Old Sarum Water Pipeline Specialist Reports

Charred Plant Remains

By C. Stevens

wessexarchaeology

Portway House
Old Sarum Park
Salisbury
Wiltshire
SP4 6EB

www.wessexarch.co.uk

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Chris Stevens
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Introduction

A total of 24 samples were examined from 4 of the sites. These are broken down by site and phase in Table CPR 1.

Table CPR 1 Charred plant remains samples by site and phase

Site	*Neo*	*LBA/ Neo*	*MBA*	*LBA*	*IA*	*LIA*	*Total*
2	-	1	1	-	-	-	2
3	7	-	6	-	-	-	13
5	4	-	-	-	-	1	5
6	-	-	-	1	3	-	4
Totals	11	1	7	1	3	1	24

Bulk soil samples were processed by flotation and sieving using 1 mm and 0.5 mm meshes. The resulting flots and residues were scanned under low magnification by Sarah Wyles and the charcoal separated from plant macrofossils. Charcoal fragments measuring >2 mm in radial cross-section were considered for species identification. The large volume of charcoal in sample 2 was 50% sub-sampled.

Results

The identifiable remains were quantified by number of items present. They are recorded in Tables CPR2 and 3, following the nomenclature of Stace (1997). For hazelnut fragments this was largely pieces over 2mm in size. However, two samples from the pit 6061 produced exceptional quantities of material and are considered further below.

The results from the samples are discussed by phase with the results from each site compared to the others for the Neolithic and Middle Bronze Age and Iron Age. Identifiable charred remains were recovered from all but the possible Iron Age features from site 8146 and 8158. The state of preservation varied from exceptional to very poor. A number of the features upon the site were very shallow and this factor may have contributed to the poor preservation recorded in a number of these circumstances.

Middle Neolithic and Late Neolithic/Early Bronze Age
These samples were characterised by high numbers of fragments of hazelnut (*Corylus avellana*). In most cases general number of fragments and conditions of preservation were broadly comparable. One pit 6061 did however produce outstanding quantities of well preserved hazelnut fragments, including several complete half shells. These same samples also produced high numbers of parenchyma fragments that in many cases from their overall morphology could be identified as from the internal cotyledons (the edible

part) of hazelnut. Some of these were highly shrunken characteristic of immature or aborted kernels.

Most of the samples contained occasional cereal grains, identified where possible as barley (*Hordeum vulgare sensu lato*) and wheat (*Triticum* sp.). While no grains were well enough preserved to identify naked and hulled varieties with utmost confidence it would appear nevertheless that both varieties were present. While the wheat grains were on the whole poorly preserved it is probable that both free-threshing and hulled varieties were present. Several grains characteristic of emmer or spelt were present and in a few cases were diagnostic of emmer wheat (*Triticum dicoccum*), the main hulled wheat recorded from Neolithic Britain. A few grains were characteristic of free-threshing wheat (*Triticum aestivum sensu lato*) and a single possible rachis fragment was also recovered. A point of interest is that while identified cereal grains never numbered more than ten that many samples still produced evidence for two to three different species of cereal.

Few further remains from edible or inedible species were recovered. One seed of probable sloe (*Prunus spinosa*) came from Pit 3328, within Site 3. From Site 5, pit 6065, produced charred seeds of elder, (*Sambucus nigra*) while a possible apple pip (*Malus* cf. *sylvestris*) came from Pit 6061.

Possible fragments of tubers of onion couch (*Arrehenatherum elatius* subsp. *bulbosus*) were recovered, and while other tuber remains were also recorded, several of which had small amounts of external morphology, none could be identified further. Onion couch or false oat grass is a common feature of poorly grazed grasslands, although it is also recorded along grass rides and is a common feature within hedgerows. The samples from pit 3000 in Site 3 also produced a seed of fumitory (*Fumaria* sp.), while that from 320 and 3328 contained seeds of probable vetch. One of these (half a cotyledon) resembled bitter vetch (*Vicia ervilia*), a fodder crop present from Neolithic sites in France (Marinval 1991) but unknown from the British Isles. The seed was not well enough preserved for a positive identification and its general proportions are within the range of other Vicia species. Species of vetch and fumatory are common weeds of arable land and contaminant of seed grain by virtue of its large grain sized seeds. These most probably came into the assemblage with the cereal grains.

No real differences were notable between the sites, although the single pit from Site 2 did produce more cereal grains, mainly of barley. That the pit is of a probable late Neolithic / early Bronze Age date may be in part the reason for the difference seen.

Middle Bronze Age

All these samples came from Site 3, apart from one from a cremation pit within Site 2. All contained cereal remains, including barley grains of which one could be identified as of the hulled variety, and emmer grains and glume bases. No remains of free-threshing wheat were recorded. Fragments of hazelnut were present in two of the samples from Site 2 and the roundhouse posthole 3147. Seeds of common arable weeds were also present, although in limited quantity from the samples. These were predominately of larger seeded species seeds, black bindweed (*Fallopia convolvulus*), cleavers (*Galium aparine*) and vetch (*Vicia/Lathyrus*). Fragments of probable clover/medick (*Trifolium/Medicago* sp.), a small seed of grass, probably meadow grass or cats' tails' (*Poa/Phelum* sp.) and oats (*Avena* sp.) in these samples. All are common weeds of arable fields although none have specific ecological requirements.

Grass tubers and other seeds are common finds within cremation pits, although none of the former were found within Pit 2129, Site 2 and the seeds of wild species are similar to those encountered along with cereal remains in the samples from Site 3.

Later Bronze Age and Iron Age Samples
All these samples came from Sites 5 and 6. All the grain identified within these samples were of barley and in the case of the later Bronze Age sample could be identified as mainly hulled rather naked barley. A single grain of wheat was recovered from pit 3300. No chaff or weed seeds were present within these samples and the general preservation in all but the later Bronze Age samples was very poor indeed. The only other identifiable remains were two fragments of the tuber of false oat grass from Iron Age posthole 8115 and a further possible example from the kiln 6163. This latter feature produced few identifiable remains. All these samples contained frequent fragments of parenchyma type material, although it was badly preserved and might relate to some other unidentified activity or deposit.

Medieval
The postholes from the rectangular structure produced little material although both a hulled grain of barley and probable grain of free-threshing wheat were recovered. Both are common cereals grown within this period.

Discussion

Aspects of change within Neolithic and Bronze Age subsistence regimes
Even though the excavation was relatively small-scale and samples limited in material, they still provide a typical example of the differences reflected elsewhere in Britain concerning the nature of Neolithic and Bronze Age subsistence regimes.

Comparing the samples several differences become obvious. The Neolithic samples without exception produced hazelnuts from every sample. The Middle Bronze Age samples produced only two fragments of hazelnut one from the posthole of roundhouse 3177, one from the cremation. The other major difference is that the Neolithic samples produced no evidence for chaff and only three weed seeds, while all the Middle Bronze Age samples produced evidence for weed seeds bar that from posthole 3177.

At King's Barrow near Amesbury, middle Neolithic pit fills contained large quantities of hazelnut shells, a seed of sloe and single hulled wheat grain and a large weed seed of black bindweed (Carruthers 1990). Samples from Poundbury (Monk 1987) and Whitesheet Down contained similar remains, (Hinton *in press*) produced similar remains.

Earlier Neolithic sites in southern England produced similar range of material, for example samples from Robin Hood's Ball produced only hazelnut shells (Moffett *et al* 1989), while those from Hazelton long barrow produced evidence for both hazelnuts, cereals and large weed seeds (Straker 1990a).

Far fewer sites of middle Bronze Age date are known in the region. One from the Dorset ridgeway produced possible storage pits with large amounts of barley grain (Carruthers 1991) and predominately larger weed seeds. While other sites in the Dorchester region produced only a few cereal remains, mainly of barley (Straker 1997). An examination of Middle Bronze Age sites from south-west Britain in Devon (Clapham

and Stevens 1999), Cornwall (Straker 1991) and Brean Down, Straker (1990b) showed a somewhat different pattern. Here both cereal remains and smaller seeds were more frequent within the assemblages, a point that is returned to later.

Charred remains as they relate to Neolithic subsistence

It has been argued that such a predominance of hazelnut remains on Neolithic sites indicates a continued reliance on wild resources (Moffett *et al* 1989, Robinson 2000). The high numbers of hazelnut remains compares well to Mesolithic sites where such remains are often the only plant remains recovered other than wood charcoal (e.g. Zvelebil 1994).

Others have argued that hazelnuts survive on Neolithic sites by virtue of their robustness and the lack of cereal grains is a product of small sample size (e.g. Legge 1989, Jones 2000). The outstanding remains from the site at Old Sarum, along with other such evidence from close to the Whitesheet enclosure are rare, but in both cases preservation has occurred through the burning of hazelnuts in close proximity to the pits in which they were found.

The quantities of remains in the two richest pits are not substantial compared to those recovered from the Colonsay midden (Mithen 2000), where it was estimated two to three dustbins worth were present. The number is more comparable to those from Whitesheet Hill (Hinton ***in press***), where around 250 hazelnuts were estimated. Such figures following those conducted on Mesolithic sites by Scaife (1992) and Mithen (2000) should at least be doubled if not quadrupled to account for fragments of nutshell that did not survive. However, it is questionable how far such figures represent the number of hazelnuts originally involved. As the hearth deposit was not burnt *in situ* we will neither have the original number of shells before or after charring. An estimate of the number of nuts that might have originally been involved therefore could clearly go to tens of thousands.

While the exact input of hazelnuts to the Neolithic diet may continue to elude us, the general density of hazelnuts within Neolithic British sites would seem to indicate more than a casual relationship with this resource.

The exact period over which hazelnuts were used is problematic. Robinson (2000) suggests that the pits where hazelnuts are found in abundance are unsuitable for grain storage but may have been used for the storage of hazelnuts. Unless picked ripe and stored in cool dry conditions, hazelnuts are difficult to store beyond March (Howes 1948). Hazelnuts ripen in late summer from late August/early September to October, if they were indeed stored in pits for one to four months then we might envisage that these sites represent late autumn to winter occupation.

Modelling of Mesolithic communities in Britain (Lake 2000) has suggested that groups living in temperate regions exploiting wild foods, in particular hazelnuts, are likely to have been relatively small in size, perhaps one to three families. Such people would also have been quite mobile moving to new locations where small temporary encampments are erected every one to two weeks as resources within the local area ran low and it became beneficial to move the camp to a new site.

The increase in excavation and routine sampling of sites within Britain has gradually revealed a number of sites where Neolithic pits either clustered in small groups of two to 3 or found in isolation have been associated with hazelnut remains and limited

evidence for cereals. It is possible that such pits are to be associated with a mobile people exploiting wild resources including hazelnuts.

This suggests primarily that the people who dug the pits at Old Sarum were most probably engaged in the collection of hazelnuts during the autumn months, which possibly formed a substantial part of their diet over this period. Sloe, along with elder would have also been collected during these months.

Neolithic cereal cultivation

We may now turn to a second question concerning the extent of involvement of these people with farming. The samples here as with many Neolithic and later Neolithic/early Bronze Age remains are rich in remains of hazelnuts, with less grain, no chaff and no weed seeds. Several authors (e.g. Robinson 2000, Legge 1989) have commented on the general absence of weed seeds and chaff from Neolithic sites. A point that has been used to suggest that Neolithic people may have been less reliant on farming (Thomas 1999).

Robinson (2000) has commented on the possibility that chaff may have been removed and burnt elsewhere, a point that is considered in more detail here. Later prehistoric sites frequently contain reasonable quantities of both cereal chaff and weed seeds. This difference has also been picked up albeit to a lesser extent on this site when comparing the Neolithic samples to those of the middle Bronze Age.

One explanation proffered for the usual abundance of chaff and weed seeds on later prehistoric settlements is that charred assemblages result from the taking of crops routinely throughout the year from storage, processing them (involving the removal of glumes) and discarding this waste into the fire (Stevens 2003). In this way chaff and weed seeds that are removed during summer after harvest, but before the crops are brought to the settlement to be stored, are often left in the field and so never become charred.

In applying this information to the assemblages from this site we may ask whether the hazelnuts themselves were derived from similar activities - the collection, storage, processing and discard of such material during the sites occupation. For many of the pits this is a clear possibility, and given the ubiquity of remains of hazelnut shells across both this and other Neolithic sites, would seem probable.

The processing of cereals and their preparation into food also results in some loss of grain. If only clean grain was brought to and stored on the site then only a few grains may be lost, and chaff and weed seeds will be absent. This implies that much of the processing, including the de-husking of glume wheats had been done elsewhere. This may have been in the field immediately following harvest. Or perhaps crops were stored temporarily as spikelets and then processed *in bulk* throughout the year at non-domestic sites e.g. causewayed enclosures, where the waste did not become incorporated into domestic fires.

Charred evidence for stored crops e.g. Hambledon Hill and Claythorpe pipeline, offer conflicting results. The former was seen to contain burnt spikelets (Glynis Jones *pers. comm.*) while the latter produced clean grain (Huntley 1996). This might then be seen to support the second theory.

The storage and transport of clean grain is in keeping with the interpretation of such sites as temporary encampments. Unprocessed cereals are more bulky than processed cereals. For hulled crops those stored as clean grain take approximately two-thirds of the space (and presumably weight) of those stored as clean grain.

A second point concerns the equipment needed for processing. Within modern ethnographic communities de-husking frequently involves the use of heavy wooden mortars that would have been inconvenient to carry around. For relatively mobile peoples these factors would make the transport of more fully processed cereals more convenient, although de-husking would make them less suitable for storing for long periods.

What we don't know is whether the people who dug the pits at Old Sarum were themselves engaged with the growing of the crop. Harvesting and post-harvest processing of cereals before storage are highly labour intensive activities. It would seem probable that whether crops were grown by the community, small-scale farmers, or farmers engaged in foraging that processing would have been a highly communal activity occurring around late summer. After harvest the resultant clean grain would then have been distributed amongst the group before they dispersed to collect wild foods in late summer to early autumn.

Middle Bronze Age subsistence

The middle Bronze Age samples produced little evidence for the exploitation of wild foods, a few fragments of hazelnuts were recovered as is still common on sites of this date, perhaps indicating some continued exploitation of such resources albeit on a relatively small scale. The number of cereal and chaff remains in these samples is low, but when compared to the wider differences seen between the Neolithic and middle Bronze Age are still significant. The observation made for sites dating from the middle Bronze Age to the Romano-British, where glume wheats are present, is that glumes appear to either exceed or approximately equal the estimated number of hulled wheat grains. While the samples from this site are small this can still be seen to apply to the middle Bronze Age samples from Site 2. This implies their storage within the glumes and the removal of these on a day-by-day basis, as and when clean grain was required. Weed seeds were few, but are consistent with the large seeds extracted by hand at the end of the processing sequence (Stevens 2003). The differences alluded to earlier between this site and those in the south-west England may also be related to differences in storage with those in the south-west perhaps stored in a less processed state.

The samples then represent a change in which some processing rather than being conducted after harvested is spread throughout the year along with the demand on labour needed to conduct it. Such a change may be more in keeping with smaller self-sufficient, less mobile farming families.

The differences seen between the middle Neolithic and middle Bronze Age at the Old Sarum pipeline may then be compared to those changes seen within the wider landscape. Most notably the appearance of field systems on Cranborne Chase (Barrett *et al* 1991) and on the Salisbury plain lying some 5 to 10 kilometres to the north of the Old Sarum sites (Bradley *et al* 1994, McOmish 1998, McOmish *et al* 2002).

Later Prehistoric and Medieval Remains

The remains from the later prehistoric samples, those of Iron Age date and Medieval period as seen were very poorly preserved, and in some cases it was even problematic to establish that cereals were even indeed present. These remains came from Sites 3, 5 and 6. Those from site 6 were particularly poor and it is difficult to put any interpretation upon them.

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Table CPR2 Charred plant remains, Neolithic and Early Bronze Age

Site	*2*	*3*						*5*			
Phase	*LN/EBA*	*MNEO*					*?Neo*	*MNEO*			
Feature	*1034*		*3000*		*3007*	*3020*	*3119*	*3328*	*6056*		*6061*	*6093*
Context	*1035*	*3002*	*3001*	*3008*	*3012*	*3021*	*3120*	*3329*	*6057*	*6063*	*6064*	*6097*
Original Volume litres	*28*	*30*	*15*	*30*	*30*	*30*	*30*	*9*	*30*	*30*	*20*	*20*
Flot Volume ml	*410*	*90*	*40*	*120*	*150*	*60*	*235*	*80*	*240*	*230*	*500*	*175*
Cereals and other crops												
Hordeum sp. (grains, hulled)	cf.1	-	-	-	-	-	cf.1	-	-	-	cf.1	-
Hordeum sp. (grains, naked)	cf.2	-	-	-	-	1	-	-	-	-	-	-
Hordeum sp. (grains indet.)	10	1	-	-	-	-	1	-	-	-	-	cf.1
Triticum sp. (grain)	1	-	-	-	-	1	3	-	-	-	-	-
T. dicoccum/spelta (grain)	2	-	-	-	-	-	2	-	-	-	-	-
Triticum dicoccum (grain)	-	-	-	-	-	-	-	cf. 2	-	1	-	cf.1
Triticum aestivum sl (grain)	-	-	-	-	-	1	1	-	-	-	3	cf.1
Triticum aestivum sl (rachis)	-	-	-	-	-	-	-	cf.1	-	-	-	-
Cereals undiff. (grains)	2	5	2	-	-	2	-	1	-	-	1	-
Cereal undiff. (grain frgs.)	1	-	-	-	-	3	-	-	-	-	-	-
Cereal/Poaceae (grain)	-	-	-	-	-	1	-	-	-	-	-	-
Species name												
Fumaria sp.	-	1/2	1/2	-	-	-	-	-	-	-	-	-
Corylus avellana (hazelnut frgs.)	131	64	50	189	*350+*	19	96	283	478	3000+	10,000+	96
Corylus avellana (parenchyma)	-	-	-	-	-	-	-	-	-	10+	50+	-
Hazelnut fragments >4mm	-	-	-	-	-	-	-	-	-	215	437	-
Prunus spinosa	-	-	-	-	-	-	-	cf.1	-	-	-	-
Malus sylvestris	-	-	-	-	-	-	-	-	-	cf.1	-	-
Potentilla/Fragaria sp.	-	-	-	-	-	-	-	-	-	1	-	-
Vicia/Lathyrus sp.	-	-	-	-	-	-	-	-	-	2	-	-
Vicia/Pisium/Lens sp.	-	-	-	-	-	1	-	cf.1	-	-	-	-
Sambucus nigra	-	-	-	-	-	-	-	-	1	-	-	-
Poaceae/Cereal (culm nodes)	-	1	-	-	-	-	-	1	-	-	-	-
Poaceae tuber small indet.	-	-	1	-	-	-	-	-	-	-	-	-
Arrhenatherum elatius var. *bulbosum* (tuber)	-	-	cf.1	-	-	-	-	-	-	-	1	-
Hordeum murinum	-	-	-	-	-	-	-	-	-	-	-	cf.1
Parenchyma (non-vascular)	-	11	4	9	11	31	29	30	25	25 frgs	-	7
Parenchyma/Cereal type	-	-	-	-	-	-	-	-	2	-	2	-

Site	*2*	*3*						*5*			
Phase	*LN/EBA*	*MNEO*					*?Neo*	*MNEO*			
Feature	*1034*		*3000*		*3007*	*3020*	*3119*	*3328*	*6056*		*6061*	*6093*
Context	*1035*	*3002*	*3001*	*3008*	*3012*	*3021*	*3120*	*3329*	*6057*	*6063*	*6064*	*6097*
Original Volume litres	*28*	*30*	*15*	*30*	*30*	*30*	*30*	*9*	*30*	*30*	*20*	*20*
Flot Volume ml	*410*	*90*	*40*	*120*	*150*	*60*	*235*	*80*	*240*	*230*	*500*	*175*
Tuber indet.	-	-	1	-	4	-	5	-	2	-	1	-
Fish Bone	-	-	-	-	-	-	-	-	1	-	2	-

Table CPR3 Charred plant remains, Middle Bronze Age to medieval

Site	*2*	*3*					*5*				*6*
Phase	*MBA*	*Middle Bronze Age*			*Medieval*		*LIA*	*LBA*			*Iron Age*
Feature Type	*Crem. grave*	*Pit*	*3240 roundhouse posthole*		*3251 structure pit/posthole*		*Kiln*	*Pit*	*8023 roundhouse posthole*	*8100*	*Pit*
Feature Number	*2129*	*3102*	*3091*	*3147*	*3177*	*3300*	*3306*	*6163*	*8080*	*8115*	*8146*	*8158*
Context	*2120*	*3133*	*3114*	*3173*	*3178*	*3253*	*3261*	*6164*	*8082*	*8116*	*8147*	*8159*
size litres	*20*	*20*	*7*	*20*	*6*	*18*	*18*	*20*	*20*	*9*	*5*	*20*
flot size ml	*125*	*70*	*30*	*80*	*25*	*50*	*60*	*80*	*100*	*40*	*40*	*80*
Cereals and other crops												
Hordeum sp. (grains, hulled)	-	-	-	1	-	1	-	-	3	-	-	-
Hordeum sp. (grains indet.)	cf.1	1	5	2	cf.1	-	-	2	6	cf.1	-	-
Triticum sp. (grain)	1	-	-	-	-	-	-	-	1	-	-	-
Triticum dicoccum/spelta (grain)	-	-	2	-	-	-	-	-	-	-	-	-
Triticum dicoccum (grain)	-	-	cf.2	cf.1	-	-	-	-	-	-	-	-
Triticum dicoccum (spikelet fork)	-	-	1	-	-	-	-	-	-	-	-	-
Triticum dicoccum (glume base)	-	-	1	-	-	-	-	-	-	-	-	-
T. dicoccum/spelta (glume bases)	-	-	1	1	-	-	-	-	-	-	-	-
T. dicoccum/spelta (spikelet forks)	-	-	-	1	-	-	-	-	-	-	-	-
Triticum aestivum sl (grain)	-	-	-	-	-	cf.1	-	-	-	-	-	-
Cereals undiff. (grains)	-	4	2	9	-	5	cf.2	-	4	2	-	3
Cereal undiff. (grain fragments)	-	14	3	-	-	-	-	-	-	-	-	-
Cereals undiff. (rachis fragment)	-	-	-	-	-	-	-	-	1	-	-	-
Species name												
Corylus avellana (hazelnut frgs.)	1	-	-	1	-	-	2	-	-	-	-	-
Fallopia convolvulus	1	-	-	2	-	-	-	-	-	-	-	-
Vicia/Lathyrus sp.	1	1	1+cf.1	1	-	-	-	-	-	-	-	-
Medicago lupulina/Trifolium sp.	-	-	-	cf.1.	-	-	-	-	-	-	-	-
Galium aparine	-	2	-	cf.1	-	-	-	-	-	-	-	-
Monocot stems and root stems	-	-	1	-	-	-	-	-	-	-	-	-
Poaceae/Cereal (culm nodes)	-	-	-	-	-	-	-	-	-	-	1	-
Poaceae large (>2mm)	-	cf.1	-	-	-	-	-	-	-	-	-	-
Poa sp./Phleum sp.	-	-	cf.1	-	-	-	-	-	-	-	-	-
Arrhenatherum elatius var. *bulbosum* (tuber)	-	-	-	-	-	-	-	1?	-	1+1	-	-
Avena sp. (grains)	-	-	-	cf.2.	-	-	-	-	-	-	-	-

Site	*2*			*3*				*5*				*6*
Phase	*MBA*		*Middle Bronze Age*			*Medieval*		*LIA*	*LBA*			*Iron Age*
Feature Type	*Crem. grave*	*Pit*	*3240 roundhouse posthole*			*3251 structure pit/posthole*		*Kiln*	*Pit*	*8023 8100 roundhouse posthole*		*Pit*
Feature Number	*2129*	*3102*	*3091*	*3147*	*3177*	*3300*	*3306*	*6163*	*8080*	*8115*	*8146*	*8158*
Context	*2120*	*3133*	*3114*	*3173*	*3178*	*3253*	*3261*	*6164*	*8082*	*8116*	*8147*	*8159*
size litres	*20*	*20*	*7*	*20*	*6*	*18*	*18*	*20*	*20*	*9*	*5*	*20*
flot size ml	*125*	*70*	*30*	*80*	*25*	*50*	*60*	*80*	*100*	*40*	*40*	*80*
Seed indet. <2.5mm	-	-	2	?2	-	-	-	-	-	-	-	-
Parenchyma (non-vasular) indet.	17	-	24	21	9	36?	42	18	27	10	25	23
Tuber/Cereal indet.	-	-	1	-	-	-	5	2	-	-	1	-
Wood charcoal	++	+	+	+	+	+	+	-	-	-	-	-
Bud indet.	-	-	-	-	-	-	-	1	-	-	-	-
Fish	-	-	-	2	-	-	-	-	-	-	-	-
Indet.	-	-	-	-	-	-	3	-	-	-	-	-

Wessex Archaeology Ltd registered office Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB
Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk www.wessexarch.co.uk

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