**Plant remains**

by Anne Davis

Introduction

Environmental samples from seven of the eastern cemetery sites have been studied for this report. Over 100 samples were taken from HOO, and those containing plant remains were analysed initially by Dominique de Moulins, who wrote an archive report (de Moulins 1990). Results of analysis of these samples are incorporated here with those from more recently studied samples. The remaining samples comprised 17 from MSL, 10 from WTE, 18 from SCS, 8 from HAY, 3 from PRE, and one from ETN. After processing (see below) and assessment of all samples, the number considered worthy of detailed study was reduced to a total of 60 from HOO (from 34 contexts), 13 from MSL, 6 from WTE, 3 from HAY, 5 from SCS and 3 from PRE.

The samples came from a wide variety of feature types, some from cremation and inhumation burials, some from burnt material elsewhere, including redeposited cremation debris, and a few from contexts not apparently connected with burials. Table 7F.1 shows the distribution of samples between context types on each site.

| feature type | HOO | MSL | WTE | HAY | SCS | PRE |
|---|---|---|---|---|---|---|
| urned cremation burials | 13 | 1 | | | | |
| unurned cremation burials | 13 | 2 | 5 | 2 | | |
| pyre deposits | 30 | 1 | | | | |
| cremation debris | 4 | 9 | | | | |
| gravefills etc | | | 1 | 1 | 2 | |
| pitfills etc | | | | | 3 | 3 |
| totals | 60 | 13 | 6 | 3 | 5 | 3 |

Table 7F.1 Number of samples from each feature type, by site

The size of the samples varied greatly, all those from SCS, for example, being smaller than 5 litres, while some from HOO exceeded 100 litres. The volume of each sample is shown (where known) on Table 7F.XX. In some cases, particularly the cremations, samples contained 100% of the context from which they came, and so may have been unavoidably small. At HOO, large spreads of pyre debris were subdivided and samples taken from each division, resulting in up to seven samples from each context.

Methods

Samples from HOO and WTE were processed on site at the time of the excavations, and those from the other sites were stored for up to ten years before being processed in the environmental laboratory at the Museum of London. Most samples were processed using a Siraf flotation tank, with a 0.25mm mesh sieve to catch the flot and a 1mm mesh to retain the residue. Bucket flotation was used for the smallest of the samples. Flots and residues were dried, and the residues fully sorted by eye.

Some of the flots from HOO were very large, and those larger than 100ml were subdivided, using a riffle box, into fractions of 50-100ml before sorting. [Flots from HOO represented 0.2% of the total samples.] Two subsamples were then sorted for each sample to check for consistency. Flots were sorted for plant remains using a low-powered binocular microscope, at magnifications up to x40. Charred plant remains were extracted from the flots before identification, as close examination and comparison of these specimens is often necessary, but waterlogged material was identified, and its presence and abundance recorded, while scanning the flots. Only unusual waterlogged seeds, or those whose identification is problematic, were extracted for more detailed examination.

Identifications were made with the help of the modern reference collection at the Museum of London and standard seed identification manuals (Berggren 1981; Beijerinck 1947; Katz et al 1965). Botanical nomenclature follows Clapham et al (1987). Counts were made of charred material, but abundance of waterlogged remains was rated on the following scale: + up to 10, ++ 11-50, +++ 51-c 250, ++++ over 250 (possibly many hundreds). Taxon codes and abundance ratings were recorded using the environmental archaeologists' Informix-SQL database and this was used to produce tables of taxa with their broad habitat preferences, and potential uses and their abundance, for each site (Table 7F.XX).

Analysis included using absolute numbers and percentages of plant types (cereals, pulses, weeds for charred; habitat preferences, potential uses for waterlogged) to see if any groups emerged within or between sites, between context or feature types, by period, between plots). Selected data were loaded onto a relational database (described in Chapter 1) and correlations with various other categories of evidence (sex, age, grave goods) sought. There were too few seed data to produce very meaningful results in this part of the analysis; too few samples were from actual burials, for example.

Plant remains

The majority of plant remains found on the cemetery sites were preserved by charring. The excavated sites lay on sands and gravels, so they were relatively well drained and waterlogged preservation was not good. Some seeds were preserved in this way on all sites except HOO, however, and they were relatively frequent at SCS.

(1) Types of charred remains

Cereal grains were present in most samples, but almost always in very low numbers. Wheat (*Triticum* sp.) and hulled barley (*Hordeum sativum*) were the most common cereals, but oat (*Avena* sp.) also occurred occasionally. In many cases the wheat grains could not be reliably identified to species, but a few grains each of bread wheat (*T. aestivum*) and glume wheats, spelt or emmer (*T. spelta/dicoccum*) were identified. Quite a high proportion of grains, particularly at HOO, could not be identified even to genus, as they were too badly distorted and fragmented.

Cereal chaff was generally very rare, and limited to occasional glume bases of spelt wheat from HOO. The exception was at PRE, where relatively large numbers of glume bases were found in the fills of a well. All of those which could be firmly identified were from spelt wheat. A few fragments of oat awn were found in the same fills.

A few charred weed seeds were present in most samples, mainly from species characteristic of arable fields and other disturbed land, such as sheep's sorrel (*Rumex acetosella*), knotgrass (*Polygonum aviculare*), great plantain (*Plantago major*), oat/broom grass (*Avena/Bromus* spp.) and other grasses.

The most interesting component of the charred plant assemblages was the frequent presence of cultivated pulses. These were predominantly lentils (*Lens culinaris*) at HOO and peas (*Pisum sativum*) at MSL and WTE, with Celtic bean (*Vicia faba*), the predecessor of the modern broad bean, occurring less frequently on all these sites. The identification of these species has been confirmed by A Butler (University College, London). In addition to complete or, more frequently, half seeds, many samples from the same sites also contained fragmentary or very distorted remains of legumes, which could not be accurately identified. These have been categorised as '*Lathyrus/Vicia/Pisum* sp.' or merely 'Leguminosae', depending on their condition. These broad taxa require explanation, as they include several distinct types of remains, some of which tended to be specific to particular sites. At HOO

'*Lathyrus/Vicia/Pisum* sp.' included a number of quite large, flattened fragments of cotyledon, reminiscent of Celtic bean, although not identifiable as such, and 'Leguminosae' referred largely to smaller and more shapeless fragments of similar looking material. At MSL and WTE however, '*Lathyrus/Vicia/Pisum* sp.' referred mainly to smaller, roughly spherical legumes, whole or fragmented, which could again not be firmly attributed to a single genus but in some cases could be peas. 'Leguminosae' again covers mainly smaller fragments of what could well be the same species. Occasionally, smaller seeds of wild leguminous plants have also been included under this taxon.

Also present in many samples were small vesicular fragments, different from the broken cereal grains, some of which had a clinkery shine about them. Their origin could not be ascertained, although de Moulins (1990) suggests that they might be plant fuel ash.

(2) types of waterlogged remains

Seeds preserved by waterlogging were low in both frequency and diversity at all sites except SCS. The most commonly occurring taxa over all were small fruit pips from fig (*Ficus carica*), blackberry/raspberry (*Rubus fruticosus/idaeus*) and strawberry (*Fragaria vesca*), and common disturbed ground weeds such as fat hen (*Chenopodium album*), red/glaucous goosefoot (*C. rubrum/glaucum*), stinging nettle (*Urtica dioica*) and elder/danewort (*Sambucus nigra/ebulus*). Other seeds mostly fell into the same two categories of food remains or disturbed ground weeds, but a few suggested more specific habitats such as wet places or meadows.

Discussion, by plot

Plots 8, 22, 28 and 29 (HOO)

All the plant remains recovered from HOO samples were charred, and many in a poor state of preservation, with many unidentifiable fragments. Of the cereal grains, more barley than wheat was identified (85% and 15% respectively), but the majority of cereal grains could not be identified, so this may be misleading. Lentils greatly outnumbered any other leguminous species, particularly in the pyre samples, with a few Celtic beans and very occasional peas also found, except in the single sample from [694] where they dominated [ref?].

The samples from HOO came from four quite distinct categories of deposit: urned cremation burials, cremated material in pits, spreads of burnt material, and apparently redeposited cremated material in other features, and so will be described in these groups.

Urned burials

While the original volume of the samples varied from 1-20 litres, the maximum flot volume was only 5ml, therefore very few plant items were recovered. A few barley and wheat grains were identified, but most cereal grains were too poorly preserved for identification. Lentil was recovered from four of the 13 samples, and unidentifiable fragments of pulses and legumes from a further three. Only three weed seeds were found from these samples. The seed assemblages were too small for comparisons to be made between samples.

Pit fills

The pit samples were generally larger than those from urned burials, and the numbers of plant remains were correspondingly higher. Lentils were found in six of the 13 samples and cereal grains (barley, wheat and a single oat grain) in 11. A more diverse assemblage of weed seeds was found in the pit samples, most of them from plants of disturbed ground such as arable fields and waste ground. There was considerable variation between the ratios of the three main categories of charred plant remains in individual samples. For example, [992] (sample 126) contained only pulses and a single cereal grain with no weeds, while [1560] (sample 203) contained 83% cereals and no legumes, and the assemblage from [1566] (sample 204) was 100% weed seeds. The sample from [694] is unusual in that instead of lentils it contained a number of peas, as well as two examples of Celtic bean. It is the only sample from HOO to have produced more than a single pea. The origin of this fill is unclear, and it may consist of pyre debris rather than a burial. This sample was not processed and sorted at the Museum of London but had been sent to the cremated bone specialist, who sorted and forwarded the plant remains (McKinley, Chapter 4), but no reason can be found why this should have affected the taxa recovered.

Burnt spreads

These features produced the largest samples (up to 300 litres, although some were less than 20 litres), and consequently the largest plant assemblages. While there was some variation between individual samples from each context, pulses comprised, on average, 65% to 89% of the plant items in all contexts where plant remains were found. The remaining items were

mainly grains of barley and wheat, with weed seeds in all spreads comprising less than 5% of the total. The exception to this was 1589] (sample 207), which was dominated by cereal grains (81%).

A number of the smaller spreads contained no plant remains. These sterile features seemed to be situated in the northern and central areas of the site, while the spreads containing plant remains were mainly in east, south and north [check]. This observation may not be significant however, as the sterile features, and therefore their samples, tended to be smaller.

Residues from some of the larger samples produced a relatively high proportion of lentils and Celtic beans, particularly those from context 916. These are listed on a separate table (Table 7F.00) from those found in the flots (Table 7F.00), as they come from the whole residue, whereas only a proportion of the flots were sorted. For smaller samples, where the whole flot was sorted, any seeds from the residues were added to those from the flot. Sample 119, from [946], produced a single charred grape pip (*Vitis vinifera*), and sample 210, from [1590], a shell fragment of hazelnut (*Corylus avellana*). These were the only evidence of food remains, other than cereals and pulses, from HOO.

Other features

Four samples, from grave fills and a ditch, were thought to contain cremated material. These produced only six plant items, but as they included lentils, it is likely that they did indeed contain cremated material.

Comparison of feature types

The mean percentages of the three categories of plant remains found in the samples are shown in Table 7F.00.

| | urns | pits | spreads |
|---|---|---|---|
| cereals | 63 | 33 | 27 |
| legumes | 31 | 23 | 70 |
| weeds, others | 6 | 44 | 3 |
| total numbers | 51 | 227 | ? |

Table 7F.XX  Total numbers of each of the three categories of plant remains, as percentages of the total plant items for each feature type.

While all three types of deposit were obviously derived in some way from cremations, it is difficult to work out the relationships between them and their most likely origins. With the exception of the sample from [1589], those samples from the spreads which contained plant remains were mostly quite uniform in the composition of their assemblages, and it is reasonable to assume that they had a similar origin. Individual samples from the pit contents, on the other hand, were much more variable in the ratios of different types of plant remains, and mean percentage values for this group may therefore be meaningless. The one thing they had in common was that weed seeds, where present, made up a much more significant proportion of the assemblage than in either of the other two groups.

Seed assemblages from the urned cremations were so small that it was impossible to assess the degree of inter-sample variation, and therefore difficult to know whether comparisons of the group as a whole with those from pits or spreads are valid. If the urn samples are taken as a group, they seem to resemble those from the burnt spreads in that the plant remains consist mainly of cereal grains and pulses with very few weeds. On the other hand the proportions of these are reversed, with a mean of 62.7% grains and 31.4% pulses in the contents of urned cremation burials, and 27.6% and 69.8% respectively in the spreads.

Similarities between the urn contents and pyre debris suggest that material may have been taken from the pyre deposits, or from some common source, to fill the urns. The fill of one of the pits [992], which had a similar plant assemblage, could perhaps have had the same origin. Other pitfills, with their more variable composition and higher number of weeds, must then have had a slightly different origin. De Moulins (1990) suggests that the pits may have contained general debris from the cemetery [check], and this would account for their lack of uniformity.

After a cremation burnt material would have been taken, presumably from near the top of the burnt deposit, to fill the funeral urn, and the bulk of the remaining pyre debris would then have been removed to specific dumps (pyre deposits). Ash remaining on the pyre site, and including small charred weed seeds which would have dropped through the burning pyre, may then have been swept into pits.

Alternatively, as the apparent similarity between pyre deposits and urn contents may in fact be misleading, it is possible that the latter could have come from the same source as the pit fills. The absence of small weed seeds in the urn fills could be accounted for by sieving of the original cremated material before filling the urns. This would probably be desirable in any case to get rid of fine ash. Excess, unsieved material could then have been shovelled into pits for

disposal. This explanation, however, would make it difficult to account for the similar lack of weed seeds in the pyre debris as it is most unlikely that large quantities of cremated material would have been sieved, when very little was needed to fill the cremation urns.

There seems to be a higher occurrence of pulses in samples from contexts dating from the mid 2nd century onwards at HOO, although they were also found in certain early features, notably pyre deposits [916] and [946]. This may correlate with the area of the cemetery with the most lentils [check?].

Plot 1 (SCS)

Samples from SCS were all very small (5 litres or less), and appeared to contain no cremated material. Several grains of wheat and barley were found, along with a small charred weed assemblage, similar to that from HAY (Table 7F.00). Seeds of sheep's sorrel, small legumes and grasses comprised 65% of all charred weed seeds from the site, and their origin is likely to be a meadow-type environment, possibly within the cemetery, as discussed for HAY (see below).

The samples from grave backfill [144] and pitfill [132] contained richer assemblages of waterlogged seeds than most from these sites. The first of these included seeds from a wide variety of environments, suggesting that the deposit comprised a mixture of material from several sources. Damp ground and aquatic habitats were represented by seeds of gypsy wort (*Lycopus europaeus*), celery-leaved crowfoot (*Ranunculus sceleratus*), lesser spearwort (*R. flammula*), spike rush (*Eleocharis palustris*) and sedges (*Carex* spp.), and a few grassland taxa were present, such as sheep's sorrel, lesser stitchwort (*Stellaria graminea*) and ragged robin (*Lychnis flos-cuculi*). Seeds of disturbed ground plants were also common. For example fat hen (*Chenopodium album*), stinking mayweed (*Anthemis cotula*), chickweed (*Stellaria media*) and dyer's rocket (*Reseda luteola*) which can grow in cultivated land or waste places, and stinging nettle (*Urtica dioica*), red/glaucous goosefoot (*Chenopodium rubrum/glaucum*) and hemlock (*Conium maculatum*), which prefer soil with a high nitrogen content such as in farmyards or on rubbish heaps. Strawberry and blackberry/raspberry were the only taxa in this sample likely to have been used as human food, and seeds from both of these could equally well have been deposited in bird's droppings.

The assemblage from pitfill [132] was less diverse, containing mostly small fruit pips and disturbed ground weeds. In addition to the fruits present in [144], this sample contained seeds of fig and mulberry (*Morus nigra*), both of which are less likely to have arrived in the pit by

natural dispersal methods, although they will both grow in this country. The majority of the disturbed ground plants whose remains were found here belong to the group described above, which thrives in nitrogenous waste ground, and they probably represent the environment in the area of the pit. The pit therefore seems to have contained some household rubbish or human faeces [bones? finds?], and was probably close to domestic or agricultural buildings, where organic waste would lead to high nitrogen levels in the soil.

Plot 2 (MSL)

The 13 samples from this site were small (1.0-18.0 litres) and not particularly rich in either charred or waterlogged plant remains (see Table 7F.00). Cereal remains were virtually absent, with only two grains found, but a number of charred pulses and weed seeds were present.

Nine of the 13 samples came from upper fills of inhumation grave cuts for B573 [check] and BXXX. These samples produced a few charred peas and some weed seeds. Pitfill [1888] contained a number of lentils and Celtic beans, and a fragment of hazelnut shell, but no peas, cereals or weed seeds. This assemblage is more similar to those from the pyre debris samples at HOO than any from the other sites, and is the only sample from any site outside HOO to produce lentils. Other samples had too few charred remains for comment to be made on them.

Waterlogged seeds were present in most samples, but were not frequent. The majority were small fruit pips from grape (*Vitis vinifera*), blackberry/raspberry (*Rubus fruticosus/idaeus*), strawberry (*Fragaria vesca*) and fig (*Ficus carica*). A single peppercorn (*Piper nigrum*) was found in [1146]. This is thought to be the first such find from Roman London, and pepper has previously been found only from post-medieval contexts. The few remaining waterlogged seeds were from common weeds of disturbed and damp ground.

Plot 2 (WTE)

Plant remains were found in six samples from WTE. Records have not been kept of the original sample volumes, although the residue sizes would suggest that they must have been small, probably less than 10 litres.

Samples from cremation burials in pits (BXXX, BXXX, BXXX, BXXX, [1055], [1056], [1059] and [1063]) were the richest in charred plant remains (Table 7F.00). Peas were found in three out of the four and were particularly numerous in [1055]. These samples also contained a few cereal grains of wheat, barley and oats, and a relatively high number of weed

seeds. The majority of these were small grass seeds, and stem fragments, probably also from grasses, were also quite common.

The relatively high proportion of weed seeds in these samples resembles those from the cremations in pits at HOO and may reflect a similar origin, although at WTE the presence of peas and absence of lentils suggests that peas had been used as pyre goods instead of lentils. The predominance of grass seeds as well as stem fragments, particularly in the sample from [1055], may suggest that grasses or hay were also included in the funeral pyre, possibly as kindling. The two other samples, both from cremations, contained few seeds, although that from [1052] had the only Celtic bean from this site.

Very few waterlogged seeds were found at WTE (Table 7F.00), and most were from weeds of waste and arable land, although fig and blackberry/raspberry pips were present in [1059].

Plots 10, 11 and 12 (HAY)

Only three samples from this site produced plant remains (Table 7F.00), virtually all of them charred. Two samples from [433] and [460], both unurned cremation burials in pits, produced plant assemblages consisting mainly of weed seeds, with a few grains of wheat and oat. No cultivated pulses were found on this site, although seeds of wild legumes resembling clover (*Trifolium* spp.) and vetch (*Vicia/Lathyrus* spp.) were present. Grass seeds were common in [433]. The weed assemblage included plants of waste or arable land, as at other sites, but also several species common in grassy meadows, such as sheep's sorrel (*Rumex acetosella*) and bedstraw (*Galium* sp.) as well as the wild leguminous plants. These may have been cut with the grasses for hay, and possibly been used to help fire funeral pyres, as suggested for WTE. These assemblages could represent the local environment in or around the cemetery, rather than meadows elsewhere, as a periodically cut grassy surface seems likely, at least in areas of the cemetery in use at any particular time.

Alternatively, some or all the weed seeds may have derived from arable fields, and would have been harvested along with the cereal crop(s), some of which is represented in the samples.

Only three taxa were represented by waterlogged seeds at HAY.

Plot 18 (PRE)

The three samples from PRE came from fills [33], [34] and [36] of a timber-lined well. Their residues contained numerous inclusions of building material, pottery, glass, animal bone and marine mollusc shells as well as plant remains, showing that the (presumably disused) well was used to dispose of a variety of domestic rubbish.

The lower two fills ([34] and [36]) were particularly rich in charred plant remains and all three had assemblages very similar in composition (Table 7F.00). Each sample contained several wheat grains (*Triticum* sp.), those which were further identifiable being spelt (*T. spelta*) or emmer/spelt (*T. dicoccum/spelta*). Between 84% and 90% of each assemblage was made up of wheat chaff, including spikelet bases, glume bases, and fragments of glume. Fills [34] and [36] also contained 6-8% weed seeds, all of them from arable weeds which are common contaminants of cereal crops.

These charred assemblages represent waste from a second stage of crop processing, as described by Hillman (1981; 1984), in which, after threshing, the husks are separated from the grain and smaller weed seeds by sieving. Glume wheats such as spelt were often transported from the farms on which they were grown still within their spikelets (husks), and the final threshing and sieving would thus take place where the grain was to be consumed. While there is no obvious link between this crop processing waste and the cemetery activities, it could have been burnt as tinder on either a domestic fire or a funeral pyre, and the remains later disposed of down the well.

There is a danger that the waterlogged seeds (Table 7F.00) found in these samples may be modern contaminants, as the sample bags broke during the long time they were in storage after excavation. Species diversity was very low, and the majority were from nitrogen-loving disturbed ground plants. It would be dangerous to make any interpretations from this however, with the uncertainty about the age of these remains.

Discussion

The widespread preservation of charred lentil, pea and Celtic bean seeds in features containing cremated human bone at the cemetery sites strongly suggests their use as pyre goods. Seeds of these species have been found at other Roman sites in London, but usually in very small numbers, and identified only tentatively. More substantial numbers of lentil were found in a timber-lined pit at St Thomas Street, Southwark (Willcox 1977), where they were considered

more likely to be imported than a home-grown crop, although the latter was possible, and from a burnt grain deposit at the forum (Straker 1984), where the lentils were interpreted as weeds of an imported wheat crop. It is not known whether lentils were indeed grown in this country during the Roman period or imported from southern Europe, but peas and Celtic beans would certainly have been grown here.

All these pulses are nutritious foods, high in protein, and are known to have been used in Roman cooking (Renfrew 1985); they might have been regarded as sustaining the dead in any journey to the afterlife. Nowadays peas and broad beans are more often picked when young and eaten fresh, but in the past all these species were commonly dried and could therefore be stored for long periods. It is evident from the distinctive, rounded shape of the seeds recovered, that these were deposited raw. Pulses, particularly lentils, tend to lose their shape when cooked, and would have been unlikely to survive charring in a recognisable state.

While the unusual frequency of charred pulse seeds in cremated deposits makes it very likely that they were indeed used as pyre goods, the same does not apply, unfortunately, to the cereal remains. Wheat and barley are found, usually in small numbers and associated with similar assemblages of crop weed seeds, at virtually all Roman sites in London (Armitage et al 1987; Davis in prep.). There are at least three possible origins for those found with cremated material. Firstly, the cereal grains, and their associated weed seeds where present, may indeed have been part of semi-cleaned crops deposited with burials. Secondly, the weed seeds, and perhaps the cereals too, may have come from dried hay or straw used as tinder for lighting funeral pyres. At least some of the seeds could have come from plants growing locally in or around the cemetery. Thirdly, both the cereals and the weeds may be part of the background assemblage found in all sorts of deposits where there was Roman occupation, and representing a wide variety of domestic accidents and spillages unrelated to burial practices. Charred seeds are very robust, and may survive for long periods unless crushed, perhaps becoming distributed some distance from their place of origin. There is no obvious difference in number or composition between the charred cereals and weeds found in association with cremations, and those found from other features at SCS, suggesting that these remains may be unrelated to burial practices, but the number of samples from the latter is too small to draw definite conclusions from this.

While the inclusion of various raw, probably dried, pulses in cremation pyre goods was obviously widespread in the eastern cemetery, there is virtually no evidence for any other food plants. A single charred grape pip was found in pyre debris from [946] at HOO, and fragments of hazelnut shell from [1590] at the same site and [1888] at MSL. It is perhaps surprising that

more remains were not found of fruits and spices, some of which would surely have survived the funeral pyre in a charred state if they had been present. As other, artefactual, grave goods seem to vary considerably between graves it is (tentatively!) suggested that perhaps the use of lentils or peas was part of a ritual akin to throwing rice at a wedding, rather than part of an individualised meal for the deceased.

Fruit pips preserved by waterlogging were quite widespread although low in both numbers and species diversity. They came mainly from species which, like the charred cereals, are ubiquitous on Roman sites, namely fig, grape, strawberry and blackberry/raspberry. These seeds could be the remains of funerary feasts in the cemetery, but are equally likely to have come from nearby households, or could even have been deposited in bird droppings. It is even possible that these fruits may have grown in funerary gardens within the cemetery. Inscriptions show that these were quite common in the Roman world (Toynbee 1971). The single peppercorn found in redeposited cremated material at MSL is a rare find of what would have been an expensive spice, and is therefore more likely to have been part of the funeral offerings.

One aim of this study was to compare samples from the three groups of cremated material (urned cremation burials, unurned cremation burials and deposits of pyre debris) across all the sites. Differences were noted between these groups at HOO, and suggestions made as to likely explanations for these and for the origin of the deposits. Problems arise however, when attempting to classify assemblages from similar deposits at the other sites. Firstly the number of relevant samples is very small. Only a single sample, from MSL, came from material described as pyre debris, and although 14 came from unurned cremations, these were from three sites and sample sizes tended to be much smaller than at HOO. Secondly the inter-site differences, particularly in the species of pulse seed recovered may be more significant than those between feature types.

In general, samples from HOO contained frequent lentils, occasional Celtic beans but very rarely peas, and slightly more barley than wheat, although the majority of grains could not be identified. At MSL and WTE lentils were absent (with one notable exception) and, although peas seemed to take their place, fewer samples contained pulses of any sort, and when they did there were fewer of them. This may be a real difference between sites, or may merely reflect the smaller sample sizes [seeds per litre?]. Wheat was slightly more common than barley. No charred pulse seeds were found at HAY, SCS, or PRE, but most samples from these sites did not contain cremated material. In general, peas and lentils were not mixed, and the occurrence of one or the other seems to be related to plot, although occurrences were so few that this may be misleading.

The pyre debris sample from [1888] at MSL is something of an enigma, as its composition is very similar to those from similar deposits at HOO, being composed mainly of lentils, while the unurned cremations from the same site contained peas. Hence the ideas put forward to explain the relationship between the three types of cremated deposit at HOO do not apply here. It is pointless to speculate about reasons for this apparent inconsistency with so few samples available from this site. It is perhaps surprising that the plant assemblages from the pyre debris are so similar. With only one exception, these contexts had either no plant remains, or a remarkably similar composition. The answer obviously lies in the origin of these deposits, and it will be necessary to compare equivalent samples from other cemetery sites before a convincing explanation can be found.

The observation that at HOO unurned cremations tended to contain more charred weed seeds than either urned cremations or pyre debris, seems also to be true of similar deposits at MSL and WTE, although there are few samples from the latter two deposits to compare them with.

Evidence for the vegetation growing in the cemetery was scarce. Waterlogged seeds from various environments were found, but the assemblages were mostly small and very mixed. It is thus impossible to distinguish assemblages representing the plant communities inside the cemetery, which in any case may have been quite diverse in such a large area, and those that could have been brought in from elsewhere by either natural or human agency.

It has not been possible to study the spatial or temporal variations in the plant assemblages, except to a very limited extent at HOO, and to note differences between sites, as there were too few samples from most sites to produce meaningful results. A further problem was the difficulty of using negative evidence. The low recovery of plant items, partly because of small sample sizes, meant that where no plant remains were found in a small sample it could not be assumed that none would have been present had the sample been larger. Further study of larger samples from new sites in the study area is needed if these research questions are to be answered.

[5605 words]