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Contents

The Lingwood Wells:
Waterlogged remains from a first millennium BC settlement at Cottenham, Cambridgeshire

Christopher Evans
with contributions by R Darrah, J D Hill, P Murphy and P Wiltshire

During the evaluation of a later Bronze Age/Early Iron Age scatter, finds from waterlogged features included what are probably parts of a tripartite disc wheel and bowl/scoop fragment. Lines of postholes suggest rectangular structures, and the existence of hedges can be inferred from the site's environmental remains. More tangible evidence of such organic boundaries have been recovered from other excavations of this date within the area and their ramifications for land allotment patterns are discussed.

The ready provision of on-site water is an obvious prerequisite for permanent settlement, and its introduction (i.e. wells) arguably marks a turning point in later prehistory. This paper reports the excavation of a cluster of Early Iron Age waterlogged wells that was undertaken by the Cambridge Archaeological Unit (CAU) of the University of Cambridge. It occurred as part of an English Heritage Fenland Management Project (FMP) evaluation of a Bronze Age settlement straddling Smithy Fen Engine Drove at Lingwood Farm Cottenham, Cambridgeshire (COT 5; TL 5415/7115; Evans 1993b; Hall & Coles 1994). Although our picture of the site is hampered by its strict sample-grid exposure, these investigations serve as a vehicle to discuss the results of a number of similar terminal Bronze Age/Early Iron Age sites in the region, in which the recovery variously of evidence of long houses (or at least rectangular post settings) and hedged landscapes suggests a major 'horizon'. Their occurrence and further study may eventually inform of insular traditions, continental influence and material culture transition (i.e. metalwork), in contrast to what seems a continuum of the 'domestic'.

Methodology and context

Located near to the peat fen-edge immediately south of the Old West River, a number of Fenland Survey scatters cluster within 0.5km of the Lingwood site (Fig. 1). Associated with dense cropmarks, Sites 2 & 4 to the west are respectively of Late Iron Age/Roman and Roman attribution; to the east, Site 6 is a small Early Iron Age scatter (Hall 1996: 136, Fig. 75). While the latter was originally thought to be 'open' (unenclosed), subsequent reconnaissance has shown that it is also associated with cropmark ditches and a sub-rectangular enclosure (Fig. 2). It was in Wilburton Fen, just north of the Old West, that a renowned later Bronze Age founder's hoard was discovered in 1882 (Evans 1884; Brown & Blin-Stoyle 1959).

In November 1992 the Lingwood site was fieldwalked and sample investigated; brief return was made in the July of the following year to further excavate features in its southwestern quarter. Only the northern extent (?half) of the site was investigated as the field southwest of the drove lay under set-aside. Its partial investigation was due to the fact that it had apparently been mis-plotted in the course of the Fenland Survey (at TL 45137137; Hall 1996: Fig. 75). When inspected in the winter of 1991/92 no surface material was present at that location and, instead, a scatter of flint-tempered sherds was found 200m to the south. This displacement was confirmed in the next season's ploughing and the decision was then made to proceed with investigation, even though only part of the site was available. Although it is unenclosed and has no definite cropmark register, by this southeastern shift the site's position would correlate with a major cropmark boundary which runs southwest-northeast across the field immediately south of the drove. In all likelihood this relates to Roman field systems (Hall 1996: Fig. 75).

Relatively few sites of later Bronze/earlier Iron Age attribution were recovered during the Fenland Survey, and subsequent developer-funded initiatives within the region confirm the low surface representation of such settlements. 100% fieldwalking collection, by $10m^2$ units, was made across the 0.8ha of the Lingwood site. As defined by pottery densities of two/three sherds or more per unit, the 3450 sq m core of the spread was targeted for in-depth investigation. To evaluate total topsoil artefact densities, metre square test pits (TP1-5) were hand dug at the corners of this central zone ($40m^2$) and, another, in its middle. Thereafter eleven $5m^2$ test stations (TS7-17) were excavated, on an axially staggered 20m grid, to investigate cross-site feature distribution. The 279 sq m area cover

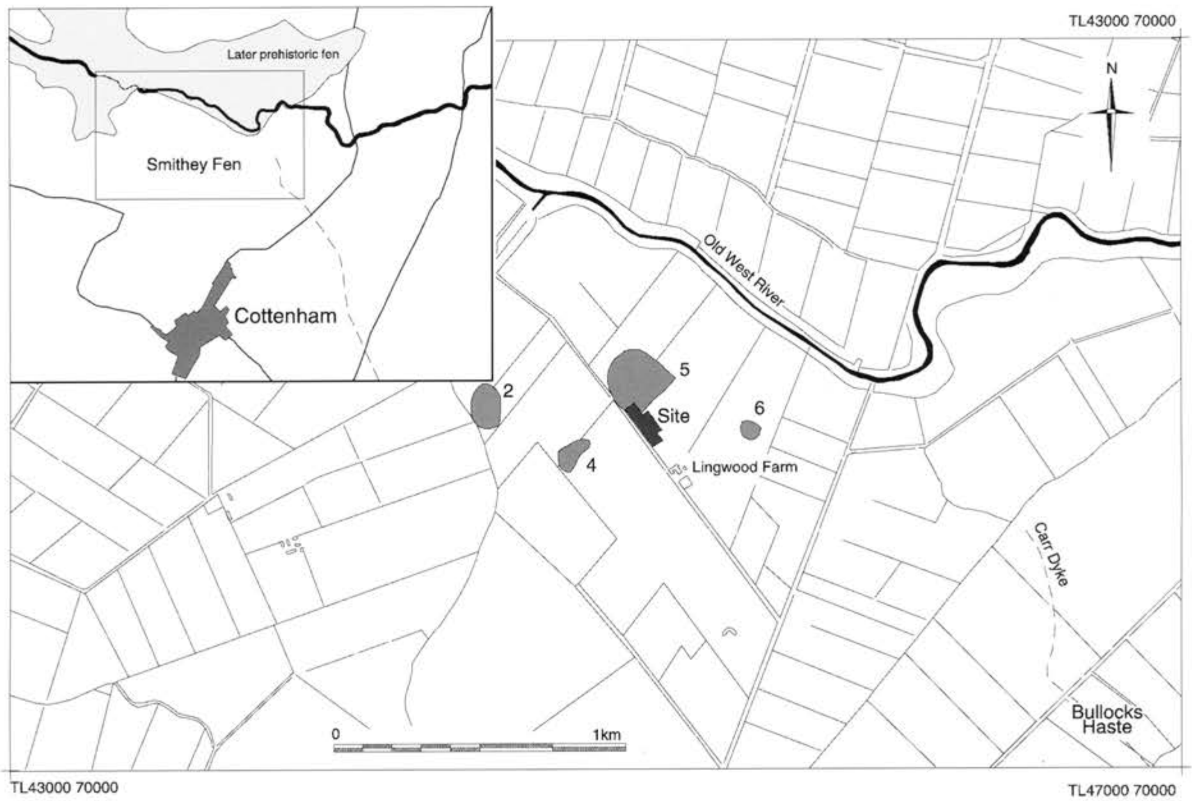

Figure 1. *Top - Site location; note that '5' indicates Fenland Survey plotted site location.*

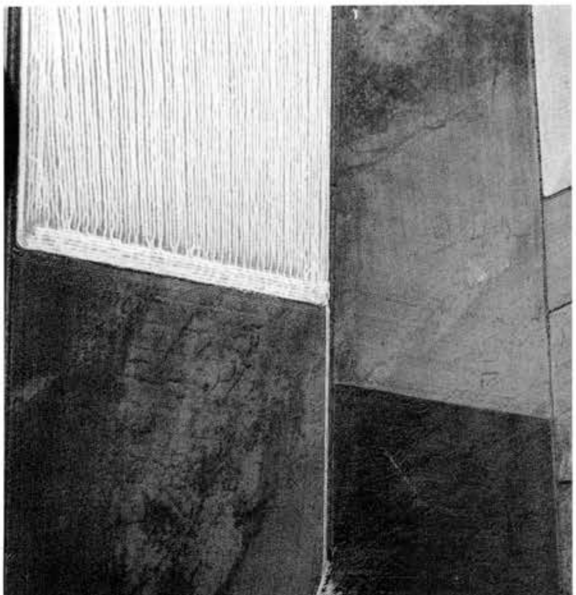

Figure 2. *The Lingwood Farm complex – as re-located the Cottenham 5 spread falls amid the 'dark splodge' in the bottom left (west of the farm buildings). Whereas the 'crack-line'/ice-wedge patterns there visible all seem of periglacial origin, note the sub-square cropmark north of the farm associated with the Site 6 scatter (upper right; photography by R. Palmer, Aerial Photographic Services)*

of the test pits and stations represents a basic 8% in-depth sample of the settlement's core (Fig. 3).

Fifty-four features were recorded (121 contexts). To further trace the extent of some, trenches were also dug along the west and southwestern margin of the site (TS 10 was also laterally extended on two sides to delineate a structure), taking the total excavation sample to 12.6%. Providing only a series of dispersed 'windows' across the site, the inadequacies of this type of formal sampling programme for such archaeology are obvious. The methodologies employed were the standard procedures of the FMP and were designed with the principle of interrelating plough- and sub-soil distributions (see Evans, forthcoming a). They, nevertheless, allowed for the characterisation of sites with only limited area destruction in the event that they warranted scheduling. Certainly such sample-exposure means that it is inappropriate to discuss settlement layout and individual features at length. This was not an open-area excavation and the data should not be stretched beyond its limits. Yet interpretative confidence is gained by the fact that the array of feature types which were found are largely typical of other settlements of the period: field system ditches, wells, four-poster structures and other post-hole configurations. These need not be described in detail. Rather, the focus of this report is with the well complex exposed in its southwestern quarter, both as a context for waterlogged remains and its closed-group finds assemblage.

Two samples were dated from this feature group (from wood in the primary fills of F. 1). While not

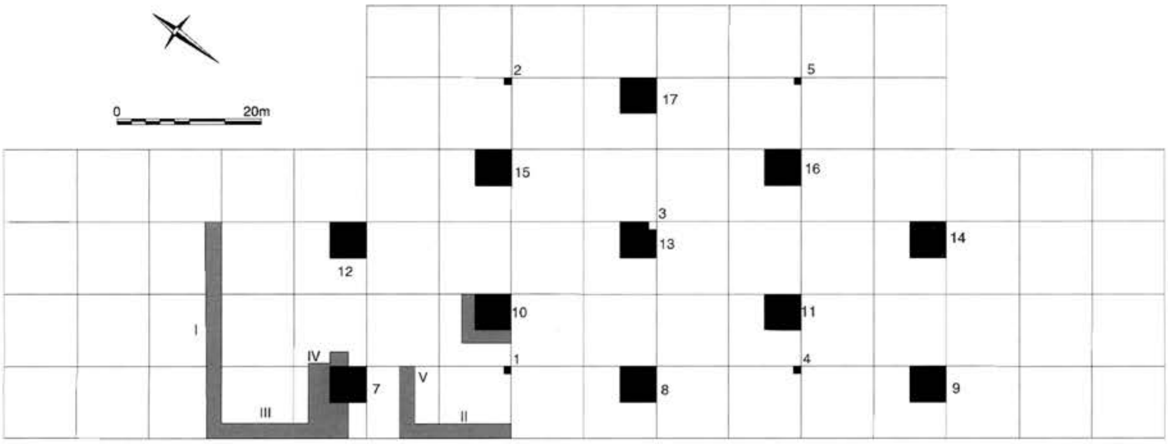

Figure 3. The sample grid: 1-5 indicates test pits; 7-17 five-metre test stations; I-V (grey tone), additional trenching.

statistically significantly different, when calibrated they fall within the mid 1st millennium BC radiocarbon 'plateau':

1) 2490 + 60BP; cal. BC 800–510 (68% confidence); 810–400 (95%; GU-5731)
2) 2480 + 50BP; cal. BC 780–510 (68% confidence); 800–400 (95%; GU-5732).

Topography and soils

Located on fen skirtland, the site lies on a slight rise. The ground surface falls away from 3.70m OD along its southeastern margin to *c.* 3.30m OD in the west and north. This slope is all but unnoticeable and, on the whole, the immediate topography is unremarkable.

Generally consisting of orange silty clay, only along the southern margin of the site did the subsoil have any substantial sand and/or gravel component. This was overlain by a homogeneous buried soil horizon of mid-dark grey-brown loam (0.10–.20m thick). No horizontal cultural strata survived (i.e. feature-associated banks or surfaces). When machining the buried soil, ard/plough lines were recognised in the 'B'-horizon. Oriented north/northwest-south/southeast, given that very few (modern) plough scars were visible in the top of the buried soil, these would seem to derive from pre 20th century agriculture and are probably late prehistoric/Roman. It was probably this activity that eradicated any strata and truncated the top of the sub-soil features, resulting in their non-distinction/survival within the upper buried soil level (see French in Evans 1994a, Appendix VI for soil micromorphological studies). The ploughsoil was a heavy clay loam, and the combined depth of the top-soil cover varied from 0.35 to 0.50m (buried & plough-soil).

Surface finds and buried soil densities

508 artefacts were recovered through fieldwalking, including 180 pieces of prehistoric pottery and six Romano-British sherds (Fig. 4).[1] The site could be seen resolving itself by surface densities of three sherds per collection unit. Five sherds or more occurred within a 40m^2 'middle zone' and within this core two highs are apparent: the west-central southern margin (two occurrences of 11 sherds each) and in the centre-north (17/16 sherds).

This definition pattern is matched by the lithic distributions (125 and 141 worked and burnt flints recovered respectively; Fig. 4). Of this material, with the exception of a few Neolithic blades and blade fragments, there are virtually no artefacts which are diagnostic of particular periods. This paucity of tool types and the technological characteristics of the assemblage suggest a Middle Bronze Age attribution (Edmonds in Evans 1994a, Appendix I). The site could be defined by densities of both worked and burnt flint greater than two per unit. However, the lithic distributions extend further west than the pottery and, despite a general fit between the finds categories, rogue values locally occur beyond the site's targeted core. Whilst perhaps just a product of the fact that the settlement is unenclosed, there can be no certainty that the scatter is discrete.

Worked flint was recovered in every test pit with an average density of 4.4 pieces (range 2–10). Pottery was present in all but the north-westernmost with a range of 0–26 pieces (average 10.2 including two nil values). The densities roughly correlate with those from the fieldwalking except in the case of the north-easternmost, which was unaccountably high (16 pieces of pottery and 10 flints). The buried soil lay thick there (0.50m), either suggesting that greater top-soil masking may have locally skewed surface recovery and/or the location of a feature.[2]

The central test station was selected to specifically investigate the relationship between buried soil densities and sub-soil features. Alternative metres were carefully hand-excavated with the central square dug in 2 cm spits. Quantities of material were recovered. Ranging from 1 to 6 pieces, worked flint occurred on an average of 2.8 per metre, with pottery varying from 3 to 13 pieces (6.75 average). This excludes the central spit-excavated square in which 34 sherds were found; its inclusion takes the average density of pottery up to 8.8 per metre.

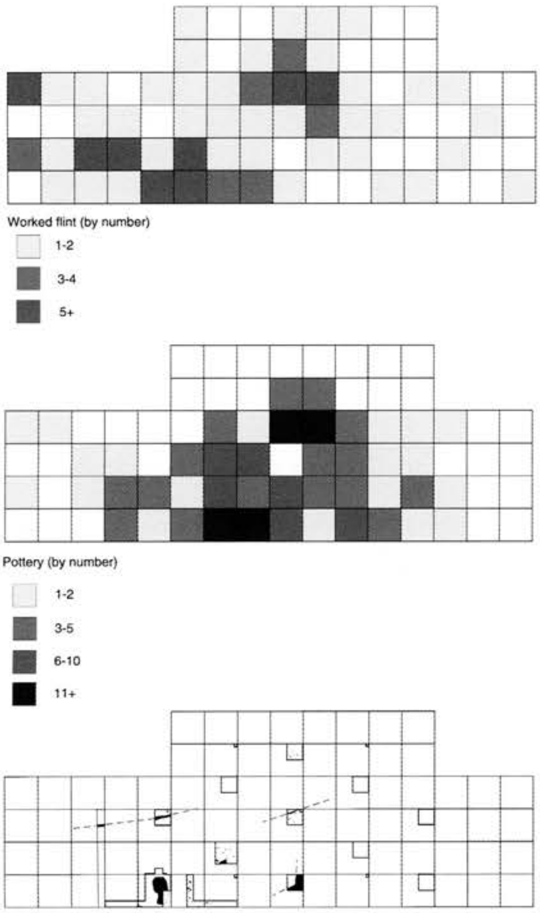

Figure 4. *Middle and top – surface densities by 10m²; bottom, features*

In-depth Investigations

Features were found in five test stations across the southwestern quarter of the site (7, 8, 10, 12 & 13) and in the northernmost (17; Fig. 4 & 5). A 0.70–.90m wide ditch was found to run east-west across Test Station 12 (F. 3), which, as excavated, was 0.15–.25m deep. However, the 'ghosted' traces of its profile could be made out for a further height of 0.15m within the buried soil. The ditch was observed to continue across Trench I and, to the east, probably equates with F. 8 in Test Station 13. In the latter instance, as excavated it was much reduced, only 0.15–.25m wide and *c.* 50mm deep. While within the buried soil profile the ditch section was more substantial (0.40m wide and 0.20m deep in total), this may have been a minor parallel 'linear' (see below). Only one other (definite) feature was excavated in Test Station 12, either a small concave-profiled pit or posthole (F. 7; 0.40 x .45m; 0.15m deep).

Six minor postholes were excavated in Test Station 13 (50mm–.15m deep; F. 20–23, 25 & 56). Although alignments can be distinguished, they do not constitute any regular structural pattern; an ard-mark was also recorded (F. 9).

Apart from what seemed an ard-line (F. 14; though in hindsight this may be a cart rut; cf. Welland Bank, see below), the only features found in Test Station 17 were four postholes 0.10–.25m deep (F. 10–13). Set in a regular square (1.75 x 1.45m), this would seem a classic four-poster. Its location, beyond/north of the F. 3/8 ditch-line at the edge of the surface spread, would have parallels with the settlement-marginal distribution of such structures on other later settlements.

Four postholes were also present in Test Station 10 (F. 15–18), all were large and relatively uniform (*c.* 0.20m in diameter; 0.25–.30m deep). Yet, unlike those in the northernmost square (17), they did not

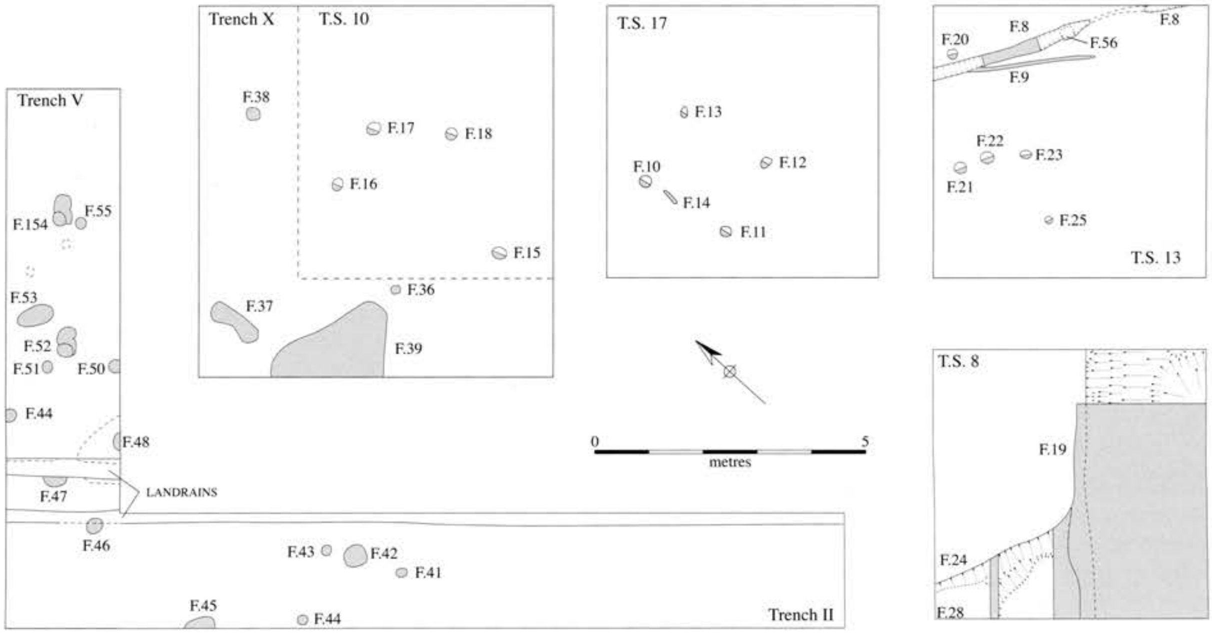

Figure 5. *The central Test Station/Trench features*

form a regular pattern. In order to understand their distribution, the western and southern sides of the square were extended by 1.75m. Three other postholes, including one double (F. 36–8), and a large pit (F. 39) were thus found. However, even over this greater area the postholes did not resolve into an obvious structural pattern. While two alignments of three posts each can be distinguished (F. 17, 18 & 38; F. 15, 36 & 37), these are not parallel and, alternatively, they may rather relate to an irregular (sub-) circular setting.

A complex ditch/pit configuration excavated in Test Station 8. F. 19 appeared to be a north-south oriented linear feature some 2.50m+ wide whose western side sloped down broadly to a flattish, if irregular, base 0.6m deep (east side not exposed). Recovered from the upper fill of this feature, which consisted of peat below subsided ploughsoil (in which were scorched lenses probably from burning off vegetation), were 19th and 20th century finds, and its profile had obviously been open until quite recently. Below this was dark grey/brown silty clay (buried soil-derived) with iron panned gravels, from whose basal deposits only two sherds of later prehistoric pottery were found (a few Roman sherds were also present).

Whilst possibly reflecting the re-cut earthwork survival of a Roman ditch-line, in all likelihood the entire feature is of late date and probably relates to quarrying. Its stratified horizons could reflect that the buried soil had been stripped from the immediate area during the course of small-scale gravel extraction and subsequently deposited into the bottom of the quarry trench. This matter was made more complicated due to the fact that its western edge was apparently continuous with the upper line of an 'early' feature (24) that extended along the southwestern side of the square. In the main, this seemed to be a sub-circular 0.80m+ deep pit/well. Backfilled with deposits of silty sand and gravel, quantities of later prehistoric artefacts were recovered from its upper subsided fill (mid-dark grey sandy clay silt), including much charcoal. Although substantially deeper, its edges would complement a western return of the F. 19 ditch-line. A posthole (F. 27) and gully (F. 28) were thought to be identified below this subsidence horizon. However, that no similar settlement-type features were found to extend exterior to these features (i.e. in the top of adjacent natural) would suggest they were probably the result of tree-rooting.

The recovery of postholes in Test Station 10 continued into the (unexcavated) trenches along the southern side of the site: Trench II, F. 41–46; Trench V, F. 47–55. Some were quite substantial (e.g. F. 42: 0.40m in diameter) and there were a number of double-post settings (F. 52–4). Although given the limited scale of the area investigated interpretative certainty is impossible, these would not seem to resolve into circular patterns but rather have linear distributions. Two, NW-SE oriented parallel lines can be distinguished: F. 45–47, 49 and F. 41–3, 50–53. Lying only 2.00–2.50m north of the F. 45 (*et al.*) line the latter alignment extends for 8.50m+. Given this, and the apparent irregularity of their setting/interval, it is difficult to understand this post pattern and, again, interpretation is not abetted by limited exposure. Certainly they do not appear to relate to a circular building and suggest instead either a major fence/post line or a rectangular structure. Conclusive evidence of both have

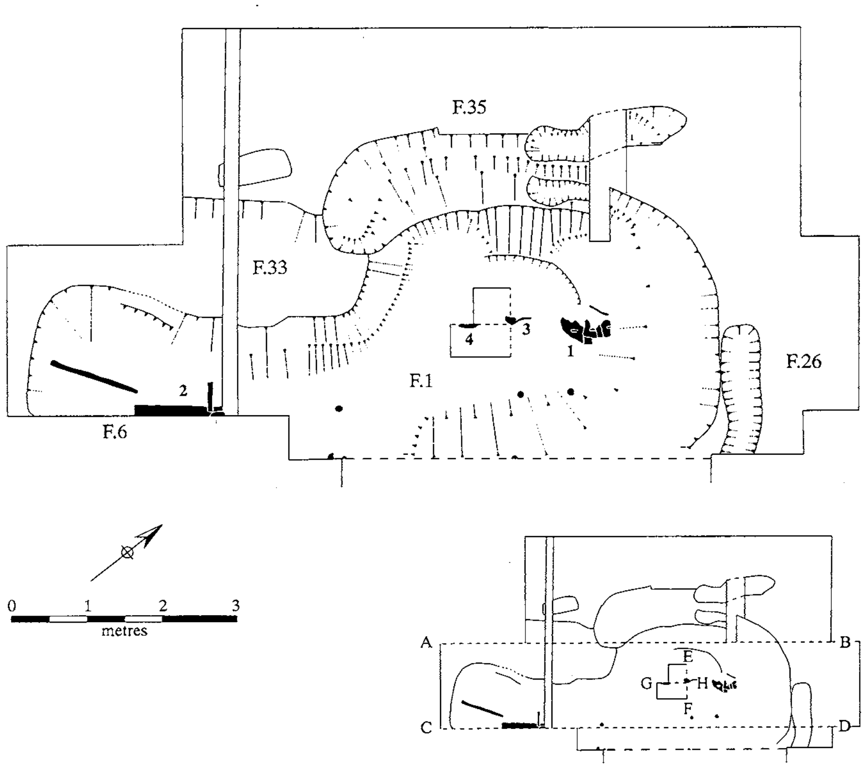

Figure 6. *The Test Station 7 wells (with timbers blacked); inset indicates section locations (A-H; see Fig. 7 & 8)*

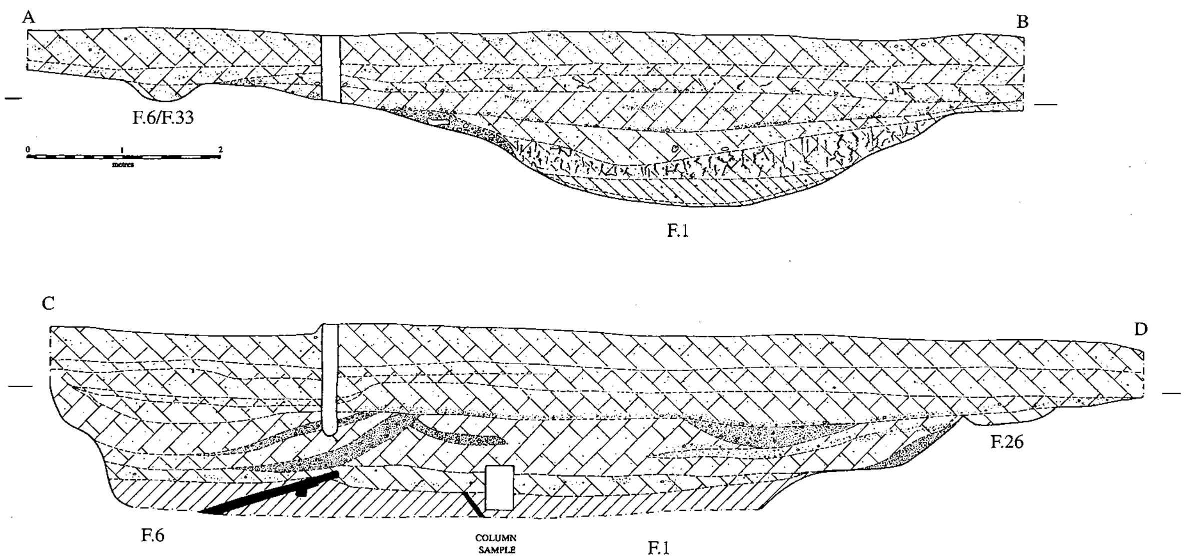

Figure 7. Well sections (with timber elements blackened; see Fig. 6 for location)

been found on later Bronze Age sites within the area, which will be discussed below.

No postholes were present in the trenches west of Test Station 7/8. There, apart from the continuation of the east-west ditch (F. 3/8) into Trench I, the only other feature found was a large pit in Trench III, F. 40.

The Well Complex

Fills extended across the entire area of Test Station 7 and, in order to establish some sense of this feature's extent, a trench was cut along the western edge to expose its north-south limits. An irregular 'T'-shaped

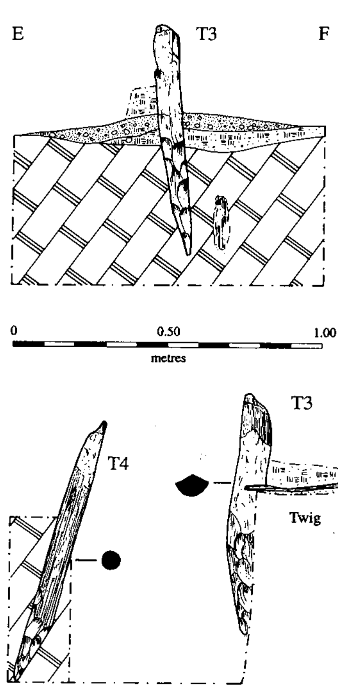

Figure 8. Stake sections in base of Feature 1 (see Fig. 6 for location)

feature-group was revealed (Fig. 6). From its exposure within the test station (F. 1) a rather bulbous, apparently linear, configuration ran along the eastern side of the southern trench extension (F. 6; 1.80m+ wide) that ended in a sub-circular butt 4.50m south of the edge of F. 1. This initially appeared to be the recut corner of a large enclosure ditch with a terminal at its southern end. Mixed with gravel backfills within its upper profile were great quantities of domestic refuse: large pieces of pottery and bone. The southern feature (6) was spit-excavated across its exposed width and a 1.00m wide sondage excavated across F.1.

Digging proved difficult as the water table was high. Persistence in the excavation of these deep features related to the fact that not only were they producing a rich finds assemblage (and providing much needed dating evidence), but also because the lower 0.30–.40m of its fills were waterlogged, with quantities of roundwood and worked wood. This included a large split oak plank, sharpened stakes (driven *in situ*) and a fragment of a bowl or scoop/ladle. More important, in the base of F. 1 was found a third of a composite circular wooded piece that was lifted by the Ancient Monuments Laboratory conservators. Detailed cleaning and study revealed this to be a complex jointed piece, with planks pegged by dowels and an inset bar (see Darrah, below).

Upon full excavation F. 6 proved to be *c.* 1.40m deep; F.1, *c.* 1.20m (Fig. 7). Two pits were observed to cut through these features (F. 5 & F. 7) and a minor ditch (F. 26) ran parallel along their northern side whose scale and pale leeched fills could suggest a relationship to the ditch excavated in TS 12 & 13. Although interpretation had to be qualified by the conditions in which these features were dug, as this phase of fieldwork was completed we still thought that we were dealing with a corner of a ditched enclosure system, albeit one displaying marked irregularities.

Successful application was made to return the following summer to further excavate these features. The east-west trench was re-opened and extended west (7 x 6.00m). Surprisingly, this feature group butt-ended only 1.50 m beyond the western section of the previous year. Following the removal of the backfill, the western fills (F.1/31) were carefully excavated and the eastern section line cut back by 0.50m. Apart from pottery and bone, further pieces of wood were recovered, including five more driven stakes (*in situ*), one of which had a roundwood rod woven around it, suggesting they perhaps supported a wattle revetment (Fig. 8). Their alignment, the overall form of the feature and its irregular profile (produced through successive collapse and recutting), caused its re-interpretation. Instead of enclosure-related, they were a cluster of intercutting post revetted pit-wells. (This was confirmed by the cutting of Trench VI just east of the side of TS 7, where no linear continuation of these features was found.) The F.1/31 pit group was ringed with irregular linear scoops (F. 35), evidently the result of incidental reduction along its top edges (i.e. a by-product of repeated access).

The Wood Assemblage

P. Murphy

485 pieces of wood were collected during the excavation of the wells. While large items were collected and bagged individually, much of the wood from the site consisted of small roundwood fragments; samples of the latter, comprising up to 125 fragments per context, were amalgamated in single bags. All individually-collected items were recorded and identified, but only sub-samples of the roundwood debris were examined. The wood was generally well-preserved, often with bark, though many stems were indurated due to deposition of iron compounds. This often made it impossible to prepare complete transverse sections, so stem ages could not usually be determined. Identifications were based on Schweingruber (1978).

The overall composition of the wood assemblages from these features is summarised in Figure 9 (excluding the artefacts discussed in the following section). A very high proportion of the material collected was unworked roundwood fragments, mostly short lengths under 100mm. Worked roundwood pieces were uncommon (cut and/or split), making up only 2.4% of the total collection. Other material included chips, shapeless 'chunks' of larger wood with no original surfaces surviving, bark fragments and small abraded fragments.

Identifications are summarised in Figure 10. Overall, the roundwood was mainly of *Corylus* sp. (hazel), *Fraxinus* sp. (ash) and *Prunus* sp. The *Prunus* wood included some stems with rays >4 cells wide, and in several samples was associated with thorns. It is thought to be predominantly or entirely of *P. spinosa* (blackthorn). Roundwood from trees characteristic of wet soils was also identified, including *Alnus sp.* (alder), *Salix/Populus* sp. (willow/poplar) and *Viburnum* sp. Separation of *V. opulus* (guelder rose) and *V. lantana* (wayfaring tree) is not possible from wood alone, though on ecological grounds *V. opulus* is probably represented, since it is more characteristic of damp soils (Clapham *et al.* 1987). Roundwood stems of *Quercus* sp. (oak) and the *Crataegus* group (Pomoideae: hawthorn, etc.) were also present. Chips of alder, hazel, ash and oak were recorded, and *Acer* sp. (field maple) was represented only by chips.

The distributions of roundwood stem diameters for the three main species are shown in Figure 11. Large stems of ash and hazel (>50mm diameter) had been selected for conversion to stakes which revetted the sides of the features. They were straight stems; no coppiced heels were observed, though a slight widening on one side of an ash stake hinted that the stem was beginning to curve. The roundwood (<50mm) consisted mostly of short fragments, but so far as could be determined straight stems predominated. Some of the *Prunus* stems, however, showed irregular,

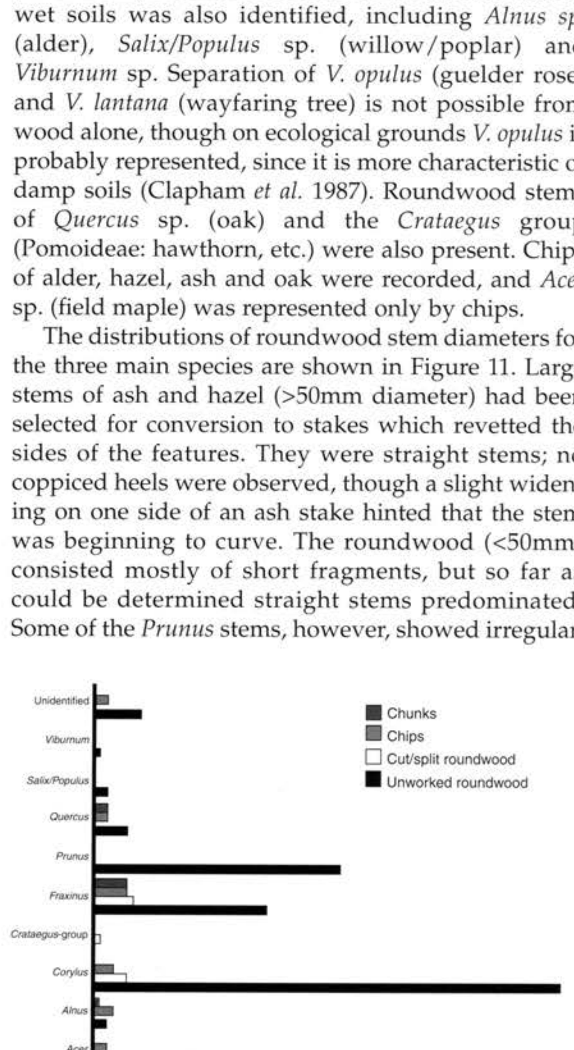

Figure 10. *Wood identifications*

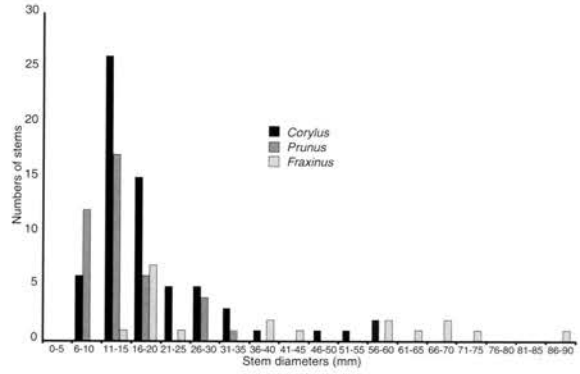

Figure 11. *Stem diameters of* Corylus, Prunus *and* Fraxinus

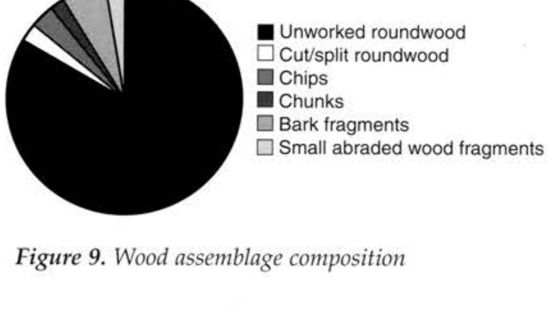

Figure 9. *Wood assemblage composition*

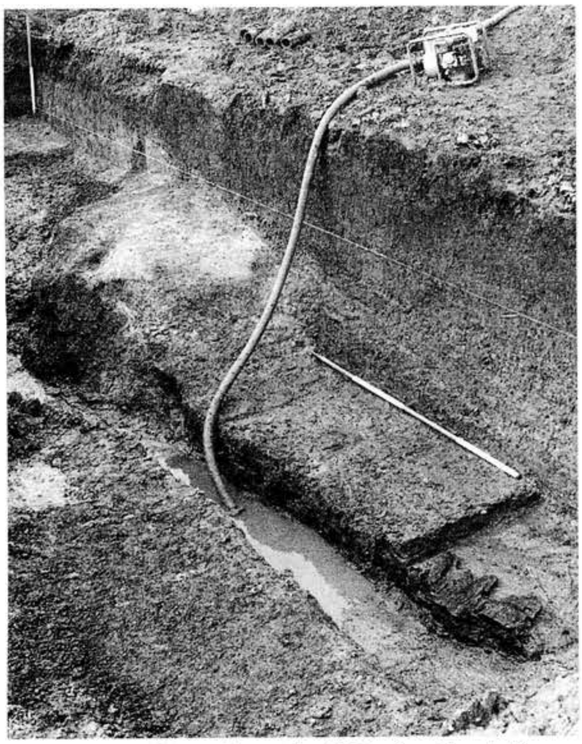

Figure 12. *The well complex (F. 1; cf. section A-B, Fig. 7); note the 'fragment' in lower right corner. 1.00 metre scale.*

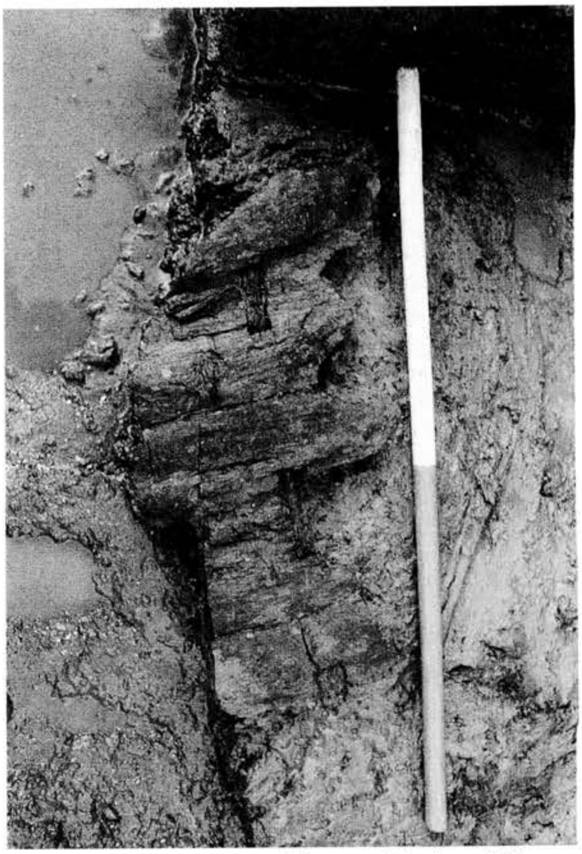

Figure 13. *The Lingwood 'fragment' in situ within basal deposits of well F. 1. 1.00 metre scale.*

contorted growth. In general, the roundwood stems showed rapid initial growth, with narrow outer rings, suggesting increasing competition for light, water and nutrients. The wood chunks were from larger wood, but apparently not trunk wood.

One piece of split ash roundwood showed surface borings of the ash bark beetle (*Hylesinus fraxini*). The very few wood chips recovered were mostly fragmentary, but at least some had been cut from roundwood.

Apart from the few worked items (see below), there is no reason to think that this wood was intentionally selected for use, and much of it probably represents a 'natural' accumulation of twiggy and thorny debris from adjacent vegetation.[3] Almost all is small roundwood and (apart from the oak and ash plank artefacts) there is no distinct evidence for timber trees in the vicinity, but rather shrubs. Nor is there clear evidence for management. No coppiced heels were seen and the variations in growth rates indicated by ring-widths are not specifically diagnostic of intentional coppicing. The wood includes a high proportion of straight stems, but this need not indicate management, particularly in the case of the commonest species – hazel – which is, in effect, 'self-coppicing' and naturally produces long straight stems.

The high proportion of blackthorn stems is unusual, but is paralleled by a collection of wood from Iron Age pit alignments at Meadow Lane, St Ives (Taylor in Pollard 1996). The wood from that site included a blackthorn stem with a right-angled bend, a growth form which may be produced by hedge-laying. Taylor interpreted the St Ives material as debris from a hedge. Although no such bends were noted at Lingwood Farm, contorted and curving stems of blackthorn were present. From the overall species composition and distribution of stem diameters characterising the wood from this site, it seems reasonable to interpret most of the wood as debris from a hedge composed largely of hazel, blackthorn and ash. In practical terms, enclosing the wells within a perimeter hedge would have made sense, for they would have been a potential hazard to stock.[4]

Although pollen preservation was generally poor and only low counts were obtained, the palynological results indicate a generally open landscape of weedy grassland nearby, which is consistent with data obtained from assessment of fruits and seeds (see below). The main trees/shrubs identified from pollen were hazel-type and oak, though at low frequencies. Regular trimming of hedgerow trees and shrubs would have inhibited flowering, so the low pollen percentages of woody taxa are not inconsistent with the presence of hedges at the site. The absence or rarity of pollen of Rosaceae, despite the abundance of *P. spinosa* roundwood, is unsurprising, for sloe is insect-pollinated and therefore produces relatively little pollen.

Wooden artefacts

R. Darrah

A complex piece (T. 1), possibly part of a wheel, was

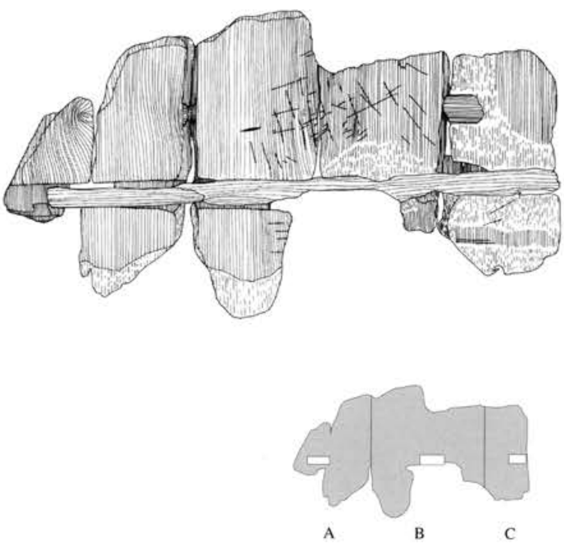

Figure 14. The Lingwood Fragment (lower face; toned inset shows upper face with position of slots cut through to bar channel)

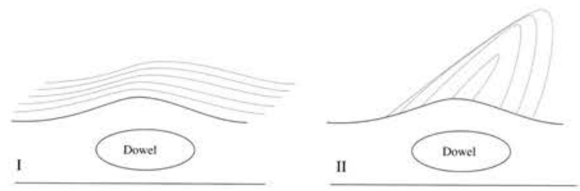

Figure 15. The Lingwood Fragment showing grain direction; I indicates flow of the grain over the dowel suggesting that the wood has been compressed on either side; in II the grain contours the raised area above the dowel and would have been seen if the wood had been carved to this shape

Figure 16. The Lingwood Fragment showing the effect of compression on the cross-section of the channel; the square sectioned channel (I) may become dovetailed when compressed vertically (II)

found lying horizontally within F. 1 (Fig. 12 & 13). It consists of three ash planks (A, B & C), joined edge-to-edge by two oak dowels (E & F) and with a channel housing an oak bar (D) lying beneath them. Turned over before being drawn (Fig. 14; Table 1), grain was visible on both faces and appeared well preserved, though there appears to have been considerable loss of structure within the wood. There was no evidence as to the original size of the structure (its edges 'feather'), nor of its original shape. The three incomplete planks are poorly preserved and each have been fractured; the oak bar is spongy and badly decayed. If all three boards were originally the same width, the piece would have been at least 810mm across.

The grain suggests that plank A was a tangential section across the diameter of the trunk, the pith line from the original centre of the tree can be seen in its surface; the grain is straight and knot free. Plank B is also tangentially cut, but with a slight curve in the grain. 'C' is probably radial, although there is insufficient wood remaining to be certain that this not just the radial part of a tangential plank. The oak bar (D) has a radial surface uppermost, and may have been of heart or sapwood; it is straight grained with a growth rate of 2.5mm per year. The dowels were of oak, but have not been removed from their position in the piece or examined so little is known of the section of wood used (E & F).

The upper surface of the piece (on the opposite side from the oak bar) has a slot cut through each plank (Fig. 14). Cut into the channel (into which the oak bar fitted from the opposite side), these are the same width as the channel (*c.* 30mm); the slot in plank A was about 70mm long (the other slots were damaged so that these lengths cannot be determined). Where the ends of the slots survive they have been cut cleanly across the grain with a sharp blade. They are not the result of the channel being cut too deeply, but were intentionally made (Fig. 13). As tool marks are visible on the outer surface this is not a case of the wood decaying down to these holes, but that the holes were originally cut right through. The oak bar was studied *in situ* and there was no evidence of it being shaped to fit into these slots.

That the faces of the planks curve up above dowels, and the wood grain follows this curve, provides the clearest evidence that compression has distorted this find (see Darrah forthcoming concerning compression effects). If the surface had been carved to curve over the dowels then the wood grain would have been cut creating a series of annual ring contour line. (Fig. 15).

The dowel, now oval (28mm x 17mm in cross section), was probably originally circular. This has been compressed and suggests that the compression was about one third of its original depth. Using this measurement the best estimate is that the whole piece has

Table 1. *The species dimensions of the 'wheel' components.*

Part	Description	Species	Section of wood	Tool marks	Dimensions(mm)
A	Outer plank, part missing	Ash	Tangential	present	275 x 190 x 5-40
B	Central plank, part missing	Ash	Tangential	present	320 x 268 x 5-40
C	Outer plank, part missing	Ash	Radial	present	235 x 120 x 5-30
D	Bar	Oak	Radial	none	534 x 30 x 28
E	Dowel	Oak		none seen	diameter 25
F	Dowel	Oak		none seen	diameter 30

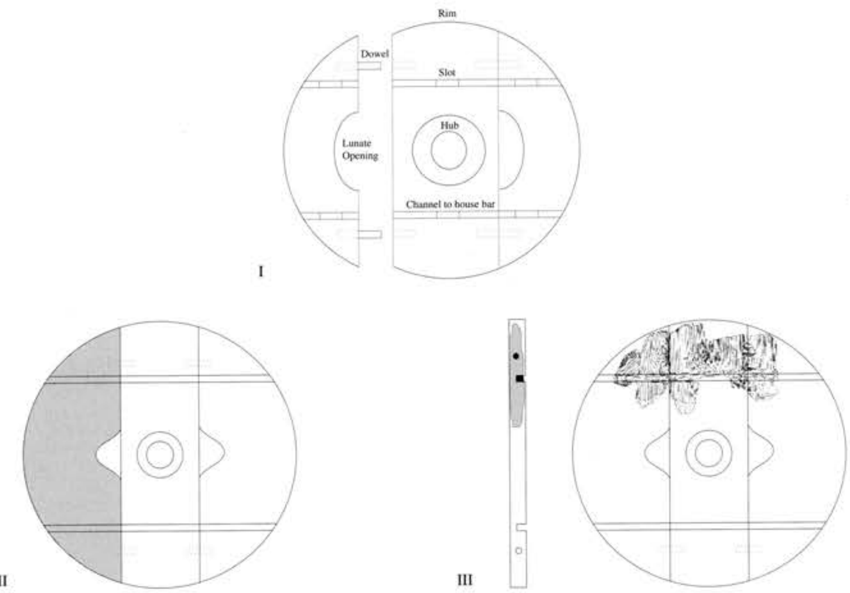

Figure 17. I, tripartite wheel terminology and components; II, the surviving segment of the Flag Fen wheel (not to scale); III, the Lingwood fragment superimposed on a Flag Fen-type wheel outline

been compressed in thickness by approximately this amount. With more detailed measurements this ratio could be refined, but the thickness of the planks varies so widely over their surviving surface area that it is difficult to know which measurements to use. It does strongly suggest, though, that the original thickness of the ash planks was over 60mm, and that the oak bar was probably more than 45mm thick.

The lower face, as found and pictured in Figure 14, had a continuous channel to house the bar cut across all three planks. This was damaged by compression, which makes it impossible to check whether the sides had originally been vertical or a dovetail section (Fig. 16).

The only tool marks seen were those which may have been from an axe on the surface of plank A. These pieces were deliberately worked as the presence of dowel holes, the slots and the channel attest. The jointing of the plank edges suggest careful construction and the cutting of the slots indicates that sharp tools were used to cut across the grain. However, the damage to the object within the ground has masked or destroyed most of the evidence relating to its construction (e.g. whether the channel holding the oak bar originally had dovetailed sides or straight sides). The internal joints (the dowel holes) might not have been so damaged, but these have not been taken apart or examined. Channels and dowel holes are found in earlier, Bronze Age, woodworking, so are not exceptional techniques at this period. If the dowel holes were drilled, rather than gouge-cut then this might be of interest, as would any foxed wedging.

In terms of the diverse wood-types employed in this piece, different species are often used for specific purposes. The planks were of ash, which, while quite light, is tough and resilient but not resilient to rot. It is more difficult to split into planks than oak, and harder work to hew to shape, but its use would render the finer work in the dowel holes and channel less likely to split. This makes it more surprising that the dowels and bar are not also of ash, but oak. Oak heartwood is more rot resistant, but less able to cope with stress and flexing without splitting.

Ash planks A and B had a growth rate of about 3mm per year near the centre, reducing to about 2mm per year near the outside of the plank. This type of growth could be expected from trees in woodland, where the canopy was not too dense. In smaller pieces there are not enough rings to comment on growth patterns. The width of plank B, the only plank which retains its full width, is 28mm. Unless the wood is being used wastefully this is likely to have come from a tree of diameter 300–350mm (including bark).

This structure may have come from a wheel, or it may relate to a very different object. Wooden wheels are known from the archaeological records as chance finds from peat bogs in Ireland, Scotland and Denmark, and recently, in excavation context, at Flag Fen (Pryor, forthcoming). Although Neolithic wheels were carved from single pieces of wood, the Bronze Age and Iron Age they are made from three planks fixed together with bars of wood and loose tenons or dowels (for terminology see Fig. 17.I). The defining features of wheels from this period include shape (i.e. 'roundness'), a hub, and construction from the joining of three planks using a variety of techniques. The latter include bars set into dovetailed channels across the width of the wheel (e.g. Flag Fen and Ezinge; Weeks 1982), loose tenons (Ezinge) or dowels (Flag Fen) set into the edges of the planks or bars/rods set into bored holes (Duogarymore and Blair Drummond; Sheridan 1996); through slots occur in the Duogarymore example in the National Museum of Ireland.[5]

The Lingwood fragment has been superimposed onto an outline of a Flag Fen-style wheel (Fig. 17. III).

Artefact	Description	Species	Section of wood	Tool marks	Dimensions(mm)	Point type
T. 3/420	Stake point	Crataegus	Split half	Sharp axe	750 x 110 x 55	Multifaceted
T.4/421	Stake point	Fraxinus	Round wood	Blunt axe	710 x 63	Multifaceted
T.5/422	Stake point	Corylus	Round wood	Blunt axe	500 x 55	Multifaceted
T.6/423	Stake point	Fraxinus	Split quarter	Blunt axe	420 x 55	Irregular
T.7/425	Vessel wall, bowl?	Pomoideae	Tangential	None	80 x 60 x 2-4	

***Table 2.** The form, species, dimensions, and tool marks of the wood artefacts.*

The latter has a dovetailed channel, oval dowels, a lunate cut and the circular outline of a wheel segment. While the Lingwood structure could be a wheel (and the presence of the channel, dowels and slots make it likely), no circular outline is present. The three planks also suggest a wheel, however there may have been more than three planks in the original piece. None of the attributes which would unequivocally define this structure as a wheel have survived; the rim, hub, and even secondary features such as the lunate cutaways and the thickening for an integral hub are all missing. It may be a mistake to assume that because one joining technique is used in wheels, that it was exclusively used in their construction. There are certainly features here reminiscent of the Flag Fen and Duogarymore examples, but this may not have been a wheel and it might, for instance, have been part of a door.

Other Pieces

Of the seven uprights within the base of the wells the points of four stakes were recorded (Table 2), all made from wood of less than 120mm diameter. Three have similar tool marks on their points as they had been shaped with a very blunt axe. No tool signatures were seen but the indication is that these three stakes were pointed at the same time. There is no reason to assume that this was a stone axe; tool marks made with a blunt metal axe may be mistaken for those made with a stone axe. Stake T.3/420 was shaped with a much sharper metal blade, which must have been a different axe (Fig. 8).

F.6 produced a tangentially converted large oak plank. 1.53m long, it had a cross-section of 197 x 70mm; the surface was abraded, and showed no tool marks (T. 2; Fig. 7).

A thin piece of pear or hawthorn (Pomoideae) was also recovered (T.7/425; Fig. 18.12). Cut across the grain, its shape was consistent with it being a wood chip (as the waste from an axe cut). However wood chips tend to have both blade marks and splits running across them, even when preservation is poor, but this has neither. This suggests that it is a fragment of a hollowed object, such as a bowl or scoop. There are no striations left by lathe turning, nor any other tool marks on either face.

Plant Macrofossils

P. Murphy

Waterlogged material

Bulk samples and a column sample were collected from the lower fills of the well F. 1 (Fig. 7):

0–75cm: Brown sandy clay loam; moist, firm; grey clay inclusions; large reddish-brown mottles at base; moderately stony, with flint and quartzite clasts up to 15mm; bone fragments; charcoal; merging contact

75–100cm: Grey sandy clay loam; moist, firm; large reddish-brown mottles; some sand lenses; slightly stony; merging contact

100–117cm: Grey slightly sandy clay loam; waterlogged, soft; large black mottles; rare flints; roundwood fragments; pale grey sand layer at 112cm; sharp contact

117cm+: Coarse grey stony sand (underwater); assumed to be natural gravel.

0.2–.3kg sub-samples from three bulk samples of the basal fills, and another from the column at 100–117cm, were disaggregated. Their organic fractions were separated by manual wash-over (0.5mm and 0.25mm meshes) and scanned at low power for assessment. They included plant macrofossils, roundwood fragments, roots, some monocotyledonous stem and leaf fragments, and charcoal, as well as ostracods, cladoceran ephippia, beetles and fly puparia. Nomenclature follows Stace (1991).

The taxa noted from the basal fill of the well included: Alismataceae indet (water plantain, etc.), *Atriplex patula/hastata* (orache), *Carex* spp. (sedges), *Cerastium* sp. (mouse-ear), *Chenopodium album* (fat-hen), *Eleocharis palustris/uniglumis* (spike-rush), *Lemna* sp. (duckweed: very common), *Polygonum aviculare* (knot grass), *Ranunculus acris/repens/bulbosus* (buttercups), *Rorippa* sp. (water cress), *Rumex* sp. (dock), *Sonchus oleraceus* (sow thistle), *Stellaria media* (chickweed), *Urtica dioica* (nettle). Assemblages of this general type, dominated by weeds and grassland species, with variable amounts of aquatics, have commonly been reported from later prehistoric wells/watering holes in Eastern England (e.g. Murphy 1988, 1997; Wiltshire & Murphy 1998). Whilst full analysis would have enlarged the species list, it was not considered that analysis would alter the conclusion that this basal well fill was deposited under standing water, with damp weedy grassland in the vicinity.

There are, however, grounds for thinking that the well complex dried-out periodically or seasonally as cladoceran ephippia, resistant structures produced in response to environmental stress, particularly desiccation (Schmitt 1973), were observed. The palynological data suggest that there had been differential decomposition of pollen grains, whilst the absence of iron pyrites framboids (which form and survive only in waterlogged anoxic sediments, in reducing conditions) indicated a relatively high redox potential, pointing to intermittent desiccation (see Wiltshire, below).

Given the abundance of woody plant detritus (principally twigs and thorns), the apparent absence of fruits and seeds of woody taxa is at first sight surprising (e.g. hazel nutshells, sloe fruit stones). Middle/Late Bronze Age and Iron Age wells at Slough House and Chigborough Farms, Essex consistently included macrofossils of trees and shrubs, and in some features they were abundant, reflecting either nearby hedges or patches of scrub (Wiltshire & Murphy 1998). It may be that the samples assessed at Lingwood Farm were too small to detect large macrofossils of this type. However, if (as is argued above) the wood came mainly from hedges, repeated trimming may have inhibited flowering and/or fruiting. Alternatively, almost all fruits or nuts could have been collected by the occupants of the site.

Charred material

Thirty-five bulk samples were processed from the buried soil and tested features (*c.* 7 litres sub-samples with 0.5mm meshes were used throughout; see Murphy in Evans 1994a, Appendix V). Charcoal densities were low and indeterminate poorly-preserved charred cereal grains were noted in only ten samples in very small numbers: *Triticum* (wheat) grains in three, *Hordeum* (barley) grains in one, *Triticum dicoccum* (emmer) glume bases and spikelet bases in two, and *Corylus* (hazel) nutshell in one. Fruits and seeds of Bromus mollis/secalinus (brome grass), *Chenopodium album* (fat-hen), *Eleocharis* sp. (spike-rush), *Galium aparine* (goosegrass), *Persicaria* sp, indeterminate Poaceae (grasses) and rhizome fragments occurred, but were generally represented by only single specimens in 1–2 samples.

The fills of posthole F. 27 and pit F. 24 included the highest densities of material (3.6 and 1.7 items per litre of soil respectively). These maximum densities are nevertheless very low, compared to several other Early Iron Age settlement sites in Eastern England (Murphy, in preparation). Although some sort of process involving the use of emmer and barley is indicated, there is no evidence for large-scale cereal processing on site.

Pollen

P. Wiltshire

This section must be prefaced by the fact that the interpretation presented below is based on a qualitative assessment of the material and not a quantified analysis. Samples were examined from depths of 71, 79, 85, 94, 107, 112, 115 and 119cm from a monolith obtained from F.1, with care being taken to sample each distinct horizon in the lithology. Pollen frequency was low; the greatest abundance was found at 85cm and lowest at 112cm, and the paucity of palynomorphs might indicate a rapid accumulation of sediments. There appeared to be no clear relationship between pollen frequency and lithology, and the limited taxa recorded suggests that differential decomposition had operated within the sediment. This might indicate that, during its history, the feature dried out periodically and became aerated to some extent. There was certainly no evidence of redox potential having been low enough for iron pyrite framboid formation (Wiltshire *et al*, 1994), as might occur under conditions of persistent standing water. Evidence for slightly wetter conditions were recorded between 85 and 112cm, with *Ranunculus flammula* type (e.g. lesser spearwort) and *Typha angustifolia* (lesser bulrush) being found. However, although Murphy (see above) recorded aquatic plant macrofossils from the feature, lesser spearwort might have been growing around its muddy edges and emergent plants like bur-reed could have been growing in the fen some distance away.

Pollen of Poaceae (grasses) were the most frequently encountered palynomorphs and together with herbs such as *Plantago lanceolata* (ribwort plantain), *Trifolium* type (e.g. clover), *Centaurea nigra* type (e.g. knapweed), and *Ranunculus* type (e.g. buttercup) the data suggests expanses of weedy, grazed grassland in the immediate locality. The presence of cereal-type pollen points to arable as well pastoral farming being practised in the environs of the site. Areas of open, disturbed and/or trampled ground are indicated by ruderals such as *Rumex* undiff. (docks), *Artemisia* (mugwort), *Plantago major/media* (e.g. greater plantain) and Chenopodiaceae (e.g. orache). Damp soils might be indicated by the presence of Cyperaceae (sedges), while *Pteridium* (bracken) and *Rumex acetosella* (sheep's sorrel) suggest drier, acid, oligotrophic areas in the locality. The landscape supported trees and shrubs with *Quercus* (oak) and Coryloid (cf. *Corylus* hazel) appearing to be the most frequent, especially in the later history of the feature, but *Pinus* (pine) and *Alnus* (alder) were also recorded from the catchment. There is no direct palynological evidence for hedges as suggested by Murphy (see above), but invariably many of the woody plants selected for hedging are thorny, insect pollinated shrubs that rarely feature in the palynological record. Ferns (monolete *Pteropsida, Polypodium* and *Pteridium*) might have been growing under trees since all are commonly found as understorey plants today, particularly where the canopy is relatively open. Equally however, many ferns grow in hedge banks and along with sheep's sorrel, bracken might have been infesting the acid grassland.

The palynological assemblage suggests that environs offered a mosaic of soils and habitats. Dominated by weedy grassland (probably pasture), the catchment also had either stands of trees and/or hedges, in which oak and hazel were major components. There were also wet soils and patches of stagnant water supporting emergent vegetation.

The Faunal Assemblage

Producing 323 fragments of bone (434 site total; identified by R. Luff), the faunal assemblage recovered from the wells is of interest in terms of the development of a sheep-based economy. Not including 110 fragments unassignable to taxa but only size (large/small mammal), by NISP sheep/goat represent 41%; cattle, 36%; pig, 19%; and red deer, 4%. Most later Bronze Age assemblages in the region are dominated by cattle and are more akin to the percentages as represented by the earlier phase features (34 identifiable pieces from F. 24 & 28: 68% cattle; 18.7% sheep/goat; 12.5% pig). Whereas by the later Iron Age sheep/goat generally occur at a level of 50–70%; with 40% in this category, the Early Iron Age assemblage from the Lingwood Wells may have an interim status in relationship to this economic transition.[6]

This change could tell of attitudes towards stock. Over the course of the 1st millennium BC the fen margins were getting markedly wetter and increased sheep/goat specialisation may imply tolerance of such diseases as hoof rot (i.e. what disease factor was considered acceptable loss vs. any sense of economic optimism). Equally noteworthy in the light of these environmental factors and, typical of 1st millennium assemblages from the region, is the absence of marshland species. A dated pollen core from nearby in Willingham Mere indicates the development of marsh conditions from the 8–7th century BC (Waller 1994: 163; Q-2583, 2595+50BP, cal. BC 840–600) and on the neighbouring Upper Delphs terraces its later Iron Age inhabitants were taking considerable numbers of beaver and large fowl (e.g. pelican, swan and crane; Evans & Serjeantson 1988). These, and almost any direct evidence of the 'marsh' whatsoever, are missing from the Lingwood assemblages and perhaps suggest that such exploitation as at the Delphs was specialised.

Later Prehistoric Pottery

JD Hill

A single feature, F. 24, produced a small quantity of Middle Bronze Age Deverel-Rimbury style pottery. In addition to two small fragments of flat-topped vertical rims, it contained a complete base from a vessel 170mm in diameter made in a heavily burnt flint tempered fabric with common angular burnt flint inclusions 3–12mm across. The base was complete and appears to have been trimmed, its walls roughly broken to the same height around the circuit. Ethnographic studies provide parallels for the use of bases (e.g. Skibo 1992), and this piece could have been in circulation long after the original vessel had broken. No other distinctly Middle Bronze Age pottery was recovered during the excavations.

The well complex produced a small assemblage of Early Iron Age pottery which, comprising only 177 sherds (1.6kg), is unremarkable in terms of quantity and preservation. No complete vessels, or even profiles, are represented. Rather, the upper fills of the well contained small to medium size sherds (*c.* 5–25gms in weight) from a number of different vessels. Rarely is the same vessel represented by more than a single sherd. The majority of the assemblage appears to represent 'rubbish', dumped into the upper profile of the well with other material (bone). In other circumstances this collection would probably not warrant detailed discussion, but in the context of the first half the 1st millennium BC within East Anglia any material with a closely associated absolute date is of importance.

In common with the majority of ultimate Late Bronze Age and Early Iron Age pottery assemblages across southern England, the material consists of two main groups: fine and coarse wares. The former are typified by geometric decoration and smoothed or burnished exterior surfaces. The coarse wares are distinguished by fingertip or nail decoration with unsmoothed or unburnished surfaces (Barrett 1980). All bar four sherds are made from fossil shell fabrics of different degrees of coarseness; the remainder are tempered with crushed burnt flint.

A range of different fine ware vessels is represented. Two rim sherds come from different simple rounded, slight 'S'-profiled vessels with out-turned rims (Fig. 18.3 &.4). Both were black to dark grey in colour with smoothed, rather than burnished surfaces. This probably reflects the difficulty of obtaining a true glossy burnished finish of the fossil shell fabrics found in the region. These fine ware bowls would have look strikingly different to the other fine ware vessels in the assemblage. Of the latter, one was a sharply angled, probably tripartite, bowl as represented by an angular shoulder sherd with three horizontally incised lines (Fig. 18.1) that are reminiscent of the horizontal grooves found on 'Darmsden-Linton' style Early Iron Age fine ware bowls from Essex, Suffolk and south Cambridgeshire (Cunliffe 1974, Brown 1996). The fourth vessel is of less certain form. The one sherd present is part of the wall of a wide curved bodied vessel with a very slight, unpronounced shoulder break (Fig. 18.2). Above the shoulder is a zone of incised lines forming a panel of diagonal lines and triangles. This could be from a jar, a vessel much taller than it was wide. Alternately, it can be argued this sherd came from a deep and wide, decorated round bodied bowl typical of the 'Fengate-Cromer' style of Early Iron Age pottery (Cunliffe 1974; cf. Pryor 1984).

While the fine wares appear to derive from different forms of bowls, all of the diagnostic coarse wares represented in the well are jars forms. Shapes vary from a rounded high shouldered type with an upright tapered rim (Fig. 18.7) to a sharply shouldered tripartite jar (e.g. Fig. 18.9 and possibly .5) – one with a decorated cordon around the neck (Fig. 18.5) – and a rounded tripartite jar (Fig. 18.0). The few rims are usually flat topped, slightly lipped (Fig. 18.8 & .10). These vessels were only decorated with lines of fingernail impressions; finger-tipping or other round impressions are absent. Fingernail impressions occur on the tops of rims, around the outside of the rim, around the shoulder, neck or lower wall of the vessel.

Overall, the pottery offers a 'snapshot' of a 6th century BC assemblage characterised by a marked visual and tactile distinction between fine ware bowls and coarse ware jars. However, even within this small assemblage there is considerable diversity of vessels

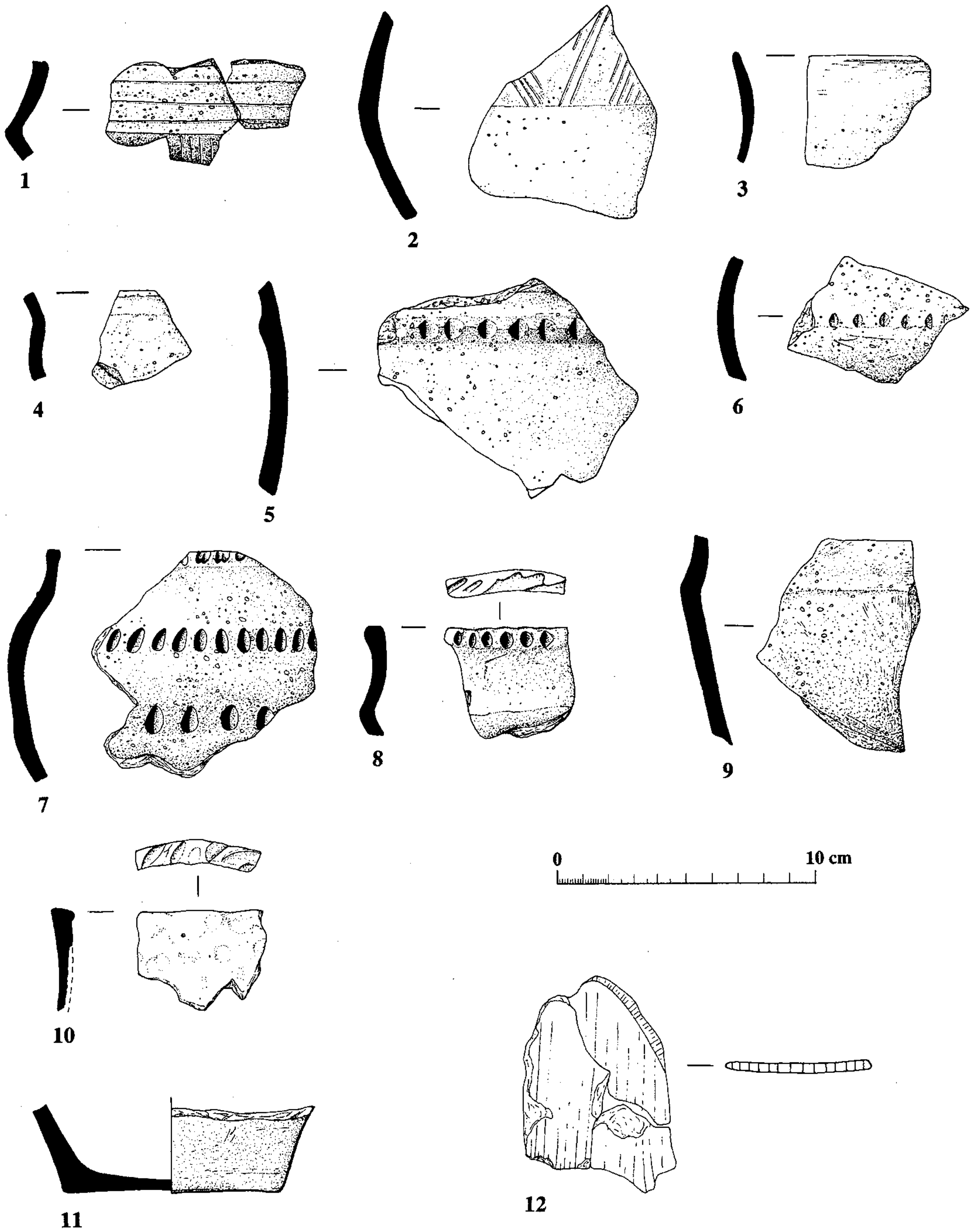

Figure 18. *The pottery assemblage (1-11); 12, fragment of wooden bowl/scoop (T. 7/425)*

within each category. This variability is also seen in the range of fabrics present. Every sherd is made from a slightly different fabric, with varying densities and sizes of fossil shell inclusions.

Fine Ware Communities?

The lack of a reliable chronology for the late Bronze Age and Early Iron Age lies at the heart of problems which surround our understanding of this period in northern East Anglia. As a result of the paucity of major Iron Age excavations in the region since the 1950s, the dating and distribution of its Late Bronze Age and Early Iron Age pottery has undergone little revision since Cunliffe's seminal work of the late 1960s (1968; 1974). His identification of broad stylistic zones, based largely on diagnostic fine wares, remains the main chronological pegs to hang the region's pottery sequence upon – the West Harling-Staple Howe, Fengate-Cromer, Darmsden-Linton and Chinnor-Wandlebury styles (Cunliffe 1974). As such, the Late Bronze Age and Early Iron Age ceramic series is still essentially rooted in only a few key sites such as Fengate (Hawkes & Fell 1945), West Harling (Clark & Fell 1953), Linton (Fell 1953) and Wandlebury (Hartley 1956). Dug to varying degrees of stratigraphic and contextual reliability, few have definite metalwork associations and most are without absolute dates. Establishing detailed and reliable pottery chronologies are key priorities for future work on the Late Bronze Age/Early Iron Age in the region (Bryant 1997); absolute dating of new material and earlier collections is imperative.

This is not the place for a detailed discussion of the chronology and distribution of East Anglian Late Bronze Age and Early Iron Age pottery (see M. Brown 1996, Knight 1984, Hill 1996 and Needham 1996). Although the broad trends identified by Barrett (1980) for southern English Late Bronze Age pottery hold true for the region, local styles, possible conservatism and simply a lack of evidence make close dating a problem. Clear Late Bronze Age traditions are emerging around Peterborough, the central fens and in southern Cambridgeshire (Barrett's 1980 'plain phase' Post Deverel-Rimbury), although details of change in this period, now known to extend from 1200/1100 to 800 BC, are unclear. There are similar problems with the exact details of change within the Early Iron Age (which should now include Barrett's 1980 'decorated phase'). In this period developments within the 'Darmsden-Linton' pottery of south Cambridgeshire, Suffolk and Essex are becoming clearer from recent excavation, but the Fengate-Cromer style still remains elusive. It is probably to this broad tradition and not 'Darmsden-Linton' that the Lingwood assemblage belongs.

A criticism of Cunliffe's approach (and that of his successors) is that it is based only on the current known distribution of a few particular types of fine ware vessel: the clear vessel-types he could use to construct his style zones in the late 1960s (Cunliffe 1968; 1974). This approach was completely justifiable at that time and the search for parallels for a few key diagnostic vessels in an assemblage remains the common approach to dating pottery. It is one that does not involve the whole assemblages of pottery found in the region. 'Complete' assemblages, even this small collection, often contain considerable diversity in vessel form and treatment within the basic categorisation of fine and coarse wares. Whilst it would be useful if angular tripartite, angular bipartite, rounded bipartite coarse ware jars, etc. each individually had a distinct currencies for a short period in the Early Iron Age, this does not appear to be the case. Although broad trends are discernible, a repertoire of basic vessel forms and decorative motifs seems to have been drawn over large areas for several centuries. Without unequivocal dating, it seems more reasonable to suppose that specific features of one assemblage – for example, a preference for a certain jar form or the use of two rows of impressed dots on a shoulder – are not general features of pottery across the region of a particular date. Rather, they are probably local manifestations of this broader tradition and similar features may occur on other sites at different dates. Coarse ware forms may share geographically wide-spread forms and motifs. As Cunliffe's ability to deploy fine ware forms shows, these may have been more geographical restricted in distribution, although still to regions the size of several counties (e.g. 'Darmsden-Linton' bowls). Specific ceramic features may, but not necessarily always, change more rapidly across a region at the same time (e.g. the adoption of the foot ring). But even with fine ware bowls, it is clear that many north East Anglian assemblages were not restricted to a single type of fine ware bowl. The identification of an assemblage as being 'Darmsden-Linton' or 'Fengate-Cromer' may overlook this pluralism of fine wares. The rounded, 'S'-profile bowl represented here, may be the common component of many Early Iron Age assemblages in the region, but these have been overlooked because they are not particularly diagnostic. As such they have not been held to be a peg for its own style-zone. If this was the case then this type of bowl may have had a very long currency as basically similar vessels are common in the Plain Ware Late Bronze Age assemblage from Stonea Grange (Needham 1996).

The range of both coarse and fine ware forms in these assemblages demands explanation. As this small collection shows, at least three different shapes of fine ware bowl were used at the same time. Such diversity could indicate that the same community did not make different types of vessel; the various forms suggesting exchange of pottery between groups. Examples of clearly anomalous and non-local fine wares are present in several Early Iron Age assemblages. There is a single sherd possible from a 'Fengate-Cromer' style vessel from a Darmsden-Linton assemblage at Lofts Farm, southern Essex (Brown 1988), considerably further south than the assumed currency of this type of vessel. The type bowl for the 'Chinnor-Wandlebury' style (Cunliffe 1974) from Wandlebury itself is totally unlike the other fine wares in the assemblage and may have been marked out for special treatment in how it was deposited between three pits on the site (Hill 1996). The closest parallels for it are in southern Hertfordshire, not Cambridgeshire. Equally, at the Langwood Ridge, Chatteris complex, there is a single flared bowl, unlike all others in the assemblage, made from a fabric with limestone inclusions and originating from at least 20km distance (Hill 1995; Evans 1994b). These examples hint at possible wide-scale 'movement' of fine ware bowls and social links between distant communities.

'Exchange' and social networking only partially explains the diversity of forms in these assemblages. The different shapes of coarse wares present at Cottenham and other sites may also reflect such links, although there are so far no clear examples known in non-local fabrics. Another explanation for the range of forms present is that individual potters did not feel constrained by tradition to produce a limited range of forms. A situation might be envisaged where relatively few pots were in use at any one time and few were required annually to replace broken vessels. In such situations, the differences in vessel shape and decoration would be relatively easy to tie to specific people and events: who made or gave a specific pot, and when and why. The lack of standardisation, as compared with Middle/Later Iron Age pottery in the area, might be caused by a desire or need on the part of potters to produce vessels which were clearly distinguishable as made at a particular time and as relating to a distinct person or community. The diversity within the broad categories of fine and coarse ware, far from being an accidental product (or 'noise'), was possibly rooted in the particular organisation and immediate requirements of these communities.

Discussion: Dispersed Settlement Archaeology

Given the occurrence of sherds from Deverel-Rimbury vessels, and the characteristics of the flintwork, the site probably did see both Middle/later Bronze Age and Early Iron Age occupation. The discrete character of these phases is demonstrated by the localised distribution of the early wares within one feature (F. 24 in TS 8) and the fact that struck flint was not a component of the wells' assemblage. This may well be a case of settlement shift inasmuch as defined by inclusion within only one feature (and their status may there be residual), the focus of Bronze Age activity probably lies outside of the immediate site. Equally, that the well complex was backfilled presupposes some degree of continuity of usage/settlement within the vicinity. Given the density of this area's Roman occupation, the occurrence of sherds of this date can be considered 'incidental'. Otherwise, it seems reasonable to assign the remainder of the features to the same Early Iron Age horizon as the Test Station 7 wells (the east-west ditch F. 3 also conceivably relates to the site's Bronze Age usage)

With little cropmark register, it is only in recent years through developer funding that relatively low density, open settlements such as at Lingwood have been regularly found. This kind of dispersed archaeology would have largely been missed by earlier researchers as the recovery of sites of this type requires substantial landscape sampling (and subsequently area-stripping). Given the nature of the site's archaeology, the question arises whether what was investigated is, in fact, a discrete settlement. Obviously its southern half went untested, but does it extend to, and is it continuous with, the eastern Early Iron Age scatter, Site 6? As opposed to the sense of the site as a 'constant' (and the frequent house rebuilding and generally higher finds densities of the Middle/later Iron Age), these later Bronze Age/earlier Iron Age settlements are generally quite sparse. That their houses were rarely rebuilt and settlements themselves not ditch-enclosed, suggests that there was not the same investment in the 'plot' as during ensuing periods.

Like those at Lingwood, large pit-wells are a common feature on later Bronze Age/earlier Iron Age settlements in the region (e.g. Evans 1997a; Evans & Knight 1997 and forthcoming; Pryor 1998). Often waterlogged and holding substantial finds assemblages through backfilling and/or the catchment of occupation refuse, they are, effectively, a 'type fossil' of settlement of the period. In contrast to the more slight settlement architecture of the Neolithic and earlier Bronze Age (e.g. Bruck, forthcoming), they tell of permanent occupation and the guarantee of water resources (Edmonds, *et al*, 1999). The Lingwood well cluster is comparable to those excavated at Storey's Bar Road, Fengate (B3 & W17; Pryor 1978: 26–30, 39–44) and Well 840 at Lofts Farm, Essex (Brown 1988: Fig. 13). Four large stakes were recovered from the latter, one of which had a distinct notch (*ibid.* 293, Fig, 26 & 27). Evidently serving as 'step-ladders', notched logs were also recovered from the larger of the Fengate features (W17; the other had a wattle lining) and recently from a later Bronze Age pit well at Deeping St James, Lincolnshire (Hall & Coles 1994: 94–6; T. Lane pers. comm.). From this it can be inferred that access had evidently to be made down into the pit and that, at least at certain times of the year, the water level lay low within the features (cf. single 'step' stakes to the four-notched ladder from Sutton Common; Parker Pearson & Sydes 1997: 233–4). Yet, it cannot be said that the 'operation' of such wells is understood. In the case of the Lingwood series no obvious/regular structural pattern is evidenced by the surviving stakes. Given their size, it seems unlikely that they supported any above-ground superstructure, and all that can be supposed is that they represent an *ad hoc* attempt to keep organic waste at bay (i.e. trying to achieve 'cleanish' water from basal deposits). If for human consumption, one can only suspect a filthy source with high levels of parasite inclusions (see Note 4).

If the worked Pomoidae fragment was from a ladle or handled scoop, then wooden artefacts recovered from the site fulfil predictions concerning waterlogged goods in later prehistoric contexts (Evans 1989a).[7] A ladle/scoop and wheel are items whose tensile capabilities cannot be rendered in non-organic materials, and it is the same type of objects that have been found on the Flag Fen platform (Taylor in Pryor, forthcoming). In contrast to the expectations of earlier researchers (e.g. Clark & Godwin 1940: 57), organics do not seem to have widely duplicated non-organic objects (e.g. pottery). This is not to say that skin bags and wooden bowls did not occur, but that the results of wetland excavation continue to demonstrate that their frequency may have been over-estimated in relationship to mass-produced ceramics. Any such arguments are biased, of course, by recovery. Nevertheless, presuming 'wet' contexts are representative of the total range of material culture assemblages, then 'organics/non-organics' seem to have been largely mutually exclusive categories.

With a piece of a similar wheel found at Flag Fen and cart ruts at Welland Bank (Pryor 1998), the recovery of the possible wheel fragment from the Lingwood wells (apart from a minor contribution to the prehistory of wheeled transport; Piggott 1983), speaks of movement. This evidence helps to balance an increasing immediate site (-only) emphasis in recent settlement studies; the sense of site as 'universe', an isolated or closed totality without trade and kinship affiliations. Attesting to the fact that people move (with 'things'), the 'little' carts which these wheels transported would have facilitated off-site procurement and inter-settlement exchange.[8]

As discussed above, the inferred evidence of hedges from the Lingwood site corresponds with the results from Meadow Lane, St Ives where a waterlogged riverside Early/Middle Iron Age pit alignment produced much hedge-trimming debris (Pollard 1996). Recent excavation on the later Bronze Age field system at Barleycroft Farm on the Ouse just above its junction with the fen shows that, at least locally, amongst its axial components were double-ditch lines only 1.50m across (Evans & Knight forthcoming). Too narrow to have functioned as droveways and of minor proportions (main ditch, 0.50m wide and 0.30m deep; minor, 0.15 x 0.08m), rather these must relate to hedge-line embankment (Fig. 19). Some of the Fengate axes show a similar configuration of close-paired ditches and minor troughs, and probably also involved hedging (Pryor 1980 & 1996). Collectively the evidence is beginning to suggest the existence of hedged landscapes, possibly by the later Bronze Age and certainly during the earlier Iron Age. The inferred recovery of hedges at such settlements as Lingwood potentially undermines any easy distinction between enclosed and open settlements, and addresses the prominence of 2nd millennium BC land allotment in the region *vis-à-vis* a paucity of 1st millennium systems (i.e. which could have been hedged rather than ditched). Moreover, as a long-term organic 'artefact' hedging could provide a mechanism for the possible fossilised survival of such pre-Roman co-axial field systems as advocated by Williamson (1987) and others (e.g. Oosthuizen 1997).

Apart from the four-poster in Test Station 17, the recovered posthole patterns at Lingwood do not form obviously regular structural patterns. Interpretative recourse could be taken in ubiquitous Flag Fen-like post-alignments (similar dryland alignments have recently been found at Barleycroft Farm on the lower Ouse; Evans & Knight, forthcoming). Yet here this seems more an issue of 'building cognition' rather than non-settlement (-building) modes of site usage. Given the evidence as a whole, the density of finds and range of features, there is every reason to think that this complex was settlement-related: houses must be there, the problem is their recognition.

Usually lacking eaves gullies (Evans 1997a), it is difficult to definitely distinguish regular round building post-patterns in settlements of the period.[9] Whereas the Test Station 10 configuration might well relate to a circular structure, this would not explain the alignments in Trenches II and V. Whilst it is conceivable that they relate to a complicated overlap of four/six-post granaries (or re-set fence-lines), a 'long' rectangular building is a plausible alternative. The basis for this interpretation relates to the recent recovery of long house plans at both Barleycroft Farm (Evans & Knight, forthcoming) and the Welland Bank excavations in south Lincolnshire (Pryor & Lane, forthcoming). Awaiting final radio-carbon results detailed attribution is impossible. The former aisled

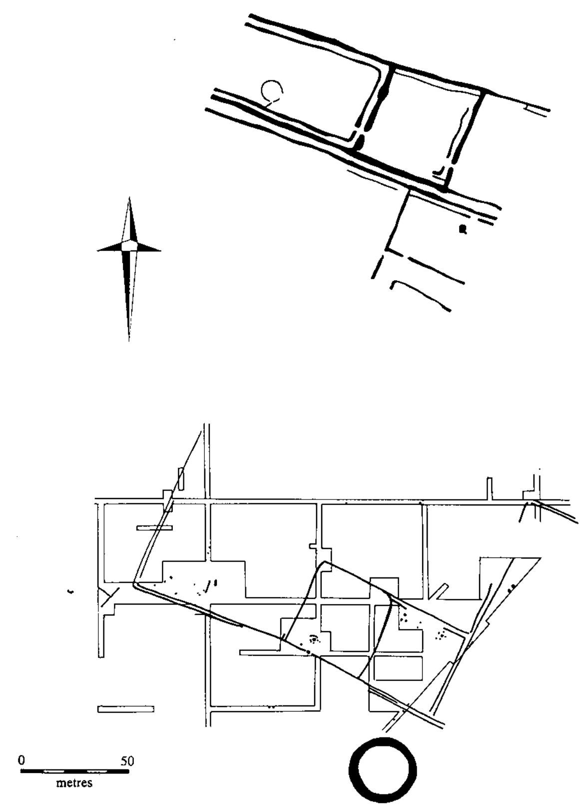

Figure 19. 2nd millennium BC hedged field systems: top, Fengate (after Pryor 1980); below, Barleycroft Farm (see Evans & Knight, forthcoming).

example relates to a re-cutting of the extensive mid 2nd millennium BC field system, though its surrounding enclosure produced Post-Deverel Rimbury wares; the Welland Bank buildings would also seem to be of terminal Bronze/Early Iron Age date. Linear post-settings recently discovered through evaluation fieldwork at the Tower Works, Fengate (3.30/4.00 x 12.00m+) would also seem to be of Late Bronze Age/Post-Deverel Rimbury attribution (Lucas 1997; producing considerable finds assemblages, this complex is the first substantive evidence of field system-contemporary settlement that has been recovered from within the Fengate environs). To this list could be added the later Bronze Age rectangular post structure at Lofts Farm, Essex. 15.50m long, its parallel post lines were only 2.00m across, leading the excavator to speculate whether only the aisle-lines were post-set, the outer wall being screen-like (Brown 1988: 260, Fig. 2). Irregular quasi-rectangular structures were also identified at the later Bronze Age midden site at Runnymede Bridge (e.g. Needham & Spence 1997).

It would be rash to collectively identify these post buildings as some kind of 'longhouse horizon' and only seek continental sources. Although the Barleycroft Farm and Welland Bank examples are long houses and do seem to fit this categorisation, the remainder are probably more appropriately considered rectangular structures, not necessarily houses (i.e. possibly of ancillary function). In reaction to the dominance of the round house tradition in later British prehistory, the existence of rectangular structures has long been postulated based on a few, and often tenuous, examples (see Evans 1989b). Now that such buildings are being found with some frequency we should be wary of the other extreme of considering these settlements only in the light of continentally-inspired long house models. Nevertheless, the recovery of Late Bronze/Early Iron Age sites of this type must be counted amongst the major achievements in later British prehistory over the last decade. Bridging the 'grand' field systems of the 2nd millennium and the 'obvious' domestic-scale enclosure of the later Iron Age, and providing an occupation basis to a major material culture transition (bronze to iron), they clearly have considerable research potential.

Endnotes

1 41 sherds of Late pre-Roman Iron Age/Roman date were recovered, nearly all very abraded. The fabrics are almost exclusively reduced wares and only two fine ware sherds were found, likely Nene Valley kiln products. The date range was restricted, and is largely, if not wholly, to the 1st–2nd centuries AD (the only later sherd being a grey ware dish rim of probable 3rd century or later date). Given the range of fabrics, and the size and condition of the sherds, the material is probably manuring-derived (see Going in Evans 1994a, Appendix III).

Otherwise relevant finds categories are discussed within the text (only six pieces of undiagnostic/unimpressed daub were found and no metal was recovered in stratified context).

2 Averaging only 2.5 pieces of struck flint per 10m², reflective of its limited plough-damage the site's surface representation is low when compared to the test pit densities. As indicated by the test pit-to-topsoil ratios, only 0.57% of its total population lay on the surface; substantially less than the 2–7% usually accredited to fieldwalking representation (Edmonds, *et al.* 1999; A. Brown 1996: 204). These low surface densities raise questions concerning the site's definition. If plough-damage was not uniform then the topsoil densities probably differ according to 'natural'/buried soil topography (i.e. off-'core' slope).

3 See Evans 1997b: 128 and Porter 1969: 61 concerning regional wood folklore associations; see also Garthoff-Zwaan 1987 and Therkorn *et al.* 1984 for ethno-historical wood studies in the Netherlands.

4 In terms of health of the site's inhabitants, although it makes functional sense to have employed hedges to restrict access to the wells, hygiene may not have been an abiding concern. On the one hand, there is the evidence of the Lingwood wells' insects. Whilst their preservation was found to be good in a 400gm sample assessed from the organic basal fill from F.1, the concentration of remains was low. About half the beetles are aquatic species such as *Helophorus brevipalpis* gp. and *Octhebius* sp. which can tolerate stagnant conditions. The terrestrial beetles include *Aphodius* which are likely to have feed on the dung of domestic animals (see Robinson in Evans 1994a, Appendix V). Admittedly much more inferential, a 'logic' of such activity can be established from other sites. In the early 'open' phases of the Haddenham V later Iron Age enclosure pit wells occur in association with the houses. When the site was enclosed by a massive rectangular ditch no wells occurred within its interior (though one in an adjacent yard may have served stock). From this it can only be presumed that the inhabitants took their water from the open ditch, the profile of which was locally 'pooled' (i.e. deeper). Of similar date, the Wardy Hill ringwork also lacked distinct wells (Evans 1992) and it is presumed that the deep ditches of its defensive circuit provided water. It could, of course, be argued that human drinking water was collected from roof run-off, but there has never been any direct evidence of such nor would this account for why in the unenclosed phases of such sites wells occur in association with houses (see Evans 1997a concerning the 'hydraulic logic' of these sites).

5 As a design-type the tripartite disc wheel is long-lived (Piggott 1983: 26). Whereas the Dolonog wheel is dated to 1000–1245 cal. AD (920 + 60 BP; OxA-1975), the Blair Drummond example has been dated to cal. BC 1260–815 (2810 + 85 BP, OxA-3538; Sheridan in Hedges *et al.* 1993: 156).

6 At the 2nd millennium BC sites at Newark Road, Fengate and Barleycroft Farm sheep/goat respectively occur at levels of 11 and 14%, with there being 86% cattle at both (Evans & Knight 1997: 80–2; cf. Pryor 1996). Whereas in a number of recently excavated later Iron Age sites in the region the frequency of sheep/goat is generally much greater: Haddenham V (61%; Evans & Serjeantson 1988); Watson's Lane, Little Thetford (65%), Fen Drayton (71%); West Fen Road, Ely (57%) and Owl End Road, Bury (49%; see Yannouli in Evans, forthcoming b for overview).

7 Relatively few major organic assemblages have been published since the 1989 appraisal (Evans 1989a). Amongst these is that from the Early Iron Age enclosure complex at Sutton Common, where, apart from structural timbers, the only artefact recovered was a notched ladder (Parker Pearson & Sydes 1997). It is not without a degree of self-critique that, in contrast, at the later Iron Age Wardy Hill ringwork on the Isle of Ely (Evans 1992) the only wooden artefact recovered from its desiccated ditch deposits was a metal-decorated wooden stave from what was probably a tankard – arguably a high status 'good'.

8 The apparent frequency of such vehicular transport may also have implications concerning the processes of site abandonment. By such means much more of a settlement's still 'usable' material culture repertoire (e.g. pots and other non-fixtures) may have been removed to new locales; carts may, effectively, have promoted artefact curation (*vs.* what could be carried by hand).

9 The results of recent fieldwork emphasises what an extraordinary building configuration Site II at West Harling, Norfolk was (Clark & Fell 1953). Whilst its interpretation showed the influence of Bersu's excavation of 'great' round houses at both Woodbury and later throughout the Celtic fringe (see Evans 1998 for summary), its double-entrance ditch-surround is without immediate parallel. It is a site which obviously warrants re-appraisal.

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Contents