

# **Berkhamsted - Once a Defended Medieval Town? An Excavation at New Manor Croft, Manor Street**

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with contributions by

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*In the summer of 2010 Archaeological Services & Consultancy Ltd carried out archaeological excavation of two areas on the western side of Manor Street, Berkhamsted in advance of housing development. The overwhelming majority of archaeological features were of medieval date. Evidence retrieved from a large ditch, suggests it is contemporary with the foundation of the castle and possibly the town. Evidence of medieval industrial and craft activities was present in the form of pits and ovens containing environmental evidence relating to iron smithing and horn core working; and “backland” settlement activity in the form of cess pits and waste disposal pits. Other archaeological features consisted of a palaeochannel and two large naturally formed depressions, of which the lower deposits were dated to the late Neolithic-mid Bronze Age and the upper fills were of medieval date; an early Romano-British ditch; some post-medieval pits and the remnants of brick footings belonging to ‘Manor Croft’, a mid 19<sup>th</sup> century house that once stood on the site.*

## **INTRODUCTION**

### **The Project Background**

In 2010 Archaeological Services & Consultancy (ASC) completed an open-area excavation at New Manor Croft, Manor Street, Berkhamsted. The excavation was undertaken in advance of housing development after a trial trench evaluation had identified two large features, containing medieval Hertfordshire Grey Ware pottery, a ditch, a modern gully and the remnants of a brick built structure (Summerfield-Hill & Kaye 2009).

The investigations were commissioned by W.E Black Ltd and were required as a condition of planning permission for the development of the site. Copies of the evaluation (Summerfield-Hill & Kaye 2009) and excavation reports (Cuthbert 2011a & b) are included in the site archive, which will be deposited with the Dacorum Heritage Trust, Berkhamsted (Accession Number: DACT 3570).

### **Location and Description**

The site lies in the centre of Berkhamsted (NGR SP 9949 0775), on the west side of Manor Street, c.50m north of the High Street, c.50m east of Castle Street, 170m south of the river Bulbourne and c.300m south of the circuit of Berkhamsted Castle. It comprised an irregular shaped piece of land (2951 sq. m), accessed from Manor Street (Fig. 1). The site was bounded by residential housing and their associated gardens to the north, south and west. All buildings on the site were demolished, and outside the footprint of the demolished buildings the site comprised a former car park surfaced with tarmac.

## Topography and Geology

The terrain is broadly flat with a slight fall from the southwest (c.104m AOD) to northeast (c.102m AOD), towards the river Bulbourne. The stratigraphy comprised a mix of numerous modern human activities and its former natural component, which would have been a shallow calcareous soil over the alluvium of the river Bulbourne (Soil Survey 1983, 812a). The underlying geology is Pleistocene comprising a shifting pattern of silty clays, glacio-fluvial gravels and peat deposits overlying the Lower Chalk of the Cretaceous period (BGS, Sheet 238).

[Insert Fig 1 Location plan](#)

## Historical and Archaeological Background

Little is known in detail of Berkhamsted during the Roman period but a major Roman road, now known as *Akeman Street*, followed the valley bottom, linking *Verulamium* (St Albans) and *Corinium* (Cirencester). The route has not been explored in detail but the line of Berkhamsted High Street probably follows the approximate course of the Roman road (Copeland 2009).

The town of Great Berkhamsted, to give its formal title, is mentioned in the Anglo-Saxon chronicle for the year 1066 (Garmonsway 1955, 200). Almost a century earlier the name appears in the will of Aelgifu in his bequest of lands (Sawyer 1968, 415, no. 1484). The location of the Anglo-Saxon settlement has never been precisely defined. The earliest physical evidence survives in the form of architectural detail in the church of St Mary, '*North Berkhamsted*', i.e. the 'North church', 2.3km northwest of the site (SMR 4447; Smith 1973, 11).

Prior to the foundation of the castle and the construction of St Peter's Church, the focus of the Saxo-Norman settlement may have been the church, of St James on the site of the Old Post-Office, c.700m west-northwest of the excavation site (*ibid*, 23). Once the castle was established it became an important influence in the development of the town and at this point it is believed the focus of settlement shifted to the closest point of the castle to the High Street, where the market place was laid out and the church of St Peter was constructed (HER 10; *ibid*). St Peter's church is c.80m west of the development site (HER 9092). The present church dates from the 13<sup>th</sup> century, though it may have earlier origins.

Berkhamsted appears in the Domesday survey (1086) as *Berchehastede* (Morris 1976, 15.1). It is recorded as a *burbiun* (borough) whose burgesses paid £4 from tolls and held half a hide of land. The survey records 52 burgesses, although it has been suggested this is an error and that the figure should be 12 (Doggett & Hunn 1985, 22).

Berkhamsted Castle was probably built in the late 11<sup>th</sup> century following the Norman Conquest (Remfry 1998). The castle is not mentioned directly in Domesday, but there is a reference to a '*fossarius*' or ditcher, who was in effect an overseer or engineer responsible for the construction and upkeep of defensive ditches and moats (Morris 1976, 15.1). At the time of the Domesday survey the castle belonged to William the Conqueror's half-brother, the Count of Mortain, and became Crown property following the Count's abortive insurrection in the early 12<sup>th</sup> century. Thereafter, it developed from a simple motte and bailey castle into a substantial concentrically defended seat of royal authority.

Further construction works or repairs to the castle would have served to increase any existing trade and industry in the area. In a document from the Cartulary of Missenden Abbey c.1225 the following occupations were noted within Berkhamsted: 1 merchant, 2 painters, 1 goldsmith, 1 forester, 2 farriers, 2 tailors and 1 maker or seller of mead (Doggett & Hunn

1985, 32). The taxation list of 1290 provides a further insight into other industries including brewing, butchery, lead burning, carpentry, tanning, smithing and cloth-making, while a survey of 1357 mentions a metal worker and a number of butchers, but strangely no other trades (*ibid*, 28).

Within the Cartulary of Missenden Abbey there is mention of a ‘great ditch’ located in Berkhamsted: “*tenementum quod iacet inter terram que fuit Roberti Runifar et Elueneweie et magnum fossatum*”-The tenement which lies between the land which belonged to *Robert Runifar, and Elueneweie* (now Chesham Road), and the great ditch’ (Jenkins 1955, 47). This passing comment is the only written evidence that Berkhamsted may have once been a defended town. An earth bank was noted in close proximity to Chesham Road, at Priory Gardens: the bank was aligned NW-SE (Hunn *pers comm*). However, no finds were recovered, so its function and date are unknown.

A number of small-scale excavations and watching briefs have taken place along the High Street within the historic core of Berkhamsted. Work to the rear of 71-77 High Street, c.125m southeast of the site, revealed a complex of medieval pits (HER 12694; Nicholson 2008) and a further pit or ‘soakaway’ was recorded to the rear of the former Rex Cinema, c.150m southwest of the development site (HER 11823). Approximately 180m west of the site a post-hole and an assemblage of 12<sup>th</sup>-14<sup>th</sup> century pottery were recorded at 125 High Street (HER 9961). Further evidence of medieval occupation, comprising a clay floor, well and a pit was present c.150m to the west at 3-4 Church Gate (HER 13356; Hunn 2006).

Large-scale excavation has been limited within the historic core of Berkhamsted. However in 1996 an excavation took place c.700m northwest of the site, prior to the construction of a supermarket at “Kingsgate”. Three extensive archaeological layers were present, most likely put down to consolidate a boggy area thought to be part of the river Bulbourne, which in turn overlay a natural deposit of peat. Large quantities of pottery, metal working slag, tile, animal bone and oyster shell were retrieved from all the deposits. In addition, shallow boundary ditches dated to the late 12<sup>th</sup>-14<sup>th</sup> centuries cut these consolidation deposits (Guttmann 1996).

Archaeological work within close proximity to the site has also been limited. Approximately 50m to the east a medieval ditch and plough soil were present (HER 10944). An excavation at 110 High Street, c.50m southwest of the site, revealed a series of postholes, at least five of which may represent one half of a structure. Pottery recovered from the fills was dated to between 1050-1287/1350 (Kaye forthcoming).

The site is c.50m northeast of a large building on the High Street named *Pilkington Manor*. The earliest map to show the development site in any detail is the 1839 Berkhamsted Tithe map, which depicts it as part of the formal gardens of *Pilkington Manor* with a fishpond close to the northern border of the site. Manor Street was not in existence at this time. The current building known as *Pilkington Manor* was constructed during the 18<sup>th</sup> century, but an earlier reference to a house named *Pilkingtons* is recorded here as a head tenement from 1616 (HER 9297).

A photograph believed to have been taken in c.1860 indicates that Manor Street had been constructed, that the only house on the site is set back from Manor Street and is most likely named *Manor Croft* (Hastie 1999).

The 1887 edition Ordnance Survey (OS) map confirms that Manor Street had been constructed by this time, with housing on both sides of the road. Two terraced houses were present on the site, fronting onto Manor Street, constructed sometime between c.1860 and 1887. To the rear of the terrace houses is *Manor Croft* which was constructed on the development site sometime between 1839 and c.1860 and was demolished in 1959. Fragments

of wall footing probably belonging to *Manor Croft* were exposed and recorded during the evaluation and excavation of the site.

OS mapping shows that the site remained largely unchanged until sometime between 1960 and 1972, when *Manor Croft* was demolished. In 1989, the terraced houses fronting on to Manor Street were demolished to make way for the construction of a social services day-centre.

## EXCAVATIONS

### Objectives

The primary objective of the excavation was to determine the sequence of occupation on the site, then through this, to establish the nature of the site with a focus on the medieval period, summarising pre-dating and post-dating periods, the remains of which were present in the evaluation and in other archaeological investigations close by. In addition, the artefactual and environmental potential of the site was to be determined, and used to help identify the development of commercial and industrial processes.

### Methods

A trial trench evaluation of the site was undertaken earlier in 2010 (Summerfield-Hill & Kaye 2009). This identified medieval features in three (T1, T2, T3) of five trial trenches (Fig. 2). On the basis of the evaluation results two areas, A (675 sq. m) and B (503 sq. m), were subject to open area excavation during August and September 2010 (Fig. 2). The excavation areas were located in the undisturbed areas within the footprint of the new development. The central and southwest areas of the site and the northeast corner, fronting onto Manor Street, were thereby excluded from the excavation. The work was undertaken in accordance with an approved methodology (Kaye 2010). Following the excavation a Summary Excavation Report (Cuthbert 2011a) was produced, followed by a Post Excavation Assessment & Updated Project Design (Cuthbert 2011b) that included recommendations for publication of the results.

[Insert Fig 2: All phase plan](#)

## EXACATED EVIDENCE

### Introduction

The open-area excavation began with a mechanically controlled strip of the two areas down to the first archaeological horizon, carried out under constant supervision. Following discussions with the HEA, selective cleaning and hand excavation of the archaeological deposits and features took place. Given the extent and depth of some of the features this was limited to a variety of hand and mechanically cut transects. The environmental potential was reviewed and samples were retrieved from deposits and processed for environmental and industrial residues.

The stratigraphy of Area B and the eastern half of Area A comprised modern made ground of brick rubble and aggregate overlying the first archaeological horizon. No natural soil profile survived and the areas had been truncated, most likely during the construction of a car park in the 1990s. Areas at the western end of Area A were much less disturbed and the stratigraphy comprised modern made ground over a subsoil of mid-brown reddish clayey silt, which in turn overlay the first archaeological horizon.

## Results

The excavation revealed finds and features, interpreted as defining seven phases of activity. The majority of dated features were medieval, but a small number of prehistoric, Romano-British and post-medieval features were also identified.

Excavated features were phased through dated artefacts and stratigraphic relationships. However, there was a paucity of stratigraphic relationships overall, and much of the evidence relating to the medieval period was broadly dated, so the phasing remains tentative. The following sections examine and discuss the excavated evidence in chronological order. Fill and deposit numbers are shown in parentheses.

### Phase 1: Prehistoric Period (Fig. 3)

Three large naturally formed features that may have once adjoined the Bulbourne river system have been assigned to this phase.

#### *Naturally formed features/Palaeochannels*

Feature 145 was identified at the eastern end of Area A. It measured c.22m wide, c.15m long and 1.14m deep and extended beyond the northern limit of excavation. A machine-cut transect was excavated across the feature. Naturally deposited layers containing humified organics as well as fragments of wood were present at the base of this feature, whilst the upper deposits contained medieval pottery, bone and slag. A one metre monolith sample <11> was taken through the deposits for pollen and macrofossil analysis (NGR SP 995094 077783).

The pollen analysis of the primary and secondary deposits (139 and 138 respectively) identified alder, lime and hazel as the dominant vegetation species, with a gradual decline of lime and alder, and an increase in hazel numbers within the top section of the secondary deposit (138).

Two humified organic samples from the base (ref: 49-50cm) and top (ref: 37-38cm) of deposit (138) were submitted for radiocarbon analysis, the results from the base sample dated to 2201BC – 2028BC and the top sample to Cal 1211BC – 1001BC. A single sherd of mid-late Bronze Age pottery was recovered from context (138) (Barclay *pers comm*) as well as a sherd of medieval pottery which may be intrusive from the deposits above.

Four wood samples were recovered from feature 145, all were identified as oak. The tree ring sequences from all samples were unidentifiable and therefore remain undated.

The partial remains of a palaeochannel, 183, were identified during the machine excavation of ditch segment 105 at the western end of Area A. A number of clay and gravel layers, cut by ditch 105, overlay a green silty sediment (182) revealed at a depth of 4.2m. Machine excavation at this point stopped, so full dimensions of the channel were not obtained. Pollen from an environmental sample <15> taken from this deposit suggest a similarity with the mid Bronze Age deposit (138) of 145, where hazel dominates with fewer lime and alder.

Wild cherry stones from the environmental sample were submitted for radiocarbon dating and the results dated to AD1013–AD1159.

The stratigraphy and pollen results of this deposit suggest a prehistoric origin, whilst the radiocarbon data indicates a Saxo-Norman date. A radiocarbon date obtained from the lower fills of ditch segment 105 (Phase 3) is also of a similar Saxo-Norman date (1034-1165); therefore contamination from the lower deposits of ditch 105 could be the cause of this inconsistency.

A large naturally formed feature 256 was identified at the eastern end of Area B. The feature measured c.18.8m wide, c.17m in length and 2.44m deep and extended beyond the southern limit of excavation. A machine-cut transect was excavated across the feature. Naturally deposited layers (307, 301 & 303) were present at the base of this feature, containing humified organics as well as fragments of wood, whilst the upper deposits produced medieval pottery, slag and animal horn cores.

Pollen data from environmental samples <25> & <28>, from the secondary deposit (303) of this feature, suggest a similarity with the mid Bronze Age deposit (138) of 145 and (182) of 183, where hazel dominates with fewer lime and alder.

Archaeological finds were not present in the primary (307) and secondary deposits, though four small fragments of slag and a single small sherd of early medieval pottery were retrieved from the third deposit (301) and may be intrusive from the layers above.

The pollen data and lack of historical finds within these lower deposits suggest this feature was in existence well before the first medieval settlement activity took place on the site, most likely in the prehistoric period.

Levels taken from the base of feature 256 (100.69m AOD) and 145 (100.59m AOD) are similar indicating a slight fall from the southwest to northeast.

#### *Other Finds and Features*

Ninety flint fragments were retrieved as residual material from the fills of ten medieval features within Areas A and B. All were recovered from environmental samples.

The assemblage included two scalene microliths and a bladelet, dated to the late Mesolithic period, recovered from two fills of feature 256. The two scalene microliths were recovered from the secondary deposit (303) of feature 256. Therefore, if deposit (303) is prehistoric in date the flint finds maybe contemporary and therefore date this feature.

A further three small bladelet fragments also dating to this period were recovered from three securely dated medieval features within close proximity of the naturally formed features in Areas A and B. The remaining eighty-four flint fragments were not diagnostic.

A small circular feature, 258, was revealed at the base of feature 256, cutting the natural. Its fill was similar to the naturally formed deposit (307) that sealed it. This feature is most likely a naturally formed hollow at the base of the feature.

[Insert fig3 phase 1 & 2 feature plan](#)

#### **Phase 2: Romano-British Period (Fig. 3)**

A NNW-SSE aligned ditch 185 was identified within Area A. Three segments were excavated across the ditch revealing a shallow 'U' shape profile c.1-1.2m wide and c.0.4-0.6m deep. Twenty-one sherds of pottery were retrieved from the fills of two segments, 147 & 149, dating to the middle 1<sup>st</sup> to middle 2<sup>nd</sup> centuries.

A single early Romano British pottery sherd was retrieved from context (064), a layer compressed into the top of segment 067 of ditch 185. However, this deposit also contained medieval pottery.

Five Romano-British sherds were retrieved as residual material from securely dated medieval contexts, all in close proximity to ditch 185, suggesting that these medieval features disturbed earlier Roman features or ditch 185 itself.

A small amount of Roman ceramic building material (CBM) was retrieved from securely dated medieval contexts, all of which were in close proximity to ditch 185.

## **Medieval Period**

Features have been assigned to phases 3, 4 and 5 (Figs 4, 6 & 8 respectively) through analysis of the pottery assemblage, spatial distribution of feature types and comparisons in the environmental evidence recovered from the sampled features. However, pottery sherds with a narrow date range, mainly mid 12<sup>th</sup> to the mid 14<sup>th</sup> century, were retrieved from the fills of a number of features across the two areas, stratigraphic relationships between features were sparse and only a percentage of the features were sampled for environmental analysis; Therefore, accurate phasing of features assigned to phases 3-5, all of which are of medieval date, remains tentative.

[Insert Fig. 4: phase 3 feature plan](#)

### **Phase 3: Medieval Period (1066-1250) (Fig. 4)**

#### *The Defensive Ditch*

A broad U shaped ditch, 187, (Fig. 5) was located at the western end of Area A aligned NNE-SSW, parallel with Castle Street.

Two segments 105 & 163 were excavated across the ditch revealing a deep gradual 'U' shape profile, c.6.5m wide and 1.72-1.96m deep (as measured from the surface of modern ground reduction), with evidence of three initial re-cuts, and two later re-cuts assigned to the late medieval period (Phase 5). Environmental evidence from the primary deposits associated with the original cut 105 and subsequent recuts 189, 184 and 193 indicate a waterlogged environment with evidence of frog and stickleback and waterlogged plants such as watercress and pondweed. Pollen analysis of these primary fills suggests the site was open ground with abundant evidence of hedgerow, wetland and disturbed/waste ground plants such as bramble and nettle.

A fragment of wood from the primary fill (181) of original cut 105 was submitted for radiocarbon analysis and the results were dated to 1034-1165.

Dateable evidence from these primary deposits was sparse, with eleven large unabraded pottery sherds recovered from fill (115) and five pottery sherds from fill (180), all mid-12<sup>th</sup> to mid-14<sup>th</sup> century date. A single sherd of pottery dating from 1230-1350 was recovered from the secondary fill of re-cut 189.

Three sherds of mid 14<sup>th</sup>-15<sup>th</sup> century pottery were retrieved from contexts (167), (169) and (080) within segment 163. However, during excavation of this feature the ditch section collapsed and contamination of earlier deposits may have occurred.

West of ditch 187 a slight change in soil type was noted beneath the layer of modern made ground (003) and above the natural clay (005). However owing to its similarities to the subsoil (004) and the high level of modern truncation it was not recorded in plan during machining and was not seen in section in the excavation. This layer (188) could be the remnants of bank material relating to ditch 187, or could simply represent a slight change in the natural geology.

[Insert Fig.5 Section of 187](#)

#### *The Medieval Backfill of Palaeochannel 256*

Pollen analysis of the primary naturally deposited fills of natural hollow 256, in area B, indicates the feature was potentially open in the mid Bronze Age (Phase 1).

The upper deposits suggested that deliberate backfilling of this natural hollow began in the medieval period; evidence of this backfilling included rubbish deposits, many of which incorporated iron smithing detritus and evidence of craft activities. Fill (300), potentially the primary medieval deposit, contained over 11.5kg of slag and quantities of hammer scale, as well as pottery dating to the late 10<sup>th</sup> to mid 12<sup>th</sup> century. Fill (304) contained over 100 goat horn cores. Medieval pottery sherds dating from the mid 11<sup>th</sup> to mid 14<sup>th</sup> centuries were also retrieved from many of the upper deposits.

A silver stirrup finger ring (Registered Find 003) of 13<sup>th</sup> to 14<sup>th</sup>-century date was recovered from upper fill (297) of feature 256.

#### *Other Features*

Other features tentatively assigned to this phase include two truncated pits, 030 & 033, exhibiting similar bowl-shaped profiles, within Area A. A single sherd of mid-11<sup>th</sup> to mid-12<sup>th</sup> century pottery was retrieved from the fill of pit 030.

Two short, shallow, truncated gullies, 089 & 093, were located at the centre of Area A, and a shallow posthole 095 located just west of natural hollow 145. The fills of these features contained pottery sherds dating to the mid 12<sup>th</sup> to mid 14<sup>th</sup> centuries.

Four truncated postholes, 015, 017, 044 & 047, displaying similar 'U' shape profiles were revealed at the eastern end of Area A. Fill (018) of posthole 017 contained pottery sherds dating to the mid-12<sup>th</sup> to mid-14<sup>th</sup> centuries: the fills of the other three features did not contain any dateable evidence, but because of their similar profiles and close proximity they have been tentatively placed within this phase. Their functions are unclear.

Two truncated postholes, 261 and 296, located at the western end of Area B have been tentatively assigned to this phase, both exhibiting similar 'U' shape profiles. Three sherds of mid-12<sup>th</sup> to mid-14<sup>th</sup> century pottery were retrieved from the fill (260) of posthole 261. The fill of 296 did not contain any dateable evidence but its similar profile and close proximity with 261 means it has been tentatively placed within this phase.

Posthole 280 and a gully 277 were revealed just south of postholes 261 & 296. The fills of both features contained pottery dating to the mid-11<sup>th</sup> to late-13<sup>th</sup> centuries: fill (276) of 277 also contained one fragment of mid 12<sup>th</sup> to mid 14<sup>th</sup> century date. These features cut each other but their relationship was unclear due to similarities in the colour and consistency of the fills. The function of these features is unclear.

[Insert Fig 6: phase 4 feature plan](#)

#### **Phase 4: Medieval Period (1200-1400) (Fig. 6)**

Features associated with industrial and settlement activity on the site are the main focus of this phase, with two ovens and a number of pits constructed.

#### *Ovens*

Two structures 213 & 281 located at the eastern end of Area B have been tentatively identified as bread ovens or drying ovens.

Oven 213 (Fig. 7), located c.1.5m from the eastern edge of feature 256, was keyhole shaped with a stoke hole located at the WNW end. The walls of the oven (221) consisted of flint, bonded with clay. Two separate burning episodes (220 & 251) were identified inside the



oven, separated by deposits of stone and worked clunch, indicating a later re-use of the oven or a perhaps a structural modification. Pottery dating to the mid 12<sup>th</sup> - mid 14<sup>th</sup> century was recovered from the rake out associated with the primary burning episode. Ditch 344, assigned to phase 5, truncated the oven at its northern end.

Oven 281 was located at the south of the site, cutting the upper fills of feature 256. The walls of the oven have not survived. However, a layer of compacted flint (338) located on the eastern side of the oven could have been the remnants of a footing. A number of burning episodes were identified within the oven. Pottery dating to the mid 12<sup>th</sup> to mid 14<sup>th</sup> century was recovered from the possible footing on the eastern edge.

Samples from burnt layers associated with the two ovens produced the richest environmental assemblage for the site, with an abundance of charcoal and charred grain including wheat, rye oat and barley.

[Insert Fig 7: plan drawing of oven.](#)

#### *Other Features*

A large pit, 124, located at the western end of Area A was also tentatively assigned to this phase. The pit (3m x 2.2m, 1.65m deep) was sub-circular in plan with a 'U' shape profile and contained four distinct fills. Thirty-two sherds of pottery, mainly dating to the mid 12<sup>th</sup> to mid 14<sup>th</sup> century, were recovered from three of the fills of the pit. Pit 124 was cut by phase 5 pit 137.

Pit 034, located at the eastern end of Area A, cut a north-south aligned gully, 186. The pit was sub-oval in shape with a shallow bowl-shaped section. Three distinct fills were present. The upper fill (035) contained a half clipped, Henry II silver short-cross penny dating from 1180-1247 (Registered Find 001). Nineteen sherds of mid 12<sup>th</sup> to mid 14<sup>th</sup> century pottery were also recovered from the feature.

Two pits, 021 and 240, located at the eastern ends of Areas A and B respectively, displayed similar characteristics in their shape and size in plan and in profile. Sherds of pottery dating from 1230-1400 were recovered from their fills.

Samples taken from the primary fill of pits 021 & 124, the combined fills of pit 034 and the fills of gully 186 contained frequent fragmented charcoal and occasional charred grain, perhaps indicating that ovens 213 and 281 were in use during this time. The fills also contained large quantities of iron smithing detritus, indicating a continuation of the industrial practices that were occurring close to the site, identified in phase 3.

[Insert Fig 8: phase 5 feature plan](#)

#### **Phase 5: Medieval Period (1350-1600) (Fig. 8)**

Features associated with settlement and occupation activity on or within close proximity to the site are the main focus of this phase.

#### *Burgage Plot Boundary Ditches*

The last two recuts 191 and 192 within ditch segment 105 form ditches 197 and 198 respectively (Fig. 5). Both were broadly on the same alignment as ditch, 187. However, their depths and widths (c.1.5m wide, 0.7m deep and 3m wide, 0.5m deep) were not indicative of a defensive function, but more likely boundary ditches for burgage plots fronting onto Castle Street.

Pottery sherds dating to the mid 12<sup>th</sup> to mid 14<sup>th</sup> century were recovered from the fills of each re-cut, whilst a localised dump comprising 27kg of fragmented roof and floor tile was retrieved from fill (072) of re-cut 195. This may have been placed as 'hardcore' to level a hollow within ditch 198. Waste disposal pit 154, also assigned to this phase, cut the fills of re-cuts 197 and 198 of ditch 187.

Ditch 344 located at the eastern end of Area B was aligned NNE-SSW, parallel to Castle Street and phase 3 ditch 187. At its northern end the ditch cut phase 4 oven 213, indicating this feature had fallen out of use by the time the ditch was dug. Segments excavated across the ditch revealed a shallow 'V' section (c.0.6m wide, c.0.3m deep). Ditch 344 could possibly be the remnants of a burgage plot boundary that ran from the High Street, NNE across the site. Twenty-three sherds of mid-11<sup>th</sup> to late-13<sup>th</sup> century pottery were retrieved from the excavated segments.

A narrow gully, 241, (0.34m wide, 0.12m deep) running parallel and east of ditch 344 was tentatively assigned to this phase. The gully was aligned NNE-SSW and extended beyond the southern limit of excavation. Two sherds of mid 11<sup>th</sup> to late 13<sup>th</sup> century pottery were retrieved from its fill.

#### *Cess Pits*

Two partially excavated pits, 273 & 345 within Area B, and two fully excavated pits, 123 & 137 within Area A, were interpreted as cess pits, possibly related to occupation fronting onto either the High Street or Castle Street.

Environmental evidence recovered from the fills of pits 123 and 137 confirmed that cess was present. Samples from pits 273 and 345, however, suggested that no cess was present. All the pits displayed steep sided 'U'-shaped profiles with similar fill sequences, consisting of a soft layer with a deliberate solid capping of clay and stone. Therefore, the lack of environmental evidence from the partially excavated pits in Area B does not preclude the possibility that these were also cess pits.

#### *Waste Disposal Pits*

Pits 263 & 270 within Area B, along with pits 092 and 154 from Area A exhibited very similar characteristics in their shape and fills. All were sub-rectangular in plan (c.1.4-1.6m wide) with steep sided 'U'-shaped profiles. Most of the pottery from the four pits dates to the mid-11<sup>th</sup> to mid-14<sup>th</sup> century. However later sherds ranging from 1350-1450 were retrieved from the fills of 092, 154 and 270.

The quantity of pottery within each feature suggests occupation within close proximity to the site, and loose clean fills may have been placed deliberately within the pits, perhaps to act as soakaways.

Sherds of pottery from a single vessel were retrieved from features 092, 123 and 137 indicating that these features were contemporary.

[Insert Fig 9: phase 6, 7 & unphased combined feature plan](#)

#### **Phase 6: Post-Medieval Period (Fig. 9)**

This phase covers the post-medieval period, in which four pits and four postholes were constructed.

A sequence of shallow intercutting pits, 063, 054 and 056, cut the medieval deposits of phase 1 feature 145 on its western edge, within Area A. Pit 054 contained sherds dating from 1600-1900.

Pit 091 located at the southwest corner of Area A, exhibited a steep sided square cut profile. The feature cut through the subsoil (004) and was sealed by a layer of modern made ground (003). It had a single fill (103) suggesting that one phase of deliberate backfilling occurred after the pit went out of use, its function remains uncertain. Pit 091 contained two sherds of late 16th to 17th-century redware along with eighteen sherds of medieval pottery. It cut phase 5 pit 092 and was in turn cut by pit 098, attributed to phase 7.

Four postholes at the western end of Area B all exhibited similar shallow bowl-shaped profiles. Postholes 283, 285 & 287 did not contain any dateable evidence, though fill (271) of posthole 272 contained one sherd of possible late 16th to 17th-century redware. Because of their similar profiles and close proximity, these postholes have been tentatively assigned to the same phase.

### **Phase 7: Victorian/Modern Period (Fig. 9)**

From cartographic evidence, Manor Street was laid out in the Victorian period, and a number of properties were constructed along its length. This phase describes the structures and features constructed at this time.

#### *Manor Croft*

Structure 209 comprised a rectangular brick footing, extending beyond the northern limit of Area B, and measured 6.2m in length and 4.2m in width. Complete bricks and fragments of brick were incorporated into the structure and were bonded with lime mortar. The footing was seven courses deep and two courses wide. Other building materials comprised three stone slabs along with traces of wood, all of which were located within the southern face of the structure. This structure represents part of the remains of the late 19<sup>th</sup> century house 'Manor Croft'.

#### *Other Structures*

Two small square brick footings, 212 (1.68 × 2.36m) and 236 (1.25 × 2.15m) have been identified as outhouses relating to either 'Manor Croft' or the terrace housing that once fronted onto Manor Street. Complete bricks and fragments of brick were incorporated into the walls of the structure, bonded with lime mortar. Both footings were five courses deep and two courses wide.

Brick footings 244, 247, 250 & 254 are most likely small boundary structures or garden features such as gateposts and wall footings, also relating to the late 19<sup>th</sup>-century developments that once stood on the site.

#### *Other Features*

Modern gas, water and electric services crossed both areas of the site. All related to the 19<sup>th</sup> century developments, and to the modern structure that was demolished prior to fieldwork.

Posthole 028, at the centre of Area A, cut phase 2 ditch 185. A modern air brick was retrieved from its primary fill.

Pit 098 was located at the western end of Area A. The pit was only seen in section at the edge of the excavation. No finds were recovered from its fill and it is assigned to phase 7 through its stratigraphic relationship with phase 6 pit 091.

## **Unphased** (Fig. 9)

Posthole 069, located at the western end of Area B, and postholes 023 and 025 located at the centre of Area A, all cut Roman ditch 185, therefore post-dating this feature.

Features 173 & 175 were cut by phase 3 ditch 187 therefore pre-dating this phase. However no dateable evidence was recovered from their fills. Pit 041, located at the eastern end of Area A, and postholes 227 & 229, at the eastern end of Area B, contained no dateable evidence. Their close proximity to medieval features tentatively suggests they may be broadly medieval. Pits 223 & 224 cut structure 213, whilst pit 324 cut structure 281. No dating evidence was retrieved from the fills of these features. All appear to post-date phase 4.

## **SPECIALIST REPORTS**

### **The Flint Assemblage**

Lynden Cooper

#### **Introduction**

A small assemblage of 90 flint fragments weighing a little over 10g was retrieved entirely from environmental samples from 12 contexts.

#### **Results**

The most diagnostic pieces were two small scalene triangle microliths from (303) of feature 256, both of which have an additional, slight modification along the un-retouched long edge. Both date to the late Mesolithic and, given their small size, probably date to the 'latest' Mesolithic (Roger Jacobi pers. comm.). Three bladelet fragments and one secondary bladelet (not true), of similar date, were also recovered. The remaining pieces, mostly representing micro-debitage, are of later date.

### **Dendrochronology**

Ian Tyers

#### **Catalogue**

Timber samples were collected from five contexts:

- 1 Feature 145: Oak tree trunk. 270mm diameter with sapwood and possibly bark edge. Over eighty years of tree rings.
- 2 Feature 145: Oak wood. Split radial section from a much larger timber, with heartwood/sapwood boundary.
- 3 Feature 145: Oak, branchwood? 87mm diameter, with over 60 tree rings and the sapwood/heartwood boundary.
- 4 Feature 145: Oak trunkwood, maximum radius from centre 110mm, with over 60 tree rings. Heartwood/sapwood boundary, but most of sapwood lost. Naturally decomposed edges and indications that the piece is the stump and lower trunk.
- 5 Feature 256 (303): Oak, tangential outer heartwood section from a much larger timber of estimated diameter of approximately 400mm, with heartwood/sapwood boundary.

## **Results**

The outer sapwood layers have degraded; therefore there is no evidence for any workings on the timbers. The sections do not reflect any intentional reduction of the timber and could all derive from natural splitting or decomposition.

Samples 1, 2 and 5 are likely to derive from trunk or large branchwood, whilst sample 3 derives from smaller branchwood. Timber sample 1 seems likely to be the remnants of a trunk. Its occurrence implies that it fell or was discarded into feature 145. Only a sample was taken of this timber so the character of what was left in the ground is not known.

Two oak (*Quercus* spp.) samples (1 & 4) from feature 145 were submitted for dendrochronological analysis. Both contained measurable sequences. Sample 1 was complete to bark edge but unfortunately had an extremely narrow band of rings directly under the bark edge. Such bands usually mean the tree was either dying or was otherwise stressed. Both samples did not match and neither produced tree-ring sequences that match reference data, therefore both samples are currently undated.

## **Pottery: Romano British**

Nicholas J. Cooper

### **Introduction**

A total of 27 Roman period sherds weighing 249g were retrieved, mainly residually from medieval contexts. However, the occurrence of Roman pottery indicates earlier settlement on the site, and may provide information on contexts which contain no other artefactual material. For this reason, the material has been assessed and dated.

### **Methodology**

The pottery has been analysed by form and fabric with reference to the Museum of London Roman Pottery Fabric Series (Davies *et al.* 1994, 3) and quantified by sherd count and weight, and recorded on an MS Excel spreadsheet which can be consulted in the project archive.

## **Results**

The material consistently ranges in date from the middle of the 1st century to the early or middle second century at the latest, where the sherds are diagnostic enough. In contexts (009), (064), (076), (125) and (130) the material is residual but in (148) and (150) from segments 147 and 149 of ditch 185, they provide the only dating material and could indicate these features are early Roman in date and relate to settlement activity on the site. Although the material from these ditches is fairly abraded, the sherd weight is larger than elsewhere, and it does include joining sherds from a collared flagon in Brockley Hill white slipped ware (148) and a substantial part of a necked jar in a fine reduced fabric (150) suggesting stratified primary rubbish rather than the re-incorporation of secondary material into medieval features.

## **Pottery: Medieval and post-medieval**

Lucy Whittingham

### **Introduction**

This site produced a total assemblage of 1506 sherds, weighing 19.5kg. The majority of the assemblage (91%) is medieval with a small percentage (6%) of early medieval wares and post-medieval wares (1%) and a small Roman assemblage (2%). A large proportion of the assemblage is in a poor state of preservation with the exception of the larger sherds from a

small number of vessels in the medieval assemblages from contexts (152), (153), (297) and (304). Sherds from the same vessels join between contexts (102), (122), (132) and (153). Within the medieval assemblage one hundred and nine rims, primarily of South Hertfordshire Greyware have been recorded; the post-medieval and Roman assemblages are less well preserved.

All of the post-Roman pottery has been identified with reference to the fabric type series established by the Museum of London Archaeology and the London Archaeological Archive and Research Centre (<http://www.museumoflondonarchaeology.org.uk/Publications/Online-Resources/MOLA-ceramic-codes.htm>) which can be applied to similar fabrics found in Hertfordshire. All of the sherds have been quantified using sherd count and an estimated number of vessels (ENV). Fabric type, vessel form and various attributes, such as decoration and glaze, are also recorded and a spot date calculated on the fabrics present. These records have been entered onto an Excel spreadsheet and can be consulted in the project archive.

### **Phases 3-5: Medieval (1066-1600)**

The medieval assemblage of 1464 sherds (19kg) is more diverse than has previously been identified from a site in Berkhamsted. It ranges in date from an early to late medieval period, 970 to 1500, though the principal wares are mid 12th to mid 14th-century date.

Early medieval wares dating from 970 to 1150 form 6% of the medieval assemblage, comprising eighty-seven sherds (933g) from sixty-six vessels. The largest component of these early medieval wares are forty-seven sherds of early medieval chalk-tempered ware (EMCH) dating from 1050-1150. Nine cooking pots/jars are identified by a characteristic simple, everted rim. Four of these vessels are decorated on the exterior surface with combed lines on the body. Another vessel is decorated with a five-pronged tool which has been stabbed randomly into the shoulder. This fabric is one of the more common of the early medieval wares and has been found frequently at other early medieval sites in Berkhamsted. Four other fabric types make up the early medieval assemblage; eleven hand-built sherds in early medieval flint-tempered ware (EMFL) and seven sherds in early medieval sandy ware (EMS) both dating from 970-1100. The remainder of the sherds are possibly slightly later in date being, two hand-built sherds in early medieval grog-tempered ware (EMGR) and twenty sherds from the same early medieval shell-tempered ware (EMSH) cooking pot/jar dating from between 1050 and 1150 (Vince & Jenner 1991).

The most common of the medieval wares dating from 1150 to 1350 are 1206 sherds (15kg) from 1091 vessels in South Hertfordshire Greyware (SHER). A variety of fabrics occur within this greyware tradition. These have been recorded as South Hertfordshire Greyware (SHER), coarse South Hertfordshire Greyware (SHER COAR/SHER FINE) and South Hertfordshire Greyware with flint (SHER FL). There is no chronological difference in these fabric types at this site and occasionally variations in the colour and the coarseness of fabric are found within the same vessel. These differences are related to technological variations in manufacture and are therefore not chronological. Various kilns within the county are known to produce South Hertfordshire Greyware, of which those at Nettleden and Potten End (Turner-Rugg 1993) are the closest source to Berkhamsted.

By far the most common type of vessel is the cooking pot/jar represented by seventy-four rims and sherds decorated with characteristic applied thumbed strips. A small number of jugs are represented by eleven rims and a further twelve jugs represented by decorated sherds or strap handles with slashed decoration. Two pipkins are also represented by handles. All of these diagnostic sherds include the most common characteristic features of South Hertfordshire Greyware vessels.

Though the medieval assemblage is dominated by local products in South Hertfordshire Greyware there are also small assemblages of other regional wares bought in from outside of Hertfordshire.

Two other wares found commonly in Hertfordshire are an early medieval coarseware with calcareous/chalk temper and Late Medieval Hertfordshire glazed ware (LMHG) found throughout the county. The first of these is found more commonly in North Hertfordshire but was also recognised on the site excavated 110 High Street, Berkhamsted (Whittingham 2009). Here at Manor Street there is a small assemblage of one hundred and four sherds (1.5kg) from at least ten cooking pots/jars and two jugs. These wares date from between c.1050 and 1287/1350. One cooking pot rim is decorated on the exterior edge with notches and a possible jug with incised lines forming a cross-hatched pattern on the exterior of the body.

The second Hertfordshire ware is the distinctive Late Medieval Hertfordshire glazed ware (LMHG), dated 1340-1450, with its characteristic splashed copper glaze, represented here by twenty-nine sherds (906g) from nine jugs. These are all glazed sherds baluster and rounded jugs with applied strip decoration in alternating white and red clay.

A small number of individual vessels are brought in from other regions. Thirteen Kingston-type ware jugs from Surrey are represented by lead or copper glazed sherds from highly decorated vessels with applied strip decoration in alternating white and red clay. Three types of London type ware can be found from three different periods of production. At least three jugs in coarse London-type ware (LCOAR) are the earliest products dating from 1080-1200. Four jugs with lead glaze and white slip decoration are jugs of London type ware (LOND) dating from between 1080 and 1350 and two Late London-type ware (LLON) cooking vessels are characteristic of this 15th to 16th-century ware. One distinctive sherd from a Mill Green coarseware jug with white slip decoration is a product from Essex produced between 1270 and 1400. Two sherds of late medieval redware are possibly Dutch imports (DUTR) of 14th to 16th-century date.

### **Phase 6: Post-medieval**

A small post-medieval assemblage of fourteen sherds contains two early post-medieval distinctive wares. One is a sherd of Surrey-Hampshire border whiteware (BORDG) with copper green glaze, produced in the Farnham region between 1550 and 1700. A sherd of Martincamp type III flask is a distinctive import produced in northern France between 1600 and 1650. The remaining sherds of post-medieval date are from a variety of redware vessels; two cooking pot/jars, one deep bowl and a flowerpot. These basic utilitarian 17th and 18th-century household forms in lead or black-glazed red earthenwares are likely to the 17th or 18th-century products of a local industry such as those at Potters Row, Great Missenden and Chesham in the nearby Chilterns area of Buckinghamshire or a post-medieval earthenware industry thought to be in the Hatfield area (Turner Rugg *pers comm*).

### **Discussion**

The presence of residual sherds of early medieval ware (EMCH) in contexts (011), (012) and (013) in pond 145 where Roman pottery is also found in context (009) indicates that the fills of this pond feature have disturbed earlier features.

The majority of the early medieval wares are residual but those found in contexts (298), (301) and (304) all associated with large pit 256 may be contemporary. Similarly early medieval wares in contexts (279) from post hole 280, context (055) from pit 056 and context (230) from gully 233 may be contemporary if the features have a terminus post quem of 1150. The other pottery in these features may still be contemporary until 1350, in which case all of the early medieval wares in the Manor Street assemblage are residual.

The majority of the assemblage from this site date from between c.1140 and 1350 and contains locally produced South Hertfordshire Greyware which is scattered between nearly all of the features in both Areas A and B. Sherd links from the same vessels occur between contexts (102) in pit 092, (122) in pit 123, (132) in pit 137 and are residual in context (153) within pit 154. These three pits 092, 123 and 137 are all located closely together at the western limit of excavation in Area A. Pits 092 and 137 are adjacent to each other and therefore likely to be contemporary as their fills contain sherds from the same pottery vessels. Context (073) may be a slightly later medieval context in ditch 088, a re-cut of ditch 163, dated by the Mill Green ware as late 13th to 14th century date.

A later medieval assemblage dating from 1350-1450 is associated primarily with contexts (152) and (153) both fills of pit 154. These contain a large number of sherds from the same two Late Medieval Hertfordshire glazed ware jugs (LMHG). Ditch 163 may also date from the mid 14th to mid 15th centuries, as sherds of LMHG occur in three contexts (167), (169) and (080). (A very small abraded sherd of questionable late medieval Dutch redware, weighing one gramme, was retrieved from sample <12> of lower fill (179) of ditch re-cut 184 of segment 105).

Post-medieval redwares and Surrey-Hampshire border whitewares of mid 16th to early 17th-century date occur in contexts (052) and (053) from pit 054. Fill (072) from large ditch 088 contains mid 14th to mid 15th centuries Late Medieval Hertfordshire glazed ware but also the early 17th-century Martincamp type III flask sherd. Late 16th to 17th-century redwares are found in context (103) of pit 091 and (271) of pit 272.

### **Regional significance**

The early medieval wares are typical of those found elsewhere in Berkhamsted, for example at 110 High Street and also worthy of note as an indicator of early medieval settlement between c.970/1050 and 1150 in this area of the town. These wares have been well documented and dated within the London and St Albans archaeological sequence (Vince & Jenner 1991), where EMCH is also the most prevalent ware. Vince argues that the provenance of EMCH can be localised by petrology to the north-west of St Albans and in the direction of Berkhamsted (*ibid* 44). The largest part of this pottery assemblage is comprised of locally produced south Hertfordshire greyware. Various kilns within the county are known, of which those at Nettleden and Potten End (Turner-Rugg 1993) are the closest source to Berkhamsted. These local wares date the majority of the archaeological features on this site as between 1140 and 1350. Of note are the small number of wares bought in from Essex, London and Surrey, suggesting a significant level of purchasing power attached to the occupants of this site. A small assemblage of later medieval wares (14th to 15th century) are associated with two features - pit 154 and ditch 163. The post-medieval assemblage is of little significance. This assemblage is similar in character to material previously excavated in Berkhamsted (Whittingham 2009) and confirms that a consistent ceramic type series may be developed for the town by which the various periods of medieval settlement within Berkhamsted may be defined.

### **Ceramic Building Material**

Jonathan Hunn

#### **Introduction**

A total of c.60kg of ceramic building material (CBM) was recovered from the Manor Street excavation. Of this, the majority (97.6%) was composed of tile debris. The remainder (2.38%) consisted of Roman brick fragments. The tile assemblage was overwhelmingly of



medieval/early post medieval date, although a few residual Roman tile fragments were also present, notably a fragment of flue tile. Of the tile some 49.25kg (84.15%) was derived from the fills of ditch 187. By comparison, the pits contained 12.5% of the assemblage, of which 2.8 kg (4.9%) came from pit 054.

## Dating

The dating of the CBM is wholly dependent on its association with the pottery record. Most of this material consists of small fragments so it is suspected that some may be residual in character. According to the ceramics record (Whittingham this report), the majority of the CBM dates to the mid-12<sup>th</sup> to mid-14<sup>th</sup> century. The earliest association was a single tile fragment from posthole 280, found with pottery dating to the mid 11<sup>th</sup> to mid 12<sup>th</sup> century. Two fragments of tile from ditch fill (231) were dated to the mid 11<sup>th</sup> to late 13<sup>th</sup> century, and a possible floor tile came from a pit fill containing 12<sup>th</sup>/13<sup>th</sup> century sherds. Six tile fragments came from a gully containing late medieval pottery. There was an almost complete absence of CBM dating to the 16<sup>th</sup> century. The latest group of CBM (15.25%) came from the upper fill (072) of ditch 187, dating to the first half of the 17<sup>th</sup> century. The latest CBM was found in association with pottery dating to 1580 - 1900.

## Discussion

To what extent the CBM assemblage is representative of this type of medieval settlement is uncertain, especially as there are comparatively few published sites in the town. The assemblage was derived from forty-two contexts out of a potential total of one hundred and twenty-six fills/layers, mostly from contexts dated to the 12<sup>th</sup>/14<sup>th</sup> centuries. The earliest documentary reference to 'tegula' being manufactured at Berkhamsted comes from the early 13<sup>th</sup> century (Caley 1802). There is a second early mention of the use of tile on the 'grange' of Berkhamsted, dating to the end of the 13<sup>th</sup> century (Midgeley 1942). The fragmentary and abraded nature of the assemblage suggests it may be derived from mid to late medieval activity and may be associated with building activity on Castle Street and the High Street. However, the presence of Roman CBM and the fragments of glazed floor tile may suggest that this type of material was brought onto the site from further afield.

## Registered Finds

Bob Zeepvat

## Catalogue

- 001 Silver short-cross penny, half clipped. Dia c.20mm. Legends on obverse and reverse indecipherable. Date 1180-1247.  
*Context 035: gully/pit fill*
- 002 Fragment of disc of white metal, possibly silver? Dia c.25mm, Th.3mm. Rounded edge, no decoration / legend visible on faces?  
*Context 011: top of pond*
- 003 Silver finger ring, traces of gilt. Ext. dia 22mm, int dia 20mm. Wire ring, plain mount with a small oval blue stone setting (glass or sapphire). This is a 'stirrup ring' almost certainly of medieval date: examples have been widely recorded in copper alloy, silver and gold, frequently with blue stone settings (<http://www.finds.org.uk/database>)  
*Context 297: upper fill of Pit 256*
- 004 Cu alloy pin. Large domed head, thick tapered shaft. Overall length c.50mm, head dia. 12mm max, shaft dia 6mm max. The size of this object makes it too large for

conventional 'pin' functions (e.g. clothes fastening, jewellery, dressmaking). Possibly part of a furniture fitting?

*Context 297: upper fill of Pit 256*

- 005 Lead fragment. Max dimensions 26 × 24 × 7mm.  
*Context 297: upper fill of Pit 256*
- 006 Cu alloy strip fragment, folded. Total length 38mm, width 14mm. No rivet holes, markings etc visible.  
*Context 297: upper fill of Pit 256*
- 007 Fragment of lead sheet. Max dimensions 33 × 25 × 2mm.  
*Context 297: upper fill of Pit 256*
- 008 Fragment of lead strip, roughly triangular section. Length 65mm, width 12mm, depth c.6mm.  
*Context 297: upper fill of Pit 256*
- 009 Lead fragment. Max dimensions 17 × 13 × 2mm.  
*Context (127): fill of Pit 124*
- 010 Worked limestone/clunch block, H 12cm, W 16cm, D 15.5cm. Diagonal tool marks on face.  
*Context 167: primary fill of Ditch 163*
- 011 Cu alloy fragments, joining. Max dimensions 18 × 10 × 2mm. No holes or decoration. Function unknown.  
*Context 332: kiln/oven fill*
- 012 Pottery sherd, South Hertfordshire Greyware, with lead rivet. Medieval.  
*Context 115: fill of Ditch 105*

## Results

The excavation recovered twelve registered finds comprising: ten metal artefacts, one worked stone fragment and one of pottery. Most of the metalwork consists of fragments of copper alloy or lead strip or sheet, ubiquitous finds from occupation sites of Iron Age or later date. Two metal objects are of particular interest. 001, a half-clipped short-cross penny of late 12<sup>th</sup> to mid 13<sup>th</sup>-century date, is of potential significance for dating pit 034, and 003, a gilt silver stirrup ring, also of medieval date, which is of intrinsic interest.

The body sherd of South Hertfordshire Greyware with a lead rivet, 012, is unusual. Lead rivets are frequently found in Roman contexts, used to repair fine ware vessels, such as Samian. However, their occurrence in medieval contexts is less frequent, and the use of a lead rivet to repair a vessel in a readily available coarse ware has implications for the intrinsic value of this particular vessel, possibly as an heirloom.

## Worked Stone

Karin Semmelmann and Bob Zeepvat

## Results

16 fragments of worked clunch measuring between 60 x 75 x 24mm and 125 x 100 x 90mm were retrieved from context (218) of oven structure 213 and a single worked stone fragment from context (167) of Ditch 163 (registered find 010). All were of similar petrological composition which suggested that they originated from the same bed of chalk, probably quarried at Totternhoe. Most fragments had tool marks on at least on face; some had chisel

marks on one or more faces and bolster marks on another. Most of the tool marks were worn, but two pieces, which appeared to have come from rectangular blocks, had fresh chisel marks on one face and more worn bolster marks on two other faces. This may well indicate later reworking of the stone.

The only moulded fragment is triangular in shape with a clear edge with worn tool marks on one side and roll moulding at right angles to it. The roll moulding also retains some tool marks both on the interface between the roll and the adjacent flat section and on the outer curve of the roll. The tool marks on the flat section run diagonally between the straight edge and the roll moulding. The fragment is 25mm deep and is likely to have formed part of a window or door dressing.

## **Discussion**

The fragments are not sufficiently diagnostic to be able to indicate date or function. Clunch was commonly used in the medieval period for secular and ecclesiastical buildings either as a dressing or for an entire build. Roll moulding was also a common motif at this time and it is highly probably that the fragments are from a mid-high status medieval building. The resurgence of gothic architecture in the Victorian period led to the reproduction of medieval architectural themes and building styles, but the construction techniques had undergone some modernisation. Although this is generally less apparent in hand worked stone where similar tools were used, Victorian tooling can be detected on fresh or reworked stone surfaces. The fresher tooling seen on two of the fragments from context (218) could fall into this category, but the worn arises suggest otherwise.

## **The Slag and Chalk Construction Material Analysis**

Jane Cowgill

### **Methodology**

The slag was washed when necessary and identified solely on morphological grounds by visual examination, sometimes with the aid of a  $\times 10$  binocular microscope. It was counted and weighed and catalogued broadly by type (e.g. tap, smithing slags) with brief comments on condition where this may affect its interpretation or be relevant for the initial stage of interpreting the site. It was recorded on *pro forma* recording sheets and this information was entered directly into the catalogues (retained in the project archive).

Most of the bags of magnetic material were sub-sampled and often only *c.*1g was rapidly counted in a petri dish using a  $\times 10$  microscope. The hammerscale (plate and spheroidal), slag and iron corrosion flakes were counted together and the sum multiplied up to give the minimum totals (retained in the project archive).

The chalk-construction material was dried and the composition was recorded with the aid of a  $\times 10$  binocular microscope. The three groups are very dusty and this may have masked some of the compositional elements in the chalk mix.

### ***Slag***

A high proportion of the slag recovered from the site is tap slag, a by-product of the production of iron in a shaft-bloomery furnace. This requires a good quality ore (over 50% available iron), copious quantities of charcoal (and therefore wood) and a clay source for the building and repair of the furnace/s. The soil conditions on the site have affected the slags: many have lost their true surfaces and a few pieces even have a 'powdery' texture when handled, which makes judging their condition difficult (*i.e.* whether they are abraded and

redeposited). The quantity, however, suggests that smelting may have occurred on or near the site between the 12<sup>th</sup> and 14<sup>th</sup> centuries. Comparisons can be made with deposits of slag found in the medieval towns of Norwich, Thetford and Stamford where iron smelting seems to have occurred unusually close to the centre of occupation when major building programmes in the form of churches/cathedrals and castles were being undertaken. As a cautionary note a large dump of slag of 12<sup>th</sup> -14<sup>th</sup> century date (Phases 2 and/or 4) was recorded at Kingsgate, close to the river Bulbourne waterfront (Guttmann 1996). This was interpreted as the large-scale dumping of mainly smelting slag from an unknown source, which had been imported onto the site to increase the height of the land above potential flooding levels and perhaps to improve drainage (Cowgill 1996).

The quantity of tap slag from Area A appears on initial examination to be quite limited and at this stage of recording a focus is not apparent. In Area B the main features containing these slags are the upper medieval deposits within palaeochannel 256 and the smaller nearby pit 273.

### ***Hammerscale***

Hammerscale is produced by all smiths when they forge iron: it is an unavoidable by-product resulting from the oxidation of the surface of the hot iron when it is removed from the hearth. Both flake and spheroidal scale is produced, the latter during fire welding at very high temperatures and, it is thought, during bloom smithing which is essentially a similar operation. A number of contexts have produced a significant quantity of hammerscale, indeed some may be large enough to suggest that they could be a primary dump from an iron smithy. Preliminary examination of the site evidence suggests that there is limited evidence for iron smithing from Area B, apart from some magnetic matter (300+) recovered from pit 256 with further smaller groups of some 100+ pieces from pit 273 and oven/kiln 281. In Area A more smithing slags were, recovered from ditch segment 088, pits 092 and 123. The largest groups of magnetic matter come from pits 021, 034 and 124, and gully 186. The existence of these assemblages is entirely dependent on what contexts were sampled and therefore may not actually truly reflect the distribution of this material on the site.

### ***Chalk Construction Material***

This group represents three different chalk-based materials that have been used for construction purposes. It has in all instances probably been mixed with varying proportions of clay to bind it, sometimes flint and organic inclusions are also apparent. It is light in weight and varies in colour between a fleshy-pink to an almost pure white. Uneven surfaces exist amongst the assemblages from contexts (217) and (330), but only the pieces from (217) appear to have been white-washed, probably with lime-based paint. These surfaces were possibly once the external faces of a building or the rough inner face of a barn or other building of a similar status.

Chalk was used as a component in a variety of unbaked earth mixes, all of which needed a 'good hat and a good pair of shoes', the former usually of thatch and the latter some form of plinth (Clifton-Taylor, 287). A possibility is that these groups are the remains of some form of chalk-cob walling, a laborious building process that called for semi-skilled labour. The clay and chalk mix had to be carefully blended and each layer had to harden before the next could be added, with the result of making the construction period of fairly long duration. Each layer was built up by eye as no shuttering was used (*ibid*, 289). 'A good wet mix of 'chalk mud' might have as much as three parts chalk to one part clay: for durability, the higher the proportion of chalk the better'. Alternatively sometimes walls were built entirely of a chalk mix, as opposed to chalk blocks (clunch). Here the method was to 'pug' the chalk by adding

water, pour the mix between a pair of boards, ram it down, tread on it and wait for it to dry out. The result was closely comparable to cob, although inferior to clunch (*ibid*, 290). These comments by Clifton-Taylor apply to house building techniques in the medieval but mainly post-medieval period, whether the chalk/clay combination was ever used for hearths or smaller structures is not mentioned.

At the excavation at Kingsgate, the 12<sup>th</sup> - 14<sup>th</sup> century layer that sealed the site was described as dark-grey chalky clay containing a quantity of finds. This layer was described by Dr Macphail as 'a 'pale dark earth' derived from the abundant chalk inclusions which may relate to dumped structural debris from chalk floors or cob houses' (Guttmann 1996, 5).

### **Environmental Analysis**

James Rackham, Catherine Langdon, John Giorgi and Robert Scaife

The analysis of the plant macrofossil remains was undertaken by the John Giorgi and James Rackham and the pollen analysis undertaken by Rob Scaife and Cath Langdon.

### **Introduction**

Thirty two bulk samples and one monolith were collected for environmental study. These samples were assessed (Rackham *et al* 2011) and recommendations made for further post-excavation analysis.

### **Phase 1: Prehistoric Period**

#### *Palaeochannel 145*

The earliest dated feature on site is 145, originally interpreted as a pond, but subsequently re-interpreted as a prehistoric palaeochannel. This feature is higher in terms of level than feature 183 which might therefore be interpreted as an earlier palaeochannel, although this has not been confirmed by radiocarbon dating (Table 1) and there is no direct stratigraphic relationship. Feature 145 was sampled in a 1m monolith, sample <11> (NGR SP 995094 077783). The lower fills, (139), of 145 comprise humified organic silty flint gravels, overlain by (138), very humified peat, becoming more silty upwards (010) and with incipient soil development of its upper part. These are overlain by stoney clays, (011), in turn overlain by organic stoney silt, (009). The upper part of this sequence, contexts (010) and (011), include archaeological debris dating to the 12<sup>th</sup>-14<sup>th</sup> centuries AD. Two radiocarbon dates were submitted from the organic-rich sediments in the monolith sample (Table 1) and the humic acid fractions dated. A late Neolithic/early Bronze Age date was obtained for the base of the stone free humified peats at 49-50cm and a late Bronze Age date a few centimetres (37-38cm) above, indicating that context (138) represents the humified, dried and shrunken remains of a thousand years of peat growth. The soil developed out of the peats above, represented by (010), was deemed unsuitable for dating, but might presumably be taken to represent at least the early part of the 1<sup>st</sup> millennium BC.

After the preliminary evaluation (Rackham *et al* 2011) established the presence of sub-fossil pollen and spores, further analysis was undertaken on the sediment fills of palaeochannel 145. The organic rich (138) part of the sequence in this feature has been radiocarbon dated to the Bronze Age (Table 1), while the upper (010) is likely to reflect peats formed during the 1<sup>st</sup> millennium BC and subsequently subject to incipient soil development, before finally being sealed by stony alluvial clays and archaeological deposits in the medieval period. Material of medieval date in context (010), the soil developed on the top of the peats, has probably been trampled into this deposit. Pollen survived in the sampled organic horizons of the sequence

and shows significant changes in the vegetation from woodland to an open agricultural (pastoral) habitat.

#### Insert table 1

Two local pollen assemblage zones (l.p.a.z.) have been delimited in the 35cm of the profile studied. These are delimited primarily by the substantial differences in the number of tree pollen in the lower part of the sequence compared with above. Details of these local pollen assemblage zones are shown in Table 2 below.

#### Insert table 2

Two distinct environmental phases are apparent in this profile (*i.e.* delimited by the local pollen assemblage zones). The first is clearly a phase of dominant woodland, the second, one of an open agricultural habitat. These data are superimposed on the on-site/wetland record of vegetation change.

Radiocarbon dating places the transition from woodland to open environment between *c.*3700 BP and 2900 BP, during the Bronze Age, probably in the middle Bronze Age. Poor pollen preservation and greater humification of the peat at *c.*44cm suggests (thus the pollen count was much reduced) that there may have been a hiatus, albeit a relatively short one, during this period. It was, perhaps deforestation (the lime decline, discussed below) which caused the further onset of peat accumulation through decreased woodland evapotranspiration, higher ground water table and increased surface run-off, but may also reflect the cut off of this channel from the river system and the development of organic deposits in the former channel. Dates for such deforestation are in accord with the Lime Decline variously described from southern England.

There are distinct changes to the development of the terrestrial vegetation. *Tilia* is regarded as being poorly represented in pollen assemblages taken at distance from its growth (Andersen 1970, 1973). Here, the values can be regarded as being extremely high and, certainly signifying dominance of lime/linden (probably *Tilia cordata*) woodland on well-drained soils in close proximity to the site. This is in accord with many other pollen data from southern and eastern England which have shown that lime, after arriving at the end of the Boreal (Flandrian Ic), prior to separation of Britain from mainland Europe, became dominant during the middle Holocene (Atlantic period) and remained so until widespread, but asynchronous clearance in the late prehistoric (Sub-Boreal) period (Godwin 1975; Greig 1982; Moore 1977; Scaife 1980, 2000, 2003; Waller 1993, 1994). The lime decline, once thought to be climatically induced (Godwin 1956), is now attributed to anthropogenic causation (Turner 1964) and frequently attributed to the middle Bronze Age, as here, although late Neolithic phases have also been described (Scaife 2000). Thus, although a limited hiatus may be present in this sequence, it is also evident that a substantial reduction in lime woodland had occurred, probably through human activity at *c.* 3,000-3,300 BP, the Middle Bronze Age.

Subsequently (l.p.a.z. 2), the local environment was open with few trees in the local region. However, hazel (*Corylus*) remained and indeed, appears to have become more important than in the preceding l.p.a.z. with values which suggest local importance. This is attributed to the expansion of hazel scrub consequent upon woodland clearance, or due to increased flowering in a more open environment. During this phase, from 3,000 BP, there is a clear change to a pastoral environment with little evidence of cultivation - only a single cereal pollen grain is present at 24cm in the profile. Grasses (Poaceae) and dandelion types (Lactucoideae) are the clearest indications of this pastoral habitat. Increase in bracken (*Pteridium*) with some weeds, goosefoots and/or oraches (Chenopodiaceae) and mugwort (*Artemisia*) for example, also indicate waste and disturbed ground.

There are distinct changes in the on site vegetation. Initially (l.p.a.z. 1) alder (*Alnus*) became progressively more important on the adjacent floodplain. This culminated at the top of l.p.a.z. 1 when conditions became drier corresponding with the short-lived hiatus at c.44 - 40cm. As seen here, pollen preservation is typically poor in such biologically active floodplain woodland. Subsequently (l.p.a.z. 2) on-site conditions became wetter. Alder became much reduced associated with a change to a grass-sedge fen. Other floodplain/damp ground taxa are present with meadowsweet (*Filipendula*), hemlock (*Conium*) and water dropwort (*Oenanthe* type) present. Occasional pollen of aquatic macrophytes include pond weed (*Potamogeton*) and bog-bean (*Menyanthes*) and attest to shallow water. These pollen may, however, have derived from fluvial transport from upstream and subsequent overbank deposition, although the interpretation of the features as a cut off channel would be consistent with these taxa. Spores of ferns are numerous in the lower half of l.p.a.z.2. It is not clear where these derive from. It is possible that these may be from the on-site community for example, *Thelypteris palustris* type (although the typical perinous spines were absent) or from fluvial transport which is also a typical feature of overbank deposition.

Two bulk samples, (139) and (138), samples <10> and <9> respectively were collected from the lower deposits of palaeochannel 145. Neither sample produced any archaeological finds although one sherd of middle-late Bronze Age pottery contemporary with this deposit and a intrusive sherd of medieval pottery were recovered during hand excavation from the upper context (138). The sample from the lower deposit, (139), included only unidentifiable degraded vegetable matter, with degraded wood and occasional moss, but frequent rootlets from higher up the sequence. Preservation in the layer above, (138), was somewhat better. The sample produced a large flot (1250ml) consisting largely of fragmented wood and degraded un-identifiable organics with only a small range of identifiable plant remains for information on the character of the local environment in the Bronze Age.

The only botanical evidence for domestic rubbish in the sample was a single charred grain of possibly free-threshing wheat and charcoal. The grain could possibly have been introduced down the profile through worm holes or bioturbation so cannot be treated as confidently Bronze Age. There were virtually no wetland plants except for a few *Carex* seeds with the best represented species being *Urtica dioica*, which, as noted above, grows in a range of habitats and is indicative of nitrogen rich soils, unsurprising on humified peats. Occasional blackberry/raspberry and elder seeds and a few hazel nut shell fragments (the latter also detected in the pollen record from the pond) may point to the presence of woodland/hedgerow/scrub vegetation close-by. The few remaining wild plant/weed seeds are from plants that may be found in more than one habitat, for example, *Ranunculus acris/repens/bulbosus* and *Rumex*, species of which grow in both grassland and disturbed ground, and *Ajuga reptans* (bugle), a plant that may grow in woods, shady places and damp grassland.

This adds little to the picture from the pollen evidence, although perhaps supporting the cleared/pastoral interpretation for this level in the palaeochannel, with remains perhaps suggesting hedgerow/scrub and damp vegetation in the vicinity of the palaeochannel.

### *Palaeochannel 183*

Palaeochannel 183 was identified within Area A, sealed beneath the large medieval ditch 105. This palaeochannel appears to be stratigraphically earlier than palaeochannel 145 and comprised a layered (waterlain) silty clay with flint gravel. A sample, <15>, taken from 183 produced no archaeological debris but had a fairly rich waterlogged plant and insect assemblage suggesting disturbed/waste ground and wetland habitats. Stones of *Prunus avium* (wild cherry), and *Prunus* sp. were submitted for radiocarbon dating and unexpectedly

produced a late Saxon/early medieval date (Table 1). This is dramatically inconsistent with the interpretation of the deposit as a prehistoric palaeochannel and can only be explained as contamination from the lower fills of feature 105 above, presumably deriving from medieval occupation or medieval cherry trees growing nearby, although the stratigraphic drawing of the sample indicates a very clear distinction between ditch 105 and the sampled primary fill of channel 183 beneath. Owing to the depth of the trench in which channel 183 was observed the sample was collected from the machine bucket (Hunn *pers comm.*) and it seems probable that this scraped material off the section of ditch 105 as it was raised contaminating the sample from the channel below.

### Insert table 3

A spot pollen sample was taken from sample <15> and studied during the assessment (Rackham *et al* 2011; Table: 3). In this single sample *Corylus avellana* type is dominant (62%) with smaller numbers of *Tilia* (4%), *Quercus* (13%), *Ulmus* (9%) and *Pinus* (3%). There are few herbs with small numbers of Poaceae (2%) and spores of *Dryopteris* type (typical ferns) and *Pteridium aquilinum* (bracken). This pollen assemblage is consistent with a late prehistoric age. Hazel woodland is dominant with oak and some lime but with higher elm values. This is at odds with the radiocarbon date, but also is inconsistent with a date earlier than palaeochannel 145 in which l.p.a.z.1 was lime woodland, suggesting a similarity with l.p.a.z.2 in channel 145 where hazel dominates (Table 2).

There is an unresolved inconsistency between the pollen results, stratigraphy and radiocarbon result, which suggests contamination of the sample and precludes any use of these results in the period discussion.

### Palaeochannel 256

Feature 256 in Area 2 had bulk samples taken from two of its lower organic fills, 301 and 303, and a single spot pollen sample from 303. Pollen is abundant and well preserved in the sample (Rackham *et al* 2011; Table 3). Trees and shrubs are dominant with *Corylus avellana* type most important (72%) with *Betula* (2%), *Quercus* (10%), *Ulmus* (8%), *Pinus* (4%), *Betula* (2%) and *Alnus*. There are few herbs with only small numbers of Poaceae (1%). Spores of ferns are relatively important with monolete forms, *Dryopteris* type (9% sum + spores).

The vegetation suggested by these data is similar to that in channel 183 and the upper part of channel 145. Trees and shrubs are markedly dominant with hazel being the most important and growing local to the site. It is probable that this formed hazel scrub or hazel coppice in managed woodland with oak and elm. Pine is also present and whilst it is capable of very long distance wind (anemophilous) transport, the numbers here suggest occasional local growth in the region, and lime is still present. There are no indications of agriculture or any taxa that would indicate a historic age for the deposit.

The bulk samples from the lower part of this feature, contexts (301) and (303), were devoid of historic archaeological finds, including hammerscale which was ubiquitous in the later samples, although one sherd of pottery and a sheep sized chopped rib fragment were recovered during excavation from (301), a piece of cattle tooth enamel in (303) two late Mesolithic microliths from (303) and charcoal in the two samples from context (303).

It seems a possibility that this feature may be part of the prehistoric palaeochannel system on the site, and that the lower fills are early in date, context (300) perhaps reflecting the primary fill of a much later deposit into the palaeochannel, and the pottery intrusive into (301) from the layer above, while the late Mesolithic microliths could date the feature or activity on its bank.



### Phases 3-5: Medieval period

A large proportion of the bulk samples were taken from deposits assigned to the medieval phases of the site, phases 3-5.

#### Introduction

Cereal grains accounted for almost three-quarters of the total number of identified items along with a few chaff fragments (4%) while other plant remains, predominantly from weeds/wild species, made up the remaining 21%. Most of the individual charred plant assemblages, however, were small, fifteen of the twenty samples containing twenty items or less, with a density of identified charred items of less than one per litre of processed soil.

A small amount of mineralised botanical remains was present in two samples although poor preservation meant that little could be identified or only reduced to family, for example Cerealia/Poaceae (cereals/grasses), Rosaceae (rose family) and Fabaceae (legumes). On the other hand, the 'waterlogged' plant remains in four samples included three rich assemblages in the fills of ditch 105, with a high species diversity of mainly wild species associated with a range of habitats and including the residues of a few potential economic/food plants. Many of the dry flots also contained un-charred seeds, particularly of *Sambucus* (elder) and *Rubus* (blackberry/ raspberry) which owing to their robust woody structure may be contemporary with the sampled features. There were exceptionally large numbers of these seeds in two fills from pit 137 and in a fill of ditch 163. A few un-charred *Ficus carica* (fig) seeds were also found in ditch 163. The un-charred seeds in the dry flots have not been tabulated but will be referred to in the text if considered to be contemporary with the sampled features.

Almost 75% of the quantified remains were recovered from just one sample, the rake-out (219) of Oven 213 with a density of almost forty items per litre of soil. Fragmented charcoal was present in all these samples with large amounts in the oven rake-out (219) and fill (317).

Cereal grains and/or indeterminate fragments were present in twenty samples, although preservation was poor and well over half (62%) could not be identified, while there were variable amounts of indeterminate and un-counted cereal fragments in most of the samples.

*Triticum* (wheat) was by far the best represented cereal, accounting for 29% of the quantified grains and identified in eighteen samples. The well-preserved remains consisted almost entirely of free-threshing wheat grains, either hexaploid bread wheat (*Triticum aestivum*) and/or tetraploid rivet wheat (*T. turgidum*). These two cereals can usually be distinguished by their rachis fragments and although forty-one free-threshing chaff fragments were found in stoke-hole rake out (219), the rachis fragments in this instance were too poorly preserved and incomplete to be used as a diagnostic indicator of either species. The only other wheat species was represented by just two grains of the hulled grain *Triticum dicoccum/spelta* (emmer/spelt) among the numerous grains in oven rake out (219).

There were significantly smaller amounts of other cereals in the samples; fifty-one grains of *Avena* sp. (oat) (7% of the grains) in eleven samples; thirteen grains of *Hordeum vulgare* (barley) in nine flots, including a few twisted hulled grains indicative of six-row hulled barley; and just three grains of *Secale cereale* (rye) in two samples. Rye was also identified from a single rachis fragment. Other potential cereal debris consisted of a few charred and mineralised culm node fragments in three samples. There was no significant difference in the range or proportions of the various cereals represented in the different phases of the site.

Free-threshing wheat, hulled barley, rye and oats are the four main cereals cultivated during the medieval period in southern Britain (Greig 1991, 321) with similar finds from a number of other sites in Hertfordshire; for example, free-threshing wheat, barley and oats were identified

at Stocks Golf Club, Aldbury, just north of Berkhamsted (Giorgi 2011), Sutton's Farm, near Hatfield, (Giorgi 2012) and Tyttenhanger Farm close to St Albans (Giorgi 2000). Free-threshing wheat was also the main grain with smaller amounts of hulled barley and oats and traces of rye in late Saxon/early medieval deposits from excavations at Marriot Lonsdale School, Stevenage (Giorgi 2012a).

Free-threshing wheat was the most widely cultivated crop in the London region during the medieval period (Campbell *et al* 1993, 38), the most commercially valuable cereal (Hammond 1995, 2) and the main bread grain, bread wheat being preferred to rivet wheat, the latter producing poorer quality flour. The archaeobotanical record also suggests that bread wheat was more extensively grown than rivet wheat in southern England during the medieval period (Moffet 2006, 49).

Oats were also widely cultivated and on an almost equal scale with wheat in the London region because of its many uses, including in brewing, pottage (along with the other cereals) and for animal fodder (along with barley) while barley, followed by rye, were grown on a smaller scale (Campbell *et al* 1993, 27, 38). All the cereals (with the exception of rye) were grown around London during the medieval period for use in brewing although there was no evidence in the form of sprouted grains in the samples to suggest the use of any for brewing at Manor Street. Brewing, however, was carried out in the town as shown in the taxation list of 1290 for Berkhamsted (Doggett and Hunn 1985).

The samples also produced evidence for a small range of other potential food/economic plants represented by charred, mineralized and 'waterlogged plant remains.

A small assemblage of poorly preserved Fabaceae (legume) seeds was recovered as mineralised and charred remains in eleven samples including two seeds tentatively identified as *Vicia faba* (broad bean). These are frequently found in medieval deposits but usually only in small amounts (Moffet 2006, 53). Legumes were widely cultivated in the London region but only as a minority crop (Campbell *et al* 1993, 134-5) with an important use as fodder, beans being used for a product known as horse bread by the early 14<sup>th</sup> century (*ibid.*, 27). Beans were also used for human food, together with cereals for bread and also in pottage, particularly by the poor and following failed cereal harvests (Wilson 1991, 201-2). Pulses were also grown as a means of restoring nitrogen to the soil as part of crop rotation (Campbell *et al* 1993, 134). The other legume seeds could only be broadly identified as *Vicia/Lathyrus* sp. (vetch/tare/ vetchling) or *Vicia/Lathyrus/Pisum* sp. (vetch/tare/vetchling/pea) and thus could be from either cultivated and/or wild plants.

A few 'waterlogged' seeds of *Linum usitatissimum* (flax) and *Cannabis sativa* (hemp) were identified in individual samples. Both of these plants were mainly grown for their fibres for making canvas, cloth and rope, although oil from the seeds may have been used for cooking and lighting while flax seeds were used in bread and stew (Greig 1988, 122). Evidence for both plants has been found from medieval sites in southern England (Greig 1991, 326) including hemp seeds from Suttons Farm, Hertfordshire (Giorgi 2012). Cloth-making is also listed as an industry in the town in the taxation list of 1290 (Doggett and Hunn 1985).

A range of fruits was identified in many of the samples represented mainly by 'waterlogged' seeds and also by occasional charred remains. The most numerous fruit seeds, preserved largely by 'waterlogging' and only occasionally by charring, were blackberry/raspberry and elder seeds, identified in eleven and eight samples respectively, and including six large assemblages. Other fruits included a few 'waterlogged' fruit stones of *Prunus domestica* (plum/bullace), *Prunus spinosa* (sloe/blackthorn) and *Prunus avium* (cherry) in several samples, a small number of mineralised *Prunus* type stones in one sample, small amounts of

charred and ‘waterlogged’ hazelnut shell fragments in eight samples and occasional *Crateagus monogyna* (haws) in one sample.

The fig seeds identified in one sample are widely found in medieval deposits in southern England (Grieg 1991, 325) and may have been grown locally although figs were also imported as dried fruit in the medieval period (*ibid.* 326). The other fruits, with the probable exception of elder, brambles and haw, may have been both cultivated and/or growing wild during the medieval period.

The fruits may have had a range of uses both as food and drink and for other purposes during the medieval period, although little fruit was eaten fresh because it was considered unhealthy (Weinstein 1990, 82), but rather used in pies, pastries or in pottage or preserved as jams and jellies (Wilson 1991). Hazelnuts were preserved for later consumption. Elder had a range of uses, the fruit for wine (Grieve 1992, 268), and the tannin in the bark and roots in tanning leather. Tanning is mentioned as an industry in the 1290 taxation list for Berkhamsted (Doggett and Hunn 1985).

A wide range of wild plants/weeds were represented by ‘waterlogged’ remains, with a smaller number represented by charred material and some species being represented by both forms of preservation.

Charred seeds of other plants were found in fourteen samples, with over 75% being found together with the rich grain assemblage in the oven stoke-hole rake-out (213) and thus probably representing arable weed seeds burnt following on-site crop-processing activities. The other samples only contained occasional or very small numbers of charred weed seeds.

*Anthemis cotula* (stinking chamomile) was well represented by charred (and occasional ‘waterlogged’) seeds in four samples, particularly in the oven stoke-hole rake-out (219) and is found usually on calcareous but often heavier soils (Stace 2005) and is an indicator of waterlogged loams and clay soils (Hanf 1983). Early surveys of arable weeds in Hertfordshire record the presence of *Anthemis cotula* on both heavy and light soils in the county (Brenchley 1911; 1913). The rake-out (219) sample also contained a few seeds of *Tripleurospermum inodorum* (scentless mayweed), a plant which grows in all types of soils except chalk; *Sherardia arvensis* (field madder) found in all soil types but more usually on light calcareous loams (Wilson *et al* 2003); and *Rumex acetosella* (sheep’s sorrel), a weed that grows mostly in acid sandy soils and is infrequent in calcareous soils (Stace 2005).

None of the other seeds could be reduced to species but included relatively good representation of Poaceae (grasses), both large-seeded including *Bromus* sp. (brome), the seeds of which are often found in cereal storage deposits because they are difficult to separate from the grains other than by hand-sorting, and small-seeded grasses. Leguminous seeds were also fairly well represented although some of these may derive from cultivars rather than weeds. There were also a few *Carex* spp. (sedges) and *Eleocharis* sp. (spike-rushes) seeds, indicative of damp ground.

The presence of *Anthemis cotula* and *Sherardia arvensis* suggests the use of calcareous soils for cultivation, similar to those in the immediate area of the site although the occasional records for *Rumex acetosella* and *Tripleurospermum inodorum* may tentatively point to the use of (acidic) sandy soils for growing crops. The different cereals in the samples can be cultivated on a range of soils but free-threshing wheat grows well on heavier calcareous soils and is typically associated with deep clay loams in Britain (Jones 1981, 106). Barley is best suited to lighter loams while oats and rye may have been grown on more acidic soils. Beans grow best on clay soils (Barker 1985, 46). The limited weed seeds, however, cannot provide

any other detailed information on possible crop husbandry practices although any evidence of crop-processing activities in different areas of the site will be highlighted below.

The bulk of the 'waterlogged' plant remains were recovered from the three early medieval (Phase 4) fills of ditch 105 and probably mainly reflect the nature of the local environment within and in the close vicinity of the ditch during this period. There was evidence for plants from a wide range of habitats in this feature, which are considered below.

## Results

The following sections discuss the results of the plant macrofossil analysis regarding the medieval phases, in phase order.

### Phase 3: Medieval (1066-1250)

Deposits assigned to Phase 3 include the medieval deposits in the top of feature 256, a possible prehistoric palaeochannel in Area B. Context (300) is the primary medieval deposit and is characterised by an abundance of slag, with an upper fill, (304), containing abundant hammerstone, and indicating an iron smithy in the vicinity. (300) produced very little environmental evidence with just a little charcoal and a few uncharred seeds of *Rubus* (bramble/raspberry). (304) produced a very small charred plant assemblage consisting of a few grains and fragments (including free-threshing wheat and oat) and a few wild plant/weed seeds, probably representing background cereal debris blowing around the site from activities nearby. Occasional charred *Carex* and *Eleocharis* seeds may be the residues of arable weeds, possibly suggesting the cultivation of damp ground or wet areas nearby, but could easily have derived from plants growing at this location, particularly if the layers below represent the infill of a palaeochannel.

Context (304) had evidence of another industry. The sample produced a number of male goat horn cores that had been chopped from the skull, and many further cores were recovered during excavation clearly indicating waste from a horners' workshop, this is discussed in more detail in the animal bone section below.

Five further samples have been assigned to this phase all from the deposits infilling the two segments, 105 and 163, excavated across ditch 187 in Area A. The primary fill of 105, context (181), was radiocarbon dated using a roundwood sample (Table 1), and produced a date of 1034-1165 cal AD. As seems likely if the date obtained from the sample from palaeochannel 183 was contaminated by material scraped off the section of 105, then this date (Table 1) on *Prunus* stones, which also occur in the fills of 105, might reflect the age of the fills in 105. The date of 1013-1159 cal AD (at 94.7% probability - Table 1) is sufficiently consistent with the date from context (181), in combination with the fact that it was obtained on *Prunus* stones, to support the inference of contamination of the sample from (182) by material from 105.

The three lower fills from segment 105 of ditch 187 produced broadly similar 'waterlogged' botanical assemblages with no significant difference between the individual fills and with evidence for a wide range of plants, while one of the samples from segment 163 produced a dry flot, but with some uncharred seeds present. The assemblages were dominated by the remains of wetland (both aquatic and bankside/marshland) and disturbed (including cultivated)/waste ground species. There was a smaller range of plants from woodland/hedgerow/scrub environments and potential grassland species although many of the plants represented in the sample, particularly those that could not be reduced to species, may be found in several habitats. Non-seed parts included moss, thorn, bud, leaf and wood (including charcoal) fragments.

The following wetland plants were identified in all three samples; *Apium* spp (marshworts) including *Apium nodiflorum* (fool's watercress) which was particularly well represented; the submerged aquatic *Zannichellia palustris* (horned pondweed) which grows in a range of shallow water habitats; the semi-aquatic/aquatic *Rorippa nasturtium-aquaticum* (water cress); *Ranunculus sceleratus* (celery-leaved crowfoot) found on the muddy edges of ponds and ditches and in marshy fields; and *Bidens* spp. (bur-marigolds) including *Bidens cernua*. A number of these plants, for example *Apium nodiflorum*, *Zannichellia palustris* and *Ranunculus sceleratus* point to the presence of eutrophic (nutrient rich) conditions within the ditch although *Rorippa nasturtium-aquaticum*, prefers mesotrophic (moderately nutrient rich) rather than eutrophic waters. Other wetland plants in one or two of the ditch fill samples included fewer records for *Persicaria hydropiper/mite* (water pepper/tasteless water pepper), both species found in damp places and shallow water, often shaded, *Lycopus europaeus* (gypsy-wort) and *Carex*. Other indicators of standing water in the ditch include ostracods and sticklebacks, while the presence of frogs or toads in all the samples is further support for this wet and damp environment.

There was a very wide range of plants associated with disturbed and waste ground habitats suggesting human activities or animal grazing taking place close-by; some of the disturbed ground weeds, however, may have arrived on the site as crop contaminants, for example *Anthemis cotula*, represented by a few 'waterlogged' seeds as well as a single charred seed.

*Urtica dioica* (common nettle) was exceptionally well represented in the ditch fill samples and may be found in a range of habitats, especially woodlands, fens, grassy places, cultivated ground and where animals defecate (Stace 2005). This plant is found in nitrogen rich soils which is also true of many of the other well represented weeds including elder, *Urtica dioica* (stinging nettle), *Urtica urens* (small nettle), *Atriplex/Chenopodium* spp. (oraches/goosefoots etc), *Stellaria media* (common chickweed), *Conium maculatum* (hemlock) and *Solanum nigrum* (black nightshade), and less well represented weeds, for example *Fumaria officinalis* (fumitory), *Lapsana communis* (nipplewort), *Hyocyanus niger* (henbane) and *Sonchus asper* (spiny milk-/slow thistle).

The presence of hedgerows growing alongside or near the ditch could be indicated by the evidence for brambles, elder, hazel, plum/bullace, cherry, sloe/blackthorn and hawthorn as well as the fairly large amounts of large/small round wood and possibly Rosaceae thorns in the samples. On the other hand, these fruit remains could also represent food debris.

There were few specific grassland species in the ditch fills although there were a number of the plants that may be found in grassland as well as other habitats, for example *Ranunculus acris/repens/bulbosus* (buttercups), *Prunella vulgaris* (self-heal), *Rumex* (docks) and *Carduus/Cirsium* (thistles) species. There was also a fairly good representation of small-seeded Poaceae (indeterminate grasses).

Plant food debris and other plant waste in the ditch fills included a few free-threshing wheat grains in two samples, charred oats (cf *Avena* sp.) in (161) and possibly the flax and hemp seeds; both these plants may have been growing close-by. A few uncharred *Ficus carica* (fig) seeds in (161) and other fruit stones and pips might indicate the presence of human faecal waste in the ditch. Other food debris or 'domestic' rubbish in the samples includes cattle, sheep/goat, hare, small bird, fish bones, oyster and common mussel shell.

The botanical evidence from these fill samples suggest a fairly open environment in the vicinity of the ditch although with hedgerow/scrub vegetation possibly growing alongside the feature and/or nearby. The wetland plants suggest eutrophic waters in the ditch, which may have been a result of the dumping of domestic waste, with the fish and ostracods indicating at least semi-permanent water in the ditch. Nutrient rich soils in the areas adjacent to the ditch

may point to human activities and the presence of dumps/refuse tips and cess/rubbish pits (as recorded during the excavations) in the area as well as very possibly animal activity, with enrichment by the excrement of livestock watering at the ditch. Several ecological indicator values (light, water, nitrogen levels) used by Ellenberg (1988) (albeit limited to those plants that could be reduced to species) also suggest a fairly open environment with damp conditions and nutrient rich soils in the vicinity of the ditch.

#### **Phase 4: Medieval (1200-1400)**

Nine samples were collected from deposits dated to Phase 4, although only eight were studied during post-excavation, the ninth being recorded only during the assessment.

Four of the samples derive from a gully and pits in Area A, gully 186 and pits 021, 034 and 124, the sample from the latter described as a 'cess' layer. While the remaining five are all associated with two ovens in Area B, 281 and its later recut 316, and a sample from the stoke hole of oven 213.

The four samples from Area A all contained occasional or very small charred botanical assemblages, mainly cereal debris, with a few grains of (free-threshing) wheat and hulled barley and a rye rachis fragment, plus a possible broad bean and hazelnut shell fragment, probably background food debris blowing around the site. There was no evidence in the sample from pit 124 to support the interpretation of this layer as 'cess', and the broad range of debris recovered from the samples suggests domestic rubbish. But the samples from all three pits contained relatively high concentrations of hammerscale. Although hammerscale can, in small quantities, get carried around the concentrations here suggest iron smithing nearby. These pits are fairly remote from the concentration of slag and hammerscale in 256 in Area B, and are dated two phases later, so it is possible that this material reflects a second focus of smithing on the site.

Of the five samples from Area B, four are associated with oven 281. A single sample from the 'cob' side wall of the original oven (335), another derived from the lining (332), and two samples from the fill of recut 316. The lining (332) produced a little charcoal, a high magnetic component (indicating fired material) and a little slag, bone and pot, but no charred plant remains, while the 'cob' side wall (335) produced no archaeological finds, very little evidence of burning, and just a few grains (including six-row hulled barley) and occasional small weed seeds. Apart from the evidence for burning in (332) neither of these samples gave any clue as to the function of the structure.

The evidence from the recut 316 of this oven is a bit more positive. These two fill samples produced a moderate sized charred plant assemblage, mainly from fill (317), with a good number of charred grains including free-threshing wheat, six-row hulled barley and oat, a hazel nut shell fragment and a small number of weed seeds, mainly large grasses including *Bromus*. There was a large amount of charcoal in fill (317). (320) lacks archaeological finds, although a small sample, while (317) has a few finds as well as the slightly richer, although similar, cereal assemblage. Both samples suggest cleaned grain – the grass seeds being similar in size to the cereals – and this burnt grain may have been accidentally burnt while being dried before storage, milling or use, or during cooking of whole grains, with the large weed seeds also indicative of the final stages of crop cleaning/food preparation. Once again the results from the samples are inconclusive and give no confident interpretation of function.

The sample from the stoke hole rake-out (219) of oven or kiln 213 produced almost 75% of the quantified charred plant remains from the site with a rich assemblage largely consisting of cereal grains and charcoal. The grains accounted for almost 74% of the quantified remains, with chaff fragments making up 5% and other plants 21% of the total. The proportion of

grains would have been even greater had it been possible to quantify the hundreds of unsorted and un-identifiable small grain fragments.

The grains were poorly preserved and 68% could not be identified further although virtually all the well-preserved grains were identified as free-threshing wheat, with only traces of rye, barley and oat. A few hulled wheat grains may be relics from past harvests or possibly residual material from Roman activity on the site. The chaff consisted exclusively of free-threshing wheat rachis fragments. There were also a few Poaceae/Cerealia culm node fragments. Most of the charred weed seeds from the site were found in this sample from a range of potential arable weeds, particularly *Anthemis cotula* (see above).

This assemblage represents a grain deposit of free-threshing wheat which may have been accidentally burnt while being dried in the oven before milling or storage. There is no evidence in the form of germinated grain to suggest that the cereal was being prepared for malting. The weed seeds and chaff may have been used as tinder together with the charcoal as fuel for the oven/kiln; the rachis fragments would have been removed at an early stage of the crop-processing sequence mainly following threshing, while the weed seeds in the sample, which were generally smaller than the grains, would have been removed by the use of the 'wheat sieve' at a later stage of grain cleaning (Hillman 1981, 4). There were only a few weed seeds, for example *Bromus*, of an equal size to the grains, which would have required hand-sorting in the final stages of crop-processing.

None of this evidence gives any conclusive indication of function for the ovens, and even the use of oven 213 for drying the wheat prior to milling or storage does not indicate that this was its primary function.

#### **Phase 5: Medieval (1300-1600)**

Seven samples were taken from contexts assigned to Phase 5. Six of these, (122), (136), (146), (291), (292) and (314), were taken from three pits interpreted as cess pits and a fourth possible cess pit, and the seventh from pit 092.

Two of the 'cess' pits were located at the north end of Area A, pits 123 and 137. The sample from pit 123, just to the north of pit 137, was found to contain a moderate sized assemblage of mineralised plant remains, much of which however, was too poorly preserved for identification but included 12 grains, a small number of Rosaceae (*Prunus* type) fruit stones, a few legumes (very possibly broad bean), a large Poaceae (cf. *Avena*) seed and a few Poaceae/Cerealia culm node fragments; these remains may point to the presence of cess within the pit. There was also a little charred plant debris with occasional grains including possibly free-threshing wheat. The presence of eel and herring vertebrae, including misshapen vertebrae suggestive of having been through the gut, tends to support the presence of some cess in the pit, although slag, pottery and bones of cattle, pig, dog and cf cat suggest domestic rubbish entering the pit as well.

Nearby 'cess' pit 137 had samples taken from the primary (146) and secondary (136) fills. These produced a moderate number of charred cereal grains of mainly free-threshing wheat, a little oat and traces of hulled barley plus a few weed seeds from the final stages of crop processing and food preparation. Fill (136) also contained a small assemblage of mineralised plant remains including large Poaceae (grass) and *Vicia/Lathyrus* seeds, Poaceae/Cerealia culm node fragments and indeterminate calcified seeds, which may be indicative of cess. Both samples also produced potential food debris in the form of hundreds of un-charred elder and blackberry/raspberry fruit seeds. Again the presence of small eel and herring, including misshapen vertebra, tends to support the presence of cess, while pottery and a few bones of a very small piglet, and oyster shell indicate some rubbish discarded into the pit.

The third sampled pit in Area A, 092, only contained a few charred cereal grains of free-threshing wheat, barley and possibly oat plus a few weed seeds including *Anthemis cotula* and *Carex* sp.. One or two fish vertebra were present, including eel, and one misshapen vertebra, while bones of pig, cat and chicken, and pottery and a little slag again suggest domestic rubbish.

The two pits in Area B, 'cess' pit 273 and possible 'cess' pit 315 lie at the north end. Two samples were taken from pit 273. (292) the secondary fill produced very little charred plant material, a little charcoal and uncharred seeds of *Rubus* sp., with pottery, fired earth and slag, and bones of cattle, pig, sheep/goat and chicken. The tertiary fill of the pit, (291), was barely richer with single grains of wheat, oat? and brome?, charred seeds of *Persicaria* and *Rumex*, cattle bone, pottery, slag and a relatively high hammerscale count. The samples have produced no evidence to suggest the presence of cess.

The last pit, 315, interpreted as a possible cess pit, equally produced little. Some fragmented charcoal, a single grain of possible free-threshing wheat, a little pottery, fired earth, slag and a pig bone. As with pit 273 there is nothing to indicate that this was a cess pit.

## **Animal Bone**

James Rackham

### **Introduction**

The assessment (Rackham *et al* 2011) recorded a total of 688 bones and teeth fragments recovered by hand excavation of the deposits. The stratified and well dated material has been identified and recorded following the procedures of the Environmental Archaeology Consultancy. The majority of the bone is in good condition with only 7.4% showing evidence for dog gnawing, 12.6% with evidence for butchery, 20% were goat horn cores chopped from the skull, and two red deer antler waste fragments were sawn.

### **Results**

The total fragmentation index (total number of zones/total number of fragments) is 1, indicating a fairly low level of fragmentation, but if this is considered within species groups then the fragmentation index for cattle = 1.06, for sheep/goat = 2, for pig = 1.33, for horse = 2.1 and for goat = 0.73. These reflect the scale of butchery on each species carcass, and in the case of the goats that fact that only horn cores are present on the site. The horse bones are the least heavily butchered and this must reflect that most of this material derives from disturbed burials. The cattle have an index half that of sheep/goat, indicating that the cattle bones are much more heavily butchered to reduce the butchered units to a manageable size for domestic cooking, and the pig bones lie between the sheep and cattle. This is to a degree supported by the butchery evidence, with 24% of cattle bones showing butchery marks, but only 16% of the sheep/goat bones. This has implications for comparing the relative species frequencies since the cattle bones represent a similar number of animals to the sheep bones, although a much larger number of identified bones and a greater quantity of meat!

The assemblage has been recovered from features assigned to phases 3-7, with the bulk deriving from just two features, the medieval deposits (Phase 3) within the prehistoric palaeochannel 256, and the various phase 3 and 4 fills of segments 105 and 163 of ditch 187. These two features account for 72.5% of the whole assemblage, with the recut, 088, fills of segment 163 producing most of the bone from ditch 187.

Bones of cattle, horse, sheep, goat, pig, dog, fox, cat, red deer, fallow deer, chicken and goose have been identified and their frequency is summarised in and retained the site archive. It is



probable that most of the horse bones derive from disturbed burials although only one context (077) was positively identified as such. The bulk of the horse bones derive from the recut of segment 163 in contexts (072, 073, 074, 076, 077 and 079) and it is possible that most of these derive from the same disturbed adult skeleton. Two bones were complete and allowed an estimate of the withers height of the animal to be calculated. A tibia gives a withers height of 1452mm and a femur one of 1264mm, i.e. 14 ½ hands and 12 ½ hands. This discrepancy between the two estimates suggests that there are likely to be two animals represented in these ditch fills. A complete metatarsus from (052) yields a withers height of 1508mm or 15 hands. Part of an adult dog skeleton was recovered from phase 5 context (122) in 'cess' pit 123. Folklore has it that a small carcass thrown into a cess pit (septic tank) that has stopped working will kick the system off again and maintain the bacterial levels which are needed to keep the smell down and prevent the cess stagnating.

There are suggestions that the relative species frequency changes through the phases, with pig reducing in number in the later medieval phase, and sheep/goat become relatively more abundant in this phase. But the assemblage size is too small to attach any confident significance to these results, although they might fit with expectation. Despite any changes beef was probably the most important meat throughout the medieval period. The smaller bones of chicken and goose are likely to be under-represented, while the fallow deer bones in (073) indicate some access to venison in the late medieval period.

The assemblage is small so little can be gleaned of the husbandry and other economic roles of the stock. The cattle bones derive mainly from adult animals, although one or two bones from immature beasts are present, and a mandible from a calf. The sheep/goat post-cranial bones all derive from adult animals, but the mandible and maxillary fragments show both adult and immature animals are present although no lambs were recorded. The pigs are dominated by immature animals, and a femur from a piglet in (304) and a few small ribs from a piglet in one of the samples (136), might imply breeding on the site in phases 3 and 5 at least. Unfortunately these data are insufficient for any interpretation of the other economic contributions the animals might have made.

#### [Insert fig 10](#)

#### *Bone and horn working*

The most interesting aspect of the bones is that relating to local industry or crafts. Two possible waste pieces of red deer antler with sawn ends and a shaved side suggests professional bone working being undertaken somewhere nearby. This could be related to the dump of goat horn cores in context (304) of 256. Over one hundred and thirteen individual goat horn cores, four cattle core and one ram's horn core were present in the dump. These represent at least fifty two male goats, seven female goats, two cattle and one ram. These are mixed with forty seven other bone fragments of general butchery and domestic food waste. This dump is assigned to Phase 3, with one worked antler fragment from phase 3 recut 088 of ditch 187. These cores are the only goat bones identified from the site, and their concentration is clear evidence for the horn sheaths being the commodity in demand.

Unfortunately most of the goat cores were broken to some degree, generally with their tips broken off so length measurements were not possible, but the maximum basal diameter has been plotted against the minimum basal diameter (Fig. 10). The separation of the female and male horn cores is clear, but it is not possible to divide the male cores up with any clarity that might have indicated different age groups or possibly even different breeds. The absence of any such separation suggests that the animals were not killed annually or all at the same age, the latter might have been expected to lead to a tighter size distribution. The difference in size

(some male cores were approximately 140mm long while others exceeded 200mm) and porosity between the cores indicates animals killed, probably, over two or three years, but it is not possible to age individual horn cores. Most of the cores are very similar with similar backward curves and very little twist to the core, even those surviving over 200mm long, suggesting a similar type of animal for all the cores.

The cores were generally removed from the skull by a chop through the skull from the lateral side just below the base of the core, but one or two cores show a chop mark on the medial side of the core. This butchery was clearly done elsewhere and only the core and sheath transported to the horner's workshop, and the core subsequently discarded. The almost exclusive use of goat horns suggests a specific range of products for which this horn was preferred, but we know little of what these products might have been, although spoons, ladles and also bracelets have been made from mountain goat horn ([britishmuseum.org/research/search\\_the\\_collection\\_database/search\\_object\\_details](http://britishmuseum.org/research/search_the_collection_database/search_object_details) and occasionally drinking horns (Doppelfeld 1964).

Similar early medieval assemblages are relatively rare, although cattle horn core dumps are common, but the sites of Tanner Row and 21-33 Aldwark in York (Bond and O'Connor 1999), Melbourne Street, Southampton (Bourdillon & Coy 1980), and Walbrook, London (Drummond-Murray & Liddle 2003), produced similar assemblages of Saxon and early medieval date, and other sites have produced cattle, goat and sheep horns (see MacGregor 1985).

## **Environmental Analysis and Animal Bone Discussion**

James Rackham

The site lies on the south side of the alluvial floodplain of the river Bulbourne. The radiocarbon dates for the humified organic horizons in 145 indicate that a Neolithic and Bronze Age river channel crossed the site, and the stratigraphic evidence for 'palaeochannel' 183, and the pollen results and stratigraphic position of the lower fills of 256 suggest that this channel or a second prehistoric channel also crossed Area B of the site.

This period is not represented in the archaeological remains although two microliths from (303) in feature 256 are dated to the late Mesolithic (Cuthbert 2011), but the palaeoenvironmental evidence shows a clear pattern of change to the landscape from the early to the late Bronze Age. A clear picture of lime dominant woodland is evident through the late Neolithic and early Bronze Age with a low incidence of grassland communities. An apparently dry episode recorded in the fall in pollen density, poor preservation and greater humification coincides with the start of a major change in the landscape and perhaps reflects a hiatus in the sediment accumulation, indicating a drying out of the now redundant palaeochannel. This drying out may have been related to changes in the course of the river channel and the hydrology of the floodplain and may have been part of the stimulus for forest clearance. This episode is followed by clear indications that the woodland has been removed. The length of any hiatus at this level cannot be great on the basis of the radiocarbon dates above and below it (Table 1), but it would appear that a substantial part of the woodland clearance may have taken place during it, and this can perhaps be equated with the middle to late Bronze Age, although the specific horizon has not been dated. By the late Bronze Age, around 1100 BC, the local landscape is cleared of major woodland, although hazel scrub has expanded, probably as a result of the clearances. A brief rise in alder pollen in the level associated with the poorer pollen survival probably documents local growth of alder along the palaeochannel before the drying episode.

The late Bronze Age presents an entirely different landscape. Apart from some local hazel and oak woodland the landscape is one of grassland and pasture, perhaps with stock causing the disturbance that encourages waste and disturbed ground plants, such as bracken, goosefoots and/or oraches and mugwort to colonise. If we can take the waterlogged remains from (138) to reflect the local plants at this time these support a pasture and disturbed ground environment with buttercups, bugle, docks, sedges and nettles, and fragments of hazel nutshell suggest local hazel scrub. An absence of wetland plant macrofossils, other than sedges which need not be wetland types, contrasts somewhat with the pollen evidence. The upper part of the studied sequence in 145 (Table 2) shows an expansion of Cyperacea and meadowsweet (*Filipendula*), and the presence of water dropwort (*Oenanthe* type), with occasional aquatics such as pond weed and bogbean, throughout l.p.a.z.2 suggests the palaeochannel hollow remained damp and sometimes flooded. Finally at the top of the studied pollen sequence hazel pollen falls, perhaps indicating clearance of this scrub and the final development of floodplain grasslands. Cereal type pollen in the upper two samples is the only evidence for any cultivation and may indicate some arable use of the floodplain or adjacent interfluvium. We have no date for the top of the sequence but the 12cm between the two dates in Table 1 represent a thousand years, which means that the time between the late Bronze Age radiocarbon date and the top of the sequence at 24cm could be another thousand years, with most of the 1<sup>st</sup> millennium BC contained within l.p.a.z.2. If this were correct then the top of the sequence may be of late Iron Age, or even early Roman date. Radiocarbon dating of this part of the sequence was not undertaken because the incipient soil development was felt to jeopardise the value or interpretability of any result. This soil development indicates an extended period when the ground surface was dry and must represent another hiatus. It could quite possibly reflect a period of dry floodplain conditions during the late Iron Age and Roman periods.

The spot pollen samples studied for the assessment (Table 3) from palaeochannel 183 and (303) in feature 256 reflect the dominance of hazel and are therefore equated with l.p.a.z.2 of the sequence from 145 (Table 2) and tentatively assigned to the late Bronze Age to Iron Age. It is on this basis that these two features are also interpreted as prehistoric palaeochannels, although no secure dating evidence is available.

By the end of the 1<sup>st</sup> millennium BC the floodplain appears to have been open pasture, with perhaps a little arable cultivation, and ditch 185 is evidence that the landscape is divided to some degree in the early Roman period (Cuthbert 2011), but a thousand years later this part of the floodplain is occupied, perhaps on the periphery of the late Saxon or early Norman town.

The earliest activities appear to be a mix of domestic and industrial. Iron smithing is indicated by slags in the upper fills of 256, and later by hammerscale concentrations in both excavations areas, suggesting a smithy continued to function in the area. A dump of goat horn cores in 256 in Area B testifies to the presence of a horn worker in the vicinity in the Norman period using predominantly male goat horns, and a piece of partially worked red deer antler may indicate a bone worker, although this could also be waste from the horner. The remainder of the material, the general debris, charred food and animal bone remains indicate domestic rubbish, and presumably nearby domestic habitation.

Further phase 3 samples also provide evidence for smithing, but their concentration in Area A, ditch 187, combined with the lack of any animal bone from Area B assigned to phase 4 means that we cannot say whether the horner's workshop was still functioning during the period. Most of the environmental evidence comes from ditch 187, including its recut 088. The environmental evidence indicates the ditch carried water, with aquatic animals and vegetation and wetland elements on its floor and banks. A wide range of species found in disturbed and waste ground habitats suggests either domestic stock or human disturbance of

the ground. The ditch may have been hedged with elder, plum/bullace, blackthorn, hawthorn and barmble, and some of the land bordering the ditch was probably grassland or pasture. A few charred cereal grains, uncharred fruit stones and pips, animal bone and pottery indicates the debris from habitations, while the figs seeds in (161) might indicate human cess getting into the ditch, helping to reinforce the proximity of houses. Ditch 187 produced one of the larger assemblages of hand collected animal bone, particularly from the fills of the later recut 088 of ditch segment 163. This produced the second fragment of worked/waste red deer antler from bone working, and also the very incomplete partial skeleton of at least one, and probably a second, adult horse.

No significant waterlogged assemblages survive in features post-dating phase 4, so we have no data on the immediate landscape and environment. The phase 4 sampled contexts are associated with two oven structures in Area B and a gully and three pits in Area A. Those from Area A merely reflect typical domestic rubbish, although all produced relatively high concentrations of hammscale perhaps suggesting the presence of another smithy nearby. Unfortunately the oven samples give little or no indication of the function of the structures. A high magnetic component in (332) suggests high temperatures associated with this layer, the lining of oven 281, but small charred plant assemblages in all but context (219), the rake out from the stake hole of oven 213, are typical of domestic rubbish, with a few charred wheat, barley and oat grains although very little animal bone and only a few sherds of pottery were present. Very little animal bone was recovered by hand excavation from phase 6 contexts. The charred plant assemblage from oven 213 was the richest from the site, producing three quarters of the all the remains identified. It was dominated by charred grain of free-threshing wheat, with a little rye, barley and oat, some chaff and a small assemblage of charred weed seeds. This is reminiscent of a mixture of cleaned grain and the final cleanings before food preparation and was collected from a deposit of limited extent in the rake out of the stoke hole. It implies perhaps some use of the oven for grain, perhaps drying before milling or storage, but this need not have been the primary function of the structure, although the free-threshing wheat would have been favoured above barley, rye and oats for bread making.

Seven of the samples were taken from deposits assigned to Phase 5, and six of these deposits were interpreted as cess deposits, five of them in 'cess' pits. None of the samples from Area B produced any evidence to support the interpretation of the deposit as cess, or the features as cess pits, being more consistent with general domestic rubbish. The presence of slag and a fairly high concentration of hammscale in the samples from pit 273 again suggest iron smithing, but with ceramics dominated by vessels of 1140-1350 date it is possible that this could derive from reworked sediments originally associated with the earlier evidence for smithing. In contrast the three samples from pits 123 and 137 do contain evidence that suggests these deposits contain human cess. Several of the seeds are mineralised, *Prunus* sp fruit stones are present and several small fish vertebra are misshapen, suggesting they have travelled through the gut (Wheeler & Jones 1989, fig. 5.2) all of which support an interpretation that cess was present. A dog skeleton in 123 and a kitten in 137 might also reflect the folklore that carcasses were deposited in stagnating cess pits to kick start the natural breakdown processes which help to keep the smells down. These 'cess' pits produced little hand collected animal bone, most of the assemblage from this phases deriving from the phase 4 fills of recut 088 of ditch 163. Two fragments of fallow deer metatarsus were recovered from this ditch suggesting at least access to venison at this time.

## **Environmental Analysis and Animal Bone Conclusion**

James Rackham

Pollen data, radiocarbon dating and stratigraphic evidence suggests that the hollows or depressions in both excavation areas can probably be interpreted as prehistoric palaeochannels, former channels of the river Bulbourne, left cut off from the later Bronze Age and subsequent river course. The pollen evidence from these palaeochannels indicate a lime dominated woodland through the Neolithic and early Bronze Age with little evidence for human activity, that was replaced in the late Bronze Age and 1<sup>st</sup> millennium BC with a cleared grassland and pastoral floodplain, and a slight possibility of cereal cultivation on the floodplain or immediate interfluvium. An early Roman ditch suggests a fairly high water table, at least seasonally, possibly bounded by a hedge with local grassland and disturbed or waste areas possibly through animal or human activity.

The botanical evidence from the medieval bulk samples suggests the use and probably local cultivation of mainly free-threshing wheat and to a lesser extent, oats, hulled barley and rye and broad bean, with a little evidence for flax and hemp. A few fig seeds, possibly from imported dried fruit were found in one sample while other potential foodstuffs consisted predominantly of a range of fruits including elder, blackberry/raspberry, plum/bullace, cherry, sloe/blackthorn and hazelnuts; these fruits (except probably blackberry/raspberry and elder) may have been cultivated and/or could have been growing wild on site or further afield. Other food remains include beef, mutton, goat, pork, chicken, goose, venison, hare, eel, herring, cyprinid and oyster.

The composition of the individual charred plant assemblages are fairly similar, mainly consisting of only occasional or small amounts of grain from the final stages of crop-cleaning and food preparation with only traces of cereal by-products from the earlier stages of crop-processing. The kiln/oven 213 contained most of the charred grains, chaff and weed seeds, the assemblage mainly representing a deposit of free-threshing wheat, possibly accidentally burnt while being dried before milling or storage.

The botanical assemblages from the pits suggest that some of these features may have been used for the disposal of cess as well as other food refuse including crop-processing waste, while the other biological remains from these fills suggest that debris from a range of activities (industrial, domestic) was dumped in these features. There is a strong indication that one or more smiths' were located on the site or nearby for much of the medieval period. A horners workshop must have been nearby in phase 3, where the horner may also have worked some antler.

## DISCUSSION & CONCLUSIONS

Martin Cuthbert

Seven phases of activity were identified during the excavations on this site, of prehistoric, Roman, medieval, post medieval and modern date. Three large naturally formed features of prehistoric origin are the earliest evidence of activity on the site; the first settlement evidence is in the form of an early Romano-British ditch. The bulk of evidence regarding settlement occurs in the medieval period, beginning shortly after the Norman Conquest. Drainage ditches, cess and waste pits, ovens and other features of medieval date were found. Later post medieval pits and the remnants of brick footings relating to Victorian and modern developments were also identified. A useful assemblage of pottery was found, together with interesting environmental information and a number of artefacts.

### **Phase 1: Prehistoric Period**

*Naturally formed features/Palaeochannels*

The three large naturally formed features on the site provide the first ever insight into the environmental conditions of the Bulbourne valley between the late Neolithic and late Bronze Age periods.

Pollen analysis and radiocarbon dates from the base of the secondary deposit in feature 145 indicate that the site was wooded in the late Neolithic period, whilst the top of the secondary deposit, c.12cm higher in the sequence, indicates a change in conditions with fewer trees and a more open pastoral environment in the late Bronze Age. Pollen from the deposits in features 183 & 256 is similar to that from the Bronze Age deposits in feature 145.

The decline of lime and alder trees, and an increase in hazel, coupled with the radiocarbon dates, suggest a programme of deforestation was occurring during the middle Bronze Age, fitting with the model of change from woodland to open agricultural habitat described for this period in the south of England (Scaife: this report).

The three large features on the site represent ponds or palaeochannels that may have once been linked to the Bulbourne river system during the prehistoric period.

Environmental evidence from an archaeological watching brief at Stag Lane, Berkhamsted (Batchelor *et al* 2008) revealed late Mesolithic and early Neolithic peat deposits. The pollen from these deposits was similar to the lower deposit (139) of feature 145, with deciduous woodland comprising oak, elm, lime and pine dominating the vegetation cover.

Further analysis of contemporary environmental deposits from the Bulbourne Valley is required in order to construct a model of the environmental change occurring in the area at this time.

## **Phase 2: Romano-British Period**

Pottery dating to the early Roman period was recovered from ditch 185. This represents the first evidence of settlement activity occurring along *Akeman Street*, within the core of the modern town. The ditch is on a different alignment to the present High Street which is thought to follow the line of the Roman road, and might indicate a pre-Roman field alignment. The residual Roman CBM recovered from the site may have been brought in from further afield along with the medieval CBM.

## **The Medieval Period**

The project has allowed further insight into the early development of the medieval town of Berkhamsted. Three phases of activity have been identified relating to the medieval period. The first (Phase 3) indicates that large scale industrial practices were taking place close to the site, and a large ditch was dug. The second phase (Phase 4) indicates a quieter period, though industrial practices continue close to and on the site. Evidence for this includes iron-smithing detritus from a number of pits, and two small structures believed to be ovens. The third phase (Phase 5) includes boundary ditches and a number of pits redolent of domestic function.

The baulk of artefactual evidence from the site supports the theory that a change in power introduced by the Norman Conquest has shifted the local and regional focus further south away from the potential Saxon manorial site of Northchurch to the area around Berkhamsted Castle.

## **Phase 3: Medieval Period (1066-1250AD)**

### *The Defensive Ditch*

Between the mid 11<sup>th</sup> to mid 12<sup>th</sup> century a large ditch, 187, was excavated across the western end of the site, aligned NNE-SSW. The ditch was c.7m wide and 2m deep.

There is no evidence of late Saxon activity on or within the vicinity of the site, so the deposition of pottery and the radiocarbon date are more likely to be associated with the earliest stages of castle and town construction, some time after the Norman Conquest.

The steep sided profile and considerable width and depth of this ditch are indicative of a defensive function rather than a simple boundary ditch or quarry. Though it is situated outside the accepted extent of the Norman castle earthworks, the length observed within this site appears to be broadly parallel with Castle Street, an urban feature accepted as the main route from the High Street to Berkhamsted Castle.

A radiocarbon date from the primary deposit indicates the feature was open by the mid-11<sup>th</sup> to mid-12<sup>th</sup> century, whilst pottery from the secondary fill of an initial re-cut suggests the feature was still open and used in a defensive capacity in the mid-13<sup>th</sup> century. The first cut and subsequent three re-cuts indicate the ditch was well maintained over the course of its existence. This large Saxo-Norman ditch was unexpected in its form and location. The historical ambiguity of the ditch may allude to a relatively short duration as an open topographical feature, although the artefactual and environmental evidence suggests it was open and maintained for at least 100 years, perhaps even longer.

Stratigraphic relationships and pottery from the upper deposits suggest a change in the function of the ditch from defensive to that of a simple boundary, by the mid 14<sup>th</sup> century.

The presence of this unusually large Saxo-Norman ditch raises the questions as to its function and purpose. Could it represent a defensive circuit in which the town was constructed?

A projection of a possible defensive circuit (Fig. 11) has been constructed from the information stated below:

The portion of ditch recorded on the site was aligned NE-SW the feature may, therefore, extend southwest towards the High Street, and northeast from the site towards the castle and the River Bulbourne. An early 13<sup>th</sup> century reference to a “great ditch” located close to Chesham Road, and a NW-SE aligned earthwork bank close to Priory Gardens near Chesham Road (Hunn *pers comm*) may, although tentatively, be related to the ditch identified at New Manor Croft and could possibly form the western side to a defensive circuit. The northern side of a projected defensive circuit, like the west, its pure speculation; here it has been aligned with an unusual kink in the River Bulbourne and is equidistant from Chesham Road as the ditch discovered at New Manor Croft.

#### [Insert fig 11](#)

Comparisons with other medieval settlements in England with similar-sized large ditches can be made. Excavations close to Marlborough Castle, Wiltshire (Heaton & Moffat 2002) revealed a large ditch, approximately 7m wide and 4m deep, whilst a field observation by English Heritage regarding the motte and bailey castle at Lydham, Shropshire, noted the outer bailey ditch to measure 7m wide and 2.4m deep.

Discovery of further sections of the ditch may enable resolution of the date and duration of the feature and confirm whether it does indeed form a defensive circuit in which the town could be developed.

*Feature 256: Evidence for medieval industry*

Artefactual and environmental evidence from the upper fills of feature 256 and other pits assigned to this phase indicate industrial processes and craft activities were occurring close to the site.

The large number of goat horn cores retrieved from the upper fills indicates a horner's workshop may have been located close to the site.

The slag deposits discovered in the lower fills may relate to primary rubbish deposits from an iron smithy that may have been located close to the site. However, the slag may have been brought onto the site from further afield to consolidate the boggy deposits at the base of the hollow, similar to slag deposits discovered at Kingsgate (Cowgill 1996). Whether the deposit of slag represents a primary or secondary use it indicates that a major iron production industry was operating somewhere very close to medieval Berkhamsted.

The industrial practices that were occurring within the vicinity of the site may relate to the early stages of castle and town construction or later phases of construction or repairs that occurred throughout the 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup> centuries.

Natural hollows 145 and 256 indicate the east of the site was boggy during the early medieval period (phases 3 and 4) perhaps explaining why there are only a small number of cut features in this area. An alternative explanation is that if, as speculated, large ditch 187 was constructed to demarcate an area in which the town could grow, then the industrial practices that were occurring close to the site may have been located outside of this boundary away from settlement activity.

The quantity of metalworking evidence retrieved from medieval features suggests the presence of an area of early medieval industrial activity. These findings are significant because it is the first evidence for activity of this kind to be discovered within the medieval core of Berkhamsted.

#### **Phase 4: Medieval Period (1200-1400AD)**

Naturally formed feature, 256, had been fully backfilled by the time a later phase of small scale domestic and industrial activity close to, and on the site commenced.

##### *Ovens*

The two ovens located on the site are the only structural evidence of medieval date. The environmental evidence retrieved from them, although abundant, does not clearly indicate their function, though the quantity of cereal grains suggest they may have been bread or drying ovens.

The deposit of worked clunch material (218) within oven 213 included fragments of 'roll moulding', normally found in mid to high-status medieval buildings, suggesting that this material was readily available to the builder. The origin of this material is unknown, but there is reference to high status buildings in Berkhamsted in the early 13<sup>th</sup> century, inclusive of two hospitals (Dogget and Hunn 1985, 28).

The two ovens and associated environmental evidence indicate the beginnings of domestic activity occurring close to and on the site.

##### *Other features*

The iron smithing evidence from pits assigned to this phase suggest a continuation of the industrial practices (phase 3) that were occurring close to the site, perhaps however, on a more limited scale.



## **Phase 5: Medieval Period (1300-1600AD)**

### *Burgage plot boundary ditches*

The earliest three re-cuts of ditch 187 were of substantial width and depth, indicating a defensive purpose. However, the dimensions of the last two re-cuts, 197 and 198, assigned to this phase, suggest the ditch now served a different purpose, perhaps as a boundary demarcating the rear of burgage plots fronting onto Castle Street.

### *Cess and waste disposal pits*

Cess and waste disposal pits located to the west of ditch 187 represent the back-lands of burgage plots fronting onto Castle Street, which was established during the 14<sup>th</sup> and 15<sup>th</sup> centuries. Waste disposal pit 154 most likely represents a later stage of this medieval back-land activity. Similar features in Area B also represent the back-land of a burgage, more likely associated with properties fronting onto the High Street.

The pits and ditches assigned to the late medieval period (phase 5) indicate that the town was expanding beyond the confines of the large ditch, implying it had fallen out of use, suggestive of a period of relative safety and prosperity.

Further excavation of features either side of the ditch may help resolve whether the ditch was constructed to confine an early phase of town development, and whether the settlement expansion does relate to a later medieval phase.

## **Phase 6: Post-medieval Period**

The limited number of features dating from this period suggests that the site at this time formed part of the formal gardens of *Pilkington Manor*. The pits assigned to this phase may be a continuation of the backland activity identified in phase 5, or, rubbish pits at the rear of the formal gardens of *Pilkington Manor*.

## **Phase 7: Victorian/Modern Period**

The remnants of the larger brick footings in Area B relate to *Manor Croft*, a house constructed between 1839 and c.1860, whilst the smaller brick footings have been identified as outhouses and garden features relating to either *Manor Croft* or the terrace housing that fronted onto Manor Street in the latter part of the 19<sup>th</sup> century.

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## **Bibliography**

Andersen S Th 1970 'The relative pollen productivity and pollen representation of North European trees, and Correction factors for tree pollen spectra'. *Danmarks Geologiske Undersogelse*. Ser II, 96, 99.

- Andersen S Th 1973 'The differential pollen productivity of trees and its significance for the interpretation of a pollen diagram from a forested region', in H J B Birks & R G West (eds) *Quaternary Plant Ecology*. Blackwell, 109-115 (Oxford)
- Bagwell M 2008 *Stag Lane, Berkhamsted, Hertfordshire, Archaeological Watching Brief*. Pre-Construct Archaeology (unpublished).
- Barker G 1985 *Prehistoric Farming in Europe* (Cambridge)
- Batchelor C R, Branch N P, Green C P, Elias S, Young D & Williams K 2008 'Environmental Assessment', in Bagwell 2008, 57-77
- BGS *British Geological Survey 1:50,000 Series, Solid & Drift Geology*.
- Bond J M & O'Connor T P 1999 *Bones from medieval deposits at 16-22 Coppergate and other sites in York*. The Archaeology of York **15**: The Animal Bones, 299-429
- Bourdillon J & Coy J 1980 'The animal bones' in P Holdsworth *Excavations at Melbourn Street, Southampton, 1971-76*. CBA Research Report **33**, 79-118 (London)
- Brenchley W E, 1911 The weeds of arable land in relation to the soils on which they grow. *Annals of Botany* **25**, 155-165.
- Brenchley W E 1913, The weeds of arable soil III. *Annals of Botany* **27**, 141-166.
- Caley J (ed.) 1802 '*Taxatio Ecclesiastica P. Nicholai IV' c. 1291* Records Commission (London)
- Campbell B M S, Galloway A, Keene D, & Murphy M 1993 *A Medieval Capital and its Grain Supply. Agrarian Production and Distribution in the London region c.1300*. Historical Geography Research Series **30**
- Clifton-Taylor A 1987 *The Pattern of English Building*. Faber and Faber (London)
- Copeland R 2009 *Akeman Street: Moving through Iron Age and Roman Landscapes*. The History Press (Stroud).
- Cowgill J 1996 'The Metal-working Debris from the Medieval Excavation at Kingsgate, Berkhamsted', in Guttman 1996, 24-29
- Cuthbert M 2011a *Summary Excavation Report: 8 Manor Street, Berkhamsted*. ASC report (unpublished)
- Cuthbert M 2011b *Post Excavation Assessment and Updated Project Design: 8 Manor Street, Berkhamsted*. ASC report (unpublished)
- Davies B, Richardson B & Tomber R 1994 *A dated Corpus of Early Roman Pottery from the City of London*. ARL vol. 5; CBA Research Reports **98** (London)
- Doggett N & Hunn J 1985 'The Origins and Development of Medieval Berkhamsted', *Hertfordshire's Past* **18**, 18-36
- Doppelfeld O 1964 Das frankische Knabengrab unter dem Chor des Kolner Domes, *Germania* **42**, 156-88
- Drummond-Murray J & Liddle J 2003 Medieval industry in the Walbrook valley. *London Archaeologist* **10**, 87-94.
- Ellenberg H 1988 *Vegetation Ecology of Central Europe* 4<sup>th</sup> edition (Cambridge)
- Garmonsway G N 1955 *The Anglo-Saxon Chronicle*. Dent (London)
- Giorgi J 2000 *The Charred Plant Remains from Tyttenhanger Farm, Hertfordshire (TQW99)*. Archive report
- Giorgi J 2011 *The Charred Plant Remains from Stocks Golf Club, Aldbury, Hertfordshire (1319ASG)*. Archive report

- Giorgi J 2012 *The Charred Plant Remains from Suttons Farm, Hertfordshire (SF518)*. Archive report
- Giorgi J 2012a *The Charred Plant Remains from Marriot Lonsdale School, Stevenage, Hertfordshire (1382SML)*. Archive report
- Godwin H 1956 *The History of the British Flora* 1st edition CUP (Cambridge)
- Godwin H 1975a 'History of the natural forests of Britain: establishment, dominance and destruction.' *Philosophical Transactions of the Royal Society of London* B271, 47-67.
- Greig J R A 1982 'Past and present lime woods of Europe'. in M Bell & S Limbrey (eds) *Archaeological Aspects of Woodland Ecology*. Association for Environmental Archaeology Symposia Volume 2. British Archaeological Reports . (International Series) 146, 23-55 (Oxford)
- Greig J 1988 'Plant Resources', in G Astill & A Grant (eds) *The Countryside of Medieval England*, 108-27 (Oxford)
- Greig J 1991 'The British Isles', in W van Zeist, K Wasylkova & K-E Behre (eds) *Progress in Old World Palaeoethnobotany*, 229-334 (Rotterdam)
- Grieve M 1992 *A Modern Herbal* (London).
- Guttmann E 1996 *Medieval Excavation at Kingsgate, Berkhamsted*. Hertfordshire Archaeological Trust (unpublished)
- Hammond P W 1995 *Food and Feast in Medieval England*.
- Hanf M 1983 *The Arable Weeds of Europe* (Ludwigshafen)
- Hastie S 1999 *Berkhamsted An Illustrated History*. Alpine Press (Kings Langley)
- Heaton M & Moffat B 2002 'A Possible Outer Bailey Ditch to Marlborough Castle: Excavations at Marlborough College Pool', *Wiltshire Archaeological & Natural History Magazine* **95**, 100-106
- Hillman G 1981 'Reconstructing crop husbandry practices from charred remains of crops' in R. Mercer (ed.) *Farming Practice in British Prehistory*. Edinburgh University Press, 123-162 (Edinburgh)
- Hunn J R 2006 *Archaeological Excavation Report: Land adjacent to 3-4 Church Lane, Berkhamsted, Hertfordshire*. ASC report (unpublished)
- Jenkins J G 1955 *The Missenden Cartulary Part II*. Buckinghamshire Record Society **10**.
- Jones M 1981 'The Development of Crop Husbandry' in M Jones & G Dimbleby (eds) *The Environment of Man: the Iron Age to the Anglo-Saxon Period*. British Archaeological Reports **87**, 95-127 (Oxford)
- Kaye D 2010 *Project Design for an Archaeological Excavation at 8 Manor Street, Berkhamsted Hertfordshire*. ASC document (unpublished)
- Kaye D forthcoming. 'Excavation on the site of Pilkington Manor, High Street, Berkhamsted', *Hertfordshire Archaeology*
- MacGregor A 1985 *Bone, Antler, Ivory and Horn*. Croom Helm
- Midgeley L M (ed.) 1942 *Ministers Accounts of the Earldom of Cornwall 1296-7*. Camden 3<sup>rd</sup> Series Vol 1. LXVI, 12-27
- Moffet L 2006 'The Archaeology of Medieval Plant Foods' in C M Woolgar, D Serjeanston & T Waldron, *Food in Medieval England. Diet and Nutrition*, 41-55.
- Moore P D 1977 'Ancient distribution of lime trees in Britain.' *Nature* **268**, 13-14.
- Morris J 1976 *Domesday Book vol 12, Hertfordshire*. Phillimore (Chichester).

- Nicholson K 2008 'Medieval rubbish and a 19<sup>th</sup> century garden on land to the rear of 71-77 High Street, Berkhamsted', *Hertfordshire Archaeology* **15**, 135-144
- Rackham J, Giorgi J, Scaife R G & Tyers I 2011 *Manor Street, Berkhamsted (125BMS) Environmental Archaeology Assessment*.
- Remfry P M 1998 *Berkhamsted Castle, 1066-1495*. Dacorum Heritage Trust Ltd (Berkhamsted)
- Sawyer P H 1968 *Anglo-Saxon Charters: An annotated list and bibliography*. Royal Historical Society (London).
- Scaife R G 1980 *Late-Devensian and Flandrian Palaeoecological Studies in the Isle of Wight*. Ph.D. thesis of the University of London, King's College.
- Scaife R G 2000 'Holocene vegetation development in London' in J Sidell, K Wilkinson, R G Scaife, & N Cameron *The Holocene Evolution of the London Thames. Archaeological Excavations (1991-1998) for the London Underground Limited, Jubilee Line Extension Project*. Museum of London Monograph **5**, 111-117
- Scaife R G 2003 'The Palaeoecological Background' in C Pope, L Snow, & D Allen *The Isle of Wight Flora*. Dovecote Press, 19-31 (Wimborne)
- Scaife R G 2010 *Manor Street, Berkhamsted (BMS 1251): Pollen analysis of samples from features of various ages*. Report for The Environmental Archaeology Consultancy.
- Smith T P 1973 *The Anglo-Saxon Churches of Hertfordshire*. Phillimore (Chichester)
- Soil Survey 1983 *1:250,000 Soil Map of England and Wales, and accompanying legend* (Harpenden)
- Stace C 2005 *New Flora of the British Isles, 2<sup>nd</sup> edition* (Cambridge)
- Summerfield-Hill C & Kaye D 2009 *Archaeological Evaluation: 8 Manor Street, Berkhamsted, Hertfordshire*. ASC report (unpublished)
- Turner J 1964 'The *Tilia* decline: an anthropogenic interpretation'. *New Phytologist* **61**, 328-341.
- Turner-Rugg A 1993 'Medieval Pottery in Hertfordshire: a gazetteer of the principal collections', *Hertfordshire Archaeology* **11**, 30-53
- Vince A & Jenner A 1991 'The Saxon and Early Medieval Pottery of London' in A. Vince (ed.) *Aspects of Saxo-Norman London: 2. Finds and Environmental Evidence*. LAMAS Special Paper **12**, 19-119
- Waller M P 1993 'Flandrian vegetational history of south- eastern England. Pollen data from Pannel Bridge, East Sussex'. *New Phytologist* **124**, 345-369.
- Waller M P 1994 'Paludification and pollen representation: the influence of wetland size on *Tilia* representation in pollen diagrams'. *The Holocene* **4**, 430-434.
- Weinstein R 1990 'London's market gardens in the early modern period' in M Galinou (ed.) *London's Pride. The Glorious History of the Capital's Gardens*.
- Wheeler A & Jones A K G 1989 *Fishes* Cambridge Manuals in Archaeology (Cambridge).
- Whittingham L 2009 *Assessment of the pottery from 110 High Street Berkhamsted*. ASC report, ref. 1224/BHS/2
- Wilson C A 1991 *Food and Drink in Britain. From the Stone Age to Recent Times*. Harmondsworth.
- Wilson P & King M 2003 *Arable Plants – a field guide*.