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Ancient Monuments Laboratory
Report 86/88

PLANT REMAINS FROM MIDDLEGATE, HARTLEPOOL, CLEVELAND 1987.

J P Huntley

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Summary

Excavations along the old quayside at Hartlepool, Middlegate revealed material ranging in date from 12th century to post 17th century. Most of the botanical remains were carbonised and consisted of cereal grains (bread wheat and oats predominantly) with some associated weeds and a little chaff. They have been interpreted as general activity in the area but not to specific activities or areas. Two samples had well-preserved mineralised/ waterlogged remains. These were predominantly of food plants and were probably cess-pit fills. An ordination of the data separates the samples into those from pit-fills and those from general back-fill and building layers. The data are similar to those from the nearby site of Church Close.

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PLANT REMAINS FROM MIDDLEGATE, HARTLEPOOL

INTRODUCTION

The site known as Hartlepool, Middlegate lies near to the old quayside in the town. Excavations were undertaken revealing material ranging from the 12th/13th century to the post-17th century. These consisted of waterbourne sands, back-filled layers and areas of Medieval buildings, some of which contained hearths and ovens of unknown function. The upper layers contained accumulations of soil on top of which were 18th century stone buildings with modern back-fill.

Bulk samples were taken throughout the course of the excavation and sent to the Biological Laboratory for botanical and faunal analysis.

METHODS

On receipt of the material a list of the samples and a measure of their volume was made. All bags of material with the same context number were amalgamated and treated as one sample.

All material was air-dried on trays and then floated over 500μ mesh, the residue also being retained on 500μ mesh. Floats and residues were air-dried. The residues were then hand-sorted for botanical material and fish-bone, and the floats for botanical remains. The botanical material was identified by comparison with modern reference material held in the Biological Laboratory and a tally of the numbers of each type of fruit, seed etc kept. Table 1 presents the bulk sample details and Appendix I the full botanical results. The data presented are the `raw counts' of seeds, no account has been taken of the original volume of material floated (which is recorded on the same table). The total number of seeds in 1 litre of original material has been added to Appendix I.

A simple strategy was adopted to see if there were any indications of the origins of the seeds. Each taxon (individual item identified) was attributed, where possible, to a single, broad, ecological group, viz:

1) Plants of permanently wet ground or running water - this includes fens, sedge meadows and marshes, streams etc.

2) Plants of dry, neutral grassland such as in many pastures and meadows, taller grassland on roadside verges etc..

3) Plants demanding high levels of nitrogen and/or phosphorus, particularly common around habitation.

4) Plants of cultivation and disturbed ground including waste ground, fallow land, garden areas, arable weeds and trampled areas. Most of these taxa are annuals or biennials.

5) Plants of heathland, mainly dry heather moorland.

In addition, cereals and other plants which could have had economic uses were put into separate groups. Although several of the latter were British natives, in particular from woodland and hedges, they were not included in a woodland habitat group. This was mainly because nothing other than potentially food/drug plants were recorded from this habitat and the plants could well have been isolated bushes etc. rather than specific areas of woodland. If much woodland had been represented in the material analysed then taxa other than food plants should have been recovered as well. A final group was left as unclassified when identification was imprecise.

The totals for each of these groups were calculated for each sample and phase. The values were then expressed as percentages in order to make valid comparisons between samples/phases given the widely varying totals (Figures 1-6).

MULTIVARIATE DATA ANALYSIS:

To see if there were any patterns of similarity between samples the data were analysed using an ordination program (DECORANA, Hill, 1979). An ordination seeks out axes of variation based upon the species content of the samples. The two most dissimilar samples are placed at opposite ends of the axis and the other samples arranged along it. This is repeated for all taxa and therefore, theoretically, there are as many axes of variation as there are taxa in the dataset. However, the first 2-4 axes usually demonstrate most of the variation (Figure 7). The data used were the raw counts of seeds.

RESULTS AND DISCUSSION

The following samples had no identifiable material preserved and have been omitted from the tables:

Sample 5	context 229
7	249
8	293
12	560
16	554
35	826

It is not usually possible to say whether an absence of seeds is due to environmental factors precluding preservation, to lack of seeds in the material being laid down or whether the context was 'open', ie. available for seed deposition, for only a short time.

Samples 5, 7 and 12 are all from layers inside buildings which could have been kept clean.

Sample 8 was an ash layer in a building and this may have been produced by a fire too hot to leave any carbonised plant remains identifiable. The ash may or may not have been produced in the building.

Sample 16 was a fill of a post hole and was small in volume which could account for the lack of remains.

Sample 35 was, surprisingly, a fill of a rubbish pit from a phase 6 backyard, material usually very rich in plant remains. Its original volume was 3 litres which should have been enough for such a potentially-rich feature. The material examined may not have been the 'rubbish' of the pit but may have been a back-fill layer of sterile nature.

Most of the plant remains were carbonised but in 9 samples the original sediment was waterlogged thus preserving plants by exclusion of air rather than chemical alteration. These two types of material are likely to have different interpretations and are therefore dealt with separately. Waterlogged material often represents the natural flora of an area as well as representing plants brought deliberately onto a site, carbonised remains generally represent some deliberate activity although seeds of locally growing plants can also be accidently incorporated.

The waterlogged and mineralised material:

Nine of the samples had some waterlogged or mineralised material in them (Table 2). In all cases they also had carbonised remains as well and are therefore also to be found on Table 3.

The mineralised remains were predominantly of food plants - *Ficus carica* (fig), *Vitis vinifera* (grape), *Malus/Pyrus* (apple/pear), *Prunus spinosa/P domestica s.l.* (sloe/bullace) and *Avena* (oat). In three out of the four samples with this material there are no other identifiable remains. However, the sample with the most mineralised material, sloe stones (sample 39) also has waterlogged seeds. These are either from plants of wet ground (*Eleocharis palustris* (spike-rush), *Carex* spp. (sedges), *Isolepis setaceus* (bristle-Scirpus) or, again, of potential food/drug plants (*Prunus institia* (cherry), *P. spinosa* (sloe), *Chenopodium album* (fat-hen), *Cannabis sativa* (hemp), *Hyoscyamus niger* (henbane)). Hemp may have been used as a narcotic or the fibres of its stems as the important constituent of rope. The latter is quite appropriate for a quayside location such as Middlegate. Henbane is a native plant in Britain and grows both near the sea and on disturbed ground in farmyards. Its principal, active, chemical ingredient is highly poisonous although also said to be highly efficacious in the correct dosage. It was much used as a sedative particularly during tooth extraction (Grieve, 1931).

Samples 10 and 11 have, respectively, 5 and 1 waterlogged seeds in them and little useful may be inferred from this. The plants represented are from heathland and wetland.

Samples 33 and 34 are extremely rich with a total of 39 and 64 taxa respectively.

	Sample 33	Sample 34
% wet ground	9.3	14.0
% disturbed/cultivated	12.6	60.6
% grassland	9.5	14.0
% heathland	0	0.5
% food/drug	68.7	10.2

Sample 33, from a layer at the bottom of a cess-pit, is dominated by food/drug plants, mainly *Malus* (apple pips), and *Prunus* spp. (plum and cherry stones). A few caryopses of *Avena* (oats) were recovered which could have been the remains of a porridge-like food. As with all of these cess deposits, it would be interesting to look for intestinal parasite eggs in the samples. Their presence would suggest that there was faecal material incorporated and that the sample was not just of domestic, kitchen waste.

Sample 34 was considered by the archaeologists to be leakage of medieval cess material into waterlain sand. The botanical evidence does not support this. It is dominated by species of disturbed/cultivated

ground such as *Chenopodium album* (fat-hen), *Anthemis cotula* (stinking mayweed), *Stellaria media* (chickweed) and *Polygonum lapathifolium* (pale persicaria). These are predominantly weeds of cultivation and this sample therefore may represent a period of local, intense cultivation such as a garden plot. Food plants are not common, the most abundant are hazelnut fragments.

The carbonised material:

Carbonised plant material was present in 33 of the samples (Table 2). These can conveniently be split into two.

The first group (on the left of the table) have a few seeds in them but none in sufficient quantity to draw any conclusions about.

Sample 36 (context 841) has only 3 carbonised grape-pips (*Vitis vinifera*), the fruit of which is likely to have been imported, possibly in its dried state as raisins. The sample is a layer from a cess pit and its paucity of remains is therefore surprising. Sample 35, as discussed above had no remains at all, and was also taken from a Phase 6 pit. It is therefore possible that conditions for preservation during this period (1700 - early 20th century) were poor. At least part of the adjacent area was cellared and this would almost certainly have led to natural drainage from the pits.

Sample 34 has abundant heather twigs *(Calluna vulgaris)*. This is the sample considered to be leakage of cess into sand by the archaeologists but whose waterlogged botanical assemblage suggests intense, local cultivation. The heather may indicate bonfires on the site.

The second group of samples (on the right of the table) has both more taxa and seeds. This may partly be because more of the original material was floated than for the first group of samples although the number of seeds per litre is higher in this group.

The samples contain mostly carbonised cereal grains, predominantly bread wheat and oats with a small amount of barley and the occasional rye grain. Moderate amounts of culm nodes and wheat chaff were recovered.

The wheat was bread wheat (*Triticum aestivum*) although two grains were tentatively identified as spelt (*T. spelta*).

The barley, where determinable, was naked with clear transverse wrinkles on the ventral side. This was rather surprising for a medieval site since the hulled barley had generally superseded the naked by this time. However, most of the grains were too corroded to determine. Both straight and twisted embryos were present indicating that at least some of the barley was *Hordeum vulgare*, the 6-row barley. This was confirmed

by the presence of two rachis internodes clearly attributable to the 6-row variety.

Seeds of *Vicia faba* (Celtic bean) were common in this group of samples, particularly sample 13. The occasional *Pisum sativum* (pea) was also recovered.

The samples are from a variety of contexts, mainly 'backfill' and 'layer in building', neither of which are very informative. Samples 38 and 40 are both from waterlain material which is surprisingly rich in carbonised material. It is therefore difficult to interpret the botanical remains in archaeological terms since the material could have come from anywhere.

ORDINATION RESULTS AND DISCUSSION:

Figure 7 presents the first two axes of the ordination of the data with the archaeological information included. The main distinction is that samples from cess pits and pit fills are separated from those from general backfill and building layers. Further distinctions are not meaningful probably because most samples did not have many seeds in them and the distinctions are being made on the presence or absence of perhaps 1 or 2 seeds only.

PHASE DIFFERENCES (Figures 1-6):

Table 4: Summary of phases

Phase	1	2	3	4	6
no. samples	4	5	5	18	1
% wet	5.5	0.4	2.8	9.8	.
grass	4.0	3.4	1.6	4.1	.
nitroph.	0.2	0.9	0.2	0.9	.
cult/dist	6.1	6.7	7.7	44.4	6.6
heath	22.2	43.8	37.0	8.2	.
cereals	56.6	40.9	36.6	6.2	8.0
economic	1.5	2.1	26.5	18.4	73.3
unclass	3.5	1.9	5.3	8.0	12.0

Looking at these figures, phases 1 and 2 are similar but phase 1 has more of the wetland element and phase 2 more of the heathland one. The latter is principally heather twigs and the value could be an over-estimate since the pieces are counted and they may have been fragmented

during processing. Therefore, in terms of habitats represented the two phases may be said to be the same.

Phases 3, 4 and 6 have more of the economic group of plants and cereals are drastically reduced in phases 4 and 6. To some extent this simply reflects the nature of preservation of material in that the mineralised seeds, almost exclusively food plants at this site, and the waterlogged seeds are almost exclusively in phases 3 and 4.

It is therefore considered that, in terms of habitats represented, there are only small differences between the phases. This is, perhaps, to be expected when the timespan of the whole site is only two-three centuries.

GENERAL CONCLUSIONS:

Due to the imprecision of context types and the scarcity of botanical remains from many of them a discussion of the results has to be rather generalised.

The carbonised remains were mostly of cereal grains and associated chaff and weed seeds. Bread wheat and oats were the most common, perhaps indicating food for human use rather than for animals which are usually fed barley. Chaff was found but not in enough quantity to suggest that the cereals were being threshed or de-husked on-site.

The samples were principally from general layers in buildings and back-fill material. The plant remains of the latter are particularly difficult to interpret because of its unknown origin.

Many of the samples are similar in content to those analysed from the nearby site at Church Close (Huntley, 1987), in particular with the one sample from the agricultural activity at that site.

The waterlogged and mineralised plant remains came from cess pits and pit fills. It was mostly from food or drug plants which is to be expected from this type of context. Again, the material is similar to that from the Anglo-Saxon material at Church Close.

It is unfortunate that samples were not available from the whole variety of pits found from all phases on the Middlegate site. The contents of pits are likely to have originated locally and can often tell us more of what was being used in the immediate vicinity. Dietary evidence is also commonly found in such contexts and comparing them can lead to knowledge of changing diet, etc..

However, the plant remains do tell us what was being used in the area, although not necessarily on-site. A variety of cereal grains were found, principally suggesting human food. The cess material is all from Medieval pits and shows a variety of fruits were eaten, in particular the fig which must have been imported. The presence of seeds of cultivated ground indicates perhaps garden plots in the vicinity.

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Table 1
Hartlepool Middlegate
Sample details

Sample no.	Context no.	Phase	Volume floated (l)	Feature
01	158	4	12.00	layer within building
02	186	4	12.00	layer within building
03	210	4c	0.40	layer within oven
04	219	4c	0.40	layer within oven
05	229	4c	2.00	layer within building
06	240	4d	0.80	layer within pit
07	249	4c	9.00	layer within building
08	293	4	6.00	layer within building ?asbestos
09	327	4b	11.00	layer within building
10	407	4a	3.00	?hide from bottom of feature
11	479	4a	3.00	layer within cess pit, may have sunk from 4b above
12	506	4	6.00	ash layer within building
13	538	3	24.00	fill of feature
14	527	3	22.00	fill of rectangular pit
16	554	4	1.50	fill of post hole
17	563	3	12.00	fill of feature
18	572	2	28.00	backfilled material
19	590	4	4.80	ash layer within building
20	619	4	19.50	ash layer within building
21	651	4	3.00	layer within building
22	622	4	3.00	back yard cess pit layer
23	647	4	18.80	layer within building
24	681	2	11.50	backfilled material
25	691	4	1.20	backyard layer
26	707	2	19.00	backfilled material
27	706	3	9.00	fill of feature
29	731	2	14.00	backfilled material
30	753	2	12.00	backfilled material
31	771	1	5.00	layer/feature
32	772	1	14.00	waterlain sand
33	750	4a	8.00	layer in bottom of cess pit
34	790	1/4	24.00	leakage from Med.cess pit into waterlain sand(750)
35	826	6	3.00	fill of rubbish pit
36	841	6	8.00	fill of rubbish pit
37	932	4	1.00	layer within building
38	968	1	6.00	waterlain material
39	985	3	2.00	fill of rectangular pit
40	969	1	25.00	waterlain matrix of beach boulders

Table 2: Hartlepool - Middlegate (waterlogged and mineralised material)

Sample number	11	10	35	34	36	39	21	22	31
Context number	479	407	750	790	641	985	651	622	771
Volume floated (litres)	3	3	8	24	8	2	.2		5
Phase	4	4	4	4	6	5	4	4	1
WATERLOGGED									
Ranunculus flammula/cf. flammula		1	9	56					
Chenopodium album		1	9	208		9			
Eleocharis palustris		1	9	32		5			
Achillea millefolium			1	8					
Agrostemma githago			2						
Anthemis cotula			9	214					
Atriplex sp(p).			9						
Brassica campestris			2						
Bromus sp(p). grain			9						
Carex (lenticular)			9	16					
Carex (trigonous)			1	112		4			
Cirsium sp(p).			9	24		1			
Hypochoeris radicata			9	8					
Lapsana communis			9	48					
Lychnis flos-cuculi			9						
Malus sylvestris			99						
Papaver somniferum			9						
Fallopia convolvulus			1	72					
Prunella vulgaris			9	56					
Prunus cerasifera			99			2			
Prunus domestica institia			99	8					
Ranunculus repens-type			9	80					
Rumex acetosella			9	40					
Rumex obtusifolius-type			1	56					
Stellaria media			1	152		1			
Trifolium sp(p).			9						
Rubus idaeus			9	8					
Avena grain			9						
Atriplex patula/hastata				32					
Brassica nigra				8					
Brassica sp(p).				72		4			
Cannabis sativa				8		2			
Chenopodium sp(p).				8					
Corylus avellana nut fragment				99					
Empetrum nigrum				8					
Ficus carica				8	14				
Fumaria sp(p).				8		1			
Galeopsis tetrahit				8					
Hypericum sp(p).				8					
Leontodon hispidus				8					
Linum usitatissimum				24					
Matricaria recutita				8					
Plantago major				8					
Polygonum lapathifolium				88					
Polygonum hydropiper				16					
Polygonum persicaria				32					
Potentilla reptans				32					
Rhinanthus minor agg.				8					
Rumex acetosa				16					
Sambucus nigra				16					
Scrophularia nodosa				8					
Spergula arvensis				8					

/contin.

Table 2: /contin.

Sample number	11	10	33	34	36	39	21	22	31
Context number	479	407	750	790	841	985	651	622	771
Volume floated (litres)	3	3	8	24	8	2	12		5
Phase	4	4	4	4	6	5	4	4	1
Raphanus raphanistrum pod frag.	1			24					
Stellaria graminea				8					
Tripleurospermum maritimum ssp inodorum				24					
Urtica dioica				8					
Valerianella dentata				80					
Rubus fruticosus					36				
Prunus sp(p).					1				
Fragaria vesca					1				
Aphanes arvensis					5				
Apium graveolens						1			
Prunus spinosa						1			
Malva neglecta						1			
Isolepis setaceus						1			
Papaver sp(p).						1			
Hyoscyamus niger						1			
Potentilla sp(p).		1							
Calluna vulgaris		1				1			
MINERALISED									
Labiatae undiff.							3		
Ficus carica							5		
Avena grain							2	1	
Vitis vinifera							1		1
Prunus domestica s.l.						99	3		
Malus/Pyrus							1	1	
Linum catharticum									1

Table 3: Hartlepool - Middlegate (carbonised material)

Sample number	3	4	6	10	11	2	21	22	32	33	41	34	44	9	25	29	1	37	20	12	18	19	39	17	13	14	23	26	27	24	38	40	30
Context number	210	219	240	407	479	186	651	622	772	750	771	790	841	327	691	731	158	932	619	506	572	590	985	563	538	527	647	707	706	681	968	969	753
Phase	4	4	4	4	4	4	4	4	4	1	4	1	4	6	4	4	2	4	4	4	2	4	3	3	3	3	4	2	3		1	1	2
Volume floated (litres)	1	1	1	3	3	12	12		14	8	5	24	8	11	2	14	12	1	20	3	28	5	2	12	24	24	19	19	9	12	6	25	12
Cerealia undiff.		5				3	1									1	9			3	14	2		3	13	7		7	1	2	4	13	3
Avena grain						1			1	3	3	3	2	2	1				11	1	6	1	2	13	23	3	6	17	8	7	36	11	17
Triticum aestivum grain	1					1	3				3	2	3	5				1	1	1		40	2	9	38	14	22	38	23	15	83	69	11
Triticum (hexaploid)				1								1				2			2		1		1	4	1			2	1	3	4	4	
Cula nodes																			3		1	1		5	4	2	1	27		6	12	6	1
Hordeum indet.							1	1											1					3		1	1	5	6	3	4	13	5
Triticum floret base										1				1					1						1	2	1	4		1	28	7	
Triticum glume base							1																	2		1				2	5	4	
Triticum sp(p). grain	1												1				1											3			1		
Hordeum rachis internode		3																													1		
Secale rachis internode		1																															
Avena fatua floret base																			1					1									
Triticum spelta																							1	1									
Avena sp(p). fl. base							1																	1									
Hordeum straight naked																					1												
Triticum rachis internode (hexaploid)																			1												1	1	
Avena sativa floret base												1															1						
Secale cereale grain																												1				1	
Hordeum 6-row rachis internode																											1			1			
Hordeum naked									1			2																					
Hordeum twisted naked												1																					
Triticum rachis internode																															1		
Legume <4mm				1							2			1		1			1		2			5	8	2	3	2	2		3	1	
Carex (trigonous)																		1	1		1		1		2		2		1		13	10	
Chenopodiaceae undiff.																		3	1	1	1				2		1	3	1	1		2	
Gramineae undiff.															1	1		1	1	1			1		2	2		8			3	17	8
Vicia faba							1				1									1			1		24	1	3	1	9	2		1	
Legume >4mm									1						1									3		1			2				
Rumex obtusifolius-type															1									1	3	1	3		1	1	3		
Rumex acetosella				1					1			4													1		2						
Anthemis cotula																			2		1			1	1	1	1	4			3	9	8
Valerianella dentata																		1			1	1			4							1	
Pisum sativum																				1				1		2		1					8
Erica tetralix leaf/shoot																								1				9		1	9	8
Galium aparine																								1				2		1		1	
Bromus sp(p). grain																								1	2							1	1
Calluna vulgaris twigs											++					+		+					++		++	+	++	++			++	+	++
Sieglingia decumbens																								1	1			2			1	1	8
Stellaria media																		1							1	1					1	1	
Brassica sp(p).											1	1								1					2	1		2			4	1	
Quercus charcoal						++													+						+					++			+
Corylus charcoal																														+			+
Alnus charcoal																																	+
Fraxinus charcoal																																	+
Carex (lenticular)																		1		1								1			1	2	
Chenopodium album												1						1			1				3						3		
Plantago lanceolata																		1			1						1		2			1	
Corylus avellana nut frag.		1																			2	2		1								1	
Agrostemma githago		1																		1						1	1		1			1	
Polygonum lapathifolium																											1						8
Polygonum persicaria												2																					8
Vitis vinifera														3											1								
Atriplex sp(p).																		1										2		1			
Spergula arvensis																							1					1	2		2		
Fallopia convolvula																												1			1		
Chrysanthemum segetum																												2				1	
Scirpus setaceus																										1						1	
Umbelliferae undiff																													2			1	
Cirsium sp(p).																													2				
Urtica dioica																													2			1	
Montia font. font.																														3			
Ranunculus repens-type																			1														
Luzula sp(p).																			1														
Indeterminate																			1												1		
Caryophyllaceae undiff																															2		
Eleocharis palustris																															1	2	
Linum usitatissimum																															1		
Calluna vulgaris																															1		
Rumex acetosa																								1									
Polygonum lapth./persicaria																																1	
Raphanus raphanistrum pod frag.																														1			
Labiatae undiff.																		1															
Hyoscyamus niger																		6													1		
Stellaria graminea															1																		
Matricaria sp(p).															1																		
Malus/Pyrus																										1							
Prunella vulgaris																										1							
Veronica hederaefolia																										7							
Euphrasia/Odontites																										1							
Linum catharticum																										1							
Lychnis flos-cuculi																										1							
Ranunculus flammula																											1						
Potentilla reptans-type																				3													

Appendix I: Hartlepool - Middlegate (samples in phase order, taxa in habitat groups)

Sample number	31	32	36	40	18	24	26	29	30	13	14	17	27	39	1	2	3	4	6	9	10	11	12	19	20	21	22	23	25	33	34	37	36
Context number	771	772	968	969	572	681	707	731	753	538	527	563	706	985	158	186	210	219	240	327	407	479	506	590	619	691	622	647	691	750	790	932	841
Phase	1	1	1	1	2		2	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6
Volume floated (litres)	5	14	6	25	28	12	19	14	12	24	24	12	9	2	12	12	1	1	1	11	3	3	3	5	20	12		19	2	8	24	1	8
Number of seeds per litre sediment	3	1	33	9	1	4	13	1	17	10	2	5	8	123	?	1	1	6	6	1	2	1	4	10	2	5	?	8	1	60	83	16	1
WETLAND																																	
wApium graveolens														1																			
cCarex (lenticular)			1	2											1										1			1					
wCarex (lenticular)																														9	16		
cCarex (trigonous)			13	10						2			1		1								1	1				2				1	
wCarex (trigonous)														4																1	112		
cEleocharis palustris			2																														
wEleocharis palustris														5							1									9	32		
cIsolepis setaceus				1																								2					
wIsolepis setaceus														1																			
cLuzula sp(p).																																1	
cLychnis flos-cuculi										1																							
wLychnis flos-cuculi																														9			
cMontia font. font.			1				2																										
cRanunculus flammula											1																						
wRanunculus flammula/cf. flammula																					1									9	56		
wScrophularia nodosa																															8		
GRASSLAND																																	
wAchillea millefolium																														1	8		
cEuphrasia/Odontites										1																							
wGramineae <2mm																											1						
cGramineae undiff.			3	17			8		8	2	2			1	1					1					1				1			1	
wHypochoeris radicata																														9	8		
wLeontodon hispidus																															8		
cLinum catharticum										1																							
wLinum catharticum	1																																
cPlantago lanceolata				1			2				1				1								1										
cPrunella vulgaris										1																							
wPrunella vulgaris																														9	56		
wRhinanthus minor agg.																															8		
CULTIVATED/DISTURBED GROUND																																	
cAgrostemma githago				1															1						1			1					
wAgrostemma githago																														2			
cAnthemis cotula			3	9	1		4		8	1	1	1													2			1					
wAnthemis cotula																														9	214		
wAphanes arvensis																																	5
wAtriplex patula/hastata																															32		
wBrassica campestris																														2			
wBrassica nigra																															8		
wcf. Cirsium sp(p).																											1						
cChenopodiaceae undiff.				2		1	3			2			1		3								1		1			1				1	
cChenopodium album	1		3							3					1								1										
wChenopodium album														9							1									9	208		
cChrysanthemum segetum			1																									1					
wCirsium sp(p).														1																9	24		
cCirsium sp(p).				1			2																										
cFallopia convolvulus							2							1														1					
wFallopia convolvulus																														1	72		
wFumaria sp(p).														1																	8		
wGaleopsis tetrahit																															8		
wLapsana communis																														9	48		
wMalva neglecta														1																			
wMatricaria recutita																															8		
cMatricaria sp(p).																				1													
wPapaver sp(p).														1																			
wPlantago major																															8		
wPolygonum hydropiper																															16		
cPolygonum lapathifolium									8	1	1																						
wPolygonum lapathifolium																															88		
cPolygonum lapth./persicaria														1																			
cPolygonum periscaria	2								8		1																						
wPolygonum persicaria																															32		
wPotentilla reptans																															32		
cPotentilla reptans-type																									3								
wRaphanus raphanistrum pod frag.																						1									24		
cRaphanus raphanistrum pod frag.				1																													
cRumex acetosella		1								1											1							2			4		
wRumex acetosella																														9	40		
cRumex obtusifolius-type			3			1				3	1	1	1							1								3					
wRumex obtusifolius-type																														1	56		
cSpergula arvensis			2																					1				1					
wSpergula arvensis																															8		
cStellaria graminea																				1													
wStellaria graminea																															8		
cStellaria media			1	1	1					1	1																						
wStellaria media														1																1	152		
wTripleurospermum maritimum ssp inodorum																															24		
cValerianella dentata				1	1		4								1									1				1					
wValerianella dentata																															80		
cVeronica hederaefolia										7																							

Appendix I continued:

Sample number	31	32	38	40	18	24	26	29	30	13	14	17	27	39	1	2	3	4	6	9	10	11	12	19	20	21	22	23	25	33	34	37	36
Context number	771	772	968	969	572	681	707	731	753	538	527	563	706	985	158	186	210	219	240	327	407	479	506	590	619	691	622	647	691	750	790	932	841
Phase	1	1	1	1	2		2	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6
NITROPHILOUS GROUND																																	
cGalium aparine				1		1	2					1																					
cUrtica dioica							2																										
wUrtica dioica																														8			
HEATHLAND																																	
wCalluna vulgaris														1							1												
cCalluna vulgaris			1																														
cCalluna vulgaris twigs			99	9			99	9	99	99	9			99														99			99	9	
wEmpetrum nigrum																															8		
cErica tetralix leaf/shoot				9		1	9		8			1																					
wRumex acetosa																															16		
cRumex acetosa			1																														
cSieglingia decumbens			1	1			2		8	1		1																					
CHARCOAL																																	
wAlnus charcoal									+																								
wBetula/Corylus/Alnus charcoal																																++	
wCorylus charcoal						+			+																								
wFraxinus charcoal									+																								
wQuercus charcoal						++			+	+												++										+	
CEREAL GRAIN AND CHAFF																																	
cAvena fatua floret base										1															1								
cAvena grain	3	1	36	11	6	7	17		17	23	3	13	8	2		1			2			1	1	11			6	1	3	3		2
wAvena grain																										2	1						
wAvena grain																														9			
cAvena sativa floret base																												1			1		
cAvena sp(p). fl. base												1														1							
cCerealia undiff.			4	13	14	2	7	1	3	13	7	3	1		9	3		5					3	2		1						
cCulm nodes			12	6	1	6	27		1	4	2	5												1	3			1					
cHordeum 6-row rachis internode			1										1																				
cHordeum indet.			4	13		3	5		5		1	3	6												1	1	1	1					
cHordeum naked		1																													2		
cHordeum rachis internode			1																3														
cHordeum straight naked					1																												
cHordeum twisted naked																															1		
cSecale cereale grain				1			1																										
cSecale rachis internode																			1														
cTriticum (hexaploid)			4	4	1	3	2	2		1		4	1	1								1			2						1		
cTriticum aestivum grain	3		63	69		15	38		11	38	14	9	23	2		1	1			5			1	40	1	3		22			2	1	3
cTriticum floret base			28	7		1	4			1	2									1					1			1		1			
cTriticum glume base			5	4		2					1	2														1							
cTriticum rachis internode				1																													
cTriticum rachis internode (hexaploid)			1	3																					1								
cTriticum sp(p). grain			1				3								1			1															1
cTriticum spelta												1		1																			
FOOD/DRUG																																	
wCannabis sativa														2																	8		
cCorylus avellana nut frag.				1								1							1				2	2									
wCorylus avellana nut fragment																															99		
wFicus carica																										5							
wFicus carica																															8		14
wFragaria vesca																																	1
cHyoscyamus niger			1												6																		
wHyoscyamus niger														1																			
cLegume >4mm											1	3	2							1							1						
wLinum usitatissimum																															24		
cLinum usitatissimum			1	2																													
wMalus sylvestris																														99			
cMalus/Pyrus										1																							
wMalus/Pyrus																										1	1						
wPapaver somniferum																														9			
cPisum sativum									8	1			1										1					2					
wPrunus cerasifera														2																99			
wPrunus domestica institia																														99	8		
wPrunus domestica s.l.														99												3							
wPrunus sp(p).																																	1
wPrunus spinosa														1																			
wRubus fruticosus																																	36
wRubus idaeus																														9	8		
wSambucus nigra																															16		
cVicia faba	1			1		2	-1			24	1		9	1		1									1			3				
cVitis vinifera												1																					3
wVitis vinifera	1																									1							

Appendix I continued

Sample number	31	32	38	40	18	24	26	29	30	13	14	17	27	39	1	2	3	4	6	9	10	11	12	19	20	21	22	23	25	33	34	37	36
Context number	771	772	968	969	572	681	707	731	753	538	527	563	706	985	158	186	210	219	240	327	407	479	506	590	619	691	622	647	691	750	790	932	841
Phase	1	1	1	1	2		2	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6
UNCLASSIFIED																																	
cAtriplex sp(p).			1				2								1																		
wAtriplex sp(p).																														9			
cBrassica sp(p).	1		4	1			2			2	1												1							1			
wBrassica sp(p).														4																	72		
cBromus sp(p). grain				1					1	2		1																					
wBromus sp(p). grain																														9			
cCaryophyllaceae undiff			1																														
wChenopodium sp(p).																															8		
wGram/cereal nodes																											3						
wHypericum sp(p).																															8		
cIndeterminate																																1	
cLabiatae undiff.													1		1																		
mLabiatae undiff.																										3							
cLegume <4mm	2		3	1	2		2	1		8	2	5	2							1		1			1			3				
mLegume <4mm														1																			
wPotentilla sp(p).																					1												
cRanunculus repens-type													3												.							1	
wRanunculus repens-type																														9	80		
wTrifolium sp(p).																														9			
cTrifolium sp(p).			1	1								2	1												1								
cUmbelliferae undiff				1						1																							

c = carbonised; w = waterlogged; m = mineralised