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COLD HARBOUR FARM, CROWMARSH, WALLINGFORD
PLANT REMAINS FROM THE CORN DRYING OVEN

ENVIRONMENTAL STUDIES REPORT

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Plant remains from the corn drying oven

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SUMMARY
Two environmental samples from a Roman corn drying oven at Cold Harbour Farm, Wallingford, Oxfordshire, produced evidence for a range of charred plant remains, including cereal grains and chaff, weed seeds, and food plants, such as peas. The assemblage suggests the use of grain processing waste (chaff and weed seeds), as a fuel for the furnace.

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ARCHIVE LOCATION

Wallingford Museum, Flint House, 52 High Street, Wallingford, Oxon. OX10 0DB

DATE OF EXCAVATION 1996

DATE OF RESEARCH 2009

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INTRODUCTION

Excavations carried out at Cold Harbour Farm Crowmarsh, Wallingford, between 1993 and 1997, revealed a cemetery of twenty five burials and a presumed domestic settlement area, consisting of a ditch, a corn dryer and a tile and stone scatter, which are clear evidence of a building, probably a defended Roman farmstead or a high class farm with a surrounding ditch. Both areas date to the late 4th century, on the basis of pottery and coins recovered.

The present report aims to examine and discuss the results of the analysis of two environmental samples taken from the corn dryer. The feature was of a T shape, with a central flue, from which the samples were taken. Associated with the dryer was a floor, which showed signs of burning. Both the dryer and the area around it seemed to have been used as a dump for domestic waste.

METHODOLOGY

Two contexts (A8 and A9) from the corn dryer were sampled. The samples were processed using a Siraf tank with a 300 micron mesh being used for the flot and a 0.5mm mesh for the heavy residue. The flots were then sent to the Oxford University Museum Environmental Archaeology Unit for a preliminary analysis.

Given the promising results, further analysis was undertaken in May 2009 at English Heritage's environmental laboratory, Fort Cumberland, Portsmouth, by Mariangela Vitolo, under the supervision of Mrs. Gill Campbell and Dr. David Robinson.

The flots were analysed using a binocular microscope at up to 50 x magnification. First of all, the plant remains, such as cereal grains, chaff and weed seeds were sorted from the matrix of charcoal, snail shells and small mammal and fish bones. Then, using English Heritage's reference collection, they were identified and quantified. For each sample, the exact number of each kind of plant remain was recorded, along with the state of preservation, using a scale of 1 to 6, where 1 is "perfect" and 6 is "clinkered", and the presence of distortions, using a scale of 1 to 5 (Hubbard R and Al Azam A. 1990). The results were eventually put on an excel sheet and are shown on Table 1.
Nomenclature follows Stace (1997) for wild plants and Zohary and Hopf (2000, table 3, table 5) for the cereals.

RESULTS

Sample A9 produced the largest flot and was the richest in plant remains. Most of the charred grains were not identifiable to genus, given the bad state of preservation, due to the conditions of charring. Over one thousand glume base fragments were recovered, confirming the presence of glume wheats at the site. Though most of the glume bases were *Triticum dicoccum/spelta* type (emmer/spelt), large numbers were identified as *Triticum spelta* and as *Triticum species.* Only thirty four grains were identified as H*ordeum sp.* (barley). Seventeen embryos and one hundred fifteen sprouts were counted, but it was not possible to assign these to a particular type of cereal. One hundred eighteen twisted awns, of the *Avena* type (oat) were recovered, whilst only thirty three were straight and identified as *Triticum/secale sp.* (wheat/rye). Three peas (P*isum sativum*) were also recovered.

A small number of oat grains (*Avena sp.),* were also found. The absence of floret bases means that it was not possible to tell whether the grains come from wild or cultivated oat, therefore in the results table they have been recorded with the grasses. Most of the identifiable wild grasses found were recognised as B*romus hordaceus* type (brome), and thirty two as *Lolium/Festuca*. The latter were very poorly preserved and the surface was worn out, so that it was not possible to identify them as one or the other with any certainty. Most of the grasses though, were indeterminate.

The majority of the weed seeds recovered were modern and they were not counted. However, a small number were charred and can be considered to be contemporary with the other charred remains. One mineralised legume was also found. The charred seeds included: *Rumex* sp. (dock), *Ranunculus* sp. (buttercup), *Tripleurospermum* sp. (mayweed), S*ilene dioica* (red campion), *Centaurea* sp. (knapweed), *Fallopia convolvulus* (black bindweed).

Sample A8 was much smaller and didn't contain such a large amount of grains, chaff and seeds. Two hundred twelve fragments of glume bases were identified as *Triticum spelta* L. (spelt wheat) and only twenty four as *Triticum dicoccum/spelta.* Just over one hundred cereal grains were found, most of them were *Triticum* sp. type (wheat), about a third were *Hordeum sp.* (barley), and the rest were indeterminate. No embryos, sprouts and awns were found in this flot. Very few grasses were recovered, of which three were bromes and two indeterminate Poaceae. Only three weed seeds were found: one *Centaurea scabiosa*, one *Rumex* sp.*,* and one *Malva* sp*.* The rest of the seeds were uncharred and modern.

DISCUSSION

The two samples differed in size and content, with A9 producing more cereal remains and charred seeds, although the grains from this sample were more distorted and less

easy to identify. The majority of the remains recovered consisted of cereal chaff, especially glume bases, although spikelet forks and one rachis internode were also found. The chaff was mostly identified as *Triticum spelta L.* (spelt wheat), but a few pieces presented some resemblance with *Triticum dicoccum* (emmer wheat), although none of them was identified as a definite emmer, therefore it is likely that all the wheat was spelt. Most grains were fairly distorted, because of the conditions of charring, and only a few were identified as barley and wheat. Sample A9 was also very rich in wild grasses, most of which were indeterminate. However it was possible to identify a fair amount as *Bromus hordaceous type* and as *Lolium/Festuca.* Only five were identified as wild oat, although one hundred eighteen twisted awns, belonging to the same kind of grass, were also found. Compared to the grains, other seeds were not numerous in both samples. Most of them were common seeds, like *Fumaria* , *Montia, Rumex* and one *Sambucus*, but they were all modern. Some charred arable weeds occurred, such as a couple of *Centaurea* sp. in sample A9 and one *Centaurea scabiosa* (greater knapweed) in A8, a *Silene dioica* (red campion), and a mineralised legume in sample A9. Some rodent droppings were recovered from the same sample.

The presence of a large number of detached sprouts from sample A9 suggests that one of the functions of the corn drier was to dry malted grain, although studies on Roman period corn dryers have shown that these structures did not have one single purpose, but were used both for roasting germinated grains in order to brew beer and for parching them for consumption and storage (Van Der Veen 1989, p.316).

To assess which crop processing stage the remains recovered represent, for both samples, a ratio of their main constituents (glume bases, wheat grains and weed seeds) has been calculated (using Method 1 from Var de Veen 1992, pp 82-84**).** For both of them the ratio between chaff and wheat grains was well above 1 (3.26 for A8 and 8.80 for A9), meaning that the cereal processing by-product was represented. This suggests that the sample represents a fine-sieving residue. However, the scarce presence of weed seeds suggests that the samples probably represented a product cleaned of the impurities prior to processing.

CONCLUSIONS

All the plant remains recovered from the two samples were preserved as a result of burning, as charred remains, apart from one single legume which presented evidence of mineralization. Most of the charred remains consisted in the fuel used to fire the corn drying oven (mainly wheat chaff), and only a few seeds were recovered, which hints to the use of a rather clean product, obtained either by rigorous cleaning of the spikelets from the weed seeds, or by reaping high on the straw, or by zealous weeding of the fields (Leech 1982).

The predominance of spelt wheat is attested at other sites of the same period, namely Barton Court Farm in Oxfordshire (Miles 1986), Claydon Pike in Cotswold Water Park, (Straker 2006), and Catsgore in Somerset. (Leech 1982)

The lack of bread wheat is not uncommon either, although, not needing to be exposed to heat, free-threshing grains could be removed at an early stage of the crop processing, therefore they might be under represented in the archaeological evidence (Hillman, 1984). One exception is represented by Roughground Farm, in Gloucestershire (Letts 1993), where *Triticum aestivum* s.l. (free-treshing bread wheat type) is present in a significant quantity in a Roman context.

From sample A9 three peas and one unidentified mineralised legume were recovered. Although legumes are not common at other British sites of the same period, a few peas and one Celtic bean were recovered in different phases at Claydon Pike (Straker 2006). It is probable however that pulses occurred in human diet at the time, but are under represented in charred assemblages, because they did not need exposure to heat after harvest under order to make them ready for consumption (Straker 2006).

The samples discussed in the present report provide us with important information, although they represent only a small dataset. Larger scale investigation would be needed, to shed more light on the overall economy of the site.

Table 1. Charred plant remains from the flues of the 4th century corn drying oven at Cold Harbour Farm. (numbers in brackets indicate tentative identifications)

Sample Context		A8	A9
Taxa (element if not a 'seed')	**Common name**		
Ranunculus sp.	Buttercup		1
Agrostemma githago L.	Corncockle		1
Silene dioica (L.) Clairv.	Red campion		1
Caryophyllaceae indet.			1
Fallopia convolvulus (L.) Á. Löve	Knotweed		1
Rumex sp.	Dock	1	2
Malva sp.	Mallow	1	
Pisum sativum L.	Pea		3
Fabaceae indet.	Legume (mineralised)		1
small Fabaceae indet.	Small indeterminate legume		3
Prunella vulgaris L.	Selfheal		1
Centaurea scabiosa L.	Greater knapweed	1	
Centaurea sp.	Knapweed		2
Tripleurospermum sp.	Mayweed		2
cf *Avena fatua* L.(floret)	cf. Wild oat		1
Avena sp. (grain)	Oat (grain)		5
Avena type(awn)	Oat(awn)		118
Festuca/Lolium sp.			32
Bromus hordeaceus type	Brome	3	36
cf *Bromus* sp.	cf. Brome		1
Poaceae indet.		2	12
Poaceae indet.(rachis)			1
cf Triticum dicoccum (Schranks)Schulb (glume base)	cf Emmer (glume base)	1	
T.spelta L. (glume base)	Spelt wheat (glume base)	213(2)	395 (22)
T.spelta L.(spikelet fork)	Spelt wheat (spikelet fork)	3	
T.spelta L.(rachis internode)	Spelt wheat (rachis internode)		2
T.spelta L. (spikelet and spikelet fork)	Spelt wheat (spikelet and spikelet fork)	9	7(6)
T.spelta L. (spikelet fork)	Spelt wheat (spikelet fork)	17	14
Triticum dicoccum/spelta (glume base)	Emmer/spelt wheat (glume base)	24	1023
Triticum dicoccum/spelta (spikelet fork)	Emmer/spelt wheat (spikelet fork)	6	248
*Ttriticum sp.*type (grain)	Wheat (grain)	63	33
Triticum sp. (glume base)	Wheat (glume base)		693
Triticum/Secale sp.(awn)	Wheat/rye(awn)		33
Hordeum sp. (grain)	Barley (grain)	21	
Hordeum sp.(rachis)	Barley (rachis)		1
cf *Hordeum* sp.(grain)	Barley (grain)		34
Cerealia indet (grain)	Indeterminate cereal (grain)	36	553
Cerealia indet. (embryo)	Indeterminate cereal (embryo)		17
Cerealia indet (sprout)	Indeterminate cereal (sprout)		115
Cereal size (culm base)			1
Indeterminate seeds			7

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