

Cambourne New Settlement

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

Volume 2: Specialist Appendices

Web Report 12

Charcoal, *by Rowena Gale*



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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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Charcoal

By Rowena Gale

North Caxton Bypass

Small quantities of charcoal were recovered from ten of the sixteen bulk soil samples collected from Phase 1, possible Bronze Age and Phase 3, 2nd–4th century Romano-British contexts. Of these, three were selected for analysis from a posthole associated with a roundhouse and two pits. Identification was undertaken to evaluate the character of local woodland and selection of fuel-woods.

Results

The taxa identified are presented in **Table Charcoal 1**.

Phase 1, Middle - Late Bronze Age

Sample 31003 was obtained from the single fill of post-hole 30080 on the south-east side of a small circular post-built structure, roundhouse group 30092. The charcoal was fragmented but included oak (*Quercus* sp.), field maple (*Acer campestre*), ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*) and the hawthorn / *Sorbus* group (Pomoideae). Although there was no evidence of a hearth structure within the building, the charcoal is likely to have originated from dispersed or discarded fuel debris from activities associated with the roundhouse.

Phase 3, mid-late Romano-British (mid-late 2nd–late 4th century)

A shallow bowl-shaped pit 30181 at the eastern end of the site contained a dark charcoally fill and included burnt stone, and general domestic waste. The charcoal included fragments up to 10 mm in length from fast-grown blackthorn (*Prunus spinosa*) and a narrow stem, possibly heather (Ericaceae). The deposit seems likely to have originated from a dump of domestic waste.

Charcoal from the fill of rubbish pit 30130, included small fragments of oak (*Quercus* sp.), field maple (*Acer campestre*), blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae).

Discussion

The charcoal from Romano-British pits 30181 and 30130 is attributed to fuel debris from domestic hearths. These indicated the use of oak, field maple, blackthorn, the hawthorn group, and possibly heather.

Similar origins seem likely for charcoal from the fill of Bronze Age posthole 30080, one of seven structural postholes associated with the roundhouse (group 30092). A similar range of woods to those from the pits was named. Most of the charcoal was too fragmented to assess the use of coppiced wood. The sample from Romano-British 30180, however, included pieces of fast-grown blackthorn, probably from fragmented roundwood. The rapid growth could reflect either optimal growing conditions of, for

example, scrub, or the fast regeneration of cropped stems such as those in recently pruned hedgerows or coppice stools.

Environmental evidence and fuel resources

The range of species identified is similar to those from other sites in the development area and included a relatively narrow range of taxa. Woodland elements included oak (*Quercus* sp.), ash (*Fraxinus excelsior*), and field maple (*Acer campestre*). Blackthorn (*Prunus spinosa*), and the hawthorn/ *Sorbus* group (Pomoideae) probably grew as marginal woodland, scrub or in hedgerows. The possible presence of heather suggests areas of leached or impoverished soil.

Table Charcoal 1. North Caxton Bypass

Feature	Context	Sample	<i>Acer</i>	<i>Ericaceae</i>	<i>Fraxinus</i>	Pomoideae	<i>Prunus</i>	<i>Quercus</i>
Phase 1, Middle – Late Bronze Age								
<i>Post-hole associated with roundhouse: roundhouse group 30092</i>								
30080	30081	31003	2	-	1	2	2	2s
Phase 3, mid–late Romano-British (mid-late 2 nd – late 4 th century AD)								
<i>Pits</i>								
30181	30180	31009	-	<i>cf.</i> 1	-	-	8	-
30130	30129	31011	1	-	-	2	1	2s

Key. s = sapwood (diameter unknown).
The number of fragments identified is indicated.

Lower Cambourne

Three hundred and twenty-three bulk soil samples were collected from features ranging from the post-glacial to the Saxon period (Phase 4), although these mostly related to the Later Iron Age (Phase 2A–B), Late Iron Age/early Romano-British (Phase 2C) and mid–late Romano-British (Phase 3A–B) periods. Charcoal was present in about two-thirds of these but usually in smaller quantities than the charred plant remains. Fourteen samples of charcoal were selected for full analysis from Phases 2, 3, and 4. These were mostly associated with deposits in structural contexts and enclosure ditches, although fuel debris from a keyhole oven was also included. Species identification was undertaken to obtain environmental evidence, to assess the use of woodland resources and to examine spatial and temporal differences in the selection of fuel.

Results

The taxa identified are presented in **Table Charcoal 2**.

Phase 1, Middle - Late Bronze Age

One sample was examined from the post-built roundhouse 487 on the eastern side of the site. Charcoal was from the fill of post-pipe 207, which also contained burnt packing stones. Although the function of the structure is uncertain, the charcoal seems likely to have arisen from activities within or close to the building. The charcoal was

sparse but included oak (*Quercus* sp.) roundwood and sapwood, hazel (*Corylus avellana*), blackthorn (*Prunus spinosa*), and the hawthorn/*Sorbus* group (Pomoideae).

Phase 2A and 2B, later Iron Age

A sample collected from the upper fill of the drip-gully of an Iron Age roundhouse 1370 (Phase 2A), built roughly in the centre of the enclosure, included charcoal of oak (*Quercus* sp.), ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), and the hawthorn/*Sorbus* group (Pomoideae).

A D-shaped shelter 5443 (Phase 2B) was of uncertain function, but possibly related to non-domestic activities. The charcoal, from the gully (feature 5008), was very fragmented but probably consisted entirely of narrow roundwood. Taxa identified included oak (*Quercus* sp.), ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), and willow (*Salix* sp.) or poplar (*Populus* sp.).

Phase 2C–2C/3A, Late Iron Age/early Romano-British to mid–late 2nd century

Roundhouse 1155, dated to Phase 2C, was sited within a large enclosure on the western side of the site. This structure may have been replaced by a second roundhouse. Charcoal from a sample taken from the fill of drip-gully north of the structure, is probably from domestic fuel debris. It was rather sparse but included ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), and the hawthorn/*Sorbus* group (Pomoideae).

The charcoal in enclosure ditch 1356 (Phase 2C) consisted mainly of narrow roundwood and twiggy material from elm (*Ulmus* sp.), ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), the hawthorn/*Sorbus* group (Pomoideae), field maple (*Acer campestre*), oak (*Quercus* sp.), and *Viburnum*. The abundance of foodstuffs in this context implies origins from domestic waste. A sample from the secondary fill of drip-gully 252 (Phase 2) of D-shaped shelter 29 was sparse but included blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae).

A sample from the fill of the terminal segment of the drip-gully 1989 (Phase 2A), relating to a possible industrial shelter 1156, in the north-west part of the site, contained charcoal of oak (*Quercus* sp.), ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), and the hawthorn/*Sorbus* group (Pomoideae). The type of industrial activity undertaken here is unknown but the presence of domestic waste materials, including cereal, could implicate both cooking and industrial activity. The character of the fuel used conforms to that from more certain domestic contexts at the site.

Enclosure ditch 1077 (Phase 2C/3A), produced oak (*Quercus* sp.) roundwood and sapwood, ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), and the hawthorn/*Sorbus* group (Pomoideae); this context was particularly productive of charred cereal grain and chaff. The deposit is thought to be domestic in origin.

Sample 107, from the roundhouse drip-gully 1095, contained small fragments of ash (*Fraxinus excelsior*), oak (*Quercus* sp.), blackthorn (*Prunus spinosa*), and the hawthorn/*Sorbus* group (Pomoideae). Large quantities of charred cereal grain and chaff were also present.

Phase 3, mid-late Romano-British (mid-late 2nd-late 4th century)

Charcoal from several features within the northern enclosure of the site was examined. The lining of the keyhole oven 1417 was scorched, particularly in the bowl where most of the charcoal occurred (sample 262). This sample was especially rich in charred cereal grain and chaff; pulses were also present. The charcoal consisted almost entirely of ash (*Fraxinus excelsior*), although oak (*Quercus* sp.) was also named.

Sample 217 was obtained from the upper fill of post-hole 1039, associated with the four-poster 1946 sited in the south-west corner of the site, west of ditch 3021. The purpose of this building is unknown, although it may have been a grain store. Charcoal was very sparse but included blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae). Charred cereal grain, bone and a fresh water oyster shell were also present. Sample 10 was taken from the fill of a rectangular shallow pit 58. The unusual morphology of the pit suggested construction for a specific but unknown function. The recovery of pottery, charred pulses, and charcoal, and abundant charred cereal grain and chaff suggests the dumping of domestic waste. Charcoal was sparse but included fast-grown oak (*Quercus* sp.) roundwood (with growth ring widths of 5 mm) and field maple (*Acer campestre*).

A D-shaped structure, built against, or adjacent to, the eastern ditch of enclosure 1151, formed a stock pen. The charcoal-rich sample 24, from the basal fill 488 of the ditch, consisted mainly of fast-grown oak (*Quercus* sp.) roundwood, but also included ash (*Fraxinus excelsior*), hazel (*Corylus avellana*), the hawthorn/*Sorbus* group (Pomoideae), and blackthorn (*Prunus spinosa*). The origin of this sample, which also included frequent charred cereal grain and chaff is unknown. Although clearly dumped in this context it could represent waste either from domestic, industrial or agricultural activities.

Phase 4, Saxon, AD 410–7th century

An unusually large sample of charcoal (5780) was recovered from one of the upper fills of the Phase 4 rectilinear enclosure ditch 5267, provisionally attributed to the Saxon period; it also included butchered bone, charred cereal grain and chaff. The charcoal consisted predominantly of blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae) but also included oak (*Quercus* sp.).

Discussion

Charcoal was examined from a representative number of structural contexts, mostly associated with redeposited waste material in the gullies and post-holes of roundhouses and shelters, dating from the Bronze Age and Iron Age Phases 1, 2A, 2B, and 2C; for example, from Bronze Age roundhouse 487, and Iron Age roundhouses 1155 and 1370, and D-shaped shelter 1169. Samples from these structures included deposits of charred cereal grain and usually other household debris such as pottery and bone. Associated charcoal is therefore ascribed as fuel debris from domestic hearths. Firewood was gathered from a range of species, the most frequently used being oak, blackthorn, the hawthorn group, and ash, with minimal use of hazel

and willow or poplar. There was little evidence to indicate the type of industry undertaken from ?industrial shelter 1156, but plainly the fuel requirements were not out of the ordinary. It is possible that the heat source was used for both cooking (as suggested by the remains of charred grain, bone, and pottery) and industrial or agricultural activities.

A similar range of taxa was present from Romano-British drip-gully of roundhouse 1090. The function of the Romano-British (Phase 3A) keyhole oven 1417 is also uncertain. The large residues of foodstuffs present in the oven suggest that it probably was used for cooking, although this does not preclude its use for other activities. Interestingly, the very large sample of charcoal which remained *in situ* in the bowl of the oven consisted almost entirely of ash and thus differed markedly from all the other samples examined (including deposits from the nearby roundhouse). Ash wood provides excellent firewood and has the benefit that it burns well while still green (unseasoned). The absence of blackthorn and the hawthorn group (which generally dominated in all other samples) suggests that ash was preferred on this occasion and thus the final use of the oven may have been for a different purpose.

Charcoal was examined from Late Iron Age/Early Romano-British enclosure ditches 1356 and 1077, and drip-gully 29. A large sample from the first of these features, was composed almost completely of narrow roundwood and twiggy material from a wide range of trees and shrubs. Charcoal was less frequent in the features 1077 and 29.

Charcoal from the Romano-British phases (ie, four-post structure 1946 and D-shaped enclosure 49) indicated a similar use of wood resources to those of the Iron Age

A significant quantity of charcoal was recovered from the Saxon (Phase 4) enclosure ditch 5267. This was also associated with domestic waste (butchered bone and charred cereal grain) and thus probably also originated from a domestic hearth. Here again the shrubby species of blackthorn and the hawthorn group provided the bulk of the fuel.

Environmental evidence and fuel resources

The site was favourably located on a south facing slope with a stream at the bottom of the hill. While pollen evidence from this site indicated an open landscape with very few trees and shrubs (Scaife, below, p. 211–2). Evidence from the charcoal, however, demonstrated access to a wider range of trees and shrubs than recorded from most other sites in the development area, with considerable use of oak (*Quercus* sp.) and ash (*Fraxinus excelsior*). The high frequency of blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae), however, would correlate with the use of hedgerow species, probably used to define the banks of the numerous enclosures. Blackthorn and hawthorn may also have grown as invasive scrub. Willow (*Salix* sp.) and alder (*Alnus glutinosa*) typically grow in damp or wet habitats and probably occurred along the banks of the stream; elm also favours rich alluvial soils such as those in valley bottoms. The infrequent use of willow and elm may have more to do with their poor performance as firewood than their distribution in the landscape; alder was not, apparently, used at all. Field maple, *Viburnum*, and hazel were also rare components of the woodpile, perhaps reflecting low distribution in the area.

Owing to gross fragmentation of the charcoal, there was no direct evidence for the use of coppiced wood. In an open environment such as that suggested by the pollen analysis, wood would have been a scarce commodity and woodland areas almost certainly would have been managed. The abundant use of roundwood from a wide range of species, particularly evident in the Iron Age samples from D-shaped shelter 5443, and enclosure ditch 1356, indicated the frequent use of juvenile stems, which, by implication, were probably coppiced. This suggestion is supported by fragments of fast-grown oak roundwood recorded in the Late Iron Age/early Romano-British pit 347 and Romano-British D-shaped enclosure ditch 49.

Conclusion

As the largest site in the development area, a correspondingly larger assemblage of charcoal was examined from Lower Cambourne. This represented Iron Age, Romano-British, and Saxon occupation. Charcoal deposits were less frequent than charred plant remains and probably originated mainly from domestic use. The character of the fuel used was similar throughout the Iron Age and Roman periods, and consisted predominantly of narrow roundwood from blackthorn and the hawthorn group, although oak and ash were also relatively frequent. *In situ* residues in a Romano-British keyhole oven, which indicated a strong preference for ash, may be indicative of specific activities other than food preparation.

Overall, a wider range of species was identified than from most other sites in the Cambourne project but, since the pollen record indicated the widespread dominance of grassland and pasture, wooded areas were probably infrequent. There was insufficient evidence to confirm the use of coppiced stems but it is argued that managed woodland would almost certainly have been necessary to sustain the requirements of the site.

Poplar Plantation

Bulk soil samples were collected from selected features dating to the Iron Age, Phase 2A and Phase 2B. Three samples are included to assess environmental data and the selection of domestic firewood.

Results

The taxa identified are presented on **Table Charcoal 3**.

Phase 2, later Iron Age

Charcoal from the upper fill of roundhouse drip-gully 72314 (Phase 2A) was interpreted as fuel debris from domestic use, consisting of small twiggy fragments from blackthorn (*Prunus spinosa*) and the hawthorn/ *Sorbus* group (Pomoideae).

The long gully 72018 (Phase 2B) was a continuation of the westerly driveway ditch leading from the enclosure. A sample was examined from the upper of two fills in a segment of the gully close to two roundhouses. The charcoal consisted of small twiggy pieces from blackthorn (*Prunus spinosa*), probably cherry (either *P. avium* or *P. padus*) and the hawthorn/*Sorbus* group (Pomoideae), and also ash (*Fraxinus excelsior*) and *Viburnum*.

Samples were also collected from two of the discontinuous segments of drip-gully 72145 and 72146. The gully was located in the western side of the enclosure and related to a roundhouse. The charcoal almost certainly derived from spent hearth fuel. Scant charcoal was present in 72145 (in the upper upper fill), but indicated the use of oak (*Quercus* sp.), field maple (*Acer campestre*) and the hawthorn/*Sorbus* group (Pomoideae). The sample from the lower fill of 72146 also contained small fragments of charcoal, mostly from narrow roundwood from *Prunus* (probably both blackthorn and cherry), the hawthorn/*Sorbus* group (Pomoideae) and *Viburnum* sp., but also included oak (*Quercus* sp.) heartwood. Both samples included charred cereal grain; a fruit stone was recorded from 72145 and pulses from 72146.

Discussion

Charcoal was examined from the fills of drip-gullies 72314, associated with the first roundhouse, and 72145 and 72146, relating to the later structure close to the western side of the enclosure. A further sample was examined from the dividing gully 72018, taken from a segment close to the Phase 2B roundhouses. These deposits of charcoal were associated with charred cereal grain and other foodstuff and almost certainly represent domestic fuel debris. The charcoal was generally rather comminuted and frequently included narrow roundwood and twiggy material, particularly from shrubby species such as blackthorn, the hawthorn group and *Viburnum*. In addition, firewood included oak heartwood, ash, cherry, and field maple. Although temporal differences in the supply and use of firewood in Phases 2A and 2B are unlikely, there was insufficient charcoal available in sample from Phase 2A for conclusive evaluation.

Environmental evidence and fuel resources

The site was located close to a stream and in the present day a boggy ditch runs through it. Assuming that firewood was gathered from the vicinity of the site, the evidence indicates the presence of woodland trees including oak (*Quercus* sp.) that was mature enough to have developed heartwood, field maple (*Acer campestre*), and ash (*Fraxinus excelsior*). In the right conditions, these species typically associate to form woodland communities and it is possible that some area of uncultivated land retained woodland. Wild cherry (*Prunus avium*) and/or bird cherry (*P. padus*) may also have grown in the woodland environment. Shrubby species, such as hawthorn (*Crateagus* sp.), blackthorn (*Prunus spinosa*), and *Viburnum* sp. indicate more open areas or scrub, although these were probably used as hedging on the enclosure ditches.

The frequency of small twiggy material from blackthorn and the hawthorn group suggests the regular trimming of these species, perhaps to stop encroachment of invasive scrub or as hedge maintenance. Conversely, the comparative paucity of wood from larger tree species could indicate low distribution and availability in the landscape. None of the charcoal examined suggested the use of coppiced stems and there was no evidence of the use of fast-grown wood such as that from managed woodland. Despite the proximity of the stream there was no evidence to suggest the use of wetland species.

Table Charcoal 3. Poplar Plantation

Feature	Context	Sample	<i>Acer</i>	<i>Fraxinus</i>	Pomoideae	<i>Prunus</i>	<i>Quercus</i>	<i>Viburnum</i>
<i>Phase 2A, drip-gully</i>								
(g72314)	72315	74018	-	-	1	2	-	-
72317								
<i>Phase 2B, gully</i>								
(g72018)	72302	74001	-	2s	5r	7r	-	2
72301								
<i>Phase 2B, drip-gully</i>								
(g72145)	72126	74020	3	-	1	-	1h	-
72124								
(g72146)	72129	74022	-	-	6r	6r	1h	2
72127								

Key. h = heartwood; r = roundwood (diameter <20mm); s = sapwood (diameter unknown)
The number of fragments identified is indicated

Mill Farm

Twenty-two bulk soil samples were collected from selected features. Charcoal was generally rather sparse and comminuted. A possible Bronze Age (Phase 1) hearth sample, and a deposit from the fill of a middle Romano-British enclosure ditch (Phase 3A) were selected for full analysis to obtain evidence of local woodland and the use of woodland resources.

Results

The taxa identified are shown in **Table Charcoal 4**.

Phase 1, Middle - Late Bronze Age

Hearth 40219 was located on higher ground at the northern edge of Area A. The hearth was roughly 0.88 m in diameter and 0.25 m in depth and the thick layer of burnt material it contained was consistent with residues from either a series of fires or from a single longer-term event. Sample 42019 was obtained from the primary fill 40220 of this feature. The sample mostly consisted of narrow roundwood and twiggy material from blackthorn (*Prunus spinosa*), the hawthorn/*Sorbus* group (Pomoideae), oak (*Quercus* sp.), and willow (*Salix* sp.) or poplar (*Populus* sp.) but also included oak heartwood.

Phase 3, mid-late Romano-British (mid-late 2nd-late 4th century)

Charcoal was examined from the primary fill 40214 of linear ditch 40018 (*phase 3a*), that formed part of enclosure 40314 in Area A. Charcoal was sparse but indicated the use of hazel (*Corylus avellana*) and the hawthorn/ *Sorbus* group (Pomoideae).

Discussion

Charcoal was examined from a possible Bronze Age hearth 40219, in Area A. The depth of burnt debris within the pit suggests that it may have been used several times. Firewood was mostly twiggy and gathered from blackthorn, the hawthorn group, oak and willow/poplar, although oak heartwood indicated that some larger sized wood was incorporated.

Charcoal was examined from the fill of the Romano-British enclosure ditch 40018 (in Area A), but since preservation here was poor and the charcoal sparse, fewer taxa were named: hazel and the hawthorn group. This material almost certainly originated from domestic fuel debris dumped in the ditch with other household waste. The sample was too comminuted to assess the use of coppiced stems.

Environmental evidence and fuel resources

The site at Mill Farm was situated on the side of hill with a watercourse and marshy areas on the lower ground. Pollen evidence from a Romano-British feature indicated a largely open environment of grassland with an almost complete absence of trees and shrubs; oak (*Quercus* sp.) and hazel (*Corylus avellana*) occurred infrequently (Scaife, below, p. 213–4). In view of the paucity of charcoal in the Romano-British context it is difficult to comment on environmental aspects. It is feasible that the hawthorn/*Sorbus* group (Pomoideae) fuel was obtained from hedgerows and, had these been maintained/cropped on a regular basis, pollen production would have been sparse. Alternatively, the area may have supported scrubby growth of this type. In general though the charcoal analysis supports evidence from the pollen record for open grassland during these periods.

The character of the Bronze Age deposit in general closely resembles those from Iron Age and Romano-British periods from other sites within the Cambourne Development Area.

Table Charcoal 4. Mill Farm

Feature	Context	Sample	<i>Corylus</i>	Pomoideae	<i>Prunus</i>	<i>Quercus</i>	Salicaceae
Phase 1, Middle-Late Bronze Age (?)							
<i>Hearth</i>							
40219	40220	42019	-	4r	3r	3h, 5r	1
Phase 3A, mid – late Romano-British (mid-late 2 nd – 3 rd century AD)							
<i>Enclosure ditch</i>							
gp40018	40214	42014	1	3	-	-	-
40213							

Key. h = heartwood; r = roundwood (diameter <20mm)
The number of fragments identified is indicated

Knapwell Plantation

Thirty-six bulk soil samples were collected, plus a further 12 sieved samples. The charcoal content varied but was mostly fairly infrequent. Five samples were selected from Phase 2A and Phase 2B Later Iron Age features to assess the character and use of local woodland resources.

Results

The taxa identified are shown on **Table Charcoal 5**.

Phase A and Phase 2B, later Iron Age

Charcoal was relatively sparse in the sample from the fill of ditch 60169, but included oak (*Quercus* sp.) heartwood, ash (*Fraxinus excelsior*), field maple (*Acer campestre*), blackthorn (*Prunus spinosa*), the hawthorn/*Sorbus* group (Pomoideae), and possibly elm (*Ulmus* sp.).

The charcoal from the secondary fill of the roundhouse gully terminal 60245 within the northern half of enclosure 60768 (Area B) consisted mostly of blackthorn (*Prunus spinosa*) roundwood, but also the hawthorn/ *Sorbus* group (Pomoideae), oak (*Quercus* sp.), and ash (*Fraxinus excelsior*).

Pit/post-hole 60479 may have been part of a small structure, later used as a rubbish pit. The fill, 60480, contained charcoal of blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae).

The fill of a charcoal-rich terminus of a linear ditch/enclosure 60141 (cut 60144), at the northern boundary of the site (Area B), included charcoal that consisted entirely of narrow roundwood and twiggy material, predominantly blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae), but also ash (*Fraxinus excelsior*), oak (*Quercus* sp.), and probably heather (Ericaceae).

A large quantity of charcoal was present in the lower fill of pit 60167 (Area B), in association with other domestic debris including charred cereal grain. The charcoal consisted of narrow roundwood from the hawthorn/ *Sorbus* group (Pomoideae), blackthorn (*Prunus spinosa*) and hazel (*Corylus avellana*); field maple (*Acer*

campestre); and oak (*Quercus* sp.) were also named, with some slow-grown oak, probably from largewood.

Discussion

Charcoal was examined from pits, an enclosure ditch and a roundhouse gully and an enclosure ditch. In view of the abundance of domestic pottery, charred food remains and other artefacts, the most likely origin for the charcoal would seem to be domestic hearth debris.

Although there was some evidence for the use of oak heartwood from slow-grown largewood in the pit 60167, the greater proportion of the firewood consisted of narrow roundwood, with much of the fuel obtained from shrubby species such as blackthorn and the hawthorn/*Sorbus* group. Overall, however, a fairly wide range of species was represented in the charcoal, and, in addition to those named above ash, field maple, hazel, and *cf.* elm and *cf.* heather were also present. None of the charcoal was sufficiently well preserved to assess the use of coppice stems but it may be significant that a (single) sample from the enclosure ditch 60141 consisted entirely of narrow roundwood and twiggy material, from a slightly narrower range of species than named from the Iron Age. This could suggest; a) a paucity of mature trees/woodland at this time, b) a preference for smallwood, or c) the use of managed woodland.

Environmental evidence and woodland resources

Pollen evidence from the site demonstrated a habitat dominated by grassland, but a higher presence of trees in the earlier sequences than seen in the Romano-British period that included birch (*Betula* sp.), oak (*Quercus* sp.), pine (*Pinus* sp.), alder (*Alnus glutinosa*), and hazel (*Corylus avellana*) (Scaife, below, 215–6). In contrast evidence from the charcoal indicated access to a wider range of arboreal taxa, including woodland trees such as field maple (*Acer campestre*), oak (*Quercus* sp.), ash (*Fraxinus excelsior*), and possibly elm (*Ulmus* sp.). Blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae) (possibly growing in hedgerows or as scrub), hazel (*Corylus avellana*), and probably heather were also all exploited for fuel. There was no evidence to indicate the use of wetland species, eg, alder and willow (*Salix* sp.) but since neither of these taxa produce good quality firewood and it is probable that they were valued more for making hurdles or other artefacts. The disparity between the palynological evidence and the charcoal could reflect the effect of species selection (perhaps the collection of firewood from further afield) and also, since much of the firewood consisted of narrow roundwood, it is possible that the persistent cropping of trees and shrubs resulted in immature woodland and the consequent reduction in pollen production. Although it seems likely that wooded areas in this farming environment would have been managed, the charcoal was too fragmented to verify this suggestion.

Jeavons Lane

Sixty-nine bulk soil samples and 28 sieved samples were collected for environmental analysis for charcoal, charred remains, and molluscs. Charcoal was relatively infrequent, particularly from later Iron Age–Late Iron Age/early Romano-British, Phase 2 features. Three of the larger samples were selected for full analysis from contexts representing Phase 2 and Phase 3 to indicate the character of the local environment and the supply of fuel reserves.

Results

The taxa identified are shown on **Table Charcoal 6**.

Phase 2, later Iron Age–Late Iron Age/early Romano-British

A sample from the top fill of the western terminus of enclosure ditch 80044, close to the southern end of pond 80004, where a narrow ramp gave access to the pond, produced charcoal of unknown origin, but was probably the product of agricultural activities. The charcoal consisted mainly of *Prunus*, possibly including both blackthorn (*P. spinosa*) and wild cherry (*P. avium*) or bird cherry (*P. padus*), but also oak (*Quercus* sp.) sapwood.

Phase 3, mid–late Romano-British (mid–late 2nd–late 4th century)

Burnt/blackened material appeared to be common in the upper fills of pit 80830 and was present in several of the enclosure ditches in this area. In view of the associated artefactual material (pot and animal bone), it is possible that the charcoal represents both domestic and industrial fuel debris. The charcoal consisted almost entirely of narrow, fast-grown oak (*Quercus* sp.) roundwood; hazel (*Corylus avellana*) roundwood was also present. Charred cereal grain and chaff were particularly abundant in this context.

Charcoal from unphased, through probably Phase 3, hearth 80494 related to fuel debris from a single burning event in the small pit or hearth. Charcoal consisted entirely of narrow roundwood, mostly from the hawthorn/ *Sorbus* group (Pomoideae) and *Prunus* (probably both blackthorn and cherry), but also fast-grown oak (*Quercus* sp.), some of which included only three growth rings. Charred cereal grain and chaff were also recorded.

Discussion

Charcoal was generally infrequent throughout the site; three of the larger samples were selected for examination from contexts of Phase 2 and Phase 3. These included a deposit from the terminus of the possible Iron Age enclosure ditch 80044; a truncated fire-pit or hearth 80494 (probably the remains from a single burning event); and a sample of the fill of mid-Romano-British pit 80830 sited close to terminus 80243 and from which domestic and smithing (hammerscale) waste was recovered. Each of these samples demonstrated the use of fuel comprising narrow roundwood from a limited range of species. Slender stems from fast-grown oak were common to all contexts but rather more sparsely in the two earlier samples (probably from agricultural activities).

The hawthorn group and probably both blackthorn and cherry appear to have provided the bulk of the fuel in these contexts. Hazel roundwood was recorded from pit 80830.

With the possible exception of hollow 80111, the location of Buildings A and B, there was no on-site evidence of Romano-British ‘industrial structures’ that might have been associated with, for example, iron-working or pottery production. The presence of hammerscale in pit 80830 (some distance from the hollow), however, suggests that smithing was undertaken on site. This suggestion is supported by the numerous pieces of ironwork, including a possible blacksmith’s punch ON80137, recovered from the site. In addition to charcoal, pit 80830 included pottery, charred cereal grain, and chaff. This feature therefore appears to contain fuel debris from both domestic and industrial use and it may be significant that it differs somewhat in species content from the two earlier samples. The charcoal consisted predominantly of oak roundwood, but also included hazel.

Environmental evidence and fuel resources

Pollen evidence mainly dating to the Late Iron Age–Romano-British period indicated an open landscape with few trees or shrubs; those named included oak (*Quercus* sp.), hazel (*Corylus avellana*), pine (*Pinus* sp.), birch (*Betula* sp.), and alder (*Alnus glutinosa*) (Scaife, below, p. 215–6). The narrow range of species identified from the charcoal (oak, the hawthorn group, blackthorn/ cherry, the hawthorn group and hazel) would be consistent with this type of environment.

It is probable that many of the ditches on the site may have been defined with hedges (including hawthorn and blackthorn). The reduction of suckering scrub and hedge maintenance would have given rise to a supply of young stems, which may have been disposed of on a bonfire, or, more likely, saved for the hearth (especially if wood supplies were scarce). Oak and hazel may also have grown in the hedgerows. It is probable, however, that both oak and hazel were grown specifically as a woodland resource in managed woodland. Although only three samples were examined (covering a wide time span), the consistent use of young stems from fast-grown oak indicated by Romano-British deposits suggests that oak was coppiced on a fairly short cycle. Growing coppice on short cycles would have suppressed pollen production.

Table Charcoal 6. Jeavons Lane

Feature	Context	Sample	<i>Corylus</i>	Pomoideae	<i>Prunus</i>	<i>Quercus</i>
Phase 2, later Iron Age to Late Iron Age / early Romano-British						
<i>Enclosure ditch next to ‘pond’</i>						
gp 80044 80233	80237	82015	-	-	10	1s
Phase 3, mid - late Romano-British (mid-late 2 nd to late 4 th century AD)						
<i>Pit</i>						
80830	80831	82102	6r	-	-	21r
Unphased, but probably Phase 3, mid - late Romano-British (2 nd to 4 th century AD)						
<i>Hearth</i>						
80494	80495	82073	-	15r	12r	4r

Key. r = roundwood (diameter <20mm)
The number of fragments identified is indicated

While blackthorn (*Prunus spinosa*) was certainly present, some fragments of charcoal included narrower and more homocellar rays that are more consistent with the structure of wild cherry (*P. avium*) and bird cherry (*P. padus*).

Broadway Farm

Fourteen bulk soil samples were collected from enclosure ditches and associated pits most dating to the Later Iron Age (Phase 2A/B) or unphased. Charcoal was generally sparse and comminuted. Samples were selected for detailed examination from the enclosure ditch 50003 and pit 50011. Analysis was undertaken to indicate the use of woodland resources and to assess the character of the environment.

Results

The taxa identified are indicated on **Charcoal Table 7**.

Phase 2A/B, later Iron Age

Enclosure 50003, located on the north-east boundary of the site, was formed from a single ditch. A sample was obtained from the basal fill (50062) of the ditch terminus 50061. The origin of the charcoal is unknown, although sparse deposits of charred cereal grain in this sample could suggest domestic fuel debris. The charcoal consisted of oak (*Quercus* sp.) heartwood and sapwood and probably the hawthorn/*Sorbus* group (Pomoideae).

Charcoal was more frequent in the sample from an upper fill 50072 of an irregularly shaped pit 50011. The pit cut through the western side of enclosure ditch 50005, close to its terminal. This context also contained a considerable amount of burnt clay and stones. Low levels of charred cereal grain were also present. The charcoal consisted of small fragments, mostly from the shrubby species of blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae) but also hazel (*Corylus avellana*), field maple (*Acer campestre*), and oak (*Quercus* sp.) heartwood.

Discussion

The charcoal and associated cereal grain may represent waste from local cooking/heating activities. Charcoal was examined from the fills of the enclosure ditch 50003 and pit 50011. The latter formed an irregular feature cutting through the western ditch of enclosure 50005; the origin of the numerous pieces of fired clay in this context is uncertain. Firewood was obtained from a range of taxa, but mainly from blackthorn and the hawthorn group; other species included oak, field maple and hazel. The charcoal was too fragmented to indicate the use of managed woodland.

Environmental evidence and fuel resources

The enclosures were sited on the summit of a clay plateau, remote from streams. On such an exposed site, it could be anticipated that the immediate landscape would have been unlikely to support any but tough scrubby species, eg, hawthorn (*Crataegus* sp.)

and blackthorn (*Prunus spinosa*). These thorny species may also have been used in hedgerows defining the enclosures. Larger woodland trees including oak (*Quercus* sp.) and field maple (*Acer campestre*) probably colonised the lower slopes of the hillside.

Table Charcoal 7. Broadway Farm

Feature	Context	Sample	<i>Acer</i>	<i>Corylus</i>	Pomoideae	<i>Prunus</i>	<i>Quercus</i>
Phase 2A/B, later Iron Age							
<i>Enclosure ditch</i>							
G50100	50062	51009	-	-	cf. 2	-	3h, 2s
50061							
<i>Pit</i>							
50011	50072	51011	1	1	9	12	2h

Key. r = roundwood (diameter <20mm)
The number of fragments identified is indicated

Little Common Farm

Thirty-four bulk soil samples were collected from features dated mainly to the later Iron Age period. Charcoal occurred fairly frequently and five samples were selected for analysis from to assess the availability and economic use of woodland resources.

Results

The taxa identified are presented on **Charcoal Table 8**.

Phase 2A and Phase 2B, later Iron Age

The sample from the charcoal-rich deposit 90025 within ditch 90007 came from relatively close to the large roundhouse 90208 (the drip-gully of which was also sampled). These samples were similar in character and may have originated from a common source (eg, a domestic hearth). They included a high proportion of narrow roundwood and consisted mainly of blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae), but also oak (*Quercus* sp.); ash (*Fraxinus excelsior*) was also present in ditch 90007. The roundhouse appeared to have been associated with butchery and animal husbandry. Charred cereal grain was also present.

Roundhouse 90237 was sited towards the northern edge of the site. Charcoal from the fill of drip-gully 90237 consisted of roundwood from blackthorn (*Prunus spinosa*), the hawthorn/*Sorbus* group (Pomoideae), and oak (*Quercus* sp.). Charred cereal grain was also present.

Roundhouse 90502 was located immediately outside the northern end of the enclosure. Charcoal was sampled from the terminus of ditch 90240 which intercepted the roundhouse. The charcoal-rich upper fill of this feature included the hawthorn/*Sorbus* group (Pomoideae), blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), and oak (*Quercus* sp.). Pit 90178 was sited south of the roundhouse; the

lower fill 90203 contained domestic waste (pot, bone, and charred cereal grain and chaff, but relatively little charcoal).

Discussion

Charcoal was often frequent in the bulk soil samples. Five samples were selected for analysis, mainly from contexts associated with activities within roundhouses 90208 and 90502 (phase 2a) and roundhouse 90327 (phase 2b) and an associated pit 90178; charcoal from ditch 90007 was also examined. Since there was no evidence to implicate industrial origins, eg, metalworking, for this fuel debris, it is probable that charcoal deposited in these contexts represents waste from domestic hearths. The charcoal was often poorly preserved and friable but generally indicated that firewood consisted predominantly of roundwood. Fuel was obtained mainly from shrubby species such as blackthorn and the hawthorn/*Sorbus* group (Pomoideae), although there was also some use of oak and ash.

Environmental evidence and fuel resources

The remains of tree-throws within the settlement area suggest that prior to the Iron Age the landscape was forested. The extent of deforestation to accommodate the settlement is unknown, but since the local economy was based on pastoral and arable farming (the latter inferred from evidence from charred seed remains), land clearance may have been extensive. This suggestion is supported by the narrow range of arboreal species present in the charcoal remains. Indeed, the bulk of the charcoal examined represents shrubby species such as blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae). These may have grown as scrub in open areas but probably also in hedgerows defining the banks of the numerous ditches. Oak (*Quercus* sp.) and ash (*Fraxinus excelsior*) were also named but often occurred as narrow roundwood, suggesting either the use of juvenile growth such as young or coppiced stems, or, possibly, brushwood from the conversion of larger wood. There was, however, insufficient evidence to verify the use of managed woodland.

Table 8. Little Common Farm – charcoal

Feature	Context	Sample	<i>Fraxinus</i>	Pomoideae	<i>Prunus</i>	<i>Quercus</i>
Phase 2A and Phase 2B, later Iron Age						
<i>Phase 2A, Roundhouse 90208</i>						
(g90208) 90364	90363	93034	-	12	8	2r
<i>Phase 2A, roundhouse 90502</i>						
(g90240) 90392	90393	93016	2	20	4	1s, 1r
<i>Phase 2A/B, pit</i>						
90178	90203	93014	1	1	3	1h
<i>Phase 2B ditch</i>						
(g90007) 90025	90443	93025	1	5	20r	1s
<i>Phase 2B, roundhouse 90237</i>						
(g90237) 90464	90463	93036	-	4	3	1r

Key. h = heartwood; r = roundwood (diameter <20mm); s = sapwood (diameter unknown)
The number of fragments identified is indicated

The Grange

Sixty-two bulk soils samples were collected mainly from Phase 3, Romano-British features and although charred plant remains were often abundant, charcoal was generally sparse. Three samples were selected for detailed examination from two ditches and a pit. The charcoal probably originated from domestic or agricultural hearths. Identification was undertaken to indicate the selection of wood for fuel and for environmental data.

Results

The taxa identified are shown in **Charcoal Table 9**.

Phase 3, mid-late Romano-British (mid-late 2nd-late 4th century)

A sample from the secondary fill of ditch 20723, part of the western section of the main enclosure ditch 20846, contained charcoal of blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae). Charcoal was also examined from the basal fill of the northern segment of ditch 20844, a sub-division of the main enclosure area. This material consisted mostly of very narrow roundwood and twiggy material, predominantly blackthorn (*Prunus spinosa*) but also oak (*Quercus* sp.); ash (*Fraxinus excelsior*) and the hawthorn/*Sorbus* group (Pomoideae) were also present. Some oak stems included only three growth rings. Both contexts included moderate quantities of charred cereal grain.

A small shallow pit 20836 (unphased but probably phase 3, ie, Romano-British), located near the western baulk of the site, contained burnt material including charcoal, stones, cereal grain and chaff. It was not clear whether this material had been burnt *in situ* or was dumped. The charcoal consisted entirely of blackthorn (*Prunus spinosa*).

Discussion

Compared to the plant remains, charcoal deposits were comparatively infrequent. Dumps of charcoal were associated with charred cereal grain and sometimes chaff, which could indicate either domestic hearth debris or grain drying as possible sources. Charcoal was examined from ditches 20846 and 20844 and also from pit 20671. These samples indicated the predominant use of firewood consisting of narrow stems and twiggy material gathered from blackthorn, although other species including oak, the hawthorn group and ash were also present. Oak only occurred in ditch 20844 and consisted of narrow three-year old stems.

Environmental evidence and fuel resources

Pollen samples from the enclosure ditch 20828 indicated a largely open environment (Scaife, this volume; pollen - The Grange), particularly in the later phase of occupation, with taxa such as oak (*Quercus* sp.) and hazel (*Corylus avellana*) being the most dominant arboreal species. The frequency of narrow stems and twiggy material from blackthorn (*Prunus spinosa*) in the charcoal deposits examined suggests

that the immediate environment was typically open scrub or perhaps supported hedgerows. The use of narrow oak stems could reflect the use of coppice, although the sample was too small to verify this suggestion. Although present as pollen, there was no evidence to indicate the use of hazel wood.

Table Charcoal 9. The Grange

Feature	Context	Sample	<i>Fraxinus</i>	Pomoideae	<i>Prunus</i>	<i>Quercus</i>
Phase 3, mid - late Romano-British (mid-late 2 nd – late 4 th century AD)						
<i>Pit</i>						
20836	20698	22040	-	-	26	-
<i>Main enclosure ditch</i>						
g20846	20723	20729	22045	-	2	13
<i>Ditches: subdivisions of the main enclosure area</i>						
g20844	20742	20743	22047	1	2	31r

Key. r = roundwood (diameter <20mm)
The number of fragments identified is indicated

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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