APPENDIX 1 - ASSESSMENT OF CHARRED PLANT REMAINS AND CHARCOAL

1.1 Charred plant remains and charcoal

By Ruth Pelling

Introduction

1.1.1 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.

1.1.2 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.

1.1.3 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

1.1.4 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

1.1.5 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

1.1.6 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

1.1.7 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

1.1.8 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

1.1.9 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.

1.1.10 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.

1.1.11 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.

1.1.12 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.

1.1.13 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.

1.1.14 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.

1.1.15 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

1.1.16 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

1.1.17 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.

1.1.18 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

1.1.19 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

1.1.20 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

1.1.21 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.

1.1.22 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.

1.1.23 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.

1.1.24 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

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

Comparative Material

1.1.26 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.

1.1.27 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).

1.1.28 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.

1.1.29 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.

1.1.30 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

1.1.31 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

1.1.32 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.

1.1.33 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.

1.1.34 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.

1.1.35 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.

1.1.36 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.

1.1.37 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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