The Excavation of a Late Bronze Age/Early Iron Age Site at Eight Acre Field, Radley

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SUMMARY

Excavations by the Oxford Archaeological Unit at Tuckwells' gravel pit, Radley, yielded evidence of settlement and land division on the first terrace in the late 2nd/early 1st millennia BC. Finds were few and suggested light or intermittent occupation. Environmental evidence from two waterholes indicated open scrub vegetation succeeded by cattle pasture. Field boundaries of the 1st/2nd centuries AD were also recorded.

INTRODUCTION

This report concerns the excavation and subsequent watching brief carried out by the Oxford Archaeological Unit on a late Bronze Age/early Iron Age site at Tuckwells' gravel pit, Radley (NGR SP 525980) in advance of gravel extraction. The work was funded by Tuckwells and carried out to a specification agreed by the Oxfordshire County Archaeologist. The excavation was undertaken in April 1992, and the watching brief between May of that year and the end of 1993.

The site lay on the first gravel terrace, in a triangle of land called Eight Acre Field which was the field to the south of the scheduled Romano-British settlement at Goose Acre Farm (OX 241) (Fig. 1). The scheduled site lies just beyond the scarp of the second terrace, which here is separated from the lower terrace by a band of Kimmeridge Clay. This acts as a natural drainage course flowing south-west. On the eastern side of the field, the main railway line artificially divides the site from the terrace at Lower Radley. On the western side a ditched field boundary may be a post-medieval drainage feature. A marshy area in the southern tip of the field seems to have been caused by the blockage of this water course by the construction of the railway embankment. The Tithe Map shows it to have originally discharged into the Thames at Thrupp, a little over a kilometre to the south.

ACKNOWLEDGEMENTS

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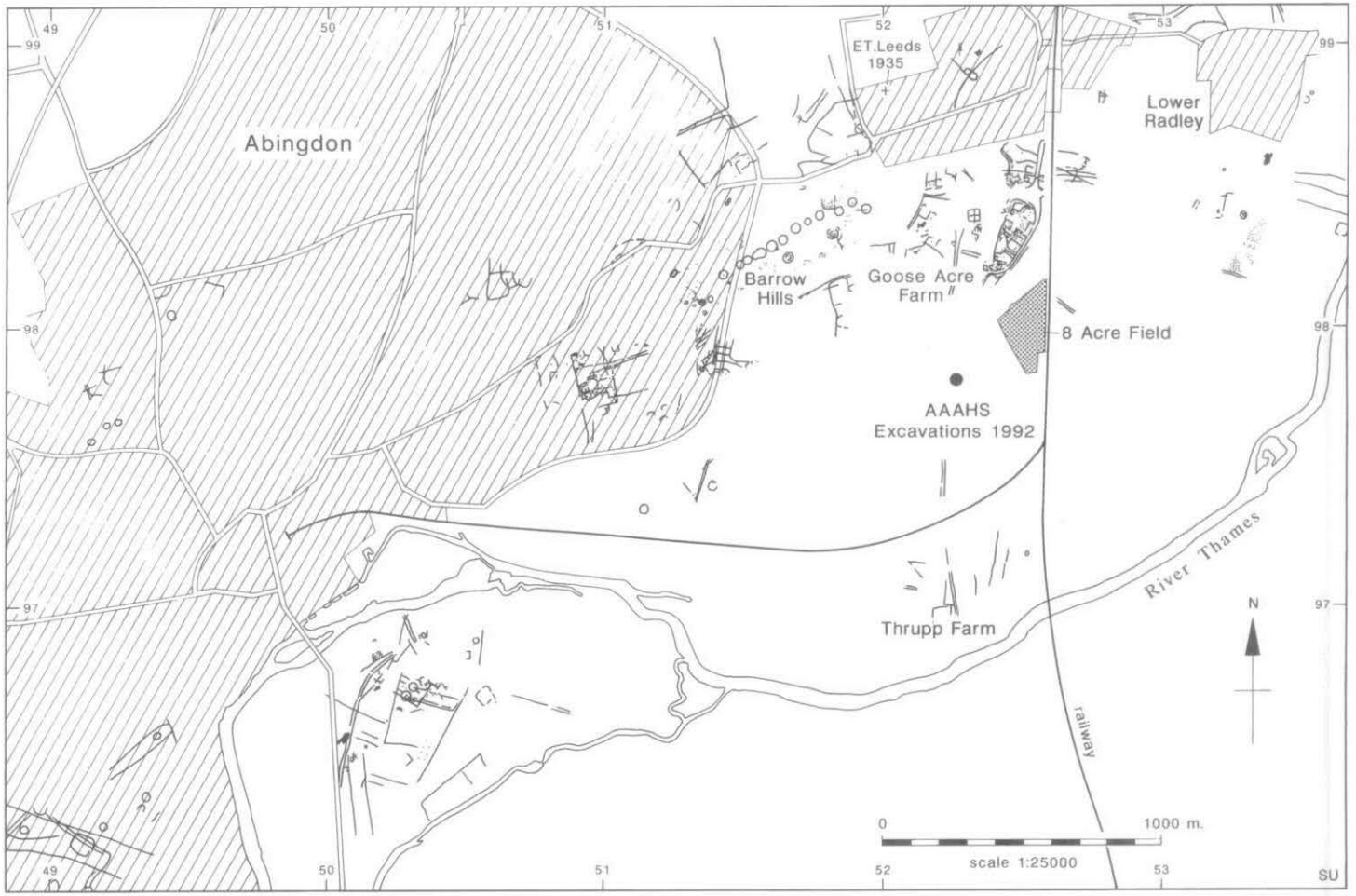

Fig. 1. The site in relation to other cropmarks in the area. The main groups of cropmarks occur on the second terrace.

ARCHAEOLOGICAL BACKGROUND

The terrace here has yielded settlement evidence spanning the Neolithic to the Roman periods. However, little detailed work had been undertaken previously, and what is known about the area has largely come through piecemeal salvage excavations by the Abingdon Area Archaeological and Historical Society.[1] While some sites on the first terrace have been revealed through aerial photography, the soils have generally been unconducive to clear cropmarks. The site at Eight Acre Field was only discovered through trial trench evaluation carried out in September 1990 by the Oxford Archaeological Unit.[2]

The evaluation indicated an extensive Romano-British field arrangement in the northern half of the field, and features suggesting prehistoric occupation in the southern part. An area of about 7,200 sq. m. in the southern part was therefore stripped and examined by excavation (Figs. 2 & 3).

EXCAVATIONS: GENERAL

Under 200–300 mm. of modern ploughsoil, the archaeological features were sealed by a mid-brown silty loam (layer 102). This layer was generally 150–200 mm. thick, but at the extreme southern end of the site it reached 500 mm. This may have been an earlier ploughsoil. Some prehistoric and later pottery and knapped flint was recovered during machine stripping and subsequent cleaning. The absence of an intact early land surface indicated that the archaeological features had been truncated by ploughing to some degree, although the depth of this disturbance was not known.

Features cut a yellowish silty clay which overlay the gravel to a considerable thickness at the southern end of the site but thinned out towards the north. This had to be cleaned largely by hand due to the difficulty of distinguishing archaeological features. The deposit had also been penetrated to a considerable degree by tree-throw holes, which covered large areas of the site and impeded the recognition of archaeological features to a certain extent. Knapped flint was recovered from the surface of, and within, some of these tree holes.

The main archaeological components of the site comprised a penannular gully and two waterholes in the south-east, an area of pits and burnt stones in the western area, groups of postholes, and alignments of prehistoric and Romano-British ditches (Fig. 3). There were generally few finds and the dating of the site relies heavily upon the material in the waterholes, supported by two radiocarbon dates from waterlogged wood contained within them.

Calibrated age ranges are determined from the University of Washington Quaternary Isotope Laboratory Radiocarbon Dating Program, 1987 (CALIB),[3] using the twenty-year atmospheric calibration curve, and the calibrated age ranges, obtained from the intercepts, are expressed at the two sigma level of confidence.

PREHISTORIC FEATURES

Circular enclosure gullies 109/126 & 149 (Fig. 4)

Two sections of curving gully, probably representing a circular structure up to 9.5 m. in internal diameter, with a main entrance to the SE, and perhaps a smaller one on the NW side. Feature 109 was semi-circular in plan. It had a deep (0.53 m.) southern terminal and shallowed towards the north, fading out completely at its northern end.

[1] G. Jones, R. Thomas and J. Wallis, 'Radley, Thrupp Farm', *CBA Group 9 Newsletter*, x (1980), 181; R. Ainslie, 'Excavations at Thrupp near Radley', *South Midlands Archaeology*, xxii (1992), 63–64.

[2] 'Eight Acre Field, Radley, Oxon; Archaeological Assessment' (Oxford Archaeological Unit client report, Oct. 1990).

[3] M. Stuiver and P.J. Reimer, *User's guide to the Programs CALIB & Display* (Quaternary Isotope Laboratory, University of Washington, 1987).

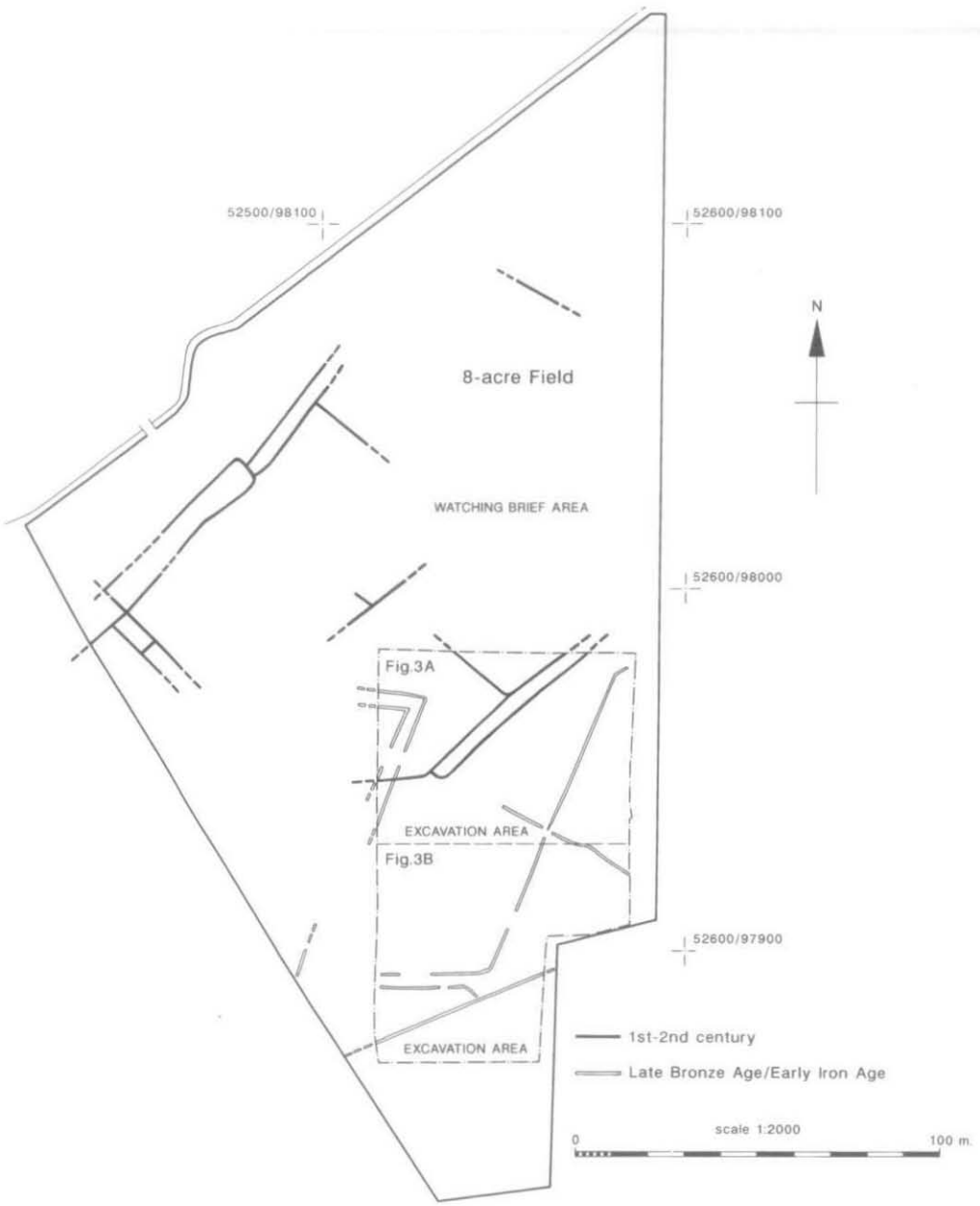

Fig. 2. The main ditches of the early Roman and later prehistoric periods. The plan of the ditches discovered outside the area of excavation during the watching brief is very incomplete.

The circular arc was continued by feature 149 which curved SE from a terminal on the northern side. Its length was not recoverable within the excavation area. If it did have a terminal opposed to 109, the SE entrance gap would be in excess of 2.40 m.

Gully 109 was V-shaped in cross-section with plunging sides. Its width varied from 0.8 m. at the southern terminal, narrowing to 0.25 m. While the gully was certainly deeper at its terminal, this might have been exaggerated by the lesser truncation of deposits at this end. The difference in the height of the gully base at its northern and southern extremes was in the order of only 0.20 m.

A collection of quartzite pebbles was found about half way down in the terminal and a sherd of late Bronze Age hooked-rim jar came from one of the excavated segments.

Gully 149 was 0.45 m. wide and 0.40 m. deep with steep sides and a rounded base. Its greater dimensions suggest that it might not be strictly contemporaneous with 109, and might represent a recut or part of an earlier gully to which 109 was added.

The only other feature which might have formed a part of this structure was a shallow circular posthole (0.30 m. in diameter and 0.13 m. deep) just east of the southern terminal. No internal features were discovered. The absence of internal postholes might be the result of subsequent truncation, or because ground-penetrating foundations were unnecessary to the structure. It seems less likely that the gullies themselves would have served as a foundation trench for upright posts. There was no evidence for post placements within them, and the near verticality of the sides of gully 109, on the south side of the ring, while seeming appropriate for the function of foundation trench rather than eaves drainage, is not a characteristic consistent within this purported structure, since gully 149 was of a markedly different profile.

Ditches 167 and 133

Ditch 167 and its continuation as 133 formed the main axis of the prehistoric land division. It ran NNE–SSW for 68 m with a single break where the cross ditches 163 and 191 abutted it at right-angles. Its form was variable both in plan and section as it was neither truly rectilinear nor consistent in profile. Ditch 167 had a relatively deep (0.44 m.), U-shaped southern terminal, but shallowed to a northern terminal 0.14 m. deep. Ditch 133 was 0.40–0.70 m. wide and 0.24–0.32 m deep with a more or less U-shaped cross-profile. At its northern end it shallowed to 0.14 m. Here it probably cut the upper fills of pits 131 and 132, although the relationship was not entirely clear. No finds were recovered from any of the excavated sections and its dating relies heavily on the evidence from waterhole 141 upon which the ditches were aligned.

Features 163, 191 & 194

These combined features formed a shallow, meandering gully which ran WNW–ESE across the central part of the site. At its eastern end the gully was 0.75 m. wide and 0.22 m. deep with moderately steep slopes and a flat base, but it became broader and shallower towards the west. At its junction with 133 it had little depth or form to it, but a shallow terminal (163/D), which was mirrored on the opposite side of 133 (ditch 191/C), indicates that it respected this major land division. Cut 163/D yielded a single Iron Age sherd. To the west of 133 the gully attained a width of 2–3 m., but it was very shallow (0.10–0.20 m.) with indistinct edges. Near pit 195 the gully had a layer of pebbles (196) on its base extending for at least 3.50 m. long by 1 m. wide. This sealed pit 195. The gully terminated in a diffuse spread of soil which overspilled its edges in the vicinity of feature 172. The gully itself appeared to turn north and be truncated by 172.

Waterhole 141 (Fig. 5, section b)

Feature 141 was a large oval pit measuring 4.60 m. NW–SE by 3 m NE–SW. It was 1.40 m. deep. The sides were generally steep or very steep with a shallower stepped SE side which perhaps served for access. The upper fills consisted of grey, light grey and mottled orange-brown silty clays which overlay cleaner sandy orange-brown edge slumping on the NW side. This in turn sealed a dark grey humic silt containing preserved organic matter. A piece of oak timber from this layer yielded a radiocarbon date of 1680–1420 cal BC (3250 ± 60 BP; GU-3379). Pottery and animal bone were found throughout these fills.

The location of this feature immediately north of the circular enclosure 109/126 with its 'access ramp' oriented towards the possible northern 'entrance' of this enclosure, would appear to indicate contemporaneity. There is nothing to suggest that Feature 141 was anything more than a source of water for domestic use, but its importance is hinted at by the fact that the main axis of land division is aligned on it, and it is respected by both the northern and southern elements of this axis (see Fig. 3).

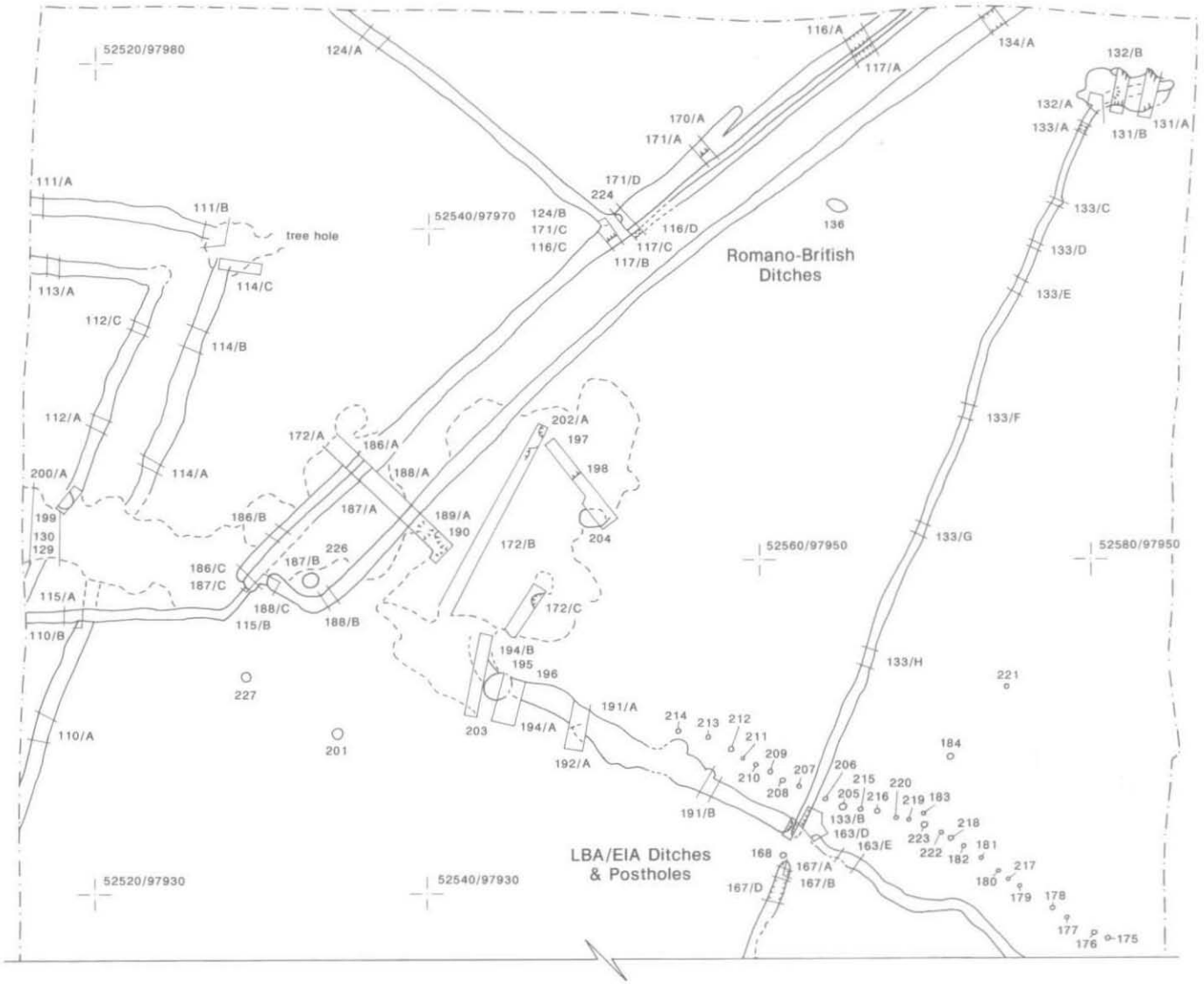

Fig. 3. Site plan showing excavated sections (a).

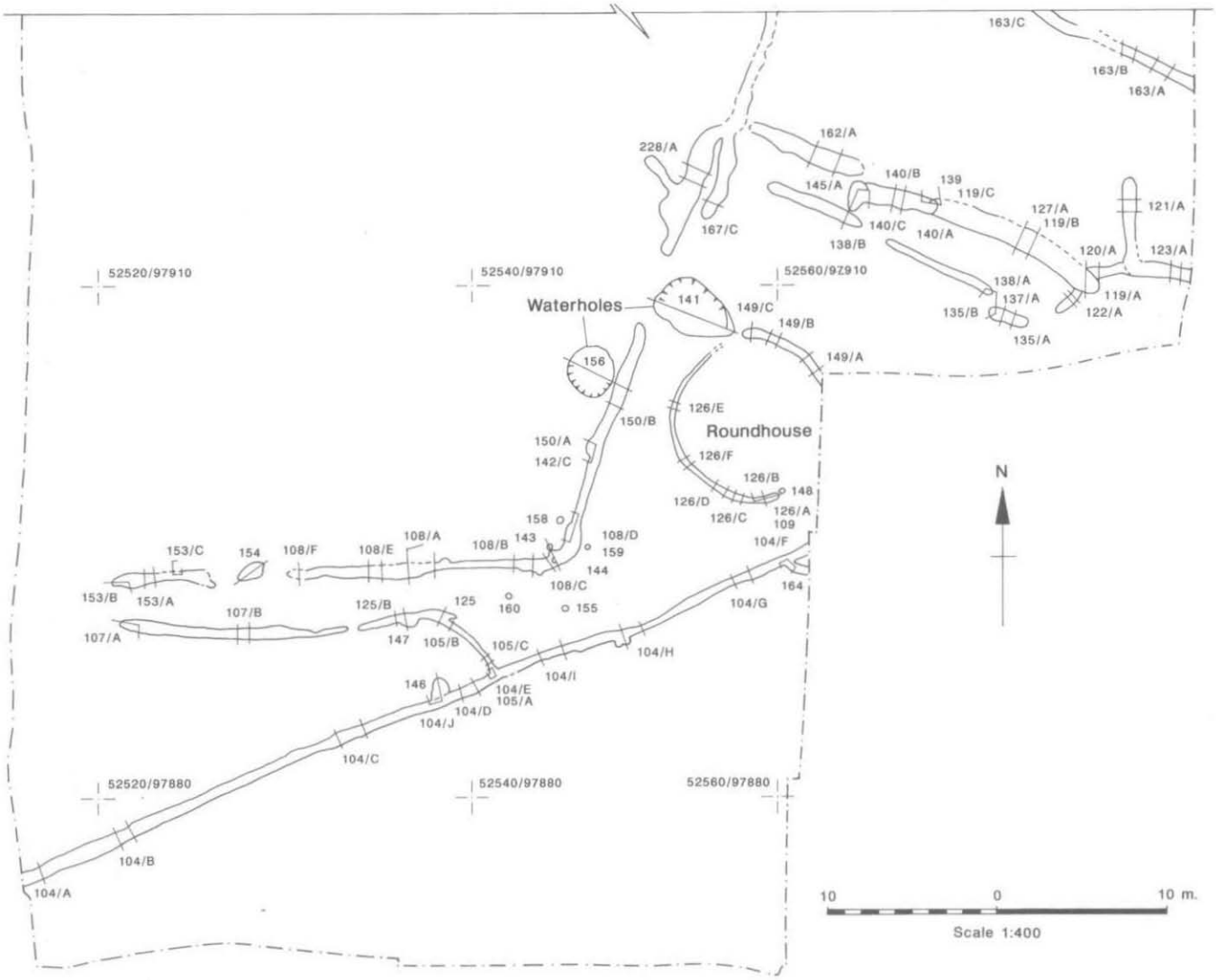

Fig. 3. Site plan showing excavated sections (b).

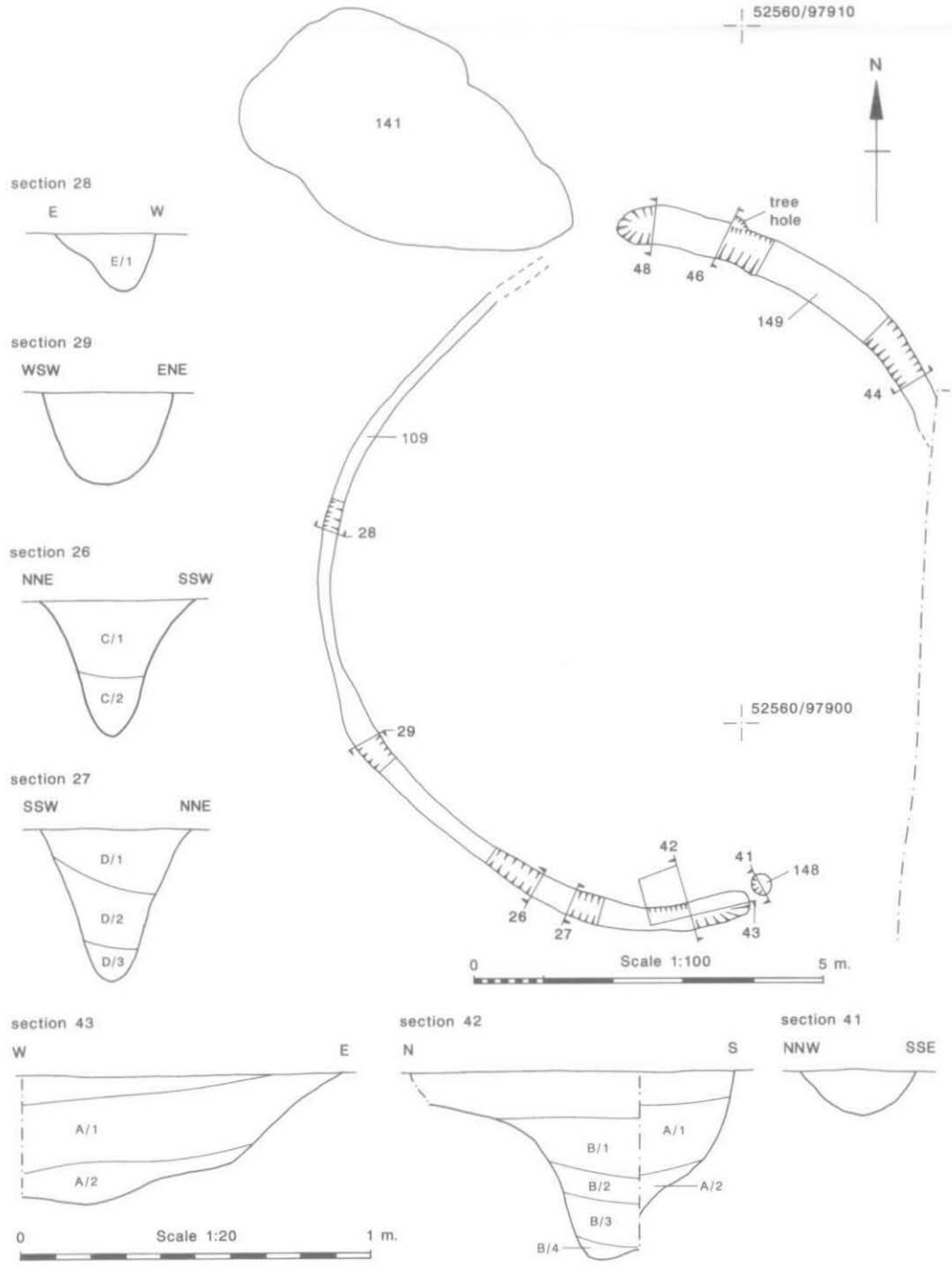

Fig. 4. Plan and sections of the round house.

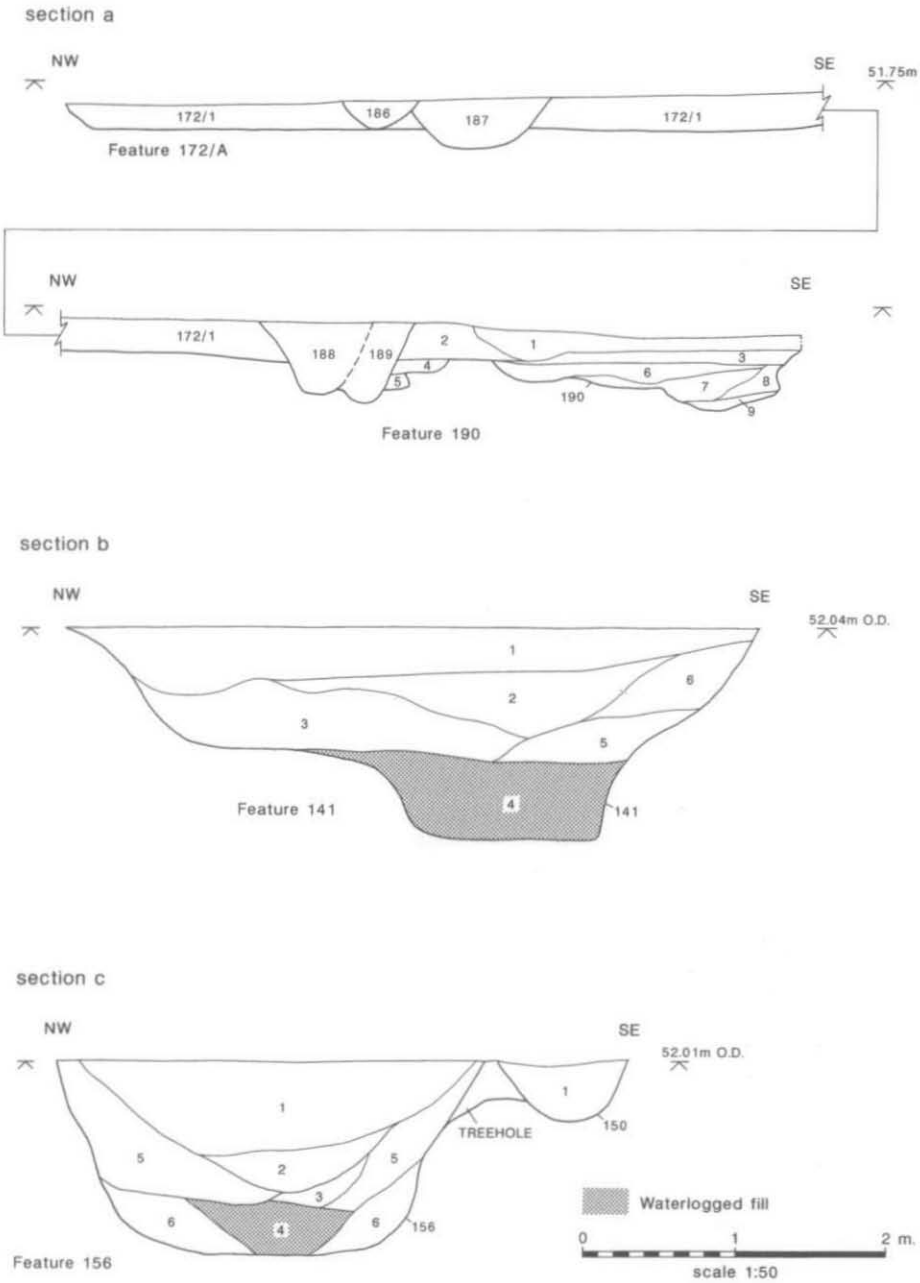

Fig. 5. Section a: Features 172/A & 190; section b: waterhole 141; section c: waterhole 156.

Waterhole 156 (Fig. 5, section c, Figs 6 & 7)

Feature 156 was a large subcircular feature measuring 3 m. N–S by 2.60 m. E–W. It was 1.28 m deep with steep sides and a flattish base. The upper fill was an orangey-brown clay containing relatively large quantities of early Iron Age pottery and knapped flint, the latter perhaps being residual. The second fill was a dark grey clay, into which a small tripartite bowl had been placed with an inverted cattle skull on top (Figs. 6 & 9.2). The bowl was complete and it is unlikely that their deposition was fortuitous. They are interpreted as votive offerings. An adjacent horse tibia and two quartzite pebbles might also have formed part of this deposit. Under this deposit were lighter orangey-grey and bright orange sediments (156/3 & 156/5) which probably accumulated through natural erosion and edge slumping. Beneath these fills the modern watertable was reached. (As with Feature 141, this was at about 1.10 m. below the present surface of the 'natural'). The lowest deposit of this feature (156/4) was a dark grey humic clay which contained waterlogged organic material, including two oak timbers (Figs. 7 & 8; see Maisie Taylor, this report). Both had been worked with simple axe-cut V-shaped notches. The larger piece (SF 180) would have been suitable for use as a simple ladder, and it seems likely that it would have been used to gain access to the pit which, like Feature 141, probably served as a waterhole. The smaller timber (SF 181) would not have been suited to this use as the notches are cut at too shallow an angle to serve as foot-holds. It does not have any obvious function and it might have been transported from its original place of use. It yielded a radiocarbon date of 1020–800 cal BC (2720 ± 70 BP; GU-3378).

Ditches in southern area of site

Feature 104. A rectilinear ditch running ENE–WSW across the full width of the site, a distance of about 50 m. Its width was 0.40–0.50 m. and its depth varied between 0.20 and 0.40 m. It was filled with a clean, light, yellowish-grey sandy silt. It was steep-sided with an uneven base, which was rounded or flattish in cross-profile. Despite some variations in profile, there was no evidence of recutting.

It appeared to cut all the features with which it had a relationship (viz. 146, 105/A, 164/A) and therefore might belong to the latest phase of prehistoric occupation. Its alignment, which is at variance with the general layout of the other prehistoric ditches, also suggests that it belongs to a different phase, and it is possibly a later addition. It yielded a sherd of Iron Age pottery and a few flint flakes.

Features 107, 125 & 105. A rectilinear segmented gully (107 & 125) on an E–W alignment, with a curving ?addition (105) linking it to ditch 104. Feature 107 ran for about 14 m. The shallow, gently sloping nature of its terminals suggested that it would originally have been a longer feature and almost certainly part of 125. Its dimensions were variable, averaging about 0.50 m. wide with a maximum depth of 0.30 m. and a rounded base. Feature 125 was a segment of ditch also shallowing at its terminals. The eastern terminal showed a slight curve to the south, suggesting that if it had extended further east its alignment would have been more southerly. Its width was 0.40 m. and its depth 0.10–0.20 m. Feature 105 was possibly a later addition to 125, but its relationship was not entirely clear from the section. It curved south, terminating at its junction with 104 by which it was cut. It was a very shallow feature (80–170 mm. deep) with steep sides and a flat base.

Feature 108. An E–W length of gully parallel to 107/125 curving north and terminating, possibly to leave an entrance between it and gully 150. It was broad and shallow, but its dimensions were highly variable (0.58–1 m. wide and 0.10–0.29 m. deep) and without a characteristic profile. Its western terminal was confused by tree-roots, but might also have been designed to allow an entranceway between it and gully 153.

Feature 153. A short E–W length of gully in alignment with 108. It was 6 m. long and 0.45 m. wide, reaching a depth of 0.40 m. At its western end it shallowed up gradually and was coterminous with 107.

Feature 150. A section of ditch 8 m. long, 0.85 m. wide and 0.40–0.45 m. deep. It was aligned along the same axis as the north-east part of 108, leaving an entrance to the south, and stopped just short of waterhole 141. Beyond 141 its alignment was taken up by ditch 167.

Feature 142. A length of gully 0.50 m. wide and 0.12–0.20 m. deep running between gullies 108 and 150 and cut by both of them. Its western edge indicated a U-shaped profile, although a complete cross-profile was not examined. It might be an earlier version of 108 and 150, in which case its extensions to the north and south would have been removed by recutting. A possible southern terminal was revealed at 142/B.

Ditches in eastern area of site

Feature 162. A broad, shallow feature running WNW–ESE, about 7 m. long, between 1 and 1.3 m. wide and 0.37 m. deep. Its sides were gently sloping and its base flat though uneven. The upper fill contained a deposit of 25 pebbles which seemed to have been deliberately spread to present a surface 0.40 m. in diameter.

Feature 140. Another broad, shallow feature continuing ESE from 162, but slightly offset to the south. It was 1.50 m. wide and 0.30 m. deep, with a very gradually sloping southern edge and a slightly steeper northern edge. Its base was flattish. Its northern terminal was cut by pit 145, and its southern terminal cut the top of ditch 119.

Feature 119. A deep segment of ditch 11 m. long running WNW–ESE with a slight southerly curve. It was 1.25 m. wide with a maximum depth of 0.55 m. Its terminals were steep. In cross-profile it was slightly asymmetrical, with very steep southern slope and a more moderate northern slope. Section 119/B showed a small longitudinal slot, 150 mm. wide and 7 mm. deep, in the base of the ditch whose interpretation remains unclear. It yielded a rim sherd of probable early-middle Bronze Age date and several flints.

Feature 120. A gully 0.80 m. wide and 0.28 m. deep surviving in a short section between ditches 119 and 123, and cut by both. It had moderately sloping sides and a rounded base. Originally it might have continued the alignment of 123 the east, but to the west it appears either to have terminated or changed direction. Its east-west orientation is at a slight variance with the ditches to the west, and it probably relates to an earlier phase of activity associated with ditch 121/123.

Feature 122. A short section of shallow curving gully to the south of the eastern terminal of 119 and cut by it. It was 0.42 m. wide and 0.18 m. deep with a flattened U-shaped cross profile. It did not appear to the north of 119 and its original form is somewhat enigmatic.

Feature 121/123. A length of ditch 0.80 m. wide and 0.28–0.45 m. deep running south from a terminal and then turning east through 90° to run outside the excavation area. The cross-profile is strongly asymmetrical, with a steep-to-vertical outer edge and an inner slope of 45°. The feature yielded no finds, but its alignment, which is at variance with that of the other prehistoric features, suggests that it is of a different phase. If it represents a recutting of 120, it would be earlier than the main body of the site.

Feature 138. Two shallow sections of gully which were probably originally continuous, running parallel to 162, 140 and 119 for 15 m. Its width was 0.50 m. and its depth 0.20 m., with moderately steep sides and a flattish base.

Feature 135. An elongated pit continuing the alignment of 138 to the SE, but offset to the south. It was 2.40 m. long, with a maximum width of 0.75 m. and a depth of 0.27 m. Its southern side was almost vertical, its northern side steep, and its base flat.

Features in north-western area of site

Features 110, 111 & 114. Ditch sections 0.80–1.1 m. wide and 0.20–0.32 m. deep with moderately sloping sides and a flat or gently rounded base. The precise cross-profiles were difficult to define due to the similarity of the primary fill to the natural. Section 114/B showed that the ditch might have been recut.

Features 112 & 113. Ditch sections about 1 m. wide and 0.19–0.28 m. deep with moderately sloping sides and a flat base.

Together these sections form two parallel ditches 3 m. apart which run NNE–SSW and then turn abruptly west at just under a right-angle. The only finds from any of these ditches were a fragment of animal bone and a flint flake. The nature of their fills, and their parallel alignment to ditch 133/167, strongly indicate a late Bronze Age/early Iron Age date. They appear to be cut by a large tree-root hole (129), and probably also by a tree-root hole at their north-east corner.

Pits in north-eastern area of site

Pits 131 & 132. Two intercutting pits whose mutual relationship could not be determined. Both cut a tree-root hole.

Pit 131 was oval in shape, 3.1 m. E–W by 2.3 m. N–S and 0.45 m. deep, with sides sloping at 45° and a rounded

base. The upper fill contained forty-four flakes of knapped flint and three sherds of prehistoric pottery. Two of these sherds are probably late Neolithic Peterborough Ware, while the other might be later. The lower fill was a dark grey charcoal-rich silt.

Pit 132 was subcircular, 2.35 m. in diameter and 0.65 m. deep, with 45° sides and a subdued V-shaped base. It contained three flint flakes.

These pits appeared to be cut by ditch 133, which, at the point of contact turned sharply east and terminated somewhere in the top of 131. However, neither the course of 133, nor its relationship to 131 and 132, were entirely clear. The flint and pottery suggest a late Neolithic date for feature 131. The later (?early Iron Age) sherd could have been intrusive from ditch 133. There were no other recognisably Neolithic features on the site, and these pits might be associated with activity further to the north and east.

Pit 136. A possible prehistoric pit, oval in plan (1.10 m. by 0.60 m.) and 0.36 m. deep, with a rounded base. It was filled with a dark grey clayey silt and yielded no finds.

Pits in eastern and southern areas of site

There were a number of pits in the eastern and southern areas of the site about which little can be said. *Pit 145* cut the terminal of ditch 140, *Pit 146* was cut by ditch 104 and, nearby, *Pit 147* cut gully 125. *Pit 154* was located between the terminals of gullies 153 and 108. There were no finds from any of these features.

Pits and tree-root holes in western area of site

In the western central part of the site was a large, irregular area (*c.* 40 m. E–W x 15 m. N–S) of mid-grey or grey-brown silty clay. The eastern part of this area (Feature 172) had considerable amounts of burnt flint and quartzite on the surface. The feature(s) was cut by the Romano-British ditches 186, 187, 188, 189 and 115, but appeared to truncate the prehistoric ditches 194/191, 112 and 110/114.

Features 129 & 130. Two N–S slots were excavated by machine towards the western edge of the site. The features were ill-defined both in plan and cross-section, and were interpreted as intercutting tree-root holes. One flint flake and a leaf-shaped flint arrowhead were recovered from 129/A/1.

Feature 172/A (Fig. 5, section a). A trench 10 m. long and 1 m. wide was hand-excavated through this feature perpendicular to the Romano-British ditches 186–189. The feature was 0.17–0.22 m. deep, with natural clay-filled hollows (?root-holes) penetrating deeper, and was filled with a mid-grey silt-clay. Occasional burnt pebbles were found and twelve fragments of early Iron Age pottery.

Feature 190 (Fig. 5, section a). A single feature number was assigned to this complex of shallow, intercutting pits and scoops whose edges could not be defined with any precision. They were filled with grey clay containing varying amounts of sandy orange-brown mottling. Burnt quartzite pebbles and charcoal were found throughout, and early Iron Age pottery came from the lower deposits (190/A/6). Their maximum depth was 0.5 m. No relationship between 190 and 172/A was visible due to the intervening ditches 188 and 189. A consideration of the northern section suggests that 190/A/2 and 172/A/1 are essentially the same deposit, which might then have been cut by features represented by 190/A/1, 190/A/3 and 190/A/6–8. While these features are rather enigmatic, their form and the material within them make it reasonable to interpret them as archaeological rather than natural.

Feature 172/B. Feature 172 was again examined by a hand-excavated trench which was 12.5 m. long and 0.80 m. wide. Under a fairly homogeneous upper fill of grey or grey-brown clay was encountered a complex of scoops and hollows of varying forms whose relationships could not be disentangled. They were filled with quite variable deposits of grey, grey-brown and orange-brown sandy silt clay, suggesting either *in situ* disturbance or deliberate back-filling. Burnt quartzite pebbles were found throughout.

Only one feature could be interpreted with any confidence as archaeological (Feature 202). The other features might be attributable to root disturbance, although it can be noted that eleven sherds of Iron Age pottery came from 172/B/3 and it is possible that this feature (and perhaps others) are archaeological.

Feature 202. This was a ?circular pit about 1 m. in diameter and 0.30 m. deep. It had steep, asymmetrical sides and a flattish base. It appeared to be overlain or truncated by 172/B/2. It contained three early Iron Age sherds.

Feature 172/C. This was a hand-excavated trench 3.50 m. long by 0.80 m. wide. As in sections 172/A and 172/B the feature was irregular in depth, reaching a maximum of 0.36 m. at the NE end, and filled largely with a grey-brown clay. The deposit contained two patches of charcoal and burnt pebbles (172/C/2) but neither were contained within discrete features. It seems probable that they were redeposited. No finds were recovered.

Feature 172/D. A machine-excavated trench 6 m long and 0.60 m wide cleaned by hand. It revealed two relatively deep intercutting features at the NW end (197 & 198) and a smaller pit (204) at the SE end. These cut 172/D/1 which was only revealed in a small section. Seven sherds of Iron Age pottery came from feature 197.

Other pits in west-central area

Feature 201. A very shallow, flat-bottomed feature. It was oval in shape (0.70 m. E–W x 0.50 m. N–S) and just 80 mm. deep. It contained some burnt pebbles and charcoal flecks.

Feature 227. A small circular pit or a posthole 0.48 m. in diameter and 0.2 m. deep. There were no finds.

Feature 226. An oval pit (0.90 m. NNE–SSW x 0.80 m. NNW–SSE) with almost vertical sides and a flat base. It was 0.20 m. deep and contained some burnt flint.

Feature 195. A large, circular pit, 1.50 m. in diameter and 0.85 m. deep which was sealed by a layer of cobbling under Gully 194. It contained no finds except a flint blade, but it is considered likely to have been Iron Age in date. A sample of charcoal taken for identification from the upper fill comprised mostly sloe (see M. Robinson, this report).

Postholes

Row of postholes parallel to gully 163. A row of twenty-eight postholes (Features 173–182, 205–220 & 222–223) was discovered running north of, and parallel to, gully 163. They were of a quite consistent size, being generally 0.20–0.30 m. in diameter and between 140 and 290 mm. deep (modal average 250 mm.). They were quite evenly, although not precisely, spaced. The modal average distance between posts was 1 m., and in twenty-two cases (out of twenty-seven) the spacing was between 0.70 and 1.40 m. The remaining five spaces, which were between 1.70 and 2.40 m., suggest that posts were 'missed out' of the standard arrangement. The postholes follow a slightly sinuous line, almost precisely mirroring the course of ditch 163 to the SE. They are readily interpreted as representing a fence-line contemporaneous with the ditch.

Feature 168. A small, shallow feature (0.32 m. in diameter and 140 mm. deep) near the northern terminal of ditch 167. A possible posthole.

Postholes in southern area of site. There were six possible postholes (Features 143, 144, 155, 158, 159, 160) in the southern area of the site. They suggest minor structures here (e.g. fences, gates) but do not form an interpretable pattern.

ROMANO-BRITISH FEATURES

The Romano-British component consisted of long rectilinear ditches at the northern end of the site. The main axis of alignment was NE–SW and NW–SE, although a shallow ditch at the southern end of the alignment (Feature 115) ran E–W. The alignment of these ditches was generally at variance with the main axes of the prehistoric land division and the Romano-British ditches differed from the prehistoric ones in tending to have darker, browner fills. For this reason it is considered unlikely that any of the technically undated features on this site belong to the Romano-British period, and that the Romano-British activity on the site was quite limited.

While the pattern of ditches was essentially quite simple, they had been subjected to various episodes of re-digging, suggesting both reiterations of, and modifications to, the original layout. The concordance of the excavated sections, and therefore the precise phasing of this activity, could not be resolved unequivocally. What follows is the most plausible interpretation.

Earlier Phase

Feature 115. This was the smallest of the ditches, being 0.55 m. wide and just 0.15 m. deep with a shallow U-shaped profile. From the western edge of the site it ran east before turning NE in the alignment of the later ditches. It cut the prehistoric ditch 110, and was cut by the terminal of ditch 187 of the later Romano-British arrangement. There were no finds.

Feature 117. A shallow ditch at the northern end of the site running NE–SW and representing the earliest phase of the ditch alignment in this area. It was truncated by 116/C and might belong to the same phase of activity as Feature 115 (above).

Middle Phases

Features 116, 170, 171, 186 & 187 comprised the various phases and sections of a ditch on a NE–SW alignment which ran NW of, and parallel to, ditch 134/188/189. Feature 124 ran perpendicular to this and seems to represent a single phase of digging.

Feature 171/A, 116/C & 187. This was a comparatively broad ditch and a little over 40 m. long, cutting both 115 and 117. Its full width was not precisely defined due to truncation by later recuts. However, at section 171/A it was probably about 1.20 m. wide, with a depth of 0.25 m. and at its terminal 0.80 m. wide by 0.20 m. deep. It had a rounded, rather uneven base.

Feature 116/A, 170/A & 116/D. The dimensions and cross-profiles of these ditch sections were rather variable; the widths were between 0.50 m. and 0.90 m. and the depths 0.28–0.35 m. The ditch might have continued SW to become Feature 187, but it is perhaps more likely that it terminated, or turned a right-angle to become Feature 124, although neither alternative was demonstrated in the excavation.

Feature 124. This ditch was 0.65 m. wide and 0.22–0.30 m. deep with an asymmetrical, bowl-shaped cross profile. It was cut by ditch 171/C. It might have terminated at the junction with 116/D, or alternatively it might represent a continuation of that ditch, notwithstanding a difference in cross-profile.

Feature 171/C, 171/D & 186. This represents the latest recut of the NE–SW ditches and is traceable from a SW terminal to just beyond the junction with 124. Its width varied from between 0.50 m. and 0.65 m., and its depth from 0.18 to 0.32 m. Since the relationship between 186 and 187 is not clear, it is possible that 187 is, in fact, the later, and represents a continuation of 171.

Latest Phase

Feature 134, 188 (189). This ditch was between 0.75 m. and 1.1 m. wide, with a depth which varied between 0.26 m. (section 134) and 0.50 m. (section 189/A). The profile was generally U-shaped, but flatter in section 134. The ditch was long and straight with a right-angled bend at its southern end. It was probably a later addition to the ditches lying to the NW – an observation which can be deduced both from the way in which the southern terminal respects ditch 186, and from the way in which it follows closely the alignment of the ditches to the NW, which do not, in fact, follow a straight line but a slight curve. In the case of these earlier ditches this appears to have resulted from recutting, and perhaps extending, the ditch system. In the case of this latest phase it is clear that any recutting that did take place did not involve changing the ditch alignment. The only evidence for recutting comes from section 188/189/A.

It can be noted that this interpretation implies that the middle and later 'phases' of ditch, while dug sequentially, were likely have been in use and backfilled at the same time.

WATCHING BRIEF RESULTS

A watching brief was maintained from the end of the excavation until the end of 1993 while topsoil stripping and gravel extraction were carried out. The prolonged and intermittent nature of these operations, combined with conditions generally unfavourable to archaeological recording, meant that recording was patchy and this probably

accounts for the lack of archaeological features encountered. Little new information was gained concerning the prehistoric occupation. Several Romano-British ditches of two or three phases were located in the northern part of the field on a similar alignment to those found in the excavation. They could only be partly traced. The two parallel ditches aligned NE–SW appear to be the same as those found crossing the northern part of the field in the evaluation. Finds were sparse but five sherds, added to the seven recovered in the evaluation, suggest a 1st to 2nd-century date.

THE FINDS

PREHISTORIC POTTERY by ALISTAIR BARCLAY

Introduction

The excavation produced a total of 167 sherds/1496 g. of pottery and one complete but broken vessel (Table 1). The material is mostly of Iron Age date (137 sherds/ 743 g. & vessel P2) but also includes small quantities of Neolithic (10 sherds/6 g.) and Bronze Age (7/47 g.) material and part of a later Bronze Age vessel (13 sherds/700 g. = P1). Few forms are present and the majority of the pottery consists of plain body sherds.

Fabrics

The fabrics have been recorded with the aid of a binocular (× 20) microscope and have been characterized by their principal inclusions into fabric groups. Fabric codes:
A = sand, F = flint, G = grog, Q = quartz/quartzite, S = shell.

Q1/Neo: hard, flaky, sparse ill-sorted sub-angular quartzite (white, pink and colourless) (< 4 mm.) and sparse coarse sand.
F1/BA: hard, ill-sorted, moderate to common mostly coarse sub-angular flint (< 4 mm.).
F2/BA: hard, ill-sorted, common sub-angular flint (< 4 mm.).
GAQ1/BA: soft, common grog (< 3 mm.), sparse to rare coarse sand (quartz) and rare angular white quartzite (< 3 mm.).
S1/BA: soft, moderate shell platelets (< 10 mm.).
A1/IA: hard, coarse sub-round quartz (< 1 mm.).
A2/IA: hard, medium-coarse sub-round quartz (0.5–1 mm.).
A3/IA: hard, fine to medium sub-round quartz (0.25–0.5 mm.).
A4/IA: soft, fine quartz (< 0.25 mm.).
S1/IA: hard, moderate coarse shell (< 10 mm.).
SA1/IA: hard, moderate shell (< 8 mm.), sparse quartz sand and ferruginous pellets.
SA2/IA: hard, moderate fine shell (<2 mm.), sparse quartz sand.

Fabric, manufacture and decoration

The Neolithic and earlier Bronze Age fabrics are characterized by inclusions of quartz/quartzite (Q1/Neo), flint (F1–2/BA) and grog GSQ/BA). The later Bronze Age fabric (S1/BA) contains inclusions of coarse crushed shell platelets. The Iron Age fabrics are characterized by inclusions of quartz sand (A1–4/IA), moderate shell (S1/IA) and an admixture of the two (SA1–2/IA). The sandy fabrics have probably been modified to exclude naturally occurring coarse inclusions although rare large inclusions of flint still occur. The Iron Age clay matrices also contain ferruginous inclusions which probably occur naturally.

Evidence for manufacture is slight. A number of ring joins were observed, especially in a base sherd from context 102. All of the sherds derive from vessels which had been hand-built and open-fired.

Decoration and surface treatment is very rare in both the earlier and later material. Only one earlier prehistoric

TABLE 1. A QUANTIFICATION OF ALL PREHISTORIC POTTERY BY FABRIC AND CONTEXT

Context	*Fabric (number of sherds, weight g.)*											
	Q1/Neo	F1/BA	F2/BA	GAQ1/BA	S1/BA	A1/IA	A2/IA	A3/IA	A4/IA	S1/IA	SA1/IA	SA2/IA	Total
102		1, 20g.	1, 5g.			10, 36g.	4, 9g.	3, 13g.	1, 2g.				20, 85g.
109/D/1		1, 5g.											1, 5g.
119/B/1				1, 10g.									1, 10g.
131/A/1	10, 6g.					1, 3g.							11, 9g.
141/A/3–4					13, 700g. (P1)								13, 700g.
156/A or B/1–5						P2 & 31, 30g.		6, 28g.	5, 9g.	11, 37g.	18, 310g.		71, 414g.
163/D/1									1, 1g.				1, 1g.
172/A & B/3									23, 115g.				23, 115g.
190/A/6						16, 95g.							16, 95g.
197/A/1												7, 55g.	7, 55g.
202/A/1					3, 7g.								3, 7g.
TOTAL	10, 6g.	2, 25g.	1, 5g.	1, 10g.	16, 707g.	58, 164g.	4, 9g.	9, 41g.	30, 127g.	11, 37g.	18, 310g.	7, 55g.	167, 1496g. & P2

sherd is decorated, the rim from context 131/A/1, which has horizontal rows of end-to-end impressed finger-nail. From the later material, a shoulder sherd decorated with a large impressed dimple is of early Iron Age character.[4]

Surface treatment in the form of smoothing and burnishing occurs on a number of Iron Age sherds (waterhole 156) manufactured from the sandy fabrics S1 and S3.

Forms

Few forms can be identified. A decorated Neolithic rim sherd (pit 131) in fabric Q1/Neo is probably from the collar of a Fengate Ware vessel. A rim from context 119 manufactured from fabric GAQ1/BA and a base sherd manufactured from fabric F1/BA are probably from simple bucket-shaped vessels of Deverel-Rimbury type. Vessel P1 (Fig 9.1) is a type of hooked-rim jar and a simple hooked rim (gully 109) is from a similar vessel form. The early Iron Age material is represented by at least three fine angular vessels from contexts 102, 156 and 190 including a complete, angular tripartite bowl (Fig 9.2) and a rim from waterhole 156, and part of a tripartite jar with a round shoulder from context 190. A number of coarse ware sherds from waterhole 156 in shelly fabrics (S1/IA & SA2/IA) have round shoulders that come from jars of early Iron Age form. A fragmentary strap handle in fabric A4/IA cam from context 172/B/3.

Discussion

Neolithic activity is represented by the rim fragment of Fengate Ware from pit 131. The rim was both abraded and fragmentary and could have been residual. Within 2 km. of the site Fengate Ware has been recorded from the Abingdon causewayed enclosure[5] and from Barrow Hills, Radley.[6]

Bronze Age activity is represented by the simple rim from ditch 119 from a bucket- or jar-shaped vessel of early to middle Bronze Age date, and by two flint-tempered sherds from layer 102 which are very similar in fabric and appearance to the Deverel-Rimbury material excavated 1 km. to the north-west at Barrow Hills, Radley.[7] The house gully, context 109/D/1, produced a single rim sherd from a hooked-rim jar and an abraded sherd in the same fabric comes from tree hole 118. The hooked-rim jar (Vessel P1) is a common late Bronze Age form and similar vessels were excavated by Leeds at Radley, 500 m. north of Goose Acre Farm[8] and at Chastleton Camp.[9] Vessels of hooked-rim form are a common component of late Bronze Age 'plain ware' assemblages in the Thames Valley.[10] Radiocarbon determination GU-3379 from waterhole 141 has a two sigma range of 1680–1420 cal BC which spans the early to middle Bronze Age. This date is too early for hooked-rim jars, as it is generally accepted that such vessels appear after 1200 cal BC.[11]

Early Iron Age pottery was recovered from contexts 102, 104, 156, 163, 172, 197 and 207. Approximately sixteen sherds, including the dimple-decorated shoulder, in sandy fabrics (A1–4/IA) and a rim in a leached shell fabric, were recovered from the subsoil layer 102. This layer also contained three grog-tempered sherds of late Iron Age date and a Saxon sherd.

[4] cf. G.H. Lambrick, 'Pitfalls and Possibilities in Iron Age Pottery Studies – Experiences in the Upper Thames Valley' in B. Cunliffe and D. Miles (eds.), *Aspects of the Iron Age in Central Southern Britain* (1984), 162–78, Fig. 11.4, motif 1.

[5] H. Case, 'The Neolithic Causewayed Camp at Abingdon, Berks', *The Antiquaries Journal*, xxxvi (1956), 23 & Figs. 35–7.

[6] R. Cleal, 'The Prehistoric Pottery' in A. Barclay and C. Halpin, *Barrow Hills, Radley, Oxfordshire, Volume 1: The Neolithic and Bronze Age Monument Complex*, Thames Valley Landscapes series monograph (forthcoming).

[7] R. Cleal, op. cit. note 6.

[8] E.T. Leeds, 'An Iron Age site near Radley, Berks', *The Antiquaries Journal*, xi (1931), 399–404.

[9] E.T. Leeds, 'Chastleton Camp, Oxfordshire, a Hill-fort of the Early Iron Age', *The Antiquaries Journal*, xi (1931), 382–98.

[10] J. Barrett, 'The Pottery of the Later Bronze Age in Lowland England', *Proc. Prehist. Soc.* xlvi (1980), 306–9.

[11] cf. J. Barrett, op. cit. note 10, 308; S. Needham and J. Ambers, 'Redating Rams Hill and Reconsidering Bronze Age Enclosures', *Proc. Prehist. Soc.* lx (1994), 235–6.

Waterhole 156 contained the greatest quantity of Iron Age pottery consisting of vessel P2 and seventy-six sherds/449 g. This feature group includes both sandy fine wares and shelly coarse wares. Apart from the vessel P2 and a rim, the material was very fragmentary, consisting mostly of plain body sherds. The rim was in a much better condition than vessel P2, which in contrast had been deposited in a rather worn state. The similarities in vessel forms and fabrics between the sherds recovered from layers 1–5 would indicate that they were discarded during a single phase of occupation. The quantity of pottery decreased with depth, and this may indicate that after the waterhole went out of use it was backfilled with refuse. Fine tripartite bowls were recorded from a settlement site to the north of Eight Acre Field.[12]

Radiocarbon determination GU-3378 from waterhole 156 has a two sigma range of 1020–800 cal BC. The dated material was stratified beneath the lowest deposit of Iron Age pottery. This determination is likely to predate the early Iron Age tripartite vessels from the fill of the waterhole and could be contemporary with the hooked-rim jars discussed above.

Catalogue

P1. Context 141/A/3 and 141/A/4. Late Bronze Age. Twenty-six sherds/700 g. from a hooked-rim jar. Fabric: S1/BA; Colour: exterior: pale brown; core: dark grey; interior: dark grey. Condition: fair to good.

P2. Context 156/A/2. Early Iron Age. An almost complete but fragmentary fine tripartite bowl with a possible omphalos base. Fabric: A1/IA. Colour: exterior: grey; core: grey; interior: grey. Condition fair to poor.

ROMAN POTTERY by PAUL BOOTH

Only twenty-five sherds of Roman pottery, weighing 217 g., were recovered in the excavation, and a further five sherds during the watching brief. None need have been later in date than the 2nd century, and a mid 1st to mid 2nd century date could cover all the material. There were single sherds of a fine white ware, black-burnished ware and a grog-tempered 'Belgic type' fabric. Oxidized and reduced coarse wares (respectively nine and thirteen sherds) made up the bulk of the material. The black-burnished ware sherd was the only non-local fabric and all the rest could be considered local products. The only vessel types represented by rims were two jars and two possible flanged bowls/dishes. A sandy reduced ware jar was comparable to Young's type R15.2.[13] The other rims, in oxidized fabrics, were not closely assignable to individual types.

Ten of the sherds came from unstratified or indeterminate contexts. The remainder were from components of the rectilinear ditch system at the northern end of the site. In the excavated area these features were divided into early, middle and late phases. The early phase ditches produced no pottery. There is no clear chronological distinction between the material in the middle and late phase ditch fills. They were therefore fairly closely contemporary and probably filled in the 2nd century. The pottery is not sufficiently plentiful to indicate the immediate proximity of an early Roman settlement.

THE WORKED FLINT by PHILIPPA BRADLEY

Introduction

A small assemblage of 227 pieces of struck flint, four pieces of burnt unworked flint and a quartzite pebble was recovered. The assemblage consists mainly of unretouched flakes; therefore dating largely

[12] E.T. Leeds, op. cit. note 8, 399.
[13] C.J. Young, *Oxfordshire Roman Pottery* (BAR xliii, 1977), 211.

relies on those technological aspects of the material which may be regarded as chronosensitive.[14] The pottery and radiocarbon dating indicates that the majority of the lithic assemblage appears to have been redeposited.

The Assemblage

The composition of the assemblage is summarized in Table 2.

Raw Material

Two types of raw material were used; a fairly good quality flint, dark brown with an unweathered chalky cortex and a less good quality flint, frequently orange, yellow or brown with a thin, stained cortex. The better quality flint is probably from the Upper Chalk of the Berkshire Downs to the south or the Chilterns to the south-east. The second type of flint may have been available more locally in the river gravels. Approximately 60% of the assemblage was made from chalk flint, 23% was gravel flint and the remainder was indeterminate (mainly burnt flint). Generally, the assemblage exhibits light to medium cortication, although a few pieces were heavily corticated.

Few diagnostic types were recovered. The retouched element of the assemblage is summarized in Table 3.

Leaf-shaped arrowheads are traditionally regarded as earlier Neolithic; however, early Bronze Age dates are attested.[15] None of the other retouched pieces are of particularly diagnostic form although the broken scraper from 102 may be Bronze Age.

Technological aspects can, however, provide some tentative dating evidence. The majority of the assemblage has been soft hammer struck (diffuse bulbs of percussion and narrow butts). Previous blade scars and proximal abrasion could be noted on many flakes. Approximately twenty flakes were blade-like. There was also some attempt at raw material conservation, attested by the core rejuvenation flakes (one reused as a blank for a scraper) and the reduced multi-platform flake core from feature 104. A Neolithic date for the material would not be out of place. The leaf-shaped arrowhead and the technological aspects of the assemblage may indicate an earlier Neolithic date, although, as noted above, any dating evidence should be regarded with caution.

The flint seems to be fairly evenly distributed, only three features producing any quantity (131–132, 156 and 166). Knapping debris seems to have been deposited in feature 166 (a tree-hole) and many tiny chips and

TABLE 2. ASSEMBLAGE COMPOSITION

Flakes	Irregular Waste	Chips	Core, Core Fragments	Retouched Forms	Burnt Unworked Flint	Other	TOTAL
162 (inc. 2 core rejuvenation flakes)	9	45	3	8	4	1	232

TABLE 3. RETOUCHED FORMS

Backed Knives	Scrapers	Leaf-shaped Arrowhead	Retouched Flake	TOTAL
2	2 side (1 burnt, 1 on a core tablet) 1 end scraper (burnt) 1 broken scraper	1	1	8

[14] As discussed by R. Holgate, *Neolithic Settlement of the Thames Basin* (BAR cxciv, 1988); A. Brown, 'Structured Deposition and Technological Change among the Flaked Stone Artefacts from Cranborne Chase', in J. Barrett, R. Bradley and M. Hall (eds.), *Papers on the Prehistoric Archaeology of Cranborne Chase* (Oxbow Mono. xi, 1991).

[15] H.S. Green, *The Flint Arrowheads of the British Isles* (BAR lxxv, 1980).

fragments of cortex were recovered. No refits could be found, although this material would seem to be from the same nodule. Some recovery biases are apparent; for example, the fill of feature 166 was sieved and thus produced the majority of the chips (forty-three out of a total of forty-five). Features 131 and 132 contained forty-four and three flints respectively. Interestingly *c.* 81% of the pieces recovered were burnt, including a large cobble of chalk flint weighing 526 g. The degree of burning was varied, many pieces being only lightly burnt. The majority of the burnt pieces were flakes, only three were unworked fragments of flint (including the large cobble).

Waterhole 156 produced eleven pieces of flint of earlier Neolithic character. It seems that this material is redeposited. The rest of the assemblage also appears to be redeposited in late Bronze Age/Iron Age features.

Discussion

Although the dating of the assemblage must remain tentative, a Neolithic date would not be out of place for the majority of the material. The material from the intercutting pits 131 and 132 is of some interest. The flint from these features was almost exclusively chalk flint and thus represents a significant amount of good quality raw material. Elsewhere in the assemblage there appears to be some concern to reduce raw material consumption. This deposit may therefore reflect a special or specific activity. Neolithic activity is well documented in the area.[16] Earlier Neolithic flint has been recovered at Barrow Hills[17] and the Abingdon causewayed enclosure.[18] The flint assemblage from Eight Acre Field provides further evidence for domestic activity in the vicinity of major monuments.

THE WORKED WOOD by MAISIE TAYLOR

Log ladder (Sf 180)

Quercus sp. oak log with shaped end and two large notches, broken across upper notch. The notches were cut with one flat surface to be used as a foot-hold.

The log had twelve growth rings and was probably taken from a tree felled around mid-summer. The log itself was almost certainly taken from a branch of a substantial tree rather than from the trunk. The main evidence for this lies in the slightly eccentric growth rings, the twisted grain and a side shoot growing at an unusual angle. The bark survives on one side but was worn on the edge of the 'step'. The log was roughly sharpened at one end or, more likely, roughly cut from a trunk. The first notch was cut with the flat surface exactly 420 mm. from the pointed end at right-angles to the trunk just beyond the centre. There were many partial tool marks in the notch and one which was complete and clear on the upper face. All the partial tool marks were of a similar curvature to the complete one and none were wider than 40 mm. The second notch is apparently similar but broken on the 'riser'. The upper end of the log is decayed and broken on a fork in the wood. If the log were used as a short step-ladder the fork would have helped its stability.

A similar log ladder was found on the Storey's Bar Road sub-site at Fengate in 1973 (Pit W17). The Fengate log was of alder (*Alnus glutinosa*) but otherwise closely similar, even to the size of the notch and the distance from the base to the step of the notch. The Fengate log ladder was dated to the later Bronze Age by the carbon dating of associated immature twigs.[19]

Notched log (Sf 181)

Quercus sp. oak log with shaped end and one notch. The log has ten growth rings and was probably felled in late summer. The last two rings are much closer together than the earlier ones. The log was possibly taken from a

[16] R. Holgate, op. cit. note 14.

[17] P. Bradley, 'The Worked Flint', in A. Barclay and C. Halpin, *Barrow Hills, Radley, Oxfordshire Volume 1: The Neolithic and Bronze Age Monument Complex*, Thames Valley Landscapes Mono. (forthcoming).

[18] M. Avery, 'The Neolithic Causewayed Enclosure, Abingdon', in H.J. Case and A.W.R. Whittle (eds.), *Settlement Patterns in the Oxford Region* (CBA Research Report xliv, 1982), 10–50.

[19] F. Pryor, *Excavations at Fengate, the Second Report* (Royal Ontario Museum Mono. v, 1978), 226–7.

branch rather than the trunk of a tree, but the branch must have been growing fairly close to the vertical. The eccentricity of the growth-ring is very slight and several side branches and shoots appear to be twisted.

The log retains bark below the notch. The bottom end of the log has been cut from two directions in the classic pattern of a felled tree, strengthening the likelihood that, if the log were from a branch, then the branch was growing very close to the vertical. There are a number of incomplete tool marks on the end surfaces, all having a similar curvature to those on the log ladder, and none are wider than 40 mm. The notch was cut with a very wide angle and was quite shallow. There are a number of incomplete tool marks in the notch, all of which are similar to those described above. The top end of the log is badly decayed.

The log was lying alongside the log ladder (Sf 180) with the notched face on the under side. Its function is not clear.

PLANT AND INVERTEBRATE REMAINS by MARK ROBINSON

Introduction

The late Bronze Age/early Iron Age settlement was situated on the first gravel terrace of the Upper Thames. However, a shallow valley which led down to the site from the second gravel terrace contained periglacial deposits of clay to sandy clay and these formed a thick superficial covering over the gravels.

Two deep late Bronze Age waterholes extended below the permanent water table and waterlogged organic deposits at the bottom of them were sampled. Samples were also taken from various undated tree-throw holes, burnt deposits and an Iron Age pit. The waterlogged samples were processed at the University Museum, Oxford, for the full range of macroscopic plant and invertebrate remains. Sub-samples of them were analyzed for pollen by Mr A. Parker at the School of Geography, Oxford (this report). The remaining samples were floated by the excavator for charred plant remains.

The waterlogged samples

141: from the bottom of the earlier of the waterholes.
156: from the bottom of the later of the waterholes.

1 kg. of each sample was washed onto a stack of sieves down to 0.2 mm. The sieve contents were then sorted using a binocular microscope for the full range of macroscopic plant and invertebrate remains. Only a one-tenth sub-sample of the fraction between 0.5 and 0.2 mm. was sorted for plant remains and the number of items recorded was multiplied by ten for inclusion in the tables. A further 11 kg. of each sample was washed over onto a 0.2 mm. mesh in order to separate the organic fraction and subjected to paraffin flotation to recover insect remains. The flots were washed with detergent and sorted under a binocular microscope. During the sorting of the 1 kg. sub-sample of sample 141, a single spikelet (2 glumes) of emmer wheat was discovered. This was regarded as an important find. So as to recover any further evidence of economic plants, the entire organic fractions from the sub-samples which had originally just been processed to extract insects were washed in detergent, sieved over a 1.0 mm. mesh and sorted for crop plant remains. The opportunity was also taken to record other plants not present in the initial sub-samples. Although time-consuming, the work was well justified by the results obtained.

The specimens were identified with reference to the collections in the OUM and the results listed in Tables 4–9, giving the minimum number of individuals or recording presence (+). Plant remains that were recorded from the 11 kg. insect sub-sample but were absent from the 1 kg. sub-sample have been indicated by *. Where the total number of a plant item from all 12 kg. of a sample has been counted, it has been given in the relevant table in brackets. The botanical nomenclature of the tables follows Clapham et al.[20] The nomenclature for the Coleoptera follows Kloet and Hincks.[21]

[20] A.R. Clapham, T.G. Tutin and D.M. Moore, *Flora of the British Isles* (1987).

[21] G.S. Kloet and W.D. Hincks, *A Check List of British Insects (revised): Small Orders and Hemiptera* (Royal Entomological Society Handbook for the Identification of British Insects xi, pt 1, 1964).

TABLE 4. WATERLOGGED SEEDS

1 kg. (12 kg.) samples		141	156
Ranunculus cf. *repens* L.	buttercup	18	26
R. parviflorus L.	small-flowered buttercup	*	–
R. S. *Batrachium* sp.	water crowfoot	10	3
Papaver rhoeas tp.	poppy	11	–
P. argemone L.	poppy	1	–
Fumaria sp.	fumitory	–	1
Thlaspi arvense L.	field penny-cress	–	1
Rorippa cf. *palustris* (L.) Bes.	marsh yellow cress	–	544
Cruciferae indet.		3	–
Hypericum sp.	St John's wort	2	–
Cerastium cf. *fontanum* Bau.	mouse-ear chickweed	6	4
Myosoton aquaticum (L.) Moen.	water chickweed	–	54
Stellaria media (L.) Vill.	chickweed	13	9
S. neglecta Weihe	greater chickweed	1	–
S. graminea L.	lesser stitchwort	–	1
Moehringia trinerva (L.) Clairv.	three-nerved sandwort	3	–
Spergula arvensis L.	corn spurrey	*	–
Caryophyllaceae indet.		–	1
Chenopodium polyspermum L.	all-seed	25	32
C. album L.	fat hen	10	10
Atriplex sp.	orache	2	13
Chenopodiaceae indet.		5	8
Linum usitatissimum L.	flax	*(1)	–
Rhamnus catharticus L.	purging buckthorn	24	–
Rubus fruticosus agg.	blackberry	41	–
Potentilla anserina L.	silverweed	6	48
P. cf *reptans* L.	creeping cinquefoil	4	–
Aphanes arvensis L.	parsley-piert	2	–
Prunus spinosa L.	sloe	5	–
Crataegus cf. *monogyna* Jacq.	hawthorn	6	–
Epilobium sp.	willow-herb	2	–
Cornus sanguinea L.	dogwood	8	–
Aethusa cynapium L.	fool's parsley	*	–
Torilis sp.	hedge-parsley	4	–
Daucus carota L.	wild carrot	–	1
Polygonum aviculare agg.	knotgrass	2	11
P. persicaria L.	red shank	2	10
P. lapathifolium L.	pale persicaria	–	4
P. hydropiper L.	water pepper	–	1
Fallopia convolvulus (L.) A.L.	black bindweed	1	–
Rumex acetosella agg.	sheep's sorrel	*	–
R. conglomeratus Mur.	sharp dock	2	1
Rumex spp.	dock	26	5
Urtica urens L.	small nettle	–	1
U. dioica L.	stinging nettle	39	1
Corylus avellana L.	hazel	–	*
Solanum cf. *dulcamara* L.	woody nightshade	9	–
Linaria vulgaris Mill.	common toadflax	*	–
Euphrasia sp. or *Odontites verna* (B.) D.	eyebright or bartsia	–	2
Mentha cf. *aquatica* L.	water mint	2	1
Lycopus europaeus L.	gipsywort	3	–
Prunella vulgaris L.	selfheal	1	1
Galeopsis tetrahit agg.	hemp-nettle	6	–
Glechoma hederacea L.	ground-ivy	11	–
Plantago major L.	great plantain	5	39
Galium aparine L.	goosegrass	1	1
Galium sp.	goosegrass	2	–

1 kg. (12 kg.) samples		141	156
Sambucus nigra L.	elder	8	–
Tripleurospermum inodorum (L.) S.B.	scentless mayweed	–	1
Carduus sp.	thistle	3	7
Carduus or *Cirsium* sp.	thistle	12	7
Leontodon sp.	hawkbit	1	8
Sonchus asper (L.) Hill	sow thistle	6	10
Alisma sp.	water plantain	12	–
Potamogeton sp.	pondweed	–	2
Juncus effusus gp.	tussock rushes	60	–
J. bufonius gp.	toad rushes	10	281
J. articulatus gp.	rushes	30	30
Juncus spp.	rush	10	50
Iris pseudacorus L.	yellow flag	1	–
Eleocharis S. *Palustres* sp.	spike rush	1	2
Carex spp.	sedge	9	2
Gramineae indet	grass	20	23
TOTAL		507	1257

TABLE 5. OTHER WATERLOGGED PLANT REMAINS

1 kg. (12 kg.) samples			141	156
Bryophyta	(moss)	leafy stem	+	+
Buds			3	2
Bud scales			16	6
Leaf abscission pad			4	–
Pteridium aquilinum (L.) Kuhn	(bracken)	frond fragments	+	+
Quercus sp.	(oak)	wood fragments	–	+
Triticum dicoccum (Schr.) Schb.	(emmer wheat)	glume base	2(5)	–
T. spelta L.	(spelt wheat)	glume base	–	*(2)
T. dicoccum (Schr.) or *spelta* L.	(hulled wheat)	glume base	–	*(1)
Twigs			+	–

TABLE 6. CHARRED PLANT REMAINS

1 kg. (12 kg.) samples			141	156
Pteridium aquilinum (L.) Kuhn	(bracken)	frond fragments	+	–
Quercus sp.	(oak)	charcoal fragments	+	+
Rumex sp.	(dock)	seed	*(1)	–
Hordeum sp.	(cultivated barley)	rachis node	–	*(1)
Triticum dicoccum (Schr.) Schb.	(emmer wheat)	glume base	*(1)	–
T. spelta L.	(spelt wheat)	glume base	–	*(1)

TABLE 7. MOLLUSCA

1 kg. samples	141	156
Anisus leucostoma (Milt.)	8	2
Cochlicopa sp.	1	–
Vallonia pulchella (Müll.)	1	–

TABLE 8. COLEOPTERA

12 kg. samples	141	156
Carabus nemoralis Müll.	1	–
C. violaceus L.	1	–
Notiophilus sp.	–	1
Elaphrus riparius (L.)	1	–
Loricera pilicornis (F.)	–	1
Dyschirius globosus (Hbst.)	5	4
Clivina collaris (Hbst.) or *fossor* (L.)	–	2
Trechus obtusus Er. or *quadristriatus* (Schr.)	1	–
Asaphidion flavipes (L.)	1	–
Bembidion lampros (Hbst.) or *properans* Step.	–	1
B. biguttatum (F.)	1	1
B. guttula (F.)	1	1
B. lunulatum (Fouc.)	–	1
Pterostichus anthracinus (Pz.)	1	–
P. longicollis (Duft.)	1	–
P. melanarius (Ill.)	–	2
P. niger (Schal.)	1	–
P. nigrita (Pk.)	1	–
P. versicolor (Sturm)	–	1
P. cupreus (L.) or *versicolor* (Sturm)	1	–
Calathus fuscipes (Gz.)	2	–
C. melanocephalus (L.)	1	–
Agonum muelleri (Hbst.)	1	1
Amara sp.	1	–
Harpalus rufipes (Deg.)	2	2
Acupalpus exiguus Dej.	1	–
A. cf. *flavicollis* (Sturm)	1	–
Haliplus sp.	1	–
Hydroporus sp.	2	4
Agabus bipustulatus (L.)	1	–
Agabus sp. (not *bipustulatus*)	1	–
Colymbetes fuscus (L.)	1	1
Dytiscus sp.	1	–
Hydrochus sp.	1	–
Helophorus aquaticus (L.)	1	2
H. aquaticus (L.) or *grandis* Ill.	–	1
Helophorus spp. (*brevipalpis* size)	9	10
Sphaeridium bipustulatum F.	–	1
S. scarabaeoides (L.)	1	–
S. lunatum F. or *scarabaeoides* (L.)	–	1
Megasternum obscurum (Marsh.)	2	7
Cryptopleurum minutum (F.)	1	–
Hydrobius fuscipes (L.)	2	1
Helochares lividus (Forst.) or *obscurus* (Müll.)	1	–
Hydrochara caraboides (L.)	1	–
Onthophilus striatus (Forst.)	–	5
Hister sp.	1	–
Hister or *Paralister* sp.	–	1
Ochthebius cf. *bicolon* Germ.	–	1
O. minimus (F.)	22	1
O. cf. *minimus* (F.)	2	2
O. cf. *pusillus* Step.	1	–
Limnebius papposus Muls.	–	2
Ptiliidae indet.	–	1
Aclypea undata (Müll.)	–	1
Micropeplus porcatus (Pk.)	1	–
Lesteva longoelytrata (Gz.)	–	1

12 kg. samples	141	156
Bledius sp.	1	3
Carpelimus bilineatus Step.	2	7
Platystethus cornutus gp.	1	5
P. nodifrons (Man.)	2	1
Anotylus nitidulus (Grav.)	–	2
A. rugosus (F.)	1	–
A. sculpturatus gp.	2	1
Stenus spp.	3	1
Lathrobium spp.	2	–
Rugilus sp.	1	–
Gyrohypnus angustatus Step.	–	1
Xantholinus longiventris Heer	–	1
X. linearis (O1.) or *longiventris* Heer	3	–
Philonthus spp.	3	1
Staphylinus caesareus Ced. or *dimidiaticornis* Gem	1	–
S. olens Müll.	–	1
Tachyporus sp.	1	–
Tachinus sp.	1	1
Aleocharinae indet.	2	2
Rybaxis or *Brachygluta* sp.	1	–
Geotrupes sp.	1	1
Aphodius cf. *fimetarius* (L.)	1	–
A. granarius (L.)	1	1
A. cf. *prodromus* (Brahm)	1	1
A. rufipes (L.)	1	2
A. cf. *sphacelatus* (Pz.)	1	4
Aphodius spp.	1	2
Oxyomus sylvestris (Scop.)	1	1
Copris lunaris (L.)	–	1
Onthophagus cf. *fracticornis* (Pres.)	1	–
O. ovatus (L.)	1	2
Onthophagus sp. (not *ovatus*)	–	1
Hoplia philanthus (Fues.)	–	2
Phyllopertha horticola (L.)	1	1
Simplocaria semistriata (F.)	1	–
Byrrhus sp.	–	1
Heterocerus sp.	–	1
Agrypnus murinus (L.)	1	1
Agricotes lineatus (L.)	1	1
A. obscurus (L.)	1	1
Agriotes sp.	–	1
Grynobius planus (F.)	–	1
Brachypterus urticae (F.)	1	–
Orthoperus sp.	–	1
Coccidula rufa (Hbst.)	1	–
Lathridius minutus gp.	1	–
Corticariinae indet.	1	1
Chrysolina polita (L.)	1	1
Gastrophysa polygoni (L.)	1	–
Hydrothassa glabra (Hbst.)	1	–
Galeruca tanaceti (L.)	–	1
Phyllotreta vittula Redt.	1	–
Longitarsus spp.	1	4
Altica sp.	1	–
Crepidodera ferruginea (Scop.)	–	1
Chaetocnema concinna (Marsh.)	1	2
Psylliodes sp.	–	1
Apion spp.	–	4

12 kg. samples	141	156
Barypeithes araneiformis (Schr.)	1	–
Barynotus obscurus (F.)	1	–
Sitona cf. *hispidulus* (F.)	–	1
Sitona sp.	2	1
Hypera punctata (F.)	–	1
Alophus triguttatus (F.)	1	1
Acalles turbatus Boh.	1	–
Bagous sp.	1	1
Notaris acridulus (L.)	1	1
Ceuthorhynchidius troglodytes (F.)	–	1
Ceuthorhynchinae indet.	3	2
Tychius sp.	–	2
Mecinus pyraster (Hbst.)	–	1
Rhynchaenus cf. *avellanae* (Don.)	1	–
Leperesinus varius (F.)	1	–
TOTAL	145	142

TABLE 9. OTHER INSECTS

12 kg. samples	141	156
Forficula auricularia L.	–	1
Scolopostethus sp.	1	–
Physatocheila dumetorum (H.S.)	1	–
Saldula S. *Saldula* sp.	1	–
Aphrophora sp.	1	–
Philaenus or *Neophilaenus* sp.	2	–
Megophthalmus scabripennis Ed. or *scanicus* (Fal.)	–	1
Aphrodes albifrons (L.)	–	1
A. bicinctus (Schr.)	3	–
A. flavostriatus (Don.)	–	1
A. fuscofasciatus (Gz.)	1	–
Aphrodes sp.	1	1
Aphidoidea indet.	2	6
Homoptera indet.	1	1
Trichoptera indet. larva	8	3
Trichoptera indet. larval case	14	3
Formica cf. *fusca* L. or *lemani* Bond female	–	1
Hymenoptera indet.	2	4
Chironomidae larval head capsules	+	+
Dilophus febrilis (L.) or *femoratus* (Meig.)	–	1
Diptera indet. adult	6	1

Samples for charred plant remains

Samples, each of 10 litres, were taken from three tree-throw holes (166, 301, 302), a feature with burnt pebbles (172) and an Iron Age pit (195). They were floated onto a 0.5 mm. mesh, dried and sorted for charred plant remains. The results are listed in Table 10. Identifiable fragments of charcoal were examined up to a total of ten for each sample. Charred remains were absent from 302.

TABLE 10. CHARRED PLANT REMAINS

		166	301	172	195
Charcoal					
Corylus tp.	hazel tp.	–	–	–	2
Prunus cf. *spinosa* L.	sloe	1	–	10	6
Quercus sp.	oak	–	10	–	2
Seeds					
Corylus avellana L.	hazel	–	2	–	–
– nut shell frags					

Interpretation

Introduction

Of the three tree holes investigated, the only one to give any useful details on the former tree cover of the site was 301, which produced much *Quercus* (oak) charcoal. The material from the late Bronze Age waterholes was very rich and a wide range of environmental information could be deduced from it. The evidence from the two water holes gave somewhat contrasting pictures so will be considered separately in detail. The charred remains from the feature with burnt pebbles (172) and the Iron Age pit (195) comprised mostly *Prunus spinosa* (sloe) charcoal. Burning seems to have been occurring on a large scale but its purpose is unclear. Charred cereal remains were absent.

Waterhole 141. The waterhole supported a flora and fauna appropriate to a small pond. Aquatic and marginal plants included *Ranunculus* S. *Batrachium* sp. (water crowfoot) and *Alisma* sp. (water plantain). Small water beetles which favour stagnant conditions, such as *Helophorus* cf. *brevipalpis* and *Ochthebius minimus*, were numerous and *Trichoptera* (caddis fly) larvae lived on the bed. The water snail *Anisus leucostoma* was also present.

The macroscopic plant remains suggest that mixed scrub surrounded the waterhole. Seeds of *Rhamnus catharticus* (purging buckthorn) and *Rubus fruticosus* agg. were the most abundant, but stones of *Prunus spinosa* (sloe), *Crataegus* cf. *monogyna* (hawthorn) and *Cornus sanguinea* (dogwood) were much in evidence. There were also seeds of various herbs that were likely to have grown in the somewhat shaded conditions amongst the bushes, including *Moehringia trinerva* (sandwort), *Urtica dioica* (stinging nettle) and *Glechoma hederacea* (ground-ivy). The insects, however, suggest that the general landscape was largely open, with wood and tree-dependent beetles comprising only 3% of the total terrestrial Coleoptera (Table 11.4). Since the dispersive power of the insects means that they would have been derived from a much larger catchment than the various remains of woody plants, which included twigs and buds as well as seeds, it is probable that the insects reflected conditions over a wider area. It is therefore likely that the scrub was limited to the vicinity of the waterhole.

TABLE 11. SPECIES GROUPS OF TERRESTRIAL COLEOPTERA AS PERCENTAGES OF THE TOTAL TERRESTRIAL INDIVIDUALS

	141	156
(1. Aquatic	48	21)
2. Pasture/dung	9	13
3. ? Meadowland	2	5
4. Wood and trees	3	1
5. Marsh/aquatic plants	2	2
6a. General disturbed ground/arable	2	2
6b. Sandy/dry disturbed ground/arable	0	0
7. Dung/foul organic material	6	8
8. Laththridiidae	2	1
9. Synanthropic	0	0
10. Esp. structural timbers	0	0
11. On roots in grassland	4	6
12. Unclassified	69	63
Total number of terrestrial individuals	98	117

For further details of the habitats of the groups and their species composition, see M. Robinson in S.P. Needham, *Excavations and Salvage at Runnymede Bridge* (1991), 278–81.

The scrub comprised species which are readily able to colonize the circumneutral soils which occur over the limestone gravel of the first terrace. Most of the shrubs are thorny and can become established even when some grazing is taking place. One of the wood and tree-dependent beetles, *Acalles turbatus*, usually feeds on the dead wood of shrubs, but two others, *Rhynchaenus* cf. *avallanae* and *Leperesinus varius*, perhaps reflect a slight background presence of woodland. The former (despite its name) feeds on *Quercus* (oak) leaves, the latter is a bark beetle of *Fraxinus excelsior* (ash).

The seeds included many from herbs of open habitats, ranging from annuals of disturbed ground, such as *Stellaria media* (chickweed) and *Chenopodium polyspermum* (all-seed), through to plants of waste ground or grassland, such as *Ranunculus* cf. *repens* (buttercup) and *Rumex* sp. (dock). There were relatively few seeds of obligate grassland plants, but beetles of grassland habitats such as *Agrypnus murinus* and *Agriotes lineatus* confirm its presence. Scarabaeoid dung beetles which feed on the droppings of large herbivores on pasture (Table 11.2), at 9% of the terrestrial Coleoptera, suggest that domestic animals were being grazed in the catchment, but the value is not sufficiently high to indicate that stock was concentrated at the site. Some of the plants identified from their seeds readily grow as arable weeds and it is possible that there were cultivated areas in the vicinity of the site. The sorting of the entire 12 kg. sample for crop remains yielded one waterlogged seed of *Linum usitatissimum* (cultivated flax), five waterlogged glumes of *Triticum dicoccum* (emmer wheat) and a charred glume base of *T. dicoccum*. Although the concentration of remains was low, they do serve to illustrate some of the crops that were being grown. The fact that one of the emmer glumes was charred suggests that their presence was related to crop processing.

The flora of the site as suggested by the seeds is typical of the circumneutral soils which occurred over large parts of the Upper Thames gravels before deep ploughing had the effect of making them calcareous by incorporating limestone gravel in them. There were slight elements of both calcicolous plants, such as *Cornus sanguinea* (dogwood) and acidophilous plants such as *Spergula arvensis* (corn spurrey) and *Rumex acetosella* agg. (sheep's sorrel). Frond fragments of *Pteridium aquilinum* (bracken) were also present. It is thought unlikely that the soil of the site was ever sufficiently acidic for this fern to become established. It is more likely that it had been brought to the site for use as litter or bedding, perhaps from the area of acid glacial drift to the north around Radley College. Some of the fragments had been charred which shows at least some human involvement with the bracken.

The insects do not give any direct evidence of any settlement. Beetles which tend to be associated with timber buildings and other synanthropic insects were absent. There was not an unusually high proportion of beetles which occur in foul organic material (Table 11.7).

Waterhole 156. The second waterhole also supported a flora and fauna of a small pond. *Ranunculus* S. *Batrachium* sp., *Helophorus* cf. *brevipalpis*, Trichoptera larval cases and *Anisus leucostoma* were all again present. The evidence for scrub, however, was entirely absent and wood and tree-dependent Coleoptera had declined to 1% of the total number of terrestrial individuals (Table 11.4).

The majority of seeds were from a community unrecorded from the other waterhole: plants of somewhat disturbed muddy ground where water stands intermittently. Seeds of *Rorippa* cf. *palustris* (marsh yellow cress) and *Juncus bufonius* gp. (toad rush) were particularly abundant but *Myosoton aquaticum* (water chickweed) was also well represented. Beetles of wet mud included *Bledius* sp., *Carpelimus bilineatus* and *Platystethus cornutus* gp.. This habitat seems to have graded into heavily trampled pasture with much *Potentilla anserina* (silverweed) and *Plantago major* (great plantain). Such conditions could have resulted from water from the waterhole being used to supply a trough at the top for domestic animals, with the inevitable effects of spillages and trampling. Scarabaeoid dung beetles had risen to 13% of the terrestrial Coleoptera, showing a stronger presence of domestic animals. They mostly belonged to the genus *Aphodius*, but there was one example of *Copris lunaris*, the horned dung beetle. This large and impressive-looking insect stocks chambers it excavates beneath cow pats, or less normally sheep droppings, with dung for its larvae. It is now of uncertain status in Britain, with very few records over the past fifty years, but it was captured in the county at Frilford Heath in 1942.[22]

There was much more general evidence from waterhole 156 for grassland than from the earlier waterhole. There were rather more seeds of grassland plants, such as *Leontodon* sp. (hawkbit). Chafers and elaterids with larvae that feed on the roots of grassland herbs (Table 11.11), for example *Hoplia philanthus* and *Agrypnus murinus* comprised 6% of the terrestrial Coleoptera. The proportion of clover and vetch-feeding weevils from the genera *Apion* and *Sitona* (Table 11.3) had risen to 5% of the terrestrial Coleoptera, and while this value is insufficient to indicate hay meadow, it does give greater evidence of grassland. The host-specific beetles included *Ceuthorynchidius troglodytes* and *Mecinus pyraster*, which both feed on *Plantago lanceolata* (ribwort plantain).

Seeds of annual weeds such as *Chenopodium polyspermum* (all-seed), *Polygonum persicaria* (red shank) and *Sonchus asper* (sow thistle) were present, but as before, they are as likely to have been derived from nutrient-rich disturbed ground around the site as from arable plots. The sorting of the entire 12 kg. samples for crop remains was again productive

[22] L. Jessop, *Dung Beetles and Chafers, Coleoptera: Scarabaeoidea* (Handbook for the Identification of British Insects v, 1986), 11.

but different species were recovered: two waterlogged glumes of *Triticum spelta* (spelt wheat), an indeterminate waterlogged glume from a hulled wheat, a charred rachis node of *Hordeum* sp. and a charred glume base of *T. spelta*.

There was no more evidence for human habitation from the insects of this waterhole than from the earlier deposit. Beetles which occur in foul organic material (Table 11.2) remained at what is a low level. Bracken continued to be brought to the site.

Discussion

The results from Eight Acre Field are important because they provide information on a period of environmental change for which there is as yet little evidence from the Upper Thames Valley. The only other late Bronze Age site in the region from which waterlogged biological remains have been investigated in detail was a pond on the third gravel Terrace at Mount Farm, near Dorchester.[23] Radiocarbon dates of 1430–1000 cal BC (3000±80 BP; HAR-4797) and 1260–840 cal BC (2850± 70 BP;HAR-4798) were obtained from the pond. Both sites were set in landscapes which had already experienced thorough clearance. At Mount Farm, tree and shrub pollen averaged only 4% of the total pollen while from both Mount Farm and the earlier waterhole (141), tree and shrub-dependent beetles comprised 4% of the total terrestrial Coleoptera. There was also similar evidence for mixed scrub around the Mount Farm pond and waterhole 141. Much of the general landscape at Mount Farm seems to have been lightly grazed grassland, as was perhaps the case at Eight Acre Field, but the proportion of scarabaeoid dung beetles was lower than from either of the waterholes.

Some of the differences in the results between the two waterholes could be explained if the organic sediments of 141 had accumulated after the main period of use of the waterhole whereas the sediments of 156 formed while it was in full use. Scrub had perhaps become established around 141 as it was neglected, while heavy use of 156 was the reason for the trampled mud around it and the higher proportion of dung beetles. However, the change in wheat species from *Triticum dicoccum* (emmer) in the earlier waterhole to *T. spelta* (spelt) in the later well is of considerable interest. A few waterlogged glumes of *T.* cf. *dicoccum* were found from the pond at Mount Farm. Charred emmer was identified from two late Bronze Age sites on the Kennet gravels: from a pit at Aldermaston Wharf which yielded dates of 1400–1105 cal BC (3000±40 BP; BM-1590) and 1020–845 cal BC (2785±35 BP; BM-1591)[24] and from features at Reading Business Park.[25] Charred emmer was also abundant in a deposit of occupation debris, which gave two radiocarbon dates of 1010–790 cal BC. (2690±80 BP.; HAR-3114, -3120) and a date of 1050–790 cal BC (2720±80 BP; HAR-3115), at the Runnymede Bridge waterfront site in the middle Thames.[26] Of these sites, Runnymede was the only one from which spelt wheat was identified, where it occurred in the same deposit as the emmer. Now that the notorious Neolithic spelt from Hembury can be discounted,[27] the earliest sites in Britain from which spelt wheat has been identified are late Bronze Age. Greig[28] gives other late Bronze Age sites where

[23] J.R.A. Grieg, 'The Palaeoecology of some British Haymeadow Types', in W. van Zeist and W.A. Casparie (eds.), *Plants and Ancient Man; Studies in Palaeoethnobotany* (1984), 213–26; M.A. Robinson, 'Landscape and Environment of Central Southern Britain' in B. Cunliffe and D. Miles (eds.), *Aspects of the Iron Age in Central Southern Britain* (O.U.C.A. Mono. ii, 1984), 1–11; M.A. Robinson and R. Wilson, 'A Survey of Environmental Archaeology in the Southern Midlands', in H.C.M. Keeley (ed.), *Environmental Archaeology: a Regional Review 2* (H.B.M.C. Occ. Paper i, 1987), 16–100.

[24] R. Bradley, S. Lobb, J. Richards and M. Robinson, 'Two Late Bronze Age Settlements on the Kennet Gravels: Excavations at Aldermarston Wharf and Knight's Farm, Burghfield, Berkshire', *Proc. Prehist. Soc.* xlvi (1980), 217–95.

[25] G. Campbell, in J. Moore and D. Jennings, *Reading Business Park: a Bronze Age Landscape* (Thames Valley Landscapes: The Kennet Valley Vol. 1, 1992), 103–10.

[26] J.R.A. Grieg, 'The Botanical Remains', in S.P. Needham, *Excavations and Salvage at Runnymede Bridge* (1991), 237, 346.

[27] L. Moffett, M.A. Robinson and V. Straker, 'Cereals, fruit and nuts: charred plant remains from Neolithic sites in England and Wales and the Neolithic Economy', in A. Milles, D. Williams and N. Gardner (eds.), *The Beginnings of Agriculture* (BAR Int. Ser. cdxcvi, 1989), 243–61.

[28] J.R.A. Grieg, op. cit. note 26, 259.

spelt was present. They date back to about 1250 cal BC/3000 BP, and were mostly of high status. In the early Iron Age, spelt became the main wheat cultivated over much of Britain, including the Upper Thames Valley. It is perhaps rather simplistic to see the complete replacement of emmer wheat by spelt wheat in waterhole 156 as necessarily representing this transition, given that only small quantities of cereal remains were present. However, the change did occur, and at the nearby Iron Age settlement on the Ashville Trading Estate, Abingdon, spelt was a major crop during the earliest phase, which was dated to 800–400 cal BC (2470±70 BP; HAR-1247), whereas there was only a trace of emmer in the assemblages of charred cereals.[29]

Eight Acre Field is not the only late Bronze Age site in the Thames Valley from which the now very rare dung beetle *Copris lunaris* has been identified. It was also present at Mount Farm and Reading Business Park as well as in a Neolithic context at Runnymede Bridge.[30] This beetle has not been recorded from Iron Age or Roman deposits in the region despite the analysis of considerably more assemblages than from the earlier periods. As arable activity increased during the Iron Age, it is possible that *C. lunaris* suffered from a loss of suitable habitat in the form of permanent pasture on well-drained soil.

POLLEN ANALYSIS by ADRIAN PARKER

Introduction

Two pollen samples from the waterholes were prepared and counted for their pollen and spore contents. They consisted of humified clayey detritus with mineral matter which proved to be calcareous. The samples were treated using standard techniques[31] modified, however, to include the use of sodium pyrophosphate[32] and sieved through a 5μm. mesh in order to remove the excess clay fraction.[33] The extracted pollen and spores were stained with safranin and placed in semi-permanent glycerol jelly mounts. The samples were examined using a Leica Axioscope research microscope; identification and counting were made at magnifications of × 400 and × 1000 (oil immersion) for critical determinations. The pollen preservation was good. The results are given in Table 12.[34]

Results

The vegetational characteristics of the two samples are given briefly as follows:

Sample 141/A/1–4: This sample is characterised by low frequencies of tree pollen (3.2%). Those species represented include *Pinus, Quercus* and *Alnus*. Shrub pollen occurred at slightly higher frequencies (5.7%) with *Corylus* being the major type represented at 4.9%. Single grains of *Sambucus* and *Ilex* were identified. This sample is dominated by herbaceous taxa (84.4%). Gramineae occur at high frequencies (45.2%), with relatively high values for *Plantago lanceolata* (12.1%), Compositae liguliflorae (4.7%), *Urtica* (1.4%), *Cirsium* (2.7%). Cereal pollen accounted for less than 1% of the total sum. The herbs comprise a mixture of taxa which are characteristic of arable agriculture and of pasture. A variety of spore taxa were represented, with *Cystopteris* and *Pteridium* occurring at frequencies greater than 1%. Aquatics are represented by *Typha* in low frequencies.

[29] M. Jones, 'The Plant Remains' in M. Parrington, *The Excavation of an Iron Age Settlement, Bronze Age Ring-Ditches and Roman features at Ashville Trading Estate, Abingdon (Oxfordshire) 1974–79* (CBA Res. Rep. xxviii, 1978), 94, 108.

[30] M.A. Robinson, 'Neolithic and Late Bronze Age Insect Assemblages' in S.P. Needham, op. cit. note 26.

[31] P.D. Moore, J.A. Webb and M.E. Collinson, *Pollen Analysis* (2nd edn. 1991).

[32] C.D. Bates, P. Coxon and P.L. Gibbard, 'A New Method for the Preparation of Clay-rich Sediment Samples for Palynological Investigation', *New Phytologist*, lxxxi (1978), 459–63.

[33] L.C. Cwynar, E. Burden and J.H.C. McAndrews, 'An Inexpensive Sieving Method for Concentrating Pollen and Spores from Fine-grained Sediments', *Canadian Journal of Earth Sciences*, xvi (1979), 1115–20.

[34] See opposite.

TABLE 12. POLLEN DATA

	WATERHOLE 141		WATERHOLE 156	
SPECIES	Number	%	Number	%
Trees				
Betula	–	–	1	0.2
Pinus	2	0.6	2	0.5
Tilia	–	–	1	0.2
Ulmus	1	0.6	–	–
Quercus	5	1.4	4	0.9
Alnus	2	0.6	3	0.7
Carpinus	–	–	1	0.2
Acer	–	–	1	0.2
Shrubs				
Corylus	18	4.9	33	7.6
Salix	1	0.6	2	0.5
Sambucus	1	0.6	1	0.2
Crataegus	–	–	2	0.5
Ilex	1	0.6	–	–
Herbs				
Gramineae	165	45.2	201	46.5
Cyperaceae	18	4.9	9	2.1
Cerealia	3	0.8	12	2.8
Caltha type	–	–	1	0.2
Ranunculaceae	6	1.6	5	1.2
Chenopodiaceae	2	0.6	1	0.2
Caryophyllaceae	1	0.3	1	0.2
Cruciferae	1	0.3	1	0.2
Rosaceae	6	1.6	4	0.9
Filipendula	3	0.8	2	0.5
Potentilla	2	0.6	1	0.2
Rumex	3	0.8	5	1.2
Plantago lanceolata	44	12.1	58	13.4
Plantago major/media	2	0.6	1	0.2
Umbelliferae	5	1.4	3	0.7
Compositae tub.	2	0.6	–	–
Compositae lig.	17	4.7	35	8.1
Cirsium	10	2.7	11	2.6
Crassula t.	1	0.3	–	–
Bidens t.	2	0.6	–	–
Urtica	5	1.4	17	1.2
Trifolium	4	1.1	2	0.9
Polygonum	6	1.6	1	0.2
Spores				
Filicales	3	0.8	6	1.4
Polypodium	1	0.3	2	0.5
Equisetum	1	0.3	–	–
Dryopteris	2	0.6	–	–
Cystopteris	5	1.4	–	–
Pteridium	4	1.1	–	–
Aquatics				
Typha	2	0.6	2	0.5
Stratoites t.	1	0.3	–	–
Unidentified	6		6	
TOTAL	365		432	

Sample 156/A/1–4: This sample too has low tree values (2.7%) with *Quercus* (0.9%), *Alnus* (0.7%), and *Pinus* (0.5%). Single occurrences of *Betula*, *Tilia*, *Carpinus* and *Acer* were also noted. Shrub taxa were represented by *Salix*, *Sambucus* and *Crataegus* occurring in low numbers. However, *Corylus* accounts for 7.6% of the total count. The herbaceous taxa represented are similar to those in sample 141 with high frequencies of Gramineae (46.5%), *Plantago* (13.4%) Compositae liguliflorae (8.1%), *Urtica* (1.2%) and *Cirsium* (2.6%). Cereal pollen occurred at a slightly higher frequency (2.8%) in this sample. Spore and aquatic types occurred at very low frequencies.

Discussion

The samples came from two waterholes and thus the area for pollen recruitment would have been mainly very local. The results from the samples will now be discussed. Radiocarbon dates are available for both features: 1680–1420 cal BC for 141 and 1020–800 Cal BC for 156.

The pollen data from both indicated an open, generally unwooded environment represented by low tree and shrub pollen. This suggests that the local landscape was substantially deforested by the time of deposition. *Quercus* (oak) is the main woodland tree represented, other tree taxa being more characteristic of open woodland or scrub such as *Corylus* (hazel), *Crataegus* (hawthorn) and *Sambucus* (elderberry). In the sample from 156 pollen of *Corylus* was relatively high, accounting for 7.6% of the total sum. The very low pollen frequencies for *Pinus* would suggest that these grains were perhaps the result of long distance transport, especially as they are wind-transported. It is possible, however, that small stands may have existed on the acidic sands and gravels which occur on the Corallian upland a few miles to the north-west of the site.

Both the samples were dominated by species characteristic of grassland. The vast majority of pollen came from Gramineae (grasses), *Plantago lanceolata* (ribwort plantain), Compositae (composites) and *Urtica* (nettles). Other herbs included Ranuculaceae (buttercups), Cruciferae (brassicas), Umbelliferae (umbellifers) and *Trifolium* (clover). The grassland and associated herb pollen suggest short grassland, perhaps pasture. Indicators of disturbed ground are *Urtica* (nettles), *Cirsium* (thistles), *Polygonum*, *Rumex* (dock) and Cerealia (cereals). This suggests that some cultivation was also in practice.

Few Bronze Age waterlogged organic remains have been recovered from the Upper Thames Valley, especially for the late Bronze Age. The reason for this has been suggested as being due to a regionally low watertable.[35] Of the long pollen sequences in the region, only one site, Sidlings Copse,[36] has organic deposition throughout the Bronze Age. Two others, Spartum Fen and Daisy Banks Fen, both record a hiatus in deposition from the late Bronze Age (*c.* 1600 cal BC/3300 BP) until the late Saxon period (A. Parker, unpub.)

Waterlogged material has, however, been recovered from a few sites across the Upper Thames region. Two sites from the floodplain of the River Windrush at Mingies Ditch, Hardwick-with-Yelford[37] and Gravelly Guy, Stanton Harcourt (unpub.) have yielded material from a series of palaeochannels and tree-throw pits. Pollen evidence from these sites showed that there was a progressive change in the local flora from a wooded/semi-cleared/scrubby environment to a much more open one between the Beaker and late Bronze Age periods, with an emphasis on pasture.

At Mount Farm, near Dorchester, pollen from two Bronze Age contexts was examined by Grieg (unpub.). The results showed that the landscape was open by the late Bronze Age, with tree and shrub pollen accounting for 7% of the total pollen sum. A grassland flora dominated the vegetation which included *Plantago lanceolata*, *Trifolium*, *Urtica* and Compositae liguliflorae and tubulflorae.

Close to the site at Radley, pollen evidence from Daisy Banks Fen (Parker, unpub.) shows that the landscape was open before the early Bronze Age. By the mid Bronze Age there was a grassland emphasis with some arable and later scrub regeneration (mainly hazel and hawthorn). The sediment stopped forming at *c.* 1600 cal BC/3300 BP due to a fall in the watertable and thus no late Bronze Age sediments were recorded.

Conclusions

Though of limited extent, the waterlogged material from the two waterholes has provided important additional information on the nature of the middle and late Bronze Age palaeoenvironments of the Upper Thames. The information adds to the picture of a generally open, cleared landscape (though

[35] M.A. Robinson and G. Lambrick, 'Holocene Alluviation and Hydrology in the Upper Thames Basin', *Nature*, cccviii (1984), 809–14; M.A. Robinson and R. Wilson, op. cit. note 23.

[36] S.P. Day, 'Post-glacial Vegetational History of the Oxford Region', *New Phytologist*, cxix (1991), 445–70.

[37] T.G. Allen and M.A. Robinson, *The Prehistoric Landscape and Iron Age Enclosed Settlement at Mingies Ditch, Hardwick-with-Yelford, Oxon.* (Thames Valley Landscapes: The Windrush Valley Vol. ii, 1993).

some scrub persisted) on the gravel terraces with grassland and some arable cultivation, perhaps with pasture on the floodplain of the Thames. Extensive clearance in many other parts of the Upper Thames Valley did not take place until the middle Bronze Age through to the Roman period, with the onset of larger scale ploughing from the Iron Age onwards resulting in increased runoff and associated alluviation.

THE ANIMAL BONES by SHEILA HAMILTON-DYER

Introduction

A total of 171 animal bones were recovered from ten features. The condition of the material varied from good, with the original bone surface intact, to poor with considerable surface erosion. Several bones had fragmented on retrieval. Where possible these have been fitted together for analysis and counted as single bones. Others were probably also conjoined originally but could not be fitted together; these have been counted as separate fragments. Identifications were made using the modern comparative collections of the Faunal Remains Unit, University of Southampton and S. Hamilton-Dyer. Measurements follow von den Driesch.[38] Withers heights of the cattle and horse are based on factors recommended by von den Driesch and Boessneck.[39] Archive material includes metrical and other data not in the text and is kept on paper and floppy disk.

Results

Overall, the majority of fragments identified to species were of cattle. A large number of fragments could be identified only as cattle/horse size. These are probably also of cattle. A small number of fragments could be identified only as pig/sheep size. Other species present are horse, sheep/goat, pig and deer – possibly roe.

Apart from waterhole 156, which had very good bone preservation, there is probably a preservational bias against those elements which are small or delicate or porous. Such elements include bone from young animals, pig bone, and bone from small species. This taphonomic loss together with the extremely small sample size renders detailed analysis unsafe.

House gully

The bone fragments from the house gully, 109 and 126, numbered twenty-three. Most of the fragments are identified only as cattle-sized and are probably pieces of limb bone shaft. Other fragments include sheep/goat and cattle teeth, and fragments of a cattle phalanx and metacarpus. The presence of head and foot bones is usually interpreted as indicating primary slaughter waste. The teeth and early fusing bones of the foot do seem, however, to survive better than some other parts of the skeleton. The small fragments from 126, two cattle-sized and seven sheep-sized, were all charred.

Waterhole 141

Near to the house gully, waterhole 141 contained a large proportion of the animal bone from the site – a total of seventy-six fragments. Many of the bones were retrieved in pieces. Except for the shaft of a sheep/goat tibia, all of the bones were of cattle or were cattle-sized fragments, including small pieces of skull. Loose teeth were frequent and there were jaw fragments from two animals both with fully erupted molars. Foot bones were present as well as

[38] A. von den Driesch, *A Guide to the Measurement of Animal Bones from Archaeological Sites* (Peabody Museum Bulletin 1, 1976).

[39] A. von den Driesch and J. Boessneck, *Kritische Anmerkungen zur Widerristhöhenberechnung aus Längemaßen vor- und frügesschichtlicher Tierknochen* (Säugetierkundliche Mitteilungen xxii, 1974), 325–48.

four vertebrae and a fragment of humerus. Butchery marks were observed on an astragalus. These consisted of several small cuts on the lateral face, probably as a result of removing the foot and ankle from the leg. Butchery marks were generally extremely rare, perhaps partly due to the lack of surface preservation in most of the other contexts. Again, the implication of the anatomical distribution is disposal of mainly slaughter waste. It should be stressed, however, that this is an extremely small assemblage and taphonomic factors have probably biased the sample.

'Ritual deposit'

The other waterhole, 156, contained a ritual deposit which includes an upturned cattle skull Sf161 and a long bone Sf160. The skull was not recovered intact, a large quantity of small fragments was examined. The rear of the skull only was present including fragments of horncore, zygomatic and petrosal. Other fragments were probably of temporal, parietal, frontal and occipital. The occipital condyles were not present, nor was there any evidence of the front part of the skull which includes the teeth. Also in this group of fragments were some non-cattle bones. These were a sheep's lower molar fragment and fragments of a horse jaw, including a lower incisor. The long bone (Sf160) is the right tibia of a horse. The proximal edges of this bone had been gnawed, probably by a dog, and there were also scratches on the shaft comparable with those made by dog teeth. Fine cut marks were observed running round the middle of the shaft. As there are several ligaments and muscles in this area it is unlikely that these were caused during skinning. Removal of the foot would normally involve cutting nearer the distal end of the bone. The distal and proximal epiphyses are both fused but the proximal fusion line can still be seen, implying that this animal was probably only about three or four years old at death, certainly not aged. Although slightly damaged the bone can be measured and gives an estimated withers height of 1.34 m., roughly 13 hands.

Waterhole 156

The other layers in this feature contain the only other bones from the site which are sufficiently complete for measurements. Even so they are not whole and the withers height estimations have had to be approximated. These were a cattle metatarsus giving a height of 1.09 m. and a radius giving a height of 1.07 m. These heights are consistent with material from the middle Bronze Age and Iron Age.[40] A cattle jaw was also present. This was from a considerably younger animal than those in feature 141 with the second molar just visible in the crypt. No sheep/goat bones were identified but there was a fragment of pig jaw, the only pig bone from the site. In addition there was a tiny fragment of deer antler, possibly of roe. This feature also contained the remaining three horse bones identified from the site, one from B/4 and the others from A/4. These were an atlas, caput femoris and proximal radius. The last two had fused epiphyses. Like the tibia, these had large canine gnawing marks and the bones were considerably damaged. These fragments, and most from this feature, were stained a dark brown and very well preserved in the waterlogged conditions.

Other prehistoric features

The other prehistoric features contributed a few bones only, mostly cattle and cattle-sized limb bone shaft fragments. The Neolithic pit, 131, contained a very small fragment of cattle jaw and four small cattle-sized shaft fragments. These, possibly from one bone, were charred. Ditch 110 contained twenty eroded fragments of cattle-sized bone, probably from a tibia. Bone from the area 172 consisted of twenty-three fragments probably from a cattle humerus, a fragment of cattle metacarpus and a cattle-sized shaft fragment. All the fragments were eroded and fragile. Feature 190 in this area contributed only a cattle deciduous upper premolar.

Romano-British features

Bone from the Romano-British ditches was negligible – a fragmented cattle occiput from 188 and five fragments, probably from a cattle tibia, from 134. The condition was again rather poor.

[40] C. Grigson, 'Cattle in Prehistoric Britain', *The Ark*, ix (1985), 47–9; R.A. Harcourt, 'The Animal Bones' in G.J. Wainwright, *Gussage All Saints: Iron Age Settlement in Dorset* (Dept. of Environment Arch. Rep. x, 1979), 150–60.

RADIOCARBON DATES by ANDREW MUDD

Two samples of waterlogged wood were sent to the Scottish Universities Research and Reactor Centre. Calibrated age ranges are determined from the University of Washington, Quaternary Isotope Laboratory, Radiocarbon Dating Program, 1987, using the twenty-year atmospheric calibration curve.

Sample 1 (Ref. GU-3378); context 156/A/4
Taken from the notched oak timber (Sf 181) found at the base of waterhole 156. It gave a date of 2720±70.
Calibrated age ranges:

1 sigma: cal BC 927–813 (cal BP 2876–2762)
2 sigma: cal BC 1020–800 (cal BP 2969–2749)

Sample 2 (Ref. GU-3379); context 141/A/4
Taken from an unworked piece of oak (Sf 59) from the base of waterhole 141. It gave a date of 3250±60.
Calibrated age ranges:

1 sigma: cal BC 1615–1450 (cal BP 3564–3399)
2 sigma: cal BC 1680–1420 (cal BP 3629–3369)

Both samples are likely to have been deposited during the use of the waterholes or at their abandonment.

DISCUSSION

PREHISTORIC OCCUPATION

General

Although the excavation produced a wide range of prehistoric material spanning the Neolithic to the Iron Age, the quantity of the earlier prehistoric material is small and the layout of the site makes sense as a single coherent phase of occupation. The ceramic and radiocarbon dating place this in the later second and earlier first millennia BC. However, it is likely that there was some earlier prehistoric activity of an ill-defined nature on the site, with artefacts from it becoming incorporated in later contexts.

Neolithic Period

A single feature could be assigned to the Neolithic period. Neolithic Fengate pottery and an assemblage of flint flakes was recovered from pit 131. A single Iron Age sherd apparently recovered from this feature was probably from gully 133 which cut the pit.

The collection of flint artefacts from superficial and sealed contexts might well belong to the Neolithic period although the dating is not secure and a wider time range might be indicated. However, it seems unlikely on typological or technological grounds that any are of the late Bronze Age/early Iron Age period and most must be considered residual. In exception to this, the assemblages of flint recovered from pits 131/132, and the tree-throw holes 161 and 166, are probably associated with those features.

The flints and pottery suggest that there was some Neolithic activity on the site, but little further can be said about it. Neolithic flintwork has been recovered from tree throw-holes on nearby sites on the first terrace at Thrupp, Curtis Gravel Pit, Corporation

Farm,[41] and the Drayton Cursus.[42] Domestic activity associated with tree clearance has been offered as an explanation in all these instances, and it seems that a similar interpretation can be put upon the evidence here. There is little to suggest how extensive or long-lived this occupation was, but the comparatively large number of flints recovered from the quite limited excavations, and the presence of the occasional sherd of Bronze Age pottery, might suggest a long-lived but diffuse occupation of this area.

Late Bronze Age/Early Iron Age Occupation

Chronological Summary. The arrangement of ditches was probably laid out in the mid-to-late Bronze Age and perhaps added to subsequently. It is clear that the main NE–SW axis of the field system was aligned on waterhole 141, which was respected by both the northern and southern elements of the pattern. The waterhole yielded later Bronze Age pottery and a radiocarbon date of 1680–1420 cal BC from oak wood in the lower fill. This dating discrepancy may be explicable if the wood was reused or deposited at the beginning of the occupation. A period of abandonment of the waterhole, before the main accumulation of sediments, would be consistent with the biological evidence, but the date still seems surprisingly early. The circular structure appears to be closely associated with this waterhole, since its NW entrance leads directly to the entrance ramp of the waterhole. The nature and extent of the double-ditched ?enclosure on the western edge of the site is obscure, but it might also be contemporaneous. Ditch 104, on a slightly different alignment, appeared to cut all the features with which it had a relationship and is likely to be somewhat later. The complex of ditches and pits in the SE area of the site represent several phases of activity. Ditch 121 is anomalous in that its alignments are different, but it is not known whether it might be earlier or later than the main activity on the site.

It is probable that waterhole 156 replaced 141 when the latter went out of use. A radiocarbon date of 1020–800 cal BC was obtained from notched wood in the bottom. It was perhaps not directly associated with the circular structure as it lay beyond Ditch 150. However, access between the two was made possible immediately to the south by a gap between 108 and 150. It is not certain that the circular structure was at any time the main focus of settlement since little debris came from its immediate vicinity. It is possible that activity on the site had always concentrated in the NW area, where the bulk of the occupation debris was found, although most of the pottery indicates that the occupation here was from the later phase of the site. The nature of this occupation, however, remains obscure and no trace of structures was found.

The site went out of use before 300 BC and was not reoccupied. However, middle Iron Age occupation on the first terrace was quite extensive and the change in settlement location need only imply a shift of some 200 m. to the west.[43]

Circular Structure. The function of the penannular gully (109 & 126) is not certain, but it is thought likely to be of the 'eaves drainage' type encircling a circular structure. This feature is accepted as sufficient evidence for the location of house sites in the Upper Thames region

[41] J. Wallis, A. Gledhill and R. Eeles, 'Investigations of Prehistoric Features East of Peep O Day Lane, South of Abingdon', *South Midlands Arch.* xxii (1992), 66–73.

[42] G.H. Lambrick and J. Moore, 'Drayton Cursus', *South Midlands Arch.* xvii (1987), 85–7.

[43] R. Ainslie, op. cit. note 1; other sites are located in G. Jones, R. Thomas and J. Wallis, op. cit. note 1.

and elsewhere, even on sites where no trace of structures actually survives.[44] This lack of evidence can occur on well-preserved sites (e.g. Mingies Ditch)[45] as well as plough-truncated ones.

While structures defined by penannular gullies are common on middle Iron Age sites, they are not typical of the late second/early first millennium BC when structures tended to be of the post-ring type without an external gully.[46] Recently excavated examples include early Iron Age houses at Yarnton[47] and late Bronze Age ones at Reading Business Park.[48] An alternative interpretation would see the gully as a 'ring-groove' foundation trench for a wall of closely spaced upright posts. This type of construction has been identified from the early Iron Age phases at Danebury where it is described as being 'a significant part of the Danebury vernacular in the early period'.[49] However, no convincing examples have been identified in the Upper Thames region, and the inconsistency of the gully cross-profiles (cf. Fig. 4, sections) perhaps argues against such an interpretation.

The absence of evidence for an internal structure or domestic features, with the exception of a possible entrance posthole, makes any more detailed discussion somewhat conjectural. At Mingies Ditch, where Iron Age floors were preserved, the sparse structural evidence in some cases was thought to be due to the use of mass construction and shallowly set internal roof supports,[50] and the same could be true at this site. Structures with opposed entrances are known from the region. A closely similar structure in terms of its size and overall plan is House 3 at Mingies Ditch.[51] It comprised two semicircular gullies with opposed SE and NW entrances. The SE entrance was 5 m. wide and the NW entrance rather narrower at 0.5 m. The wall was stake-built and the only relatively deep structural features were a pair of door post holes.

Whether the structure at Eight Acre Field was isolated or part of a larger group of structures is not possible to determine. It is not certain that it was a focus of domestic life, and the general scarcity of domestic debris might rather indicate some lightly or temporarily occupied structure. Insect evidence from the nearby waterholes did not suggest intensive human activity here.

Area of burnt pebbles. The area of clay-filled hollows and intercutting pits and scoops (feature 172) which was associated with a spread of burnt quartzite pebbles and other occupational debris, is not easy to interpret. It might have been an occupational area of a somewhat specialized nature, and cooking is the most obvious activity to suggest although there were no specific features such as ovens to support this interpretation.

Areas of occupation comprising concentrations of pits, scoops and burnt material (including dumps of burnt flint) have been reported from the late Bronze Age site at Knight's Farm, Burghfield, in the lower Kennet Valley.[52] In subsite 3, the occupation was associated with ovens. It was suggested that the pits were dug specifically to bury the debris

[44] T. Allen, D. Miles and S. Palmer, 'Iron Age Buildings in the Upper Thames Region' in B. Cunliffe and D. Miles (eds.), op. cit. note 4, 89–101.

[45] T.G. Allen and M.A. Robinson, op. cit. note 37.

[46] T. Allen, D. Miles and S. Palmer, op. cit. note 44, 100.

[47] G. Hey, 'Yarnton Worton Rectory Farm', *South Midlands Arch.* xxi (1991), 86–92.

[48] J. Moore and D. Jennings, op. cit. note 25.

[49] B. Cunliffe and C. Poole, *Danebury: an Iron Age Hillfort in Hampshire. Volume 4, the Excavations 1979–88: the Site* (CBA Res. Rep. lxxiii, 1991), 43.

[50] T.G. Allen and M.A. Robinson, op. cit. note 37.

[51] Ibid. 43–50.

[52] R. Bradley et al, op. cit. note 24.

from the ovens.[53] Such an interpretation is also perhaps the most plausible for Eight Acre Field. Concentrations of burnt stones on sites of this date have been interpreted as the remains of prehistoric saunas,[54] but while this hypothesis deserves serious consideration, it is not convincing in this instance given (a) the relatively high concentration of occupation debris, (b) the site's location at some distance from a water source and (c) the relatively small quantities of burnt stones present in comparison with burnt mound sites.

The Waterholes. The ceramic and radiocarbon evidence indicate that the waterholes were used sequentially and that 141 was the earlier. The biological evidence suggests the possibility of a periodic abandonment of the site after 141 went out of use which resulted in the establishment of scrub species, but there is no other indication of this, except, perhaps, in the rather early radiocarbon date from this feature. The features contained nothing to indicate that they were other than a source of water for domestic use. Their location with respect to the circular structure suggests that they were closely related to the occupation here, but it also seems probable that they could have been used to water cattle. This was the overwhelmingly predominant species of a rather meagre faunal bone assemblage, and the biological evidence indicated a strong presence of domestic animals associated with the later waterhole 156.

Waterhole 156 contained two particularly interesting deposits: from its base, part of a log ladder (Figs. 7 & 8), and from the middle fills a probable votive deposit of a cattle skull on top of a complete tripartite bowl (Fig. 6). The votive deposit is described in more detail in the next section and the log ladder on p. 40. The ladder is similar to one from Fengate, which was also dated to the late Bronze Age.

A waterhole dated to about 1000 BC was excavated at Mount Farm, near Dorchester on the second or third gravel terrace.[55] Like the Eight Acre Field waterholes, it appears to have been sited to take advantage of a local perched watertable, but it was not associated with any settlement at that site.

Votive deposit (Figs. 6 & 9.2). The votive deposit consisted of a small tripartite bowl which had been placed in waterhole 156 after it had gone out of use and been partly infilled. It was a fragile vessel and unlikely to have been discarded casually or accidentally. It is considered likely that an inverted cattle skull which lay on top of the pot was part of this deposit, but the skull was clearly incomplete and mixed with other animal bones (see S. Hamilton-Dyer, this report) so the deliberate association is not certain.

This particular combination of votive offerings appears to be unique to the area. However, such deposits are entirely within the tradition of the early first millennium. Votive offerings in watery contexts were a trait of this period and cattle skulls have been shown to be the most common item of special animal deposits in the early Iron Age.[56] A bovine skull in a probable waterhole has been recorded at Bradford's Brook near Wallingford.[57]

[53] Ibid. 258.

[54] L. Barfield and M. Hodder, 'Burnt Mounds as Saunas and the Prehistory of Bathing', *Antiquity*, lvi (1987), 370–9.

[55] G. Lambrick, 'Berinsfield, Mount Farm', *CBA Group 9 Newsletter No. 9* (1979), 113–15; M.A. Robinson, op. cit. note 23, 4.

[56] G.A. Wait, *Ritual and Religion in Iron Age Britain* (BAR cxlix, 1985), 149, 219 & Fig. 5.5.

[57] 'Archaeological Evaluation: Cholsey Bradford's Brook 1991; Wallingford By-Pass' (Oxford Archaeological Unit client report, June 1992). The skull was associated with late Bronze Age pottery and was located about half way up the fill of the feature (Trench 1, Feature 7).

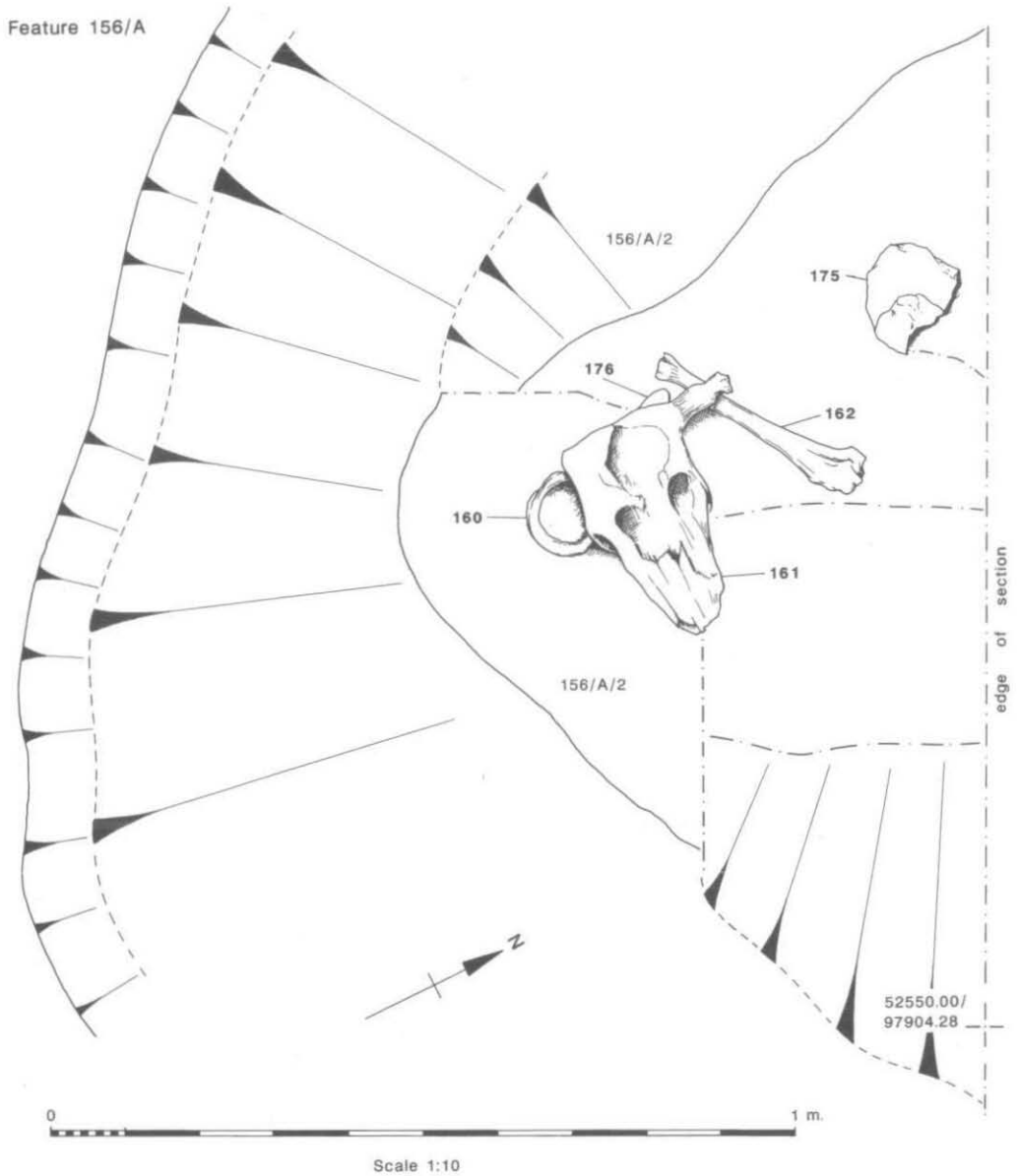

Fig. 6. Deposit of cattle skull and pot in waterhole 156.

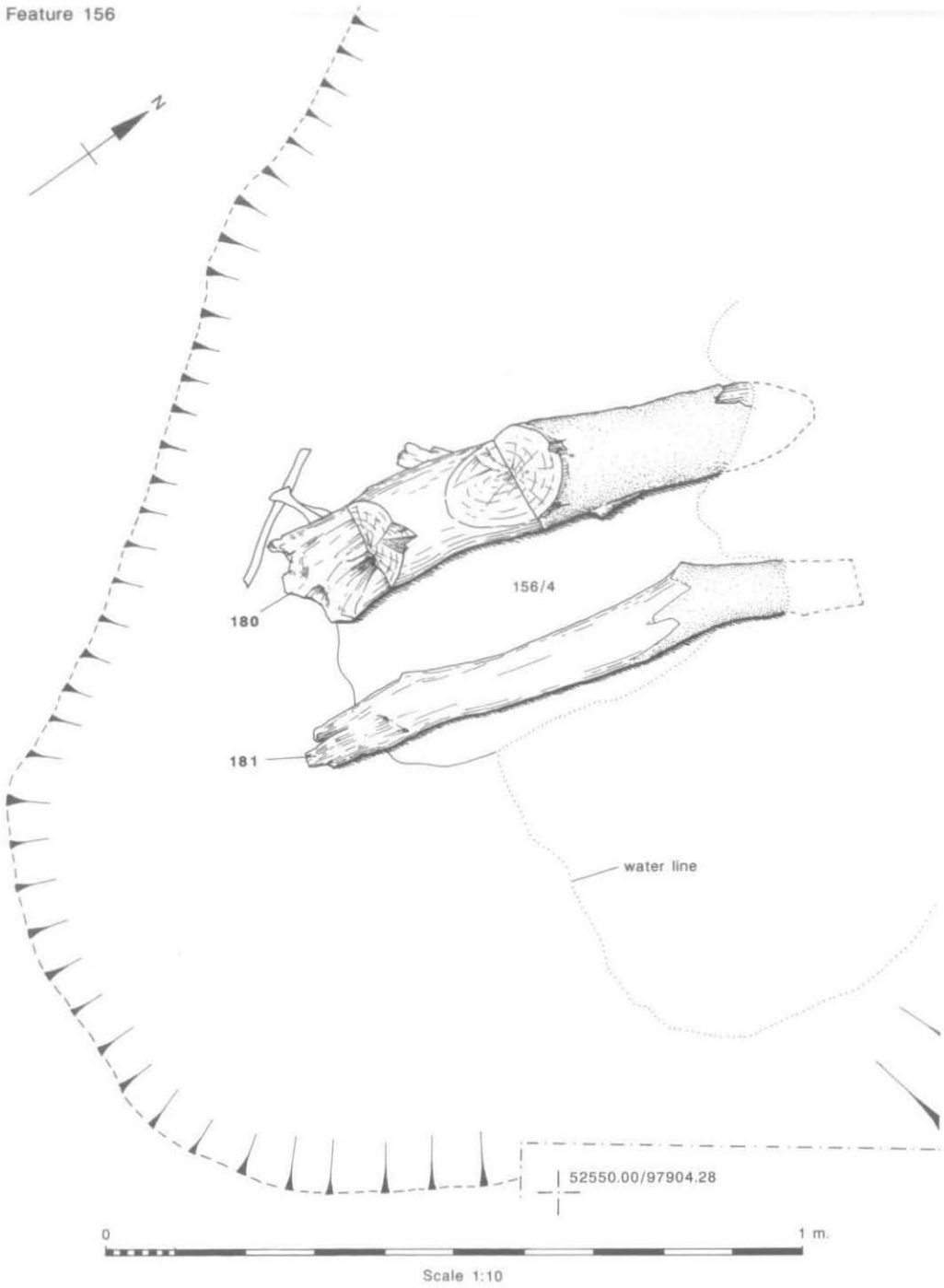

Fig. 7. Location of worked wood in waterhole 156.

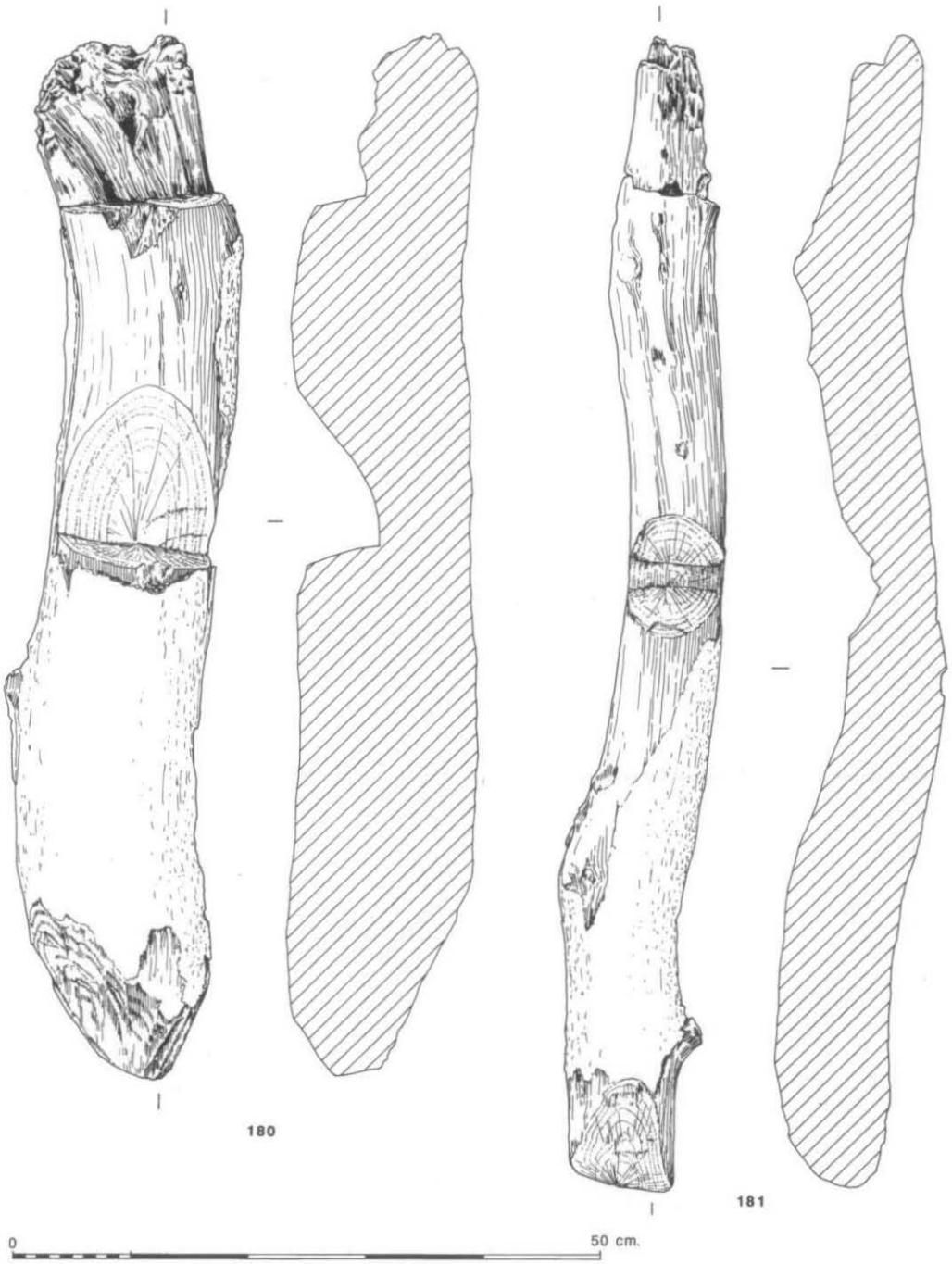

Fig. 8. Log ladder (180) and other notched wood (181).

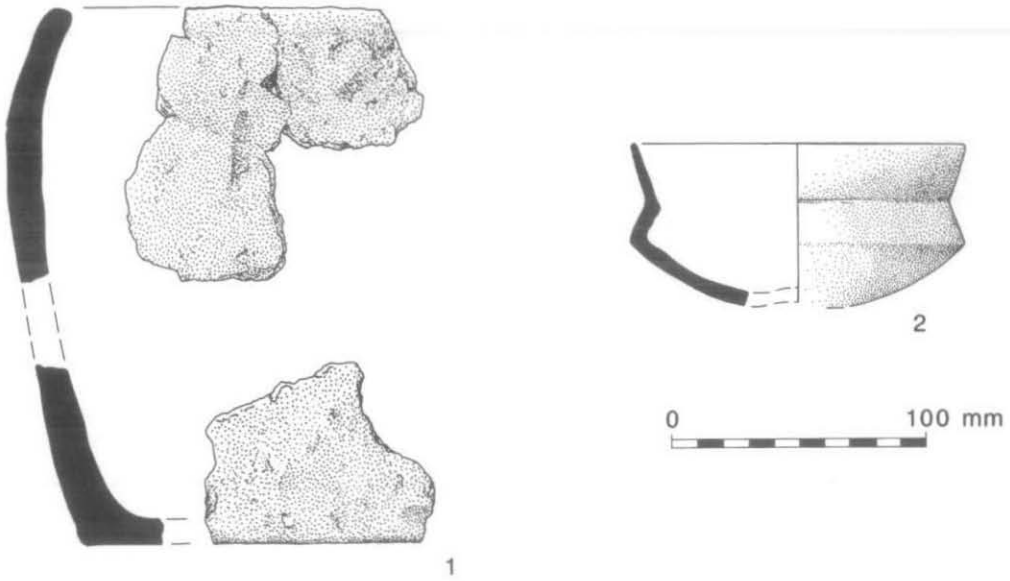

Fig. 9. 9.1 Hook-rimmed jar from 141/A/3–4; 9.2 Tripartite bowl from 156/A/2.

The Ditches. The ditches would appear to represent a formalized arrangement of land division, presumably to demarcate areas of land use. Such an arrangement would be necessary to control the grazing of livestock, perhaps particularly in a mixed farming economy such as is hinted at by the biological remains from the waterholes. The ditches are, however, very insubstantial and could not have served to control the movement of livestock on their own. A solid fence-line is indicated by the row of postholes parallel to ditches 163 and 191, and it is possible that hedges were also employed. The thorny scrub vegetation, shown by the macroscopic plant remains from waterhole 141, might have come primarily from hedgerows.

The double-ditched enclosure on the western part of the site is of a form said to be typical of the middle to late Bronze Age.[58] It is closely similar to the ones from Fengate.[59] The spacing between the ditches (about 3 m.) leaves little room for access, and it is possible that earth from the ditches was piled up to form a central bank.

The arrangement of ditches is unusual for sites of this period on the gravel terraces of the region. While there have been hints of middle-late Bronze Age landscape organization, the evidence is still slight. Most has come from the Wallingford-Dorchester area.[60] Perhaps the clearest evidence has recently been reported from Didcot where a rectilinear arrangement of

[58] R. Thomas, 'A Bronze Age Field System at Northfield Farm?' *Oxoniensia*, xlv (1980), 310–11; G. Lambrick, 'The Development of Late Prehistoric and Roman Farming on the Thames Gravels' in M. Fulford and E. Nichols (eds.), *Developing Landscapes of Lowland Britain. The Archaeology of the British Gravels: A Review* (1992), 88.

[59] F. Pryor, 'Fen-edge Land Management in the Bronze Age: an interim report on excavations at Fengate, Peterborough 1971–5' in C. Burgess and R. Miket (eds.), *Settlement and Economy in the Third and Second Millennia BC* (1976), 29–49.

[60] G. Lambrick, op. cit. note 58.

ditches has been interpreted as a field system and dated to the middle Bronze Age.[61] An undated field system at Northfield Farm, Long Wittenham, is suggested as possibly being Bronze Age in date,[62] but there is at present no firm evidence for this. At Mount Farm linear boundaries were aligned on an early Bronze Age ring ditch, and approximately on the late Bronze Age waterhole which cut it. Another possible Bronze Age boundary ditch was found cutting Drayton Cursus,[63] but while it was demonstrably pre-Roman, its dating to the Bronze Age was tentative.

Better evidence for late Bronze Age land division comes from the middle Thames region. At the Reading Business Park site in the lower Kennet Valley, a rectangular arrangement of enclosures was associated with extensive late Bronze Age settlement comprising dense concentrations of round houses, pits and four-post structures.[64]

However, perhaps the most closely similar site to that at Eight Acre Field is the late Bronze Age settlement at Knight's Farm, also on the lower Kennet.[65] While there are many differences in detail between the two sites, there are certain elements which are strikingly similar. Not least of the similarities is that both sites were difficult to locate. Both consisted mainly of scattered, shallow features with relatively few finds. Both were low-lying with a high watertable and could not be detected from the air. Both were also vulnerable to stripping for gravel.

The chief features at Knight's Farm were waterholes and ponds, pits and scoops, and shallow linear gullies. Postholes were also present, possibly occurring in groups. The main site, KF3, also showed a ring ditch 12 m. in diameter which, although forming a complete circle, contained internal postholes and was interpreted as a roundhouse with an entrance to the east.[66] It can be noted that all these elements occurred at Eight Acre Field. Indeed it does not seem to be taking the comparison too far to suggest structural similarities between Eight Acre Field and site 3 at Knight's Farm.[67] Here, not far from the roundhouse, two gullies (205 and 207) appeared to be aligned on a large subcircular feature of about 5 m. diameter which, although unexcavated, might have been a waterhole. A similar alignment of a gully on a large 'pit' (F9) was found at subsite 1.[68] 80–90 m. from the circular structure was an area of ovens and 'rubbish' pits interpreted as a cooking area and already mentioned as being comparable to the spread of burnt stones and pits at Eight Acre Field. Further to the west was an area of postholes with few pits or other features.

These separate elements have their counterparts at Eight Acre Field. However, some of the differences should also be mentioned. Chief among these was the sparseness of features at Eight Acre Field. Pits and scoops were generally rare except in one restricted area, and postholes were also limited. The contrast is likely to have been greater than it appears in view of the difficult conditions of the Knight's Farm excavations.[69] There was also an absence of four-post structures at Eight Acre Field. Finds were also more sparse here, a fact which might be explicable in terms of the relative scarcity of features for them to survive in, the relative shortness of the occupation, or the 'impoverishment' of the area in comparison with the lower Kennet.

[61] I. Ruben and S. Ford, 'Archaeological Excavations at Wallingford Road, Didcot, South Oxfordshire, 1991', *Oxoniensia*, lvii (1992), 1–28.
[62] R. Thomas, op. cit. note 58.
[63] G. Lambrick and J. Moore, op. cit. note 42.
[64] J. Moore and D. Jennings, op. cit. note 25.
[65] R. Bradley et al., op. cit. note 24.
[66] Ibid. 262.
[67] Ibid. Fig. 28.
[68] Ibid. Fig. 29.
[69] Ibid. 257.

Environment and Economy. A detailed report on the environmental evidence is to be found on page 41, and the animal bones on page 53. The pollen, plant and insect remains from the waterholes indicated a broadly open environment throughout occupation. Some scrub and a background presence of woodland was suggested from the earlier waterhole (141), while there was an overwhelming dominance of pasture later. This suggests a progressively more intensive use of the land. In the later stages at least, the economy was probably largely, if not exclusively, pastoral, although it can be noted that a charred glume base of spelt and a charred rachis node of barley were among the remains from 156 (Table 6). The predominance of cattle is suggested by the presence of the waterholes themselves, since cattle require regular access to water.[70] This interpretation is supported by the environmental evidence from 156 and the animal bone assemblage. In the earlier phases it is possible that mixed farming was carried out. The presence of possible arable weeds and a small quantity of emmer wheat, including a single charred glume base, suggest that crop cultivation and processing was being practised in the vicinity. There was also some evidence of grazing stock. While the balance of evidence suggests a less specialized and intensive use of land in the earlier phase, the provision of a waterhole and field boundaries indicate a degree of land management.

Contemporary sites in the Radley/Abingdon region. The site at Eight Acre Field supplies important evidence for settlement and land use for a period which is barely represented in the Upper Thames region.[71] Given the long chronology indicated by the pottery and radiocarbon dates, and the general paucity of features and finds, it is difficult to see the site as a principal focus of settlement. It is more likely that it was lightly or intermittently occupied, and in that case represented the pastoral component of a wider settlement system. The location of the other elements of this system cannot be ascertained. No contemporary first terrace sites are known in the Radley/Abingdon area, although, south of Abingdon, the site at Corporation Farm might have been partly contemporary. Its rectilinear layout and alignments of postholes give it a certain similarity of form to Eight Acre Field,[72] although it is dated to the middle rather than later Bronze Age. Early Iron Age occupation comprising pits and curving gullies has been located on the second terrace about 1 km. north-west of Eight Acre Field[73] and this site was probably contemporaneous, at least in part. It lies beyond the barrow cemetery at Barrow Hills which was used for burial in the later Bronze Age and is likely to have retained its importance as a focus for ceremony.[74]

ROMANO-BRITISH OCCUPATION

The results of the excavation, evaluation and watching brief indicate that the Romano-British ditches extended over most of the northern part of the field. The limited amount of pottery from them suggests that they were located at a distance from settlement, and they

[70] A. Grant, 'Animal Husbandry in Wessex and the Thames Valley' in B. Cunliffe and D. Miles (eds.), op. cit. note 4, 103–5.

[71] G. Lambrick, op. cit. note 58.

[72] J. Barrett and R. Bradley, 'The Later Bronze Age in the Thames Valley', in J. Barrett and R. Bradley (eds.), *Settlement and Society in the British Later Bronze Age* (BAR lxxxiii, 1980), 247–69 & Fig. 4.

[73] E.T. Leeds, 'Recent Iron Age Discoveries in Oxfordshire and North Berkshire', *Antiq. Jnl.* xv (1935), 38–9.

[74] A. Barclay and C. Halpin, *Barrow Hills, Radley, Oxfordshire Volume 1: The Neolithic and Bronze Age Monument Complex*, Thames Valley Landscapes Mono. (forthcoming).

can plausibly be interpreted as field boundaries related to the Goose Acre Farm Roman settlement on the second terrace. The pottery is consistent with a 1st to 2nd-century date.

The parallel ditches, both those within the excavated area and those recorded in the watching brief, do not provide access and it is likely that they formed a single boundary with a central bank. They may have been laid out parallel to the northern boundary of the field which is likely to be a natural watercourse. The two pairs of ditches are 90 m. apart. Traces of another parallel ditch exactly half way between them suggests that there might have been some regularity to the layout of the fields, but given the incompleteness of the overall plan it is difficult to say more.