

Charred plant remains from Cawston DMV, Dunchurch, Rugby, Warks (DC99).

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Introduction

The medieval settlement of Cawston was a grange of the Cistercian Abbey of Pipewell in Northamptonshire which was recorded as having a role in supplying bread to neighbouring granges in the 13th century. The excavation investigated a pre grange phase, the 12th-13th century monastic grange and rebuild of mid 13th-early 14th century. The site was excavated by Warwickshire Museum directed by Stuart Palmer and Richard Newman and sampling was carried out during the excavation to recover charred plant remains to investigate the crops cultivated and activities on the site in the past. It was hoped that these remains would provide evidence of the agricultural economy of the site and add to evidence from charred plant remains from the extensively sampled sites of Burton Dassett and Boteler's Castle and others in the region to provide evidence about life in the countryside in the medieval period.

Methods

Samples were taken at the discretion of the archaeologists from well defined contexts which were thought to have the potential to contain remains. They were wet sieved with flotation into a 0.5mm mesh sieve. The flotation fractions (flots) were air dried and all assessed for the presence of plant remains by scanning using a x10 stereo microscope. Samples with good potential to produce evidence were then analysed by sorting the flot using x10-60 magnification and the plant remains identified by comparison with modern material at the University of Leicester Archaeological Services. For the richer flots a known fraction was sorted. The remains were counted and listed (table 1), the plant names follow Stace (1991) and are charred seeds in the broad sense unless described otherwise.

Results

The cereals: Abundant cereal chaff fragments were found in four samples from the site which is unusual amongst the sites investigated in the area. Chaff is more diagnostic than grains and allows the identification of the species of wheat found (cf Moffett 1991). Wheat chaff fragments (rachis) included some of which could be identified as of bread wheat (*Triticum aestivum* s.l.) and some as a second type of free-threshing wheat which is known as rivet wheat (*Triticum turgidum* type). The rachis is the central axis of the cereal ear and each segment bears an average of three grains. Some of the identified grains were also of wheat (*Triticum* sp), mainly of the characteristic short broad shape of free-threshing wheat. Rye (*Secale cereale*) was also present as abundant chaff (rachis) and also as grains as an additional important cereal. A small amount of barley (*Hordeum vulgare*) was present as small numbers of abraded grains and chaff fragments which could not be identified further. Oats (*Avena* sp.) were also present in small numbers with cultivated oat (*Avena sativa*) identified from the form of the scar of attachment on a few spikelet bases.

Possible food plants: Other food plants were legume fragments of possibly peas or beans (*Vicia/Pisum*). A few fragments of hazel nutshell showed the consumption of gathered resources.

Wild plants: Weed seeds were not numerous amounting from 2-11% of the remains perhaps because weeding was carried efficiently. They were mainly weeds of disturbed ground or arable land particularly arable weeds associated with autumn sown cereals including corn cockle (*Agrostemma githago*), stinking mayweed (*Anthemis cotula*) which was common in medieval times and is a plant of heavy soils, and cornflower (*Centaurea cyanus*) which is more typical of lighter soils and is particularly associated with free-threshing cereals such as wheat and rye as found here. These three plants are rare or extinct nowadays. Others weeds included field gromwell

(*Lithospermum arvense*), docks (*Rumex* sp) and large grasses (Poaceae) including brome grass (*Bromus hordeaceus* or *secalinus*) which also grew as arable weeds.

Results by context

Phase 2, Pre-grange occupation 11th-12th century

Ditch fill 182/1/1: The sample contained a few cereal grains including barley and oat with a few goosefoot seeds.

Phase 3, Monastic grange 12th-13th century

Ditch fill 102/5/2: The waterlogged ditch fill also contained charred plant remains dominated by cereal chaff of rye with about equal amounts of bread wheat and rivet wheat chaff (table 1). Few grains included rye, free-threshing wheat and a little barley with few weed seeds and straw fragments. The sample was interpreted as cereal processing waste because chaff was much more abundant than grains. Some domestic waste may be represented by legume and nutshell fragments mixed with the cereal cleaning waste which was burnt possibly as waste, fuel or kindling and was dumped or accumulated in the ditch.

Ditch fill 112/1/1: The sample contains rye chaff with grains of rye, wheat and oats (table 1). There are more grains than chaff but as each chaff segment bears three grains on average only about 50% of the grains represented by the chaff is present so this does not represent whole ears of cereal product nor does it represent cleaned grain. Probable domestic waste is represented by legume and nutshell fragments in small numbers.

Phase 4, Rebuild Mid 13th- Early 14th century

Burnt layer Building C, sample 173/1/1: The sample contained only half a dozen cereals grains and some charcoal fragments. This probably represents a scatter of waste from food preparation.

Charcoal spread on floor of Building C, sample 115/1/2: This sample was dominated by rye chaff and contained only a few grains of rye and free-threshing wheat with seeds of arable weeds stinking mayweed and cornflower (table 1). The sample can be interpreted as waste from processing a rye crop. This seems most likely even though this layer occurs in a building because, although rye straw was used for thatch, recorded samples of thatch are more weedy and varied than this (De Moulins in Letts 1999). The sample has similarities with the previous sample 112/1/1 from an adjacent layer which also contains abundant rye chaff so this may be part of the same layer used as make-up for the floor. If this is not the case, this sample probably represents continuity of rye processing into this phase with the waste being burnt as fuel or kindling and then incorporated into the floor.

Enclosure ditch fill, sample 133/3/1: This sample contains very abundant cereal remains dominated by wheat chaff of both bread and rivet wheat with some rye, a moderate number of grains was present and very few weed seeds (table 1). Bread wheat chaff was more abundant than rivet wheat and much of the wheat chaff which could not be identified with certainty was also probably of bread wheat. Although grains are quite numerous because each rachis segment bears three grains about 80% of the grains have been removed in processing. Only a small fraction of the sample could be sorted and the whole sample probably contains over eight thousand chaff fragments which would have produced some 24,000 grains. The weed seeds include field gromwell, corncockle, cornflower and stinking mayweed.

Discussion

The find of identifiable free threshing wheat chaff (rachis) of not only bread wheat but also rivet wheat shows the cultivation of this cereal from 12th-14th century in the area as found at Burton Dassett, Boteler's Castle and Southam, Warwickshire (Moffett 1991a, 1997, Monckton 1998). Rivet wheat is now known from an increasing number of sites in the midlands from the Early Medieval period onwards (Moffett 1991). The earliest find is from Higham Ferrars Northhamptonshire of 8th-

10th century date (Moffett pers. comm.), and evidence at present suggests that this crop spread in use after the Norman conquest. Bread wheat and rivet wheat have been found together in many medieval urban deposits of 11th to 13th century date from Chester to Ipswich (Moffett 1991), and more recently from, for example, Leicester (Moffett 1993, Monckton 1999), and Lincoln (Moffett 1997). Rural evidence for production of the cereals is more rare but has been found mostly from Northamptonshire (Campbell 1984, Moffett pers com) and Warwickshire as mentioned above.

When free-threshing wheat is processed the grain is easily separated from the ear by first threshing and then winnowing to remove small light weed seeds and the light chaff. The grain would then be coarse sieved to remove the larger chaff fragments and then fine sieved in a sieve which retains the grains to remove small weed seeds and chaff fragments (Hillman 1981). The most productive sample here is from phase 4 ditch context 133/3 and contained light chaff and straw which may represent a mixture of threshing and winnowing waste suggesting that the cereal was grown nearby because free-threshing cereals would be processed before transport to reduce the bulk. Rye is also a free-threshing cereal and the abundance of chaff, perhaps removed as fine-sievings suggests this crop may also have been grown here. This waste was preserved because it was burnt as waste or fuel or kindling, however cereal cleanings can be used as fodder so would not all be preserved. The samples from other occupation sites in the county contain mainly grains with some chaff and weed seeds most often interpreted as waste from the final stages of cereal cleaning in food preparation, possibly for use in pottage or for small scale grinding for meal or flour. Hence the samples here differ in their richness in chaff probably because they are from the part of the site where cereals were processed rather than consumed.

The crops are represented by their waste and when mixtures of waste are found it is often not possible to tell if the crops were grown together, were mixed in use or if the waste was mixed during disposal. Sample 102/5/2 may represent a wheat crop of bread wheat and rivet wheat perhaps mixed with rye to make bread or even grown as a maslin crop. The larger oven is recorded as using corn rather than wheat and it is known that such mixed grains were used to make bread for poorer people. The samples from contexts 112/1 and 115/1 consist mainly of rye chaff with a few other remains of wheat and may represent cleaning and use of rye crops. The sample 133/3 consists mainly of bread wheat with some rivet wheat and rye and may be waste from wheat used to make white bread, possibly mixed with rye waste on disposal.

The presence of legumes and nutshell in the sample may suggest that some domestic rubbish from hearths was included in the deposits. Legumes do not require heating in their processing but may be burnt accidentally during food preparation or cooking, however, legumes may be incidentally included with the crop from a previous crop from the fields. The legumes found show cultivation and consumption of beans or peas. Hazel nutshell may be included as domestic rubbish shows the use of wild resources.

Documentary evidence from the site provides a rare example of information about how the crops were used. The end products of agriculture were bread, pottage, ale and fodder (Dyer 1989, 8) as well as thatch, flooring and bedding. Cawston is recorded as producing bread for nine other settlements making ten in all. Late 13th century records mention two ovens on the site, the larger producing bread each week from 16 quarters of corn and the smaller from 6 quarters of wheat (Palmer page XX). Grain was measured by volume and a quarter of grain was equivalent to 290 litres (Dyer 1989, xv). Each quarter of grain made 250 or so loaves of two pounds weight (Dyer 1989, 57). Hence the total of 22 quarters of grain could be used to make 5500 loaves per week which seems a vast amount even to supply ten places. Some of the bran could have been removed to make white bread and if a third was removed perhaps 3600 loaves could have been produced. The bran could have been fed to animals or made into specially baked horsebread (Dyer 1989, 57) which may have accounted for some of the loaves. Assuming an allowance of one loaf per person per day (Dyer 1989, 64) bread could have been supplied to between 520 and 785 people although probably not more frequently than on a weekly basis. This represents a large organised operation, although it

should be noted that assumptions are made on the basis of a single record and comparison with data from other sites (cf Dyer 1989).

Could all the grain have been grown by one settlement? Yields of between one and two quarters per acre are recorded (Dyer 1989, 122), the higher figure excluding seed corn, mill tolls and tithes. If grain was used at the rate described for a year, up to a thousand acres would need to be cultivated for cereals. Considering that only half to two thirds of the land may be under cereals in any year if crop rotation was used, the field system would need to be very extensive. Ploughing would be a large undertaking, it would be difficult to plough more than one acre in a day and most of the ploughing would need to be in the autumn. As other settlements were supplied with bread they may have contributed to the production of the cereals, also as a monastic property grain was probably received as tithes from elsewhere under monastic control. Of the main crops themselves, wheat grows better on heavier soils than rye which will grow on lighter poorer soils so the cereals could have been grown in different places. Bread wheat is the favoured grain for the best white bread for the upper strata of society. Rivet wheat is a productive cereal resistant to fungal and bird attack because it is protected by long awns, it is less favoured for bread making (Moffett 1991) but could be used mixed with bread wheat. Rye makes a dark heavy bread but could be used mixed with wheat to make bread (Greig 1988), this was consumed by poorer people (Dyer 1989, 57). Rye is particularly common on this site compared with the other sites from the county probably because it was used for this purpose. The evidence does suggest the possibility that bread either from mixed corn of rye and wheat, or from wheat alone was made as implied in the records for the two ovens.

Conclusions

Medieval samples of 12th-14th century date produced evidence of both bread wheat and rivet wheat with rye as an additional important cereal with a very little evidence for the presence of oats and barley. Evidence from the weeds present suggested that the cereals were autumn sown. Other food remains included a few charred legume fragments of either peas or beans and hazel nutshell fragments as evidence of the use of a gathered resource. Few plant remains were recovered from Phase 2 pre-grange contexts. Phase 3 produced evidence for the processing of wheat and rye, phase 4 produced abundant evidence for processing a wheat crop of mainly bread wheat with some rivet wheat included. The waste included straw, light chaff and rachis fragments in large numbers suggesting that significant agricultural production and processing was being carried out. The evidence was considered in the light of documentary evidence for large scale bread making on the site.

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Bibliography

- Campbell, G., (1994) The preliminary archaeobotanical results from Anglo-Saxon West Cotton and Raunds, Northamptonshire. in J. Rackham Environment and Economy in Anglo Saxon England CBA Research Report 89, 1994. p65-82.
- Dyer, C., (1989) Standards of living in the later middle Ages. Cambridge University Press 1989.
- Greig, J., (1988) Plant Resources in G. Astill and A. Grant (eds) The countryside of medieval England. Blackwell Ltd. Oxford. 1988.

Hillman G., (1981) Reconstructing crop husbandry practices from charred plant remains in R Mercer (ed) *Farming Practice in British Prehistory*. Edinburgh University Press 1981 pp123-162

Letts, J., (1999) *Smoke blackened thatch*. English Heritage 1999.

Moffett L. (1991a) 'The archaeobotanical evidence for free threshing tetraploid wheat in Britain' in *Palaeoethnobotany and archaeology*, International Workgroup for Palaeoethnobotany, 8th symposium at Nitra-Nove Vozokany 1989, *Acta Interdisciplinaria Archaeologica*, 7. Nitra: Slovak Academy of Sciences.

Moffett L. C., (1991b) Plant economy at Burton Dassett, a DMV in South Warwickshire. AML Report 111/91. English Heritage.

Moffett L C (1993) Macrofossil Plant Remains from The Shires Excavation, Leicester. Ancient Monuments Laboratory Report 31/93 (E.H.) and in J. Lucas and R. Buckley, forthcoming. *The Shires Excavation*, Leicester.

Moffett L. C., (1996) Plant remains from Flaxengate, Lincoln. AML Report 50/96. English Heritage.

Moffett L. C., (2000) Plant Remains in C. Jones, G. Eyre-Morgan, S. Palmer and N. Palmer Excavations at Botlers Castle, Alcester, 1992-3. *Trans Bham. & Warks Arch Soc* Vol 101. p74-85.

Monckton A., (1999). The Plant Remains in A. Connor and R. Buckley Roman and medieval occupation at Causeway Lane, Leicester. *Leicester Archaeology Monographs No.5*, University of Leicester Archaeological Services, 1999.

Monckton A. (1998 unpublished) The charred plant remains from medieval and post-medieval village contexts at Bascote, Southam, Warwickshire. Archive Report for BUFAU.

Stace C. (1991) *New Flora of the British Isles*. Cambridge University Press.

Table 1. CHARRED PLANT REMAINS FROM CAWSTON DMV, DUNCHURCH, WARKS (DC99).

Phase	3	3	4	4	
Date	12-13	12-13	13-14	13-14	
Context	102/5	112/1	115/1	133/3	
Feature type	Ditch	Ditch	Floor	Ditch	
Cereal chaff					
<i>Triticum turgidum/durum</i> rachis	19	-	-	41	Rivet wheat
<i>Triticum aestivum</i> s.l. rachis	17	-	-	149	Bread wheat
<i>Triticum</i> free-threshing rachis	19	2	-	196	Wheat, free-threshing
<i>Secale cereale</i> L. rachis	68	97	166	76	Rye
<i>Hordeum vulgare</i> L. rachis	2	-	-	-	Barley
<i>Avena sativa</i> L.	3	-	-	3	Oat
Cereal rachis	66	35	58	56	Cereal
Culm nodes, large	16	4	6	37	Straw
Awns	-	-	-	+++	Cereal barbs
Cereal grains					
<i>Triticum</i> free-threshing grains	5	22	6	259	Wheat, free-threshing
<i>Triticum</i> sp tail grains	-	-	-	4	Wheat
<i>Hordeum vulgare</i> L. grains	3	-	-	-	Barley
<i>Secale cereale</i> L. grains	7	84	7	4	Rye
<i>Avena</i> sp. grains	7	6	-	-	Oat
Cereal grains	23	111	20	31	Cereal
Cereal/Poaceae grains	-	29	4	-	Cereal/Grass
Collected/Cultivated					
<i>Vicia/Pisum</i>	1	4	-	-	Bean/Pea
<i>Corylus avellana</i> L. nutshell	1	3	1	-	Hazel nutshell
Wild plants					
<i>Chenopodium album</i> L.	1	1	-	-	Fat-hen
<i>Cerastium/Stellaria</i>	1	-	-	-	Mouse-ear/Chickweed
<i>Agrostemma githago</i> L. capsule frags.	-	-	-	3	Corn-cockle
<i>Rumex</i> sp	2	3	6	3	Docks
<i>Polygonum</i> sp	-	1	2	-	Knotweed
<i>Fallopia convolvulus</i>	-	1	-	-	Black-bindweed
<i>Malva sylvestris</i> L.	-	1cf	4	-	Common mallow
<i>Brassica/Sinapis</i>	1	-	-	-	Cabbage/Mustards
<i>Vicia/Lathyrus</i>	-	-	5	-	Vetch/tares
<i>Medicago/Melilotus/Trifolium</i>	1	3	-	-	Clover type
<i>Lithospermum arvense</i> L.	-	-	-	2	Field gromwell
<i>Anthemis cotula</i> L.	-	7	5	2	Stinking Mayweed
<i>Centaurea cyanus</i> L.	-	-	2	1	Cornflower
<i>Centaurea</i> sp.	-	1	1	-	Cornflower/Knapweed
<i>Carex</i> sp.	-	-	-	2	Sedges
<i>Bromus</i> sp	1	1	-	1	Brome grass
Poaceae (large)	19	5	-	3	Grasses large
Poaceae	1	1	2	-	Grasses
Indeterminate seeds	6	7	3	-	Indeterminate seeds
Capsule	1	-	-	-	Capsule
Culm fragment small	+	+	+	+	Grass stem
Stem, roots charred	+	+	+	+	Stems, roots
Weight sample	9.25	14.1	18.0	3.0	Kg.
Flot volume	110	25	135	360	mls
Part sorted	all	all	50%	6%	

Key: Remains are seeds in the broad sense unless stated.