

Cambourne New Settlement

Iron Age and Romano-British settlement
on the clay uplands of west Cambridgeshire

Volume 2: Specialist Appendices

Web Report 16

Pollen, *by Robert Scaife*

Sediments, *by Catherine Barnett*



Cambourne New Settlement

Iron Age and Romano-British Settlement on the Clay Uplands of West Cambridgeshire

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Volume 2: Specialist Appendices
Part 1. Artefacts
Part 2. Ecofacts

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Pollen

By Robert Scaife

Introduction and methods

Following sampling and assessment, a series of specific sequences was chosen for analysis and full counting. Samples had been taken in the field as monoliths, described and subsamples. Sub-samples of 2ml were processed using techniques for the extraction of the sub-fossil pollen and spores (Moore and Webb 1978; Moore *et al.* 1992). Micromesh sieving (10 μ) was also used to aid with removal of the clay fraction. The absolute pollen numbers in the samples were calculated using added exotics to the known volumes of sample (Stockmarr 1971). The pollen and spores were identified and counted using an Olympus biological research microscope fitted with Leitz optics. A pollen sum of up to 300 grains per sample level was counted where preservation allowed. Other, miscellaneous microfossils including algal *Pediastrum* and pre-Quaternary palynomorphs were also recorded. Data are presented in pollen diagram form where appropriate and in tables. The former have been plotted using Tilia and Tilia Graph (**Figs Pollen 1-3**). Where percentages are given, these have been calculated as follows:

Sum =	% total dry land pollen (tdlp).
Marsh/aquatic =	% tdlp + sum of marsh/aquatics.
Spores =	% tdlp + sum of spores.
Misc. =	% tdlp + sum of misc. taxa.

Taxonomy, in general, follows that of Moore and Webb (1978) modified according to Bennett *et al.* (1994) for pollen types and Stace (1992) for plant descriptions. These procedures were carried out in the Palaeoecology Laboratory of the School of Geography, University of Southampton.

Lower Cambourne

One sequence was analysed from this site, with five samples taken from ditch group 5401 (cut 5105) spanning primary, secondary and tertiary fills (contexts 5109–5106). The upper fill (context 5109) is Romano-British to Saxon in date (Phases 3–4) and the remaining fills should probably be ascribed to the Romano-British period (Phases 2C–3). All produced sub-fossil pollen and spores but, as with other material from this site, preservation was poor with small absolute pollen values ranging from *c.* 12,000 to 15,000 grains/ml (**Fig. Pollen 1**).

Overall, the pollen assemblages are dominated by herbs (98% of the pollen sum) with very few trees and shrubs present. Where the latter occur these are of regional origin representing areas of remaining woodland (*Quercus* and *Corylus avellana*). Of the herbs, Poaceae are dominant in the lower levels (to 78% in the basal sample at 76 cm) with Lactucoideae (dandelion types) becoming progressively more important upwards in the profile (to 76% at 12 cm). Other taxa include *Plantago lanceolata* (ribwort plantain to 9% at 56 cm) and cereal type. The overall diversity is greater in the lower part of the profile where pollen preservation is better. Fern spores of *Pteridium aquilinum* (bracken), monolete *Dryopteris* type (typical spores), and *Polypodium vulgare* (polypody fern) are more important at the base of the profile. There are very

substantial numbers of pre-Quaternary palynomorphs throughout the sequence which derive from the bedrock geology.

There is a close similarity between the pollen spectra from this ditch and those discussed for the Phase 2, later Iron Age pit at Knapwell Plantation, with the exception that the more regional tree/shrub component is marginally less noticeable. The pollen derives largely from local land use which, as at the other sites, appeared to be predominantly pasture in the adjacent field(s). However, as indicated by the small quantities of cereal pollen and associated weeds of cultivation, arable cultivation may also have been taking place in the vicinity.

As with Knapwell Plantation, the marked expansion of Lactucoideae (dandelion types) in the upper levels indicates progressively poorer pollen preservation resulting in the differential preservation of more robust types such as Lactucoideae and the destruction of thin walled grains. This is, therefore, a purely taphonomic phenomenon probably caused by oxidation/destruction of pollen in the upper sediments. This may have been caused by a fluctuating water table in the ditch. The surviving pollen, however, remains an indicator of a predominantly grassland habitat on or very near to the site.

Lower Cambourne Green
(5105)

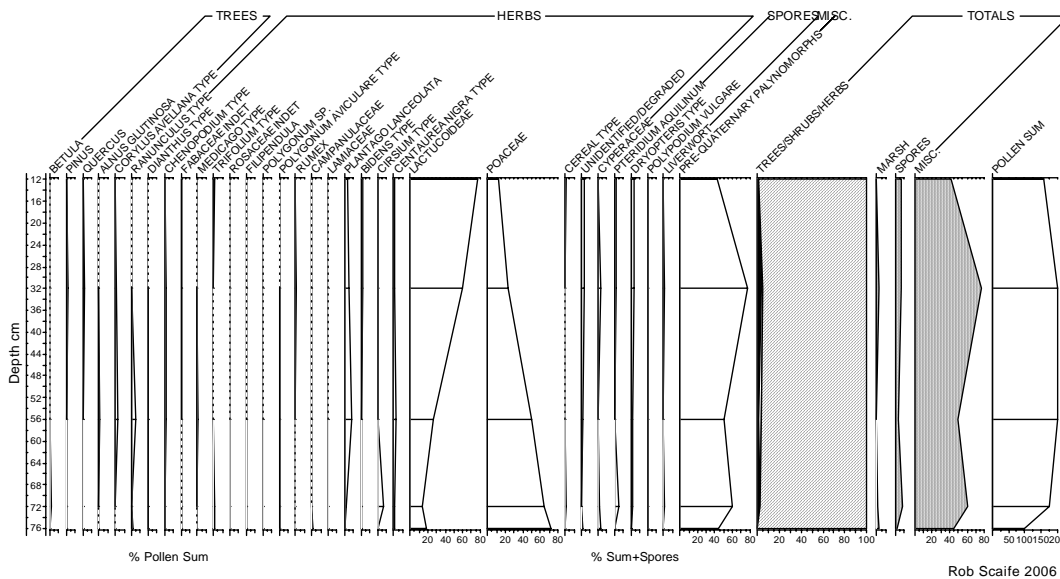


Figure Pollen 1. Lower Cambourne (ditch 5105)

Mill Farm

Four pollen samples were analysed from the Phase 3, mid-late 2nd-late 4th century Romano-British waterhole 40016, at 24 cm (40242), 56 cm (40242), and 112 cm (40244). Data are presented in pollen diagram form (**Fig. Pollen 2**). Herbs are dominant with Poaceae (76%) important throughout and Lactucoideae especially in the top sample (35%). The latter is differentially preserved as at other sites analysed and reflects poorer pollen preservation in the upper more freely drained levels. Other herbs include *Ranunculus* type (buttercup family; 11%), *Plantago lanceolata* (ribwort plantain), Asteraceae types and cereal pollen (8%). There is an almost complete absence of trees and shrubs with only sporadic/occasional *Quercus* and *Corylus avellana* type. Marsh and aquatic taxa are represented with Cyperaceae (to 24%), *Potamogeton*, *Typha angustifolia/Sparganium* type, and cysts of algal *Pediastrum*. A trace of *Ascaris* (intestinal parasite) was noted in the upper sample.

Pollen preservation, as might be expected from well sediments, is generally good in this sequence. The upper levels do, however, exhibit evidence of some differential preservation possibly caused by fluctuating ground water. This has resulted in skewed pollen data with the typical over-representation of Lactucoideae (dandelion types) because of its robust pollen wall (exine). As with other sites analysed from this phase, the near environment was one of pasture but with some evidence of cereals. There is no evidence of local woodland in the vicinity. The taphonomy of pollen in ditches and open well/water-hole features may complicate the interpretation of such assemblages since the Poaceae (grasses) may also derive from the ditch flora itself. Furthermore, cereal pollen may come from secondary sources such as crop processing and/or human and animal waste products. There is corroborative evidence that this feature was a well with standing water with fringing Cyperaceae (sedges) and *Typha/Sparganium* (reed mace and burr reed) and possibly the aquatic *Potamogeton* (pond weed). Cysts of freshwater algal *Pediastrum* are further evidence of this.

Mill Farm
Well 40116

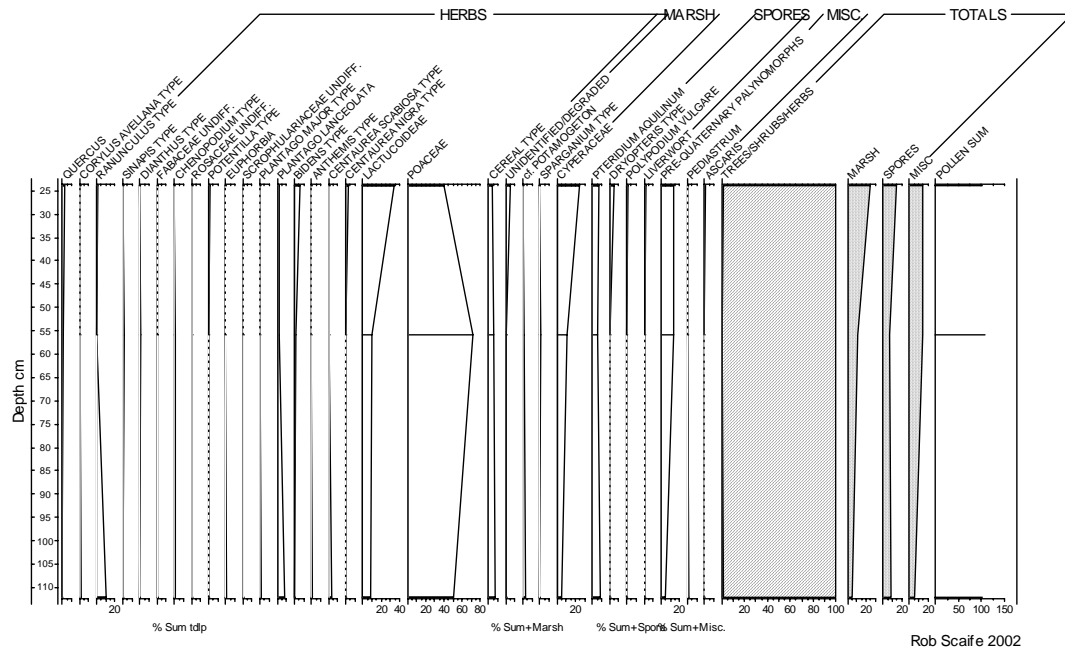


Figure Pollen 2. Mill Farm (well 40116)

Knapwell Plantation

Sequences through two features were analysed, both later Iron Age, comprising well / waterhole 60005 (Phase 2A) and pit 60763 (Phase 2B).

Later Iron Age well/waterhole (60005), Phase 2A

Two samples from the lower levels (at 80 cm, context 60042 and at 92 cm, context 60042) were examined. Of these, the upper had relatively poorly preserved pollen (a.p.f of *c.* 4000 grains/ml), although some useful information was obtained. The lower sample has higher values of *c.* 9000 grains/ml. Trees and shrubs comprise small numbers of *Betula*, *Pinus*, *Quercus*, *Alnus glutinosa* and slightly higher numbers of *Corylus avellana* type. Herbs are, however, most important with Poaceae (55–60%) and cereal type (10%), the latter in the basal sample. Better preservation in the lowest level has also resulted in a more diverse range of herbs/pollen taxa. There are only occasional occurrences of Cyperaceae and no full aquatic types. Spores are relatively important with *Pteridium aquilinum* (to 18%), *Dryopteris* type (to 15%) and *Polypodium vulgare* (to 4%). There are substantial numbers of derived pre-Quaternary pollen and spores from the local bedrock.

Later Iron Age pit (60763), Phase 2A

Six samples were examined from pit 60763 (contexts 60765, 60766, 60772, and 60773) which span the full depth of this later Iron Age feature. Pollen presence was variable with poor preservation in the upper half of the profile (at 16 cm and at 40 cm). However, data was obtained from all samples and is presented in diagram form (**Fig. Pollen 3**). There are few trees and shrubs, including *Quercus* (oak; to 5%) and sporadic occurrences of *Alnus glutinosa* (alder) and *Corylus avellana* type (hazel). Herbs are dominant with Poaceae (grasses; to 75%) and Lactucoideae (dandelion type; to 78%). The latter is a reflection of the poor pollen preservation in the upper levels of the ditch fill. Cereal pollen occurs sporadically throughout. There are substantial numbers of derived geological palynomorphs from the local bedrock. The intestinal parasite *Ascaris* is present at 40 cm.

The large numbers of geological palynomorphs and Holocene Lactucoideae (dandelion types) attest to the poor pollen preservation and the complex pollen taphonomy of such ditch fills. Absolute pollen frequencies are, however, greater in the lower levels reflecting better pollen preserving conditions. The data suggest that an open grassland/pasture habitat existed in the adjacent field system with a small arboreal component reflecting non-local oak and hazel woodland growth. It is not clear whether arable cropping was being practised or whether the cereal pollen comes from secondary sources such as dumped faecal material (note the cysts of the intestinal parasite *Ascaris*), although this may also be an indication of pasture animals on site.

Discussion

Both the well (60005) and pit (60763) are of later Iron Age date. Overall, the pollen spectra suggest grassland habitat and since the pollen catchment of such features will be largely restricted to the on-site and immediate local area, it is probable that this

pasture was local (adjacent fields). Cereal pollen attains important values (10%) in the basal sample of well (60005) and may indicate local arable cropping or, alternatively, crop processing which would liberate cereal and herb pollen trapped in the ears of grain.

Although the overall pollen data from all periods examined at Cambourne are very similar, showing an open pastoral habitat with a minor arable component, the flora differs subtly from that of the Romano-British features described. The two Knapwell profiles have marginally higher values of tree and shrub pollen than later periods, although these are still considered to be non-local, regional elements. *Alnus* (alder) is present here but whilst this may indicate some growth of this wetland tree, the values of the high pollen producer do not indicate significant local growth. This also applies to the somewhat higher values of *Corylus* (hazel) noted in the basal sample.

Knapwell Plantation
Ditch 60140

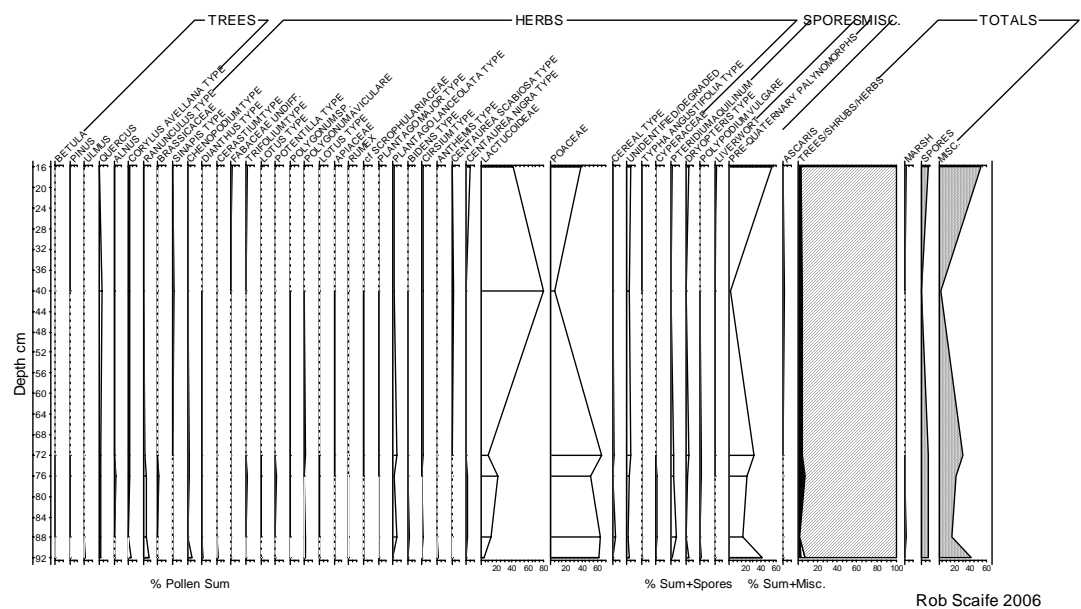


Figure Pollen 3. Knapwell Plantation (ditch 60140)

Jeavons Lane

Two profiles have been analysed from Jeavons Lane that provide information about the pre-later Age to Romano-British environment. These comprise pond 80004 of possible Late Iron Age/early Romano-British date or earlier (Phase 2C) and a 2nd-3rd century Romano-British well 80062 (Phase 3A). Both of these suggest a predominantly open grassland environment with the possibility of some arable cropping, although the taphonomy of pollen in such features is complex and there is the possibility that the latter elements may come from secondary sources (see below). Assessment of an undated prehistoric channel 57607 produced too little pollen to comment further, but the pre-Late Iron Age/early Romano-British field ditch 80005 (Phase 1?-2C), whilst not providing spectra suitable for analysis, did enable some comment on the earlier environment.

Pre-Late Iron Age/early Romano-British field system ditch 80005, Phase 1?-2 century

The assessment of four samples demonstrated that the uppermost (at 8 cm, context 80352) was devoid of pollen. Pollen preservation and absolute pollen frequencies are variable, the latter ranging from 2500 grains/ml to c. 130,000 grains/ml. Herbs are dominant with Poaceae (to 73%) and Lactucoideae (32%). Overall, herbaceous diversity is small reflecting the poor pollen preserving conditions. Other taxa present include *Cirsium* type (13%; thistles) in the basal sample and *Chenopodium* type (goosefoots and oraches). There are few trees and shrubs, but a single *Tilia* grain (lime/lindens) is noted.

Given the potentially early date of the contexts with pollen in this feature it is unfortunate that pollen is not well preserved. A single grain of *Tilia* (lime) may be one of the last vestiges of lime woodland which is thought to have been dominant over wide areas of southern and eastern England during the late prehistoric period. The pollen data, however, suggest an open herbaceous environment of grassland or pasture. High values of Lactucoideae (dandelion types) demonstrate differential preservation has taken place which has skewed the pollen data in favour of the more robust taxa.

Late Iron Age/early Romano-British pond (80004), Phase 2C

A single sample with good pollen preservation from pond 80004 at 48 cm (80415) shows a predominantly open, grassland/pasture habitat in close proximity. Pollen was well preserved with an a.p.f value of c. 23,000 grains/ml. As with all other contexts examined, there are few tree and shrub pollen taxa present with only sporadic *Quercus*, *Corylus avellana* type and *Alnus*. Herbs are dominated by Poaceae (77%) with only small numbers (three) of Lactucoideae and other herb taxa. There are substantial numbers of Pre-Quaternary palynomorphs derived from the local bedrock or reworked sediments.

2nd–3rd century Romano-British well 80062, Phase 3A

Analysis of samples from this well produced data which is similar in every way to all other contexts assessed at this site and the analysed sequence from pond 80004. That is, a dominance of herbs indicative of an open pastoral landscape.

Two samples were analysed, from 32 cm (80391) and 88 cm (80391). Pollen was well preserved and relatively abundant in the lowest level which had an absolute pollen value of 59,000 grains/ml. The upper sample although containing *c.* 22,000 grains/ml was, however, poorly preserved. There are few trees and shrubs with only occasional *Quercus*, *Corylus avellana* type, *Betula* and *Pinus*. Herbs are dominant with Poaceae (to 60% at 88 cm) and Lactucoideae (36%) at 32 cm (differential preservation). Other taxa of note include *Polygonum* sp. (2–10%), *Centaurea nigra* type (6%), and cereal type (2%). There are substantial numbers of Holocene spores (*Pteridium aquilinum*, *Dryopteris* type and liverworts) and geological palynomorphs.

Discussion

The lower and better preserved samples suggest that pasture/grassland was present around the site. The high levels of Lactucoideae in the upper sample is similar to other ditch profiles here and is due to poor pollen preservation in the upper levels, perhaps due to a fluctuating water table. Some cereal pollen in the basal sample suggests local growth, or at least use of crops, with pollen possibly derived from crop processing, from refuse or from faecal material incorporated into the sediments.

The Grange

Four samples were examined as part of the assessment from late Romano-British ditch 20846 at 24 cm (20815), 62 cm (20811), 92 cm (20811), and 120 cm (20807), and a brief summary is provided here. While the lower fills are likely to have infilled during the 3rd– 4th centuries, in some sections the uppermost fills of this ditch contained sherds of Saxon pottery.

Pollen and spores were present in all of the samples. Herbs are dominant throughout with Poaceae (to 65%) in the lower profile and Lactucoideae (to 52%) in the upper level. Cereal pollen (7%) is present throughout with a range of other herb taxa which include *Sinapis* type (charlocks), *Ranunculus* type (buttercups), *Polygonum aviculare* type, and *Plantago lanceolata* (ribwort plantain), and sporadic occurrences of a variety of other types. There are greater numbers of trees and shrubs (ie, numbers and diversity) in the lower half of the profile (contexts 20807 and 20811). *Quercus* (oak) and *Corylus avellana* type (hazel) are most important, albeit in small numbers. Marsh taxa are represented by Cyperaceae (sedges) with a peak to 28% at 62 cm and occasional *Typha angustifolia/Sparganium* type (bur reed and greater reed mace). There are spores of *Pteridium aquilinum* (bracken), *Dryopteris* type (monolete spores of typical ferns) and liverworts. The lower fills (contexts 20807 and 20811) contain abundant geological palynomorphs from local bedrock. Of note is a single occurrence of the intestinal parasite *Ascaris* (round worm).

Not surprisingly, pollen is better preserved in the lower part of the profile while the upper level shows typical over-representation of Lactucoideae (dandelion types), which are characteristic of poor preserving environments giving skewed pollen data. Some woodland is evidenced with oak and hazel in the lower levels. This is most probably the background/regional component and, in particular, the occasional occurrences of *Betula* (birch) and *Pinus* (pine) are not considered to be important. The local environment was largely pastoral as evidenced by the high Poaceae values along with *Plantago lanceolata* and Asteraceae types (daisy family including knapweed). However, cereal pollen is also present, along with herbs which may come from associated ruderals (*Spergula/spurrey* and *Polygonum aviculare*-knotweed). It is, nevertheless, possible that this pollen suite may derive from crop-processing or human and/or animal waste. The latter is tentatively evidenced by the presence of intestinal parasites (*Ascaris*) probably from faecal waste. High values of Cyperaceae (sedges) and possibly grasses are likely to come from the vegetation growing in the ditch. The presence of *Typha/Sparganium* suggest a degree of wetness in the ditch.

Sediments

By Catherine Barnett

Introduction

Sediments relating to Bronze Age–Romano-British and probable Anglo-Saxon activity have been recovered from five sites at Cambourne. Sediments were examined and briefly described according to Hodgson (1976). The context records created during excavation have been reproduced and enhanced to produce the sediment description tables given for each site, allowing interpretation of the sedimentary processes acting on each feature. Pollen samples were taken on the basis of the assessment, and are listed in the sediment table for each site. Sediments from separate features have been compared and, where possible, correlated on the basis of their sedimentology.

Sediments from a number of natural and man-made features were described and interpreted. Despite being geographically separated (see Figs 1 and 3), the five sites had a number of aspects in common, notably all were wet and prone to alluvial sedimentation under waterlogged conditions. They were apparently influenced by overbank sedimentation from palaeochannels in the area and fills were often of this material mixed with / comprising reworked, weathered boulder clay. Few organic and/or stasis horizons were identified other than at the top of feature fills, but where discerned these have been highlighted for each site.

Lower Cambourne

Three sedimentary sequences from natural and anthropogenic features were analysed. Full descriptions are given in **Table Sediments 1**, and on the basis of these, the following interpretations can be made:

Phase 0, palaeochannel 850

This feature was described in the field as an irregular natural channel, cut in places by ridge and furrow, with a palaeosol over a silt fill. The recovered sequence was desiccated and somewhat disturbed, consequently no pollen was taken. The material was heavily iron-stained but there was no clear evidence of pedogenesis. The feature was filled with alluvial silts and fine sands laid down within a relatively low-energy fluvial regime and the interpretation as a palaeochannel is supported.

Phase 2C, pond/waterhole 2716

The recovered sediments proved to be of fine alluvial material, i.e. lain by water from in-wash possibly associated with ditch 3060 or overbank sedimentation, which had subsequently dried out and oxidised, with the top pedogenically altered to form an overlying soil horizon, later disturbed by ploughing. While not recovered by monolith (and therefore not directly observed) the feature was described on-site as having a cobbled, metallised base. This in addition to a lack of organic material, as would be expected from a vegetated pond, lends support to an interpretation of the feature as a waterhole.

Phase 2C–4, enclosure ditch group 5401

Secondary and tertiary ditch fills were observed in the recovered sediments from this feature. The primary fill was not recovered, but was described on-site as mottled grey and orange (possibly gleyed) clay, very similar to the overlying fills described here. It could be that the feature had been cleaned out after primary fill deposition and those fills observed were also secondary fills, however the underlying ‘natural’ is of Boulder Clay and initial in-wash and slumping of the weathered fine drift deposit is also possible. The secondary fills are again interpreted as of alluvial origin (water lain), comprising fine in-wash, which may have contained a substantial input of overbank sedimentation of fluvial source. The uppermost (tertiary) fill was described in excavation as possibly derived from (eroded and ploughed) topsoil, but a degree of *in situ* pedogenesis is also suggested. Artefactual material was found in the upper layers.

Site overview

The palaeochannel sediments were sedimentologically different to the fine alluvial material filling the later enclosure ditch and pond / waterhole, being coarser in texture. However, true colour could not be discerned due to substantial iron deposition caused by drying of the sequence after deposition, and textural differences might be explained by degree of proximity to the main channel flow. If the alluvial sediments in the archaeological features were of fluvial source, they were of fine overbank sedimentation, deposited at times of high water/ flood, but are also likely to contain a proportion of weathered boulder clay, washed in to the features by run-off and sorted by the water. The site as a whole was clearly damp at the time of sediment deposition, possibly influenced by proximity to the palaeochannel and periodic flood events, but in the intervening centuries has dried out, allowing oxidation of previously waterlogged sequences.

Table Sediment 1. Lower Cambourne

Phase 0, Early Holocene Paleochannel 850, monolith 38

<i>Depth¹ (cm)</i>	<i>Pollen samples taken</i>	<i>Context</i>	<i>Description</i>
0–31	None	850	0–6cm Empty of sediment 6–31cm Orange (Fe stained) soft silt. Few inclusions, rare charcoal 1K4mm. Gradual boundary. <u>Oxidised alluvium</u>
31–55			Orange (Fe stained) silty sand with 40% very small flint clasts (<i>c.</i> 1 mm). Gradual boundary <u>Oxidised alluvium</u>
55–118			Pale grey soft coarse silt-fine sand, numerous small macropores, common coarse strong Fe mottles, becoming total 70 cm upwards. Common small sub-rounded chalk and flints 1–5 mm <u>Oxidised alluvium</u>

Phase 2C, LIA/ERB Pond/waterhole 2716, segment 2617, monolith 264

<i>Depth¹ (cm)</i>	<i>Pollen samples taken</i>	<i>Context</i>	<i>Description</i>
0–8	None	2621	Greenish brown crumbly clay loam, occasional 1mm flint. Described as containing a Medieval furrow. Clear boundary Soil (A/B) formed on alluvium
8–72		2620	Two contexts undifferentiated in monolith, description on context sheets are also the same
		2619	Grey silty clay with coarse strong Fe staining and nodules. Occasional small-large sub-rounded-angular chalk and flint, pottery, bone and flint. Coarse blocky structure noted in monoliths, accentuated if not caused by desiccation, described in excavation as mud cracks caused by repeated drying of pond sediments, filled in subsequently with silts. Oxidised alluvium NB. Underlain by context 2618 'stone floor, metalled surface' bed of cobbles, assumed to have been deliberately laid, over 2617 (cut in natural)

Phase 2C–4, LIA/ERB Saxon Encl ditch group 5401, cut 5105, monolith 518

<i>Depth¹ (cm)</i>	<i>Pollen samples taken</i>	<i>Context</i>	<i>Description</i>
0–20	12 cm*	5109	Grey brown silty clay loam, occasional flint sub-rounded-sub-angular 1–4 mm, pottery, bone and charcoal. Clear boundary Pedogenically altered tertiary fill NB cut by ridge and furrow and later land drain
2078	20 cm	5108	Light grey silty clay with green tinge, occasional flecks of chalk and sub-angular flints 1–5 mm, Fe and manganese staining, pottery and bone. Described on site as cessy layer, possibly animal waste washed into the ditch.
NB few	28 cm		Tertiary fill?
sediments	32 cm*		
changes	36 cm		
observed in	44 cm		
monolith	52 cm	5107	Light grey greasy brown silty clay, occasional sub-angular flint pebbles, flecks of chalk
and no	56 cm*		Secondary fill of alluvium
boundaries	60 cm		
defined, the	64 cm	5106	mid brown greasy silty clay, common fine faint Fe mottles, deposition increasing up the profile. Occasional 1mm chalk and rare charcoal 1–2 mm.
descriptions	68 cm		Secondary fill of alluvium
largely	72 cm*		
follow those	76 cm		
on-site			Overlies basal fill of 5110 described as primary fill of mottled and mixed light grey and orange silty clay, rare 1 mm flint. Context 5106 described as redeposited natural

*indicates previous sample, already assessed

Mill Farm

Two sedimentary sequences from a probable waterhole and a palaeochannel were analysed. Full descriptions are given in **Table Sediments 2**.

Phase 1, channel 40310 (40287)

Artefactual material was recovered throughout the shallow minerogenic sequence, the base suggested onsite to represent churning of soils by people/ livestock, with pottery trampled in to the underlying natural. These artefacts might have entered the feature

either by *in situ* deposition during a period of drying or, more likely were thrown or washed in, since there is no sedimentological evidence of a stasis horizon in the sequence. The fills were again alluvial in nature, interpreted as low-energy fluvial deposition. Substantial iron redeposition throughout show an extended period of drying post-deposition and fine rootlets had penetrated the sequence to depth. Pollen assessment showed pollen preservation was poor.

Phase 3, waterhole 40116

While fewer contexts could be discerned from the monolith than were described on-site, all were of waterborne/ alluvial sediments with charcoal in-wash at depth and no primary fill observed. A permanently or periodically wet feature is indicated, and an interpretation as a watering hole is supported.

Table Sediments 2. Mill Farm

Phase 1, Channel 40310, monolith 42027
Section drawing 44071

<i>Depth¹(cm)</i>	<i>Pollen samples taken @</i>	<i>Context</i>	<i>Description</i>
0–30	None	40288	0–25 cm Dark grey (slightly organic?) silty clay with common coarse strong Fe staining. Rare sub-rounded-sub-angular clasts, archaeological components include burnt stone, worked flint, bone, pottery Oxidised alluvium
25–30	None	40287	Mottled grey and orange (Fe) clay silt, with common fine charcoal. Bone, pottery and worked flint. Clear boundary. Oxidised alluvium
30–57	None	Natural (cut of channel 40286)	Orange soft amorphous clay silt. Pottery sherds (?BA) described as trampled in to the surface of this unit (not observed in monolith) Alluvium

No pollen samples were taken from this dry shallow minerogenic channel sequence, assessment indicated poor preservation

Phase 3B, Waterhole 40116, monoliths 42022–42023 (0–56 cm, 42–120 cm)
No section drawing available

<i>Depth¹(cm)</i>	<i>Pollen samples taken @</i>	<i>Context</i>	<i>Description</i>
0–20	17 cm	42041	Dark grey silty clay loam, slight increase in organic content compared to below. Pottery inclusions Alluvium, slight indication of pedogenesis
20–53	24 cm* 41 cm 56 cm*	42022	These three contexts cannot be discerned from the monolith. They are also sedimentologically similar to the unit above: smooth dark grey silty clay, common coarse Fe mottles. Massive, no visible structure or bedding. Occasional small flints 1-3mm, common molluscan remains. Fine rootlets though rare, penetrate to 50 cm, rare chalk 1–5 mm.
53–90	65 cm 89 cm	42023	
90–120	113 cm*	42044	81 cm <i>Anisus leucostoma</i> shell: amphibious mollusc taxon indicative of wetlands 98–104 cm inclusion of fine comminuted charcoal Alluvium

*indicates the sample is at or adjacent to those already assessed, original pollen slides to be used unless unavailable

Knapwell Plantation

Three sedimentary sequences from anthropogenic features were analysed. Full descriptions are given in **Table Sediments 3**.

Phase 2A, well 60005

This was first described on-site as a deep posthole/pit, but later suggested to be a small well. The section drawing indicates one edge is steep, one shallow and since the fills are alluvial in nature, this might actually be best described as a waterhole. The sediments include massive gleyed water-sorted material at the base, with little indication of primary fill, indicating the feature was not open for any length of time (and rapid alluvial sedimentation took place) or it was cleaned out and the basal fill is of somewhat later date than the cut. Artefactual material occurred throughout the sequence, from fine charcoal in-wash at the base to pottery sherds and possible dumped material in the secondary and particularly tertiary fills.

Phase 3, enclosure ditch 60140

Secondary and tertiary ditch fills were observed in the recovered sediments from this feature. Primary fill was not clearly discerned and on-site the boundary to weathered regolith, proved diffuse, and was defined on the basis of presence/absence of charcoal. It is possible the feature was not bottomed or that context 60775 to the sides of the feature (not recovered and again fine grained) represents the initial fill. It may be, however, as observed in ditch 5401 at Lower Cambourne that the underlying ‘natural’ is of boulder clay and in-wash and slumping of the weathered fine bedrock material occurred in addition to possible input of fine overbank sedimentation. The secondary fills are again interpreted as alluvial (water lain), being of fine in-wash, which may

have contained a substantial input of overbank sedimentation of fluvial source. Artefactual material occurred throughout.

Phase 3, enclosure ditch 60141

The sediments were similar to those of ditch 60140, comprising oxidised alluvium, pedogenically altered to the top.

Overview of site

The alluvium identified in the two enclosure ditches proved very similar, indicating at least a similar source and mode of formation.

Table Sediments 3. Knapwell Plantation

<i>Phase 2A, Waterhole 60005, sample 62010, monoliths 62003 & 62004 (0–52 cm, 52–103 cm)</i>			
<i>Section drawing 64003a</i>			
<i>Depth¹(cm)</i>	<i>Pollen samples taken @</i>	<i>Context</i>	<i>Description</i>
0–18	None	60006	Very dark grey silty loam, increasingly organic to the top, rare sub-angular flint <20 mm. Pottery sherds and a single worked flint were recovered in excavation and the unit described as a dump of ash and charcoal. Clear-diffuse boundary Dumped tertiary fill
18–40	None	60007	18–35 cm Dark greyish brown gleyed and Fe stained clay silts, very rare sub-angular flint <25 mm to top, burnt stone, bone, pottery. 35–40 cm silty clay as above, darkened due to common fine comminuted and occasional 0.1–0.3 mm charcoal. Described in excavation as deliberate dump of ashy material. Clear boundary Alluvium with dump or in-wash of charcoal (secondary fill)
40–64	None	60041	Soft heavily gleyed grey brown silty clay, rare sub-angular flint <25 mm. As below but with less Fe staining (occasional, coarse) pottery. Diffuse boundary <u>Alluvium (secondary fill)</u>
64–88	78 cm 82 cm* 86 cm	60042	Soft heavily gleyed grey silty clay, with common coarse Fe staining and nodules (notably at 24–36 cm). Very rare sub-angular flint <25 mm, pottery. Clear boundary. Oxidised alluvium (secondary fill)
88–103	90 cm* 98 cm 102 cm	60056	Heavily gleyed dark grey silty clay (with minor constituent of fine sand). Common fine Fe staining, slightly crumbly structure, moderately compacted. Rare 1–2 mm charcoal fragments, very rare sub-rounded chalk <10 mm. Basal (not primary?) fill of feature formed of alluvium

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Phase 3, Enclosure ditch 60140, sample 62078, monoliths 62076 & 62077 (0–61 cm, 50–100 cm)
Section drawing 64132

<i>Depth¹(cm)</i>	<i>Pollen samples taken @</i>	<i>Context</i>	<i>Description</i>
0–35	16 cm*	60765	mid brown orange stiff silty clay, colour, texture and inclusions similar to contexts 60766–60773 Diffuse boundary. Suggested in excavation may be redeposited ‘natural’ on top of feature, deliberate infilling. Numerous artefacts included bone, pottery, iron Obj. no. 60155, lacquered stone Obj. no. 60157. Secondary/tertiary fill including sediment of alluvial origin
35–49	36 cm 40 cm* 44 cm	60766	Mid–dark brown grey organic silty clay loam, 1% flint, <1% chalk, occasional charcoal 1–2 mm, pottery, burnt flint, and bone recovered in excavation. Gradual boundary
49–80	56 cm 72 cm	60767 60772	Stasis/slow deposition horizon in ditch fill sequence These two contexts were indistinguishable in the monolith (and unclear in excavation) and are only differentiated from context 60773 on the basis of an increase in Fe staining (oxidation): mid-brown–orange silty clay, heavily oxidised, Fe stained. 1% chalk and flint, c.5% 1–3 mm from 85 cm upwards 1% charcoal (1 frag. observed in monolith 0.5 cm @ 82 cm. Burnt flint, sandstone, pottery, and bone. NB diffuse boundary to weathered regolith, in excavation based on presence of charcoal, may not have reached base
80–100	80 cm* 84 cm 88 cm 92 cm 96 cm*	60773	Oxidised ?secondary fill of probable alluvial source (10YR 5/2 greyish brown and 7.5YR 5/8 strong brown) gleyed silty clay with common coarse faint Fe staining, common rounded-sub-rounded chalk and flint 1–3 mm from 85 cm upwards. Water ingress to the deposit during excavation. 1 frag. 0.5 cm wood charcoal at 82 cm. Pottery and burnt stone Oxidised secondary fill of probable alluvial source

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Phase 3, Enclosure ditch group 60141, cut 60787, sample/ monolith no. 62079
Section drawing 64137b

<i>Depth¹(cm)</i>	<i>Pollen samples taken @</i>	<i>Context</i>	<i>Description</i>
0–16	14 cm	60788	Dark grey brown highly organic silty clay, occasional fine roots. Gradual boundary. Pottery, bone and 2 iron nails identified in excavation
16–58	22 cm 38 cm 54 cm	60789	Tertiary fill and azonal soil formed of/on alluvium (10YR 5/2 greyish brown) silty clay, common coarse Fe mottling increasing to the top (context 60789). 5% chalk 1–3 mm, occasional sub-rounded-sub-angular flint gravel 2–30 mm. 2 mm frag of charcoal noted at 54 cm and 63 cm. Diffuse boundary
58–72	62 cm 70 cm	Natural	(Primary/) secondary fill including oxidised alluvium As above, not clearly differentiated from 60789 in excavation or on examination of the monolith, although decreased Fe staining was apparent. This unit is believed to also be of secondary fill including sediment of alluvial source rather than ‘natural’ or that underlying the cut <u>(Primary/) secondary fill including oxidised alluvium</u>

*indicates the sample is at or adjacent to those already assessed, original pollen slides to be used unless unavailable

Jeavons Lane

Three sedimentary sequences from natural and anthropogenic features were analysed. Full descriptions are given in **Table Sediments 4**.

Phase 0, ?palaeochannel 57607

The series of contexts defined on-site all proved very similar, with only slight changes in the degree of iron staining and inclusions observed in the recovered material. All were of fine alluvial sediments. These were very heavily oxidised and possible worm sorting of clasts was noted at 92–99 cm. Drying and oxidation of formerly wet (waterlain) sediments is demonstrated, and a slight blocky structure was noted throughout, though likely accentuated by desiccation. Pollen assessment showed the drying had led to poor preservation

Phase 2C, waterhole 80004

Fills of fine alluvial sediments were observed (lain by water from in-wash and/ or overbank sedimentation). As with a similar feature described for Lower Cambourne (pond 2716), the recovered sequence overlay a cobbled, metalled base (not recovered by monolith and, therefore, not directly observed). This, in addition to a lack of organic material as would be expected from a vegetated pond, lends more to an interpretation of the feature being a waterhole. Complex cuts and stratigraphy are apparent on the section drawing although the sediments to the edge (including the monolith position) were more coherent. Artefacts appeared throughout the sequence and, of particular interest, is the occurrence of a stasis horizon at 34–40 cm, containing a number of bone, pottery and burnt flint fragments. It is suggested that the surface was exposed for a period of time as a stable land surface, during which time material from occupation accumulated prior to resurgence of alluvial deposition. The infilled feature subsequently dried out and oxidised, with the top pedogenically altered to form an overlying soil horizon.

Phase 3, field boundary ditch 80351

Secondary and tertiary ditch fills have been described, all alluvial in nature, laid down by water including regular fine in-wash, evidenced by faint laminations. No clear primary fill was observed, although this may be represented by context 80352 (dominated by input of weathered boulder clay?). The green tinge to the tertiary fill is suggestive of input of animal manure, and artefactual material was recovered from the lower fills (contexts 80353-3) on site. Assessment showed poor pollen preservation.

Overview of site

The site has much in common with the others examined, notably Lower Cambourne Green, with three similar features sampled, all of which contained low energy, water-sorted sediments. The palaeochannel sediments compare well, although all are highly oxidised, obscuring particularly colour. The fills of the terrestrial features are similar to these palaeochannel fills also, and a substantial input of overbank sedimentation during times of flood is probable in addition to input of fine in-wash sources from weathered (fine, boulder clay) ‘natural’.

Table Sediments 4. Jeavons Lane

<i>Phase 0, Palaeochannel fills 57607 monolith 1: members 2-4</i>			
<i>Monolith 2 = 0-62 cm (monolith 3= 43-101 cm disturbed duplicate of 4), monolith 4= 43-101 cm</i>			
<i>Depth¹(cm)</i>	<i>Pollen samples taken</i>	<i>Context</i>	<i>Description</i>
0-23	None, assessment showed poor and differential preservation	57612	Light-mid-greenish brown clay, common faint coarse Fe staining, <1% small flint gravel, chalk flecks. Diffuse boundary
23-45		57613	Alluvium, according to context sheet altered as ploughsoil Two contexts not discernible from the monolith
45-55		57614	Mid-greyish brown massive silty clay, common coarse faint Fe staining, 5% small flint gravel with 1-2% chalk. Gradual boundary Oxidised alluvium
55-72		57615	Olive massive silts, common coarse strong orange Fe staining, clay increasing to top, <1% small flint and chalk. Gradual boundary Oxidised alluvium
72-92		57616	Orange coarse silt, very heavy Fe deposition (all sediment is stained and texture altered: coarser due to Fe), <1% small flint and chalk. Clear boundary <u>Heavily oxidised alluvium</u>
92-99		57617	Orange Fe stained coarse silts with c. 15% 1-30 mm angular-rounded flint gravel. Clear boundary Oxidised alluvium
99-101		'Natural'	Grey silty clay common coarse Fe mottles, occasional flint and chalk 1-3 mm Regolith/'natural'
<i>Phase 2C, LIA/ERB Waterhole 80004, monolith 82076</i>			
<i>Depth¹(cm)</i>	<i>Pollen samples taken</i>	<i>Context</i>	<i>Description</i>
0-14	0 cm 8 cm	80455	mid-brown slightly organic clay, weak crumb structure, <5% 1-5 mm (in mono, common small-large in ex) sub-angular flint gravel, bone Gradual boundary. Note on context sheet that waterlain deposit seals and masks pond sequence, later in date and could be trampled marshy ground Pedogenically altered alluvium
14-34	16 cm 24 cm 32 cm	80417	Grey/brown massive silty clay <1% 1-3 mm (in mono, common small-large in ex) sub-rounded-sub-angular flint, rare flecks of chalk, pottery, bone, burnt flint. Gradual boundary Alluvium
34-40	36 cm 38 cm	80416	Dark grey humic silty clay, common fine strong Fe redeposition. Rare 1-3 mm small-medium sub-angular-sub-rounded flint gravel, charcoal, pottery, bone. Clear boundary <u>Stasis horizon</u>
40-68	40 cm 48 cm* 52 cm 56 cm 60 cm 64 cm 68 cm	80415	Light grey silty clay, occasional fine-medium Fe mottles. 5% small-medium sub-rounded-sub-angular flint gravel, flecks of chalk, bone, flint, burnt stone. Alluvium NB unit overlies context 80413 cobbled layer

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Phase 3, Field boundary ditch 80351

<i>Depth¹(cm)</i>	<i>Pollen samples taken</i>	<i>Context</i>	<i>Description</i>
0–20	None, assessment showed poor and differential preservation	80357	mid-brown (slight greenish yellow tinge) smooth clay. Rare medium-large sub-rounded-angular flint, animal bone. Gradual boundary Tertiary fill
20–36		80356	mid grey silty clay, occasional fine strong Fe mottles, very rare flint (1mm in monolith, small–large sub-rounded-angular randomly distributed in fill). Diffuse boundary Alluvium as secondary fill
36–46		80355	Light grey silty clay, occasional fine, strong Fe mottles and nodules. Rare small-medium sub-rounded-angular flint. Faint laminations/banding. Gradual boundary Alluvium as secondary fill, including regular fine in-wash
46–72		80353	Light olive–grey silty clay, occasional fine moderate Fe mottles. Occasional small-medium sub-rounded-angular flint in lower fill. 1 frag. animal bone, occasional molluscs and charcoal, 3 charcoal fragments noted from monolith: 2 x 2 mm, 1 of 0.5 cm @51 cm. Gradual boundary Alluvium as secondary fill
72–87		80352	Pale grey smooth silty clay, occasional medium strong Fe orange mottles, occasional small–medium subrounded chalk and flint 1–4 mm randomly distributed in lower part of fill, chalk flecks in upper. 1 small pot sherd and charcoal Alluvium as ?primary/secondary fill

The Grange

One sedimentary sequence from an enclosure ditch was analysed. Full sediment descriptions are given in **Table Sediments 5**.

Phase 3B–4, ditch group 20846

A series of ditch fills was observed, but the feature was not bottomed in excavation and it is believed no primary fill was recovered. The secondary fills of late Romano-British date were of fine alluvial material which had been deposited under wet conditions, and included fine in-wash of weathered ‘natural’. The tertiary fill, probably extending the sequence into the Early Saxon period was of organic loam indicating erosion and in-wash of topsoil material, subsequently sealed with occupational debris. The sequence was heavily iron stained, indicating drying since deposition.

Table Sediments 5. The Grange

Phase 3B-4, LRB–Anglo-Saxon Enclosure Ditch grp 20846, cut 20669 Monoliths 22058 a–c

<i>Depth¹(cm)</i>	<i>Pollen samples taken @</i>	<i>Context</i>	<i>Description</i>
0–26	12 cm	20815	Mid-brown silty clay loam, rare sub-rounded chalk, <i>c.</i> 5% sub-angular flint <55 mm, most <3 mm. Macropores present but no other structure visible. Overlain by some occupational debris. Gradual transition. Final ditch infill: tertiary fill
26–108	28 cm 44 cm 62 cm 70 cm 78 cm 86 cm 94 cm*	20811	Grey gleyed silty clay with common red–brown Fe staining. Common rounded- sub-angular chalk and flint 1–10 mm. Macropores present Secondary ditch fill, includes substantial alluvial input
108–135	110 cm 118 cm* 126 cm 134 cm	20807	Grey gleyed silty clay, common coarse Fe staining, very similar in appearance to overlying but increased clay and no macropores. 6 cm chalk encrusted flint nodule at 128–134 cm. Contains organic material on eastern side of trench. Not fully excavated as >1.2 m deep. Secondary ditch fill, includes substantial alluvial input

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NB the lower sequence observed in the monolith was cracked and slightly disturbed

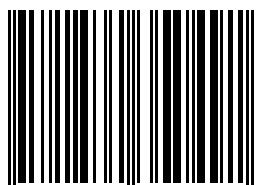
Twelve excavations were carried out by Wessex Archaeology within the Cambourne Development Area. Situated on the clay uplands west of Cambridge, which have seen little previous archaeological investigation, the results presented here are important in demonstrating the ebb and flow of occupation according to population or agricultural pressure.

Short-lived Bronze Age occupation was followed in the Middle Iron Age by small farming communities with an economy based on stock-raising and some arable cultivation. The Late Iron Age seems to have seen a recession, perhaps partly due to increased waterlogging making farming less viable.

From the mid-1st century AD new settlements began to emerge, possibly partly stimulated by the presence of Ermine Street, and within a century the area was relatively densely occupied. Several farmsteads were remodelled in the later Romano-British period, though none seems to have been very prosperous.

Dispersed occupation may have continued into the early 5th century at least, followed by a hiatus until the 12th/13th century when the entire area was taken into arable cultivation, leaving the ubiquitous traces of medieval ridge and furrow agriculture.

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