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Summary

Fifty-eight samples from cremations and fourteen from associated charcoal-rich fills were examined in detail and samples from other contexts assessed. The cremations produced sparse remains of cereals, fruits, seeds and tubers from grassland plants and arable weeds, with some fruitstones and nutshells. The material seems to represent uprooted plants from Arrhenatheretum grassland and possibly some crop processing waste used as kindling. In one sample cereals were fairly common and may represent intentional deposition. The pit fills produced mainly oak charcoal with few other macrofossils.

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Introduction

Excavations at this Middle Bronze Age cremation cemetery provided an opportunity for extensive soil sampling in order to retrieve carbonised plant remains. In the past, cremation deposits have frequently been treated as though they were in some way distinct from any other soil sample. In many cases they have been coarsely sieved to separate identifiable bone fragments and large charcoal fragments, whilst the finer fractons have been discarded. Obviously such a technique may involve loss of potentially informative small macrofossils. At Brightlingsea the cremations and fills of associated features were flotated, as detailed below, to ensure retrieval of all size categories of material. It was anticipated that information on the environment of the site would be gained, together with some data on Bronze Age crops. More speculatively it was hoped that the samples might shed some light on the cremation rite and changes in ritual practice throught time.

The cremations: descriptions

The matrices of the cremation deposits were fairly uniform, being derived from coarse sandy fluvio-glacial drift with overlying horizons of silty loessic material. Full descriptions of all samples were therefore not made: the following notes are based on five typical samples from unurned cremations (F1005/503, F1026/569, F1032/562, F1098/719, F1130/919) and three from urned cremations (F1000/500, F1001/515, F1100/717).

Soil matrix texture varied from sandy silt loam to loamy sand and colour from strong brown, through brown and dark greyish-brown to near black. These colour variations were related to charcoal content, the presence of ferrimanganiferous concretions and humic content. They were quite misleading: some samples selected on site for radiocarbon dating proved to contain very little charcoal (see Appendix 1). The samples were consistently slightly stoney, with mainly rounded to subangular flints and rare quartzites up to 60mm but usually less. Their content of cremated bone fragments was extremely variable: some samples included no bone or only token amounts but in others bone fragments were abundant.

Methods

The samples from un-urned cremations were received entire, as excavated. The fills of the cremation urns had been extracted by the conservators, who had in some cases picked out large charcoal and bone fragments and occasionally had reconstructed and consolidated the latter. Apart from this the urned and un-urned cremations were treated identically. Soil volumes were initially recorded and the samples were gently disaggregated under running water on a 5mm mesh. Large bone fragments, charcoal and sherds retained on this mesh were removed from this coarse fraction before discarding the pebbles. Carbonised plant material was then separated from the fraction under 5mm by manual flotation, using a 0.5mm collecting mesh. The non-floating residue was wet-sieved on a 1mm mesh and dried. The residue fraction 1-5mm still included small bone fragments but extracting all of these would have been prohibitively time-consuming. This fraction has therefore been retained unsorted for the bone specialist to scan over for diagnostic small fragments.

Bulk samples were also taken from pit and ditch fills and other contexts for bulk sieving/flotation, using 0.5mm meshes throughout. In total bulk samples from 283 contexts were processed and the majority of these produced some flots. Assessment indicated that a few (568, 572, 576, 577, 720, 769, 795, 796, 798, 811, 892, 895, 896) were conspicuously rich in charred plant material (mainly charcoal) and these flots were sorted. The remaining samples were of two types: some produced virtually no flot and others had flots composed largely of intrusive modern plant material. It did not seem that sorting all these was likely to be a profitable use of time. Instead 30 samples (just over 10%) were selected on a random basis for sorting, in order to determine whether any useful additional information to that already gained from the cremation deposits could be had from them. The results of this assessment were not thought to justify further work but all flots have been retained.

The dried flots were graded into size fractions prior to sorting and charcoal fragments >2mm were extracted for weighing. The carbonised macrofossils almost all have a silty coating which may have reduced the rate of retrieval during flotation and recognition during sorting. Contaminants include fibrous roots and modern fruits and seeds, particularly of Veronica hederifolia, Spergula arvensis, Scleranthus annuus and Chenopodiaceae. Carbonised macrofossils identified from the cremations are listed in Appendix 1, from other charcoal-rich contexts in Appendix 2 and from the 30 bulk samples assessed in Appendix 3. Counts are given where ever possible, though numbers of rhizomatous fragments are related purely to the degree of fragmentation, so only a rough indication of abundance is given.

The carbonised plant remains

Apart from charcoal and a few charred fragments of thorns and buds the plant material from the cremations falls into four categories: cereal remains, fruits and seeds of grassland and weed plants, remains of scrub plants and charred vegetative plant material. Frequencies and counts (where possible) are given in Table 1.

The cereal remains are quite sparse and often poorly preserved. Indeterminate grains occur sporadically and include both barley and wheat. F1096/714 produced a slightly larger assemblage of barley grains, in rather poor condition. Due to deformation and loss of surface detail it is not clear whether two or six-row barley is represented. A few grains seem to be of a hulled variety. Some grains show very large scars in the embryo area and may have germinated before carbonisation. Single glume bases of emmer and spelt are present in F1012/559 and F1006/504 respectively and there is a single large robust free-threshing wheat rachis node in F1077/758.

The fruits and seeds of grassland and weed taxa are of common species and do not call for detailed comment. The specimens of Vicia/Lathyrus spp consist of isolated cotyledons and intact seeds which do not, however, show clear hilums. The seed of Lathyrus nissolia is identified from its surface detail. Two grass fruits, probably of the heath grass Sieglingia decumbens are present in F1000/500: these match S. decumbens well in overall size, shape and embryo size but have abraded and silt-encrusted surfaces.

Scrub plants are represented by fragments of hazel nutshell (Corylus avellana), rough-surfaced endocarp of sloe (Prunus spinosa) and a single seed of elder (Sambucus nigra).

Vegetative plant material including stem fragments, 'tubers' and rhizomatous fragments is common. Four main types are distinguished in this report. Type 1 comprises swollen basal internodes ('tubers') of the grass Arrhenatherum elatius (L) Beauv.ex. J. and C. Presl. var. bulbosum (Willd.) Spenner. These vary greatly in bulbosity: some are distinctly pyriform, others consist of scarcely enlarged internodes. A few are still attached at their nodes. Type 2 consists of ovoid to elongate rounded 'tubers', sometimes attenuated at one end, sometimes 'waisted' and prone to fragmentation at the constrictions. Some have split into thin discs. They are up to 4mm wide and have small projections on their surfaces. In fractured TS an outer epidermal layer and central parenchymatous tissue is visible. Elongate rhizomatous fragments with short internodes, longitudinal ribbing and sometimes root scars are listed as Type 3. Type 4 includes a heterogenous collection of rhizome/root fragments with root/shoot stumps, usually rather poorly defined.

Charcoal weights (g. of charcoal >2mm) were recorded for each of the cremation samples and other charcoal-rich deposits to give an indication of charcoal densities. The material has not been fully identified, though examination of representative fragments from the larger charcoal deposits (in cremations F1034/568 and F1076/811 and in the pits listed in Appendix 2) indicates that oak charcoal (Quercus sp.) from mature timber vastly predominates. Other samples contain little charcoal, in small fragments, from which it proved difficult to prepare the requisite fractured sections. However, an outline examination indicates that Quercus charcoal occurs frequently but some fragments of Pomoideae and Prunus charcoals are also present.

		Frequency	Total counts
1.Cereals			
Cereal indet.	caryopses	7	27
Hordeum sp(p)	caryopses	2	21
cf.Hordeum sp	rachis nodes	1	1
Triticum sp	caryopses	1	1
Triticum diccoccum Schübl.	glume bases	1	1
Triticum spelta L	glume bases	1	1
Triticum aestivum s.l.	rachis nodes	1	1
2.Weeds/grassland plants. (fruits/seeds)			
Raphanus raphanistrum L		3	3
Montia fontana L.subsp. chondrosperma		7	12
Chenopodium album L		1	2
Medicago-type		2	11
Vicia/Lathyrus sp(p)		13	17s+19co
Lathyrus nissolia L		1	1
Leguminosae indet		1	1
Polygonum aviculare agg		1	1
Rumex acetosella agg		2	21
Rumex sp		2	4
Polygonaceae indet.		1	1
Plantago lanceolata L		6	15
Galium aparine L		2	4
Gramineae indet		4	5
cf.Sieglingia decumbens (L) Bernh.		1	2
3.Scrub plants (fruits/nuts)			
Prunus spinosa L		1	-
Corylus avellana L		2	-
Sambucus nigra L		1	1
4.Vegetative plant material			
Type 1 Arrhenatherum elatius 'tubers'		17	-
Type 2 'tubers'		18	-
Type 3 rhizomatous fragments		14	-
Type 4 rhizomatous fragments.		30	-
Total no of samples		58	

Table 1: Summary of carbonised plant remains from cremation samples

Taxa are represented by fruits or seeds except where indicated.

Distributions of carbonised plant material

Examination of the distribution of carbonised plant material, spatially and between different types of context, at Bronze Age settlement sites has revealed patterns which may be interpreted in terms of types of activity and the utilisation of space within the settlement area (eg Lofts Farm: Murphy 1988; Springfield Lyons: Murphy 1990). Whilst full interpretation of assemblages of charred material resulting from ritual activity may always prove impossible it nevertheless seemed worth inspecting the data from Brightlingsea to see whether any patterning could be distinguished.

The samples from features containing only low - density background scatters of material have not been considered. The remaining samples from cremations and charcoal-rich pit fills were examined. For each sample the density of charcoal (g/litre of soil) was calculated and presence/absence of carbonised cereals, nutshells and weed seeds noted. (It seemed conceivable that the latter might perhaps be related to seasonality). However, when these characteristics were drawn up on the site plan no spatial patterning could be distinguished: virtually all feature-groups produced samples varying widely in composition.

Considering the data in terms of feature-type (Table 2) adds little. There do not seem to be significant differences in composition between samples from urned and un-urned cremations: the slight difference in charcoal densities is small, compared to the total range of densities from the site and both types of cremation produced cereals and nutshells. The pit fills are obviously quite different, with much higher charcoal densities and no cremated bone. They occur both in isolation and in feature-groups with cremations. Other than their apparently ritual character nothing can be said about them.

	Cremations		
	Urned	Un-urned	Charcoal-rich pit fills
Mean charcoal densities (g>2mm per litre of soil)	mean 0.64 range 0.01-2.49	mean 0.29 range 0.01-2.28	mean 82.15 range 0.67-583.7
Frequency of carbonised cereals	10/44	1/14	1/14
Frequency of charred hazel nutshells	1/44	1/14	0/14

Table 2: Distribution of carbonised macrofossils between samples from different context-types

The charcoal rich pit fills sampled were 568, 572, 576, 577, 720, 769, 795, 796, 798, 811, 892, 895 and 896.

Local habitats

The high frequency of vegetative plant material-stems, tubers, rhizomes etc - in these samples is notable. Most cannot at present be identified, apart from the characteristic tubers of Arrhenatherum elatius, the onion couch. These are common and characteristic charred macrofossils from Bronze Age cremations. References to sites elsewhere in the country are given by Robinson (1988, 102), to which can be added specimens from Bronze Age cremations at Rush Green, Clacton (Murphy 1983, 127) and North Shoebury (Murphy, forthcoming). A. elatius is characteristically a grass of Arrhenatheretum coarse grassland, which occurs nowadays on verges, poorly-managed pasture and meadow and abandoned cultivated land which is ungrazed or only lightly grazed (Robinson, ibid). The samples from Brightlingsea produced remains of other taxa which could occur in tall grassland of this general type, including Medicago-type (medicks etc) Vicia/Lathyrus spp (vetches/tares), Lathyrus nissolia (grass vetchling), Plantago lanceolata (ribwort plantain) and Galium aparine (goosegrass). These taxa were also present at Rush Green and North Shoebury. Rumex acetosella and the tentatively identified fruits of Sieglingia decumbens point to the presence of acidic grassland types, as would be expected on the sand and gravel-based soils of the site. Montia fontana (blinks) is also represented and may be derived from damper grassland downslope towards the River Colne or perhaps from damp patches closer to the site caused by locally impeded drainage.

In summary the short species list from Brightlingsea is dominated by grassland plants, possibly representing more than one type of community but including rough ungrazed grassland growing probably on abandoned land. The taphonomy of the assemblages is not entirely clear: Robinson (ibid) suggests the use of uprooted grasses for kindling pyres could account for the presence of Arrhenatherum tubers; carbonisation of tubers in their position of growth beneath a pyre, followed by their being scraped up with the cremation for interment is another possibility.

The remaining plants identified include weeds such as Raphanus raphanistrum (wild radish), Chenopodium album (fat-hen), Polygonum aviculare (knotgrass), Fallopia convolvulus (black birdweed) and Rumex spp (docks). Scrub plants are represented by a few fragments of sloe fruitstones (Prunus spinosa), hazel nutshells (Corylus avellana) and an elder seed (Sambucus nigra) besides charcoals of the Pomoideae and Prunus sp. These sparse macrofossils obviously give no useful indication of the extent of scrub in the vicinity.

Crop plants

Cereals identified from carbonised grains and spikelet fragments are Hordeum sp (barley), Triticum dicoccum (emmer), Triticum spelta (spelt) and bread-type wheat (Triticum aestivum s.l.). In Essex the presence of cereal remains in Bronze Age cremation deposits seems to be quite characteristic: grain fragments also came from the Rush Green cremation and the cremation from North Shoebury produced an emmer spikelet fork and grains of T. aestivum-type and Hordeum sp. Quantities of material are, however, generally very low and could perhaps merely represent accidental inclusions in the cremation pyre. The sample from F1096/714 at Brightlingsea is exceptional in producing markedly more material: at least 37 grains in a 4.0 litre sample. The

absence of any spikelet or rachis fragments may imply that this cannot be explained as a consequence of incompletely-threshed ears and straw being used as kindling. Rather, the deposit seems to represent intentional inclusion in the pyre of cleaned grain, apparently sprouted barley grain, which could represent malt.

At present no early-middle Bronze Age settlement sites have been excavated and sampled in Essex and the sparse results from these cremation deposits provide the only information available on crop production at this time. Extensive sampling at the Neolithic settlement Blackwater Site 28 produced low-density scatters of cereals, consisting mainly of emmer, with some einkorn, bread wheat and naked barley (Murphy 1989). At late Bronze Age sites - Lofts Farm and Springfield Lyons - denser cereal deposits, implying larger-scale processing of a different range of cereal crops (emmer, spelt, bread wheat, naked and hulled barley) have been sampled (Murphy 1988, 1990). The single spelt glume base from Brightlingsea provides a useful indication that spelt had been introduced to this area by the middle Bronze Age.

Mollusca

Context F1036/701 produced small fragments of mussel shell (Mytilus edulis) and F1036/702 contained a single winkle shell (Littorina littorea). It seems improbable that these would survive for long in the acidic sandy deposits prevalent at the site and they are thought to be intrusive and fairly recent, perhaps related to some form of marling.

Appendix 1. Macrofossils from cremations and associated contexts.

F1000/500 47.9 litres

Vicia/Lathyrus spp (cotyledons)		3
Galium aparine		2
Gramineae indet		1
cf.Sieglingia decumbens		2
Indet seeds etc.		3
Rhizomatous frags	(Type 2)	++
	(Type 3)	+
	(Type 4)	+
?Monocot stem frags		+
Charcoal 2-6mm		2.9g
>6mm		0.3g

F1000/500 2.5 litres 'C14 sample'

Charcoal 2-6mm		0.3g
>6mm		0g

F1001/514 20.0 litres

Cereal indet		3
Hordeum sp		1
Rhizomatous frags	(Type 2)	+
	(Type 3)	+
	(Type 4)	+
?Monocot stem frags		+
Buds		2
Charcoal 2-6mm		5.9g
>6mm		0.1g

F1001/515 26.5 litres

Cereal indet		2
Galium aparine		2
Indet ?fruitstone		1
?Arrhenatherum elatius tuber		
	(Type 1)	1 underdeveloped
Rhizomatous frag.	(Type 4)	+
Thorn		1
Charcoal 2-6mm		3.9g
>6mm		0g

F1002/526 1.7 litres

Corylus avellana (nutshell frags)		+
Rhizomatous frag	(Type 4)	+
Charcoal 2-6mm		0.1g
>6mm		0g

F1004/542 14.0 litres

Cereal indet		1
Leguminosae indet (cotyledon: 3mm)		1
Rhizomatous frags	(Type 2)	+
	(Type 4)	+
Charcoal 2-6mm		1.3g
>6mm		0g

F1005/503 18.9 litres

Rhizomatous frag	(Type 4)	+
Indeterminate elongate objects		2
Charcoal 2-6mm		1.6g
>6mm		0.2g

F1006/504 2.0 litres

Triticum spelta (glume base)		1
Indet. seed		1
Rhizomatous frags	(Type 2)	++
	(Type 4)	+
?Monocot stem frags		+
Stem frags		+
Charcoal 2-6mm		0.4g
>6mm		0g

F1007/505 21.2 litres

Cereal indet		2
Triticum sp		1
Montia fontana subsp chondrosperma		1
Medicago-type		1+1cf
Vicia/Lathyrus sp		1+1cf
?Gramineae		2
Indet seed		1
?Arrhenatherum elatius tuber	(Type 1)	1 underdeveloped
Rhizomatous frags	(Type 2)	+++
	(Type 3)	+
	(Type 4)	++
Stem frags		+
Charcoal 2-6mm		3.3g
>6mm		3.0g

F1007/517 1.3 litres 'C14 sample'

Rhizomatous frags	(Type 2)	+
	(Type 4)	+
Charcoal 2-6mm		0.7g
>6mm		0.1g

F1009/508 6.6 litres

Charcoal 2-6mm	0.1g
>6mm	0g

F1010/566 3.6 litres

?Monocot stem fragment	+
Charcoal 2-6mm	1.5g
>6mm	0g

F1011/513 13.4 litres (25% of fraction <2mm sorted)

Charcoal 2-6mm	3.7g
>6mm	0.8g

F1011/555 0.1 litres 'C14 sample'

Charcoal 2-6mm	0.1g
>6mm	0g

F1012/559 24.3 litres

Triticum dicoccum (glume base)		1
Vicia/Lathyrus spp		3s+1co
Rumex acetosella		1
Plantago lanceolata		9
Gramineae indet		1
Indet (seeds etc)		4
?Arrhenatherum elatius tubers	(Type 1)	5 underdeveloped + frags
Rhizomatous frags	(Type 2)	+++
	(Type 3)	+

	(Type 4)	++
?Monocot stem frags		++
Stem frags		++
Charcoal 2-6mm		5.9g
>6mm		0g

F1014/524 2.0 litres

Medicago-type		9
Rumex sp		3
Indet. seeds		2
Arrhenatherum elatius tubers		
	(Type 1)	2+frags
Rhizomatous frags	(Type 3)	+
	(Type 4)	++
Charcoal 2-6mm		0.2g
>6mm		0g

F1015/522 13.3 litres

Vicia/Lathyrus spp		2s+2co
Plantago lanceolata		1+1cf
Indet ?seeds		9
Arrhenatherum elatius tubers		
	(Type 1)	3
Rhizomatous frags	(Type 2)	++
	(Type 3)	+
	(Type 4)	++
Stem frags		+
Charcoal 2-6mm		0.7g
>6mm		0g

F1016/528 8.4 litres

Raphanus raphanistrum		
	(siliqua frag)	1
Montia fontana subsp.chondrosperma		4
Plantago lanceolata		1
Vicia/Lathyrus sp		1co
Indet seed		1
?Arrhenatherum elatius tuber		
	(Type 1)	1 frag (uderdeveloped)
Rhizomatous frags	(Type 2)	+
	(Type 4)	+
Stem frags		+
Charcoal 2-6mm		1.8g
>6mm		0g

F1017/551 0.4 litres

Charcoal 2-6mm		0.1g
>6mm		0g

F1018/521 26.0 litres (25% sorted)

Stem frags		+
Charcoal 2-6mm		10.8g
>6mm		1.7g

F1019/537 12.5 litres

Vicia/Lathyrus spp		3s+2co
Indet seeds		2
Rhizomatous frag	(Type 2)	+
Charcoal 2-6mm		4.9g
>6mm		1.4g

F1020/565 33.2 litres (25% sorted)

Montia fontana subsp chondrosperma		1
Vicia/Lathyrus spp		4s+3co
Rhizomatous frag	(Type 4)	+
?Monocot stem frags		+
Stem frags		+
Charcoal 2-6mm		4.7g
>6mm		0.1g

F1020/571 3.5 litres 'C14 sample'

Montia fontana subsp chondrosperma		1
Vicia/Lathyrus sp		1co
Indet seeds		2
Rhizomatous frag		+
?Monocot stem frag		+
Charcoal 2-6mm		6.8g
>6mm		1.9g

F1021/557 3.6 litres

Rhizomatous frag	(Type 2)	+
Stem frag		+
?Phosphatic vesicular concretions		+
Charcoal 2-6mm		3.5g
>6mm		0.3g

F1021/557 0.5 litres 'C14 sample'

Charcoal 2-6mm		0.4g
>6mm		0g

F1022/533 20.0 litres

Prunus spinosa (fruitstone frags)		+
Indet seeds		2
?Arrhenatherum elatius tuber	(Type 1)	+ frag underdeveloped
Rhizomatous frags	(Type 2)	++
	(Type 3)	+
	(Type 4)	++
Stem frags		+
Charcoal 2-6mm		3.4g
>6mm		0g

F1023/535 13.8 litres

Raphanus raphanistrum		1
Rumex sp		1
Indet seeds		2
Rhizomatous frags	(Type 2)	+
	(Type 4)	+
?Monocot stem frags		+
Charcoal 2-6mm		0.6g
>6mm		0g

F1024/531 5.8 litres

Charcoal 2-6mm		13.1g
>6mm		0.1g

F1025/530 5.9 litres

Vicia/Lathyrus sp		1s
Indet seed		1
Rhizomatous frags	(Type 4)	+
Charcoal 2-6mm		11.9g
>6mm		0.1g

F1026/569 14.4 litres

Montia fontana subsp chondrosperma		1
Plantago lanceolata		1
Arrhenatherum elatius tubers		
	(Type 1)	+++ frags/underdeveloped
Rhizomatous frags	(Type 2)	+++
	(Type 3)	+
	(Type 4)	+
?Monocot stem frags		+
Stem frags		+
Charcoal 2-6mm		23.4g
>6mm		5.3g

F1026/570 3.1 litres

Plantago lanceolata		1
Arrhenatherum elatius tuber		
	(Type 1)	1
Rhizomatous frags	(Type 2)	+
	(Type 3)	+
	(Type 4)	+
?Monocot stem frags		+
Stem frags		+
Charcoal 2-6mm		1.4g
>6mm		0.8g

F1026/725 (virtually no soil matrix)

Rhizomatous frags	(Type 2)	+
	(Type 4)	+
Stem frags		+
Charcoal 2-6mm		0.1g
>6mm		0g

F1027/544 4.2 litres

Rhizomatous frags	(Type 2)	+
	(Type 4)	+
?Monocot stem frags		+
Charcoal 2-6mm		1.4g
>6mm		0g

F1028/870 4.0 litres

Indet seed		1
Stem frags		+
Charcoal 2-6mm		0.1g
>6mm		0g

F1030/548 7.0 litres

Charcoal 2-6mm		0.1g
>6mm		0g

F1031/549 7.3 litres

Indet seed		1
Arrhenatherum elatius tubers		
	(Type 1)	1+frags
Rhizomatous frag	(?Type 2)	+
Monocot stem frags		+
Charcoal 2-6mm		0.3g
>6mm		0g

F1032/562 10.4 litres

Raphanus raphanistrum	(siliqua frag)	1
Indet seed		1
Arrhenatherum elatius tubers	(Type 1)	4+frags
Rhizomatous frags	(Type 2)	+
	(Type 4)	+
Stem frags		+
Charcoal 2-6mm		1.5g
>6mm		0.3g

F1077/758 1.7 litres

Triticum aestivum s.l.	(rachis node)	1
Charcoal 2-6mm		0.7g
>6mm		0g

F1078/581 1.0 litres

cf.Hordeum sp (rachis node)		1
Charcoal 2-6mm		0.1g
>6mm		0g

F1081/925 9.0 litres

Charcoal 2-6mm		0.9g
>6mm		0g

F1082/927 3.6 litres

Indet seed		1
Rhizomatous frag	(Type 3)	+
Charcoal 2-6mm		0.2g
>6mm		0g

F1083/928 4.8 litres

?Rhizomatous frags		+
Charcoal 2-6mm		0.2g
>6mm		0g

F1093/772 0.2 litres (small urn)

Charcoal 2-6mm		0.1g
>6mm		0g

F1093/772 0.5 litres (large urn)

Charcoal 2-6mm		0.1g
>6mm		0g

F1093/772 2.0 litres

Charcoal 2-6mm		0.5g
>6mm		0g

F1096/713 1.0 litres

Sambucus nigra		1
Charcoal 2-6mm		0.2g
>6mm		0g

F1096/714 4.0 litres

Cereal frags		+++
Cereal indet		17
Hordeum sp		20
Rumex acetosella		20
Vicia/Lathyrus sp		1
Lathyrus nissolia		1
Indet seeds		11
?Arrhenatherum elatius tubers	(Type 1)	+++ underdeveloped
Rhizomatous frags	(Type 4)	++
Monocot stem frags		+++
Stem frags		+
Charcoal 2-6mm		3.9g
>6mm		0.1g

F1097/718 3.0 litres

Vicia/Lathyrus sp		1co
Polygonum aviculare		1
Indet seeds		2
Stem frags		+
Charcoal 2-6mm		1.6g
>6mm		0g

F1097/728 6.0 litres

Vicia/Lathyrus sp		4co
Indet seeds		3
Rhizomatous frags	(Type 3)	+
	(Type 4)	++
Stem frags		+
Charcoal 2-6mm		0.9g
>6mm		0g

F1098/715 13.0 litres 25% sorted

Indet seeds		2
Arrhenatherum elatius tuber	(Type 1)	1
Rhizomatous frag	(Type 4)	+
Charcoal 2-6mm		5.0g
>6mm		0.3g

F1098/716 10.3 litres 25% sorted

Chenopodium album		2
Polygonaceae indet		1
Indet seeds		2
?Arrhenatherum elatius tubers	(Type 1)	+ underdeveloped
Rhizomatous frags	(Type 4)	+
Charcoal 2-6mm		3.5g
>6mm		0g

F1098/719 17.9 litres 25% sorted

Montia fontana subsp chondrosperma	1
Stem frags	+
Monocot stem frags	+
Charcoal 2-6mm	6.5g
>6mm	0.3g

F1099/723 1.0 litres

Indet seed		1
Rhizomatous frags	(Type 4)	+
Monocot stem frags		+
Stem frags		+
Charcoal 2-6mm		0.1g
>6mm		0g

F1100/717 23.9 litres 6.25% sorted from fraction <2mm; 25%>2mm

Cereal indet		1
Rhizomatous frag	(Type 4)	+
Stem frags		+
Charcoal 2-6mm		13.5g
>6mm		0.9g

F1108/721 5.1 litres

Vicia/Lathyrus sp		1co
Indet seed		1
Arrhenatherum elatius tubers		
	(Type 1)	10 + underdeveloped
Rhizomatous frags	(Type 3)	+++
	(Type 4)	+++
Monocot stem frags		+
Stem frags		+
Charcoal 2-6mm		Not recorded
>6mm		Not recorded

F1121/785 15.3 litres

Cereal indet		1
Vicia/Lathyrus sp		1co
Indet seed		1
?Arrhenatherum elatius tuber		
	(Type 1)	+ underdeveloped
Charcoal 2-6mm		2.8g
>6mm		2.3g
Thorn		1

F1130/919 61.0 litres 25% sorted

Montia fontana subsp chondrosperma		3
Plantago lanceolata		1
Gramineae indet		1
Indet seed		1
?Arrhenatherum elatius tubers		
	(Type 1)	+ underdeveloped
Rhizomatous frags	(Type 3)	++
	(Type 4)	++
Charcoal 2-6mm		3.6g
>6mm		0.2g

F1130/924 19.4 litres

Corylus avellana		+
Monocot stem frags		+
Stem frags		+
Charcoal 2-6mm		1.0g
>6mm		0g

Appendix 2: Macrofossils from charcoal-rich pit fills

568	0.4 litres 'C14 sample'	
	Charcoal 2-6mm	7.4g
	>6mm	49.4g
568	0.3 litres 25% sorted	
	Charcoal 2-6mm	10.9g
	>6mm	17.6g
568	31.5 litres 25% sorted	
	Charcoal 2-6mm	6.7g
	>6mm	10.2g
572	45 litres 6.25% sorted	
	Polygonaceae indet	1
	Gramineae indet	1
	Stem frags	+
	Charcoal 2-6mm	16.8g
	>6mm	22.4g
576	18 litres 25% sorted	
	Triticum sp	1
	Chenopodium album	1
	Indet seed	1
	Charcoal 2-6mm	19.4g
	>6mm	28.8g
577	13.5 litres	
	Charcoal 2-6mm	3.2g
	>6mm	6.1g
720	20.25 litres	
	Raphanus raphanistrum	1
	Chenopodiaceae indet	+
	Indet seed	1
	Rhizomatous frags (Type 2)	+
	Stem frags	+
	Charcoal 2-6mm	7.9g
	>6mm	8.7g
769	9 litres 25% sorted	
	Charcoal 2-6mm	spilt
	>6mm	20.1g
795	31.5 litres 25% sorted	
	Rumex sp	1
	Polygonaceae indet	2
	Charcoal 2-6mm	8.7g
	>6mm	9.5g
796	4.5 litres 25% sorted	
	Rumex sp	1
	Charcoal 2-6mm	5.9g
	>6mm	0g

798	27 litres	
	Rumex sp	5
	Polygonum sp	1
	Fallopia convolvulus	1
	Indet seed	1
	Charcoal 2-6mm	11.2g
	>6mm	7.1g
811	0.35 litres 'C14 sample'	
	Charcoal 2-6mm	39.9g
	>6mm	164.4g
892	72 litres 50% sorted	
	Cyperaceae indet	4
	Charcoal 2-6mm	22.9g
	>6mm	19.7g
895	45 litres 12.5% sorted	
	Cyperaceae indet	5
	Gramineae indet	1
	Stem frags	+
	Charcoal 2-6mm	18.9g
	>6mm	10.8g
896	9 litres	
	Charcoal 2-6mm	7.1g
	>6mm	5.6g

Appendix 3: Macrofossils from other bulk samples.

Flots from contexts 541, 545, 561, 599, 603, 604, 616, 650, 706, 726, 732, 736, 747, 753, 778, 780, 835, 844, 857, 860, 866, 888, 891, 897, 902, 915, 921, 923, 935 and 962 were sorted. Apart from small charcoal fragments the only carbonised macrofossils present were as follows:

545	18 litres	
	Cereal indet (frag)	1
561	13.5 litres	
	Indet seed	1
	Rhizomatous frags	+
	Stem frags	+
650	13.5 litres	
	Indet seed	1
	Rhizomatous frag	+
726	18 litres	
	Stem frag	+
866	2.25 litres	
	Cereal indet	1

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