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AN IRON AGE SITE ON THE LAND OF THE PLANT BREEDING INSTITUTE, TRUMPINGTON

IAIN DAVIDSON[1] AND GODFREY J. CURTIS[2]

INTRODUCTION

THE purpose of the excavation was to investigate a pronounced cropmark (Pl. I) in sugar beet trials in 1969 at the Plant Breeding Institute (Grid ref. TL 434545). The mark had been known from aerial photographs since 1954.

It was hoped to explore the potentialities of the site as a source of archaeological samples of faunal and floral remains, for the estimation of the economy of an area during the Iron Age.

RESULTS

The Excavations

Two main areas were excavated in October–November 1969 to investigate the circular enclosure. Evidence was recovered of three phases of ditched enclosure, and an earlier, narrow ditch on a different line (Figs. 1 and 2).

Section 1 shows the earliest phase of the enclosure ditch (site Phase 2), cut from the top of sandy gravel, and subsequently cut by another ditch of similar depth (Phase 2*a*). These ditches, when filled, were finally cut by a shallower ditch (Phase 3), on a slightly different line, but at this point within the limits of the earlier cuttings.

In the small area excavated, it was difficult to be certain whether the surface uncovered below the topsoil was an original ground level at the time any of the ditches was cut. The effects of leaching on this gravelly soil are very rapid, and no traces of contemporary humus were evident. There were no internal features in the area excavated, but the slope of the ditches suggests that this might not be the case in all areas.

Section 2 shows the narrow ditch (Phase 1), cut from below the top of the earliest phase of the circular enclosure. The effects of leaching again make it difficult to judge the nature of the ground surface at the time of cutting. This ditch was sealed by a gravelly deposit, but there was no other indication of date.

[1] Selwyn College, Cambridge. [2] Plant Breeding Institute, Cambridge.

Plate I. Trumpington, Plant Breeding Institute. Cropmark in sugar-beet crop, 1969.
Copyright, Cambridge University Committee for Aerial Photography

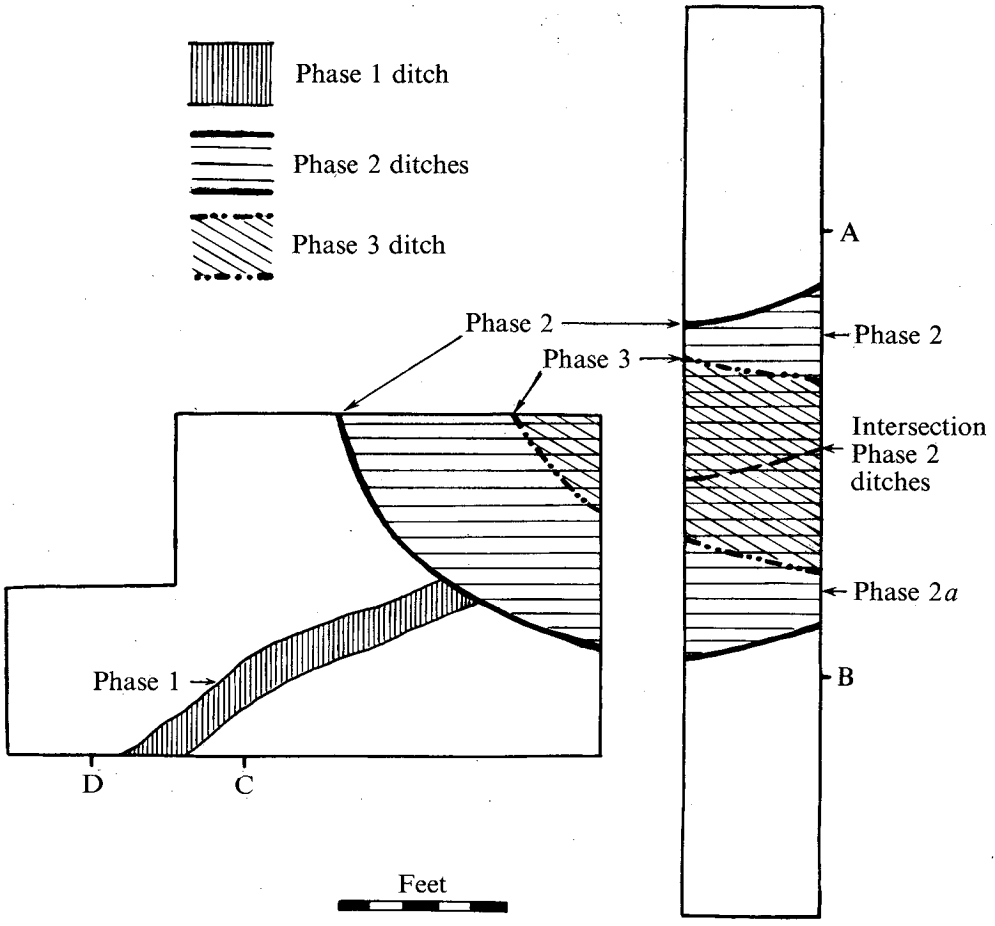
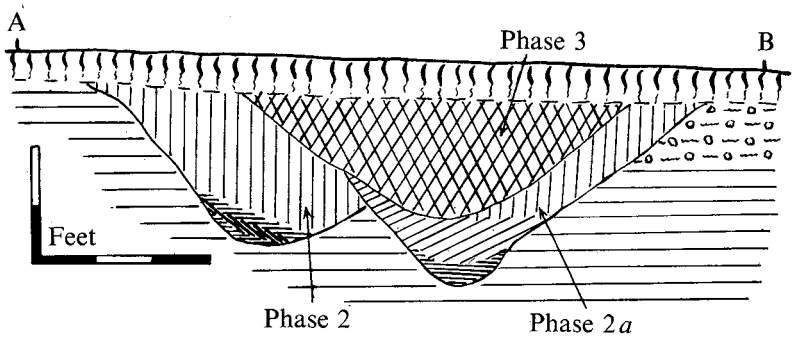


Fig. 1. Plan of main excavation area.

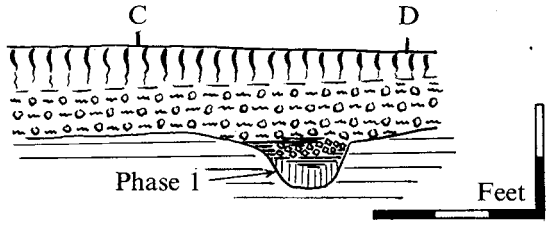
Dating

The dating at the site depends for the most part on two sherds. The first (Fig. 3) is an Iron Age A sherd from the primary silt of the Phase 2 ditch; it is similar to one well described at Hunsbury[1] as 'Sherd of coarse, buff-coloured, corky ware. Paste contains dark flecks...outer surface ornamented with deep parallel scratches, about ½ in. apart, running diagonally...Fracture has run along these lines.' The Hunsbury material was not well stratified, and Miss Fell implies that it could have almost any date in the pre-Roman Iron Age, probably before introduction of wheel-made pottery.

[1] C. I. Fell, 'The Hunsbury Hill-fort, Northants', *Arch. Jour.* XCIII (1937).



Section 1: A–B



Section 2: C–D

Fig. 2. Sections in main excavation area.

A similar sherd is illustrated from the New Addenbrooke's Hospital site,[1] which is said to be late. Further dating of this latter site is based on comparison with other quadrangular Iron Age enclosures. The Plant Breeding Institute enclosure, however, is circular, although the pottery may be compared in date with that from the New Addenbrooke's site. It is suggested that Iron Age enclosures of different types may be contemporary in Wiltshire,[2] and the typology of Cambridge sites may confirm this. Neither site can be dated with certainty as late in the Iron Age.

The second sherd of importance for dating the site is a fragment of Terra Sigillata, probably of the first century A.D., from the Phase 3 ditch. The other Romano-British pottery found on the site may be as late as A.D. 150. The Phase 3 ditch, however, contains some handmade native Iron Age wares, some of which may be derived from

[1] M. D. Cra'ster, 'New Addenbrooke's Iron Age Site, Long Rd, Cambridge', *P.C.A.S.* LXII (1969).

[2] H. C. Bowen and P. J. Fowler, 'Romano-British Rural Settlements in Dorset and Wiltshire', in C. Thomas (ed.), *Rural Settlement in Roman Britain*, C.B.A. Research Report VII (1966).

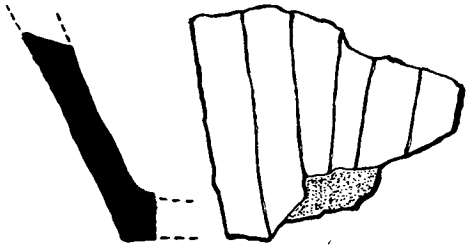


Fig. 3. Iron Age potsherd. Scale ½ (approx.).

the cutting of this ditch through the earlier phases. They include a fragment similar to that illustrated (Fig. 3), which could be contemporary with the Terra Sigillata. Thus Phase 3 cannot be earlier than the Roman period, but we cannot say that any phase of the site is certainly early in the Iron Age.

There is no trace of Belgic pottery on the site. This is often the case with many of the excavated sites round Cambridge, and in fact dating of these has usually been based on the presence or absence of Belgic pottery. However, there is no evidence at Trumpington that native, Iron Age A traditions did not continue through the Belgic period and the Roman invasion, without Belgic or significant Roman influence.

Animal bones

Only 68 bones were excavated which could be identified. Of these, 26 came from Phase 3 where the preservation was good. A more useful sample might be obtained from more extensive excavation. The minimum number of animals represented was 10, and of these 6 were from Phase 3. For the purposes of this discussion all phases will be considered together.

Horse, cattle, and sheep/goat were present in Phases 2 and 3, but only sheep/goat in Phase 1. Of the 10 bones which could be aged, only 1 sheep and possibly 2 horses did not survive the first winter, whereas only 1 example each of cattle and sheep definitely survived the second.[1] Only 2 bones (cattle, both from Phase 3) were complete

TABLE 1. *Measurements of cattle bones from Phase 3 of the settlement*

	Maximum length	Anterior/posterior width
Lower 3rd molar	28 mm	—
1st phalanx	58 mm	25 mm

[1] J. M. Ewbank *et al.*, 'Sheep in the Iron Age: a Method of Study', *P.P.S.* XXX (1964).

enough to give useful measurements, and these suggested very small size (Table 1). The tooth is as small as the smallest range which Degerbøl[1] quotes for medieval cattle, and smaller than his Iron Age cattle. The 1st phalanx is shorter than the smallest of Higham's modern comparative Aberdeen Angus bulls,[2] but about average for cows; it is narrower than the smallest of either sex.

There was no trace of pig, or of wild animals.

Plant and microfaunal remains

About 100 kg soil were taken from the lowest part of the infilling of the Phase 2 ditches. After air-drying it was processed in the flotation cell[3] and the organic detritus held on a 0·03 mm mesh was examined at a magnification of 50 diameters. Table 2 and Fig. 4 show the species of seed identified and their relative abundance. Other

TABLE 2. *Seeds recovered from infilling deposits in a ditch of an Iron Age site at Plant Breeding Institute, Cambridge*

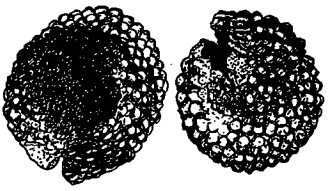
Species	Relative frequency (+ present; + + frequent)	Habit
Polygonum convolvulus	+ +	Annual herb
P. aviculare	+ +	Annual herb
P. hybrids of intermediate character	+ +	Annual herb
Veronica hederifolia	+	Annual herb
Stellaria media	+ +	Annual herb
Melandrium album	+	Annual/short-lived perennial herb
Sambucus nigra	+	Shrub of disturbed soil
Viola sp.	+ +	Annual herb
Papaver sp.	+ +	Annual herb
Plantago sp.	+	Perennial
Carex sp.	+ +	Perennial marsh
Senecio sp.	+	Dependent on species
Chenopodium sp.	+	Dependent on species
Rumex sp.	+	Dependent on species

[1] M. Degerbøl, 'Prehistoric Cattle in Denmark and Adjacent Areas', in A. E. Mourant and F. E. Zeuner (eds.), *Man and Cattle*, R.A.I. Occasional Papers XVIII (1963).

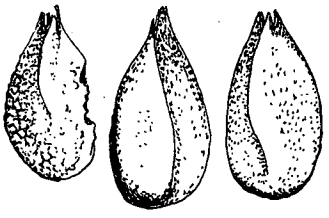
[2] C. F. W. Higham, 'Metrical Attributes of Two Samples of Bovine Limb-bones'. *Proc. Zool. Soc. Lond.* CLVII (1).

[3] H. N. Jarman, A. J. Legge and J. Charles, 'A Flotation-cell for the Complete Recovery of Plant Remains from Archaeological Sites', 1971 *in litt.*

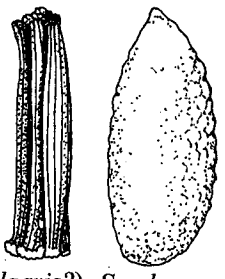
Melandrium album



Stellaria media

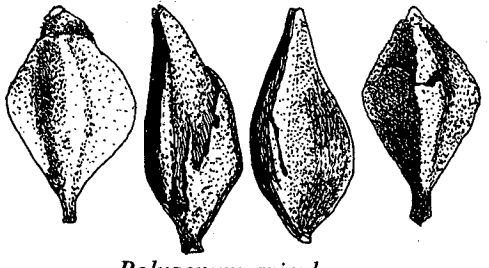


Viola sp.

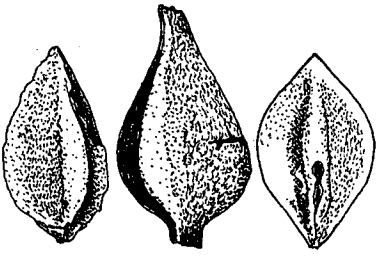


Senecio (*vulgaris*?) *Sambucus nigra*

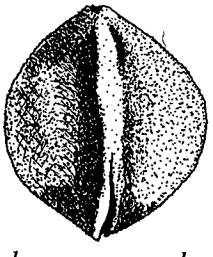
Papaver (*dubium*?)



Polygonum aviculare



Polygonum arenostrum



Polygonum convolvulus

Rumex sp.

1 mm

Fig. 4. Seeds recovered from the infilling of the ditch.

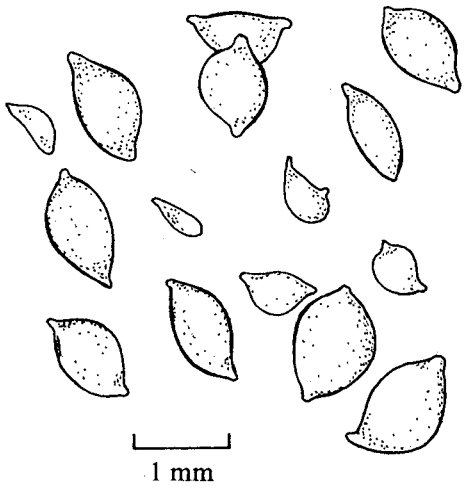


Fig. 5. Range of shape among nematode cysts recovered from the infilling of the ditch.

pieces of plant material, notably tiny fragments of apparently carbonized wood, and similar remains, were not identified.

Empty cysts of plant parasitic Nematodes[1] (Fig. 5), particularly *Heterodera* species, were abundant and indicated a level of concentration of the order of 200 cysts per 100 g soil sampled. The state of preservation varied, and it was not possible to gauge

TABLE 3. *Species of snail from infilling deposits in the ditch of an Iron Age site at Plant Breeding Institute, Cambridge*

Species	Relative frequency (+ present; + + frequent)	Habit
Cecilioides acicula	+ +	Dry/damp land burrowing
Hygromia hispida	+ +	Predominantly dry land
Vallonia costata	+ +	Dry land
Cochlicopa lubrica	+	Damp land
Planorbis planorbis	+	Aquatic
Bithynia tentaculata	+	Aquatic

[1] *Nematodes* – a large group including roundworms and eelworms.
Gastropods – the group of molluscs comprising snails.
Arthropods – a group including insects, centipedes and millipedes, spiders, woodlice, etc., etc.

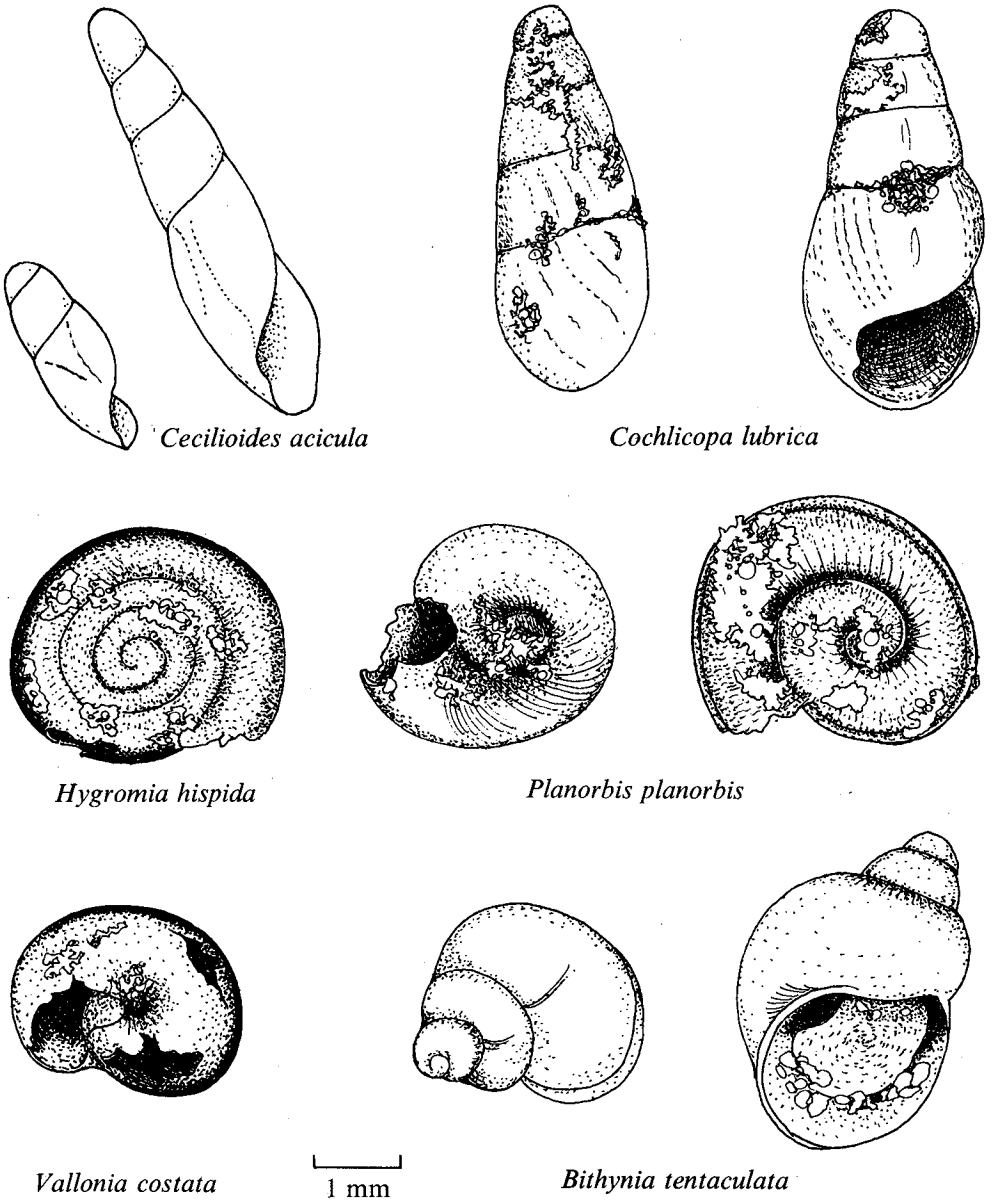


Fig. 6. Snails recovered from the infilling of the ditch.

how many generations of nematode were represented in the sample. By contrast, topsoil in the same area contains 8 cysts per 100 g and all cysts are new and contain eggs.

Gastropods were present (Table 3 and Fig. 6), and quantities of exoskeletal remains of Arthropods, including beetle elytra, chelae of *Pseudoscorpiones* and abdominal segments of insects, occurred which were not further identified.[1]

Other finds

Flint blades and a blade core, still retaining the cortex of the parental nodule, were found at the bottom of the ditch of Phase 2*a*.

There were two fragments of saddle quern from Phase 3.

Other periods

In addition to the areas already discussed, an area to the south was excavated, after the topsoil had been removed mechanically. The feature revealed was outside the scope and purpose of the excavation. The exposed surface of a scooped-out area had been burnt, and subsequently filled with clean sand. Glass, pottery and slag, possibly from the railway, suggest a nineteenth-century date. This site may be connected with the coprolite digging which took place early in the twentieth century in this area.

DISCUSSION

It must be emphasized that these excavations were only exploratory, since subsoiling operations were about to be carried out over the site. However, in the event the depth of these does not appear to have disturbed many archaeological features, and the cropmarks were still visible in the summer of 1970. It is quite clear that the cropmark is directly due to the ditches cut in the gravel. The dry summer had severely reduced soil moisture and, in this area of gravelly soil, had resulted in crop failure. The ditches, however, containing relatively more moisture, stood out from the area of greater drought. A recent land drain, again a disturbed soil, stood out in a similar way.

The geological survey for the Western Cambridge By-pass (1970) indicated that, outside the gravel ridge here, peat and clay are the normal subsoils; it is likely that this was a major factor in the location of the site. Another site in Trumpington, under the old recreation ground, is also on gravel, as are the Arbury Road and Hauxton

[1] *Elytra* – beetle outer wings; *Chelae* – pincers: *Pseudoscorpiones* – a group related to spiders.

sites. The hill-forts at Cherry Hinton[1] and Wandlebury,[2] and the New Addenbrooke's settlement are on high ground and also on chalk, another well-drained subsoil. Clearly a site near the river, in an area notoriously liable to flood, should be on well-drained land. The records of Cantelupe Farm, just across the river, indicate that crops have often been destroyed by flooding, even in the last twenty years despite drainage.

The location

Any attempt to compare the spatial distribution of suspected contemporary archaeological sites clearly depends on the criteria used to date them; we have already suggested that in this area the establishment of pottery typologies may not give a very precise dating. Although the site at the Plant Breeding Institute has a sequence of at least four occupations, covering an indefinite period, up to three of these phases may be contemporary in most archaeological terms with the New Addenbrooke's site. Supposing that all or most of the Iron Age sites in this area have now been located, we can consider the implications if they represent an approximation to the total economic exploitation of this area during that period. It is not necessary to consider minor variations, but rather the broadest relevant picture, since short-term variations may frequently be the result of unsuccessful exploitations.[3] The map (Fig. 7) gives the distribution of sites, based on the O.S. map of Iron Age Britain.[4] Not all these sites are of the same type, but a hill-fort and a simple enclosure can be compared in this survey, since they are both bases for economic exploitation. (Wandlebury has provided evidence, from a large bone sample, of domestic activity.) It is clear that there is a regularity of spacing of 1–1½ miles, and that each is about equidistant from Castle Hill, Cambridge. This distance agrees with present-day estimates for the radius of modern intensive agricultural exploitation,[5] and the spacing from Castle Hill may relate to the early growth and importance of Cambridge. More detailed aspects of the economic situation of these Iron Age sites are being considered, but require to be supported by the results of further excavation.

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[1] D. A. White, 'Excavations at the War Ditches, Cherry Hinton 1961–2, and 1949–51', *P.C.A.S.* LVI–LVII (1964).

[2] B. R. Hartley, 'The Wandlebury Iron Age Hill-fort', *P.C.A.S.* LI (1957).

[3] C. Vita-Finzi and E. S. Higgs, 'Prehistoric Exploitation in the Mt. Carmel Area: a Site Catchment Analysis', *P.P.S.* XXXVI (1970).

[4] Ordnance Survey, *Map of Southern Britain in the Iron Age* (1962), and C. Fox, *The Archaeology of the Cambridge Region* (1948).

[5] M. Chisholm, *Rural Settlement and Land Use* (1962), p. 42.

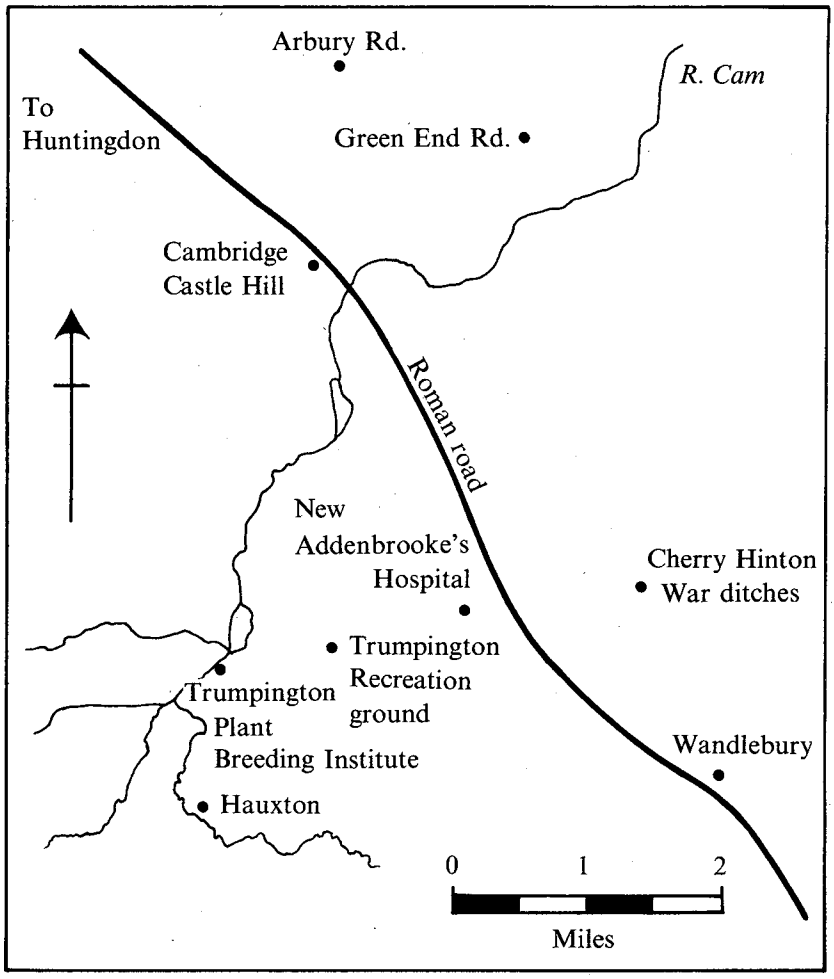

Fig. 7. Distribution of Iron Age sites in the vicinity of Cambridge.

Plant and microfaunal evidence

Soil samples taken from specific horizons can still be contaminated by the action of such agents as earthworms and other soil fauna. Grass seeds, for example, have been recovered from depths of several feet.[1] Nevertheless, from the poor state of preserva-

[1] E. J. M. Kirby (Plant Physiologist, Plant Breeding Institute, Cambridge), personal communication.

tion of the seed and from the condition of the other organic remains, much of the detritus examined here must have collected in the ditches during the period of occupation. All the seeds upon which any significance has been placed were black and corroded and appeared to be reduced to carbon.

The majority of the species represented are annuals which establish seedlings on open ground in conditions of little competition, so their presence would agree with any of the following situations existing at the site during the period of occupation. In the first place, since all the species are common weeds of arable crops at the present time, their presence would support a view that the area was similarly utilized then. Secondly, similar weeds might be expected to occur in a domestic area, where broken ground was repeatedly colonized by weeds, following mechanical clearing or fire. Lastly, in view of the close proximity of the river, it is possible that winter flooding could cause areas of barren ground which would become colonized by a similar plant community during the rest of the year. The presence of *Veronica hederifolia*, however, a plant of well-drained land, and which grows actively over winter, argues against this last possibility.

The absence of any cereal grains in what, from other evidence, is clearly a settled community, is disappointing, but it must be emphasized here that members of the Polygonaceae were themselves exploited at this period as a food source. Thus Helbaek[1] identified *P. lapathifolium* and *P. convolvulus* in the stomach of the Tollund man and the Graubelle man of Iron Age Denmark. It is possible that Polygonum species were actually grown as crops (cf. buckwheat, *Fagopyrum esculentum*), and that at the present site they were themselves part of an arable system.

The relative abundance of the *Heterodera* cysts is hard to explain. It could be that they were washed down into the ditch and therefore accumulated; certainly a few live cysts from the surface layers were found contaminating the sample. Such populations occurring in topsoil would indicate infestation levels severely damaging to the host plant, and might suggest continuous cropping. Most of the cysts appear to be *H. avenae*, but some *H. schachtii* occur. The presence of *H. avenae* is not significant because it infects most wild and cultivated grasses. The host range of *H. schachtii* includes all British Chenopodiaceae (beet family) and a large part of the Cruciferae, in particular the Brassicas (cabbage tribe). It is also found occasionally on some Polygonaceae. It is worth noting that *Chenopodium album*, a host plant, is thought to have been cultivated in Iron Age Denmark,[2] and *Chenopodium* seed fragments were recovered from the Trumpington site. However, given good conditions for the

[1] H. Helbaek, 'Tollund mandens sidste maaltid', *Aarboger for Nordisk Oldkyndighed og Historie* (1950), and 'Prehistoric Food Plants and Weeds in Denmark', *Danm. Geologiske Undersogelse*, II R. 80.

[2] H. Helbaek, 'Comment on *Chenopodium* as a Food Plant in Prehistory', *Ber. D. Geobot. Inst. Rübel, Zurich*, XXXI, 16.

preservation of chitin[1] (which might occur in the mud of a water-filled ditch), accumulation of cysts over many years might quite erroneously produce the impression of high populations of the nematode.

The evidence from the snail species indicates that the ditch was water-filled (*Bithynia* and *Planorbis* are exclusively aquatic), and that the surrounding area must have been well drained for shells of land snails like *Vallonia* and *Hygromia* to have accumulated in the ditch. The burrowing snail *Cecilioides*, however, can reach depths of several feet, so that its presence here may be recent.

SUMMARY

The site was occupied in several different phases, of which four are revealed by the present excavations. The circular enclosure probably spans the period of the Roman conquest. The large rectangular enclosure, visible on the aerial photograph, was not examined.

One sherd type indicates affinities with another site in the area, and with the site at Hunsbury. It is suggested that the people may have been a native community, relatively uninfluenced by Belgic or Roman cultures.

Plant and animal remains allow speculation on the original economy of the site in particular and the area in general, and it is suggested that the site has potential for further investigation.

ACKNOWLEDGEMENTS

Thanks are due to Dr G. D. H. Bell, Director of the Plant Breeding Institute, and to all the members of his staff who helped us; to Mr Anthony Pemberton for access to farm records; to Professor J. G. D. Clark for his active participation, and to Mr E. S. Higgs and Miss Mary Cra'ster for their help in many ways. We are particularly indebted for identifications to Mr R. Bishop (pottery), Dr Christine E. Quartley and Mrs Gay Wilson (seeds), and Mr B. W. Sparks (snails).

Notes are deposited at Cambridge in the Museum of Archaeology and Ethnology, and the finds in the Plant Breeding Institute, Cambridge.

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[1] A compound allied to cellulose; it is the main component of *Arthropod* exoskeleton and is a major constituent of the wall of nematode cysts.

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