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Cotton Farm Wind Farm, Graveley, Cambridgeshire

Updated Project Design and Assessment of Results

Client: RENERCO

November 2012

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COTTON FARM WIND FARM, GRAVELEY, CAMBRIDGESHIRE

Client	RENERCO
National Grid Reference	TL 23540 64050
Address	Cotton Farm, Graveley, Cambridgeshire
Parish	Graveley
Council	Cambridgeshire
Event Number	ECB3793
Planning Application No	0802296FUL
OASIS No	headland4-127596
NMR No	
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Listing Category	
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Fieldwork	23 rd April – 24 th May 2012
Report	November 2012

Between April and May 2012, Headland Archaeology undertook an archaeological investigation at Cotton Farm, Graveley in Cambridgeshire. This was in advance of construction of an eight-turbine wind farm along with associated groundworks. A program of pre-determination archaeological work carried out in 2007 (including desk-based assessment and evaluation) revealed field boundary ditches recorded on the 1st Edition 6" Ordnance Survey map of 1891 as well a small assemblage of Roman and Saxon pottery within the ploughsoil. In addition, a study of aerial photographs held in the Historic Environment Record revealed extensive cropmarks within the development areas. With this evidence in mind, a condition was placed on planning permission requiring the implementation of a programme of archaeological investigation.

A Written Scheme of Investigation (WSI) in accordance with a request from Cambridgeshire Archaeology Planning and Countryside Advice (CAPCA) specified the work that would be undertaken to fulfil the condition. Headland Archaeology was commissioned by RENERCO to undertake this programme of work.

Excavation of the site revealed evidence of rural Roman settlement and indirect evidence of industrial activity alongside remains pointing to long lived agricultural activity taking place at the site. Whilst the agricultural activity was evident in all excavation areas, Roman settlement in the form of ditches, pits and gullies was more

isolated and was represented at the compound area and Turbine 4, but mainly at the junction between Tracks E1 and E2 (Illus. 1).

This document presents an assessment of the archaeological remains revealed during the investigations, the data from which have the potential to address a number of regional research agendas. The document also contains proposals for further analysis and publication of the data, and the methodologies and resources required to complete the project. The end product will be the publication of the results in the county journal *Proceedings of the Cambridge Antiquarian Society* and the deposition of the project archive (Event Number ECB3793) with Cambridge County Council's repository.

1. INTRODUCTION

1.1 Project background

Cambridgeshire County Council granted RENERCO planning permission (0802296FUL) for the construction of a wind farm comprising eight wind turbines. As part of the process of considering the application, Cambridgeshire Archaeology Planning and Countryside Advice (CAPCA) advised that the Development Area (DA) was located in an archaeologically sensitive area. As a result, the applicant was required to commission an archaeological evaluation in order to gain information on the potential of the site to contain sub-surface heritage assets.

A desk-based assessment (CgMs, 2007) and an evaluation by trial trenching (Oxford Archaeology, 2007) were previously undertaken. The evaluation recorded the presence of ditches that corresponded with field boundaries on the 1st Edition OS Map, as well as a small quantity of Roman pottery and late Saxon pottery recovered from the plough soil. Alongside these results, a study of aerial photographs held in the Cambridgeshire Historic Environment Record (CHER) revealed extensive cropmarks within the development areas reminiscent of Roman ladder enclosure (farmstead). Based on these results, the potential for the presence of significant archaeological remains was considered by CAPCA to be high and a condition was placed on planning permission requiring the implementation of a programme of archaeological investigation. This was to comprise open area excavation in advance of construction in those areas of archaeological potential impacted by the development..

RENERCO commissioned Headland Archaeology (UK) Ltd to undertake the work. The fieldwork was carried out prior to construction between 23rd April and 24th May 2012. All works were in accordance with a WSI prepared by Headland Archaeology (April 2012) and approved by CAPCA.

1.2 Site Location and Geology

The development area (DA) is located to the south-west of Cotton Farm centred on TL 23540 64050 and lies at a height of c. 54m OD. Cotton Farm is the former site of RAF Graveley (used during the Second World War), situated within the village of Graveley, approximately 6km north east of St Neots in Cambridgeshire.

The geology comprises Oxford Clay overlain by Middle Pleistocene Till. This is characterised by clay/sand mix directly below the topsoil (British Geological Survey Website). The development area can be characterised as flat, open arable farmland.

1.3 Archaeological Background

The line of a Roman Road from Sandy to Godmanchester (01045a) runs across the eastern end of the DA in an N-S direction. A second Roman Road (17569) also, aligned N-S is located just beyond the western boundary of the site. Other remains include find-spots of Roman coins (02487) and Roman finds recovered from Toseland Wood (04805).

The Cambridgeshire HER details a number of sites in the area identified as cropmarks from aerial photography. A series these Cropmarks are present within the DA. Morphologically, they indicate field systems and enclosures made up of large ditched enclosures and a ladder enclosure (MCB 18990, 18985). Prior to this investigation, the cropmarks (identified through aerial photography) had not been subject to intrusive investigation and their dates were unknown, although they were thought to be Iron Age and Roman in date.

The Moated Scheduled Ancient Monument (SAM27925) at Toseland Wood lies immediately south of the DA and medieval field systems are well documented across the area (mainly Ridge and Furrow: 02495, MCB18981, MCB18980, MCB18983, MCB18982, MCB18885, MCB18884)

Post-Medieval field systems also lie within and around the DA, as do the remains of the WWII Airfield, RAF Graveley (CB15135).

1. 4 Purpose of this Report

This report presents an assessment of the results of all stages of the archaeological investigations. An Updated Project Design (UPD) is included, listing all the tasks that will be required to analyse, publish and archive the results of the fieldwork. The completion of these tasks will fulfil the criteria stipulated in the WSI (Headland Archaeology 2012), enabling the discharge of the archaeological planning condition by Cambridgeshire County Council.

2. ORIGINAL AIMS AND OBJECTIVES OF THE INVESTIGATION

2.1 Introduction

A series of research aims were established in the project-wide WSI (Headland Archaeology, April 2012). These were necessary to ensure that the investigation was appropriately targeted in accordance with local, regional and national research priorities.

2.2 National Research Frameworks

At a national level, English Heritage's criteria for prioritising archaeological "sites" are evolving. It's funding criteria for rescue projects, as set out in *Exploring our past* (EH 1991), were similar to those it uses to define a "site" as being of schedulable quality. These included period, rarity, group value, survival/condition, fragility/vulnerability and potential. More recently a draft Research Agenda (EH 1997) built upon the earlier criteria, with the aim of developing an approach reflecting 'the greater determination to pursue research themes' and 'wider interests (*e.g.* in landscapes)'. These include goals such as advancing understanding of England's archaeology, supporting the development of national, regional and local research frameworks and promoting public appreciation and enjoyment of archaeology.

Although the Research Agenda was intended for projects seeking English Heritage resources, *i.e.* not those undertaken within the PPG 16 framework, its goals and objectives are relevant to the investigations occasioned by this development.

2.3 Regional and County-based Research Agendas

Broad national research priorities have been formalised by English Heritage in *Exploring our Past* (1991), updated in their draft Research Agenda (1997). The County Archaeologists of East Anglia have published a resource assessment (Glazebrook 1997), a subsequent research agenda and strategy (Brown and Glazebrook 2000) and a revised framework (Medlycott 2011) for the eastern counties. This study covers Cambridgeshire and adjacent counties of Hertfordshire, Essex, Suffolk and Norfolk. This document is a useful tool for assessing the significance of the archaeological remains within the development area.

The Archaeology of the East Midlands: An Archaeological Resource Assessment and Research (Cooper 2006) covers the adjacent county of Northamptonshire. This region lies adjacent to and possesses certain historical similarities with Cambridgeshire.

2.4 Original Research Objectives

A number of research objectives, both generic and period-specific, were considered relevant to these works. They are set out below.

Objective / Theme	Research Aims/Themes	Source (Published or internally generated by Project Team)
1.	Date the cropmarks (described in section 1.3) by investigating those parts which lie within area of impact. If these are late Iron Age/Roman in date – gather data useful in increasing knowledge of the following areas/objectives.	Internally generated
2.	Late Iron Age – How were livestock being managed? What evidence is there for agrarian production at this site?	Bryant 2000, Pg.14 II
3.	Iron Age/ Roman Transition – Assuming we could obtain datable evidence for activity in both periods. This site may yield useful data on the transition from the Iron Age to the Roman periods. Exemplar sites exist for this and even though this one is being investigated in parts – it may help to build the growing picture of this period of transition.	Medlycott 2008, Pg.31 III
4.	Rural settlements and landscapes – The likely combination of ‘ladder enclosure’ (farmstead) and surrounding fields are examples of rural settlement and landscapes and any data gathered from them is relevant to this research objective.	Medlycott 2008, Pg.47
5.	Romanisation - If the field systems and ladder enclosure can be shown to post date any earlier landscape boundaries, there may be evidence of Romanisation. As with the ‘transition’ Objective 3. This may provide us with evidence to use in increasing our understanding of how Romanisation occurred in this region.	Medlycott 2008, Pg.47

Table 1: Summary of original research objectives and themes

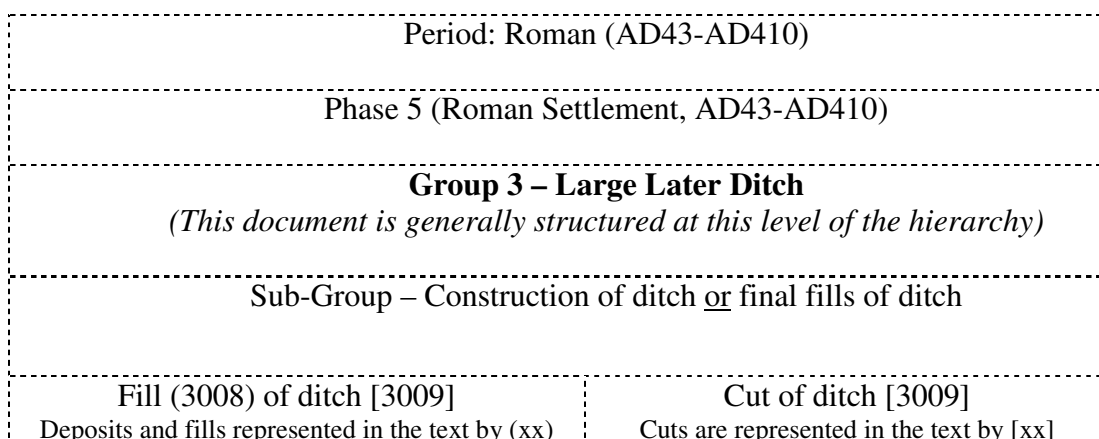
3. PROVISIONAL SUMMARY OF RESULTS

3.1 Methodological approach to assessing contextual data

The contextual data were rapidly assessed in order to establish whether they would provide a coherent spatial and chronological framework. A total of 249 contexts were assigned to provisional Assessment Groups, *e.g.* boundary ditch, post-holes, bedding trenches, *etc.* (Table 2). The allocation of individual contexts to specific sub-groups of contexts was made on the basis of the following criteria:

- Do the contexts form a coherent spatial unit *e.g.* ditch length, pit group *etc.*?
- Do the contexts represent key positions within the stratigraphic sequence?
- Do the contexts contain suitable dating material?

Fills and cuts were then assigned to sub-groups (*e.g.* primary fills of post holes in the sunken featured building (SFB) or Cuts of postholes within SFB) and sub-groups were then assigned to a number of distinct Groups (*e.g.* SFB), corresponding to larger coherent and contemporaneous spatial units. These Groups were then assigned to a number of Phases of human activity corresponding to broad, chronological periods, *e.g.* Phase 5 – Anglo-Saxon settlement of the Anglo-Saxon Period. This phasing was based on their artefactual assemblage, character and stratigraphic position.



The text which follows is structured by chronological period, and discussed by Group, and, where relevant for detail (by context and/or sub-group); where relevant for making broad interpretations, the discussion utilises Phase and Period groupings.

<u>Period</u>	<u>Phase</u>	<u>Group</u>	<u>Sub-Group</u>	<u>Description</u>	<u>No. of features</u>	<u>No. of Contexts</u>
Roman	1	1	1.1	Construction of ditches	5	6
	2		1.2	Fill of ditches		12
	1	2	2.1	Construction and primary fill of pits and gullies	5	10
	2		2.2	Fills of pits and gullies		9

Period	Phase	Group	Sub-Group	Description	No. of features	No. of Contexts
Roman	2	3	3.1	Construction and primary fill of later ditch	1	9
	3		3.2	Fills of later ditch		6
	1	4	4.1	Construction of ditch	1	2
	2		4.2	Backfilling of ditch		5
	2		4.3	Final fill of ditch		2
	1	5	5.1	Construction of ditch	1	1
	2		5.2	Backfill of ditch		1
	1	14	14.1	Construction of pit	1	1
	2		14.2	Backfill of pit		1
Medieval / Post-medieval	4	6	6.1	Construction of Furrow		1
			6.2	Backfill of furrow		1
	4	7	7.1	Construction of furrows	9	6
			7.2	Fills of furrows		6
	4	8	8.1	Creation of furrows?		1
			8.2	Backfill of furrows?		1
	4	9	9.1	Construction of gully, wallow		3
			9.2	Backfill of gully		1
Post-medieval / Modern	5	11	11.1	Construction of ditches	4	4
			11.2	Backfill of ditches		4
	5	12	12.1	Construction of ditches	2	2
			12.2	Backfill of ditches		3
	5	16	16.1	Construction of ditch	1	3
			16.2	Backfill deposits within ditch		7
			16.3	Later re-cut/ pits in ditch	2	2
			16.4	Backfill deposits of re-cut/pits		2
			16.5	Spread associated with ditch	1	1
	5	10	10.1	Cut of gully	1	1
			10.2	Backfill of gully		1
Unphased	6	13	13.1	Construction of ditches and primary fill	4	6
			13.2	Backfill deposits of ditches		6

<u>Period</u>	<u>Phase</u>	<u>Group</u>	<u>Sub-Group</u>	<u>Description</u>	<u>No. of features</u>	<u>No. of Contexts</u>
Unphased	6	15	15.1	Cut of ditch		1
			15.2	Fill of ditch		1
	6	17	17.1	Creations of ditches, pits & tree throw		2
			17.2	Backfill of ditches, pits & tree throw		4
	6	18		Wallows, standing water, tree throws	3	2
	6	19	18.1	Creation of hedge row, boundaries		6
			18.2	Back fill of hedge row, boundaries		9
	6	20	20.1	Creation of tree bowls/throws		5
			20.2	Backfills of tree bowls/throws		7
	6	21	21.1	Creation of ditch		1
			21.2	Backfill of ditch		2
	6	22	22.1	Creation of gully		1
			22.2	Backfill of gully		1
	6	23	23.1	Creation of gully, drain		2
			23.2	Backfill of gully, drain		2
	6	24		Topsoil, subsoil, natural geology and natural channels		76
				Total	41	249

Table 2: Summary of provisional phasing

3.2 Structural Illustrations

A series of illustrations are enclosed which, due to the layout of the excavation, break the remains up by area and period. It is often the case that elements of remains from one period (e.g. Iron Age field boundaries) are present in later periods (e.g. Saxon). By showing remains from several periods together, it allows the reader to appreciate the effect (if any) that later features may have had on ‘earlier’ landscapes.

3.3 Summary of Contextual data results

Period: Roman (43AD– 410AD)

Phases 1 and 2 of the site consist of Romano-British settlement, apparently occupying the central and western part of the DA. Based on the evidence revealed, it began with the construction of ditches, probably around the middle 1st century AD. These ditches were deliberately backfilled and a replaced by a new arrangement of ditches, around or after the middle 2nd century AD. Artefacts and palaeo-environmental evidence point to domestic activity (Appendix 1 and 2).

G1: Ditches (Illus 3)

Four ditches were revealed on a N-S alignment and one on an E-W alignment. They varied in width between 0.5 and 1m. Apart from [3044] which was 0.50m deep, their depths were c. 0.1m. They were filled by dark grey clay and yellow re-deposited natural clay deposits (SG1.2), both of which contained sherds of pottery dating to late 1st / early 2nd century AD. The shallow depth of these features indicated that they had been affected by plough truncation over time.

G2: Pits and gullies (Illus 3)

Associated with the G1 ditches were a series of gullies and pits. These comprised a curvilinear feature (on a curving NW-SE alignment), a small gully (roughly E-W) and three pits, one of which was truncated slightly by ditch G3 (below). All features were shallow (0.05-0.2m) and were backfilled by firm dark grey clay (SG2.2) which produced 174g of Roman pottery of the same period as G1. Again, these are likely to represent only the basal remains of features truncated by ploughing.

G4 & G5: Ditches (Illus 5)

Ditch G4 (curving E-W) and located c. 300m east of G1 & G2 G4 was 1.40m wide and 0.70m deep and contained sherds of pottery from a single large storage jar which appears to have been placed or broken in the base of the ditch. The backfill deposit (SG4.2) was mid brown yellow clay with small stones and chalk inclusions. The deposit suggested mixing prior to deposition and it is reasonable to suggest that the ditch was purposely backfilled at the end of its use with material from the surrounding area.

A similar ditch (G5) was located to the south of G4 and was similar in character to G4 with early Roman pottery being recovered from the backfill (SG5.2). No other features of a contemporary date were found in the immediate vicinity of these ditches. Their shape indicates they formed part of an enclosure rather than field boundaries.

G3 (SG 3.1): Ditch construction (Illus 3)

A large ditch orientated E-W measured on average 2.5m in width and 0.45m deep. The cutting of the ditch through pre-existing features suggests it represents a deliberate reorganisation/redesign of the field system. This is supported by the presence of backfill deposits within G1 and G2 which may have been thrown into the ditches to make way for G3.

G14: Pit (Illus 6)

An oblong pit measuring 1m by 0.9m and 0.2m in depth was recorded in the SE of the DA. It had a concave profile and contained dark brown/black clay (SG14.2) which produced finds of animal bone and pottery dating to the mid 1st to early 2nd century AD. The initial purpose of the pit is unclear but the backfill deposit suggested domestic waste and been deposited within it during the backfilling process. This may indicate the presence of further activity in the vicinity of the G14.

Phase 3 represents the final occupation of the Romano-British settlement, with the ditch being backfilled and some evidence of later occupation present. Artefacts also suggest a continuation of domestic activity, although the presence of iron nails and quantities of magnetic residue, suggest the possibility of industrial activity in the vicinity. No features directly linked to industry were found.

G3 (SG3.2): Ditch out of use

The fill (SG3.2) of ditch SG3.1 contained pottery dating to the late 2nd to early 3rd century AD suggesting it was starting to be backfilled during or after this time. The deposit comprised dark grey brown clay with inclusions of small stones, chalk and charcoal. These inclusions were evenly spread throughout the deposit suggesting mixing prior to deposition and deliberate backfilling of the ditch once it was out of use (similar to process seen in ditches G4 and G5).

Period: Medieval – Post Medieval (1066 – 1800)

Phase 4: Ridge and Furrow and related features (Illus 2, 4 & 6)

G6, G7 & G8: Furrows (Illus 2, 4 & 6)

Furrows were visible across the DA; particularly in the S-E where they were best preserved. G7 and G8 furrows were aligned N-S, whilst G6 was E-W. On average, they were spaced between 6m and 7m apart. The alignment of the furrows was different to the layout of earlier ditches boundary features, indicating that any former boundaries / enclosure had been largely removed by the time of their creation.

G9: Associated features (Illus 6)

Two linear features, aligned roughly NE-SW measuring 0.6m in width and 0.3m in depth. They were filled by a soft brown clay (SG9.2) similar to deposits within the furrows.. Although no dating material was recovered from the fill, no clear distinction was observed in the relationship between the features of G9 and G6 and it was presumed they were contemporary. It is possible that the features were part of the medieval landscape, providing drainage between the ridge and furrow. A sub-rectangular feature [5004] to the east of the gullies, at first thought to be created by tree rooting, was interpreted as a wallow, most likely created by livestock in the area, again contemporary with the furrow and gully features.

Period: Post-medieval and Modern (AD1800 – Present)

Phase 5: Modern agricultural use

G10: Drainage and Ploughing

Agricultural use of the land continued into the modern period, with the insertion of land drains, mole drains and gullies. Occasional plough scars were also observed across the DA.

G11: Boundary ditches (Illus 5)

A ditch running broadly NNW-SSE measured 1.4m wide and 0.72m deep. It was filled by loose grey brown clay (SG11.2) which contained fragments of decayed wood and modern iron machinery parts. Two morphologically similar ditches lay broadly perpendicular, on an E-W alignment; the northernmost lying to the east of the NNW-SSE ditch and the southernmost projecting to the west. The northernmost E-W ditch was separated from the NNW-SSE ditch by a small gap of c. 7.5m. They are considered to be the remains of post-medieval or modern field boundaries. The presence of modern machine parts and wood in their deposits indicates they were backfilled in the modern era. The gap between two of the ditches may represent an entranceway between two fields.

G12: Ditches (Illus 5)

These two parallel ditches were morphologically similar to G11 and were aligned broadly ENE-WSW. The larger of the two was 3m wide by 0.75 deep and their fills continued undiagnostic finds comprising an iron object and animal bone. The sterility of their deposits and the apparent lack of any other nearby contemporary features, suggests that they are field boundary ditches. They were truncated by the NNW-SSE ditch of G11 which was aligned perpendicular to them, indicating they may have formed an earlier phase of the field layout.

G16: Large boundary ditch (Illus 2)

A large ditch was revealed in the NW of the DA, corresponding with a large cropmark in the area. Modern artefacts comprising a horseshoe and a glass fragment were recovered from the ditch. It measured, on average, 1.3m wide and 0.5m deep and was on a NW-SE alignment and its deposits comprised backfilled material (SG16.2). Its extent in plan was obscured by a spread of silty material, which extended several metres to the north of the ditch edge (SG16.5). This indicates that the final fill of the ditch was a result of natural silting after it had gone out of use.

Two pits [SG16.3] were recorded in section, having been cut into the backfilled ditch. The pit fills were sterile and it is possible they were simply dug to recover some of the backfilled material from the underlying ditch or to remove vegetation for land clearance.

Period: Unphased

Phase 6: Unphased

G13: Ditches (Illus 6)

Although it was possible to assign a date to most of the features revealed on the site, some remained undated. A series of ditches were recorded in the SE of the DA. Three were on a broadly N-S alignment, whilst the fourth ran E-W. The largest of these measured 1.2m wide and 0.55m deep and contained a compacted, mid grey/yellow silty clay backfill. Only a single un-diagnostic iron object was recovered from this group.

G18 & G20:

A number of tree throws and wallows were spread across the DA. Their date could not be determined although two in close proximity to G11 and G12 ditches (Illus 5) are likely to be contemporary with their use.

G15, G17, G19, G21, G22 & G23:

A series of ditches were observed across the DA during the evaluation stage of the project. Their date could not be determined but they were interpreted as boundary ditches, hedgerows and drainage gullies associated with agricultural use of the land.

4. ANALYTICAL POTENTIAL OF THE DATA

4.1 Introduction

For the following discussion, the datasets recovered during the investigations have been divided into three main classes: contextual; artefactual; and ecofactual.

- **Contextual** data relate to the identification of individual events such as the digging of a ditch, its primary infilling *etc.* These have been recorded as context records during the evaluation and open area excavation. All contexts have a detailed record sheet; many have a plan and section drawing along with photographs.
- **Artefactual** data comprise manmade objects recovered during the open area excavation. These have been divided for ease of discussion into pottery, ceramic loom weights, lithics and other artefacts (including registered artefacts and bulk finds, such as industrial residues).
- **Ecofactual** data comprise natural materials found within excavated deposits. These are able to yield information on the nature of past human activity and its environmental setting. They include animal bones and information obtained from environmental samples (*e.g.* plant remains).

Contextual data are discussed first in the following sections, as they have provided the framework for the preceding summary of results and the subsequent dataset discussions. The methodological approach taken with each dataset is discussed, followed by sections dealing with quantification, provenance (spatial and chronological) and also condition. All these factors are important in deciding the potential of the material for analysis.

4.2 Contextual Data

Quantity of records

Table 3 presents a breakdown of the total quantity and type of contextual records. These comprise the written description/interpretation of a deposit/feature (context sheets), a map-like drawing showing the location and inter-relationship between features, including digital mapping (a plan), a profile drawing through a feature and its fills (section), and photographs.

Contexts	Plans	Sections	Photographs
249	11	19	357

Table 3: Quantity records

Survival and condition of remains encountered

The most significant remains identified date from the Roman Period. Other remains of lower significance were dated to the medieval period or later (post-medieval and modern). The remains had been truncated by the creation of ridge and furrow during the medieval/post-medieval period and in areas, through ploughing, in modern times. This was evident through plough marks visible at the level at which significant archaeological remains were encountered. The components of these landscapes that

survived best were relatively deeply cut negative features such as ditches and (at one time) large pits. There was an absence of subsoil across the excavation areas, which furthermore demonstrated the extensive ploughing that had taken place at the site. The current ploughsoil had been imported after the WWII airfield had gone out of use (Farm Manager, pers. comm.) and below this; a buried ploughsoil was observed in areas up to 0.20m thick which sealed the archaeology. This imported soil has likely helped preserve some of the archaeological remains, as it created a buffer against the extensive ploughing regime in the last half century.

The archaeological features comprise mainly evidence of Roman settlement. These remains are spread across the excavations areas but are particularly concentrated in the NW of the site, in the vicinity of the greatest density of cropmarks. Although only a small number of features make up this group, given the small size and dispersed nature of the excavation areas, it is presumed they are only a small portion of a far more complex group of remains.

A variety of ditches representing various field boundaries, as well as evidence of post-medieval/modern agricultural activities were observed across the site. Some of the field patterns, along with more ancient remains (Roman settlement), survive as cropmarks. Efforts will be made to recognise these patterns during analysis, which may aid in distinguishing between ancient and modern cropmark evidence.

The distribution of certain types of artefact (*e.g.* pottery) has assisted in identifying where settlement activity was focused and when it took place. The presence of varying artefactual data will provide further information on the use of the land in the Roman Period.

The presence of charred plant remains and molluscs across the site will assist in a reconstruction of the site's palaeoenvironmental conditions. However, conditions of preservation were generally such that few remains from these data-sets were recovered, limiting the interpretive value.

4.3 Artefactual Data

Pottery

Roman

Late Iron Age and Roman pottery was retrieved from the excavation. A small number of 'transitional' late Iron Age to early Roman forms are present amongst this assemblage but no definitively late Iron Age contexts were established and it is likely these types represent occupation after the Roman conquest. The majority of the pottery present dates to the mid to late 1st to early 2nd century AD with a few contexts dating to the second half of the 2nd century AD.

Much of the pottery from the early phases is abraded and does not provide a close date for the earliest activity on the site. Many of the contexts have high levels of abrasion as might be expected from a rural assemblage and a considerable residual element is present in most of the latest groups. On the basis of this ceramic assemblage it appears likely that there was little occupation in the investigated area beyond AD175.

The Roman pottery assemblage is substantial and stratified within the fills of archaeological features. Further analysis will provide valuable dating evidence and also allow inferences about the nature and status of the settlement. The associated metalwork will add a further dimension to this interpretation.

Medieval/post-medieval

Overall the pottery assemblage is in a fairly poor condition although some sherds are reasonably large and/or fairly fresh. Ordinary domestic pottery types are represented. The latest pieces in the assemblage are a 17th-18th century Midlands blackware bowl rim and another unglazed fine sandy orange ware bowl rim, which is probably of 16th century date. Other, residual, pieces include a few sherds of glazed or unglazed late medieval orange sandy wares and a surprisingly high number of sherds in late Saxon St Neots-type ware. Little will be gained from further analysis of this assemblage as it was recovered from the ploughsoil and unstratified. No further work is recommended.

Metalwork

A single coin recovered from the subsoil (3001) provides the main interest in the assemblage. It is of Roman date: a late 3rd century Antoninianus, possibly Victorianus (269-71), though is very worn. Metal finds associated with Roman pottery comprised nails and hobnails. These finds do not in themselves warrant further investigation, although they have the potential to help with the interpretation of the Roman pottery during analysis.

There were also a number of more recent iron finds. These included a very large horseshoe (2019) which can be dated by way of its toe clip to the mid 19th century or later. Other finds include iron straps and some unidentified pieces of heavy cast iron, probably machine parts associated with the WWII airfield. These modern finds require no further work.

Lithics

The lithic assemblage contains cores, debitage and tools, all of flint. None are clearly diagnostic of date but their origins most likely lie in the Neolithic or Bronze Age. The lithics are all residual, found within the backfill of Roman ditches. Little insight into the potential underlying prehistoric activity on the site can be gained from this assemblage.

Building Materials

A sherd of box-flue tile was recovered from the subsoil (3001) while a piece of fired clay, possible daub was found in ditch fill (3038). They were both Roman in date. The assemblage is too small to yield further information through analysis.

Glass

One sherd of green bottle glass was recovered. Its size and association with modern metalwork implies it is modern in date and requires no further work.

Clay Pipe

A single sherd of clay pipe was recovered from a boundary ditch (SG11.1). Its narrow bored indicated a 19th or early 20th century date and requires no further work.

Industrial Waste

An assemblage of industrial waste was recovered from contexts associated with Roman pottery. The largest concentration (124g) was from ditch fill SG 3.2. The material appears to represent ironworking, though the small size of the fragments and lack of associated *in situ* deposits or features limits the interpretive potential of these finds.

4.4 Ecofactual Data

Animal Bone

The animal bone recovered, all from Roman contexts, included sheep/pig, horse, cattle and bird but was highly fragmented. The potential of the assemblage is restricted by its high fragmentation, as well as limited age-at-death and metrical evidence. It is unlikely that any further information will be gained by analysis of this assemblage.

Molluscan Remains

A number of species of molluscan remains were recovered from ditch features across the site. Further analysis of these remains will identify type and preferred habitat helping to reconstruct the surrounding environment and landscape of the site.

Plant Remains

Only limited charred plant remain (CPR) assemblages were recovered from the samples taken (all from Roman contexts), with the charred cereal grain present being poorly preserved and possibly reworked or intrusive. The assemblage has limited potential to inform on rural Roman agricultural practices and economy or on woodland management techniques. It is therefore recommended that no further work be undertaken on the CPR assemblage recovered from the site.

4.5 Potential of Datasets to Address Original Research Objectives

The potential of each dataset to contribute to the project's original research objectives is summarised in Table 5.

Objective	Contextual	Pottery	Metal work	Other artefacts	Animal Bone	Molluscan Remains	Plant Remains
1 Date the cropmarks (described in section 1.3) by investigating those parts, which lie within area of impact. If these are late Iron Age/Roman in date – gather data useful in increasing knowledge.	Medium	Medium	Medium	Medium	-	-	-
2 Late Iron Age - How were livestock being managed? What evidence is there for agrarian production at this site?	Low	-	-	-	Low	-	-
3 Iron Age/Roman Transition – Assuming we could obtain datable evidence for activity in other periods, this site may yield useful data on the transition from the Iron Age to the Roman periods.	Low	Low	-	-	-	-	-
4 Rural settlements and landscapes – can any data be gathered as evidence of ‘ladder enclosure’ and rural settlement?	Medium	Medium	Medium	-	Low	-	Low
5 Romanisation – if the field systems and ladder enclosure can be shown to post date any earlier landscape boundaries, is there evidence of Romanisation?	-	-	-	-	-	-	-

- High Dataset is able to contribute direct, significant data that can expand our knowledge in this area.
- Medium Dataset can contribute direct data which will be relatively standard for this chronological period and region.
- Low Dataset has a relatively low potential to augment our knowledge of this subject. It may be of only minor relevance to the research aim, or may help to add to a database of ‘less significant evidence’ which, when combined, is useful in recognising patterns, e.g. pottery assemblages, settlement types.
- Dataset has no potential to provide useful information on this subject.

Table 5: Potential of recovered datasets to address the original research objectives

5. RESEARCH OBJECTIVES FOR ANALYSIS

5.1 Introduction

Following assessment of the various datasets, it has been possible to refine and add to the original objectives (Table 5). The ways in which these research objectives will be addressed are listed below, with reference to national and regional research frameworks. Original research objectives 2, 3 and 5 have not been retained due to insufficient evidence to undertake substantial analysis; however aspects of these objectives have been incorporated in the revised versions.

5.2 Revised research objectives

Table 6 summarises the potential (Low, Medium, High) of each dataset to contribute to the revised research objectives for analysis.

What is the nature and extent of Roman activity in the area and specifically, what evidence is there for 'ladder enclosure'?

Further analysis of contextual (medium), artefactual data (medium) - particularly Roman pottery - would provide useful identification and dating information for evidence of the type of Roman settlement discovered at Cotton Farm. Analysis will provide valuable dating evidence and also allow inferences about the nature and status of the settlement. The associated Roman metalwork (low) might add a further dimension to this interpretation. Comparison of the contextual and artefactual data with similar sites nearby in the region will place the finding in their wider context within that region. Molluscan remains (medium) will help to recreate the surrounding landscape in which the settlement was set.

What is the nature and date of the cropmarks?

Our investigations revealed evidence of field boundaries and ditches throughout the site – some which correspond in location to cropmarks previously mapped through aerial photography. The contextual data, along with artefactual data (medium) will be analysed in order to better understand the features, how they correspond to the cropmarks, their dates and how they are connected with settlement in the landscape.

How does the Roman activity in this landscape compare with contemporary sites in the surrounding area?

Analysis will aim to establish how contemporary settlements in the region interacted throughout the period. Comparator sites will be sought and these sites will be used to look for patterns of similarity and areas of difference. This will aim to contribute to the collation and analysis of the many rural sites that have been excavated in recent years in the region (Medlycott, 2011). A first stage in our analysis will be designed to approach the Cambs HER and other organisations working in that area in order to seek out useful 'type sites'. Contextual, documentary and artefactual (medium) data will aid in these various analyses.

Objective	Contextual	Documentary Data	Other Artefacts	Pottery	Metalwork	Animal Bone	Molluscan Remains	Charred Plant Remains
• <i>What is the nature and extent of Roman activity in the area and specifically, what evidence is there for 'ladder enclosure'?</i>	Medium	Medium	Low	Medium	Low	Low	Medium	Low
• <i>What is the nature and date of the cropmarks?</i>	Medium	Medium	Low	Medium	Medium	-	-	-
• <i>How does the Roman activity in this landscape compare with contemporary sites in the surrounding area?</i>	Medium	Medium	Low	Medium	Low	-	-	-

- High Dataset is able to contribute direct, significant data, which can expand our knowledge in this area.
- Medium Dataset can contribute direct data, which will be relatively standard for this chronological period and region.
- Low Dataset has a relatively low potential to augment our knowledge of this subject. It may be of only minor relevance to the research aim, or may help to add to a database of 'less significant evidence' which, when combined, is useful in recognising patterns, e.g. pottery assemblages, settlement types.
- Dataset has no potential to provide useful information on this subject.

Table 6: Research objectives for analysis and potential of datasets

6. UPDATED PROJECT DESIGN

6.1 Introduction

This section provides a task list for the analysis, publication and archiving programme. Table 7 provides a description of the tasks associated with analysing each dataset and summarises the tasks associated with publication, archiving and overall project management. Table 8 describes the project team and lists their initials, and Table 9 details the proposed timescale for completion of each key stage in the project.

6.2 Publication Synopsis

An article will be submitted to the editors of *Proceedings of the Cambridge Antiquarian Society* for inclusion in that journal. It will contain the following sections. These are derived from the Revised Research Objectives in Section 5.2, Table 6 (this document). Analysis and the written article which is the product of this work is an iterative task, therefore, the following outline is subject to change as ideas evolve and new ideas are generated.

Section	Pages	Illus
Introduction		
• Project background	¼	
• Site location and description	¼	1
• Archaeological and historical background	½	
Results of investigation		
• Roman rural settlement		2
○ Settlement activity	1	
▪ Finds	1	10
▪ Molluscs	¼	
○ Cropmark comparison	½	1
○ Ladder enclosure?	½	
• Field boundaries and farming – medieval to modern day (including the site as a WWII airfield)	¼	
Discussion	2	
Conclusions	1	
Acknowledgements	¼	
References	2	

Table 7: Summary of all tasks associated with Analysis, Publication and Archiving

Task Names divided by Key Stage	Description of Task	Title/ Organisation initials	Person Days
Structural analysis liaison/meetings	On-going discussion will take place between the principal members of the project team throughout the analysis and publication stages. These will involve discussion over the nature of the work required, as well as commissioning the work and addressing any queries that arise during the course of the analysis.	PO/HA	1
Analysis of HER and historical maps	The Cambridgeshire Historic Environment Record will be visited to provide background information on archaeological sites in the vicinity. The focus will be on late Iron Age and Roman sites in the vicinity. All relevant maps, photographs and other documents will be examined.	PO/HA	1
Contextual, Sub-Group and Group analysis	<p>Each context will be assigned to a single Sub-Group, consisting of one or more (usually several) contexts that are closely related both stratigraphically and interpretatively. The Sub-Group to which each is assigned will be determined by analysis of the primary contextual information, specifically context sheets and sections/plans that were produced on site.</p> <p>The fills of features will be assigned to separate Sub-Groups from their cuts. The only exceptions to this are for deposits interpreted as packing or lining, and for primary fills that formed only a short time after the feature was constructed. For deep features that may have filled up over a long period of time, more than one Sub-Group will be used in order to separate their lower and upper fills. However, to ensure that their spatial location is easily identifiable, they will be issued a Sub-Group number comprising a decimal point of the ‘containing’ Sub-Group. For example, the non-primary lower fills of enclosure SG7 would be assigned to SG7.1, and the upper fills to SG7.2. When assigning contexts to Sub-Groups, the artefactual and ecofactual assemblage recovered from each context will be considered. This will identify any that contained significant assemblages, which may need to be referred to in detail in the descriptive section of the publication text. Such contexts will also be separated out at Sub-Group level.</p> <p>Groups will be composed of Sub-Groups that are stratigraphically similar, and which combine to form a coherent unit of contemporary activity. Sub-Groups containing non-primary fills may be assigned to separate Groups, in order to reflect the possibility that they are considerably later in date than the construction/primary fill Sub-Groups, and would therefore need to be analysed separately. However, to ensure that their spatial location is easily identifiable, they will be issued a Group number comprising a decimal point of the ‘containing’ Group. For example, the non-primary fills of farmstead G7 would be assigned to G7.1.</p>	PO/HA	½
Phase analysis	Each Group will be assigned to a higher level of interpretation known as a Phase, which may contain one or more Groups. Each Phase will represent a chronological period. A plan will be produced for each Phase, with the location	PO/HA	¼

Task Names divided by Key Stage	Description of Task	Title/ Organisation initials	Person Days
	of all relevant Groups marked.		
Assistance with structural analysis	The Project Manager will discuss the process of contextual analysis (Sub-Grouping, Grouping, Phasing) with the PO on a regular basis in order to ensure this iterative process benefits from a range of ideas/experiences brought in from other projects.	PM/HA	½
Pottery liaison & transportation		HA	¼
Site phasing and finds spot dating	Liaison with site staff over site phasing, and groups, establishing site stratigraphy and spatial distribution of finds.	FM & PO/HA	½
Pottery quantification and recording	Amendments to quantification, identification and dating of pottery completed at assessment stage.	FS/ Freelance	½
Mollusc quantification and recording		TW Freelance	½
Keystage 1: completion of analysis			
Structural phasing/publication liaison	Once the final phasing has been established, the various specialists will be informed. Each will receive detailed phasing information, the required format of their publication text, and any other information that they may require.	PO/HA	½
Artefacts publication liaison		FM/HA	¼
Pottery publication text (Roman)		FS/ Freelance	1 ½
Pottery illustration	10 vessels appear suitable for illustration	GD/HA	4
Metalwork publication text		FS/Freelance	¼
Combined finds report editing	Editing different finds reports together to provide technically and stylistically consistent report	FM/HA	1
Molluscs phasing/publication liaison	Direction given on overall phasing of the site and publication layout.	TW/ Freelance	¼
Molluscs publication text	Any references to be added to place site in wider context and how this information ties in with research frameworks within the area. Publication text and tables to be written as to direction given above.	TW/Freelance	½

Task Names divided by Key Stage	Description of Task	Title/ Organisation initials	Person Days
Keystage 2: completion of all specialist text			
Structural illustration	Plans will be produced to show all features in each Phase with Groups identifiable.	PO & GD/HA	2
Assistance with structural illustration	The Project Officer will advise and assist the Graphics section in order to ensure illustrations are as helpful to the reader and integrated with the text as is possible.	PO/HA	½
Production of site narrative and integration of all specialist publication reports to create site narrative report	The site narrative will form the basis of the descriptive section of the publication text. It will be organised by Period, Phase, Group and, where appropriate, Sub-Group and context number. A report will be submitted that is suitable for inclusion in an approved archaeological journal, in this case Proceedings of the Cambridgeshire Antiquarian Society. The chronological phased development of the site will provide the basic structure for the site narrative. Within each Phase text will be organised by Group, with artefactual and ecofactual information integrated into the text as appropriate. Evidence from documentary, cartographic and photographic sources will be integrated into this chronological framework.	PO/HA	4
Assistance with site narrative report	The Project Manager will assist the Project Officer where necessary. Input may be given by other individuals with experience of similar sites.	PM/HA	1
Amendments and queries in consultation with specialists during article preparation	The Project Officer will work in consultation with specialists in integrating reports into the article. The synthetic narrative of the article will set the tone and direction with specialist contributions serving this aim. Certain technical data may be saved to the project archive rather than appear in print in order to ensure an un-cluttered and interesting narrative.	PO/HA	1
Production of synthesis	The assessment suggests that the discussion will concentrate on the evidence from the late Iron Age/Roman period. In particular, it will focus on the research objectives identified in Section 5.2. Remains from the other represented periods will form a smaller part of the discussion. Further analysis of the material relating to those periods will be guided by the data presented in this assessment. The outline of the publication should be considered as only a guideline, and may be altered during the analysis and pre-publication stages if the results warrant it.	PO/HA	1
Editing publication text		PO & PM/HA	1

Task Names divided by Key Stage	Description of Task	Title/ Organisation initials	Person Days
Keystage 3: completion of 1st Draft			
	Headland's refereeing process	-	1
Keystage 4: Submission to PCAS			
	Submission to <i>Proceedings of the Cambridgeshire Antiquarian Society</i>		
	Amendments resulting from editor's comments	PO/HA	½
	Proof reading	-	¼
	Printing	-	-
	Archive preparation (Structural)	PO/HA	1
	Archive preparation (Artefacts)	FS/HA	1
	Archive preparation and liaison with Museum	PO/HA	1
	Archive microfiching	-	-
	Archive transfer (storage costs)	-	-
	Archive transfer	-	½
	Project management (Overall)	PM/HA	½
	Project management (Headland)	PM/HA	½
	The management of the project includes monitoring the task budgets, programming tasks, checking timetables, and liaising with all members of the project team.		

Task Names divided by Key Stage	Description of Task	Title/ Organisation initials	Person Days
Keystage 5: end of project			

6.3 The Project Team

To ensure a consistency of approach, the same specialists will be used (as far as possible) who have been involved in the assessment stage of the project.

Task	Organisation, Title and Name	Initials of Title
Daily management	Headland Archaeology (HA), Project Manager, James Newbould and Project Officer, Nuala Woodley	PM/PO
Structural analysis	HA, Project Officer, Nuala Woodley	PO
Pottery analysis (Roman)	Freelance, Finds Specialist, Ian Rowlandson	FS
Metalwork analysis	HA, Finds Manager, Julie Franklin	FM
Molluscs	Freelance, Mollusc Specialist, Tom Walker	TW
Illustration	HA, Graphics Department	GD
Archiving	HA, Project Officer, Nuala Woodley	PO

Table 8: The project team

6.4 Timetable

Following acceptance by the client and CAPCA of the assessment and Updated Project Design, Headland would like to proceed with analysis and publication of the results. This would ensure that project momentum is maintained.

Table 9 sets out the five key stages within the analysis and publication programme. An indication of the time required to reach the first three key stages is indicated, and these could serve as appropriate monitoring points, if required.

Task	Anticipated date of completion
Structural Analysis	January 2013
Quantification and recording by specialists	February 2013
Completion of KEY STAGE 1	
Compilation of specialist reports	March 2013
Completion of KEY STAGE 2	
Compilation of 1st draft	June 2013
Completion of KEY STAGE 3	
Refereeing	July 2013
Completion of KEY STAGE 4	
Publication of report*	Mid-Late 2013
Deposition of archive	Late-2013
Completion of KEY STAGE 5	

Table 9: Provisional timetable to complete the project

*Publication, and therefore deposition of the archive with Cambridge County Council's repository, will be dependant on the publication timetable of *Proceedings of the Cambridge Antiquarian Society*.

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APPENDIX 1: Finds Assessment

by Julie Franklin, Ian Rowlandson, John Cotter and Julie Lochrie

Introduction

This report identifies, quantifies and interprets the hand-collected and wet-sieved finds from all phases of work at the site: both the trial trenching by Oxford Archaeology and the excavations by Headland Archaeology. Information from both finds assessments has been combined to create an overview of the entire assemblage. A complete table of all the finds is included in the archive.

A summary of the assemblage is shown in Table 10

Table 10 Summary of the finds assemblage by phase and sub-group, quantified by number of finds

Phase	Sub-Group	Pottery (Rom)	Pottery (PM)	CBM	Metalwork	Industrial Waste	Clay Pipe	Glass	Lithics	Period
1	1.1	34	-	-	-	-	-	-	-	Roman
2	1.2	56	-	-	3	-	-	-	1	Roman
1	2.1	5	-	-	-	-	-	-	-	Roman
2	2.2	174	-	-	3	2g	-	-	57	Roman
2	4.2	144	-	-	-	1g	-	-	314	Roman
2	5.2	12	-	-	-	-	-	-	145	Roman
2	14.2	69	-	-	-	1g	-	-	80	Roman
2	3.1	30	-	-	10	2g	-	-	150	Roman
3	3.2	365	-	1	8	124g	-	-	152	Roman
5	11.1	-	-	-	-	-	1	-	-	Modern
5	11.2	-	-	-	2	-	-	-	-	Modern
5	12.2	-	-	-	8	-	-	-	-	Modern
6	13.2	-	-	-	1	-	-	-	-	?
5	16.2	-	-	-	1	-	-	1	-	Modern
6	20.2	-	-	-	-	-	-	-	1	Prehistoric?
6	-	83	12	1	coin	-	-	-	-	Mixed

Methodology

Hand-collected and wet-sieved finds were processed and recorded on an Access database. The finds were quantified by sherd count, though joining sherds from the same artefact were counted as one. Natural flint was discarded; only pieces which were likely to have been knapped were kept. The finds were labelled and packaged appropriate to their material types according to guidelines laid out by Cambridgeshire County Council Archaeology Store (HER 2004/1). The pottery has been archived using count and weight as measures according to the guidelines laid down for the minimum archive by *The Study Group for Roman Pottery* (Darling 2004) using the codes developed by the City of Lincoln Archaeological Unit (see Darling and Precious *forthcoming*). Rim equivalents (RE) have been recorded and an attempt at a 'maximum' vessel estimate has been made and is noted in the archive.

Results

Roman Pottery

The late Iron Age and Roman pottery retrieved from the excavation consisted of 972 sherds with a total weight of 11.087kg and a total rim equivalent of 10.55. A small number of 'transitional' Late Iron Age to early Roman forms are present amongst this assemblage but no definitively late Iron Age contexts were

established and it is likely these types represent occupation after the Roman conquest. The majority of the pottery present dates to the mid to late 1st to early 2nd century AD with a few contexts dating to the second half of the 2nd century AD.

Much of the pottery from the early phases is abraded and does not provide a close date for the earliest activity on the site. The larger fresher assemblages from Sub-Group 2.2 and the small group from Sub-Group 2.1 suggest that the site was occupied from some time in the middle of the 1st century and into the 2nd with the majority of the activity in the late 1st to early 2nd century AD and some groups suggesting activity into the later 2nd century AD (Sub-Group 3.2). With the exception of contexts from Sub-Group 2.2 and Sub-Group 4.1, many of the contexts have high levels of abrasion as might be expected from a rural assemblage and a considerable residual element is present in most of the latest groups. On the basis of this ceramic assemblage it appears likely that there was little occupation in the investigated area beyond AD175. This group has similarities with the published material from the rural early Roman assemblage from Little Paxton, Cambridgeshire where much of the pottery was retrieved from ditches and there was a similar average sherd weight (Evans 2011).

Phase	Sub-Group	Group	Sherds	Weight(g)	Total RE %	Dating
1	1.1	1	34	423	17	mid 1 st to early 2 nd century AD
2	1.2	1	56	403	77	late 1 st to early 2 nd century AD
1	2.1	2	5	16	0	Roman
2	2.2	2	174	2242	222	Late 1 st to mid 2 nd century
2	4.2	4	144	2218	99	Mid 1 st to early 2 nd century
2	5.2	5	12	81	0	Early Roman or later
2	14.2	14	69	238	5	Mid 1 st to early 2 nd century
2	3.1	3	30	67	23	Mid 1 st to mid 2 nd century
3	3.2	3	365	4205	518	Late 2 nd to early 3 rd century
6		24	83	1194	94	Late 1 st to late 2 nd century

Table 11. Roman Pottery Quantification and Dating by Sub-Group

Medieval and post-medieval pottery

A small collection of 12 post-Roman sherds was retrieved during the initial archaeological evaluation (Oxford Archaeology) from two topsoil contexts (2000) and (2001). No further sherds were found during excavation.

Overall the pottery assemblage is in a fairly poor condition although some sherds are reasonably large and/or fairly fresh. Ordinary domestic pottery types are represented. The latest pieces in the assemblage are a 17th-18th century Midlands blackware bowl rim and another unglazed fine sandy orange ware bowl rim, which is probably of 16th century date. Other, residual, pieces include a few sherds of glazed or unglazed late medieval orange sandy wares and a surprisingly high number of sherds in late Saxon St Neots-type ware - seven in total. This regional shelly ware tradition was common in the southeast Midlands and Cambridgeshire during the period *c* 900-1100. Included in the St Neots assemblage here is a bowl rim of classic late Saxon hammerhead form, and a beaded rim jar (Oxford, 2007, 12).

Metalwork

There were 37 metal finds, all of iron but for one copper alloy coin. The coin provides the main interest in the assemblage. It is of Roman date: a late 3rd century antoninianus, possibly Victorianus (269-71), though is very worn and unfortunately found in the subsoil (3001). Finds associated with Roman pottery were made up of a few nails and hobnails.

There were also a number of more recent iron finds. These included a very large horseshoe (2019) which can be dated by way of its toe clip to the mid 19th century or later. Other finds include iron straps and some unidentified pieces of heavy cast iron, probably machine parts.

Lithics

The lithics number exactly 900 pieces and include cores, debitage and tools, all of flint. Individually, none are particularly diagnostic of date although various characteristics point towards both Neolithic and Bronze Age with the possibility of a mixed period assemblage being strong.

The lithics were all residual, found in the backfill of Roman ditches. As the material is not *in situ* and may be from multiple periods of activity little insight can be gained into the underlying prehistoric activity.

Building Material

There were two fragments of building material, both of Roman date. A sherd of box-flue tile was recovered from the subsoil (3001), while a piece of fired clay, possible daub was found in ditch fill (3038).

Glass

One sherd of green bottle glass was recovered. It was associated with modern metalwork and is clearly of recent origin.

Clay Pipe

A single sherd of clay pipe was the only find recovered from Sub-Group 11.1. Its narrow bore indicates a 19th or early 20th century date.

Industrial Waste

A total of 130g of industrial waste was recovered from contexts associated with Roman pottery. The largest concentration (124g) was in the Sub-Group 3.2 ditch fills. The material appears to represent ironworking, though the small size of the fragments and lack of associated *in situ* features limits the interpretive potential of these finds.

Summary

The earliest activity on site is shown by a substantial assemblage of lithics. However all of this material is residual and none can be closely dated. It is clearly prehistoric in date but may represent multi-period activity.

The Roman period provides the largest and best stratified assemblage. The Roman finds are mainly of pottery, with a smaller quantity of metalwork and two pieces of ceramic building material. The finds derived from a series of pits and ditches and can be dated from the mid 1st century AD until the late 2nd century. A single coin dates to the late 3rd century and indicates that there was activity at the site after pottery ceases to be deposited.

A handful of pottery sherds indicate a late Saxon presence at the site. There are also a few post-medieval pottery sherds. The nature of activity during these periods is unclear. A group of modern finds include a horseshoe from a heavy horse and cast iron machine parts and clearly indicate agricultural activity.

Recommendations

The Roman finds clearly provide the most interesting part of the assemblage. The Roman pottery assemblage is substantial and stratified within the fills of archaeological features. Further analysis will provide valuable dating evidence and also allow inferences about the nature and status of the settlement. The associated Roman metalwork, although not in itself recommended for analysis, will add a further dimension to this interpretation.

No further work is recommended for the remaining finds. The prehistoric lithics are ambiguous and residual. The medieval and post-medieval pottery and finds are too few to provide any detailed information about activity during those periods.

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APPENDIX 2: Charred Plant Remains Assessment

S. Timpany and O. Power

Introduction

Archaeological investigations prior to the Cotton Farm Wind Farm development at Gravely, Cambridgeshire led to the discovery of Romano-British settlement, medieval ridge and furrow and post-medieval to modern features relating to agricultural activity on the site. During the course of the excavation of these features bulk samples were taken for the retrieval of palaeoenvironmental and archaeological materials that may provide dating evidence for these features.

This report presents the results of the bulk sample assessment from these features. A total of 8 bulk samples were taken during investigations of which all were processed for assessment. The aims of the assessment were to:

- Assess the presence, preservation and abundance of any palaeoenvironmental materials within the samples.
- Assess the potential of the material for any indications of the use of these features.
- Assess whether a proxy-date for these features can be provided based on any palaeoenvironmental materials present.

Methodology

Samples were processed in laboratory conditions using a standard flotation method (cf. Kenward *et al.*, 1980). This was then sorted by eye and any material of archaeological significance removed. All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappars *et al.* (2006).

Results

The results are presented in Table 12 (retent sample results) and Table 13 (flot sample results). Suitable material for AMS dating is also identified within each table. All plant material was preserved by charring.

Charred Plant Remains (CPR)

Charred cereal grain was recovered in small quantities from samples taken from Phase 2 features (G2, G3, G4 and G5) (Table 13). The charred grain assemblage from these features is fairly diverse despite the paucity of grain retrieved. The charred grain assemblage from the Phase 2 features consists of oat (*Avena* sp.), probable barley sp. (cf. *Hordeum* sp.), probable wheat sp. (cf. *Triticum* sp.) and wheat sp. (*Triticum* sp.) together with bread/club wheat (*Triticum aestivo-compactum*). Indeterminate cereal grain (*Cerealia* indet.), grain too poorly preserved to be able to identify to genus or species level was present in four of the samples from Phase 2 (Table 2). Preservation of the grain was found to be poor with the majority of the grains present found to be fragmented grain or showing signs of abrasion and breakage. The poor preservation combined with the small quantity of grain recovered suggests there may be taphonomic issues such as reworking and movement within the deposits.

Wild taxa were only present in Sample 02 from G5, SG 5.2 of Phase 2, with the presence of a single burdock sp. (*Arctium* sp.) achene (Table 13). Burdock is a plant that grows in waste places and waysides (Clapham *et al.*, 1962), although it may also be found as a weed of cultivated ground (Hanf, 1983).

Charcoal fragments were present in all of the samples with maximum fragment size ranging from 0.3 to 1.3cm (Tables 12 and 13). The majority of fragments were found to be less than 1cm in size. Abundance of charcoal fragments ranged from rare to occasional. Charcoal fragments were observed by eye to represent mainly both oak and non-oak taxa used for wood fuel from all phases of activity (Tables 12 and 13).

Other finds

Together with the CPR a range of other materials were also recovered from the processed samples (Table 12). Pottery sherds of Roman Age were recovered from all samples in rare to abundant quantities, with the exception of Sample 05 from G4, SG 4.2. Lithics were present in common to abundant quantities in all

samples. Metal objects were recovered in rare to common quantities in samples (05 and 06) from Phase 2 and (08) from Phase 3. Industrial waste in the form of iron (Fe) slag was present in rare quantities in Sample 05, with magnetic residue (Mag res) retrieved from samples (01, 05 and 06) from Phase 2. Burnt mammal bone was recovered in rare to common quantities from five samples; all from Phase 2 from Phase 1 (01, 02, 03, 04 and 06). Unburnt bone was retrieved from all samples in rare to common quantities. Marine shell was present in samples (04, 06 and 08) from Phase 2, recovered in rare to abundant quantities; the majority of which was recorded as oyster shell, with some mussel shell also present in Sample 06. Terrestrial shell was recovered from all samples in rare to abundant quantities with a maximum of 5 different taxa observed during the flot assessment (Tables 12 and 13).

Discussion

The results are discussed in relation to the phasing of the site.

Roman Period (Phases 2 & 3)

The seven samples from Phase 2 were taken from the fills of pit [3048] and five ditches; [4003, 4009, 4017 and 3026]. The sample from Phase 3 came from ditch fill [3036]. The recovery of 1st to 2nd century AD pottery sherds from these features (Rowlandson, this report), which include a near complete storage jar from ditch [4009], G4, SG4.2, indicate that the features from Phases 2 and 3 are Roman; confirming interpretations made during excavation. The overall charred grain assemblage from the features is sparse and consists largely of poorly preserved, broken and fragmented grain. The presence of oat, wheat sp. and bread-club wheat, the only definite identifiable grain in the samples, together with probable barley and wheat, would not be out of character for a Roman assemblage (e.g. Monckton, 1996; Fryer, 2008).

However, all of these cereals could equally be of later (e.g. medieval) date and therefore is of little use in providing a proxy-date for the site. The poor condition of the grain suggests the grain may have moved around either within the ditch deposit when it was exposed (e.g. through multiple discard events) or prior to its inclusion within the ditch fill (e.g. present on the ground surface and then transported into the ditch).

As with the charred grain, only small quantities of charcoal fragments were recovered from the Phase 2 and 3 samples (Tables 12 and 13). The charcoal fragments are most likely representative of wood fuel, with observation by eye of the fragments suggesting a mixture of oak and non-oak taxa were resourced.

The overall assemblages from the pit and ditch features are more informative than the CPR assemblages alone. The pit and ditch features from Phase 2 contained a mixture of probable domestic waste. This included Roman pottery (including a storage vessel) together with food debris (small quantities of burnt mammal bone, charred grain, unburnt mammal bone and a small quantity of oyster shell from the fill of ditch [4009] from G4, SG4.2). The Phase 3 ditch fills also contain similar domestic waste assemblages although with larger quantities of marine shell, again largely oyster, with some mussel. However, they do differ to those from Phase 2 in containing metal objects (Iron nails) and quantities of magnetic residue, suggesting these fills are associated with an industrial phase of activity.

One sample was processed from the back fill (5022) of ditch [5021] within G14, SG14.2. The presence of Roman pottery sherds within the back fill of pit [5021] suggests it is of the same date as those features from Phase 2. The overall assemblage from this feature is similar, containing both industrial (magnetic residue) as well as domestic waste in the form of pottery sherds, burnt mammal bone and unburnt mammal bone. CPR within this sample (01) was limited to a small quantity of oak and non-oak charcoal fragments.

Conclusions

Only limited CPR assemblages were recovered from the processed samples, with the charred cereal grain present being poorly preserved and possibly reworked or intrusive.

The paucity of CPR in the samples provides little informative information to the activities associated with these features.

The poor condition of the grain together with the possibility it may be intrusive indicates it is of little use in providing a proxy-date for the site.

The ditches all contain pottery sherds of Roman date between 1st and 2nd centuries AD.

Overall ditch assemblages contain a mixture of domestic, food and fuel waste with those from Phase 2 also containing possible industrial waste material in the form of magnetic residue.

The collective assemblages indicate that material was discarded into these features but provide little evidence for wider activity.

Statement of potential

The paucity of the CPR recovered from the samples together with the poor preservation of the grain present indicates it has limited potential to inform on regional research questions set for the East of England for the Roman Period. The small quantity of grain and wild taxa is unable to inform on rural Roman agricultural practices and economy as highlighted as a research question by Murphy (in Going and Plouviez, 2000). Similarly the charcoal fragments are too few in quantity of sizes suitable for analysis to inform on any woodland management techniques that may have been practiced and would provide only limited information on the composition of regional woodland during this period; both highlighted as research goals by Going and Plouviez (2000). It is therefore recommended that no further work be undertaken on the CPR assemblage recovered from this site.

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Table 12: Retent Sample Results

Context Number	Sample Number	Group	Sub-group	Feature	Sample Vol (l)	Ceramic		Stone	Metal	Industrial Waste		Burnt bone	Unburnt bone	Shell		Charcoal		Material available for AMS Dating	Comments	
						Pottery	Roman			Lithics	Stone			Fe object	Fe slag	Mag res	Mammal			Mammal
Phase 2																				
3027	6	3	3.1	Primary fill of ditch [3026]	40	+++	++++		+++		+++	++	+++	+++	++	+	1.0	Burnt Bone +, Unburnt Bone ++, Charcoal +	Fe objects are nails. Oyster shells present. Charcoal is oak and non-oak.	
3049	7	2	2.2	Primary fill of pit [3048]	20	+++	+++						+++			+	1.3	Unburnt Bone ++, Charcoal +	Charcoal is non-oak.	
4012	3	4	4.2	Back fill of ditch [4009]	30	++++	+++					+	++		+	+	0.5	Burnt Bone +, Unburnt Bone ++	Charcoal is oak.	
4013	4	4	4.2	Back fill of ditch [4009]	40	+++	++++					+	+	+	+	+	1.0	Unburnt Bone +, Burnt Bone +, Charcoal +	Charcoal is oak and non-oak.	
4018	5	4	4.2	Primary fill of ditch [4017]	20		++++	+		+			++		++	+	1.0	Unburnt Bone +		
4004	2	5	5.2	Back fill of ditch [4003]	40	+	+++					+	++		++++	+	<0.5	-	Charcoal not retained.	
5022	1	13	13.2	Back fill of ditch [5019]	20	+++	+++				++	+++	++		+	++	1.0	Burnt Bone ++, Charcoal +, Unburnt Bone +	Charcoal is oak and non-oak.	
Phase 3																				
3038	8	3	3.2	Fill of ditch [3036]	40	++	++++		+		++++		+++	++++	++			Unburnt Bone +++		
Key: + = rare (0-5), ++ = occasional (6-15), +++ = common (15-50) and ++++ = abundant (>50) NB charcoal over 1cm is suitable for identification and AMS dating																				

Table 13: Flotation Sample Results

Context Number	Sample Number	Group	Sub-group	Feature	Total flot Vol (ml)	Cereal grain:	<i>Avenasp.</i>	<i>cf. Hordeum sp.</i>	<i>cf. Triticum sp.</i>	<i>Triticumsp.</i>	<i>Triticum aestivo-compactum</i>	<i>Cerealia indet.</i>	Other plant remains	Charcoal Quantity	Charcoal Max size (cm)	Material available for AMS	Comments
Phase 2																	
3049	7	2	2.2	Primary fill of pit [3048]	20		1	1			1			+	0.5	-	Mollus identification
4004	2	5	5.2	Back fill of ditch [4003]	25			1		1		1	<i>Arctium sp. 1</i>	+	0.3	-	Mollus types i
4012	3	4	4.2	Back fill of ditch [4009]	10					1		1				-	Mollus identification
4013	4	4	4.2	Back fill of ditch [4009]	10							1				-	Mollus identification
4018	5	4	4.2	Primary fill of ditch [4017]	10				1			1				-	Mollus identification
3027	6	3	3.1	Primary fill of ditch [3026]	30							1		+	0.4	-	Mollus types i
5022	1	13	13.2	Back fill of ditch [5019]	30									+	0.7	-	Mollus identification
Phase 3																	
3038	8	3	3.2	Fill of ditch [3036]	40									++	0.4	-	Mollus types i

Key: + = rare (1-5), ++ = occasional (6-15), +++ = common (16-50) and ++++ = abundant (>50)

NB charcoal over 1cm is suitable for identification and AMS dating

APPENDIX 3: Mollusc Assessment

T. M. Walker

	Habitat preferences	Phase 2					Phase 3	Phase 6	
		3049 <7> Primary fill of pit [3048]	4004 <2> Back fill of ditch [4003]	4012 <3> Back fill of ditch [4009]	4103 <4> Back fill of ditch [4009]	4016 <5> Primary fill of ditch [4017]	3027 <6> Primary fill of ditch [3026]	3038 <8> Fill of ditch [3036]	5022 <1> Back fill of ditch [5019]
<i>Carychium minimum</i>	Marsh						1	1	
<i>Galba truncatula</i>	Marsh		2				17		1
<i>Anisus leucostoma</i>	Marsh						11		
<i>Truncatellina cylindrica</i>	Open country						3	10	
<i>Vertigo pygmaea</i>	Open country		3	4	2		32	23	
<i>Pupilla muscorum</i>	Open country	3	4	4		2	124	59	4
<i>Vallonia costata</i>	Open country						4	1	
<i>Vallonia excentrica</i>	Open country		17	4	3	4	48	21	1
<i>Vallonia pulchella</i>	Open country		7				8	1	1
<i>Vallonia</i> spp.	Open country	3	20	1	1	3	65	42	2
<i>Punctum pygmaeum</i>	Catholic		1						
<i>Vitrea crystallina</i>	Shade						1		
<i>Aegopinella nitidula</i>	Shade						3	1	
<i>Nesovitrea hammonis</i>	Shade							1	
<i>Cecilioides acicula</i>	Burrowing								1
<i>Ashfordia granulata</i>	Catholic	9	80	3	3	2	78	67	2
<i>Cermea virgata</i>	Open country		4				7	6	
<i>Helicella itala</i>	Open country		6				41	20	
<i>Trochulus</i> sp.	Catholic		9	2	1				
<i>Cepaea nemoralis</i>	Catholic		1						
<i>Cepaea</i> sp.	Catholic		1	fragment	2		fragment	fragment	
TOTAL SHELLS		15	155	18	12	11	443	253	12
TOTAL SPECIES		3	11	5	5	3	14	15	6
	Marsh		2				29	1	1
	Shade						4	1	
	Catholic	9	92	5	6	2	78	67	2
	Open country	6	61	13	6	9	332	183	8

Table 14: Summary of mollusc assemblage

Introduction and Methodology

The molluscs from each sample were sorted and identified to species level wherever possible using standard texts (Cameron 2008) and a reference collection. Habitat information was derived mainly from Evans (1972) and Boycott (1934, 1936).

Results

The assemblage comprises 919 fragments (by initial count) of twenty-one species. Shells were obtained from all samples (Table 14), although were present in significant numbers only from the back fill of ditch [4003] (context (4004), sample <2>) and the primary fill of ditch [3026] (context (3027), sample <6>), both from Phase 2, and in the fill of ditch [3036] (context (3038) sample <8>) in Phase 3. The presence of specimens of *Truncatellina cylindrica* provides good evidence that the assemblages containing these species are archaeological rather than recent.

Conclusions and Recommendations

As a whole, the assemblage contains a number of species, the majority of which prefer open county habitats. Further analysis is recommended to establish the distribution of species and aid in interpreting and reconstructing the surrounding landscape.

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APPENDIX 4: Faunal Assessment

Tegan Daly

Introduction

Fieldwork at Cotton Farm, Cambridgeshire, produced a small assemblage of animal bone from three of the five areas investigated and from 22 different contexts. The site represents an Early Romano-British occupation area. The bone was retrieved by hand-recovery which may have created a bias towards the recovery of larger mammals compared to the smaller bones of, for example, birds. This was addressed during sieving for environmental analysis where smaller bones and bone fragments were recovered from 15 of the 22 contexts. The assemblage is summarised in Table 15.

Table 15: Bone recovery by context

<i>Phase</i>	<i>Group</i>	<i>Context</i>	<i>Weight (g)</i>	<i>Total No. (TNF)</i>	<i>% of Total No.</i>
2	1	3003	66.99	8	1.73
2	2	3005	30.98	3	0.65
2	2	3014	16.02	1	0.22
2	1	3016	52.05	4	0.86
2	2	3018	8.03	4	0.86
2	3	3027 un-burnt	11.03	37	0.95 (TNF 45)
		3027 burnt	1.00	8	
2	2	3040	1.97	1	0.22
2	3	3046	443.23	43	9.29
2	2	3049	11.00	22	4.75
2	2	3054	7.03	2	0.43
2	2	3057	89.20	3	0.65
2	5	4004 un-burnt	125.11	24	6.48 (TNF 30)
		4004 burnt	2.01	6	
2	4	4012 un-burnt	5.98	17	5.18 (TNF 24)
		4012 burnt	2.99	7	
2	4	4013 un-burnt	0.20	6	1.51 (TNF 7)
		4013 burnt	0.03	1	
2	4	4018	75.03	26	5.62
2	14	5022 un-burnt	5.00	35	21.17 (TNF 98)
		5022 burnt	18.95	63	
3	3	3007	118.00	17	3.67
3	3	3028	135.97	13	2.81
3	3	3037	770.15	59	12.74
3	3	3038	33.98	49	10.58
5	12	4015	100.01	3	0.65
5	12	4021	42.85	1	0.22
	-	Surface find	4.99	1	0.22
		Total	2179.78	463	100%

Methodology

The assessment follows English Heritage MAP2 (1991) and Environmental Guidelines (2011). The small size of the mammal bone assemblage negated the need to sub-sample, and so all bones have been catalogued for this assessment.

Numbers of identifiable, ageable and measurable specimens, as well as the preservation and modification of the bone, were recorded to allow assessment of quantity, quality and information potential of the recovered material. Identification referred to the Headland reference collection (Alcester unstratified) and Schmid 1972. Fragments not identifiable to species or genus level were generally allocated to an approximate category, either sheep/goat, 'cattle/horse-sized' or 'sheep/pig-sized' as appropriate. Bones were considered ageable if the state of epiphseal fusion could be ascertained (Silver 1969) or mandibles had one or more

molar teeth present (Grant 1982, Payne 1973). The number of measurable elements follows Von der Driesch (1976). The number of identifiable species present by bone (NISP) was calculated as well as the minimum number of individuals (MNI). The MNI for each species takes into account bone part and side with the most common repeating bone element representing the MNI. The MNI can be calculated by two methods:

- Context MNI: A count of the most commonly repeating element within each context – the MNI in each context may be obtained from a different bone element.
- Site MNI: A count of the most commonly repeating element across the whole site.

Results

The assemblage comprised 463 fragments (by initial count), which were characterised by fair to good surface preservation, likely due to the relatively alkaline soils in this region (Farwell *et al.* 2012), but with high fragmentation (Table 15). Of the 463 fragments recovered only 66 could be identified to species level (14.3%); context (5022) was by far the most fragmented context resulting in the highest amount of unidentified bone (Table 16). Fragmentation was pre-depositional in nature and due to burning of bone in some contexts, however, in others fragmentation may be due to trampling (e.g. midden deposits) or smashing of long bones for marrow extraction common during this period especially in urban settlements (Maltby 2007). There was limited evidence of weathering on the bone surfaces (Brehrensmeier 1978) and damage due to scavenging animal was absent suggesting the bone was not exposed for long before deposition; however, this latter assumption is tentative given the amount of bone surface observable on the fragmented bone.

Cattle dominated the assemblage by number of fragments, despite the MNI showing a similar number of other species present on site:

- Context MNI: ten cattle, eleven sheep, three horses, two pigs and three birds; the bird remains were of small passerine birds.
- Site MNI: Two cow, two sheep, two horses, one pig and one bird.

Age could be ascertained for a total of four mandibular sheep teeth and two sheep un-fused bones; this allowed limited interpretation of animal husbandry for this site. The un-fused bones represented a minimum of two lambs aged 18-28 months and 36-42 months: the optimum age at which sheep are killed for meat is between 18-30 months (Payne 1973). Animals not suitable as breeders (the majority of males) or with lesser wool quality were also often killed young. The ageable teeth were from contexts (3007) and (3018), representing a minimum of two individuals, and indicating an older age of 3-6 years which may suggest sheep were also being bred for wool production.

There is no clear bias in body-parts present in the assemblage suggesting that whole carcasses or live animals were present on-site; fragmentation however makes this difficult to assess. There does not seem to be a pattern of deposition of a particular species within differing types of contexts e.g. ditches or pits.

Two bones indicated evidence of butchery marks. A single oblique chop mark was present on a cattle-sized rib fragment from (3037); this is part of the dismemberment process to produce sizable cuts and can be seen in rib-racks. The femoral neck of a cow from (3016) showed multiple blade marks which represent distinctive filleting marks using a knife (Lyman 1995; Maltby 1989). Burning was noted on bone fragments in contexts (3027), (4004), (4012), (4013) and (5022); all of which were within ditch features, with the exception of (5022) found within a burnt feature. Burnt bone was particularly fragmented and those fragments present displayed a range of colours (black, grey and white) indicating that they had been incinerated at temperatures of between 200-600 degrees (Gilchrist and Mytum 1986). The only identifiable bone included one sheep-sized rib fragment in context (5022). The presence of both burnt and un-burnt bone within these contexts could represent different waste products or uneven exposure to the fire or possibly the use of roasting as a cooking method.

Two bones had possible signs of an infectious process including a horse proximal phalange [context (4015)], which exhibited irregular porotic new bone formation (lamellar) on the lateral surface and a sheep-

sized long bone fragment [context (3016)] with similar bone formation but within the marrow cavity. Two mandibular horse teeth [context (3037)] showed buckling of the enamel folds, which may have been due to overcrowding during development and eruption (Dixon 2002).

Potential for further work

The potential of the assemblage from Cotton Farm is restricted by its high fragmentation, as well as limited age-at-death and metrical evidence. A range of Early Romano-British sites with animal bone assemblages have been uncovered within Cambridgeshire and the South-east of England (Albarella and Pirnie 2008) amongst which Cotton Farm can be included; however, the small size and preservation levels of the Cotton Farm assemblage indicate that limited comparison can be undertaken. It is unlikely that any further information will be gained by analysis of this assemblage.

Table 16: Summary of faunal assemblage

<i>Context</i>	<i>Bird</i>	<i>Horse</i>	<i>Cattle</i>	<i>Sheep/goat</i>	<i>Pig</i>	<i>Cattle/horse -sized</i>	<i>Sheep/pig- sized</i>	<i>U*</i>	<i>NISP</i>	<i>MNI</i>	<i>Ageable</i>	<i>Measurable</i>
3003			7					1	7	1		
3005			3						3	1		
3007				7			10		7	2	5	1
3014			1						1	1		
3016				1			3		1	1		
3018				2		2			2	1	1	
3027	1			1			4	39	2	2		
3028			3	3		5	2		6	2		
3037	5	8	1			6	8	31	14	3		
3038			1	1			8	39	2	2		
3046			4	1	1	4	12	21	6	3		
3049				1			6	15	1	1		
3054						2			0	1		
3057		1				1		1	1	1		
4004			5		1	1	17	6	6	2		
4012				1			1	22	1	1		
4013	1							6	1	2		
4015		1				2			1	1		1
4018			2			5		19	2	1		
4021			1						1	1		
5022				1			2	95	1	1		
Surface							1		0	1		
Total	7	10	28	19	2	28	74	295	66	32⁺	6	2

*unidentifiable – small fragments of mammal bones; ⁺in three contexts mammal bones were present indicating an individual however species could not be identified.

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