively it is possible that cereal production was operated on a small scale only, and the richer samples represent exceptional accidents or special, ritual deposits. The assessment would appear to indicate that the pit samples, including the cremation pit generally consist of grain, chaff and weeds, thus is likely to be derived from unprocessed grain, possibly whole ears. The four-post structures seem to have produced cleaner; fully processed grain with only limited chaff or weeds. Where cereal remains are present within pots, such as in the cremation deposit, it would seem appropriate to suggest that they represent special placed deposits. Of particular interest is the fact that grain may have been deliberately burnt before being placed in the cremation pit in a pot. The metal working pits appear to be dominated by cereal chaff. Wood charcoal is also common in several samples. Both chaff and charcoal may represent fuel used as part of the metal production process, although it must be considered that they could represent no more than re-deposited cereal processing waste. The find of the mineralised *Brassica/Sinapis* seeds from the stomach area of the skeleton in grave 2184 is particularly interesting and could be derived from the gut content.

The Pilgrims Way charred remains are likely to have largely derived from background scatters of food processing waste. Some evidence exists of the collection of wild woodland resources. Charred grain is likely to have derived from processing accidents. There is no evidence of the by-products of cereal processing (the chaff and weeds) although this could be a result of preservation. The coniferous wood is present in those samples with woodland resources, which suggests it is an early prehistoric occurrence, although these samples are not dated.

Cereal grain and charcoal dominate the charred remains from West of Boarley Farm. The grain is likely to represent processed spoilt crop, perhaps thrown on fires. In most cases it is likely to be no more than re-deposited material present across the site and thrown into the pits with back-filled deposits. The grain rich sample may be the result of a deliberate dump of waste material. The charcoal is very mixed, so may perhaps represent firewood rather than structural remains. The dominance of free-threshing wheat would suggest that most of the samples are Saxon or Medieval in date.

Conservation

The flots are in a stable condition and can be archived for long term storage.

Comparative Material

Hazelnut shell tends to be the most commonly recovered plant of economic importance found within Neolithic and Early Bronze Age deposits in Britain. Crab apple is also recorded on a number of sites throughout the British Isles (see Moffett *et al.* 1989). The presence of these species is therefore not unusual for sites of this date, although the paucity of collected woodland resources was surprising given the large number of samples taken. This is perhaps more characteristic of ritual sites rather than domestic settlement sites. The samples do not suggest that cereal agriculture played a significant role at the sites, at least until the Middle Bronze Age, as suggested by sample 24 from Pilgrims Way. It is not possible to establish quite how significant cereal cultivation was at this time based on one sample, and it is too early to establish if agriculture was important elsewhere in Kent at this time. Within the CTRL project Neolithic and Early to Middle Bronze Age material was recovered from Eyhorne Street and Tutt Hill, where a similarly low concentration of remains were recovered, and the evidence for cereal production was again poor. There are no known published records of material of this date from within Kent.

The later prehistoric samples indicate that both emmer wheat and spelt wheat were being cultivated in the region in the Iron Age. The cultivation of emmer wheat is seen at other sites on the CTRL, such as Thurnham Villa and Eyhorne Street. There are occasional published records of emmer wheat in the Late Iron Age from Wilmington in Kent (Hillman, 1982) and from outside the region from Hascombe in Surrey (Murphy 1977) and Ham Hill in Somerset (Ede 1990). There appears to be a regional pattern in which, despite the widespread cultivation of spelt wheat, emmer wheat remained a significant crop and was cultivated throughout the Iron Age and Romano-British period. The White Horse Stone samples suggest that this tradition represents a continuation from the Bronze Age rather than a reintroduction within the Iron Age. Elsewhere in Britain the cultivation of emmer wheat in the Iron Age appears to be restricted to the Highland Zone with occasional records in southern Britain possibly representing no more that contamination of the spelt crop. On the continent spelt wheat is restricted to certain Alpine regions during the Iron Age while emmer wheat is much more widely cultivated (Bakels 1991).

It is very difficult to examine aspects of 'ritual' uses of plant remains due to the general nature of the botanical evidence. While an articulated skeleton may be easy to attribute to ritual, the charred grain recovered from the fill of a pit may simply represent re-deposited waste. Attempts to distinguish between ritual and rubbish were made in the Danebury Environs programme which suggested that the disposal of material seemed to be most related to the activities taking place close to those features (Campbell 2000). The fact that the present samples include charred grain deposited in pots in association with other 'placed' objects must imply some degree of ritual. A similar deposit was recovered during the evaluation at White Horse Stone.

The material from West of Boarley Farm provides some evidence for arable activity during the Middle Saxon period. The range of species identified is consistent with those usually recovered in the Middle Saxon and medieval period in Southern Britain, for

example from West Cotton (Campbell 1994). To date there are no available assessment results for Saxon material within the CTRL project.

The later prehistoric material conversely offers very good potential for analysis (Fieldwork Event Aims 1, 5, 8) in order to explore both aspects of the arable systems in its local, regional and national context, and specific aspects of activity within the site including ritual.

Updated research aims

Themes concerning chronology, settlement, landscape and society (status, settlement organisation), material culture, regionality and processes of change can be addressed.

General

- To produce a detailed species list of faunal and charred plant species. This will contribute to a national dataset (e.g. Environmental Archaeology Bibliography (EAB) English Heritage/University of York) of remains associated with Neolithic long house structures in Britain.

Chronology

- To explore trends in crops grown and animals reared through time in order to build a chronological framework and to highlight gaps in that framework.

Settlement, landscape and society

- What is the nature of Neolithic woodland habitat if the coniferous wood is confirmed as being of this date? It is suggested that the date of the coniferous charcoal should be confirmed by radiocarbon dating. Its contextual associations should be considered especially its occurrence in postholes of the Neolithic house and its absence from other contexts.

To further explore the economic basis of the Iron Age communities particularly:

- Are there Late Bronze Age origins in arable intensification
- To explore the treatment of emmer wheat and spelt wheat for example are they grown as a single crop or as separate crops
- To explore the economic role of oats and brome grass
- To explore the status of non-cereal crops such as Brassicas
- To explore the treatment of cereal post-harvest including storage patterns
- To investigate the composition of possible special deposits and the relationship/association between plant remains, faunal remains and other artefacts and between feature types.
- To investigate the function of different features/areas.
- To investigate the various types of fuel and their contextual associations

Regionality

- Is there evidence for any non-local contact?

Processes of change

- When was settled cereal-based agriculture fully established? Did this occur by the middle Bronze Age?

Recommended further work

Samples that produced plant remains and charcoal from the Neolithic long house and associated features should be analysed (species identification and quantification) given the archaeological importance of these contexts, even though the concentration of remains is low.

It is recommended that the Middle Bronze Age sample (sample 24) from Pilgrim's Way is sorted, and that the assessment results are considered in the final report.

It is recommended that the richer samples from pits and the postholes are sorted and analysed in full. In addition some of the charred seeds and chaff and the charcoal from the metal working pits should be analysed more closely to explore aspects of selection of fuel for industrial processes. While the majority of the charcoal identified so far was of oak, it is important to identify any additional taxa.

The residues of samples that produced mineralised remains should be checked for remains that have not floated. This material provides a useful additional source of information about cultivated species, which do not normally survive in the archaeological record, and should be considered in relation to storage and possible use of manure.

The relationship and association between grain deposits and other 'placed' remains in pits, particularly the metalworking residue, and animal bone should be explored. Any differences in deposit type across the site should be examined particularly differences between possible spoilt stored crop, disposed or reused cereal waste, ritually disposed cereal waste and ritually deposited cereal product. The possible ritual deposit recovered during the evaluation should be included in the analysis.

Saxon material is not widely available from the general area. It is therefore suggested that the rich sample from West of Boarley Farm, with an additional 3 or 4 samples, are sorted and analysed in full. Analysis of the wood charcoal from 4 or 5 of the deposits producing mixed taxa (assuming that these are confirmed as Saxon in date) would provide interesting information on fuel use in this period.

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Blind Lane

- MACROSCOPIC PLANT REMAINS

Assessment of Charred Plant Remains

by Ruth Pelling

Introduction

Samples were recovered for charred plant remains and charcoal during excavation works at West of Blind Lane. Despite the evaluation suggesting the environmental potential of the site was poor, small number of representative samples were recovered from a range of features for comparative purposes. Eight samples were taken in total from a middle-late Bronze Age ditch, two late Iron Age-Roman ditches, a late Iron Age post hole and a layer in the southern part of the site where a number of features other than ditches are concentrated.

The samples were taken in accordance with the Landscape Zone Priorities and Fieldwork Event Aims for the site, which are set out in section 2 of the main report, above. The aim of taking the samples was to elucidate the function and economic basis of the site.

Methodology

Samples were taken from a representative range of feature type and period. In total 8 samples were taken for the recovery of charred plant remains. The volume of deposit processed for each sample ranged from 7 to 40 litres. Samples were processed by bulk water flotation using a modified Siraf machine, and the flots collected onto 250 μm mesh sieves. Flots were air dried slowly before being submitted for assessment. Six samples produced flots and were submitted for assessment. Each flot was first put through a stack of sieves (2 mm, 1 mm and 500 μm) in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at magnification of x10. Any charred seeds and chaff were provisionally identified and an estimate of abundance was made. Fragments of charcoal were randomly fractured and examined in transverse section at x10 and x20 magnification.

Quantification

A total of 6 samples were assessed. A summary of the assessment results are shown in Table 7.1 below. Flots were generally quite small and contained frequent rootlets and modern moss. Charred seeds and chaff were noted in three samples, in each case in low numbers (less than ten items). Cereal grain was noted in two samples and included *Hordeum vulgare* (barley), while a *Triticum spelta* (spelt wheat) glume base was noted in another sample. A single weed seed was noted. In addition one *Vicia/Pisum* sp. (vetch/pea) pulse was recorded. Charcoal was noted in all samples, but generally in low

quantities of poorly preserved indeterminate taxa. More abundant quantities of *Quercus* sp. (oak) charcoal were noted in two samples.

Provenance

The occasional cereal and pulse remains were recorded from two late Iron Age-Roman ditch samples and a sample of disturbed natural or eroded deposit in which a scatter of slag, perhaps derived from marling, was recorded. Small quantities of slag or clinker were also noted in this sample. The remains are likely to represent no more than background scatters of cereal processing debris present in the deposits across the site. There is unlikely to be any significant association with feature type. The presence of cereal remains does suggest some cereal consumption occurred on the site, although there is no evidence of significant cereal production or processing.

Conservation

The flots are in a stable state and can be archived for long term storage.

Comparative Material

Few deposits of middle-late Bronze Age date have been examined from the CTRL. Recently material of middle Bronze Age date has been examined from a site at Dartford (Pelling unpubd) which produced a large deposit of cereal grain and chaff, and included both emmer and spelt wheat. Evidence for large-scale cereal production from this period is therefore known from within the Kent region and is also known from outside it, for example from Black Patch, East Sussex (Hinton 1982). The evidence now suggests this is a period of agricultural change in which spelt wheat was replacing emmer wheat, possibly quite rapidly.

Evidence for the late Iron Age and early Roman period is more prominent within the region of the CTRL. There is evidence of cereal production and crop processing from some sites, for example the East of Station Road site and Eyhorne Street, which also produced early Iron Age deposits. Cereal remains suggestive of small scale production and processing were also present, for example, at South of Snarkhurst Wood and Hockers Lane. Evidence across southern Britain (eg from the Danebury Environs region, Campbell 2000; Greig 1991) indicates intensive cereal production was occurring in many, although not all areas and that barley and spelt wheat were the prominent cereal crops of the period, although emmer wheat is also recorded from some sites.

Potential for Further Work

The samples offer only limited potential for examining aspects of the economic activities at the site in any more detail. The absence of significant seeds or chaff is such that no further work is recommended. Nevertheless the general absence of evidence for large-scale cereal production is important and should be considered in any overview.

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Table 7.1: Summary of charred plant remains

Sample details					Flot details						
Sample	**Context**	**Feature Type**	**Period**	**Sample size (l)**	**Flot size (ml)**	**Grain**	**Chaff**	**Weed seeds**	**Other**	**Charcoal**	**Comments**
2001	2131	Natural layer 2131	?	40	30	+	-	+	-	++	Clinker?
2002	2063	Ditch 3007	LIA	35	5	+	-	-	-	+	Roots/moss
2003	2136	Ditch 3006	M-LBA	32	5	-	-	-	-	+	Roots/moss
2004	2053	Ditch 3006	M-LBA	40	10	-	-	-	-	+	Roots/moss
2005	2125	Ditch 3008	LIA-RO	40	10	-	+	-	+	+	Roots/moss
2006	2128	Post-hole 2130	LIA	7	60	-	-	-	-	+++	

East of Station Road / Church Lane

- MACROSCOPIC PLANT REMAINS AND CHARCOAL

Assessment of the Charred Plant Remains

by Ruth Pelling

Introduction

Samples were recovered during excavation works at East of Station Road for the recovery of charred plant remains and charcoal. A total of 18 samples were processed by flotation in a modified Siraf-type machine. The flots were collected onto a 250 μm mesh and allowed to air dry slowly. The samples were taken from ditch fills, pit fills and a tree-throw hole with the intention of examining the economy of the site and its interaction with the local environment. The deposits are of late Iron Age - early Roman date.

Methodology

All the samples processed were submitted for assessment. Flots were first put through a stack of sieves from 500 μm to 2 mm mesh size in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Any seeds or chaff noted were provisionally identified based on morphological characteristics and an estimate of abundance was made.

Quantification

Of the 18 samples assessed six contained charred remains other than charcoal (Table 18). Cereal grain was infrequent, present in only four samples, and always less than 50 items (usually less than 10). Chaff was more commonly present, recorded in five samples. Three samples contained quite useful quantities, with 51 to 100 items. Weeds were noted in three samples, again in low numbers. In addition a single monocotyledon rhizome was noted in sample 22 from burnt pit 1345.

The cereal species noted were dominated by *Triticum spelta* (spelt wheat), with *Hordeum vulgare* (barley) grain noted in sample 1. The weeds noted included *Montia fontana* (blinks), *Rumex* sp. (docks) and *Tripleurospermum inodorum* (scentless mayweed), all presumably occurring as weeds of the arable crop.

Charcoal was present in 13 samples and in abundant quantities in six samples. *Quercus* sp. (oak) dominated the assemblages, while Pomoideae (apple, pear, hawthorn etc.) was the only other taxon noted. Much of the charcoal was poorly preserved and presented difficulties for identification due to the presence of iron deposits.

Provenance

The remains are typical of cereal processing waste, with few grains but frequent glume bases and some weeds. It is likely that the waste has been reused in fires as fuel and then

discarded as refuse. The chaff rich samples all came from ditch fills. The samples from burnt pits 1349 and 1361 (samples 21, 22 and 23) were rich in charcoal but produced few cereal remains.

Conservation

The flots are in a stable condition and can be archived for long term storage.

Comparative Material

Hordeum vulgare and *Triticum spelta* have been recorded from other contemporary sites within the CTRL project (for example Thurnham Villa, Waterloo Connection and Hockers Lane). They are the principal cereals recorded throughout southern Britain at this time, for example in the Danebury Environs area (Campbell, 2000). Some of the richer deposits from Thurnham Villa and Hockers Lane have also produced emmer wheat and oats, which have not been recorded a the East of Station Road site. It will be important for addressing the fieldwork aims to establish how important these crops were and at what date, and equally to establish when they are absent.

Potential for Further Work

While the concentration of remains in the deposits are not comparable in terms of scale to those of the larger sites, such as Thurnham Villa, they do provide additional information which within the context of the CTRL project as a whole is very important. Prior to the CTRL work knowledge of the agricultural activities of the area in the Iron Age and Romano-British periods was very limited indeed. There is now the opportunity to conduct an informative landscape study, within which the smaller sites, such as this one, will add useful additional information for the study of past agricultural regimes and change in cereal production and exploitation of the landscape over time. It would be of value for addressing Fieldwork Event Aims 2 and 3 to produce an extensive dataset so as to track the occurrences or absences of the poorly understood crops such as emmer wheat, oats and the pulses. It is therefore recommended that in order to produce a worthwhile data-set, the three samples (3, 19 and 20) which produced large quantities of chaff are examined in detail.

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Table 18: East of Station Road: summary of the charred plant remains

Context	Feature	Period	Sample No	Sample Vol (l)	Flot size (ml)	Grain	Chaff	Weed seeds	Charcoal	Notes
1318	Ditch 1319	LIA-RO	4	10	50				+	uncharred root? Wood
1320	drainage ditch	LIA-RO	5	7	10		+			
1215	Ditch 1341	LIA-RO	6	10	10					roots/ modern weeds
1217	Ditch 1218	LIA-RO	7	7	10					Roots
1314	Ditch 1315	LIA-RO	3	10	10				++	
1307	Ditch 1326	LIA-RO	2	11	10	+	+++			
1706	Ditch 1707	LIA-RO	8	4	20				+++	
1712	Ditch 1713	LIA-RO	9	4	100				+++	
1708	Ditch 1707	LIA-RO	10	10	50				+++	
6008	gully 6009	LIA-RO	1	10	10	+			++	
1714	layer	LIA-RO	11	6	10				++	
1715	1716	LIA-RO	12	6	50				+++	
1614	Ditch 1615	LIA-RO	13	18	10				++	
1330	Ditch 1331	LIA-RO	19	10	20	++	+++	++	++	
1345	Ditch 1358	LIA-RO	20	10	20	+	+++	+		Roots
1350	burnt pit 1349	LIA-RO	21	10	20				+	Roots
1351	burnt pit 1349	LIA-RO	22	10	30		+	+	+++	Rhizome
1363	burnt pit 1361	LIA-RO	23	4	200				++++	

\+ = 1-10
++ = 11-50
+++ = 51-100
++++ = 101-1000
1000+ = >1000

Chapel Mill

- PLANT REMAINS

Assessment of Charcoal

by Dana Challinor

Introduction

During strip, map and sample excavation works at Chapel Mill, five samples were taken in order to sample two cremation pits in their entirety for the recovery of charred plant remains and cremated bone.

The samples were taken in accordance with the Fieldwork Event Aims for the site, which are set out in section 2 of the main report, above. The purpose in sampling was to examine the evidence for change and continuity in burial practices between the late Iron Age and the Roman period.

Methodology

All five samples were processed and assessed. The volume of soil processed ranged from 8 to 40 litres. The samples were processed by flotation in a modified Siraf-type machine, with the flots collected onto a 250µm mesh. The flots were air-dried and divided into fractions using a set of sieves. Fragments of charcoal were randomly extracted, fractured and examined in transverse section under a binocular microscope at x10 and x20 magnification. Fragments caught in the >2mm sized sieves were quantified as identifiable. In the case of large flots, a sample of *c* 20% was examined. The flots were also scanned for the presence of any other charred plant remains.

Quantification

A total of five samples was assessed, of which four produced identifiable wood charcoal (Table 10). Four taxa were identified - *Fraxinus excelsior* (ash), *Quercus* sp. (oak), *Alnus/Corylus* (alder/hazel) and a single fragment of coniferous wood, cf. *Pinus* sp. (pine). Ring-porous taxa are more easily recognisable at low magnification, although the identification of the diffuse porous taxa is tentative and the presence of coniferous wood will need to be confirmed. Pit 205 produced a huge quantity of charcoal in its upper fill, with an assemblage dominated by large pieces of *Fraxinus excelsior* and a very little *Quercus* charcoal. The lower fill of the same pit had a similar composition but produced fewer and smaller fragments of charcoal. Pit 213 contained a different assemblage which was dominated by *Alnus/Corylus* type charcoal. In this pit, the primary fill produced the greatest quantity of charcoal and the coniferous wood. Most of the flots also contained some charred amorphous tissue, possibly parenchymatous. Indeed, both flots from pit 205 produced some charred tubers and monocotyledonous rhizomes. A small amount of coal and modern material, such as insect remains and seeds, were present in all flots.

Provenance

There is a marked contrast in the selection of fuelwood for cremation in the two cremation pits at this site. However, there is no suggestion that more than a single burning event is represented in the composition of both pits, as all the assemblages appeared to be dominated by a single taxon (it is assumed that the *Alnus/Corylus* type charcoal is either one or the other as the fragments exhibited similar patterns). The presence of other taxa in the assemblages, although in smaller quantities, may relate to the position of the wood in the fire or it may represent the remains of artefacts placed on the funeral pyre. The preservation of the charcoal was very good and concentration was high, which is to be expected in a burial pit containing the remains of the original pyre. Sample 100 produced large fragments of ash charcoal with up to seven years growth, from which a clear pattern was discernible. This pattern was compatible with those produced by the practice of woodland management, but some of the large pieces clearly fitted together to form a single branch, suggesting that a single branch/tree had been used as fuel. It would be difficult to infer woodland management from a single tree, and no other flot produced fragments of a large enough size.

Conservation

The flots are in a stable condition and present no problems for long-term storage and archive.

Comparative material

The predominance of a single taxon in prehistoric cremation assemblages, indicating the use of a single tree or specifically selected species in ritual activities, has been noted at Radley Barrow Hills (Thompson 1999, 352) and at Rollright Stones (Straker 1988). It has also been suggested that the abundance of oak or ash in cremation deposits, compared to other species, is a result of the pyre structure, the timber from these trees providing the supports in a central position, less likely to have been totally reduced to ash (Gale 1997, 82). The presence of tubers in cremation deposits has been noted elsewhere (e.g. Jones 1978, 108; Carruthers 1992, 63; Moffett 1999, 245) and may have been linked to ritual activity. At Chapel Mill, the evidence is more convincing for the use of grass as tinder, since the small burnt rhizomes would not be edible. However, there has been little publication on Iron Age and Roman charcoal from cremation deposits (Gale 1997, 77), although other sites along the CTRL are likely to provide comparable data.

Potential for further work

The utility of further work on these samples is dependent upon obtaining better dating through which it would be possible to determine whether or not the cremation pits are contemporary. It is anticipated that minimal work could be carried out to confirm the predominance of a single taxon and the absence of other taxa. Certainly, it is not considered that full fragment counts would provide useful information. A full discussion of the charcoal from these cremation deposits will allow valuable comparisons to be made with other sites, both regionally and nationally.

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Table 10: Summary of charcoal from cremations

Sample details					Flot details		
Pit	**Context**	**Period**	**Sample no.**	**Sample size (l)**	**Flot size (ml)**	**Charcoal**	**Taxa**
205	203	LIA	100	38	1400	1000+	*Fraxinus excelsior* *Quercus* sp.
	204	LIA	101	40	150	++	*Fraxinus excelsior*
213	211	-	103	35	250	+++	*Alnus/Corylus* *Quercus* sp. cf. *Pinus* sp.
	212	-	104	38	300	++++	*Alnus/Corylus*

+ = 1-10; ++ = 11-50; +++ = 51-100; ++++ = 101-1000; 1000+ = >1000

Snarkhurst Wood

- MACROSCOPIC PLANT REMAINS AND CHARCOAL

Charred Plant Remains and Charcoal

by Ruth Pelling

Introduction

Samples were taken during excavation works at South of Snarkhurst Wood for the recovery of charred plant remains and charcoal.

Features sampled included ditches, postholes forming a circular structure and four-post structures and pits. All features sampled were of late Iron Age to Early Roman date (1st century BC to 1st century AD). Samples were processed using bulk water flotation and the flots collected onto 250μm mesh sieves. Flots were air dried slowly before being submitted for assessment. All residues were processed.

The samples were taken in accordance with the Fieldwork Event Aims for the project, which are set out in section 2 of the main report, above. The purpose of sampling was to investigate economic activity at the site and to refine understanding of the development of the settlement.

Methodology

Samples were taken from each class of archaeological feature, focussing on secure contexts. In total 26 samples were taken for the recovery of charred plant remains, 25 from the main excavation site and one sample during the watching brief. The volume of deposit processed for each sample ranged from 2 to 40 litres. All the samples were processed and submitted for assessment. Each flot was first put through a stack of sieves (2mm, 1mm and 500μm) in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at a magnification of x10. Any charred seeds and chaff were provisionally identified and an estimate of abundance was made. Fragments of charcoal were randomly fractured and examined in transverse section at x10 and x20 magnification.

Quantification

A total of 26 samples were assessed. The results are shown in Table 8.1 below. Flots were generally quite small and contained frequent rootlets. Charred seeds and chaff were absent from 11 samples. One sample contained between 11 and 50 charred items. The remaining 11 samples contained only low levels of cereal grain and chaff with occasional weed seeds (0-10 items). Both cereal grain and chaff were present in the samples. *Hordeum vulgare* grain was noted in 9 samples. Hulled wheat grains were recorded in 8 samples while glume bases were noted in 9 samples. In most cases the preservation of both grain and glume bases was poor and identification was not possible to species. Both *Triticum spelta* and *Triticum dicoccum* were noted amongst the occasional better preserved remains. Weeds were generally only rarely observed and included *Rumex* sp.

(docks), *Vicia/Lathyrus* sp. (vetch/tare/vetchling) and small seeded Gramineae (grasses). In addition, nutshell fragments of *Corylus avellana* (hazel) were noted in one sample (sample 100).

Charcoal was present in low numbers in 12 samples. Three samples contained moderate quantities while six samples contained quite frequent amounts. *Quercus* sp. (oak) dominates the charcoal assemblages. Pomoideae (apple/pear/hawthorn etc) and *Prunus spinosa* (sloe) were occasionally noted. The identification of the non-*Quercus* charcoal is tentative.

Provenance

The richer of the samples was derived from a ditch (context 126). Low levels of remains and charcoal were recovered from the full range of features. There appears to be no relationship between the quantity and quality of the remains and feature type. The preservation of material is poor to moderate. In part this is the result of damage during charring. Some abrasion may have occurred as the result of post-depositional damage. The preservation is such that there is little potential to take the identifications of cereal remains any further.

Conservation

The flots are in a stable state and can be archived for long term storage. It is recommended that the flots are retained until completion of the CTRL post-excavation report.

Comparative material

The range of material noted in the samples is generally typical of the late Iron Age and Roman periods throughout southern Britain, with spelt wheat the dominant cereal and hulled barley also cultivated. The role of emmer wheat (*Triticum dicoccum*) is less well known than spelt for this period. There is good evidence of its cultivation in the late Iron Age from Wilmington in Kent (Hillman 1982) and from outside the region from Hascombe in Surrey (Murphy 1977) and Ham Hill in Somerset (Ede 1991). In the Romano-British period, evidence from sites such as Tiddington (Moffet 1986) or Barton Court Farm (Jones and Robinson 1984) suggest emmer to be a minor crop compared to spelt; possibly even present as a weed of the spelt crop. More recently much larger assemblages were recovered from a site at Mansfield College in Oxford (Pelling, unpublished).

Potential for further work

The samples offer only limited information about the economic activities at the site and do not refine understanding of the development of the settlement. The samples do provide some useful data in terms of the development of the archaeobotanical dataset for the region as a whole. Barley and hulled wheat, including both spelt and emmer, are represented. There is no evidence of cereal processing, and it is not possible to establish if the cereals were locally produced or were imported into the site. There is no potential for more detailed analysis of these samples. The quantity and range of material is such that detailed analysis will not provide any additional information to the assessment. However,

the results of the assessment are useful and should be included in the final reports. Of particular importance is the presence of emmer wheat, albeit in low numbers. The role of emmer wheat in the cereal economy of the Iron Age and Romano-British period is not well understood at present, and this assemblage provides further evidence for its cultivation on a small scale.

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Table 8.1: the Charred Plant Remains

Context	Type	Period	Sample No.	Sample size (l)	Flot size (ml)	Grain	Identified grain	Chaff	Identified chaff	Weed seeds	Other	Charcoal	Comments
10		LIA	1		20	+	Hor	-		+	-	+	
126	Ditch	LIA - 50	100	35	150	++	Hor T.spt/dic	++	T.dic T.spt/dic	+	+	+++	
132	Ditch	0 - AD50	102	13	10	-		-		-	-	-	
143	Posthole	40 - 70	103	16	10	-		-		-	-	+	
152	Posthole		104	20	10	-		-		-	-	-	Roots
153	Posthole		105	21	10	+	indet	-		-	-	+	
157	Posthole	c.AD43 - 70+	106	4	50	-		+	T.spt/dic	-	-	+	
158	Posthole	c.AD50 – 180+	107	20	50	+	indet	+	T.spt/dic	-	-	+	
165	Posthole		108	15	100	+	Hor T.spt/dic	+	T.cf dic	+	-	++	
166	Posthole		109	11	10	-		-		-	-	+	
173	Pit	AD40 – 70	111	40	150	+	T.spt Hor	+	T.spt/dic	+	-	+++	
173	Pit	AD40 – 70	112	40	150	+	T.sp	+	T.spt/dic	+	-	+++	
186	Ditch	LIA	113	20	10	-		-		-	-	-	Roots
183	Ditch		116	40	50	-		-		-	-	+	Roots
127	Pit		119	40	150	-		-		-	-	+++	Roots
259	Ditch		120		10	-		-		-	-	+	
261	Ditch	AD40 - 70	121	40	150	+	T.spt/dic Hor	+	T.spt/dic	+	-	+	
125	Ditch	AD40 - 70	122	2	10	-		-		-	-	-	Roots
233	Pit	LIA - 43+	123	40	100	-		+	T.spt/dic	+	-	++	
268	Pit		124		10	-		-		-	-	+	
266	Pit		125	26	10	-		-		-	-	-	
269	Pit	LIA - 70	126	30	10	+	T.spt/dic	-		-	-	+	
237	Other	AD30 - 70	127	40	100	+	Hor	-		-	-	+	
238	Other	AD40 - 50+	128	40	250	+	Hor	+	T.spt/dic	+	-	+++	
280	Other	LIA - 50+	129	26	250	+	T.spt/dic Hor	-		-	-	+++	
252	Other	LIA - 50	130	40	100	+	Hor T.spt/dic	-		+	-	++	Roots

+ = 1-10 items/charcoal present; ++ = 11-50 items/charcoal moderate; +++ = 51-100 items/charcoal common
Hor *Hordeum vulgare*; T. spt *Triticum spelta*; T. dic *Triticum dicoccum*; T. sp *Triticum* sp.; Cory *Corylus avellana*

Thurnham

- MACROSCOPIC PLANT REMAINS AND CHARCOAL

by Ruth Pelling

Assessment of the Charred Plant Remains and Charcoal

Thurnham Roman Villa (ARC THM 98) and Honeyhills Wood (ARC HHW 98)

Introduction

Samples of archaeological deposits were taken during excavation works at Thurnham Roman Villa (ARC THM 98) and Honeyhills Wood (ARC HHW 98) for the recovery of charred plant remains.

The recovery and study of the samples was undertaken in accordance with the Fieldwork Event Aims for the site, which are set out in section 2 of the main report, above. The sampling programme aimed to address general questions concerning the diet and cereal economy of the site as well as gaining specific information about the function and nature of individual features, buildings or activity areas. On a wider, regional and national level it was hoped to gain information about the Late Iron Age and Romano-British economy of Kent and to look at the development of agricultural trends through the periods particularly at the time of the Roman conquest.

Methodology

Sampling on site ensured that deposits from all major feature types and phases were represented. Where possible, samples were taken from discrete and secure contexts with the minimum of intrusive material or contamination. Multiple samples were taken from a corn-drier for detailed analysis and interpretation of the function of the feature.

All samples were processed and submitted for assessment of their potential for analysis. Samples were processed by bulk water flotation and flots were collected onto 250μm mesh sieves. Residues were retained on 1mm sieves.

Quantification and Provenance

A total of 249 samples were taken from the Thurnham Villa main site and one sample from Honeyhills Wood. The volume of material processed ranged from 3 to 40 litres. The volume of flots ranged from about 10 ml to 4 litres, but is generally in the region of 50 to 250ml. Table 10.1 shows the number of samples for each feature type. The samples are discussed by feature type. Table 10.2 indicates contexts that contained useful quantities of seeds or chaff.

Ditches

The majority of ditch samples were of Late Iron Age to early Roman date.

The best results were seen in samples from early Roman phase 3 ditches 20400 (the proto-villa boundary) and 10660 (the east side of the enclosure). Sample 10346 (context 12203; ditch 10660) produced a large flot (600ml) with in excess of 1000

items each of grain, chaff and weed seeds. Grain included both *Triticum spelta* (spelt wheat) and *Hordeum vulgare* (barley) as well as some short grained *Triticum* sp. (wheat) which may be either a free-threshing bread type wheat or a short grained spelt. The chaff includes both *T. spelta* and *T. dicoccum* glume bases and *Hordeum vulgare* rachis. Frequent *Bromus* subsect *Eubromus* (brome grass) seeds were noted amongst the weeds.

Three other samples (10380, 10381, 10383), all from ditch 20400, contained reasonable quantities of material with up to 100 grains and in two cases up to 100 items of chaff. Weeds were noted in all three samples. Cereal remains noted included *Triticum spelta* with some germinated grain and *Hordeum vulgare*. These richer flots produced moderate to well preserved remains.

Of the remaining ditch samples 33 flots produced no charred seeds or chaff and only small quantities of charcoal if any, and 30 produced a limited range of grain and chaff and very few weeds. Flots were generally small and the preservation of remains poor.

Moderate quantities of *Quercus* sp. charcoal were seen in the richer samples and occasional to moderate quantities in other samples. Possible Pomoideae charcoal was noted in one sample.

Structures

Four samples were taken from structures, but the results are poor. Samples 10063 and 10062 both produced small flots (*c* 10ml) with less than 10 items. A *Hordeum vulgare* grain and a *Triticum spelta* glume base were identified. No weeds were noted in either sample. *Quercus* sp. (oak) flecks were noted in both samples. Samples 10276 and 10275 produced slightly bigger flots (400 and 100ml) consisting almost entirely of charcoal. Very occasional cereal grains (less than 10) were noted but no chaff. The charcoal identified included *Quercus* sp. and Pomoideae.

Postholes

Ten posthole samples were assessed, and the flots were generally small. Two samples (10059 and 10664) produced no seeds or chaff. Charred plant remains were generally limited in the remaining samples. Samples 10272 and 10061 contained between 11 and 50 cereal grains while sample 10294 contained a similar number of chaff items. The other samples produced only 1 to 10 items of grain, chaff and/or weed seeds. The cereal species noted in the samples included *Triticum spelta* (spelt wheat) and *Triticum spelta/dicoccum* (spelt/emmer wheat) and *Hordeum vulgare* (barley). *Quercus* sp. charcoal is present in small quantities and possible Pomoideae in sample 10277.

Postpipes

A total of 21 samples were assessed from postpipes. Charred seeds and chaff were noted in all samples, generally in low numbers. Four samples produced more than 11 cereal grains, one of which also produced 51-100 items of chaff and 11-50 weed seeds (sample 10038; postpipe within the aisled building). Cereals identified included *Triticum spelta* (spelt wheat), some of which had germinated, *Hordeum vulgare* (barley) and *Avena* sp. (oats). The chaff was generally dominated by *Triticum spelta* glume bases. In addition to the cereals occasional *Corylus avellana* (hazel nut) shell fragments were noted and *Prunus* sp. (sloe, plum etc.) stones were present in samples

10280 and 10038. Charcoal was noted in all samples, mostly of *Quercus* sp. (oak) but with some Pomoideae and possible *Corylus/Alnus* sp. (hazel/alder).

Gullies

Four samples were assessed from gullies. Sample 10060 produced 11 to 50 items each of grain, chaff and weeds. The remaining samples produced only low levels of remains. Sample 10052 did produce a very large flot but this consisted predominantly of *Quercus* sp. (oak) charcoal. The cereal remains noted in the samples included *Triticum spelta*, some of which had germinated and occasional *Avena* sp. (oats).

Ovens and Hearths

Six oven and 13 hearth samples were assessed. Eight samples produced no seeds or chaff and a further five contained only small quantities levels of material. Three samples, two from hearths and one from an oven, produced more useful quantities of remains each with 50 to 100 grains; the two hearth samples were from the aisled building, while the oven sample was from the late (4th century) oven within the villa building. *Hordeum vulgare* (barley), *Triticum spelta* (spelt wheat) and a short grained *Triticum* sp. (wheat) were all recorded. Chaff was infrequent but does include possible *Triticum aestivum* type rachis as well as *Triticum spelta* glume bases. Weeds were again infrequent. Occasional *Corylus avellana* (hazel nut) shell fragments were noted and a *Vicia/Pisum* sp. (vetch/bean/pea). Charcoal was present in most samples and in large amounts in three. *Quercus* sp. appears to be dominant while *Corylus/Alnus* sp., Pomoideae and *Prunus* sp. may also be present.

Inhumations

Two samples were assessed from early Roman inhumations. Both produced low levels of remains with between 10 and 50 items of grain, and chaff. *Triticum spelta* and *Triticum spelta/dicoccum* were noted and occasional *Quercus* sp. charcoal.

Pits

A total of 20 samples were assessed from pits, mostly of Late Iron Age to Early Roman date. Ten samples contain no charred remains and a further eight samples contain only very small to moderate amounts. Two samples (from contexts 10548 and 12372) produced very large amounts of charred remains; these were from context 10548 (part of feature 10570 in the extreme south-east of the site), and context 12372 (from post-row 11500 north of the main villa house). There were over 1000 chaff items in each and over 100 grains in sample 10378. Weeds were present in fairly low numbers (11 to 50).

Cereals identified include *Triticum spelta*, including germinated grain, *Hordeum vulgare*, *Avena* sp. and *Triticum* cf. *dicoccum* (possible emmer wheat) noted amongst the grain. The very large quantities of chaff were dominated by *T.spelta* glume bases. The pit samples also tended to contain moderate to large amounts of charcoal, mostly *Quercus* sp. with occasional Pomoideae (apple, hawthorn etc.) and possible *Corylus/Alnus* sp. (hazel/alder).

Corn-drier

A total of 12 samples were assessed from the corn-drier, of which six produced useful numbers of remains. The composition appears to vary between samples with different

proportions of grain, chaff and weeds. *Triticum spelta* dominated the assemblages, while *Hordeum vulgare* and *Avena* sp. were also noted. Several of the *T.spelta* grains had germinated. In addition to the cereals, *Vicia/Pisum* sp. (vetch/bean/pea) and *Linum usitassimum* (flax) seeds were also noted in sample 10019.

Well

Two samples from well deposits produced only occasional grain, chaff and weeds. *Triticum spelta*, *Triticum spelta/dicoccum* and *Chenopodium album* (fat hen) were all noted. Occasional charcoal of *Quercus* sp. and Pomoideae were also identified.

Layers

A total of 80 samples were assessed from archaeological layers. Useful quantities of material were present in 14 samples. Up to 50 grains were noted in samples 10022, 10049, 11083, 10016 and 10287 (within the Aisled Building, and in the vicinity of the corn-drier), with 50-100 items of chaff in all but sample 10049 which had in excess of 100 chaff items. Weeds were present in all 6 of these samples although in smaller numbers. Cereal species noted were *Triticum spelta*, including germinated grain, *Hordeum vulgare* and *Avena* sp. *Linum usitassimum* (flax) was present in sample 10023.

Samples 10019 and 10452 (aisled building), 10025 (layer within ditch 10660), and 10414 (layer containing material raked out of oven 15280 in the aisled building) each contained 51-100 grains. Sample 10452 contains more than 100 items of chaff, while the remains of these samples have less than 50 items. All five produced between 11 and 50 weed seeds. Cereals identified included *Triticum spelta*, *Hordeum vulgare*, *Avena* sp., *Triticum dicoccum* and possible free-threshing *Triticum* sp. Occasional *Vicia/Pisum* sp. and *Linum usitassimum* were also noted.

The remaining four samples (10097, 10017, 10024 and 10405), all from the area of the oven in the aisled building, were very rich indeed. Samples 10024 and 10405 contained over 1000 items each of grain and chaff. Weeds, particularly *Bromus* sp. (brome grass) were very numerous in sample 10017 and in particular in 10024. The cereal species identified include *Triticum spelta*, *Triticum dicoccum*, *Hordeum vulgare* and *Avena* sp. Germinated grain and sprouted caryoptiles were present in sample 10017. Charcoal was present in moderate quantities in most samples, generally of *Quercus* sp, with occasional *Corylus/Alnus*, *Prunus spinosa* and Pomoideae charcoal.

The remaining 32 samples had much lower concentrations of remains while seeds and chaff were entirely absent from six samples. The occasional grain and chaff noted included *Hordeum vulgare*, *Triticum spelta* and *Avena* sp. Other items noted include *Prunus spinosa* (sloe) stones, *Vicia/Pisum* sp. (vetch/bean/pea) and *Corylus avellana* (hazel) nut shell.

Other

Six samples from other features were assessed. Two contained no charred seeds or chaff while three contained only limited numbers of grain and virtually no chaff. However, sample 10040 (from a layer overlying the enclosure ditches east of the villa) contained in excess of 100 grains including *Triticum spelta* and *Hordeum vulgare*. Occasional chaff and weeds were also noted. Charcoal present in six samples

and in very large quantities in three, was mostly identified as *Quercus* sp. (oak), with occasional Pomoideae (apple/pear/hawthorn etc.) and possible *Prunus spinosa* (sloe).

Honeyhills Wood

The single sample from Honeyhills Wood produced occasional Pomoideae charcoal and a recent (modern) apple core. No charred seeds or chaff were present.

Conservation

The samples are in a stable condition. If kept dry they can and should be archived for storage, until final decisions are made about further analysis.

Comparative material

There is little published botanical material from Roman villa sites in Kent. Comparable published assemblages include The Mount Villa at Maidstone (Robinson 1999), and the Roman small town at Springhead (Campbell nd). As yet unpublished material has been analysed from a Romano-British settlement at Monkton, Mount Pleasant on the Isle of Thanet (R Pelling unpublished).

Further afield, material from a comparative site has been published from Bancroft Roman Villa in Buckinghamshire. Charred plant remains from this site were examined from the villa, mausoleum and a corn-drier (Nye and Jones 1994, 562-565; Pearson and Robinson 1984, 565-584). Several corn-driers from areas across southern Britain have now been sampled (Van der Veen 1989), including a recently excavated structure at Grately, Hampshire, which is associated with a villa and aisled hall (G Campbell pers. comm).

Within the CTRL project similar material although in low levels has been recovered from the Late Iron Age and early Romano-British deposits at South of Snarkhurst Wood, East of Station Road and Church Lane Smeeth. There spelt wheat and barley were the principal cereals represented while low levels of emmer wheat were also noted. Further material which may be contemporary has been reported from South of Beechbrook Road. In the context of the wider Landscape Zone Aims of the CTRL project, these small assemblages will be of value as indicators of the presence or absence of poorly understood crops such as emmer wheat, oats and pulses on sites of different types. Charred plant remains are present in samples taken at Northumberland Bottom, and good material of comparable date may be available here. Good charred plant remains are present from the Early Iron Age site at White Horse Stone and may provide evidence for change between the Early Iron Age and Roman periods.

Published records of Late Iron Age and Romano-British date generally tend to be dominated by spelt wheat with barley and occasionally oats. The role of emmer wheat is not yet understood although good evidence of its cultivation during the Late Iron Age is available from Wilmington in Kent (Hillman 1982) and from outside the region from Hascombe in Surrey (Murphy 1977) and Ham Hill in Somerset (Ede 1991). In the Romano-British period, evidence from sites such as Tiddington (Moffet 1986), or Barton Court Farm (Jones and Robinson 1984) suggests emmer to be a minor crop compared to spelt, possibly even present as a weed of the spelt crop. More recently much larger assemblages were recovered from a site at Mansfield College in Oxford (R Pelling, unpublished) suggesting it was, at least occasionally, deliberately cultivated as a crop.

Potential for further work

CTRL Landscape Zone Priorities and Fieldwork Event Aims

The following section discusses potential for further work in the light of the Landscape Zone Priorities and Fieldwork Event Aims.

There is great potential to address some of the original research aims of this site, particularly in understanding of the agricultural regime of a Roman Villa complex. There are good samples available from all phases of Romano-British activity, which have the potential to shed light on agricultural trends such as increasing crop diversity, or the introduction or intensification of garden crops or cash crops.

In terms of assessing the transition from the Iron Age to the Roman period, in general the Iron Age deposits offer less potential for analysis, as the samples generally provide poorer information. Material is available, however, from the Late Iron Age to Early Roman period, which must relate to pre-and post conquest activity.

In terms of assessing the decline of the villa, good samples are available from a number of late contexts, including the corn-drier, the soil layer overlying the smithy, and the late oven inside the main villa house. These samples have the potential to provide valuable information about continuing agricultural exploitation of the site despite its apparent abandonment for occupation. They will provide an interesting contrast with the earlier Roman samples and may show evidence of change in the agricultural regime.

The distribution of rich samples over the site suggests that they have good potential to contribute to analysis of the function of structures, and the existence of functional zones. The corn-drier in particular produced very rich deposits and offers good potential for further investigation of its function.

The Thurnham assemblage can be combined with the evidence from other sites mentioned above, to provide an overview of the representation of species at a variety of different rural settlements of different types. A comparison with the Early Iron Age material from White Horse Stone should also provide useful information regarding change in agricultural regimes.

New research aims and objectives for the CTRL archaeology project

On a regional and national scale there is potential to examine whether the patterns for this period in Kent are consistent with elsewhere in southern Britain or if there are any trends visible not seen outside the region. It has been noted above that there are few published studies of plant remains from this region. The Thurnham assemblage therefore has the potential to provide a valuable addition to understanding of the Roman agricultural regime in Kent.

It is recommended that richer samples are analysed in detail from each category of feature, with samples selected covering the full range of periods. All the corn-drier samples containing charred remains should be analysed.

Samples from the inhumations, the well, and the structures offer little potential for further work.

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Hockers Lane (ARC 420 62+200-63+000)

Introduction

Samples were taken during excavation works at Hockers Lane, for the recovery of charred plant remains and charcoal.

The deposits sampled were of Late Iron Age to early Romano-British date(*c* AD 0–70).

The sampling was undertaken in accordance with the Fieldwork Event Aims for the site, which are set out in section 2 of the main report, above. The samples were taken in order to address questions concerning the diet and cereal economy of the site and

particularly to examine any difference in economy and cereal production between Hockers Lane and Thurnham Villa. All the samples examined are listed in Table 10.3.

Methodology

The sampling programme was intended to recover material from the full range of feature type and date excavated. Samples were taken from ditches, pits and layers. Twenty samples, ranging from 3 to 40 litres in volume, were processed by bulk water flotation and the flots collected onto 250μm mesh sieves. Flots were air dried slowly before being submitted for assessment Each flot was assessed by scanning under a binocular microscope at x10 magnification. Any seeds or chaff noted were provisionally identified and an estimate of abundance made. Random fragments of charcoal were fractured and examined in transverse section at x10 and x20 magnification.

Quantification

A total of 26 flots were assessed. Flots were small (10 to 150 ml) and contained frequent roots. Occasional molluscs were present in samples 26 and 29.

Charred plant remains were absent from seven samples, while a further five samples contain no seeds or chaff but did contain occasional charcoal. Two samples produced no cereal remains but occasional *Corylus avellana* (hazel nut) shell fragments and charcoal.

Cereal grain was present in 10 samples, while chaff was present in only two samples. Sample 11 (context 84) produced 10 to 50 items each of cereal grain, chaff and weeds, with between 50 and 100 items in total. The cereal remains included *Triticum spelta* (spelt wheat) glume bases and *Triticum spelta/dicoccum* (spelta/emmer wheat) grain. No charcoal was present in this sample. The remaining samples produced low levels of cereal remains (less than 10 items) which include the grain of *Triticum spelta*, *Triticum spelta/dicoccum* and *Hordeum vulgare* (barley).

Charcoal was present in 11 samples in generally low quantities but with frequent remains in two samples. The taxa identified were *Quercus* sp. and Pomoideae.

Provenance

Sample 11 was taken from a pit fill. The remaining samples which produced low levels of cereal remains were from pits, ditch or gully fills and an archaeological layer. Samples producing *Corylus avellana* fragments were all from ditch or gully fills.

Conservation

The flots are in a stable condition and can be archived, although it is not necessary to retain the flots for long-term storage.

Comparative Material

The range of species recorded during the assessment is well-attested for Late Iron Age and Romano-British sites in southern Britain (see Greig 1991). The small scale of cereal processing represented can be contrasted with Thurnham Villa for which very large scale cereal production is attested. The possible cash crops or oil crops at Thurnham Villa are not represented at Hockers Lane.

Potential for further work

Given the absence of good cereal assemblages and charcoal other than oak and Pomoideae the samples offer no potential for further work. The range of species, spelt wheat and hulled barley, were the cereals most commonly cultivated during the Iron Age and Romano-British period in southern Britain. The samples provide no potential for extending this species list. The remains are characteristic of low levels of redeposited remains of cereal processing activity.

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APPENDIX 7- plant remains

7.1 ASSESSMENT OF THE CHARCOAL

by Dana Challinor

Introduction

7.1.1 A total of five samples were taken during the excavation from the deposits of five cremation urns, which were sampled in their entirety for the recovery of charred plant remains and cremated bone. The cremation urns were dated to the late Iron Age and early Roman period. The purpose in sampling was to examine the evidence for change and continuity in burial practices between the late Iron Age and the Roman period.

Methodology

7.1.2 All five of the samples taken were processed and assessed. The volume of soil processed ranged from 1 litre to 7 litres. The samples were processed by flotation in a modified Siraf-type machine, with the flots collected onto a 250µm mesh. The flots were air-dried and divided into fractions using a set of sieves. Fragments of charcoal were randomly extracted, fractured and examined in transverse section under a binocular microscope at x10 and x20 magnification. Fragments caught in the >2mm sized sieves were quantified as identifiable. In the case of large flots, a sample of *circa* 20% was examined. The flots were also scanned for the presence of any other charred plant remains.

Quantification

7.1.3 A total of five samples was assessed, of which four produced identifiable wood charcoal (Table 12). Two taxa were identified - *Quercus* sp. (oak) and Maloideae (hawthorn, apple, pear etc.). Ring-porous taxa, and particularly *Quercus*, are easily recognisable at low magnification, although the identification of Maloideae is tentative. It appeared from the way in which the charcoal had fragmented that most of the flots contained only *Quercus* charcoal. Indeed, non-oak charcoal was noted in only one sample (context 39). No other charred plant remains were present.

Provenance

7.1.4 Most of the cremation urns were dated to the early Roman period and one was late Iron Age in date, although the close spacing of the features suggests that the cremation urns were more or less contemporaneous. Certainly, the evidence from the charcoal suggests continuity in burial practice. The preservation of the charcoal was reasonable, but the concentration was low, which is to be expected in burial urns where the bone has been carefully removed from the pyre remains. The charcoal fragments were too small in size to provide information on activities such as woodland management.

Conservation

7.1.5 The flots are in a stable condition and present no problems for long-term storage and archive.

Comparative material

7.1.6 The predominance of a single taxon in prehistoric cremation assemblages, indicating the use of a single tree or specifically selected species in ritual activities, has been noted at Radley Barrow Hills (Thompson 1999, 352) and at Rollright Stones (Straker 1988). It has also been suggested that the abundance of oak or ash in cremation deposits, compared to other species, is a result of the pyre structure; the timber from these trees providing the supports in a central position, less likely to have been totally reduced to ash (Gale 1997, 82). There has been little publication on Iron Age and Roman charcoal from cremation deposits (Gale 1997, 77) so there are few comparable sites, although other excavations along the CTRL are likely to provide a wealth of comparable material.

Potential for further work

7.1.7 Full analysis on these samples is unlikely to provide more information on the nature of their composition than was ascertained at the assessment. Nevertheless, a full discussion of the charcoal from these cremation deposits will allow valuable comparisons to be made with other sites, both regionally and nationally. Therefore, it is important that the results are included in any future publication.

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Table 12: Summary of charcoal from cremations

Sample details					Flot details		
Pit	Context	Period	Sample no.	Sample size	Flot size (ml)	Charcoal	Taxa
39	39	AD 70-200	1	1 litre	5	++	*Quercus* sp. Maloideae
	40	AD 70-200	2	1.1 kg	18.5	+++	*Quercus* sp.
43	45	LIA-AD 70	3	1 litre	3	+	*Quercus* sp.

	44	AD 70-200	4	7 litres	40	++	*Quercus* sp.

+ = 1-10; ++ = 11-50; +++ = 51-100

- PLANT REMAINS

Assessment of the Charcoal

by Dana Challinor

Introduction

A total of seventeen samples were taken during the excavation from the deposits of seven burnt pits and two cremation pits. Fourteen were from the excavation at Hurst Wood and three were from the watching brief at East of Newlands. The purpose in sampling was to examine the evidence for change and continuity in burial practices, and to consider the function of the pits.

Methodology

The samples were processed by flotation in a modified Siraf-type machine, with the flots collected onto a 250µm mesh. All seventeen of the samples taken were processed and assessed. The volume of soil processed ranged from 4 to 44 litres. The flots were air-dried and divided into fractions using a set of sieves. Fragments of charcoal were randomly extracted, fractured and examined in transverse section under a binocular microscope at x10 and x20 magnification. Fragments caught in the >2mm sized sieves were quantified as identifiable. In the case of large flots, a sample of *c* 20% was examined, although any quantification given is based on estimates of the entire flot. The flots were also scanned for the presence of any other charred plant remains.

Quantification

A total of seventeen samples were assessed, of which sixteen produced identifiable wood charcoal. Three taxa were provisionally identified - *Quercus* sp. (oak), *Alnus/Corylus* (alder/hazel) and Maloideae (hawthorn, apple, pear etc.). A possible fourth taxa was present in pits 104 and 122 at Hurst Wood; small round fragments with very large pores, wide rays and a distinctive ridged stem, which potentially could be charred rootwood. Superficially, the charcoal looked like *Clematis vitalba* (clematis), but could equally be *Vitis vinifera* (vine) as the growth rings were not wide enough for the full anatomical characteristics to be displayed. Further work is required to identify this charcoal.

The two middle-late Bronze Age cremation pits at East of Newlands differed in taxonomic composition (pit 3 containing *Quercus* and pit 7 containing *Alnus/Corylus*), but the concentration of charcoal was low in both (Table 37).

All of the burnt pits at Hurst Wood produced medium to large assemblages dominated by *Quercus*, some with smaller quantities of Maloideae and the possible rootwood fragments (Table 38).Other charred plant remains were scarce and limited to a single glume base from context 22 and a couple of weed seeds from pit 140. Context 143 produced two immature grape seeds, which appeared to be charred although further tests will be needed to confirm this. Roots and modern seeds were present in most flots.

Provenance

The apparent dominance of a single taxon in the cremation deposits at East of Newlands is appropriate for cremation burials of this period and provides evidence for the local practice of deliberate selection of fuelwood.

The fact that the burnt pits at Hurst Wood are also dominated by a single taxon suggests deliberate selection of fuelwood for a specific purpose. Consequently, it is possible that the function of these pits was for making charcoal. Preservation was generally very poor; most of the charcoal fragments were infused with sediment, hindering examination of the anatomical patterns. The preservation status of the grape seeds requires elucidation. If contemporary with the dated pits, it could suggest evidence for vine-growing on the site, although the dating of these features is very uncertain and there is little potential for further analysis.

Conservation

The flots are in a stable condition and present no problems for long-term storage.

Comparative Material

The predominance of a single taxon in prehistoric cremation assemblages, indicating the use of a single tree or specifically selected species in ritual activities, has been noted at Radley Barrow Hills (Thompson 1999, 352) and at Rollright Stones (Straker 1988). It has also been suggested that the abundance of oak or ash in cremation deposits, compared to other species, is a result of the pyre structure, the timber from these trees providing the supports in a central position, less likely to have been totally reduced to ash (Gale 1997, 82).

Traditional methods for making charcoal may shed light on the possiblility that the pits at Hurst Wood were used to make charcoal. Traditional charcoal burners do utilise shallow pits but the dimensions are generally larger than those at Hurst Wood (Edlin 1949, 160). Moreover, there was no real evidence for the layers of straw, grass or bracken traditionally used to shut out the air, although this may be a bias of preservation. Indeed, there are other taxa which make better charcoal than *Quercus*, such as *Frangula alnus* (alder buckthorn), *Alnus glutinosa* (alder) and *Salix* sp. (willow) (Edlin 1949, 165). In fact, *Quercus* has such good burning properties as a wood fuel, it hardly seems necessary to make it into charcoal, although this would depend upon the purpose of the charcoal burning.

Potential for Further Work

Detailed analysis on these samples is unlikely to contribute greatly to our understanding of the site. However, the *Clemtis/Vitis* charcoal should be properly identified and time should be allotted to an examination of the grape seeds. Radiocarbon dating of the grape seeds may be appropriate. The presence of this material suggests wine growing in the vicinity, and the suggested late Saxon date for this is of considerable interest as an indicator of when this was taking place. It would be of value to confirm both the species identification, and the radiocarbon date with the dating of a second sample. This would contribute to CTRL research priorities at Landscape Zone Level concerning changes in agricultural practice over time.

The results from the cremation pits provide a few further details of the practice of cremation which appear to conform to wider patterns along the CTRL and may thus make a small contribution to our understanding of burial practices.

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Table 37: East of Newlands: summary of charcoal

Sample details					**Flot details**		
FFeature	CContext	PPeriod	Ssample no.	SSample size (l)	FFlot size (ml)	**Charcoal**	**Taxa**
3	2	MBA	1	14	45	++	*Quercus* Stone plinth or machine base.
7	6	MBA	2	4	1	+	*Alnus/Corylus*

+ = 1-10; ++ = 11-50; +++ = 51-100; ++++ = 101-1000; 1000+ = >1000

Table 38: Hurst Wood: summary of charcoal

Sample details					**Flot details**		
FFeature	CContext	PPeriod	Ssample no.	SSample size (l)	FFlot size (ml)	**Charcoal**	**Taxa**
23	22	M-LIA	3	40	200	+++	*Quercus* sp.
27	28	M-LIA	1	30	25	++	*Quercus* sp.
	29	M-LIA	2	19	110	+++	*Quercus* sp. Maloideae
49	50	MIA	3	13	8	++	*Quercus* sp.
	51	MIA	4	4	45	+	*Quercus* sp.
	52	MIA	5	18	30	+	*Quercus* sp.
104	105	undated	7	8	220	+++	*Quercus* sp.
	106	undated	8	13	25	++	*Alnus/Corylus Quercus* sp. cf. *Clematis/Vitis*

Sample details					Flot details		
FFeature	CContext	PPeriod	Ssample no.	SSample size (l)	FFlot size (ml)	**Charcoal**	**Taxa**
	107	undated	9	30	40	++	*Quercus* sp. cf. *Clematis/Vitis*
102	103	undated	10	20	200	+++	*Quercus* sp. *Alnus/Corylus*
122	124	undated	11	20	700	1000+	*Quercus* sp.
	125	undated	12	21	110	+++	*Quercus* sp. cf. *Clematis/Vitis*
140	142	MIA	13	30	325	+++	Maloideae *Quercus* sp.
	143	MIA	14	44	60	++	Maloideae *Quercus* sp.

+ = 1-10; ++ = 11-50; +++ = 51-100; ++++ = 101-1000; 1000+ = >1000

Charred Plant Remains

by Ruth Pelling

Introduction

Samples were recovered during excavation works for the recovery of charred plant remains and charcoal. Dated deposits are either from the early Neolithic to the early Bronze Age or are Iron Age. A total of 34 samples were processed by bulk water flotation and the flots collected onto 250 μm mesh sieves. The volume of deposit processed ranged from 10 to 40 litres. Flots were air dried slowly before being submitted for assessment.

The recovery and study of the charred plant remains was undertaken in accordance with the Fieldwork Event Aims (see Section 2.2), in particular Aim 1.

The samples were taken in order to address questions concerning the diet and cereal economy of both the Neolithic/early Bronze Age and the Iron Age settlements. In addition a spot find of a *Malus sylvestris* (crab apple) core was recovered during the excavation from a late Neolithic context (18, pit 19).

Methodology

The sampling programme was intended to recover material from the full range of feature type and date excavated. Samples were taken from ditches, pits, layers, post-holes and tree-throw holes. Each flot was assessed by scanning under a binocular microscope at x10 magnification. Any seeds or chaff noted were provisionally identified and an estimate of abundance made. Random fragments of charcoal were fractured and examined in transverse section at x10 and x20 magnification.

Quantification

A total of 9 Neolithic/Early Bronze Age flots and 15 Iron Age flots were assessed. A further 10 flots of unknown date were also assessed.

Of the early prehistoric samples, two contained no charred plant remains and two contained charcoal only. Cereal remains were only present in small numbers (less than ten grains) and no chaff was noted. Four samples (1-4) produced fragments of *Corylus avellana* (hazel) nut-shell, including very large amounts in sample 1. These samples also contained moderate to abundant quantities of charcoal, including *Quercus* sp. (oak) and *Corylus/Alnus* sp. (hazel/alder). The cereal remains noted included *Hordeum vulgare* (barley) and hulled wheats including *Triticum spelta* (spelt wheat). The *Triticum spelta* in pit 23 is likely to be contamination from the later prehistoric deposits as it is not known in Britain from before the middle Bronze Age.

Of the 15 Iron Age samples charred remains were abundant in six, including over 1000 grains in at least two samples. Grain appears to dominate these deposits although abundant chaff and weed seeds were also noted. The cereal remains noted were dominated by *Hordeum vulgare* (barley) and *Triticum spelta* (spelt wheat), although *Triticum dicoccum* (emmer wheat), and *Avena* sp. (oats) were also recorded. Occasional additional plant items included *Brassica/Sinapis* sp. seeds, which may be

derived from cultivated brassicas (cabbage, mustard etc.), a bracken frond, hazel nut shell fragments and hawthorn stones. Noticeable amongst the weeds were large quantities of *Bromus* subsect *Eubromus* (brome grass) seeds in samples 24 and 25. The preservation of remains in these samples is exceptionally good. Three samples contained fewer but still useful quantities of grain chaff and weeds. The remaining six samples contained little or no cereal grain and no chaff.

The undated samples produced very limited remains. No seeds or chaff were present in seven samples, while two samples contained occasional *Corylus avellana* (hazel-nut) shell fragments only and one sample (32) contained a single *Hordeum vulgare* (barley) grain. Charcoal was generally rare but more frequent in sample 8, consisting entirely of *Quercus* sp. (oak).

Table 6.1.1: Summary of plant remains in undated samples

Sample	Context	Feature	Period	Sample size (l)	Flot size (ml)	Grain	Id-Grain	Chaff	Id-Chaff	Weed seeds	Other	Id-Other	Charcoal	Comments
8	90	Pit		10	150	0		0		0	0		+++	
9	99	Ditch		20	20	0		0		0	0		+	Worm capsules
15	114	Pit	PR?	10	10	0		0		0	+	Corylus	+	
16	127	Pit		16	10	0		0		0	0		+	Modern insects worm capsul
20	138			30	10	0		0		0	0		+	
21	144	Ditch		7+10	10	0		0		0	+	Corylus	+	Rooty
22	146	Ditch		20	10	0		0		0	0		+	Roots, sand, coal
32	205	Pit		40	10	+	Hor	0		0	0		++	
33	189	Tree	PR?	40	10	0		0		0	0		0	
34	215	Pit		40	10	0		0		0	0		+	

Table 6.1.2: Summary of plant remains in Neolithic and Early Bronze Age samples

Sample	Context	Feature	Period	Sample size (l)	Flot size (ml)	Grain	Id-Grain	Chaff	Id-Chaff	Weed seeds	Other	Id-Other	Charcoal	Comments
1	22	Pit 23	LNE;BA	40	200	0		0		0	++++	Corylus	++++	pit
2	24	Pit 23	LNE;BA	26	50	+	T.spt/dic T.spt Hor	0		0	++	Corylus	++	small pit
3	61	Pit 60	LNE;BA	40	100	+	indet	0		+	+	Corylus	++	pit
4	62	Pit 60	LNEBA	16	150	+	Hor	0		0	++	Corylus	++	pit
5	71	Posthole 70	LNE?	10	10	0		0		0	0		+	Roots
6	72	Posthole 70	LNE?	10	10	0		0		0	0		+	charcoal flecks
7	73	Postpipe in posthole 70	LNE?	32	10	0		0		0	0		0	Occ. modern weeds
12	102	Pit 100	E-MNE	29	20	+	T.spt Hor	0		0	0		++	
13	103	Pit 100	E-MNE	20	10	0		0		0	0		0	

Table 6.1.3: Summary of plant remains in Iron Age samples

Sample	Context	Feature	Period	Sample size (l)	Flot size (ml)	Grain	Id-Grain	Chaff	Id-Chaff	Weed seeds	Other	Id-Other	Charcoal	Comments
11	76	Hollow 35/74	E-MIA	40	10	+	T.sp	0		0	0		+	
17	123	Hollow 124	E-MIA	10	10	0		0		+	0		+	
18	133	Ditch 135	E-MIA	36	20	+	Hor indet	0		0	0		+	Rooty
19	134	Ditch 135	E-MIA	40	50	+	Indet	0		0	0		+	Modern weeds, coal
23	11	Hollow 35/74	E-MIA	40	20	+	Hor	0		+	+	Corylus	++	
24	172	Pit 170	E-MIA	40	400	1000+	Hor T.spt T.dic Av	++	T.spt Av (wild)	++++	+	Brassica	+	Grain rich
25	173	Pit 170	E-MIA	40	300	++++	Hor T.spt T.dic	++	T.spt/dic Hor	+++	+	Crataegus	+	Grain rich
26	180	Pit 170	E-MIA	40	150	++++	Hor T.spt Av	+	T.spt/dic	++++	0		++	Grain rich
27	164	Pit 161	E-MIA	20	1500	1000+	Hor T.spt Av T.dic	+++	T.spt T.dic Hor	+++	+	Bracken	+	grain rich, less bromus
28	165	Pit 161	E-MIA	40	150	++++	Hor T.spt T.dic Av	++	T.spt/dic	+++	0		0	Grain rich
29	167	Pit 161	E-MIA	40	100	++++	Hor T.spt T.dic Av	++	T.spt T.dic	+++	+	Brassica	0	Grain rich
30	178	Pit 175	E-MIA	40	300	+++	Hor T.spt T.dic	+	T.spt	++	+	Vic/Pis Rosa?	++	preservation excellent
31	222	Pit 226	LIA	40	50	+++	Hor T.spt	+	T.spt	++	0		+	
35	223	Pit 226	LIA	40	50	+++	T.spt T.dic Hor Av	+	T.spt/dic	+	0		0	
36	225	Pit 226	LIA	14	10	++	Hor T.spt/dic Av	0		+	0		+	

Hor = Hordeum T.dic = Triticum dicoccum T.sp = Triticum sp. Vic/Pis = Vicia/Pisum sp.
T.spt = Triticum spelta T.spt/dic = T. spelta/dicoccum Av = Avena sp.

Provenance

The hazelnut rich early prehistoric deposits were derived from pits (23 and 60), and also contained frequent charcoal. It is likely that they represent the redeposited remains of fires, including the fuel. The fact that the hazelnut is represented by broken shell fragments rather than whole nuts suggests it to be derived from food residues, rather than entering the deposits attached to fuel wood.

The grain rich Iron Age samples are all derived from pits (161 and 170). It must therefore be considered that they are derived from stored product, perhaps recovered more or less *in-situ*, although the mixture of several types of cereal grain might contradict this. The presence of glume bases and weeds suggest that the grain had not been fully processed. The ditch deposits contained little or no material, and the remains that were present are likely to be no more than redeposited background scatters or 'noise', present across the site.

Conservation

The flots are in a stable condition and can be archived in their present state for long-term storage.

Samples that have been demonstrated to have no potential could be discarded.

Comparative Material

Hazelnut shell tends to be the most commonly recovered plant of economic importance found within Neolithic and Early Bronze Age deposits in Britain. Crab apple is also recorded on a number of sites throughout the British Isles (see Moffett *et al.* 1989). Hazelnuts clearly played an imported role in a Neolithic-early Bronze Age diet which must have still included a large wild element despite the introduction of agricultural technology at the beginning of the Neolithic. The Eyhorne Street samples do not suggest that cereal agriculture played a significant role and these results will be important for wider comparative analysis, although it is too early to establish if agriculture was important elsewhere in Kent at this time. Within the CTRL project Neolithic material has been identified from the White Horse Stone group and Tutt Hill. There are no known published records of material of this date from within Kent.

Spelt wheat and barley are the principal cereal species known in Southern Britain from the Iron Age (Greig 1991). Emmer wheat is less frequently recorded although there is some evidence of its cultivation from Late Iron Age sites. Within Kent a deposit of roughly equal proportions of emmer and spelt were recovered from a late Iron Age pit at Wilmington (Hillman 1982). Large deposits of emmer wheat have also been recovered from late Iron Age pits at Hascombe, Surrey, (Murphy 1977, 82-84), and Ham Hill, Somerset (Ede 1991). The late Iron Age deposits so far assessed from the within the Channel Rail Link project have not produced comparable results in terms of scale, although both spelt wheat and emmer wheat were represented within contemporary deposits at Thurnham Villa and South of Snarkhurst Wood. The Roman deposits from Thurnham Villa suggest a similar agricultural tradition was continuing into the Romano-British period. The evidence from within Kent is therefore suggesting that despite the widespread cultivation of spelt wheat, emmer wheat was also being

cultivated within the Iron Age and Romano-British period. It is not clear whether this represents a continuation from the Bronze Age or a reintroduction within the Iron Age.

Potential for Further Work

Given the limited range of plant remains from Neolithic-Bronze Age and from Iron Age deposits within the region the present samples have considerable potential for increasing our existing dataset for the area. The Neolithic-Bronze Age samples are unlikely to extend the known species list for the period but will provide valuable data for the region. The Iron Age samples are exceptionally rich and therefore offer great potential for investigation of the role of specific cereals, such as emmer wheat and oats, as well as broader agricultural trends at both the site and within the region. Emmer wheat is now known from the Late Iron Age, but has not been widely recorded and it has not been established if it is present as a relic of earlier agricultural systems or is a reintroduction. It is therefore important to fully record (species identification and quantification) these present samples and extend the existing dataset. Likewise, oats are recorded in significant numbers from some sites in this period, but it is not clear how much it was cultivated or how much it appears as a weed. The late Iron Age deposits may represent *in-situ* stored products. In addition to providing valuable information about agricultural systems at the site, there is also therefore the potential to look at storage patterns and possible structured deposition in a ritual context. This data will be of particular value for comparison with the Iron Age settlement at White Horse Stone. The analysis of some charcoal from Neolithic/Bronze Age deposits may shed light on the woodland landscape in the period and provide some information about woodland management. The charcoal in the Iron Age period is very limited but its identification could shed light on what species was used for fuel. This would involve species identification and quantification.

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MACROSCOPIC PLANT REMAINS AND CHARCOAL

by Ruth Pelling, with contributions by Dana Challinor

Introduction

Excavations during Fieldwork Event ARC BBW00 included the sampling of deposits for the extraction of charred plant remains and charcoal. Samples were taken from a range of features, including postholes, ditches, cremation deposits, refuse pits, and industrial features of Mesolithic, Neolithic, Bronze Age, Iron Age and Roman date.

The samples were processed by flotation in a modified Siraf-type machine. The flots were collected onto a 250 μm mesh and allowed to air dry slowly. A total of 161 samples were assessed. The assessment was intended to record quantity and quality of material present and to assess its significance at both regional and national level.

Methodology

Each sample submitted was first put through a stack of sieves from 500 μm to 2 mm mesh size in order to break the flot into manageable fractions. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Any seeds or chaff noted were provisionally identified based on morphological characteristics and an estimate of abundance was made. Charcoal was broken in transverse section and provisionally identified.

Quantification was based on a four point scale where charcoal was recorded as present (+), common (++), frequent (+++) and abundant (++++), and seeds and chaff were based on numerical estimates of 1-10 (+), 11-50 (++), 51-100 (+++) and greater than 100 (++++).

Quantification

The majority of samples contained charcoal but no seeds or chaff. Charcoal was noted in 145 samples, although in the majority of cases was merely present in small quantities. More useful amounts of charcoal were noted in 24 samples (see Table 8.1). *Quercus* sp.(oak) was most commonly identified, while *Corylus/Alnus* sp. (hazel/alder), Pomoideae (apple/pear/hawthorn etc) and possible *Prunus spinosa* (sloe) were noted.

Cereal grain was present in 33 samples, of which only 5 produced more than 10 grains. Cereal chaff was present in 9 samples, two of which contained 11 to 50 items. Two samples produced large quantities of cereal remains, in both cases consisting of abundant grain (over 100) but only rare chaff or weed seeds. Sample <200> produced grain of *Triticum dicoccum* (emmer wheat), *Hordeum vulgare* (barley) and *T. dicoccum/spelta* while sample <216> produced a very large deposit of *T. spelta* (spelt wheat) and *Hordeum vulgare* (barley) grains with some *Avena* sp. (oats).

Non-cereal remains of possible economic origin were noted in 17 samples. Pulses were present in two samples: *Vicia faba* (Celtic bean) and possible *Pisum* sp. (pea). Remains of *Malus sylvestris* (crab apple) and *Malus/Pyrus* sp. (apple/pear) were noted in five samples of Early Bronze Age and Late Iron Age date, and included the seeds,

pericarp, whole cores and whole fruits. Small quantities of fragments of *Corylus avellana* (hazel) nut shell were present in 12 samples, of Bronze Age and Iron Age date. Plant remains less likely to be of economic origin included a single *Crataegus monogyna* (hawthorn) seed in a Late Mesolithic/Neolithic sample and tubers of *Arrhenatherum elatius* (false oat-grass) in 4 samples of varied date.

Provenance

Large charcoal assemblages were recovered from samples of Middle-Late Iron Age and Roman date and occasional Bronze Age samples (also see Table 8.1). Seven samples from Late Bronze Age, Late Iron Age and Romano-British cremations deposits produced *Quercus* sp. (oak) only or *Quercus* sp. dominated assemblages. Context (1710) can be included here, since it also yielded possible cremation remains, again dominated by *Quercus* sp., and has been interpreted as the dislodged remains of a (secondary) cremation interment in barrow group 3012.

Five features in Area C associated with Late Iron Age/Early Roman industrial activity produced mixed charcoal assemblages, presumably derived from either fuel or from charcoal making. Large mixed charcoal assemblages were also recovered from ditches and postholes within Area A, including fill (2210) in sub-group 2150 (enclosure 3072) which produced an important pottery assemblage (see Appendix 1.2). These charcoal deposits might be derived largely from refuse.

Table 8.2. shows a summary of samples that produced charred seeds and chaff. The samples which produced cereal remains were of Middle to Late Bronze Age, Late Iron Age, and Late Iron Age into Early Roman date.

In terms of species, possible free-threshing wheat was present in a Bronze Age sample <246>, while hulled wheat was recorded from the Bronze Age (possibly late) onwards. Both *Triticum dicoccum* and *T. spelta* were identified in Late Bronze Age to Late Iron Age/Early Roman date. *Hordeum vulgare* was present in all periods while *Avena* seems to first appear in the Iron Age. The feature types which produced cereal remains are varied. The two large assemblages are from a Middle-Late Bronze Age pit/truncated cremation and a Late Iron Age pit/truncated cremation (samples 200 and 216). Small assemblages were noted in hearths, ditches, pits, postholes and cremation deposits.

The pulses were recovered from (sample 380) through Middle/Late Iron Age enclosure ditch sub-group 2150 in enclosure 3072, which also produced cremated human remains, and from a medieval pot (sample 291). The *Malus/Pyrus* sp. (apple/pear) remains were from the fills of a Beaker period pit [1374] (samples 277, 278, 279 and 280) associated with cremated human remains, and and Late Iron Age ditch fill (sample 281) which contained human cremated human bone. The samples from the pit [1374] also produced hazelnut shell fragments. Other samples with *Corylus avellana* (hazel) were from ditches and pits of Bronze Age to and Iron Age date.

Conservation

The flots are in a stable condition and can be archived for long term storage.

Comparative Material

While the cereal assemblages are limited from Beechbrook Wood, they do fit the pattern seen elsewhere in the Kent region. Both spelt wheat and emmer wheat have been recorded in Kent from CTRL and other sites from the Middle Bronze Age (Pelling unpub a) through to the Roman period (eg. Thurnham Villa). In other well studied areas of southern Britain, such as the Thames Valley and the Hampshire basin, emmer wheat is only present as a weed of spelt in the Iron Age, although it is recorded at some sites in the Roman period as a crop in its own right (eg. Pelling 2000). In the north-east of England emmer wheat does continue to be cultivated at some sites through the Iron Age, where the choice of wheat seems to be based on the agricultural regime of that site (Van der Veen and O'Connor 1998). It is yet to be demonstrated if there was a deliberate choice to grow either spelt, or emmer, or a mixed crop, in the Kent region or if the occurrence is totally random.

Crab apple and hazelnut remains are routinely found on Neolithic sites in the British Isles (eg. Moffett *et al* 1989; Robinson 2000), where they constitute the characteristic 'muesli diet'. In the Kent region hazelnut has been recorded on several Neolithic and Bronze Age sites, while crab apple has been identified from Middle to Late Bronze Age contexts at Pilgrims' Way. It is not clear on present evidence how important these wild woodland resources were in the Bronze Age of Kent. In much of southern Britain their importance declines by the Early Bronze Age, although recent work in Bedfordshire suggests that in some regions they may have continued to constitute a significant part of the economy into the Iron Age (Pelling, unpub b). It is interesting that wild resources may still have been significant in the Middle or even late Bronze Age in parts of Kent, yet sites yielding large quantities of cereal remains are known from the Middle Bronze Age (eg. Pelling, unpub a).

Recent work on the charcoal from cremation deposits indicates that wood taxa may have been specifically selected for cremations (eg. Thompson 1999; Straker 1988). The CTRL excavations have revealed a number of sites in Kent with cremation burials of both prehistoric and Roman date (eg. Tutt Hill, Chapel Mill and Waterloo Connection). The results from the charcoal assessments indicate strikingly similar assemblages dominated by a single taxon. The analysis of the charcoal from Beechbrook Wood will make a valuable addition to the growing body of data for the Kent region.

The greater taxonomic diversity in the industrial deposits at Beechbrook Wood is also of interest, both in its contrast to the cremation assemblages and in its similarity to the results from other Roman sites in Kent including Westhawk Farm, Ashford (Challinor in prep) and Southfleet (Campbell 1998). Moreover, ongoing assessment of material from CTRL sites is likely to provide further comparable data.

Potential for further work

The arable economy of Kent is still poorly understood, although the CTRL work has highlighted some interesting elements which seem to be characteristic of the region, but unlike neighbouring areas. The assemblage has potential to address issues highlighted for the Landscape Zone Aims of both the North Downs and Wealden Greensand Zone Fieldwork Event Aims in CTRL period categories 1, 2, 3 and 4i in particular as follows:

Hunter-foragers (4,00,000-4,500 BC)

- Define the range of human activity and where it took place, particularly through the study of palaeoeconomy
- What was the effect of climatic and environmental changes on human lifeways and adaptive strategies?

Early Agriculturists (4,500-2,000 BC)

- Define ritual and economic landscapes and their relationships
- Determine the nature of changes in economic lifeways, eg. relative importance of hunting-foraging and agriculture, studied especially through recovery of faunal and charred plant remains

Farming Communties (2,000-100 BC)

- Determine how settlements were arranged and functioned over time

Towns and their rural landscapes (100BC-AD 410)

- How were settlements and rural landscapes organised and how did they function?
- How did the organisation of the landscape change through time?

Principal characteristics seem to be the early introduction of spelt wheat and the continued cultivation of emmer through the Iron Age and Roman period. It is yet to be seen how important wild woodland resources were and for how long a period. While cereal remains from Beechbrook Wood are not particularly numerous, it is important to gather as much information about the cereal economies from as wide a range of sites as possible to facilitate a really useful analysis of the data.

It is important for example to establish why some sites produce abundant evidence for cereal production or processing and others do not. It is therefore recommended that the two cereal-rich samples are sorted and identified in full (samples 200 and 216) and also the other three samples which produced moderate remains (samples 271, 360, 380). The samples with *Malus/Pyrus* sp. remains should also be examined and quantified and the identifications confirmed, for the completeness of the data set of all classes of plant remains of economic importance. The assessment data should also be utilised in the final report.

The majority of the charcoal recovered is from redeposited fills of pits and ditches and as such probably represents firewood. Oak seems to be the most well represented taxa, as is often the case on archaeological sites, probably reflecting the availability and usefulness of the tree. Pomoideae likewise tends to be well represented in archaeological deposits. Any analysis of the charcoal from the majority of features is likely to be of limited use.

The industrial features on the site may reflect a more deliberate collection and use of wood taxa however, perhaps with taxa selected for its particular burning qualities, temperature ranges and so on. It is therefore recommended that charcoal be examined more closely from a selection of industrial features.

Cremation deposits similarly may reflect the deliberate selection of particular trees, although in the case of Beechbrook Wood oak seems to be the tree of choice in all samples. The well preserved cremation assemblages should be more closely examined to confirm the dominance of oak and to identify any additional taxa to add to the growing body of cremation evidence from the region.

The very large charcoal deposits from Area A include material found in association with an important pottery assemblage (context 2213). As it is believed that the deposits in this area represent deliberately placed material, and there is evidence for human cremated material from this section cut, it is recommend that the charcoal from a selection of samples be examined.

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MACROSCOPIC PLANT REMAINS AND CHARCOAL

by Ruth Pelling

Introduction

Samples for the extraction of charred plant remains and charcoal were taken from a range of features including postholes, pits, hearths and ditches as well as industrial furnaces with evidence of iron smelting. The deposits sampled were of Late Iron Age and Roman date. Samples of 3 to 40 litres in volume were processed by flotation in a modified Siraf-type machine. The flots were collected onto a 250 μm mesh and allowed to air dry. A total of 61 samples were submitted for assessment

Methodology

Each sample submitted was first put through a stack of sieves from 500 μm to 2 mm mesh size in order to break the flot into manageable fractions. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Seeds or chaff were provisionally identified on the basis of morphological characteristics and an estimate of abundance was made. Charcoal was broken in transverse section and provisionally identified. Quantification was based on a four point relative scale for charcoal (present, common, frequent and abundant), and on numerical estimates for seeds and chaff (1-10, 11-50, 51-100 and >100).

Quantification

A total of 61 samples were assessed, 41 of which produced seeds and/or chaff and 51 produced charcoal. Cereal grain was present in 37 samples, five of which contained over 50 grains. Samples <824> and <818>, produced very large assemblages. Sample <818> contained over 2000 grains, the majority of which where provisionally identified as *Triticum spelta* (spelt wheat). This sample also contained large quantities of glume bases. In total chaff was noted in 31 samples, 6 of which produced more than 50 items (including sample <818>). Overall the cereal species were dominated by *Triticum spelta* with occasional *Hordeum vulgare* (barley) and *Avena* sp. (oats). It was not possible to establish if the *Avena* sp. was a cultivated or wild species. In addition to the cereal remains weed seeds were present in 24 samples, generally in small quantities and two samples produced occasional large legumes recorded as *Vicia/Pisum* sp. (vetch/bean/pea). Occasional *Corylus avellana* (hazel) nut shell was noted in sample <836>.

The charcoal was dominated by Quercus sp. (oak), while cf. Prunus spinosa (sloe), Pomoideae (apple/pear hawthorn etc.) and cf. Corylus/Alnus sp. (hazel/alder) were also noted. Of the 51 samples that produced charcoal, most contained only small amounts. Two samples produced abundant charcoal with no other charred remains, pit sample <800> and furnace sample <846>. A further 12 samples contained frequent charcoal.

Provenance

All types of feature produced charred seeds and chaff. Sample <818> which produced a very large deposit of grain and chaff was taken from a posthole. Sample <824> which also produced a good cereal assemblage was taken from another posthole. The large deposits of cereal grain and chaff and the consistency of the presence of *Triticum spelta* across the site would suggest that cereal processing activities were taking place and that the remains derive from accidents during processing or storage, or from deliberately burnt and discarded cereal processing waste. Much of the material is likely to be redeposited, although some *in-situ* burning might be represented, for example in the case of the large amount of grain from posthole sample <818>. The two furnace samples and furnace associated feature sample <805> produced frequent or abundant charcoal with no seeds or chaff. It is reasonable to assume that the charcoal derived from fuel for the furnaces. Charcoal from the hearths may also represent fuel although these deposits were quite mixed and may represent redeposited material.

Conservation

The flots are in a stable condition and can be archived for long-term storage.

Comparative Material

Assessment of samples from sites along the length of the CTRL and from other sites in Kent suggest that cereal cultivation was well established by the Late Iron Age, although some sites, such as South of Snarkhurst Wood, appear not to have been involved in cereal processing on any scale. The assessment evidence also suggests that all sites in the region produced *Hordeum vulgare*, but there were sites which were concerned with both *Triticum dicoccum* (emmer wheat) and *T. spelta*, such as Thurnham Villa, Eyhorne Street and Beechbrook Wood, and sites which appear to have only utilised *T. spelta*, such as East of Station Road. An earlier assessment of samples from Leda Cottages as part of the Hurst Wood group produced *Hordeum vulgare* and *Triticum dicoccum*, with no *T. spelta*, although the number of samples and quantities of grain and chaff were small.

In other well studied areas of southern Britain, such as the Thames Valley and the Hampshire basin, *Triticum spelta* was the dominant cereal cultivated during the Late Iron Age and Roman periods. *Triticum dicoccum* appears as little more than a weed in most areas of southern Britain, although it has been recorded at some sites in the Roman period as a crop in its own right (eg. Pelling 2000). In the north-east of England both *T. dicoccum* and *T. spelta* were cultivated throughout the Iron Age and into the Roman period, where the choice of wheat seems to be based on the agricultural regime of that site (Van der Veen and O'Connor 1998). It is yet to be demonstrated if there was a deliberate choice to grow either spelt, or emmer, or a mixed crop, in the Kent region or if the occurrence is totally random.

Potential for Further Work

The arable economy of Kent is still poorly understood, although work on the CTRL has highlighted some interesting elements which seem to be characteristic of the region, but unlike neighbouring areas. Principal characteristics seem to be the early introduction of spelt wheat in the Middle Bronze Age, at least to the Thames Estuary area (Pelling, unpub.) and the continued cultivation of emmer wheat on some sites

through the Iron Age and Roman period. It is important to establish why some sites produce abundant evidence for cereal production or processing and others do not and to attempt to establish why some sites were utilising emmer and spelt and others just spelt. The data from individual sites, such as West of Leda Cottages, form critical components of the broader landscape study in terms of their agricultural relationships. It is therefore recommended that up to 5 samples which produced over 50 items of grain and/or chaff and the two very rich cereal deposits are sorted and examined in full (samples <818, <824>). In addition, the assessment data should also be utilised in the final report.

The majority of the charcoal recovered is from redeposited fills of pits, ditches and so on and as such probably represent spent firewood. Oak seems to be the most well represented taxa, as is often the case on archaeological sites, probably reflecting the availability and usefulness of the tree. Pomoideae likewise tends to be well represented in archaeological deposits. Any analysis of the charcoal from the majority of features is likely to be of limited use. The industrial features on the site may reflect a more deliberate collection and use of wood taxa however, perhaps with taxa selected for its particular burning qualities, temperature ranges and so on. It is therefore recommended that charcoal from the two furnace samples, the furnace associated feature and four or five hearth samples be examined more closely.

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Table 7.1: Quantification of charred plant remains by context

Sample	Context	Feature	Sub-group	Spot Date	Sample Volume (l)	Grain	Chaff	Weeds	Other	Charcoal	Notes
800	8006	Pit		LIA/RO	40					4	
801	8008	Hearth			12					3	
802	8010	Hearth			30					2	
803	8012	Hearth			40		1			3	
804	8015	Pit		RO	40					3	
805	8020	Hearth associated feature		LIA; ERO	25					3	
806	8017	Hearth			3					2	
807	8026	Hearth			40			1		3	Metal residue?
808	8023	Hearth			15					3	
809	8022	Hearth		LIA; ERO	30					2	metal residue
810	8032	Ditch		RO	40	1	2	1		1	Roots
811	8036	Pit		RO	40					1	
812	8051	Pit		RO	18	1	2	1		1	
813	8051	Pit		RO	20	1	1			1	Roots
814	8097	Hearth		RO	40	2	3	2		2	Big roots
815	8099	Pit		RO	40	1				1	Big roots
816	8184	Ditch	8624	LIA	40	3	1			3	
817	8192	Ditch	8624		40	1	1			3	lots large roots
818	8163	Posthole	8402		20	2000+	4	2	1		freq. grain /chaff, few weeds!
819	8155	Pit		RO	30	2	3	1	1	3	
820	8197	Posthole	8403		10	1				1	
821	8198	Posthole	8403		9					1	
822	8204	Posthole	8402		10					2	
823	8205	Posthole	8402		10					2	
824	8215	Posthole	8403		40	4	3	1		2	
825	8215	Posthole	8403		4	1	1			1	
826	8216	Posthole	8403		10	1					
827	8060	Layer		RO	40	3	3	3		2	
828	8137	Pit		LIA; ERO	40	1	2	2		1	
829	8143	Pit			10	1	1				
834	8102	Pit	8625	LIA; ERO	20	1		1		2	
835	8303	Pit			16	1		1		2	
836	8309	Pit		LIA; ERO	20	2	1	2	1	2	

Sample	Context	Feature	Sub-group	Spot Date	Sample Volume (l)	Grain	Chaff	Weeds	Other	Charcoal	Notes
837	8322	Pit		RO	40	2	1	1		2	
838	8324	Pit		RO	40	1	2	1		2	
839	8313	Ditch	8629	LIA; ERO	40	2	2	1		2	
840	8330	Pit		LIA	20	1	1			1	
841	8332	pot		LIA; ERO	2	1	1			1	
842	8281	Layer		RO	37	1	1			2	
843	8281	Pit		RO	10	2	2	1		2	rachis + glumes
845	8336	Layer	8300		18					1	Roots
846	8337	Furnace	8300		15					4	All charcoal - large bits
847	8343	Furnace	8300	LIA; ERO	20					3	
848	8368	Posthole	8402		10					2	
849	8369	Posthole	8402	LIA	10					2	
850	8370	Posthole	8402		8					2	
851	8377	Posthole			9		1			1	
852	8380	Posthole	8402		10	2	1	1		1	
853	8381	Posthole	8402		7	3	1	1		1	
854	8387	Posthole	8403		15	2		1		1	
855	8338	Posthole	8300		10	2				1	
856	8441	Ditch	8630	MD	20	1	2	1		1	Roots
857	8443	Ditch	8630	LIA; ERO	20	1	3	1			Roots
858	8445	Ditch	8627	LIA	20	1	1	1		1	Roots
859	8447	Ditch	8627	LIA; ERO	40	1	2	1		1	
860	8499	Tree throw		RO	20	2	2	1		2	
861	8498	Tree throw		RO	20		1			2	
863	8563	Ditch	8626	LIA; ERO	20					3	
864	8580	Ditch	8628	LIA; ERO	20					3	
865	8579	Ditch	8628	LIA; ERO	40	1				2	
	8145	Ditch				1				1	Roots

Lodge Wood

- PLANT REMAINS

Assessment of Charred Plant Remains

by Ruth Pelling

Introduction

Samples were taken during the investigation for the recovery of charred plant remains and charcoal. Two samples were taken from a late Iron Age - early Roman ditch (807). Six samples were taken from three 13th to 14th century AD pits. The six medieval samples were processed by bulk water flotation and the flots collected onto 250μm mesh sieves. Flots were air dried slowly before being submitted for assessment.

Methodology

The volume of deposit processed ranged from 8 to 34 litres. Each flot was assessed by scanning under a binocular microscope at x10 magnification. Any seeds or chaff noted were provisionally identified and an estimate of abundance made. Random fragments of charcoal were fractured and examined in transverse section at x10 and x20 magnification.

Quantification

Five medieval pit samples were assessed (Table 6). Low levels of *Quercus* sp. (oak) charcoal were present in four samples with moderate quantities in the fifth. Cereal grain was present in one sample only (4, context 818) but was not identifiable to species. Cereal chaff was limited to a single glume base noted in sample 5 (context 820). Weed seeds were noted only in sample 5.

Provenance

The samples were taken from the primary and upper layers of three medieval pits.

Conservation

The flots are in a stable condition and can be archived, although it is not necessary to retain the flots for long-term storage.

Potential for further work

Given the absence of good cereal assemblages and charcoal other than oak the samples offer no potential for further work. It is not possible to comment on the cereal economy of the site or the nature of the features excavated. The glume base is likely to be the product of residual contamination from features of Roman or prehistoric date. The very low potential of these samples suggests that little would be learnt from analysis of the samples from the Roman ditch.

Table 6: Summary of charred plant remains

Sample Details						Flot Details					
Sample	**Context**	**Fill of**	**Feature**	**Spotdate**	**Sample size**	**Flot size**	**Grain**	**Chaff**	**Weed**	**Charcoal**	**Comments**
3	817	816	Pit	13th-	10	10	-	-	-	+	
4	818	816	Pit	13th-	30	10	+	-	-	+	roots/m
5	820	819	Pit	13th-	34	100	-	+	+	++	
6	821	821	Pit	13th-	12	10	-	-	-	+	
8	824	824	Pit	13th-	8	10	-	-	-	+	

\+ = 1-10 items / charcoal present

++ = 11-50 items / moderate charcoal

- PLANT REMAINS

Assessment of the Charred Plant Remains

by Ruth Pelling

Introduction

Samples were recovered during excavation works for the recovery of charred plant remains and charcoal. It was hoped that the samples would provide details of the subsistence economy, the landuse and the landscape associated with the site. Samples were taken from the fills of late Neolithic-early Bronze Age features including ring ditches, late Bronze Age ditches probably forming parts of a field system, and pits and cremation pits of varying dates. A total of 40 samples were processed for the extraction of charred plant remains by flotation using a modified Siraf-type machine. The flots were collected onto a 250 μm mesh and allowed to air dry slowly. A total of 25 samples produced flots which were submitted for assessment.

Methodology

All the samples processed were submitted for assessment. Flots were first put through a stack of sieves from 500 μm to 2 mm mesh size in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Any seeds or chaff noted were provisionally identified based on morphological characteristics, and an estimate of abundance was made.

Quantification

The flots were generally small, within the region of 10 ml. Low numbers of cereal grain (0-10) were noted in nine samples, while slightly greater number of grains (11-50) were noted only in sample 6. No chaff was recorded in any sample and occasional weeds only in two. The cereal grain identified was predominantly of *Hordeum vulgare* (barley) with a single hulled wheat in sample 32 and an *Avena* sp. (oat) in sample 6. In addition to the cereal remains, occasional fragments of *Corylus avellana* (hazel-nut) shell were noted in sample 37. The preservation of the grain is generally good and in some cases excellent.

Charcoal was present in all samples, generally in low or moderate quantities. More abundant charcoal was recorded from samples 5, 6 and 47. The charcoal taxa identified were dominated by *Quercus* sp. (oak), with frequent Pomoideae (apple, pear, hawthorn etc.) and occasional *Prunus spinosa* (sloe).

Provenance

The richer sample with *Hordeum vulgare* and *Avena* sp. grain was taken from a probably late Iron Age deposit in pit 35. Given the late date for this deposit it is possible that the *Avena* sp. is from a cultivated variety, although this cannot be demonstrated in the absence of chaff. The remaining cereal grains were from largely Bronze Age deposits within both ditch and pit fills. The grain present in the samples

is likely to have derived from background scatters of cereal remains present across the site.

Conservation

The flots are in a stable condition and can be archived for long term storage.

Comparative Material

Plant macrofossil assemblages of Bronze Age date have so far rarely been assessed within the CTRL. Some middle to late Bronze Age deposits were assessed from West of Blind Lane, which produced similarly low levels of grain, although additionally with a very small amount of chaff. *Hordeum vulgare* and *Triticum spelta* were also identified. Late Neolithic to early Bronze Age deposits have been noted from Eyhorne Street. Cereal remains were again limited and may have contained some intrusive material, particularly *Triticum spelta* which has not been recorded from sites of such early date in the United Kingdom. This site also produced large quantities of *Corylus avellana* (hazel) nut shell, a characteristic find of the Neolithic and early Bronze Age which is often taken to indicate a continued heavy reliance on collected woodland resources (see Moffet *et al*. 1989). Evidence from elsewhere, notably a site within Dartford (Pelling *unpub*) indicates that by the middle Bronze Age significant cereal based agriculture was established in Kent, as it seems to be in other areas of Southern Britain, such as the Thames and Kennet Valleys. Barley and emmer wheat seem to have been the principal cereals at this time, although the Dartford material indicates that spelt wheat was introduced into Kent by the middle Bronze Age.

Potential for Further Work

The range and quantity of charred seeds and chaff within the samples is such that further analysis is unlikely to extend the species list much further. However, given the paucity of charred macrofossil assemblages of the period from the late Neolithic to the middle Bronze Age within Kent, it is recommended that the assessment results are considered in the overall synthesis. The dataset is insufficient to characterise the local environment in detail, but the rarity of information for the earlier part of the period represented at Tutt Hill suggests that it would be of value for the data to be noted in any publication.

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Assessment of the Charcoal

by Dana Challinor

Introduction

A total of nineteen samples were submitted for the wood charcoal assessment: fourteen from cremation pits (sampled in entirety for the recovery of charred plant remains and cremated bone), two from one of the ring ditches and three from two pits near the ring ditches. The purpose in sampling the cremations was to examine the evidence for change and continuity in burial practice.

Methodology

The samples were processed by flotation in a modified Siraf-type machine, with the flots collected onto a 250µm mesh. All nineteen of the samples were assessed. The volume of soil processed ranged from 0.9 kg to 40 litres. The flots were air-dried and divided into fractions using a set of sieves. Fragments of charcoal were randomly extracted, fractured and examined in transverse section under a binocular microscope at x10 and x20 magnification. Fragments caught in the >2 mm sized sieves were quantified as identifiable. In the case of large flots, a sample of *circa* 20% was examined. The flots were also scanned for the presence of any other charred plant remains.

Quantification

Sixteen flots produced identifiable wood charcoal (Table 7.1 - Table 7.2). Six taxa were identified - *Quercus* sp. (oak), *Alnus/Corylus* (alder/hazel), Salicaceae (willow, poplar), *Prunus* sp. (blackthorn, cherry), Maloideae (hawthorn, apple, pear etc.) and *Fraxinus excelsior* (ash). Ring-porous taxa are more easily recognisable at low magnification, although the identification of the diffuse porous taxa is tentative. The quantity of preserved charcoal varied between cremation pits, with some producing several hundred identifiable fragments (Table 7.1) whereas others contained only small fragments which were too comminuted to identify. There was some variation in the taxonomic composition between cremation pits. Cremation pit 46, dated to the early-middle Bronze Age, produced large assemblages dominated by *Fraxinus excelsior*, with smaller amounts of *Quercus* and Maloideae. Cremation pit 301, dated to the middle Bronze Age, was composed of fragments of Salicaceae and undated cremation pit 98 was dominated by *Alnus/Corylus* type charcoal. The ring-ditch deposits produced low concentrations of charcoal, with *Quercus* and Maloideae present, and the late Bronze Age pit (53) produced a large assemblage dominated by *Alnus/Corylus*. There was some cremated bone present in the cremation samples and also some carbonised material, potentially liquid from the cremation process. Possible modern root contamination was present in both deposits of pit 301 and coal was observed in pits 98 and 269.

Provenance

Four of the cremation pits produced interesting assemblages of reasonable size, with varied taxonomic composition (46, 98, 269, 301). All of these pits appeared to contain assemblages of fuelwood which were dominated by a single taxon (it is assumed that the *Alnus/Corylus* type charcoal is either one or the other as the fragments exhibited similar patterns). The preservation of the charcoal was good, although there were few

fragments large enough to provide evidence on woodland management. The potential of these samples to provide informative evidence for burial practices will depend upon further dating evidence being available. The ring ditch and pit samples produced assemblages low in concentration and hence of low potential, with the exception of pit 53, which produced a reasonably sized assemblage.

Conservation

The flots are in a stable condition and present no problems for long-term storage and archive.

Comparative Material

A limited range of taxa were identified at this site. This is to be expected in funerary contexts, where deliberate selection of fuelwood has been noted at other sites. The predominance of a single taxon in Bronze Age cremation assemblages, indicating the use of a single tree or specifically selected species in ritual activities, has been noted at Radley Barrow Hills (Thompson 1999, 352) and at the Rollright Stones (Straker 1988). It has also been suggested that the abundance of oak or ash in cremation deposits, compared to other species, is a result of the pyre structure, the timber from these trees providing the supports in a central position, less likely to have been totally reduced to ash (Gale 1997, 82).

Potential for Further Work

Further work on these samples depends upon obtaining a clearer indication of their date, especially in the case of the cremations. Assuming that these issues are resolved, it is considered that a full discussion of the charcoal from these cremation deposits would allow valuable comparisons to be made with other sites, both regionally and nationally. This would contribute to CTRL research aims relating to ritual practice in the 'early agriculturalists' period, and to change and continuity in burial practice in the late Iron Age and Roman period. A programme of radiocarbon dating would, however, be essential for this study to be carried out. It is recommended that this would be of greatest benefit if carried out as part of a wider study at Landscape Zone level; the results at a site-specific level would not be of particular significance.

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Table 7.1: Summary of charred plant remains

Sample Details					Flot Details						
Sample	**Context**	**Feature Type**	**Phase**	**Sample size (l)**	**Flot size (ml)**	**Grain**	**Chaff**	**Weed seeds**	**Other**	**Charcoal**	**Comments**
4	22	Pit 21	?	40	50	-	-	-	-	+	roots
5	24	Pit 23	?	40	400	-	-	-	-	++++	iron staining
6	36	Pit 35	LIA?	19	150	++	-	++	-	+++	recent roots/tubers
7	43	Pit 42	LBA	14	10	-	-	-	-	+	
15	86	Ring ditch 90	LN-EBA	40	10	+	-	-	-	++	
16	67	Ring ditch 89	LN-EBA	21	20	-	-	-	-	++	
17	68	Ring ditch 89	LN-EBA	15	10	-	-	-	-	++	
18	69	Ring ditch 89	LN-EBA	15	2	-	-	-	-	+	
19	74	Ring ditch 89	LN-EBA	4	10	-	-	-	-	++	
20	79	Ring ditch 81	LN-EBA	36	10	+	-	-	-	++	roots/sand
26	118	Pit 117	MBA	35	10	+	-	-	-	++	
27	168	Ring ditch 156	LN-EBA	20	2	-	-	-	-	+	
32	196	Ditch 190	LBA	19	10	+	-	-	-	+	roots sand
35	200	Ditch 190	LBA	14	2	+	-	-	-	+	
37	219	Pit 217	MBA	24	20	-	-	-	+	++	
38	248	Ditch 190	LBA	40	20	-	-	+	-	++	roots
39	253	Pit 119	?	40	10	+	-	-	-	++	
40	166	Ring ditch 156	LN-EBA	40	10	-	-	-	-	+	
41	177	Ring ditch 156	LN-EBA	40	10	-	-	-	-	+	
42	178	Ring ditch 156	LN-EBA	40	2	-	-	-	-	+	
43	179	Ring ditch 156	MBA	40	10	-	-	-	-	+	
44	164	Ring ditch 156	LN-EBA	40	20	-	-	-	-	++	recent large roots
47	272	Cremation 269	?	16	50	-	-	-	-	+++	
51	267	Cremation 266	?	32	10	+	-	-	-	+	
52	268	Cremation 266	?	14	10	+	-	-	-	++	

+ = 1-10; ++ = 11-50; +++ = 51-100

Table 7.2: Summary of charcoal from cremations

Sample details						Flot details		
Fill of	**Feature type**	**Context**	**Period**	**Sample no.**	**Sample size (l)**	**Flot size (ml)**	**Charcoal**	**Taxa**
301	Cremation pit	299	MBA	50	18	100	++	Salicaceae
		298	MBA	49	40	85	+++	Salicaceae
98	Cremation pit	99	Undated	21	34	165	+++	*Alnus/Corylus*
46	Cremation pit	47	E-MBA	9	30	190	++++	*Quercus* sp. *Fraxinus excelsior*
		48	E-MBA	10	20	135	++++	Maloideae *Fraxinus excelsior*
		50	E-MBA	12	0.9 kg	8	+	*Quercus* sp.
		49	E-MBA	11	2.75 kg	6	-	
44	Cremation pit	45	Undated	8	10	0.2	-	
269	Cremation pit	270	Undated	45	12	175	+++	*Quercus* sp. Maloideae
		271	Undated	46	40	100	+++	*Quercus* sp. *Prunus* sp.
70	Cremation pit	72	LIA-ER	23	36	4	+	*Quercus* sp. Maloideae
		71	LIA-ER	22	16	0.5	+	Maloideae

+ = 1-10; ++ = 11-50; +++ = 51-100; ++++ = 101-1000; 1000+ = >100

Table 7.31: Summary of charcoal from other features

Sample details						Flot details		
Fill of	**Feature type**	**Context**	**Period**	**Sample no.**	**Sample size (l)**	**Flot size (ml)**	**Charcoal**	**Taxa**
114	Pit	116	Undated	25	2.75 kg	6	+	*Quercus* sp.
		115	Undated	24	10	2	+	*Quercus* sp. Maloideae
156	Ring ditch	187	LN-EBA	29	30	9	+	*Quercus* sp. Maloideae
		188	LN-EBA	30	40	15	+	*Quercus* sp. Maloideae
170	Pit	171	Undated	28	40	5	-	
51	Pit	52	undated	13	10	200	++++	*Alnus/Corylus*
53	Pit	54	LBA	14	10	1	+	*Alnus/Corylus*

+ = 1-10; ++ = 11-50; +++ = 51-100; ++++ = 101-1000; 1000+ = >100

B. Assessment of Macroscopic Plant Remains and Charcoal

Dr M J Allen

1. Introduction

- In total, 22 bulk disturbed samples of generally 10 litres volume have been recovered and processed for macroscopic plant remains and charcoal during the fieldwork events itemised in **Table 15**. All were recovered during the hand-excavation of features.

- In terms of addressing fieldwork event aims, the recovery and assessment of these samples is primarily to establish the economic basis of agricultural communities, and to determine the local environment of the site through recovery of such palaeo-environmental data.

2. Methodology

- Samples were selected for processing according to the following criteria;
    - *A broad range of feature types was to be examined,*
    - *Samples should be spatially arranged across the entire site, and*
    - *Where possible, all chronological periods should be examined at the site*

- Standard flotation processing methods were used, with sample flots retained on a 0.5 mm mesh and residues fractionated into 5.6 mm, 2 mm and 1 mm fractions. All coarse fractions (i.e. >5.6 mm) were hand-sorted, weighed and discarded, with flots scanned under a x10 - x30 stereo-binocular microscope in order to quantify the presence of plant macrofossils.

3. Quantifications

- Macroscopic plant remains and charcoal quantification by sample per context for those fieldwork events conducted by Wessex Archaeology are provided in **Table 15**.

4. Provenance

- The samples generally produced large flots (average flot size for a 10 litre sample is 60 millilitres), which were largely dominated by charcoal with mainly low levels of both rooty material and uncharred weed seeds, both of which can be indicative of stratigraphic movement.

5. Conservation

- Analysis would include extraction and sorting of all charred remains from residues, facilitating storage and archive compilation.

6. Comparative material

- A number of sites of these periods are known in the locale, and would provide comparative data sets. These include excavations at Stonar (Paradine n.d.), Keston Camp and Wilmington (Hillman unpub), Maidstone (Arthur 1960) and Bicknor (Arthur 1961), as well as more recent CTRL investigations at sites such as Sandway Road (URS 1999).

7. Potential for further work

- Analysis will enable an interpretation of activities performed on site during the periods represented, and possibly the functions of some features. This will enable some indication of the role of the site in the social economy, and provide details of the community economy.

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Table 15: Quantification of Ecofacts

Feature type and number	Context	Sample	Size (litres)	Flot size (ml)	Grain	Chaff	Weed Seeds Charred		Charcoal >5.6mm	Other	Charcoal >5.6mm
HOL99 Excavation											
BTS 1001	1002	3001	10	625 $^{6.25}$			+	+	++		
BTS 1001	1013	3004	10	20 ^{2}			+	+	+		
BTS 1009	1010	3006	2	50 $^{2.5}$			+		++	Moll-f (+)	
BTS 1023	1024	3008	10	225 ^{5}			+	+	++		
BTS 1028	1027	3010	10	250 $^{12.5}$			+	+	++		
BTS 2068	2066	3512	10	700 ^{7}			+	+	++		
Ditch 4001	2029	3507	10	10 $^{6.5}$			++	+	-		
Ditch 4004	2085	3513	10	5 $^{0.5}$	+		+	+(h)	+	Burnt bone	
Ditch 4005	2105	3514	10	1 $^{0.1}$	+	+	+	+	-		
Hearth 1033	1034	3012	10	1000 ^{10}			+	+	++		
Pit 1029	1030	3011	10	1000 ^{10}			+	+	+++		
Pit 2003	2001	3501	10	350 $^{3.5}$	+++		+	+	++		
Pit 2043	2041	3509	10	750 $^{7.5}$			+	+	++		
HOL98 Evaluation											
Crem. 359604	359605	19	10	60 ^{6}	+	+	+	+	++	Burnt bone	+++
Crem. 359606	359607	20	15	175 $^{1.75}$	+		++		++	Burnt bone	
Crem. 359609	359608	21	15	500 ^{5}	+		++		++	Burnt bone	
Ditch 360303	360304	2	15	20 ^{2}	+	+	+	+(h)	+	Moll-f (+)	
Ditch 359205 (=4010)	359202	22	10	30 ^{2}	+	+	++	+	+		
Ditch 359205 (=4010)	359203	23	0.7	3 $^{0.3}$	++		++	+	-		
Ditch 360507	360508	18	15	35 $^{3.5}$	+	+	++		+		
Ditch 361204	361203	26	15	20 ^{12}	+	+	++	++			
Layer	352006	1	5	800 ^{8}	+		+		+++		+

Key: BTS = Burnt-out tree stump; Flot size in $^{\text{superscript}}$ = ml of rooty material; h = hazelnut; Moll-f = freshwater mollusc
+ = 1-10, ++ = 11-50, +++ = 51-100

Littlestock

C. Assessment of Macroscopic Plant Remains and Charcoal

1. Introduction

- A large series of bulk samples were taken from sealed contexts to recover charred plants remains and charcoal to aid in determining the following for each defined phase:
    - *the archaeological significance of the deposits and thus the site*
    - *the nature of the local environments*
    - *selection of woodland species for general and specific activities*
    - *the use of the wild and cultivated resources*
    - *the nature of specific activities undertaken on site, and thus the general economic status of the site*

2. Methodology

- Samples were selected for processing according to the following criteria:
    - *a broad range of feature types was to be examined*
    - *samples should be spatially arranged across the entire site*
    - *where possible, all chronological periods represented at the site should be examined.*
- Based on these criteria, 51 bulk samples of between 0.5 and 15 litres were processed from a range of Neolithic, Bronze Age, Iron Age, medieval and undated features. All bulk samples were processed for the recovery and assessment of both charred plant remains and charcoals, and artefacts.
- Standard processing methods were used, with sample flots retained on a 0.5mm mesh and coarse residues fractionated into a 4mm mesh. The coarse fraction was hand-sorted, weighed and discarded, with flots scanned under a x10 – x30 stereo-binocular microscope in order to quantify the presence of plant macrofossils.

3. Quantifications

- The quantification of macroscopic plant remains and charcoal by sample per context for those fieldwork events conducted by Wessex Archaeology are provided in **Table 18**.
- Neolithic post-hole **2507** produced a few charred grain fragments and high numbers of charred weed seeds, including hazelnut fragments. Only two of the Late Bronze Age/ Early Iron Age samples produced a few charred grains, with similar quantities of burnt weed seeds recovered from three samples. Hazelnuts were also recovered from two samples attributed to this period. It may be of note that none of the earlier prehistoric samples produced additional material such as bone (burnt or otherwise), peas/ beans or molluscs.

- Early and Early/ Middle Iron Age samples generally produced greater quantities of charred grain and burnt weed seeds than the earlier prehistoric samples. In particular, significant quantities of charred grain were recovered from the upper fill of Early Iron Age pit **2013**, a charcoal-rich deposit which may represent a shallow hearth located in the partially infilled remains of the pit. Pit **2013** also produced a few charred fragments of chaff from the lower fill, with similar quantities recovered from three of the Early/ Middle Iron Age samples. Five of the nine Middle/ Late Iron Age samples also produced hazelnut shells.

- All Middle/ Late Iron Age samples produced charred grain, with the greatest quantities recovered from enclosure **5024**; grave-pit **2031** and pit **2008**, with the enclosure and pit **2008** the only features from this period to also produce charred chaff. All of the Late Iron Age samples produced generally large quantities of charred grain, moderate quantities of burnt weed seeds and low numbers of charcoal fragments. Four of the six samples also yielded low numbers of charred chaff fragments.

- The single sample from Saxon pit **2437** produced a few charred grains, weed seeds (burnt and unburnt) and charcoal fragments, whereas all 14 medieval samples produced generally high numbers of charred grain, with two samples also producing some charred chaff fragments.

4. Provenance

- The samples generally produced small flots (average flot size for a 10 litre sample is 60 millilitres) with between 2 and 90% rooty material and varying quantities of uncharred weed seeds. As a general rule, the quantity of rooty material and uncharred weed seeds recovered from a sample is considered to be directly proportional to the amount of post-depositional movement and/or impact that a deposit has experienced. Therefore, samples producing large quantities of both categories can generally be considered not stratigraphically secure. There are, however, other agents that can be responsible for rooty material and/or uncharred weed seeds that do not necessarily comprise stratigraphic security, such as contemporaneous *in situ* bioturbation.

5. Conservation

- There are no conservation issues that conflict with long term storage for the sorted residues and extracted flots. However, the unprocessed samples, although currently stored in stable conditions, cannot remain so in perpetuity, and as such a decision regarding discard/retention needs to be reached.

6. Comparative material

- There are no major prehistoric charred remains assemblages published from Kent (c.f. Scaife 1987), although smaller assemblages are gradually being published. In particular, Neolithic and domestic Bronze Age (as opposed funerary) assemblages are especially absent. The most important of these, and relevant to Little Stock Farm, include the Iron Age sites at Wilmington and Keston camp (both Hillman unpubl.)

7. Potential for further work

- The presence of Neolithic cereals and charcoal in pit **2507** is significant in providing information on early farming and the nature of local woodland for a period poorly represented in the archaeological record of Kent.

- There is evidence of cereal cultivation (grain) and preparation (chaff) from the Late Bronze Age onwards, and the large number of weed seeds might provide an indication of the soil types cultivated. Both the charred weed seeds and charcoals may indicate the exploitation of wilder

resources, as suggested by the presence of hazelnuts. The wood species may also indicate the nature of the local woodland and whether they were coppiced or managed.

- The latter is a theme that can be addressed to a greater or lesser extent in both the Late Iron Age and medieval periods, but more significant in both these phases is the increased intensity (recovery) of evidence for the use of agricultural produce (grain). From the Middle Iron Age onwards, in particular, there is a demonstrable intensification in arable farming at Little Stock Farm: cereal grain is common and there is potential for changes in the species grown, and also peas/beans are a part of the crop.

- Given the enhanced potential for the site as a whole to contribute to the study of the prehistory in Kent, it is recommended that all remaining samples from *4th Rank* (see **Appendix 7.1**) or greater features are processed and sorted to augment the ecofact and micro-artefactual assemblages already obtained.

- In summary, the palaeo-environmental information is well preserved, with stratigraphically secure features identified to provide a basis for future analysis. The archive may therefore enable the examination of changing woodland and exploitation of the local environment. The cereal and charred plant remains can provide detailed of the farming economy and activities occurring on site in each period, as well as recording the developments in the crops and farming from the Neolithic to the medieval period. Within this the weed seeds might enable some comment of changing soil types or of selection of specific soil types for cultivation, the former indicating degradation by human action and the latter specific selections.

- All of the palaeo-environmental data will aid in the interpretation of the activities and function of each phase of activity, above and beyond mere presence/ absence statements. This will provide an environmental framework on which to base consideration of human economy, intervention and interaction with the landscape of Little Stock Farm from the earlier prehistoric to medieval times.

8. Bibliography

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Table 18: Quantification of Ecofacts

Sample Details (by period)				**Flot Details**							**Residue Details**
Feature (inc. sub-group)	**Context no.**	**Sample no.**	**Size (litres)**	**Size (ml)**	**Grain**	**Chaff**	**Weed Seeds** *a) Unburnt*	**Burnt**	**Charcoal >5.6mm**	**Other**	**Charcoal >5.6mm**
Middle Neolithic											
Post-hole 2507	2506	3024	10	30 $^{0.6}$	+		++	++(h)	+		
Late Bronze Age/ Early Iron Age											
Vessel-hole 2104 (fill of ON 4002)	2103	3003	4	10 ^{2}			+	+(h)	+		
Vessel-hole 2503 (fill of ON 4003)	2501	3009	0.5	5 $^{0.5}$			+	+(h)	+		
Vessel-hole 2503	2502	3011	6	5 ^{1}	+		+	+	+		
Ditch 2346 (=5016)	2347	3057	3	3 $^{1.5}$			+				
Vessel-hole 362706	362707	6	15	10 ^{1}	+		+				
Early Iron Age											
Pit 2013	2011	3020	5	40 ^{4}	++		+	+	+	burnt bone; p/beans (+); min. matter	
Pit 2013	2012	3022	8	5 $^{0.5}$	+	+	+	+	+	unburnt bone; p/beans (+)	
Vessel-hole 2304 (fill of ON 4001)	2302	3004	6	5 $^{0.5}$			++	+	+	unburnt bone	
Vessel-hole 2304	2303	3010	10	15 $^{0.5}$	+		++		+	burnt bone	
Vessel-hole 2304	2303	3013	10	10 ^{1}	+		++	+	+	unburnt and burnt bone	
Vessel-hole 2304	2303	3017	10	40 ^{2}			++	+	++	unburnt bone	
Vessel-hole 2304	2303	3018	0.25	3 $^{0.3}$			+		+		
Early/ Middle Iron Age											
Grave-pit 2037	2032	3042	10	5 ^{1}	+		+	+		mollusc (+)	
Post-pit 2441 (= 5019)	2442	3062	10	10 $^{0.5}$	+		+	+(h)	+		
Post-hole 2505	2504	3023	10	20 ^{2}	+		++	++(h)	+		
Gully 2010 (=5002)	2009	3016	5	10 ^{1}	+	+	+	+(h)	+	unburnt bone	
Gully 2028 (=5007)	2027	3040	5	5 $^{0.5}$	+		+	+(h)	+		
Pit 354606	354602	1	15	150 ^{135}	+	+	++			mollusc (++); smb (+)	
Pit 354606	354603	2	15	125 $^{112.5}$	+		+	+		mollusc (++); smb (+)	
Ditch 355116	355112	15	15	10 ^{1}	+	+	++			mollusc (+); smb (+)	
Pit 355118	355117	16	15	5 $^{1.5}$			++	+(h)		mollusc (+); smb (+)	
Post-hole 362708	362709	7	15	20 ^{2}	++		+		+	smb (+)	
Middle/ Late Iron Age (Phase I)											
Grave-pit 2031	2029	3041	10	25 $^{3.75}$	++		+	+(h)	+	unburnt bone	
Ditch 2410 (=5003; part of 5024)	2413	3034	10	35 $^{0.7}$	+		+	+	+	smb (++)	
Ditch 362704 (=5003; part of 5024)	362705	5	15	30 ^{3}	+		+		+	smb (+)	
Ditch 2324 (=5011; part of 5024)	2321	3029	10	25 $^{7.5}$	++	+	++	++		smb (+); p/beans (+)	
Ditch 362721 (=5011; part of 5024)	362722	12	15	10 ^{3}	++	+	+	+	+	smb (+); p/beans (+)	
Contd.Sample Details (by period)				**Flot Details**							**Residue Details**

Feature (inc. sub-group)	Context no.	Sample no.	Size (litres)	Size (ml)	Grain	Chaff	Weed Seeds *b) Unburnt*	Weed Seeds Burnt	Charcoal >5.6mm	Other	Charcoal >5.6mm
Middle/ Late Iron Age (Phase II)											
Pit 2008	2007	3008	4	5 [1]	++	+	++	+		smb (+); p/beans (+)	
Ditch 362725 (=5004; part of 5025)	362726	13	15	5 [1]	+		+		+	p/beans (+)	
Late Iron Age											
Hearth 2006	2003	3005	10	10 [3]	++	+	++	++	+	smb/f (++); p/beans (+)	
Hearth 2006	2003	3007	4	15 [1.5]	++	+	++	++	+	smb (+); p/beans (++)	
Post-pit 2124 (=5015)	2125	3043	10	25 [1.25]	++		+	+	+	smb (+)	
Ditch 2002 (=5001; part of 5026)	2001	3002	10	5 [1]	+	+	+	+	+	smb (+)	
Ditch 362725 (=5005; part of 5026)	362716	8	15	25 [2.5]	++	+	+	+	+	smb (+); p/beans (+)	
Saxon											
Pit 2437	2438	3056	10	10 [3]	+		+	+	+		
Medieval (Phase I)											
Pit 2036	2034	3044	5	10 [1.5]	+		+		+	smb (+)	
Pit 2036	2035	3045	4	15 [10]	+		+	+(h)	+		
Hearth 2421	2423	3048	10	50 [1]	++	+	++	+(h)	++	smb/f (+); mollusc (+)	
Hearth 2421	2423	3049	10	60 [1.2]	++		++	+	++	smb (+); p/beans (+)	
Hearth 2421	2423	3050	10	50 [1]	++		+	+	++	smb (+); p/beans (+)	
Quarry 2522	362717	11	15	10 [5]	+		++			mollusc (+); smb (+)	
Ditch 2026 (=5006)	2025	3038	8	15 [7.5]	++		+	+		smb (+); p/beans (+)	
Ditch 2211 (=5006)	2210	3015	10	10 [0.5]	++		++	+	+	smb (+); min. matter	
Ditch 362712 (=5006)	362711	3	15	15 [6]	++	+	++		+	smb (++); p/beans (+)	
Ditch 355205 (=5027)	355206	10	15	30 [1.5]	+		+			mollusc (++); smb (+)	
Medieval (Phase II)											
Ditch 2439	2440	3055	10	5 [1.25]	+		+	+(h)	+	unburnt bone	
Ditch 362714 (=5010)	362713	4	15	20 [14]	+		+	+		smb (+)	
Ditch 355203 (=5010)	355204	9	15	20 [1]	++		+			mollusc (++); smb (+)	
Pit 362504	362503	14	15	5 [4]	+		++			mollusc (++)	
Undated											
Natural feature 355111	355107	17	15	20 [2]	+		++			mollusc (++); smb (+)	

Key: Flot size in [superscript] = ml of rooty material; ON = Object No.; h = hazelnut; smb/f = small mammal bone/ fish; p/beans = peas/beans; min. = mineralised; + = 1-10 items, ++ = 11-50 items

D. Assessment of Charred Plant Remains and Charcoal

Michael J. Allen, Enid Allison and Sarah F. Wyles

1. Introduction

- A full sampling programme was conducted during excavation for the retrieval of charcoal and charred plant remains to provide information and interpretation of the economic and palaeo-environmental aspects of the site.

- The recovery and assessment of the samples was undertaken in accordance with the Fieldwork Event Aims for the site. The sampling programme aims to allow general questions concerning the diet and economy of the site, and of land-use for the site, as well as more specific information about the function and nature of individual features, building or activities, to be addressed. On a wider, regional level it was hoped to gain information at varying levels from the Bronze Age to Saxon economy and lifestyle of Kent, and to look at the development of the economy and land-use through time.

2. Methodology

- Site sampling strategy ensured that a range of features from all phases were sampled. Within each defined phase the sample suite included a range of different feature or context types, and ensured a spatial array. Priority was given to samples from features or contexts that were dated, or datable, over those that were unlikely to be dated/ datable, except where specific or unusual activities were indicated by the field evidence. Where environmental sampling methodologies differ between Canterbury Archaeological Trust (CAT) and Wessex Archaeology (WA), these are indicated appropriately in text.

- Standard processing methods were used. Flotation of bulk samples facilitated the retrieval of flot on 500 µm (WA) or 250 µm (CAT) mesh sieves, with residues retrieved on 1mm mesh sieves. The fractionated residues greater than 5.6mm were sorted, recorded and discarded. Residues of 2mm and 1mm from all flotation samples (WA) were dried and are retained. Artefact samples from which charcoal was retrieved were sieved to 1mm and fractionated on 1mm, 2mm and 4mm/ 5.6mm meshes.

3. Quantification and Provenance

- A total of 547 bulk samples were taken of which 462 were processed (comprising all 353 samples taken by CAT and 109 samples taken by WA), including a representative sample of all feature types and phases. In addition a series of 59 samples were taken for artefact and charcoal recovery. A further 353 samples were taken and processed from the Anglo-Saxon cemetery and grave-related contexts.

- The samples processed were from a range of Neolithic, Early Bronze Age, Late Bronze Age/ Early Iron Age, Early Iron Age, Romano-British, Early to Mid Saxon, medieval and undated features, for the recovery and assessment of charred plant remains and charcoal.

- The majority of the bulk samples were 10 litres, but varied between 0.5 and 110 litres and artefact samples were up to 800 litres. The volume of the flots was obviously highly variable due to the range in sample size, but in general flots were average for the sampled contexts, (average flot size is *c*. 60ml per 10 litre of sample) with between 1 – 70% rooty material and low to high numbers of uncharred weed seeds, which may be indicative of stratigraphic movement. **Table 41** quantifies the assessment data.

- Charcoal fragments of greater than 5.6 mm were recovered from 73 of the samples. Eight of the Neolithic samples, nine of the Late Bronze Age/ Early Iron Age samples, one of the Late Iron Age/ Early Romano-British, one of the Saxon samples and six of the undated samples contained large quantities of charcoal. The charcoal was mainly large wood fragments.

a) Neolithic

- The ten Neolithic samples from pits W136 and W175 contained charred grain fragments in seven samples, with high numbers in one of them, charred weed seeds, including hazelnut fragments in all samples, with large amounts in seven of these. A few charred chaff fragments were recorded in the sample from W175. Burnt bone fragments were recorded in five of the flots.

b) Early Bronze Age

- The Early Bronze Age samples from the ring ditch W33 and ditch C4744 produced very few, if any charred remains in the flots.

c) Middle Bronze age

- Only one sample has been defined as Middle Bronze Age and this pit (C6253) produced good quantities of grain and charcoal.

d) Late Bronze Age/ Early Iron Age

- The Late Bronze Age/ Early Iron Age samples produced charred grain fragments in 29 samples, with high numbers in 15 of them, and charred chaff fragments in 21 of the samples, with large amounts in 10 of them. Charred weed seeds, including hazelnut fragments, were observed in 24 of the samples, with large quantities in 5 samples.

- The three samples from W207 contained exceptional quantities of charred pea/ bean fragments, with a few pea/ bean fragments present in a sample from W208. Very good preservation and quantities were also noted in pits and especially in pit C2805. The remains from ditches were typically poorer but occasional concentrations (e.g. the sample from C124) were richer. A number of samples were from cremation-related features from which charcoal was generally very good and plant remains largely poor as they were incidental to the pyre firing. Burnt bone fragments were present in six of the flots, bone fragments in a single flot and small mammal bones in one flot. Molluscs were observed in a single flot.

Table 41: Quantification of ecofacts

Period	Feature	Context	Sample	Size	Flot size	Roots	Grain	Chaff	Unburnt weed seeds	Burnt weed seeds	Charcoal	Other	Residue
PHIST	?Pit C2157	2156	36	20	70	10	C	C	c	-	A		C
PHIST	Crem/p-hole C6359	6358	940	10	5		-	-	c	-	-		C
PHIST	Crem/p-hole C6353	6352	942	30	10		A	-	-	C	-		B
PHIST	Crem/p-hole C6363	6362	941	10	10		-	-	c	C	C		-
PHIST	Ditch	2181	38	10	5	2	C	-	-	-	C		-
PHIST	Ditch	3765	810	10	10	3	-	-	c	-	B		-
PHIST	Ditch	2289	39	10	5		-	-	-	-	C		C
PHIST	Ditch C2178	2179	37	10	60	10	C	-	-	-	A		C
PHIST	Ditch C2276	2277	30	10	30	5	-	-	c	-	B		C
PHIST	Ditch C2292	2290	41	10	5	3	-	-	-	-	C		-
PHIST	Ditch C2292	2291	35	10	10		-	-	-	-	C		-
PHIST	Ditch C2306	2305	33	10	5	2	-	-	-	-	C		C
PHIST	Ditch C2308	2307	34	10	10	5	-	-	-	-	C		-
PHIST	Feat C3720	3719	802	10	10	3	-	-	b	-	C	Snails	-
PHIST	P-hole/pit C6347	6346	943	10	5		C	C	-	-	-		C
PHIST	Pit C6351	6350	944	10	5	3	-	-	-	-	-		-
PHIST	Pit C6489	6488	904	10	20		A*	B	-	B	B		C
PHIST	Pit C6489	6514	905	10	5		A	C	-	-	-	H	-
PHIST	Pit C6489	6521	909	10	5		C	C	-	-	C		-
PHIST	Pit C6489	6658	907	10	5		-	-	-	-	-		-
PHIST	Pit C6489	6659	906	10	15		A**	C	-	-	C		-
PHIST	Pit C6489	6660	908	10	5		-	-	-	-	-		-
PHIST	Pit C6499	6431	900	10	10		A*	A	cc	C	B		-
PHIST	Pit C6499	6498	948	20	50	5	A*	A	-	C	A	Fruit stone	C
PHIST	Pit C6499	6499	899	10	80	20	A**	A*	a	A	A		-
PHIST	Pit C6499	6655	901	10	5		A	-	-	-	C		C
PHIST	Pit C6499	6656	902	10	5		C	-	c	-	-	Burnt bone	-
PHIST	Pit C6499	6657	903	20	10		C	C	-	-	B	Smb	-
PHIST	Post hole C6305	6304	911	10	10		A	-	-	A	B	H	-
PHIST	Post hole C6307	6306	913	10	5		A*	-	-	-	C		-
PHIST	Post hole C6309	6308	917	10	5	3	-	-	-	-	C		-
PHIST	Post hole C6317	6316	925	10	5		C	-	-	-	-		C
PHIST	Post hole C6319	6318	928	10	5		C	C	c	-	-		-
PHIST	Post hole C6323	6322	930	10	5	3	C	-	c	C	-		-
PHIST	Post hole C6329	6328	932	10	10	5	C	-	-	-	B		-
PHIST	Post hole C6339	6338	927	10	5		-	-	c	-	C		C
PHIST	Post hole C6341	6340	926	10	10		B	-	-	-	B		-
PHIST	Post hole C6349	6348	945	10	5	2	C	-	-	-	-		C
PHIST	Post hole C6355	6354	947	10	5		C	-	-	-	C		-
PHIST	Post hole C6357	6356	946	10	5		A	-	-	C	-		-

PHIST	Post hole C6395	6394	936	10	5		C	-	-	-	-		C
PHIST	Post hole C6397	6396	938	10	10		-	-	-	-	C		-
PHIST	Post hole C6401	6400	939	10	20		B	C	-	C	B		-
PHIST	Post hole C6409	6408	933	10	10	3	B	C	-	-	B		-
PHIST	Post hole C6414	6413	934	10	5	1	A	C	c	-	C		C
PHIST	Post hole C6445	6444	912	10	10	3	A*	C	c	A	B		-
PHIST	Post hole C6447	6446	918	10	10		B	C	-	C	B		-
PHIST	Post hole C6451	6450	914	10	5		C	-	-	-	C		-
PHIST	Post hole C6453	6452	916	10	5		-	-	-	-	-		-
PHIST	Post hole C6455	6454	915	10	5		-	C	-	-	C		-
PHIST	Post hole C6457	6456	920	10	5		-	-	c	-	-		C
PHIST	Post hole C6459	6458	921	10	5		C	-	-	-	C		C
PHIST	Post hole C6461	6460	922	10	5		-	-	-	-	-		-
PHIST	Post hole C6462	6463	923	10	5		-	-	-	C	-		-
PHIST	Post hole C6465	6464	919	10	10	3	C	C	-	-	C		-
PHIST	Post hole C6467	6466	924	10	5		C	-	-	C	C		-
PHIST	Post hole C6472	6473	937	10	10		C	-	-	-	B		-
PHIST	Post hole C6487	6486	910	10	5		B	-	-	-	C		-
PHIST	Post hole C6585	6584	935	20	30		A	-	c	-	A		-
ENE	Pit W136	3371	245	20	250	12.5	A	-	b	A(h)*	A	-	-
ENE	Pit W175	3278	237	7	50	2	C	-	c	A(h)	A	-	-
ENE	Pit W175	3279	238	4	60	1.8	-	-	c	C(h)	A	Some burnt bone	1
ENE	Pit W175	3280	239	3	60	3	C	-	c	A(h)	A	Some burnt bone	-
ENE	Pit W175	3281	240	4	35	3.5	B	C	a	A(h)	B	Some burnt bone	-
ENE	Pit W175	3297	244	5	50	5	C	-	c	B(h)	A	-	-
ENE	Pit W175	3298	243	6	130	4	C	-	c	A(h)	A	-	-
ENE	Pit W175	3299	242	5	60	6	-	-	c	A(h)	A	Some burnt bone	-
ENE	Pit W175	3300	241	5	60	3	B	-	c	A(h)	A	Some burnt bone	-
BA	Barrow ditch C4744	3827	834	20	20		-	-	c	-	B		-
BA	Barrow ditch C4744	3919	831	10	5	2	-	-	-	-	-		-
BA	Barrow ditch C4744	3921	832	10	5		-	-	c	-	C		-
BA	Barrow ditch C4744	3930	825	10	10	5	-	-	-	-	B	Snails	-
BA	Barrow ditch C4744	3931	826	10	10		-	-	-	-	C		-
BA	Ring ditch C6221	6220	894	10	40		C	C	c	-	A		-
EBA	Ditch W33	1882	233	4	1	0.5	-	-	c	-	-	-	-
EBA	Ditch W33	1886	234	5	2	0.5	-	-	c	-	-	-	-
MBA	Pit C6153	6152	1046	50	40	5	A	-	a	-	A*	Snails	C
LBA/EIA	Pit	1499	93a	10	20		A*	A*		A	B		
LBA/EIA	Pit	1499	93b	10	10		A*	A*		A	B		
LBA/EIA	Pit	1499	93c	10	10		A*	A		A	B		
LBA/EIA	Pit	1499	93	22	10		A*	A*		B	B		
LBA/EIA	Pit C2805	2802	210	20	35	10	A*	C	c		A	Snails	C
LBA/EIA	Pit C2805	2802	248	20	25	5	A*	A	-	B	B	Snails	C
LBA/EIA	Pit C2805	2802	255	10	10		B	-	b	C	B	Snails	C
LBA/EIA	Pit C2805	2803	211	10	15		B	C	c	-	B	Snails	C

LBA/EIA	Pit C2805	2803	256	10	30	5	C	C	-	-	A	Snails	C
LBA/EIA	Pit C2805	2804	212	20	20	5	A*	C	c	B	B	Snails	-
LBA/EIA	Pit C2805	2804	249	10	20	5	A	A	c	C	B	Snails	C
LBA/EIA	Pit C2805	2804	257	10	20		B	C	c	-	B		-
LBA/EIA	Pit C2805	2813	213	20	20	5	A	A*	-	B	B	Snails	C
LBA/EIA	Pit C2805	2813	250	10	10	3	B	C	c	-	B	Snails	-
LBA/EIA	Pit C2805	2813	258	10	30	5	C	C	-	-	B		-
LBA/EIA	Pit C2805	2814	214	20	10	3	B	B	b	B	C		-
LBA/EIA	Pit C2805	2814	251	20	15		C	C	c	-	B	Snails	-
LBA/EIA	Pit C2805	2814	259	10	30	5	A	A	-	A	A		-
LBA/EIA	Crem W100	1727	120	0.5	10	1.5	-	-	c	-	-	Some burnt bone	-
LBA/EIA	Crem W100	1727	121	1.5	25	5	-	-	b	C	C	Some burnt bone	-
LBA/EIA	Crem W101	1729	122	1	10	2	-	-	c	-	C	Some burnt bone	-
LBA/EIA	Crem W101	1729	123	1	15	2.25	-	-	b	-	C	Some burnt bone	-
LBA/EIA	Crem W102	1700	109	1	10	1	-	-	c	-	C	-	-
LBA/EIA	Crem W102	1700	113	1.5	10	1.5	-	-	b	-	C	-	-
LBA/EIA	Crem W102	1700	110	3	25	5	C	-	b	-	C	-	-
LBA/EIA	Crem W102	1700	112	3.5	30	4.5	C	-	c	C	C	-	-
LBA/EIA	Crem W102	1701	114	1.5	5	2	C	-	c	-	C	-	-
LBA/EIA	Crem W102	1701	115	3	5	1.5	C	-	c	-	C	-	-
LBA/EIA	Crem W102	1701	111	3.5	10	4	-	-	c	C	-	mollusc (C)	-
LBA/EIA	Crem W106	1723	116	4	20	4	-	-	c	C	C	-	-
LBA/EIA	Crem W107	1725	117	3	10	2	-	-	b	-	C	-	-
LBA/EIA	Crem W223	3603	277	10	500	5	C	-	c	C	A*	Some burnt bone	-
LBA/EIA	Crem W223	3608	278	10	250	5	-	-	c	C	A*	Some burnt bone	-
LBA/EIA	Crem W223	3609	279	10	650	6.5	-	-	c	C	A*	Some burnt bone	-
LBA/EIA	Crem W223	3610	280	10	1100	11	-	-	c	C	A*	Some burnt bone	-
LBA/EIA	Crem W223	3611	281	10	1500	15	C	-	c	C	A*	Some burnt bone	-
LBA/EIA	Crem W99	1704	118	2	10	2	C	-	c	-	C	-	-
LBA/EIA	Crem W99	1704	119	0.5	10	2	-	-	c	C	C	-	-
LBA/EIA	Ditch W165	3152	219	10	10	1	A	B	b	C	C	-	-
LBA/EIA	Ditch W165	3646	287	10	60	3	A	-	b	C	B	Some burnt bone	-
LBA/EIA	Ditch W165	3646	288	10	60	3	C	-	c	C	A		-
LBA/EIA	Ditch W3	1023	6	20	10	1	C	-	c	C	-	-	-
LBA/EIA	Ditch W62	1698	108	10	50	5	C	-	a	C	B	-	-
LBA/EIA	Ditch W62	1702	124	20	40	16	B	-	a	-	-	-	-
LBA/EIA	Pit W207	5236	341	10	50	7.5	C	C	b	C	B	P/beans (A*)	-
LBA/EIA	Pit W207	5250	324	10	500	1	A	-	c	C	A	P/beans (A**)	-
LBA/EIA	Pit W207	5265	342	10	600	6	A	A	c	A	A	P/beans (A**)	-
LBA/EIA	Pit W208	5030	311	10	100	15	A	A	c	C(h)	A	Smb (C), mollusc (C), p/beans (C), bone	-
IA	Pit	4589	858	20	5	3	-	-	c	-	C		-
EIA/MIA	Grave W64	1306	55	20	15	4.5	C	-	b	C	C	-	-
EIA/MIA	Grave W69	1412	63	10	25	5	-	-	a	-	C	-	-
EIA/MIA	Grave W69	1412	68	10	25	4	C	-	b	-	C	Bone	
EIA/MIA	Grave W70	1605	96	20	15	3	C	-	c	-	-	mollusc (C), bone	-

EIA/MIA	Grave W97	1733	125	20	60	36	C	-	a	C	A	-	-
EIA/MIA	Grave W97	1735	129	20	40	10	A	C	b	C	C	-	-
EIA/MIA	Posthole W67	1410	64	10	40	6	C	C	a	C	B	-	-
LIA/ERO	?Crem	336	30	48	40	5	-	-	-	-	B	Burnt bone	-
LIA/ERO	?Crem	2944	254	10	5	3	-	-	-	-	C		-
LIA/ERO	?Hearth	3985	839	30	120		A**	B	-	B	B	Snails	C
LIA/ERO	?Pit C4586	4585	853	20	10		-	-	a	-	C		-
LIA/ERO	Crem	59	8	12	10	5	C	C	c	-	C		-
LIA/ERO	Crem	59	11	20	10	5	-	-	-	-	C		-
LIA/ERO	Crem	62	91	10	5	-	C	-	-	-	-		-
LIA/ERO	Crem	82	89	8			20		-	-	B	Burnt bone	C
LIA/ERO	Crem	2186	17x	120	710	40	-	-	c	-	A	Snails	B
LIA/ERO	Crem	2186	24x	30	500	50	-	-	-	-	A**	Snails	B
LIA/ERO	Crem	2201	20x	35	80	15	A	-	c	-	A	Snails	C
LIA/ERO	Crem	2208	18x	100	200	40	-	-	-	-	A	Snails	B
LIA/ERO	Crem	2208	25x	50	3000	10	-	-	-	-	A**		B
LIA/ERO	Crem	2216	27x	10	50	10	C	-	-	-	A	Burnt twigs, burnt bone	C
LIA/ERO	Crem	2232	28x	25	100	10	A*	-	c	B	A	Burnt bone, twigs, bird	C
LIA/ERO	Crem	2287	31x	10	5	2	C	-	c	-	C		C
LIA/ERO	Crem	2301	32x	10	5	2	-	-	-	-	C	Snails	-
LIA/ERO	Crem	2826	216	12	25	5	A	-	-	C	B	Burnt bone	-
LIA/ERO	Crem	3007	501	50	100	30	C	-	c	-	A*	Snails	C
LIA/ERO	Crem	3192	525	60	2040		-	-	-	-	A**		A
LIA/ERO	Crem	3704	801	30	70	5	-	-	c	-	A*		C
LIA/ERO	Crem	3708	800	20	20	5	-	-	c	-	B		-
LIA/ERO	Crem	3710		10	10	5	-	-	c	-	B	Burnt bone, snails	-
LIA/ERO	Crem	3737	809	10	30	5	C	C	c	-	A	Snails	-
LIA/ERO	Crem	3776	812	10	10	3	-	-	c	-	C		-
LIA/ERO	Crem	3805	815	10	20		-	-	-	B	B	?Seed heads	-
LIA/ERO	Crem	3809	816	20	20		C	-	c	C	B	?seed heads, bone	-
LIA/ERO	Crem	3894	821	10	5	3	-	-	-	-	C		-
LIA/ERO	Crem	3933	827	10	5	2	-	-	-	-	C		-
LIA/ERO	Crem	3934	828	10	10		C	-	c	-	C		-
LIA/ERO	Crem	6366	898	10	15		C	-	-	-	C		-
LIA/ERO	Ditch	4563	854	20	10	3	-	C	c	-	C		-
LIA/ERO	Ditch	4564	855	20	15		-	-	c	-	C	Snails	-
LIA/ERO	Ditch	4587	863	10	10		-	-	a	-	C		-
LIA/ERO	Ditch	4605	864	10	10		-	-	b	-	C		-
LIA/ERO	Ditch C2042	2040	3x	10	15	5	-	-	c	-	B		-
LIA/ERO	Ditch C2100	2103	6x	10	5		-	-	c	-	C	Snails	C
LIA/ERO	Ditch C2101	2102	7x	10	5	3	C	-	c	-	C		C
LIA/ERO	Ditch C2116	2115	5x	10	10	3	-	-	c	-	C		C
LIA/ERO	Ditch C2118	2117	4x	10	5		C	-	-	-	C		-
LIA/ERO	Ditch C2122	2121	8x	10	5		-	-	-	-	C		-
LIA/ERO	Ditch C2128	2126	14x	10	10		-	-	c	-	-	Snails	C

LIA/ERO	Ditch C2128	2127	13x	10	20	7	-	-	c	-	B	Snails	C
LIA/ERO	Ditch C33	32	64	10	30	5	C	-	-	-	C		-
LIA/ERO	Ditch C4566	4589	857	20	10	3	C	-	b	-	-	Snails	-
LIA/ERO	Ditch C71	34	65	20	20	5	A	C	c	-	C		-
LIA/ERO	Feat C3937	3936	829	10	20		-	-	b	-	B	Fish	C
LIA/ERO	Feat C4609	4608	861	10	10		C	-	a	-	C		-
LIA/ERO	Feat C4611	4610	862	10	20		C	-	c	-	C		-
LIA/ERO	Hollow	2282	40x	10	10	5	-	-	c	-	C	Snails	-
LIA/ERO	Pit	3911	841	60	200		A**	A**	-	A	A		B
LIA/ERO	Pit	3975	842	10	20		A*	A	-	-	A	Burnt bone	-
LIA/ERO	Pit C3800	3799	814	10	5		C	-	c	-	-		-
LIA/ERO	Pit C3910	3982	843	10	10		A	-	-	-	C		-
LIA/ERO	Pit C42	40	1	20	200	20	A	-	c	-	A		-
LIA/ERO	Post hole C2250	2251	29x	10	10	5	-	-	-	-	C		C
LIA/ERO	Post hole C4514	4513	850	40	35		-	-	a	C	B		-
LIA/ERO	Scoop C644	643	47	10	20	5	A	C	c	C	C		-
RO	Crem	49	3	8	5	5	-	-	-	-	-		-
RO	Crem	58	9	10	5	3	C	-	-	-	-		-
RO	Crem	85	12	8	5	5	-	-	-	-	-		-
RO	Crem	95	13	25	5	5	-	-	-	-	-		-
RO	Crem	113	14	20	30	20	-	-	-	-	C		-
RO	Crem	2152	10x	30	180	20	-	-	c	-	A	Snails	B
RO	Cut C176	177	67	20	20	10	C		c		C		
RO	Cut C178	179	66	20	25	55	C	C			B		
RO	Ditch	733	74	15	10		A	A		C	C		
RO	Ditch C164	163	68	10	15	8	C		c	C			
RO	Ditch C18	17	71	20	20	3	B	C		C	C		
RO	Ditch C187	204	70	10	10	5		C	c		C		C
RO	Ditch C227	180	17	10	5		-	-	-	-	C		-
RO	Ditch C450	449	37	20	20	5	A	C			B		
RO	Ditch C592	591	42	20	30	5	A	C	c		B		
RO	Ditch C618	617	45a	10	10	2	C	C	c		C	mussel	
RO	Ditch C806	801	88	10	5		C	C					
RO	Ditch C806	801	90	20	5	3	B						
RO	Feature C66	65	72	10	5	3	C		c				
RO	Grave	23	6	8	20		B	-	c	-	C		-
RO	Grave	23	19	8	10		C	-	-	C	B		-
RO	Grave	23	5	10	40	5	A	B	-	C	B	Lmb, smb	-
RO	Grave	23	18	10	15		C	-	-	C	B		-
RO	Hollow way C896	622	44a	10	20	10	A*	C		B	B		
RO	Layer C143	143	16	10	5		-	-	-	-	-		-
RO	Layer C352	352	31	45	30	5	A*	-	c	-	B		-
RO	Oven C630	629	51	10	20	5	C			C	B		
RO	Oven C630	629	80	30	40						A		
RO	Pit	754	63	10	10	5	B		c		C		

RO	Pit C175	174	15	20	20	5	A*	-	-	-	C		-
RO	Pit C4550	4551	851	30	150	20	B				A	Snails	
RO	Pit C518	582	40	20	10	7	C				C		
RO	Pit C612	611	78	20	20	3	A*	A		B	B		
RO	Pit C703	702	69	22	10	5	A			C	C		
RO	Pit C9	10	4	40	125		A*	A*	-	A	B	H	-
RO	Pit C9	261	20	10	10		C	-	-	-	C		-
RO	Post hole C382	381	33	10	30				c		B		
RO	Scoop C644	643	47	10	200	5	A	C	c	C	B		
RO	Stoke hole C638	637	52	10	125					C	A		
RO	Stoke hole C638	637	58	20	450		A				A**		
RO	Stoke hole C638	637	59	10	250						A**		
RO	Stoke hole C638	637	60	10	125		C				A*		
RO	Stoke hole C638	637	61	10	30						B		
RO	Stoke hole C638	637	62	10	40						B		
RO	Stoke hole C638	637	81	20	800	10	A			C	A**	H	A
RO	Stoke hole C638	637	82	20	300		A				A**		B
RO	Stoke hole C638	637	83	20	300		A				A**		B
RO	Stoke hole C638	637	84	10	200					C	A**		B
RO/EM	Grave W59	1390	59	20	50	25	A	C	a	C(h)	C	-	-
RO/EM	Layer W46	1612	97	20	40	20	C	-	a	C(h)	C	-	-
EM	?Grave	2480	60	10	10	5	C				C	Snails	
EM	?Post hole	642	50	10	10	3					C		
EM	Feature C2835	2836	218	10	20	5			c		C	Snails	
EM	Feature C2835	2838	219	100	5	3					C	Snails	
EM	Feature C2835	2842	221	10	5						C		
EM	Feature C2835	2844	222	100	10	3	C		c		C		
EM	Feature C2835	2861	226	20	5						C		
EM	Feature C2835	2863	227	10	5						C		
EM	Feature C2835	2865	228	10	5	5							
EM	Feature C384	383	34	20	30	5	A*		c		A		B
EM	Feature C384	415	36	45	2900		A**	A**		A	A		A
EM	Grave	2886	233	20	10	5	C				C	Snails	
EM	Grave	3035	528	10	20	10			c		B		
EM	Grave	3061	529	10	15	5	C				B		C
EM	Grave	3220	527	60	150	40					A	Burnt bone	C
EM	Grave	3714	808	20	20	5	C		b	C	B	Burnt bone, snails	
EM	Grave	3725		10	10	3			c		B	Charred stalks, bone	
EM	Grave	3750	805	10	20	3	B		c	C	A		
EM	Grave	3758	807	10	10						B		C
EM	Grave	3763	813	70	50		C		c		A	Bone	C
EM	Grave	3997	840	60	30	10	C		a		B		
EM	Grave	4501	845	50	50		C		a		C		
EM	Grave	4501	846	10	5				c				
EM	Grave	4501	847	10	5	3					C		

EM	Grave	4501	848	10	20				a				
EM	Grave	4565	856	20	10	5			c		C	Snails	
EM	Grave	4592	866	20	20	5			b	C	B	Human bone	
EM	Grave	4613	865	110	60				a		C	Human bone	
EM	Grave	4613	870	20	10	5	C		c		C		
EM	Grave	4616	867	30	10				b		B		C
EM	Grave	4622	868	10	20				c		B		
EM	Grave	4646	871	30	25	5	C		a	?C	C	Snails	
EM	Grave	4660	879	30	20	3	C	C	c		B		C
EM	Grave	4664	889	50	25		C		c	C	A		C
EM	Grave	4678	884	20	5	3					C		C
EM	Grave	4681	876	20	15		C		b	C	B		
EM	Grave	4687	878	10	5				c		C		
EM	Grave	4700	875	10	10				c		C		
EM	Grave	4705	877	30	30	5	C	B	b	C	B		
EM	Grave	4709	883	10	10				b		C	H	
EM	Grave	4995	860	10	5								
EM	Grave	6132	892	10	10	5			c		C	Bone	
EM	Grave	6200	893	10	10		C	C	c	C	C	?textile	
EM	Grave	6522	897	10	5	3							
EM	Grub hut	631	48	45	75	10	B		c		A	H, burnt smb, mussel	C
EM	Grub hut	632	49	65	50	10	B		c		A		C
EM	Layer C191	191	21	10	30	5	C		c		A		
EM	Layer C238	238	29	45	60	5	A*	B	c	C	A		B
EM	Pit C3753	3752	806	10	5	2			c		C		
EM	Pit C4596	4595	859	20	40				c		B		
EM	Grave W104	1706	147	20	30	12	A	C	a	C	-	-	-
EM	Grave W111	1812	180	15	20	10	C	-	a	C	-	-	-
EM	Grave W12	1147	5	20	10	1.5	C	-	a	-	-	-	-
EM	Grave W120	1897	200	20	10	5	C	-	b	C(h)	-	-	-
EM	Grave W121	1899	205	20	15	4.5	B	-	b	C	C	-	-
EM	Grave W122	1465	181	20	30	7.5	C	-	b	C	C	P/beans (C), mollusc (C)	2
EM	Grave W123	1855	186	20	50	5	A	C	a	C	A	-	6
EM	Grave W13	1072	2	20	10	1	-	-	b	C	-	-	-
EM	Grave W13	1075	3	20	10	1	C	-	c	C	-	-	-
EM	Grave W18	1125	7	20	15	7.5	B	C	a	C	-	-	-
EM	Grave W185	1320	47	20	10	1.5	A	-	b	C	-	mollusc (C)	-
EM	Grave W19	1121	17	20	20	3	A	-	a	C	-	-	-
EM	Grave W190	1647	101	10	25	15	C	C	a	C	-	-	-
EM	Grave W20	1119	9	20	30	6	C	-	a	C	-	-	-
EM	Grave W21	1117	8	20	10	1	-	-	a	C	C	-	-
EM	Grave W22	1324	44	20	10	1.5	B	-	a	C	C	mollusc (C)	-
EM	Grave W24	1115	11	20	20	2	C	-	c	-	C	-	-
EM	Grave W27	1322	45	20	10	1.5	C	-	b	C	C	-	-
EM	Grave W38	1515	95	20	10	3.5	C	-	b	C	-	-	-

EM	Grave W41	1768	173	20	30	21	B	-	a	-	-	-	-
EM	Grave W43	1574	82	20	15	10	B	-	c	-	-	mollusc (C), bone	-
EM	Grave W45	1578	192	20	50	15	A	-	a	C	C	Bone	1
EM	Grave W45	1858	194	20	50	15	A	-	a	C	-	Bone	-
EM	Grave W57	1635	168	20	15	4	C	-	c	-	C	-	-
EM	Grave W60	1454	206	20	30	9	A	-	a	C	C	P/beans (C)	-
EM	Grave W60	1458	73	20	30	10	A	-	a	C	-	-	-
EM	Grave W7	1177	16	6	5	1	C	C	a	C	-	-	-
EM	Grave W7	3032	172	20	15	1.5	-	-	b	C	-	Bone	-
EM	Grave W77	1100	4	20	25	7.5	C	-	a	-	-	-	-
EM	Grave W78	1152	18	20	40	28	C	-	a	C	-	-	-
EM	Grave W83	1300	25	20	25	5	C	-	a	C	-	-	-
EM	Grave W84	1280	20	20	30	9	C	-	b	C	-	-	-
EM	Grave W93	3008	141	20	10	2	C	-	c	-	-	mollusc (C)	-
EM?	?Hearth C3891	3890	824	10	10		C				B		
EM?	Ditch	3831	835	20	5				c		C		
EM?	Ditch	3917	830	20	30	5				C	B		
EM?	Ditch C3917	39917	837	30	25	5	A				B		
EM?	Ditch recut	3829	833	20	20		B	C			B		
MD	Beam slot	660	57	100	30	5	C		c		B		
MD	Ditch C267	266	22	10	15	3	A				B		C
MD	Ditch C316	310	25	10	20		C		c		B	Smb	
MD	Ditch C360	361	32	20	20		A		c		B	Lmb	
MD	Ditch C504	503	39	10	5	3							
MD	Ditch C520	549	79	20	20	5	A	C	c	C	B	H	B
MD	Ditch C590	589	41	20	10	5	B	C			B	H	
MD	Ditch C646	645	56	15	20	55	C		c		B		
MD	Layer C389	389	35	20	10	5	C	C	c		C		
MD	Layer C413	413	38	10	25		A*			B	B		B
MD	Pit C281	280	23	20	10		A			B	B		
MD	Pit C281	309	24	20	30		A*				B	Fish	B
MD	Pit C603	602	43	10	30	5	C		c		B	Fish	
MD	Pit C614	613	45	10	250		A**	A		A	A		B
MD	Pit C614	636	46	10	10	3	A*				B	Lmb, fish	C
MD	Pit C792	791	76	30	75	10	A*	C	c		A	H, lmb, smb, fish	
MD	Pit C792	796	77	45	225	10	A*		c	C	A	H, lmb, fish, eggshell,	B
MD	Pit C872	411	26	10	30	10	B	C			B		B
MD	Ditch W44	1569	94	1	3	0.4	B	-	c	-	-	P/beans (C)	-
MD	Ditch W66	1598	92	20	50	25	B	C	a	C	C	-	-
MD	Pit W47	1310	50	10	40	8	A*	C	a	C	B	-	-
UN	Ditch W132	3131	232	10	10	2.5	C	C	a	C	-	-	-
UN	H.way W170	3234	221	3	2	1	C	C	c	-	-	-	-
UN	Pit W137	3345	252	3	10	1	-	-	b	-	C	-	-
UN	Pit W137	3405	253	4	10	0.5	-	-	c	C	B	-	-
UN	Pit W137	3406	254	4	10	0.5	C	-	c	C	C	-	-

UN	Pit W137	3407	255	4	5	0.5	-	-	c	C	C	-	-
UN	Pit W137	3408	256	5	5	0.75	-	-	c	-	-	-	-
UN	Pit W137	3409	257	4	5	0.75	-	-	c	C	-	-	-
UN	Pit W138	3397	246	10	40	4	C	-	c	C	A	-	-
UN	Pit W138	3398	247	5	40	6	-	-	b	C	A	Some burnt bone	-
UN	Pit W138	3399	248	5	35	5.25	-	-	b	C	C	Some burnt bone	-
UN	Pit W138	3400	249	4	60	3	C	-	c	C	B	Some burnt bone	-
UN	Pit W138	3401	250	2	5	1	-	-	b	-	C	Some burnt bone	-
UN	Pit W138	3404	251	2	5	1	C	C	c	C	-	-	-
UN	Pit W138	3491	261	10	70	7	C	-	c	C	A	Some burnt bone	-
UN	Pit W139	3335	258	10	60	12	C	-	b	C	B	Some burnt bone	-
UN	Pit W139	3410	259	10	20	10	C	C	a	C	C	-	-
UN	Pit W139	3411	260	10	10	3	C	-	b	C(h)	C	Some burnt bone	-
UN	Pit W139	3499	266	10	10	3	C	-	c	C	B	-	-
UN	Pit W139	3500	267	10	10	1.5	C	-	c	-	B	-	-
UN	Pit W180	3383	264	5	60	3	-	-	b	C	A	-	-
UN	Pit W180	3498	265	5	60	6	C	-	b	C	A	-	-
UN	Pit W37	1595	93	10	90	9	A*	-	b	C	A	P/beans (A)	-
UN	?Pit C2723	2722	206	10	20	3	C	C	c	C	C		
UN	?Post hole C2536	2535	62x	30	10	3			c		C	Snails, modern insects	
UN	?Post hole C2737	2736	203	7	2	2							
UN	?Ring ditch	2503	55x	10	5	2	C		c			Snails	
UN	?Ring ditch	2509	56x	10	5			C				Snails	
UN	Cut C2720	2719	200	5	5	3			c				
UN	Cut C2923	2922	238	10	5	4	C						
UN	Cut C2937	2838	246	20	10	3			c		C	H	
UN	Ditch	2330	81x	10	5	2			c				
UN	Ditch C2471	2470	63x	10	10	3	C		c	?C	C	Snails	
UN	Ditch C2583	2582	67x	10	10	5			c			Snails	
UN	Ditch C2621	2622	70x	10	5	3	C				C	Snails	
UN	Ditch C2710	2890	245	10	25	5	C		c				
UN	Ditch C2718	2718	261	20	15	5	B	B	c	B	B	modern millipedes	
UN	Ditch C2718	2771	269	20	15	5	C				C	Snails	
UN	Ditch C2718	2775	270	20	15	5			c		C	Snails	C
UN	Ditch C2718	2787	266	20	10								
UN	Ditch C2718	2791	263	10	30	10	C		c		B	Snails, fish bone	
UN	Ditch C2718	2796	264	20	20	10	C				B	Snails	
UN	Ditch C2718	2821	267	10	20				c	?C	C	Snails	
UN	Ditch C2718	2902	262	20	20	10	?C				B		
UN	Ditch C2718	2918	265	30	25	5	C		c		C	Snails	
UN	Ditch C2718	2947	268	20	30	10			c		B	Snails	
UN	Ditch C2739	2738	205	20	30	5	C		c				
UN	Ditch C2741	2740	230	20	20	5	B	C	c		B	Snails, modern earwig	
UN	Ditch C2812	2811	207	20	60						A	Snails	B
UN	Ditch C2812	2811	234	10	10	3		C				Snails, modern earwig	

UN	Ditch C2840	2846	225	20	30	10	C	C	c		B	modern beetle	
UN	Ditch C2840	2867	229	20	20	20			c		B	modern millipede	
UN	Ditch C2911	2912	253	20	10	5			c		B	Snails, modern millipedes	
UN	Feature	2751	282	10	10	5			c			Snails	
UN	Feature	2755	276	10	10	3			c		C	Snails	
UN	Feature	2759	280	10	40	5	C		c		B	Snails, mod beetle/millip	
UN	Feature	2761	278	10	10	5			c			modern woodlice/beetles	
UN	Feature	2763	283	10	10	3					C	Snails	
UN	Feature	2777	275	10	10	3	C		c		C	Snails, modern beetle	
UN	Feature	2781	279	10	10	3			c		C	Snails	C
UN	Feature	2783	277	20	10	3	C		c		C	Snails	
UN	Feature	2904	281	20	5	3	C	C	c			Snails	
UN	Feature	3005	502	10	20	10	C	C	c		B	Snails	
UN	Feature	3013	500	20	60	30	C		c	C	B	modern beetle	
UN	Feature	3031	503	20	10	3			c		C		
UN	Feature	3031	505	10	10	5	C		c		C		
UN	Feature	3033	504	20	20	10			c		B		
UN	Feature	3057	511	10	10	3	C				C		
UN	Feature	3059	514	10	10	3	C		c		C	Fish bone, modern insects	
UN	Feature	3063	512	10	5	3				C			
UN	Feature	3065	510	10	5								
UN	Feature	3070	513	10	5		?C						
UN	Feature	3079	516	10	50	5		C		C	A		
UN	Feature	3081	517	10	15	5	?C	?C			B		
UN	Feature	3115	518	10	500	20					A**	Snails	
UN	Feature	3119	519	30	30	5	A	C	c		B		
UN	Feature	3123	520	10	15	3			c		B		
UN	Feature	3124	521	10	15	3					B	Fruitstone	
UN	Feature	3142	524	20	10	3	C				B		
UN	Feature	3079/3081	515	20	100	5			c	C	A**		
UN	Feature	3145/3149	523	10	10	5							
UN	Feature C2730	2729	202	10	5	3							
UN	Feature C2801	2800	204	20	5	2	C	C	c		C	Snails	
UN	Feature C2939	2938	247	20	50						A	Snails	
UN	Feature C3041	3039	507	20	30	10	C		c		B		
UN	Feature C3083	3082	508	10	30	10	C		c		B	Snails	
UN	Feature C3516	3515	531	10	20		?C				B	Snails, cockle shell	
UN	Feature C3525	3524	541	10	15	5							
UN	Feature C3534	3532	540	10	200	20	A**						A
UN	Pit C2354	2355	80x	25	30	5			c		B	Snails, modern insects	C
UN	Pit C2609	2608	68x	10	15	3	C		c		C	Snails	B
UN	Pit C2636	2635	69x	20	10	2	C		c	C	C	Snails, modern millipede	
UN	Pit C2678	2677	72x	10	5	2	C		c		C	Snails	
UN	Pit C2704	2703	217	10	5	4							
UN	Pit C2952	2951	260	12	10	3			c		C	Snails, mod fly puparia	

UN	Pit or post hole C2588	2589	65x	10	5	2			c		C	Snails	
UN	Pit or post hole C2591	2590	66x	10	5	3							
UN	Post hole	3723	804	20	20	5					B		C
UN	Post hole	3767	811	10	10			C		C	B		C
UN	Post hole C2431	2430	52x	10	5	2						Snails, modern fly puparia	
UN	Post hole C2455	2454	61x	10	25	5	A*			C	A	Snails	B
UN	Post hole C2461	2460	57x	10	5	5							
UN	Post hole C2546	2545	64x	10	5						C		
UN	Post hole C2653	2652	73x	10	10	3	C		c		C	Snails	
UN	Post hole C2819	2818	209	10	15	3	B	B	c		B	Snails	
UN	Post hole C2848	2847	223	2	5	3			c				
UN	Post hole C2850	2849	224	5	5	3							
UN	Post hole C2871	2970	243	12	5	3			c				
UN	Post hole C2881	2880	240	12	5								
UN	Post void C3939	3938	836	10	20				c		B		
UN	Ring ditch	2507	54x	10	5	2							
UN	Ring ditch	2511	51x	10	10	5		C	c		C		

e) Early Iron Age

- The Early Iron Age samples contained charred grain fragments in small quantities in four samples, a few charred chaff fragments in a single sample and low numbers of charred weed seeds in two samples. Bone fragments were present in two samples and molluscs in a single sample.

f) Early – Middle Iron Age

- Charred remains were generally sparse in the six samples and the origin and taphonomy of the remains in these samples is less well understood. One sample from W97 contained a number of charred cereal grains. Burnt bone fragments were observed in four samples. A single post-hole attributed to this period did not produce enough charcoal to indicate the original timber. As with the graves the origin and taphonomy of the charred remains may be questionable from these contexts.

g) Undiagnostic Prehistoric

- A number of features only remain broadly ascribed to the prehistoric period, which in general contain moderate to poor grains and chaff preservation. However, the significance and potential of these will largely rely on their final phase ascription.

h) Late Iron Age/ Early Romano-British

- The majority of the 58 samples was from cremation-related features and in general contained good to abundant quantities of charcoal, but little charred plant remains. The likelihood is that the latter are largely incidental to the funerary activities, however some were relatively rich (cremation sample C2232) and others contained seed heads (cremation samples C3805, C3809) which might relate to pyre items and tributes. Pits and hearths typically contained larger assemblages (pit sample C3911 and hearth sample C3985).

i) Romano-British

- A total of 47 samples from a range of Romano-British features (cremations, ditches, graves, ovens, trackways, pits, post-holes and stokeholes) produce a wide array of preservation. Six samples in particular stood out with useful quantities of grain or chaff and included ditch sample C733, trackway C896, layer C352, and pits C175, C612 and C9.

j) 'Sub-Roman'

- The two sub-Roman samples contained varying quantities of charred grain fragments and low levels of charred weed seeds, including hazelnut fragments. A few charred chaff fragments were retrieved from sample of grave C59.

k) Saxon

- A total of 77 samples from graves were assessed. They generally represent a single sample from each grave. Nearly all produced some grain, but largely in low quantities. Only graves W19 and W185 produced relatively high numbers of cereal grains. Hazelnuts were present in grave W120 and peas/ beans in grave W121 and W60. The remains in these graves, as with other graves, are generally low and the origin and taphonomy is not secure in view of the multiperiod activity on the site.

- The samples processed from Saxon pits (pit C3753 and C4596), hearths (hearth C38912), post-holes, ditches and other features (feature C2835) generally produced very sparse remains with only low numbers of charred and charcoal remains. A possible sunken-featured building produced some grain (samples C631 and C632), and apart from the single isolated ditch recut (sample C3829) were the only Saxon samples to contain even moderate quantities of charred remains.

l) Medieval

- Twenty-two samples were examined from medieval contexts. Ditches contained low quantities in general through the sample from medieval ditch W44 contained a moderate amount of charred grain fragments and a few charred pea/ bean fragments. Many of the medieval samples from all produced high numbers of charred grain and small quantities of charred weed seeds and charred chaff fragments, in particular those from pits W47, C281, C614 and C792.

m) Unphased

- About 115 processed samples remain unphased. the remains from very few are high, and unless these can be dated and related to the assemblages described above they are not of any great significance.

4. Conservation

- The processed samples are all stored in a dry and stable condition. If retained in the current and dry state they are suitable for long term archive until further decisions about a programme of analysis is decided. The unprocessed samples (WA) are not suitable for long term storage or retention. Any further processing of these if required should be undertaken in the near future. The remaining unprocessed samples are unsuitable for archive in their current state, and should be considered for discard if not processed.

- It is acknowledged that charred remains are present in the residues of the processed samples and will be extracted from all samples proposed for further analysis. The charred remains that exist in the samples for which no further work is proposed will be discarded. The flots of these samples will, however, be retained in the archive so a record of this proportion of the sample is always available for further examination.

5. Comparative material

- Kent is relatively poorly served for well-preserved analysis of charred plant remains from prehistoric contexts until the later Iron Age (cf. Scaife 1987). The present publication of charred remains from Neolithic to Saxon sites in Kent is relatively sparse, although it is acknowledged that there are significant assemblages coming to light as a result of recent field work (much largely a result of that associated with CTRL).

- Secure preserved Neolithic remains must be considered a priority in Kent and are of regional and national significance in view of their general scarcity (cf. Scaife 1987). Elsewhere isolated pits have produced good 'snap-shots' of early farming e.g. Grooved Ware pits at Down Farm (Robinson in Barrett *et al*. 1991), and the Stonehenge landscape (Carruthers in Richards 1990).

- The Iron Age and Romano-British assemblages find more suitable examples with which to compare in Kent. These include sites at Gravesend (Arthur and Metcalfe in Johnston 1972) and Keston Camp (Hillman unpubl., cf. Scaife 1987), and Wilmington gravel pit (Hillman 1982). Published records of Iron Age and Romano-British date tend to be dominated by spelt wheat with barley.

6. Potential for further work

- The following section discusses the potential for further work of the charred and charcoal remains in the relation to the Landscape Zone

- In general, the charred remains provide the potential to define a number of landscape-related activities and site-based activities relating to agricultural practise. The presence of grain, and peas/ beans indicate the range and diversity of crops, while the charcoal has the

potential to define the nature of the exploited landscape and the place of that activity within the landscape. Furthermore, the charred remains also have the potential to provide some indication of the farming economy and changes through time, especially the later Bronze Age to Saxon periods. Information of this type from Saxon periods is particularly sparse in much of the country nationally, but recent work in Kent has also provided some further information (e.g. Waitrose site, Margate).

- The presence of weed seeds may provide information about the wider landscape and which soil types were cultivated. They may provide some information on summer and winter sown crops.

- In the earlier prehistoric periods (Neolithic and earlier Bronze Age) information about landscape, land-use and agricultural economy is particularly important, and here can be related to a broader spectrum of landscape data defined from Godwin's pollen analysis at Frogholt (Godwin 1962).

- The presence of the better-preserved remains enables a detailed picture of the site developments, although this is biased by the changing use (burial vs settlement) reflected in different periods. The charred remains will help define specific activities (crop processing etc, placement of ritual bundles on pyres), and with the technology present on site. The presence of seed-heads in cremation related contexts enable details of funerary practice and ritual to be added to.

- The charcoal from domestic and settlement context, in particular, can help define the nature and management of the local woodland. In other features the identification of species and timber ages can help in defined the nature and technology of the activities i.e. furnaces and pyres with high burning temperatures.

- Charcoal may be able to facilitate radiocarbon dating, but the likelihood is that a closer and more useful chronology will be established by the artefacts. Although the human bones have the potential to provide absolute dates for burials, statistically there is not a sufficient sample to allow detailed analysis of burial sequence, either within individual cemeteries or between separate cemeteries.

- On a regional scale the information from the pyres and particularly from a selection of Saxon samples can contribute to a level of information poorly examined from these features and this period.

- With specific reference to the material from the Neolithic pits, the material is not exceptional in its own right but it is exceptional for the Neolithic in southern England. There are very few non-monumental, non-funerary Neolithic sites in Kent (Clarke 1982; Holgate 1981) and south-east England. Where such exist, very few which have been excavated in recent times (i.e. non-antiquarian) and even fewer from which detailed palaeo-environmental studies have been undertaken (see Clarke 1982).

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E. Assessment of Macroscopic Plant Remains and Charcoal

1. Introduction

- A large series of bulk samples was taken from sealed contexts to recover charred plants remains and charcoal to aid in determining the following for each defined phase:
    - *the archaeological significance of the deposits and thus the site*
    - *the nature of the local environments*
    - *selection of woodland species for general and specific activities*
    - *the use of the wild and cultivated resources*
    - *the nature of specific activities undertaken on site, and thus the general economic status of the site*

2. Methodology

- Samples were selected for processing according to the following criteria
    - *A broad range of feature types was to be examined.*
    - *Samples should be spatially arranged across the entire site, and*
    - *Where possible, all chronological periods represented at the site should be examined.*
- Based on these criteria, 42 bulk samples of between 1 and 10 litres were processed from Mesolithic pit **72**, and a further twelve samples of generally 10 litres were processed from a range of ditches and other features/deposits of generally prehistoric date. Samples from some undated features were also processed, partially to attempt to recover dating evidence (inc. charcoal for radiocarbon dating purposes).
- All bulk samples were processed for the recovery and assessment of both charred plant remains and charcoals, and artefacts. Standard processing methods were used, with a 4 mm mesh being used for the coarse fraction.

3. Quantifications

- The quantification of macroscopic plant remains and charcoal by sample per context for those fieldwork events conducted by Wessex Archaeology are provided in **Table 13**.
- Low numbers of charred grain fragments were recorded in 11 samples and a few charred weed seeds, including hazel nut fragments, were observed in 17 samples from the Mesolithic pit **72**.
- Small quantities of both charred grain and charred weed seeds were present in two samples from the Middle Bronze Age ditch **54** (including hazelnut fragments in one of these). Only a few charred weed seeds were retrieved from Middle Neolithic pit **133** and from the similarly dated burnt-out tree stump **49**.

- Small quantities of charcoal fragments of greater than 5.6mm were recovered from 12 of the samples from the Mesolithic pit **72** and from two of the samples from the Middle Bronze Age ditch **54**. Large amounts of charcoal were recorded in both samples from Middle Neolithic pit **133** and from the Middle Neolithic burnt-out tree stump **49**, all predominantly comprising large wood fragments.

- The presence of hazelnuts is particularly common on Mesolithic sites, and the majority of occurrences at Sandway Road are from contexts presumed to be Mesolithic (6 out of 8 samples); the remainder from Middle Neolithic and Middle Bronze Age contexts. It is of note that the hazelnut fragment submitted for AMS dating from pit **72** yielded a calibrated date of 8590-8090 BC (i.e. Early Mesolithic).

4. Provenance

- The samples generally produced small flots (average flot size for a 10 litre sample is 60 millilitres) with between 1 and 80% rooty material and varying quantities of uncharred weed seeds. Large quantities of both categories can be indicative of stratigraphic movement. The AMS dating results indicate that pit **72** at least contains both residual and intrusive material at the macroscopic level.

5. Conservation

- There are no conservation issues that conflict with long term storage for the sorted residues and extracted flots. However, the unprocessed samples, although currently stored in stable conditions, cannot remain so in perpetuity, and as such a decision regarding discard/retention needs to be reached.

6. Comparative material

- Although the Mesolithic samples produced relatively little in the way of charred remains, over 25% (11 of 42) contained charred cereal grain. Recovery of grain in these samples is of some concern as in Britain no cereal grain has been positively identified as Mesolithic from any site in Britain, despite occasional records of rare large Poacea pollen spores, which some have considered as being cereal, in Mesolithic contexts (cf. Edwards 1988, 1990).

- A possible conclusion could be that the grain from the assessed flots, although taken from 'secure' Mesolithic contexts must have worked their way into these horizons by bioturbation, the most likely cause being biotic activity such as roots or soil fauna (e.g. worms). The relatively high numbers of unburnt weed seeds in most samples seem to confirm this. However, the AMS dating results indicate that whilst both residual and intrusive material is present, there is, nevertheless, a definite Late Mesolithic element to the charred cereal grain assemblage.

7. Potential for further work

- Charcoal will provide detailed information on the local woodland and thus floral composition and change. It is unlikely, however, due to poor preservation that this can be corroborated by detailed analysis of pollen. Charcoal analysis may, however, not only provide evidence of the natural vegetation, but evidence for human clearance and changes of that vegetation which may consequently have irrevocably altered the nature of the soils, and even lead to the initiation of soil erosion and hillwash deposits.

- Given the enhanced potential for the site as a whole to contribute to the study of early prehistory in Kent, it is recommended that all remaining samples are processed and sorted to augment the ecofact and micro-artefactual assemblages already obtained.

8. Bibliography

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Table 13: Ecofact quantification

Sample Details				Flot Details							Residue Details
Feature	Context	Sample	Size (litres)	Size (ml)	Grain	Chaff	Weed Seeds Unburnt	Weed Seeds Burnt	Charcoal >5.6mm	Other	Charcoal >5.6mm
SWR98 Evaluation											
MNE Tree-throw 357705	357706	1	15	50 [7.5]			++	+	+		+
MBA Ditch 357703	357704	2	15	25 [17.5]			++	+	+		
Hearth (BTS?) 363204	363203	3	15	1000 [150]			+	+	++		
SWR99 Excavation											
(Pre?) ME Pit 167	166	73	10	15 [7.5]			++	+			
ME Pit 72	73	6	10	35 [21]			++		+		
	116	7	10	30 [21]	+		++	+	+		
	117	8	10	30 [22.5]			++				
	375151	32	10	40 [30]			++	+(h)			
	364851	37	4	20 [12]	+		++				
	364951	38	1	10 [5]			+				
	385051	39	4	30 [18]			++		+		
	384951	40	1	10 [6]			+				
	374851	41	6.5	15 [12]			++				
	384961	42	2	10 [5]			+	+			
	394831	43	6	30 [22.5]			++	+	+		
	345031	44	5	20 [12]	+		+	+	+		
	374831	45	5	20 [15]	+		++				
	395041	46	5	15 [12]			+				
	355051	47	5	15 [9]			+				
	384841	48	5	25 [18.75]			++				
	375051	49	4	15 [7.5]	+		++	+(h)			
	374841	50	4	25 [17.5]	+		++		+		
	364841	51	5	15 [9]			++	+			
	374961	52	3	15 [12]	+		+	+(h)			
	375041	53	6	25 [10]			++				
	355041	54	4	20 [15]			++	+	+		
	385041	55	4	35 [21]			++				
	384831	56	5	40 [30]			++	+	+		
	364831	57	4	15 [12]			++	+			
	344831	58	2	15 [9]			+				
	354831	59	6	25 [20]			++		+		
	375031	60	6	25 [12.5]			++				
	355031	61	5.5	25 [15]			++				
	385031	62	5	25 [18.75]			+	+(h)	+		
	395031	63	6	25 [20]			++	+	+		
	375061	64	6	10 [6]	+		++				
	355061	65	4	10 [6]			++				
	375071	66	5	5 [1.25]	+		++	+			
	385061	67	5	15 [11.25]			+	+(h)	+		
	375081	68	4	5 [2.5]	+		++				
	354961	69	2	3 [1.5]			+				
	374971	70	2.5	10 [5]	+		+	+			
	364961	71	2	10 [4]			+				
	364971	72	2.5	5 [2.5]			+				
	354951	74	2	5 [4]			+				
	374951	75	2	10 [5]			+	+(h)			
ME Pit 156	155	29	10	30 [18]			+	+	+		
MNE Pit 133	135	9	10	425 [4.25]			+		++		
	134	10	9	120 [2.5]			+	+	++		
MNE Tree-throw 160	159	36	10	40 [26]			++	+(h)			
MNE BTS 49	50	1	10	500 [35]			+	+	++		
MBA Ditch 54	70	3	10	25 [12.5]	+		++	+(h)	+		
	87	4	10	5 [2]			++				
	89	5	10	10 [1.5]	+		+	+	+		

Contd.

Table 13: Quantification of Ecofacts (contd.)

Sample Details				Flot Details							Residue Details
Feature	Context	Sample	Size (litres)	Size (ml)	Grain	Chaff	Weed Seeds Unburnt	Weed Seeds Burnt	Charcoal >5.6mm	Other	Charcoal >5.6mm
SWR99 Excavation (contd.)											
Tree-throw 151	152	26	10	30^{10}			+	+	+		
	152	27	10	20^{5}			+	+	+		
BTS 63	64	2	5	30^{3}			+		+		

Key: BTS = Burnt-out tree stump; Flot size in $^{\text{superscript}}$ = ml of rooty material; h = hazelnut; + = 1-10, ++ = 11-50

ME = Mesolithic; MNE = Middle Neolithic; MBA = Middle Bronze Age