Northamptonshire Archaeology

Middle Iron Age marginal settlement on land at
Newton Leys, Newton Longville
Milton Keynes

June 2007

Jim Brown

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Report 09/28

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QUALITY CONTROL

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OASIS REPORT FORM

PROJECT DETAILS		
Project name	Middle Iron Age marginal settlement on land at Newton Leys, Newton Longville, Milton Keynes, June 2007	
Short description (250 words maximum)	Middle Iron Age settlement was identified by means of geophysical survey and trial trench excavation on farmland designated for development at Newton Leys, Newton Longville, Milton Keynes. A targeted area of 1.6ha was subsequently excavated. A series of roundhouses, no more than 2-3 per phase, with associated enclosures were located adjacent to a stream. There was a substantial pottery assemblage, other material evidence was sparse but included two weaving comb fragments and sherds from bronze casting crucibles. Seeds and faunal remains were few, charcoal was better represented. The settlement expanded alongside the watercourse over 3-6 generations and became more extensive with larger enclosure ditches as marshland dried out. Its apparent sudden demise may have followed extensive flooding of the site as it was clear that water management was becoming increasingly more important over time. By the late Iron Age the land had reverted to marshland, the enclosures were abandoned and the land was marginalised. Throughout the Roman and Saxon periods the land remained open marsh until the establishment of the medieval open field system which left traces of ridge and furrow cultivation. A field boundary was established in the 18th-19th centuries.	
Project type (eg DBA, evaluation etc)	Open area excavation	
Site status (none, NT, SAM etc)	None	
Previous work (SMR numbers etc)	DBA (Oxford Archaeological Associates 2002), Fieldwalking by Buckingham Museum Service 1995, Geophysical survey (Holmes 2006), Trial trench evaluation (Burrow 2006), Updated Project Design (Brown 2008)	
Current Land use	Arable land	
Future work (yes, no, unknown)	No	
Monument type/ period	Middle Iron Age settlement	
Significant finds	Pottery, animal bone, charcoal and plant macro-fossils	
PROJECT LOCATION		
County	Milton Keynes and Buckinghamshire	
Site address (including postcode)	Slad Farm, Newton Longville	
Study area (sq.m or ha)	1.6 ha	
OS Easting and Northing	SP 8663 3101	
Height OD	*c*84m above OD	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology	
Project brief originators	Brian Giggins, Milton Keynes and Sandy Kidd, Buckinghamshire County Council	
Project Design originator	Rob Bourn, CgMs Consulting Ltd	
Director/Supervisor	Jim Brown, Northamptonshire Archaeology	
Project Manager	Adam Yates, Northamptonshire Archaeology & Rob Bourn, CgMs Consulting Ltd	
Sponsor or funding body	George Wimpey, South Midlands Group	
PROJECT DATE		
Start date	June 2007	
End date	August 2007	
ARCHIVES	**Location (Accession no.)**	**Content (eg pottery, animal bone etc)**
Physical	2007.97	Pottery, animal bone, metal finds, Sample residues
Paper	2007.97	Site context record, plans, section drawings, photographic record, finds drawings
Digital	2007.97	Mapinfo digital plans and client assessment report PDF
BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report (NA report)	
Title	Middle Iron Age marginal settlement on land at Newton Leys, Newton Longville, Milton Keynes, June 2007	
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June 2007

Abstract

Middle Iron Age settlement was identified by means of geophysical survey and trial trench excavation on farmland designated for development at Newton Leys, Newton Longville, Milton Keynes. A targeted area of 1.6ha was subsequently excavated.

A series of roundhouses, no more than 2-3 per phase, with associated enclosures were located adjacent to a stream. There was a substantial pottery assemblage, other material evidence was sparse but included two weaving comb fragments and sherds from bronze casting crucibles. Seeds and faunal remains were few, charcoal was better represented. The settlement expanded alongside the watercourse over 3-6 generations and became more extensive with larger enclosure ditches as marshland dried out. Its apparent sudden demise may have followed extensive flooding of the site as it was clear that water management was becoming increasingly more important over time. By the late Iron Age the land had reverted to marshland, the enclosures were abandoned and the land was marginalised.

Throughout the Roman and Saxon periods the land remained open marsh until the establishment of the medieval open field system which left traces of ridge and furrow cultivation. A field boundary was established in the 18th-19th centuries.

1 INTRODUCTION

The middle Iron Age waterside settlement at Newton Leys, Milton Keynes was identified by geophysical survey and trial excavation within an area designated for town expansion on the south side of Bletchley (Fig 1: NGR SP 8663 3101; Holmes 2006). The development area lies across the boundary of two separate planning authorities. It was the requirement of the Milton Keynes Council and the Aylesbury Vale District Council, in compliance with PPG16 and the archaeological policies of these authorities, that the impact of the development be mitigated through a programme of archaeological works as a condition upon consent for planning permissions (02/01337/OUT; 02/02091/AOP). Northamptonshire Archaeology (NA) was commissioned by CgMs Consulting Ltd to undertake these works on behalf of George Wimpey (South Midlands). The work was conducted according to a Specification compiled by CgMs Consulting Ltd (Bourn 2006) and a Written Scheme of Investigation prepared by NA (NA 2006), and approved by the planning authorities.

The principal excavations covered an area of 1.6ha, containing the middle Iron Age settlement comprising roundhouses and enclosures. This lay within the boundary of Milton Keynes Council. A further 0.25ha along the access road was designated for strip, map and sample excavation. The access road, which links to the Water Eaton to Drayton Parslow road, was within the area of Aylesbury Vale District Council. Fragments of ditch systems of probable Iron Age date were recorded here, *c*0.5km distant to the main settlement site (Fig 1).

This document comprises the final results of the excavation and will form the basis of future journal publication. The archive will be deposited with Buckinghamshire County Museum Service at the conclusion of the project (Accession no: 2007.97).

2 BACKGROUND

2.1 Topography and geology

The development area covers *c*40ha south of Bletchley, Milton Keynes, and to the east of the village of Newton Longville (Fig 1). It is bounded by the Water Eaton to Drayton Parslow road to its south-east, by the London to Birmingham railway to its east and by the former Newton Longville brickworks to its north.

The main development is divided into a number of blocks defined by future land use; Blocks B, C, D and E for residential land use and Block(s) I for industrial purposes. The middle Iron Age settlement site was located within Block B, directly to the west of a 20th-century clay pit and south of the stream. Areas designated for access lay to the south of this within Buckinghamshire.

Prior to development the site of the excavation was arable farmland occupying gentle slopes overlooking a broad shallow valley. The site of the middle Iron Age settlement occupied a narrow strip of ground adjacent to the canalised watercourse of Eaton Brook at the base of the valley, situated at *c*84m above Ordnance Datum. Eaton Brook flows east to join the River Ouzel, which flows north to meet with the River Great Ouse near Newport Pagnell.

The underlying geology of the area predominately comprises Chalky Boulder Clay with outcrops of Oxford Clay and Lacustrine deposits (Bourn 2006, 2). On the site of the middle Iron Age settlement the drift geology comprises terrace gravels filling the base of the valley depression and the clays were visible further upslope. It was a distinct characteristic of the site that the main features were confined to the gravel geology and only the linear ditches that extended away from the habitation crossed onto the clay.

2.2 Previous archaeological work

Background source material is summarised in previous publications from the area (Croft and Maynard 1993; Ivens *et al* 1995). Sites providing comparisons have been excavated at Hartigans, Caldecotte, Wavendon Gate, Pennyland, Bancroft, Westcroft, Stoke Hammond bypass and Fenny Lock, all within the Milton Keynes area. More recent work has been conducted by Northamptonshire Archaeology (NA) at Tattenhoe and reporting is in progress (Taylor 2006).

Prior to the present excavations Newton Leys was the subject of desk-based assessment which was incorporated into an environmental statement (OAA 2002). Little archaeological activity was known from within the bounds of the development area before the present archaeological programme was implemented. Fieldwalking undertaken by Buckinghamshire County Museum Service in 1995 revealed two concentrations of worked flint, probably of Bronze Age date, as well as scatters of Iron Age, Romano-British and medieval pottery (OAA 2002). These concentrations were actually located on the valley slopes to the south of the excavation area and on land in the east of the development area, close to the railway line, bearing no relation to the middle Iron Age settlement site. The south-east part of the development area had previously been the site of the early 20th-century Jubilee Brickworks with attendant clay quarries, now disused and demolished.

In 2006 NA undertook a geophysical survey of the site. This identified a series of circular and linear anomalies in the south-western corner of the development area, thought to comprise an area of past settlement (Holmes 2006). This area was subsequently investigated through trial trench evaluation by NA in the same year, demonstrating that the geophysical anomalies were attributed to a concentration of Iron Age features including evidence for both roundhouses and associated enclosures (Burrow 2006, 12). At this time the existence of the watercourse had not

been identified. A large alluvial spread was noted amongst the trenches closest to the base of the valley and a number of shallow hollows were distributed about the site containing material apparently derived through Iron Age occupation. This was thought to have been eroded during flooding episodes and re-deposited in natural hollows.

3 EXCAVATION STRATEGY

3.1 Objectives

The general aim of the archaeological field work was to meet the remit of PPG16 and preserve by record the archaeological evidence contained within the site through a programme of works with a framework of defined objectives.

Specific aims

These were agreed with the archaeological officers of both planning authorities involved. The specification identified the following criteria and questions (Bourn 2006);

- Establish both relative and absolute chronologies for the site with priority being given to establishing an overall site plan determining the phases and sub-phases of activity that constitute its development.

- Determine the internal morphology of the site and its land use. Identifying the nature, date and range of activities present, together with the spatial dynamics of their distribution over time.

- Address the following research questions;

    1. What is the natural topographic configuration of the site?
    2. Can the existing detailed understanding of the character and chronology of the Iron Age occupation of south Milton Keynes and north Buckinghamshire be enhanced by evidence from this development?
    3. What evidence is there relating to the origins, development and decline of the Iron Age occupation?
    4. Is their any evidence for continuation of occupation into the Roman period?
    5. What evidence is there for industrial and domestic activity on the site?

- Determine the environmental history of the site and its immediate surrounding area throughout the sequence of human activity on the site.

- Support the detailed assessment of the chronology of the artefactual and environmental material with a programme of radiocarbon samples where appropriate.

- Enhance the understanding of Iron Age archaeology from the region through the examination of the date, form and character of the site within its local, regional and national context.

The assessment of the paper and material archives determined that the broad scope of these objectives would remain unchanged and that statements would still be possible that would contribute significantly to our understanding of the middle Iron Age (Brown 2008, 9).

3.2 Methodology

To meet the project objectives the following specific tasks had to be completed;

- Identification, characterisation, recording and dating, by means of archaeological excavation, all features exposed within the settlement area thus providing detailed information on the presence or absence, area of extent, depth of burial and degree of survival of the deposits and features exposed.

- Compilation of written, illustrative, digital and photographic records that form an archive for all archaeological works undertaken.

- Retrieval of sufficient material evidence in the form of artefact and faunal assemblages supplemented with environmental samples to inform interpretations of the site within the context of the agricultural, domestic and industrial activities that may have been on the site and their relationship with the surrounding landscape.

- Keeping the archaeological officers of each planning authority and the representative of CgMs Consulting Ltd informed of new archaeological developments as they arose during excavation for the purposes of monitoring and provision for strategic discussion as work proceeded.

Detail retrieved from the geophysical survey and trial trench evaluation was used to guide and inform the investigation of the archaeological features.

Each excavation area was under the sole possession of the archaeological contractor during archaeological works. Access to these areas was limited to staff and machinery necessary for archaeological purposes. Upon completion of archaeological works each area was handed back to the developer with the agreement of the respective archaeological planning officer.

Excavation areas were set out using survey grade GPS (Leica System 1200). The topsoil, subsoil and medieval furrow fills were removed under continuous archaeological supervision using a 360^{o} tracked mechanical excavator fitted with a toothless ditching bucket to reveal significant archaeological remains. The topsoil was stacked separately from the subsoil and other deposits outside the working areas using dump trucks. Movement of machinery during site preparation was conducted in such a manner as to avoid impact on the archaeology.

The excavation area was cleaned sufficiently to enable the identification and definition of archaeological features. A hand drawn site plan of all archaeological features was made at scale 1:100 and was related to the Ordnance Survey with significant structures or areas of complex stratigraphy planned in greater detail. All archaeological deposits and artefacts encountered during the course of excavation were recorded. Recording methodology followed the standard NA context recording system with context sheets, cross-referenced to scale plans, section drawings and photographs, both in 35mm monochrome film and on colour slides. Deposits were described on *pro-forma* context sheets to include measured and descriptive details of the context, its relationships, interpretation and a checklist of associated finds. The record was supplemented by direct annotations of the site general plan as required. All levels were related to Ordnance Survey datum. Sections of sampled features were drawn at scale 1:10 or 1:20, as appropriate, and related to Ordnance Survey datum. A representative sample of all exposed archaeological features was excavated, with basal deposits of all sectioned features investigated.

All discrete features were sampled to no less than 50% of the whole, features of particular interest were 100% excavated. Linear features were sampled at frequent intervals to determine their function and date with interventions placed at terminals and midsections. Intersections were excavated where the relationships were not clear in plan. Artefacts and soil samples were collected by hand. Hand spoil and the surface of archaeological features was scanned with a metal detector to ensure maximum finds retrieval from secure contexts. The watercourse was partially excavated by means of a series of machine dug sections and hand cleaned interventions with sufficient areas exposed to assess the presence or absence of features in the streambed.

The palaeoenvironmental potential of the site was reviewed on site with Dominique de Moulins, Regional Scientific Advisor for English Heritage, during the excavations. Samples were taken from potential industrial or domestic features such as charcoal-filled pits and hearths, from organic or waterlogged deposits, main ditch sections and from the watercourse. Samples were only sought in deposits with a potential for the recovery of charcoal, carbonised plant remains and other ecofacts from secure and uncontaminated contexts. A minimum of 40 litres was taken for flotation in each case or 100% of the fill where this was less than 40 litres.

Following the completion of the fieldwork a preliminary assessment of the archive and material finds was conducted to inform the original project objectives and provide the basis of further enquiry (Brown 2008). Those parts of the archive with the potential to contribute a greater level of information were identified and specific avenues of enquiry outlined as the basis for further progress. The work comprised:

- Detailed interrogation of the paper archive to unlock the morphological development of the site through the study of key feature groups.
- Examination of the individual pottery fabrics and forms by feature group to provide the basis for future comparisons of site morphology including the illustration of 18 examples representing a cross-section of the pottery as a whole.
- Illustration of brooches and decorated comb fragments.
- Conduct a study of the charcoal from the site to characterise nearby woodland by identifying non-oak species
- Obtain C14 dates from significant secure contexts to support the study of the site morphology and its comparison with pottery distributions.

4 THE EXCAVATED EVIDENCE

4.1 Summary of site development

The middle Iron Age settlement site comprised three key episodes of activity within a relatively narrow chronological period (Figs 2-9). The phases are based upon the sequence of stratigraphic relationships and the overall pattern of features divided by episodes of change upon the site. Features in the road corridor were likely to have been of a similar period but they contained few finds and their relationship to the site is not known.

Phase 1: *Middle Iron Age settlement*: Three roundhouses and a large enclosure boundary ditch were established adjacent to a watercourse. Numerous non-structural pits and hollows indicated the possibility of substantial vegetation (Figs 3-4).

Phase 2: *Middle Iron Age expansion*: Earlier structures were replaced with new roundhouses within an expanded settlement. A substantial network of ditches was created to drain the marshland at the edge of the watercourse and settlement encroached onto its former sediments. Signs of vegetation were masked by occupation deposits and the area appeared to have been substantially cleared (Figs 5-6).

Phase 3: *Middle Iron Age abandonment and marginalisation:* Habitation within at least two of the main roundhouses ceased early in the phase and attempts to improve the drainage were made. Substantial flood spread horizons were deposited alongside the watercourse (Figs 10 and 11). By the end of this period all of the roundhouses had been abandoned. No further settlement features were present after this period.

Phase 4: *Casual losses in the Roman marsh*: The site was unoccupied and evidence for field enclosure or habitation was absent. Accumulated silt deposits from flooding were in evidence, and it is from these and the overlying subsoil that two Roman brooches were recovered.

Phase 5: *Post-Roman stagnation*: There was no evidence of activity of any kind on the site between the period of Roman rule and the establishment of the medieval open field system. Signs of flooding continued, creating a substantial alluvial mask.

Phase 6: *The medieval open field system of Newton Longville*: Medieval cultivation in the form of ridge and furrow was present upon the site, aligned south-east to north-west down the slope of the valley. It had caused a measure of truncation to earlier deposits.

Phase 7: *Parliamentary inclosure in the 18th century*: A single ditch is mapped upon the 1885 Ordnance Survey map for Newton Longville. Its function was to distinguish between marginal land next to the stream and well drained arable land elevated by the valley slope.

4.2 Phase 1: Middle Iron Age settlement

Fundamental to the understanding of the site and its subsequent occupation was the presence of a watercourse at the base of the valley (Fig 3). This had evidently meandered over time creating a ragged edge aligned roughly north-east to south-west and extending along the north-west edge of the excavated area with extensive spreads of clay silt indicative of marshy ground. At its widest point the watercourse extended 23m from the edge of the excavation and the depth varied between 0.5-0.8m. Firm mid greyish-orange clay silt (10389) had accumulated gradually as sediment on the gravel bed of the channel, from which small amounts of horse bone were retrieved accompanied by two sherds of Iron Age pottery. Environmental residues were poorly preserved within the clay and little was found through bulk sampling (Sample 5).

Amongst the earliest features on the site was ditch [10212] which extended from its terminal north-west towards the watercourse (Fig 4). It was 0.7m wide by 0.35m deep and filled by firm dark greyish-blue clay silt (10211) with frequent grit and pebble flint. Drainage was evidently a problem for the site in this early stage of occupation. A substantial fluvial spread (10301) lay a short distance away form the gully and was parallel to it, flowing into the watercourse. The spread comprised firm darkish grey-brown clay silt with orange mottling, rounded pebbles, pebble flint and occasional pieces of pottery. It was up to 7.5m wide and 0.22m deep, representing slope run-off prior to effective drainage being implemented.

Enclosures

Enclosure E1

Enclosure E1 formed the north corner of a much larger field or enclosure, with the boundaries extending beyond the excavated area to the south-west and south-east. Ditch [10118], the northern boundary, was located 9m from the edge of the watercourse and was parallel to it. It appeared to have a terminal at the north-eastern end, truncated by later ditch alignments. At the terminal it created an entrance with its counterpart, ditch [10431], aligned north-west to south-east. The entrance was 8m wide and provided access from the settlement to the watercourse.

Enclosure E2

The source of the water flow creating spread (10301) was on the north side of Enclosure E2, the earliest cut of which belonged to the earliest period of occupation. It was roughly square, measuring 19m across with rounded corners, although its northern corner was slightly skewed.

There were no early features within the enclosure. The initial cut of ditch [10079] was *c*1.5m wide by *c*0.9m deep. It had steep sloping sides (50-60°) that rapidly curved into a narrow rounded base. The fills at the base comprised clay silt deposits that had accumulated gradually. The upper fill contained an accumulation of domestic waste in the form of pottery, animal bone and burnt stone, although the pottery only accounts for 2.9% of the total assemblage. The accumulations of waste included the fill of pit [10075], cut into the top of the ditch fill and truncated by subsequent recutting. Amongst its datable finds was a bone weaving comb fragment showing the bases of three teeth and a vestige of the handle (Fig 15, 4). During redefinition most of the initial ditch deposits were removed, leaving only the north-west side *in situ*.

Domestic and ancillary settlement features

Three of the earliest roundhouses (R1-R3) lay close to the northern boundary of Enclosure E1 [10118] (Fig 4). Roundhouses R1 and R2 were defined by ring ditches with entrances to the south-east. A relatively short duration of occupation was supported by a meagre sherd count comprising 9.2% for the combined structures when compared with the site as a whole. It may also indicate that they were not necessarily all domestic structures as two-thirds of that proportion came from Roundhouse R1, of which 70.3% comprised sandy wares whilst pottery from Roundhouse R2 was dominated by organic wares. The differentiation between the structures within Enclosure E1 and the single Roundhouse R1 outside seems important. It is suggested that this may represent a split between domestic occupation in Roundhouse R1 and ancillary functions for Roundhouses R2-3, Enclosure E2 and the possible fenced enclosure P1. Together the structures would form a small pastoral agricultural unit capable of supporting a single small family.

Domestic roundhouse R1

Roundhouse R1 lay outside Enclosure E1 immediately adjacent to the watercourse. The ring ditch was circular, 11.5m in diameter, with splayed entrance terminals set 4m apart. The ditch was 0.73m wide by 0.23m deep but narrower to the west. A slight variation of size and orientation on the northern entrance terminal indicated that the roundhouse contained two episodes of construction. Within its perimeter were ten postholes. Two postholes, 2.4m apart, faced directly onto the entrance to the ring ditch representing the doorway of the roundhouse, with the remainder lying within the circumference of the outer wall which would have been *c*8.5m in diameter. The postholes were generally rounded circular or sub-circular with steep to near vertical sides between 0.3-0.5m in diameter and up to 0.32m deep. Of the three roundhouses, this appeared to have the most structural elements and supports the notion that its sturdiness was of greater importance than that of contemporary structures.

Ancillary roundhouse R2

Roundhouse R2 was located inside Enclosure E1, directly next to the entrance. The ring ditch formed more of an oval than a circle, 11.6m across. The ditch was narrow and shallow throughout its course, *c*0.4m wide by 0.1m deep. The entrance faced south-east and was 4.5m wide with narrow rounded terminals. Three postholes were set within the entrance, the rear pair of which formed a doorway to the roundhouse that was 2.0m wide. A total of ten shallow scoops lay dotted about the interior and indicate the roundhouse would have been *c*8m in diameter. They were generally rounded to sub-circular and no more than 0.12m deep. Several were masked by firm dark brown silt loam containing frequent charcoal flecks that formed a spread, 90mm thick. Such features could perceivably have been created by continued movement within an enclosed space. Three pits had been excavated outside Roundhouse R2, one in front of the entrance and the other two towards the south side. They were sub-circular with gently sloping sides and had rounded bases. Each pit was between 0.7-1.0m wide, was up to 0.3m deep and produced relatively few pottery sherds.

Ancillary roundhouse R3-3a

Roundhouse R3 was located adjacent to Roundhouse R2 and north of Enclosure E2. It is difficult to make firm statements about its form and structural elements as most of it was disturbed by later modifications. The initial ring ditch was no more than 9m in diameter and had a narrow north-east facing entrance that was 0.85m wide, leaving room for a small structure of little more than 6.0-6.5m diameter. The undisturbed portion of the ring ditch contained two cuts that formed a sharp steep-sided profile with a rounded base that was 0.8m wide by 0.32m deep. Its first two cuts were circular but later modifications considerably altered the size, shape, orientation and arrangement of the roundhouse. Roundhouse R3a represented its initial expansion and realignment, centred on the same juxtaposition to Roundhouse R2 (Fig 7, 2). The ring ditch was rectangular with rounded corners, 13.9m by 12.8m across. The ditch was 0.82m wide by 0.22m deep and had eroded upper sides that sloped unevenly to a rounded base. The entrance faced south-east and was 2.28m wide with rounded terminals. There were two pits inside, although these could also relate to any subsequent phase of activity. The pits were both gently sloped and rounded at the base, 0.5m and 1m wide respectively, both *c*0.3m deep.

A possible fenced enclosure P1

Various small pits, possible postholes and shallow sterile disturbances were investigated. Many of the amorphous shallow disturbances were considered to be the remnants of early vegetation disturbance predating settlement. One particular group of pits and postholes (P1), despite their apparent shallow depth and poor definition, exhibited a distribution that may have been indicative of a post structure or wattle fences. Together the features formed a generally oval corral that was 12.2m long by 7.0m wide in the area between the terminal points of gully [10248] and ditch [10212]. Most of the smaller pits were in the range of 0.4-0.7m wide by 0.2-0.3m deep with the larger pits measuring up to 1.5m wide, but of equivalent depth. The pit profiles were generally varied with no particular regular shape, pattern or profile between them except that most had 50-60° sloping sides and a flattish base. There were two shallow gully fragments in this group, [10214] and [10248]. They were 0.6m wide by 0.25m deep and 0.4m wide by 0.2m deep respectively, both having sharp 50° sloping sides meeting at a narrow rounded base. The former bounded the south-east side of the corral, whilst the latter may have been the truncated remains of a ditch leading away to the west. The group produced a total of 35 pottery sherds, comprising 0.9% of the total sherd count from the site.

Pit group P2

This cluster of nine pits appeared to be associated with Roundhouse R2. They were generally sub-circular, and most had fairly steep rounded sides meeting a flat base. The smallest pit was 0.55m wide by 0.20m deep and the largest pit was 1.38m wide by 0.62m deep. The pits produced four sherds of pottery and a small assemblage of animal bone of which 5% was burnt.

Other features

An early ditch fragment [10637] lay to the north of Enclosure E1 and predated the later settlement expansion (Fig 3). It comprised an arc 16.7m long with shallow terminals at either end. The ditch was 0.86m wide by 0.45m deep with steep sloping sides and a broad rounded base. At the southern end it was cut by a pit [10634] which was 1.6m wide by 0.76m deep, containing pottery sherds and animal bone typical of general refuse. The features indicated the possibility of an early enclosure north-east of the settlement having been eroded and obfuscated by later features and flood deposits.

4.3 Phase 2: Middle Iron Age expansion

This was the most intensive period of activity on the site exhibiting the largest number of features with the most evidence for maintenance and realignment of ditches and structures (Fig

5). These features produced the most finds, amongst which Roundhouses R4-R6 account for 61.9% of the total number of pottery sherds found on the site.

Extension of the drainage network and the area of agricultural land use

The ditch systems and enclosures were extended, replacing the boundary ditches of Enclosure E1 with a network draining marshy ground at the edge of the watercourse (Fig 5). In turn this created better conditions for a more substantial settlement that subsequently encroached upon the sediments of the former marsh.

Enclosure E3

One of the main ditches within this network, [10433], formed an L-shaped boundary separating Roundhouse R6 in the north from the roundhouses to the south. It was 1.5m wide by 0.68m deep and was cut with a sharp 60-70° angled side that sloped into a narrow rounded base. It extended from the edge of the watercourse on a north-west to south-east alignment for 49.5m where it then turned through 90° to follow a south-west to north-east alignment, where it became shallower and terminated after 92.5m. This prominent ditch formed the south-west and south-east sides of Enclosure E3. It had two main intersections with ditches [10395] and [10569] that formed the other boundaries of Enclosures E4-E6. Together these ditches formed a plot and field system that was both a retention and extension of the areas of land use established by Enclosure E1 and enforced by the topographical relationship with the nearby stream.

The intersection of ditches [10503] and [10569] with ditch [10433] had noticeably curved forms, perhaps channelling water into ditch [10433] to the south-west. Ditch [10503] was 2.1m wide by 0.72m deep and formed the north-east side of Enclosure E3, increasing the drainage capacity for settlement close to the marsh. Ditch [10569] was noticeably smaller, probably due to greater agricultural truncation and erosion on the valley slope to the south. It was 0.6m wide by 0.28m deep. The apparent truncation indicates that the geologically defined concentration of surviving archaeology may be a false impression created by the effects of modern agriculture on the slope. The narrow channel of gully [10424] connected ditch [10433] to additional drainage along the waterside margin, ditch [10395] (Fig 6). The gully was fairly small, measuring 0.7m wide by 0.1m deep, and seems to have been a shallow channel to distribute overflow between the two principal ditches. It could have been easily bridged for transit and crossed a probable trackway between ditches [10429] and [10433] that led down to the watercourse, an essential feature for watering livestock. The point of access lay in the same area as the entrance to the earlier Enclosure E1 and represented the continued use of that arrangement for Enclosure E4.

Three distinctly straight drainage channels, each set approximately 4.5m apart; [10392], [10429] and [10437], formed a major element of the additional drainage along the waterside margin. They increased the drainage capacity of ditch [10395] along the waterside margin where the sediments of the watercourse were most likely to create an area of marshy ground. These ditches were of equivalent dimensions, being *c*1.2m wide by up to 0.6m deep in each case. The main length of ditch [10395] was 0.8m wide by 0.4m deep where it cut Roundhouse R1. This indicates that the ditch along the waterside margin would have been at least as substantial as the main ditch for Enclosure E3 during its original period of use.

A further two ditches met with ditch [10395] following the slope of the valley from south-east to north-west, presumably collecting surface run-off from the vicinity of habitation. Ditch [10294], cut the line of the earlier fluvial spread (10301) and appeared to have been an attempt to channel water overflow from Enclosure E2. It formed a minor channel 0.4m wide by 0.3m deep and would have quickly become clogged. It is likely to have been a short-term measure on the part of the inhabitants to relieve drainage problems. Ditch [10385] was also a minor channel, measuring 0.34m wide by 0.14m deep. Even accounting for site truncation by ploughing it could not have been more than a short-term solution at best.

Two roundhouses and a small stock enclosure

Roundhouses R4-R5 appeared to have been the successors of Roundhouses R1-R3 (Figs 5-7). Given that they were constructed directly adjacent to the former structures, rather than being on top of them, periods of construction may have overlapped, as the one remained in use whilst its replacement was built, indicating a very close sequence of occupation. It was also noticeable that the comparison of the distribution of pottery between Roundhouses R1 and R2 was also reflected between Roundhouses R4 and R5, with a similar pattern emerging amongst their fabric types. Better quality sandy wares were dominant in Roundhouses R1 and R4, whilst rougher organic wares were dominant in Roundhouses R2 and R5. Elements of both fabric groups were present in each roundhouse alongside grog tempered wares and other fabrics, but these dominant groups share an explicit trend with the features.

Domestic roundhouse R4

The ring ditch for Roundhouse R4 was cut on at least three occasions. It encircled an area slightly larger than its forbearer, R1, and was 14.5m in diameter but remained roughly circular. The ditch was up to 1.8m wide and was 0.43m deep. The entrance was on a south-east orientation but was realigned slightly during its maintenance, obscuring the initial terminals. A number of gullies may have been slots for wattle and daub walls or perhaps drip gullies beyond the walls, built close to the edge of the ring ditch and indicating a fairly large roundhouse up to *c*12m in diameter. There was a pit containing hearth debris, six postholes and four gully fragments in total. The most substantial of the gullies was 0.4m wide by 0.08m deep and its general curvature was proportional to that of the ring ditch, whilst the least substantial was little more than a faint soil mark 0.01-0.03m deep. The postholes varied in size within a range of 0.2-0.45m wide by 0.15-0.2m deep. They were scattered within the interior with no easily interpretable pattern evident, although two to the north set 2.5m apart could have held portal posts for a house *c*10m in diameter. Pit [10131] was 0.9m long by 0.32m wide by 0.44m deep. The sides were steep, varying between a 60-70° slope and a near vertical side with a flat base. It had a noticeably high charcoal content, identified as Willow/Poplar (*Salix/Populus*) and Elm (*Ulmus* sp.), probably a mixture of kindling and heavy logs. The sample also contained the scant remains of cereals, predominantly emmer/spelt wheat (*Triticum dicoccum/spelta*) (Sample 2). Radiocarbon dating of the Willow/Poplar charcoal provided date ranges in the middle Iron Age 400-350 cal BC or 300-210 cal BC. Roundhouse R4 produced 12.2% of the pottery sherds recovered from the site of which sandy wares were the most common component. Amongst the other finds was a terminal fragment from the butt end of a bone weaving comb, decorated with a double ring and dot motif (Fig 15, 3). This roundhouse was probably one of two principal dwellings during period of settlement expansion.

Ancillary roundhouse R5 and animal folds

The ring ditch defining Roundhouse R5 was built upon the site of Roundhouse R3 (Fig 7). It was smaller than its contemporaries with an internal diameter *c*10m. Different cuts varied in depth, the latest of these was 1.05m wide by 0.54m deep and it was clear that the ditch was enlarged over time, possibly a response to increasingly wet conditions.

During the process of redefinition the alignment of the ring ditch entrance migrated in a clockwise direction from the original eastward orientation of Roundhouse R3-3a, initially to a south-east orientation and finally to face to the south, onto Enclosure E2 (Fig 7, 1-4). As it was redefined the ring ditch lost its uniform circular arc, expanding and contracting by small amounts as it did so. In its third arrangement the ring ditch lost its full circumference suggesting that there was a period where no roundhouse was present and it had been replaced by a series of small folds, perhaps for stock (Fig 7, 3). The ring ditch reappeared in the final arrangement, indicating that a structure once again formed part of the group (Fig 7, 4). The changes did not significantly alter the total area occupied. There was a lack of easily defined smaller features, such as pits and postholes and the rearrangement suggests that structures were regularly pulled down and rebuilt. Maintenance seems to have been important and its regular modification

supported a continued function at the heart of the settlement economy. The pottery comprised 7.7% of the total sherds or 9.5% of the total weight indicating slightly larger sherd sizes, perhaps more suited to storage than for domestic use. The frequency was also significantly less than that for Roundhouse R4 with the fabrics comprising a majority of organic wares. The complexity of features made secure context sampling problematic, and samples from the base of the nearby Enclosure E2 ditch indicated scant evidence of cereal processing (Sample 3).

The overall effect was to expand, modify and subsequently to link features to the adjacent Enclosure E2. In the third arrangement Roundhouse R3 was removed altogether with a ditched subdivision that created two small folds or working areas (Fig 7, 3). The west fold was subsequently subdivided again by a small gully carrying run-off from the south-east. It is possible that these gullies could have formed areas that would have been enclosed by wattle fencing. The gullies, [10276] and [10365], were 0.32-0.45m wide by 0.1-0.3m deep with sharp V-shaped profiles (Fig 6). An entrance opened north-east onto the trackway connecting to the watercourse. The corner of the east fold contained a large sub-circular pit [10368] that was 1.5m wide by 0.5m deep. It had fairly uniform curving sides at 45-50° which met in a broad rounded base. The pit contained 21 sherds of pottery, a substantial quantity from the vicinity and is likely to have been contemporary with its use. It was a rare instance of a pit that may have contained midden waste.

A small gateway lay between the east fold and the west fold (Fig 7, 3). This gateway lay at a 2.7m wide break between two shallow gullies which were 0.45-0.5m wide by 0.15-0.2m deep with shallow curved sides, rounded at the base. Within the north side of the gateway upon entering were two postholes, [10323] and [10332], of equivalent size, 0.15m in diameter and 0.1m deep with vertical sides and flat bases (Fig 6). The ground at this point was significantly trampled and a 120mm thick spread of dirty grey silty clay stained with charcoal lay within the thoroughfare.

In the final arrangement the gateway had been blocked off and a 4.7m wide entrance into a much smaller west fold was provided between Roundhouse R5 and Enclosure E2, which were connected on the east side (Fig 7, 4). Two fragments of a D-sectioned copper alloy penannular armlet were recovered from the ditch close to this entranceway (Fig 15, 1). This arrangement created a close unit with Roundhouse R4, with both entrances facing one another and an area of pits (P3 below), perhaps shallow surface fires in the area between. It seems likely that Roundhouse R5 was an ancillary structure, and that the development of the folds and the connection with Enclosure E2 represent modifications to the manner in which that space was used.

Enclosure E2

Enclosure E2 was redefined in its original position at least twice, removing most of the earlier fill deposits in the process. The ditch [10036] was more substantial than earlier cuts and was 2.5m wide by 0.9m deep. The base channel was widened so that the profile cut away much of the former ditch. This produced a wide shallow funnel at the upper edge flowing into a sharp 60-70° drop-off that met sharply with a 0.5m wide flat-based channel at the base. The ditch was continuous and it seems likely that access to Enclosure E2 would have required a platform or walkway, perhaps on the north-east side facing onto Roundhouse R5. The interior contained a single pit [10038] with no finds.

Surface fires P3

A small cluster of nine individual pits was located central to the space between the entrance of Roundhouse R4 and the entrance to Roundhouse R5 in its final stages of development (Figs 6-7). The pits were generally sub-circular and varied in size between 0.5-1.9m long by 0.5-1.5m wide and in most cases were little more than 0.1m deep. Their location and shallow depth may be consistent with small surface fires or the dumping of hearth debris. The result of this is that

the larger part of the feature deposit had been mixed into the topsoil during antiquity leaving little more than charcoal smears and black stained silty clay patches to indicate their presence.

An enclosure containing a domestic roundhouse and charcoal burning pit

Enclosure E3

The area bounded by ditches [10433] and [10503] was roughly rectangular, *c*43m long by *c*25m wide, with the watercourse at its north-west end and contained Roundhouse R6. The larger portion of the enclosure lay in front of the roundhouse, to the south, with few elements of occupational activity associated with the dwelling.

Domestic roundhouse R6

Of all the roundhouses, R6 appeared to have been the most intensively occupied. This habitation exhibited a concentrated group of features that accounted for 42% of the total sherds recovered (Fig 8). Whilst the fabrics were dominated by organic wares like Roundhouses R2 and R5, there was no immediate ancillary structure with which it was related, and given that sandy wares made up a substantial secondary proportion of the group it seems fair to suggest that the dwelling combined domestic and storage functions. The ring ditch was initially oval in plan, measuring 13m north-west to south-east by 11m north-east to south-west. The northern arm [10507/10559] was later abandoned and replaced to give a more circular plan 12m in diameter. The entrance lay to the south-east and was 4.20m wide. The recut outer ring ditch was up to 1.2m wide by 0.5m deep and comprised two principal cuts. Samples from the base of the ring ditch terminals, [10452] and [10474], contained small amounts of charcoal, cereal grains and the seeds of cultivation weeds (Samples 7 and 9).

Within this perimeter there was a circular gully with a recut that was probably the wall slot for a roundhouse *c*8.5m in diameter. The gullies varied between 0.25-0.30m wide by 0.12-0.15m deep. The entrance was aligned towards the south-east and was 2.5m wide. In places individual gullies cut through thin spreads of material derived from trampling pre-dating the roundhouse (Fig 8, grey tone).

At the terminals of the wall slot were two large post-pits, [10525] and [10537], to either side of the portal. Pit [10525] was an irregular sub-circular pit, 2.0m long by 0.8m wide by 0.6m deep, with a bulbous end. Pit [10537] was circular, 1.1m in diameter by 0.6m deep. It is likely that these pits held substantial timber uprights that formed the doorway. The fills of both pits produced large quantities of pottery. The form of pit [10525] suggested the presence of at least two timbers; a substantial door post and a lesser timber supporting a porch. The presence of a similar arrangement on the opposite side of the entrance may have been obscured by later digging out of the posts. In the later phase there was a simple circular posthole at the end of the wall slot.

Seven postholes were present within the interior. These were set towards the outer edge of the central area to either side of the entrance and towards the back of the roundhouse. The postholes were all generally sub-circular and their sizes varied between 0.2-0.4m wide by 0.07-0.12m deep. There were two sub-circular pits on the interior towards the rear of the roundhouse, [10491] and [10543], which were 1.0m and 1.3m long respectively, and 0.6m and 1.0m wide. Both were shallow at 0.15m and 0.3m deep. The fills contained a mixture of dirty grey silty clay, charcoal flecks, ash and burnt stone. It is possible they represent the burial of warm coals.

Charcoal-filled pit [10467]

Pit [10467] lay to the south-west of Roundhouse R6 (Cover, Fig 12). The pit was 2.9m long by 2.0m wide by 0.50m deep with steep, almost vertical, sides and a broad flat base. The base of the pit was lined with yellowish-blue clay that was 45mm thick, and was eroded upon the sides. The pit contained two distinctly separate fills. The base was filled by a thick charcoal-rich layer

of burnt material. On top of the charcoal deposit was mid greyish-brown silty clay containing moderate small mixed gravel. The natural ground into which this pit was cut had been lightly scorched indicating that the fill had been dumped into the pit whilst hot rather than being burned *in situ*. Its large flat base served to spread out the coals allowing them to be raked over and cooled. A total of 2.6 litres of charcoal was recovered from a 40 litre bulk sample during sieving (Sample 8). The charcoal was mainly oak, although other species were present, no charred seeds were present. Fragments of hazel (*Corylus Avellana* L.) were radiocarbon dated to 340-320 cal BC or 210-40 cal BC. The pit contained no animal bone and as such its use as a roasting pit for cooking something as large as a carcass was unlikely, similarly it lacked burnt stones for heating water of for cooking. The lack of charred seeds precluded its use for malting barley. It was almost twice the size of pit [1000] excavated at Pennyland, a further suggestion for which had been use in the process of tanning or dying (Williams 1993a, 29-31, 38-39). Pottery sherds were confined to the upper layer of backfill material and comprised ten sherds (36g), residual within the fill. The two small pits that cut the south side of the pit did not form part of a structure associated with the pit.

A roundhouse on the banks of the watercourse

Roundhouse R7 was the northernmost of all the settlement features, and extended beyond the limit of excavation. It was situated at the edge of the marsh sediments upon a spur beside the watercourse (Fig 5). Given its location it is likely to have been occupied as part of the expanded settlement quite late on. Excavation revealed a ring ditch with two cuts that was 13.5m across with rounded terminals opening to the south-east set 2.0m apart. Three pits lay within the interior of the north-east terminal arc. The ring ditch was 0.4m wide by 0.3m deep. The pits, which appeared to follow the inside arc of the ring ditch, were in the size range of 0.8-1.0m long by 0.4-0.8m wide by 0.2-0.3m deep. The partial exposure of the roundhouse limited the level of investigation and the 5.7% proportion of pottery sherds that were recovered is consequently only about half of what might have been expected had an equivalent proportion of the roundhouse been excavated to those others upon the site. Accounting for this it would still have produced significantly less pottery than Roundhouse R6, and probably a similar amount to that recovered from Roundhouse R4. A roughly equal split of organic and sandy ware fabrics and the lack of a second structure may support a similar degree of domestic and storage functions as for Roundhouse R6. This may have included use as a workshop for metalworking, as indicated by the crucible fragment, and in a similar fashion to roundhouses excavated at Coton Park, Rugby, Warwickshire, where large quantities of copper alloy casting debris and boneworking debris were associated with a roundhouse set to one side of the settlement focus (Chapman forthcoming).

Shallow spreads at the edge of the settlement

Pit group P4 was a collection of shallow pits masked by later flood deposits. The largest pits were 1.5-3.5m long by 1.0-2.0m wide and none were deeper than 0.1m. The fills were all very similar, generally comprising mixed bluish-grey silty clay with dark black stains. The group was located in close proximity to Roundhouses R6 and R7. Their function is uncertain but it would appear that the peripheral location would suit a temporary activity peripheral to the core of the settlement.

Land boundaries within the access road

The ditches that were identified crossing the road corridor were probably of similar date to the main period of site occupation. Since no physical relationship could be demonstrated between these and the main site, the five datable sherds of pottery retrieved provide the basis for a broadly Iron Age period of use. Given the general expansion of ditches on the main occupation site, it is likely that these ditches would have been an extension of the drainage pattern on the upper slopes and indicate that a largely cleared valley side was in existence during the middle Iron Age.

Two main alignments were visible (Fig 9). Ditch [10004] was at the northern end of the road corridor and crossed the point of the road junction aligned east-north-east to west-south-west. It was 0.47m wide by 0.26m deep and formed a steep-sided channel with a narrow pointed base. Four other ditches were identified roughly parallel to each other. They were aligned north-west to south-east but were not equally spaced, varying between 6-12m. These latter ditches were not quite perpendicular but respected the line of ditch [10004], either connecting with it or terminating at its boundary. All of the ditches were shallow, and generally badly truncated by ploughing. The best preserved were those at the lower, northern, end of the natural slope. The ditches varied between 0.4-0.9m wide by 0.13-0.3m deep. Fills were generally consistent comprising hard dry light to mid- orange or greyish-orange clay with none of the dark grey staining or charcoal content indicative of nearby settlement. Most contained small amounts of pebble flint or chalky flecks from the surrounding boulder clay, a sediment accumulated through slope run-off.

4.4 Phase 3: Middle Iron Age abandonment and marginalisation

The abandonment of Roundhouses R6-R7 was not immediate and there was some evidence to suggest that their occupation struggled on for a short period under increasingly wet conditions. This was indicated by the alignment of ditch [10497] from its terminal at the entrance to Roundhouse R6, flowing towards ditches that were added in an attempt to increase the effectiveness of drainage where the principal ditches of earlier phases had already silted up (Fig 10). The attempt was short lived, however, since other ditches, [10601] and [10627], cut across the former footprints of Roundhouses R6-R7. Ditch [10601] was 0.85m wide by 0.26m deep and ditch [10627] was 1.55m wide by 0.24m deep, both comprising fairly minor channels. All of these later additions attempted to channel water from the north-east either directly towards the watercourse or into the remnant ditch network.

Subsequent to the abandonment of Roundhouses R6-R7, widespread flood deposits were laid beside the watercourse that extended almost halfway across the gravel geology and covered occupation features relating to the roundhouses (R6-R7). On this basis the settlement had receded from the margins of the watercourse and occupation of Roundhouses R4-R5 would, if not already abandoned, have been in the final stage with the creation of these minor ditches and gullies representing the last attempt to save the remainder of the settlement area from regular encroachment by flood water. Environmental samples from the upper flood deposits (10388) produced only small quantities of charcoal (Sample 4). The material could easily have been residual from the occupation, mixed with the sediment of flood water.

There was a rise in water levels causing sufficiently regular flooding for it to become a problem to permanent occupation of the site. Land that may have formerly been claimed through drainage once again reverted to marsh. The attempt to mitigate this by extending the ditch network was an indication that occupation of the site lingered for a short period before total abandonment. The occurrence of levels of flooding in excess of what the drainage system could handle heralded an end to the middle Iron Age settlement of the site. Alluvium accumulated over a considerable time in the period following its abandonment (Fig 11).

4.5 Phase 4: Casual losses in the Roman marsh

At this time the site was unoccupied and features relating to field enclosure or habitation were absent. Accumulated silt deposits from flooding of the marsh were still in evidence and it is from these and the overlying subsoil that Roman pottery sherds were recovered. The flood deposits also produced a Nauheim derivative brooch of a type in use *c*AD 25-75 and a circular plate brooch of 2nd century AD date was found in the overlying subsoil (Fig 16). Both objects were found by metal detector and their casual loss in the Roman marsh confirmed the period of abandonment.

4.6 Phase 5: Post-Roman stagnation

There was no evidence of activity of any kind on the site between the period of Roman rule and the establishment of the medieval open field system. Signs of flooding created a substantial alluvial mask subsequently mixed with subsoil and medieval cultivation soils by modern ploughing.

4.7 Phase 6: The medieval open field system of Newton Longville

Ridge and furrow was present on the site and in the vicinity of the access road over the county border in Buckinghamshire. In both cases the furrows were aligned from south-east to north-west down the natural slope of the land. They were spaced at roughly 8-9m intervals and were generally between 120-250mm deep, truncating earlier deposits. The majority of metal finds from the site were located at the interface of these deposits and the subsoil.

4.8 Phase 7: Parliamentary inclosure in the 18th century

The final feature to be established on the site was ditch [10283] which appeared upon the 1885 Ordnance Survey map for Newton Longville (Fig 2). Its alignment, although similar to that of the Iron Age drainage ditches is a direct result of the topography and follows the lower edge of the valley slope. The ditch was fairly straight and substantial, it was 1.3m wide and 0.5m deep even on a site that had been damaged by the plough. A copper alloy strip of post-medieval date was found in the ditch. It continued to mark the limit to which the flood spread horizon extended upon the site. Its function, even as recently as the 18th-19th centuries, was to distinguish between marginal land next to the stream and well drained arable land elevated by the valley slope.

5 THE FINDS

5.1 Worked flint

by Yvonne Wolframm-Murray

A total of nine pieces of residual worked flint was recovered from middle Iron Age contexts. The general composition of the assemblage is summarised in Table 1.

The raw material is mostly vitreous flint that is medium brownish grey in colour with a light brownish white worn cortex. There are also a few of the opaque granular flints of dark to light brownish grey or grey colour.

There are four flakes and one fragment, of which one flake shows possible signs of utilisation. One flake and two blades have miscellaneous retouch down one lateral edge. The two blades were possibly utilised and originate from the same core, notable due to the unusual raw material (SF25 and SF27).

There is one thumbnail scraper of which the dorsal surface may have been polished (SF8). This piece of flint is possibly a flake from a Neolithic ground axe, reused in the late Neolithic or early Bronze Age.

The only diagnostic evidence comes from the thumbnail scraper suggesting both a Neolithic and a late Neolithic or early Bronze Age component in the assemblage.

Table 1: Summary of worked flint

Flint	Quantity
Flakes	3
Utilised flake	1
Fragment	1
Scraper (thumbnail)	1
Miscellaneous retouched flake	1
Miscellaneous retouched blades	2
Total	**9**

5.2 Iron Age pottery by Jane Timby

A substantial assemblage of 3690 sherds, weighing 22.7kg, and dating to the later prehistoric period was recovered from the site. Most of the assemblage appears to date to the middle Iron Age period. The sherds were in a fragmentary state; the overall average sherd size being 6g. This is largely the result of soft friable fabrics, which have been fired at moderately low temperatures. Most of the pottery was recovered from ditches and gullies with lesser amounts from pits and postholes; a total of 118 separate features.

Methodology

The collection was fully recorded following the recommendations laid out by the Prehistoric Ceramic Research Group (1997). The sherds were sorted into fabrics based on the type, size and frequency of inclusions present and quantified by sherd count, weight, and for rims, estimated vessel equivalence (EVE) for each recorded context. Very small crumbs were not classified but just counted and weighed. The data was entered onto an MS Excel spreadsheet, a copy of which is deposited with the site archive. The presence of decoration, burnishing or surface finish was noted, along with evidence of use, such as sooting or traces of adhering residues. Several joins were observed between layers during processing although this was not pursued in detail.

Description of fabrics

Fabrics were divided into six separate groups based on the dominant inclusion type, a total 22 fabrics. The descriptions are brief, but standardized. The frequency or density of inclusions are described as either rare (<3%), sparse (3-9%), moderate (10-19%), common (20-29%), or very common (30-40%). Inclusion sizes are described as fine (<0.25mm), medium (0.25-1mm), coarse (1-3mm) or very coarse (>3mm).

Calcareous

CA1: A fine textured black ware containing very fine calcareous inclusions. Limited to just three sherds, one a rim fragment.

CA2: A sandy textured ware with a sparse frequency of white calcareous matter and shell up to 1-2 mm in size and finer. Sparse grains of well sorted, rounded, quartz grains less than 0.5 mm also feature. Limited to just two bodysherds.

CA3: A black ware with a brown interior. The paste contains a common frequency of limestone with fragments of calcite and discrete grains of oolitic limestone. A moderately small group with no featured pieces. Some sherds have a smoothed or burnished finish.

CA4: A very soft, light vesicular fabric, which contains a moderately to common frequency of fine calcareous material including some fossil shell. Occasional red iron. Another small group with no featured pieces. Of the total 27 sherds, 24 came from enclosure ditch [10083].

Shelly

SH1: A brown ware with a black core. The sherds have a hackley, laminar fracture. The paste contains a moderate-common frequency of coarse fossil shell up to 3-4 mm. A small group of nine bodysherds.

SH2: A slightly larger group of material but still less than 1% of the total assemblage. A black, smooth, fine sandy fabric with a sparse to moderate frequency of fossil shell up to 2-3 mm. Featured sherds include 14 pieces from an urn-like vessel with an oxidised exterior from ditch terminal [10319]/R3/E2 (Fig 13, 4), a finger-tipped rim from boundary ditch [10036]/E2 and a vessel with a knicked rim from ring ditch [10110]/R4.

Sandy

SA1: A sandy ware characterised by grains of glauconitic sand. A small group of 10 sherds.

SA2: A sandy ware with sparse inclusions of burnt out organic matter. Featured sherds include a bowl from boundary ditch [10072].

SA3: A black sandy ware contained an ill-sorted, moderate-common frequency, of fine, rounded, quartz grains, which have a slightly sparkling appearance. Quite a common fabric accounting for 10.8% of the assemblage. Featured sherds include several jars some with everted rims, a shouldered globular jar from gully [10500], outside R6, and bowls (Fig 14, 15-16). Some sherds have deep vertical scoring on the body (Fig 13, 6).

SA4: A sandy textured fabric with sparse inclusions of shell or calcareous matter. This group accounts for 5% of the assemblage. Featured sherds include everted simple rim jars/bowls.

SA5: A very fine, sandy, distinctively micaceous ware. Some sherds have a smooth, burnished finish (Fig 13, 8). Rim sherds suggest wide-mouthed jars or bowls.

SA6: The largest group of sandy wares accounting for 25% of the assemblage, this fabric falls between SA3 and SA5 being a black sandy, micaceous fabric. Several sherds show traces of wiping or scraping of the surfaces to finish the vessels (Fig 13, 2). Other pieces have a smooth or burnished finish. Vessels include both jars and bowls (Fig 14, 10). One piece from hollow [10335] (Fig 4) has an incised lattice and one from ditch [10555]/R6 has a scar from a lug or handle. Vessels are mainly jars including some with finger-impressed or knicked rims and with barrel-shaped bodies. Traces of internal residue are present on sherds from drip gully [10507]/R6 and ditch terminal [10452]/R6.

Organic

OR1: A very hard, fine, slightly laminar fabric with a moderate to dense frequency of burnt out organic matter. Vessels include a barrel-shaped jar from drip gully [10309]/R5.

OR2: A sandy textured fabric with a sparse to moderate frequency of organic matter visible as elongate voids on the vessel surfaces. This is the commonest fabric recorded accounting for 33.4% of the assemblage by sherd count, 34.6% by weight. Vessels include barrel-shaped jars (Figs 13, 7 and 14, 11), slack-sided shouldered jars (Fig 13, 1) and an unusual one with a bevelled rim (Fig 14, 17) and bowls (Figs 13, 3 and 9; 14, 14). Some vessels have knicked rims. Bases are flat or with a slightly protruding base angle or defined stand (Fig 14, 12) and in one example the base edge has been regularly indented or facetted (Fig 14, 13). Some vessels have a scored finish, mainly vertical (Fig 13, 5).

Ferruginous

FE2: Very light, slightly porous fabric containing coarse fragments of red-brown, rounded iron grains and finer calcareous inclusions. One sherd from gully [10474]/R6 has a burnished finish. The rest of the sherds came from gully [10294] (Fig 6) and may be from a single vessel. No featured sherds.

FE1: As above but with a sandier fabric. Restricted to four unfeatured sherds.

Grog

GR1: A thick-walled grog-tempered ware. Some sherds have a soapy feel whilst others have a small amount of quartz sand. Represented by just six sherds.

GR: Other grog-tempered wares, which appear to be typical of the later Iron Age. Some have oxidised surfaces and black grog. No featured sherds.

GRSA: A thinner walled, dark brown ware with a light grey core. The paste contains a well sorted, moderate frequency of fine sand and sparse angular to sub-angular medium-sized grog. Rare.

Discussion

The assemblage belongs to occupation dating to the middle Iron Age period. The fabrics although quite diverse are largely dominated by two main groups: the organic-tempered and the sandy wares. The large urn-like shelly vessel from ditch terminal [10319], is unique in the assemblage and although it appears to be deposited alongside typical middle Iron Age sherds could be earlier in date. It is not dissimilar, for example, to a Bronze Age barrel or bucket urn from Pennyland, near Milton Keynes, which was also in a shelly fabric (Williams 1993, fig 86).

At Newton Leys sandy fabrics dominate the assemblage at 43% by count followed by organic-tempered wares at 33.5% with the shelly, calcareous, ferruginous and grog categories all forming minor amounts. The range of fabrics appears to be restricted at Pennyland with just fine and coarse shelly ware and sandy ware, which could suggest that initial occupation of the site was earlier and was supported by the radiocarbon dating (Knight 1993, 224). Hartigans had a slightly more diverse range of fabrics, including one with flint that was not present here. The commonest fabric at Hartigans is sandy with organic matter which broadly links in with Newton Leys (*ibid*, fabric 1). The range of fabrics found to the east in Bedfordshire is again slightly different, which may reflect minor chronological differences or the diverse range of raw materials locally available. At Salford, sandy wares formed the dominant component of the middle Iron Age assemblage accompanied by shelly, grog and organic and calcareous wares (Slowikowski 2005, 106).

Table 2: Distribution of pottery sherds by feature group

Group	No	%	Wt (g)	%
Period 2 Ditches	6	0.2	12	0.1
Period 3 Ditches	16	0.5	36	0.2
P1	35	0.9	96	0.4
P3	1	0.0	6	0.0
E2	107	2.9	524	2.3
E3	19	0.5	39	0.2
R1	221	6.0	993	4.4
R2	119	3.2	609	2.7
R4	449	12.2	3051	13.4
R5	287	7.8	2157	9.5
R6	1548	42.0	8939	39.3
R7	209	5.7	2703	11.9
other	673	18.2	3571	15.7
TOTAL	**3690**	**100.0**	**22736**	**100.0**

The fragmentary state of the pottery precluded a meaningful typological classification. In broad terms the assemblage reflects other contemporary groups from the region. This includes mainly ovoid or barrel-shaped vessels which can be either neckless or have upright or slightly everted rims. There is a single example of a jar with a carinated shoulder and one with a bevelled inner rim face. Also present is quite a variety of small bowl forms including necked and globular examples. There appear to be no sharply carinated vessels or vessels with complex expanded

rims, which tend to be characteristic of earlier first millennium ceramics. One possible handled jar was observed and no lugged vessels.

Few vessels show signs of a burnished finish although several have wipe marks, perhaps made with straw or grass, and perhaps where coarser, twigs. A few rims have fingernail decoration on the upper surface. Apart from several sherds of scored ware, less than 0.2% of the assemblage, there are no decorated wares. Deeply scored pottery, often with finger decorated rims has been recognised as an East Midlands phenomenon named after the types sites as Ancaster-Bredon ware which has a generally accepted date of 4th to 2nd/1st century BC (Cunliffe 1991). The centre of the distribution of the style appears to lie to the immediate north of Milton Keynes in the Nene Valley region (Elsdon 1992). In Northamptonshire examples have been documented at Twywell (Harding 1975) and many more recently excavated sites including Swan Valley, Rothersthorpe (Jackson 2005). Three variants were observed, one where the lines intersect at random; one where the lines go in one direction and the third where the scoring is arranged more formally at approximate right angles. All three versions can be observed in the assemblage here.

As can be seen from Table 2 the distribution of sherds across the site is quite uneven, possibly a reflection of the zones of habitation as opposed to enclosure used for stock or other purposes. The largest groups come from the ring ditches (R1-R7), which effectively account for 76.8% of the total recovered assemblage. Of these R6 has the highest density of material, 42% of the total site assemblage. The enclosures E2 and E3 produced very modest groups, particularly the latter with just three sherds, as did the posthole/pit cluster P1 and the network of drainage ditches. The latter have very low densities of material and the sherds are quite fragmented suggesting they are probably redeposited. Approximately 18% of the assemblage came from other features on the site. Table 3 summarises the fabric groups from each of the feature groups with in-excess of 100 sherds. Interestingly there are some significant differences in the proportions of fabrics from the different zones, which may reflect some subtle chronological differences and function may also be involved. Enclosure E2 has a relatively higher proportion of calcareous and shelly ware and sandy ware. The assemblages from R1 and R4 are dominated by sandy ware (70.3% and 87.1% respectively). By contrast organic wares followed by the grog and sandy groups dominate the assemblage from R5. Roundhouses R2 and R6 are dominated by organic wares with sandy wares as the second commonest component and R7 more equally split with organic and sandy ware. Ferruginous wares are rare and only occur in R6. Fired clay, although not prolific shows its highest concentration in groups R5 and R6. Two crucible fragments came from R7. Roundhouse R6 with the largest assemblage was also the only one of these groups to have examples of scored ware, the only other examples coming from hollow [10335] and gully [10294]. R6 also had the highest incidence of finger-tipped rims, with just two examples from R4 and one from E2.

Table 3: Distribution of fabrics by feature group (weight in g)

	GROUP													
WARES	**E2**		**R1**		**R2**		**R4**		**R5**		**R6**		**R7**	
%	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt
Calcareous	5.6	13.6	0	0	0	0	5.8	4.9	0.6	0.5	0.2	0.2	0	0
Shelly	2.8	5.9	0	0	0	0	0.2	0.8	4.6	15.3	0.8	1.6	0	0
Sandy	83.2	73.5	70.3	77.8	22.9	16.5	87.1	78.4	21.6	36.9	27.8	47.2	33	54.7
Ferruginous	0	0	0	0	0	0	0	0	0	0	0.3	0.9	0	0
Organic	8.4	7	15	17	61.9	80.2	5.4	13.9	41.3	33	43.3	43.7	47.6	44
Grog	0	0	1	1.5	0	0	1	1.5	23.4	13	0.3	0.6	0	0
Misc	0	0	0	0	0.8	1	0.5	0.5	0	0	0	0	0	0
crumbs	0	0	13.7	3.7	14.4	2.3	0	0	8.5	1.3	27.3	5.8	19.4	1.3
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
fired clay	0	0	2	5	1	4	1	10	25	150	45	322	0	0

Conclusions

The site broadly belongs to the middle Iron Age period but within this there are subtle differences in the fabrics present, which may suggest that there are different chronological phases within this or definitive areas of activity subject to particular functional processes. The assemblage is typologically very similar to other broadly contemporary groups from the region, in particular Pennyland and Hartigans (Knight 1993), Salford, Bedfordshire (Dawson 2005, phase 4) and slightly further away, Twywell, Northamptonshire (Jackson 1975).

Illustrated pottery (Figs 13-14)

1 Slack-sided, shouldered jar. Fabric: OR2. The interior has charred residue adhering to the surfaces. Ditch terminal [10168] (10166), Group R1.
2 Small bowl with an everted rim. The exterior shows traces of wiping and scraping prior to firing. Fabric: SA6. Ditch terminal [10196] (10195), Group R4.
3 Bowl with a slightly everted, flat-topped rim. Fabric: OR2. Enclosure ditch [10290] (10289), Group R3/E2.
4 Large urn-like vessel in a pale brown fabric with a black core. Fabric: SH2 with surface voids. Ditch terminal [10319] (10318), Group R3/E2.
5 Barrel-shaped jar with a flat-topped rim marked with shallow scrape marks. The body is incised with mainly vertical deeply scored lines. Brown-orange exterior with a grey interior and core. Fabric: OR2. Ditch terminal [10474] (10473), Group R6.
6 Jar with a small simple everted rim. The body has vertical scoring. Black sandy ware, fabric SA3. Ditch terminal [10474] (10473), Group R6.
7 Wide-mouthed jar with a simple incurving, slightly tapered, rim. Fabric: OR2. Ditch terminal [10474] (10473), Group R6.
8 Small diameter jar/bowl with an incurving, slightly tapered, rim. Burnished exterior surface. Fabric: SA5 with some added organic material. Ditch terminal [10474] (10473), Group R6.
9 Round-bodied bowl with a simple short everted rim. Dark black-brown in colour. Fabric: OR2. Ditch terminal [10474] (10473), Group R6.
10 Globular bowl with a slightly shaped rim. Fabric: SA6. Ditch terminal [10474] (10473), Group R6.
11 Barrel-shaped jar with a flattened slightly, shaped, rim. The body is scored with crossing lines. Fabric: OR2. Ditch terminal [10474] (10473), Group R6.
12 Base from a globular bowl or jar. Fabric: OR2. Ditch terminal [10474] (10473), Group R6.
13 Heavy base with faceting around the foot. Fabric: OR2. Ditch terminal [10474] (10473), Group R6.
14 Small vessel with a knicked rim. Fabric: OR2. Ditch terminal [10476] (10475), Group R6.
15 Round-bodied bowl with a simple undifferentiated rim. Fabric SA3. Ditch terminal [10476] (10475), Group R6.
16 Necked round-bodied bowl. Fabric: SA3. Boundary ditch [10593] (10592).
17 Wide-mouthed jar with an internally bevelled rim. Fabric: OR2. Boundary ditch [10593] (10592).

5.3 Iron Age finds

by Tora Hylton

Five finds were recovered from Iron Age deposits. Four were from ditches [10058, 10086 and 10593] and one from a pit [10075]. The range of finds, although small, is suggestive of domestic settlement and includes items relating to personal adornment and textile manufacture. The finds include fragments from two armlets and fragments from two bone weaving combs.

Armlets

There are two joining fragments from almost half of a D-shaped copper alloy penannular armlet, which expands slightly towards a rounded terminal (Fig 15, 1). They measure 55mm and 61mm long respectively. The armlet is ornamented with opposing equidistant notches along the outside edge, which gives a segmented appearance rather like an example from the Caerleon *Canabae* (Lloyd-Morgan 2000, fig 80, 49).

Part of a plain shale armlet, measuring *c*9mm by 8mm, has an oval cross-section and the curvature of the piece suggests that originally it would have measured *c*65mm in diameter (Fig 15, 2). It is difficult to determine if the original bracelet was hand made or turned on a lathe, but it has been carefully finished. Armlets of this type were in circulation throughout the Iron Age and early Roman periods. Stylistically it resembles plain examples recovered from Danebury which have been manufactured from Kimmeridge shale (Cunliffe 1984, fig 7.41, 41-4.3) and the Caerleon *Canabae* (Greep 2000, fig 116, 12).

Weaving combs

Craft-based activities are represented by two small fragments from bone weaving combs. Combs of this type are frequently found on Iron Age sites. They would have been used in conjunction with a warp-weighted loom to align the threads. Both fragments have been burnt (calcined) in antiquity and measure no more than 30mm by 17mm. One comprises a terminal fragment from the butt end of a handle (Fig 15, 3). The butt end is 'squared' with rounded corners and resembles Type 4 combs from Maiden Castle (Wheeler 1943, 298). The upper surface is decorated with a 'compass' drawn double ring and dot, a common motif on combs of this style and date. Comparison of decorative techniques in relation to ceramic phases undertaken by Cunliffe on the combs from Danebury (1991, 354) and excavated examples from Maiden Castle (Wheeler 1943, 298), suggest that combs with ring-and-dot motifs were prevalent during their later phases. The other comb comprises the bases of three teeth, together with a vestige of the handle (Fig 15, 4). The junction of the teeth and handle is marked by three lightly incised transverse lines, and just above there is a vestige of another incised line, which runs at an oblique angle and probably, would have formed a motif similar to that seen on an example from Hartigans, Milton Keynes (Williams 1993, fig 83, 4). Only one other example is known from Milton Keynes, found near Stanton Low Roman Villa (Britnell 1972, 214-215).

Illustrated finds (Fig 15)

1 Armlet, copper alloy. Incomplete. Height: 4mm; Length: 55mm and 61mm; SF 5 and 6, Context (10057), Ditch [10058], Enclosure E2

2 Armlet, shale. Fragment only. Dimensions: *c*9mm by 8mm; Length: 22mm; SF 23, Context (10592), Ditch [10593]

3 Weaving comb, bone. Burnt fragment, incomplete, part of handle only. Dimensions: 30mm by 17mm; SF 9, Context (10085), Ditch [10086], Post-medieval ditch, vicinity of Roundhouse R4

4 Weaving comb, bone. Burnt fragment with the vesicular cortex surviving on the underside. Dimensions: 23mm by 11mm Thickness: 6mm; SF 10, Context (10074), Pit [10075], Enclosure E2

5.4 Metalworking debris

by Andy Chapman

Two sherds, weighing 16g, recovered from the ring ditch of Roundhouse R7, are from bronze working crucibles as used in lost-wax casting in investment moulds.

Both sherds are in a fine, slightly sandy fabric, pale grey in colour and containing numerous small voids. The body of the crucible is 10-11mm thick and this tapers in to form a simple pointed rim. The rim sherd has a very slight curvature, which probably indicates that it comes from a triangular crucible of the form commonly in use during the Iron Age (EH 2001, fig 22, 1 and Chapman forthcoming).

On the body sherd the exterior is covered with a white encrustation with a pitted surface. On the rim sherd the outer surface and the interior immediately below the rim, to a depth of 15mm, is similarly encrusted and pitted.

A few crucible fragments of similar fabric have come from a late Iron Age and Roman settlement at Newport Pagnell (Chapman 2008) and a large assemblage of both crucibles and mould fragments was recovered from a middle Iron Age settlement at Coton Park, Rugby, Warwickshire (Chapman forthcoming).

Amongst the fired clay there is a proportion of the material that does not contain large mineral inclusions and characteristically has a grey core and oxidised light brown to orange-brown surfaces. At least some of this material might have come from broken-up investment moulds but none retain any diagnostic features. Such material was present in enclosure ditch [10305] and ditch terminal [10319] in Roundhouse R5; ditch terminal [10455] and gully [10517] in Roundhouse R6; and ditch [10593], a later drainage modification prior to final abandonment.

5.5 Fired clay

by Pat Chapman

A total of 55 fragments of fired clay weighing 472g were examined, comprising one third of the total assemblage. The material selected was from the vicinity of Roundhouse R6. It is made from soft slightly sandy clay with varying quantities of flint and chalk inclusions from 1-11mm long, the most poorly mixed having the largest inclusions. The fabric is pale orange brown to red brown with creamy streaks and some pale brown surfaces.

The fired clay fragments are generally irregular in shape, typically between 10mm by 10mm and 35mm by 20mm, by 15mm. There are a few large fragments, about 65mm by 50mm by 25mm from pit [10525] and some small flat pieces 5mm thick from enclosure ditch [10503]. The most poorly mixed come from pit [10537]. There are no features, such as stem or wattle impressions, or smoothed surfaces. These fragments would appear to be random dispersed debris.

Table 4: Quantification of fired clay

Context	Count	Weight (g)	Comment
10122	12	32	Small, irregular
10130	3	27	Irregular, flat
10501	14	47	Flat
10502	1	14	
10524	10	195	5 biggest, large flat
10536	15	157	Irregular, friable
Total	55	472	

5.6 Roman pottery by Tora Hylton

Seven sherds of Roman pottery weighing 64g were recovered. With the exception of one base angle, this small assemblage comprises undiagnostic body sherds which display minimal signs of abrasion. The assemblage comprises coarsewares in locally produced sandy greywares (5 examples), shell-gritted ware (1 example) and ?grog/sand tempered ware (1 example). Two of the sherds are from post-abandonment alluvium and the remainder were intrusive within Iron Age deposits, either introduced by field drains or lying very close to the surface where disturbed by medieval ridge and furrow.

5.7 Roman finds by Ian Meadows

Two brooches and a conical lead weight were recovered by metal detector from alluvial and subsoil layers during machining of the excavation area.

A fragmentary Nauheim derivative brooch was recovered from flood deposit (10388). It comprises the bow with plain solid catch plate and the start of the first twist of the spring. As a type this form generally belongs to the period *c*25-75AD.

A plate brooch was recovered from the subsoil (10002). It has a circular plate of which about 50% survives, including the plain catchplate (Fig 16). The circular plate measures *c*38mm diameter and extends as a small 5mm lug above the catchplate, this lug has a cast ring-and-dot motif. The surface of the plate is plain other than a series of random striae and the surface appears to preserve a thin white metal coating. This type of brooch would normally have a decorative appliqué répoussé plate, often affixed by means of solder (hence the white metal). Brooches of this type date to the 2nd century AD.

Illustrated finds (Fig 16)

5 Plate brooch, copper alloy. Incomplete, part of plate (*c*50%) and catchplate survive, no pin. Diameter : *c*38mm; SF 3, Context (10002), Subsoil

5.8 Medieval and post-medieval finds by Tora Hylton

There is one object of medieval date, a copper alloy end-cap from a knife decorated with an incised linear motif recovered from the subsoil (10002) by metal detector.

One post-medieval copper alloy strip (SF12) was found in ditch [10283]. All other post-medieval finds were recovered from the subsoil (10002). Post-medieval finds include a George III farthing (1760-1820), a copper alloy buckle for use with heavy duty straps, such as those required for riding gear, and an iron horseshoe.

6 THE ENVIRONMENTAL EVIDENCE

6.1 Faunal remains by Matilda Holmes

A total of 665 animal bone elements and fragments were analysed, 67% of the specimens had been hand-collected during the excavation and the remaining 33% was recovered from the sieved bulk environmental samples. Employing standard zooarchaeological methodological procedures, 175 specimens (26% of the total) were identified to taxa and parts of anatomy, representing four mammalian species. No bird, amphibian, fish or small mammalian bones were recovered.

The animal bone was identified using the author's reference collection, and further guidelines from Hillson (1992) and Schmid (1972). Due to anatomical similarities between sheep and goat, bones of this type were assigned to the category 'sheep or goat', unless a definite identification using guidelines from Prummel and Frisch (1986) or Payne (1985) could be made. Bones that could not be identified to species were, where possible, categorised according to the relative size of the animal represented (small: rodent or rabbit sized, medium: sheep, pig or dog sized, large: cattle or horse sized). Ribs and vertebrae except 1st and 2nd cervical and sacral were not identified to species. All fragments were recorded.

Tooth wear and eruption were noted using guidelines from Grant (1982) and Silver (1969), as were bone fusion (Amorosi 1989, Silver 1969), metrical data (von den Driesch 1976), anatomy, side, zone (Serjeantson 1996), pathology, butchery, bone working, size and condition of the bones (Lyman 1994).

A number of sieved samples were present, the bones from which were recorded only if they could be identified to species or anatomy, or showed some sign of taphonomic process. The material is to be assessed as Late Iron Age in date.

Taphonomy and condition

The bones were generally in bad condition and very fragmentary, with the majority being less than 50mm in size (Table 5). Emphasising the fragmentary nature of the assemblage, 326 fragments could be joined to make 61 larger pieces. Taphonomic factors affecting the material were recorded including burnt, gnawed, butchered and recently broken bones. Of which nearly 5% of the fragments recorded had been burnt, and a further 5% showed signs of fresh breaks. Approximately 2% had been gnawed by dogs, and only 1% had been affected by butchery. No articulated bones were recovered.

Table 5: Size and condition of the animal bone assemblage

Size (mm)	%	Condition	%
<20	33	Excellent	1
20-50	46	Good	16
50-100	17	Fair	34
100-150	3	Poor	29
>150	1	Very Bad	20

Despite the relative scarcity of butchery marks on bones, the highly fragmented nature of the assemblage suggests it was subject to rigorous processing prior to deposition, most likely the result of meat and marrow preparation supported by the number of burnt bones recorded. The presence of canid gnawing on bones suggests that they were left within access of dogs before being buried, an indicator that dogs were present on the site despite none of their bones being recorded in the faunal assemblage.

Basic description of findings

The majority of animal bones were retrieved from ring ditches in groups R1-5. Bones were present from all parts of the carcass and no isolated deposits of industrial or bone working waste was present.

Table 6 shows the fragment count of species. Due to the high fragmentation and poor condition of the assemblage, only 26% were identified to species. The majority of bones came from cattle (45%) and sheep or goat (39%). Horse was the next most common species, and pig was also present, although in very small numbers. All these species were probably consumed on the site as butchery marks were found on cattle, sheep or goat and horse bones.

Table 6: Species present in the animal bone assemblage by fragment count

Species	Count	%
Cattle	78	45
Sheep or goat	68	39
Pig	2	1
Horse	27	15
Subtotal of identified bone	175	100
Unidentified large mammal	198	
Unidentified medium mammal	74	
Unidentified small mammal	218	
TOTAL	**665**	

Little ageing data was available, although some epiphyseal fusion was recorded for horse, cattle and sheep or goat bones, suggesting that the majority of these animals were mature at death. One horse humerus was recorded from an animal less than 18 months old when it died, and four cattle and sheep or goat bones were from animals less than 36 months old at death. Tooth wear and eruption data was scarce, although it supported the fusion data.

The state of preservation for bone on the site was generally poor and the amount of material retrieved was below the level anticipated for a site of domestic occupation. Few bones exhibited signs of butchery. Many bones were smashed in antiquity or burnt signifying that the chosen method of disposal may distort the pattern of the assemblage. There was a general absence of small bones from sieved samples. Only 26% of the assemblage could be identified to species. Further interpretation of the assemblage would probably be misleading and its potential as an isolated group remains low.

The assemblage was very small with only 175 bones identified to species and does not warrant further detailed interpretation. The data may be useful in comparison with sites nearby but as a single assemblage provides limited scope for analysis. Its presence should be noted in any published material.

6.2 Plant macro-fossils by Wendy Carruthers

During the excavation soil samples were taken for the recovery of environmental information. The features targeted included an enclosure, ring ditches, a charcoal pit, drainage ditches connecting to the watercourse and the sediment deposits of the watercourse itself. Waterlogged deposits were not encountered.

The samples were processed using standard methods of floatation using a siraf tank fitted with 500 micron mesh and flot sieve. Samples were washed though a series of stacked sieves with 500 micron, 1mm and 3.5 mm apertures. The flots and sorted charcoal from nine samples were sent to the author to be assessed for charred plant remains.

The flots were dry-sieved through a 1mm sieve (to facilitate sorting) before being scanned under a stereoscopic microscope for charred plant remains. The large charcoal (>2mm) was rapidly scanned in order to roughly assess the range of taxa present, but identifications were not confirmed by high-power microscopy at this stage. Identifiable charcoal was bagged separately so that it could later be analysed by a charcoal specialist, if required.

All of the flots were very small and unproductive, except the flot from the charcoal rich sample (Sample 8), it was clear at the outset that they would have little potential for further analysis. Therefore, the flots were fully sorted at the assessment stage rather than being scanned, since this took very little extra time. The large charcoal sample was scanned more rapidly. These

types of charcoal-rich deposits rarely produce cereal remains, so it is unlikely that plant macrofossils were missed. Non-oak charcoal, however, may turn out to be more frequent than the rapid scan suggested.

Results

The results of the assessment are presented in Table 7. Charcoal has been reported upon by Lisa Gray and suitable samples were selected for radiocarbon dating.

Discussion

Despite being located at the base of the valley, with a watercourse that periodically flooded the area, very little evidence of waterlogging had survived. Where uncharred seeds were found these were obviously modern with fresh embryos present. Although Sample 7 contained a few fragments of uncharred wood, the state of preservation was so poor that more fragile items such as seeds must have been lost through drying out over time. Waterlogged deposits do not appear to have survived in this locality.

The condition of the charred plant remains was poor in all cases, except for the well-preserved large deposit of charcoal in the base of pit [10467], Sample 8. The few cereal grains that were recovered (Samples 2, 7 and 8) were eroded and fragmented, and the sparse emmer/spelt wheat (*Triticum dicoccum/spelta*) chaff fragments (Samples 2 and 3) were too poorly preserved to be identified to species level. This, and the general scarcity of charred cereal remains, suggests that the material in the samples represents low levels of background domestic waste that had been lying around the site for some time before it was blown or washed into the features.

Although the evidence was scarce, it is probably significant that the four samples out of nine examined that produced cereal remains were all associated with the ring ditches of Roundhouses R4 and R6. Domestic activities occurring nearby meant that food waste such as charred cereals was more likely to become deposited around these structures, particularly near the entrances as in Samples 7 and 9. Two poorly preserved grains of barley (*Hordeum* sp.) were recovered from these two samples, providing evidence of a crop that may have been primarily grown for fodder. Barley is commonly recovered in small quantities from Iron Age sites, although in most cases emmer and/or spelt wheat are the most abundant cereals represented.

The chaff and weed seed chess *Bromus* sect. *Bromus* in pit [10131] towards the centre of Roundhouse R1 may represent contaminants picked out of the grain prior to cooking. Chess fragments were also present in Samples 7 and 9 in Roundhouse R6. This large arable weed is difficult to separate from the grain during processing, as it is a similar size to wheat grains. For this reason it is often present as a contaminant of processed grain. Since its first appearance coincides with the introduction of spelt wheat (*Triticum spelta*), it is thought to have been introduced into the British Isles with this crop (Helbaek 1953, 223).

The only other weed taxon represented was red bartsia/eyebright (*Odontites verna/Euphrasia* sp.). The seeds from these plants are too similar to be sure which species was present, although red bartsia is more characteristic of arable fields than eyebright, a genus of grassland herbs. Both taxa are semi-parasitic on grasses. Seeds from this group are commonly recovered from later prehistoric charred cereal assemblages.

Comparing the small amount of charred cereal information from Newton Leys with findings from nearby sites such as the Willington to Steppingley pipeline to the east of Milton Keynes, and the A43 Road Project to the west, low recovery rates and poor preservation appear to be typical (Carruthers forthcoming; Carruthers 2007a). This is probably due to the heavy clay soils in the area, which may have limited arable cultivation to a low, subsistence level and would also have caused increased post-depositional loss of charred remains. Clay soils lead to silt impregnation and failure to float during soil processing, as well as surface erosion and

destruction during the wetting and drying processes that occur in clays. The latter, taphonomic problem, however, should not apply if deep features filled with richly organic domestic waste were present. These types of features appear to be rare where the soils are predominantly clay, unlike the deep storage pits that are common on Iron Age sites in southern Britain. Two possible storage pits were found at Silverstone Fields Farm, A43, but this was amongst a total of 63 samples, the remainder of which produced low-level background waste, as at Newton Leys. It is likely, therefore, that the combination of limited arable agriculture and the loss of charred material deposited in shallow, clay-filled features, is the cause of scant information being recovered from charred assemblages in the Milton Keynes area. This makes it even more important that high levels of sampling are undertaken targeting features that are deep or have large amounts of domestic waste within their fills.

Conclusions

Low-level arable cultivation was probably taking place close to the site, involving the cultivation of emmer and/or spelt wheat and barley (probably hulled, 6-row barley but this could not be confirmed due to poor preservation of the grains). It is possible that semi-processed cereals were being brought onto the site from further away, but it is most likely that the occupants would have been able to grow enough grain for their own purposes close to the settlement. Although difficult to clear and plough in the first place, clay soils can be productive and are well-suited to the cultivation of spelt wheat, in particular. The absence of deposits containing cereal processing waste or quantities of weeds suggests that cultivation was probably taking place on a small scale. Where livestock are important, cereal processing waste is a useful source of fodder, thus where processing was taking place on a very large scale charred deposits of burnt processing waste tend to survive better than on smaller subsistence sites (Carruthers 2007b).

Table 7: Charred plant remains

Sample no.	Context	Feature	Sample volume (litres)	Flot description	Charred plant macrofossils	Further potential
1	10213	Dark loamy upper fill of gully [10214] in group P1, fragments of burnt bone present	10	small flot with modern roots	occasional very poor possible cereal fragments but, too poor to confirm ID	none, a few fragments of charcoal possibly big enough to ID
2	10130	dark grey silty fill of pit [10131] within R4	40	small flot with modern roots, large bone fragments, 0.13 charred plant macros per litre (fpl)	1 poor emmer/spelt grain (*Triticum dicoccum/spelta*) 2 poor emmer/spelt spikelet forks (" " ") 1 poor emmer/spelt glume base (" " ") 1 chess caryopsis (*Bromus* sect. *Bromus*)	Charcoal ID only
3	10041	dark blue/grey clay in bottom of enclosure E2 ditch	40	small flot with modern roots, no large charcoal, 0.05 fpl	1 very poor emmer/spelt glume base (*Triticum dicoccum/spelta*) 1 red bartsia/eyebright seed (*Odontites verna/Euphrasia* sp.)	none
4	10388	dark black/grey charcoal flecked Period 3 flood deposits	40	small flot with modern roots	nil	charcoal ID only
5	10389	orange grey silty clay, lower fill of watercourse	40	mainly modern roots, some small charcoal and stones, several uncharred orache seeds (Atriplex sp.) but probably modern	nil	none
6	10391	blue/grey alluvial fill of ditch [10392], Period 3 ditch	40	few roots and occasional small charcoal, small flot	nil	none
7	10451	fill of ring ditch R6 terminal, domestic waste	20	small rooty flot with some uncharred poorly preserved twigs, ?slight waterlogging, 0.15 fpl	1 eroded poor wheat grain (*Triticum* sp.) 1 poor barley (*Hordeum* sp.) 1 chess caryopsis (*Bromus* sect. *Bromus*)	charcoal ID only
8	10466	charcoal deposit in base of pit [10467], dumped when hot	40	very large, pure charcoal deposit	nil	charcoal ID only
9	10473	fill of ring ditch R6 terminal, domestic waste	20	roots, small flot, 0.15 fpl	1 poor cf. barley (cf. *Hordeum* sp.) 1 poor cereal fragment 1 chess fragment (*Bromus* sect. *Bromus*)	charcoal ID only

6.3 Charcoal by Lisa Gray

Preservation of plant macrofossils at this site was generally poor. Charcoal in six samples was well-preserved enough for analysis.

Methodology

The charcoal was sieved through a 4mm mesh sieve to extract fragments greater than 4mm Fragments larger than this size are easier to break to reveal the cross-section necessary for more diagnostic features to survive (Smart and Hoffman 1988, 178-179). Fragments smaller than 4mm have a greater chance of being windblown or reworked (Boardman 1983, 149). Each fragment was examined under a low powered stereo-microscope with magnifications of x10 and x40. Fragments of oak were removed and the remaining fragments were separated into groups based on the pattern of porosity of the transverse sections.

Identifications of non-oak fragments were made using an epi-luminating metallurgical microscope. Examinations were made of the transverse, radial longitudinal and transverse longitudinal sections. Diagnostic features were noted and identifications were made using anatomical guides and modern reference material (Gale and Cutler 2000; Hather 2000; Schoch *et al* 2004).

Fragment counts were made before splitting to reveal sections. This was followed by weighing of each taxa and the unidentified fraction measuring less than 4mm. Nomenclature and taxa are presented in the order following Stace (1997).

Results

Identifiable fragments were present in five of the six selected samples. Fragments of oak (*Quercus* sp.), hazel (*Corylus avellana* L.), elm (*Ulmus* sp.), willow/poplar (*Salix*/*Populus*) and apple/pear/whitebeam/hawthorn (*Maloideae*) were present. These were counted and weighed and the results for each Sample presented in Table 8.

Table 8: Identification of charcoal fragments by taxa

Feature	**Gully [10214]**	**Pit [10130]**	**Alluvium**	**Ring ditch R5**	**Pit [10467]**	**Ring ditch R5**
Context	10213	10130	10388	10451	10466	10473
Sample	1	2	4	7	8	9
Taxa	**Weight (g) / Count of fragments**					
Ulmus sp. (elm)	-	<1 (1)	-	1 (1)	27 (32)	-
Quercus sp. (oak)	-	-	-	1 (2)	328 (463)	-
cf. *Quercus* sp. (oak)	-	-	<1 (1)	-	26 (46)	-
Corylus avellana L. (hazel)	-	-	-	<1 (1)	68 (112)	<1 (2)
Salix/Populus (willow/poplar)	-	<1 (2)	<1 (1)	<1 (1)	17 (44)	-
Maloideae (apple/pear/whitebeams/ hawthorns)	-	-	<1 (5)	<1 (2)	5 (14)	<1 (4)
undifferentiated diffuse porous	-	-	-	-	12 (18)	-
indeterminate charcoal >4mm^2	-	-	1 (2)	-	141 (276)	-
indeterminate wood flecks <4mm^2	<1	2	7	6	528	4

Several of the taxa identified here could not be separated into species microscopically. These were the two native species of oak (sessile and pendunculate), willow/poplar, elm and

Maloideae (Hather 2000, 11). *Maloideae* includes the genera *Malus*, *Pyrus*, *Sorbus* and *Crategus* (Hather 2000, 11).

It is clear that oak and hazel fragments were the most frequent taxa, followed by elm, willow/poplar and *Maloideae*. The hazel, willow/poplar and *Maloideae* fragments in all of the samples except Sample 1 have the potential to provide radiocarbon dates.

Discussion

The taxa represented in these samples would have provided the community with useful sources of fuel, using larger timbers such as oak, elm and coppiced hazel. Scrub elm, willow/poplar and *Maloideae* would also provide smaller fuel. This consistent with the charcoal assemblage from the Iron Age site at Pennyland, Milton Keynes where fragments of oak, hazel, hawthorn and blackthorn (*Prunus spinosa* L.) were identified (Thomas 1993, 158). The richest assemblage came from pit [10467]. The taxa within it are typically used as fuel. Well seasoned oak burns slowly providing steady heat, whilst seasoned hazel makes good kindling, burning well and fast (Skellern 2000).

Oak species prefer damp, non-calcareous soils and often grow with hazel and ash. Hazel grows in wet but not waterlogged conditions in basic to moderately acid soils amongst oak and ash. Elm species prefer rich alluvial soils, particularly riverine habitats. Species of willow are common in damp ground beside rivers or streams and poplar species frequent flood plains and rich alluvial soil (Gale and Cutler 2000; Grogan *et al* 2007). All of these species are consistent with the topographical location of the settlement.

It is often observed that charcoal fragments do not provide an accurate reflection of the local environment or of taxa presence or availability (Thomas 1993, 158). The only interpretation that can safely be made is that certain species are present and may have been gathered from a locality. In this case the environment was riverine, where larger trees such as oak and hazel grew alongside smaller trees and scrub. This is a similar conclusion to that drawn for Pennylands where marginal woodland was exploited.

The charcoal assemblage supports the exploitation of marginal land on the edge of the watercourse. This is consistent with Iron Age settlements in the Area of Milton Keynes that have a '…broadly riverine distribution…' where heavy clay soils were avoided and marginal land was inhabited (Thomas 1993, 213).

6.4 Radiocarbon dating

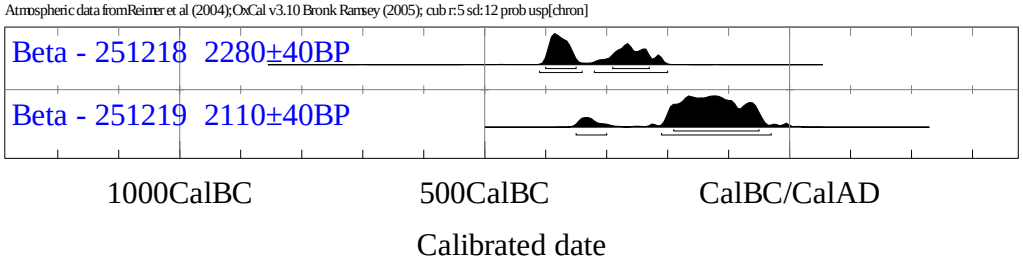
by Jim Brown

The selection of samples for radiocarbon dating were chosen from those deposits which yielded sufficient charcoal to provide datable material and were based upon the species identification of charcoal from short-lived species such as hazel, poplar and hawthorn/whitebeams, after considering the nature of the deposits in which they were found. Only two deposits were definitely secure single-event context deposits (Samples 2 and 8). All of the other samples were or could conceivably have included accumulations of material of a wind blown or waterborne nature. Such material settled in the fill during the Iron Age over a longer period of time and would have reduced the chances of narrowing the date ranges that radiocarbon dating produces.

Table 9: The radiocarbon determinations

Laboratory & Sample No.	Context	Sample details	d13C/ 12C	Conventional Radiocarbon Age BP	Cal BC Intercept 68% confidence 95% confidence
Beta-251218 10130	(10130) fill of pit [10130]	Wood charcoal (short-lived species only)	-24.0	2280 +/-40	380 390-360 400-350 & 300-210
Beta-251219 10466	(10466) base of pit [10467]	Wood charcoal (short-lived species only)	-24.4	2110 +/-40	160 190-60 340-320 & 210-40

Laboratory: Beta Analytic, Miami, Florida, USA
Calibration: Ox Cal v3.10 Bronk Ramsey 2005



Results

Due to the nature of the radiocarbon curve during the middle Iron Age, two groupings of dates were identified from each sample as opposed to a single narrow date range. This is always a problem with radiometric calibration for the middle Iron Age. By choosing undisturbed single event deposits it prevented the date ranges being even wider as had been a problem with the waterlogged wood in the pit at Hartigans (Zeepvat 1993b, 191-2).

The dates confirmed occupation of the site towards the end of the middle Iron Age, perhaps bordering on the later Iron Age. There is a strong likelihood that the charcoal from pit [10467] dates in the range 210-40 cal BC. Given that the site had a distinct lack of early or later Iron Age pottery, and that the stratigraphic sequences of features demonstrate a close and rapid site development, it is likely that the grouping of dates is closer than the 2 sigma calibration may otherwise suggest. It is therefore suggested that the date range for pit [10131] is more likely to be in the range 300-210 cal BC than earlier and that the period of abandonment would probably have been in the earlier part of the 1st century BC. The gap between the dates of the two samples places a broad sequence of occupation in the order of 200-300 years and on the basis of the pottery and morphology could be as little at 150 years. This would equate to a maximum 3-6 generations of people living continuously upon the site and is probably at the lower end of that estimate. This assumes an average life expectancy of around 40-50 years, equivalent to some modern populations. If the life expectancy were to be greater then the generation gap might also be greater, allowing for a smaller number of generations during the interim. Given the morphological evidence for the site development the disparity of dates is both feasible and informative in terms of settlement occupation. It would appear that the inhabitants occupied the site for a relatively short period of time.

7 DISCUSSION

Period of settlement

The time period between occupation and abandonment at Newton Leys falls within a narrow band, likely to be 250-100 BC. Few sites within the Milton Keynes area have been dated to such a narrow time frame and exclusively within the middle Iron Age period. The Iron Age settlement at Pennyland produced radiocarbon dates from Oak charcoal for 420-320 cal BC, although this earlier date is fraught with its own probability issues (Williams 1993a, 44). Given a total absence of wheel-thrown late Iron Age pottery, the abandonment of both sites before the middle of the 1st century BC is a distinct possibility (Williams 1993a, 47). Prehistoric enclosure activity at Caldecotte (MK117) was also of broadly Iron Age date and associated with a possible partial roundhouse gully, pits and inhumation (Zeepvat 1994a, 30-35).

Generally the published corpus of sites represents multi-phase settlement spanning a broad time scale. In these instances the settlements tend to have made continuous use of good quality land, whilst the settlement morphology has taken on numerous changes in form, function and arrangement. Excavations at Bancroft investigated archaeological remains with a long period of development beginning with dispersed flint scatters of Mesolithic origin (Williams and Zeepvat 1994). The first settlement features occurred in the late Bronze Age and there was significant Iron Age and Roman activity. Medieval robbing of stone from Roman structures was associated with the establishment of the nearby priory. At Hartigans there was prehistoric occupation from the late Bronze Age to its cessation in the mid-2nd century BC (Williams 1993a, 178). Occupation continued on the site throughout the period occupied at Newton Leys and increased alluviation elsewhere at the end of the Iron Age did not adversely affect Hartigans (Zeepvat 1993b, 192). At Wavendon Gate occupation of the site continued into the Roman period and it is likely to have been established at a time with some overlap of occupation with Newton Leys in its early phase (Williams *et al* 1996, 15).

Topography and location

The stream beside which the settlement was situated forms a minor tributary to the River Ouzel, which flows north to join the River Great Ouse at a confluence to the north-east in Bedfordshire. Like many of the minor tributary valleys in the area river gravels are overlain by a mask of colluvium beside the channel with Oxford Clay on the lower slopes overlain by Boulder Clay on the upper slopes. Other variations are present along the main valley of the River Ouzel (Zeepvat 1993a, fig 2).

The topographical location of the middle Iron Age settlement at Newton Leys is unusual when compared to many other sites that have been excavated within the Milton Keynes area as it lay upon low ground, confined to the gravel geology, and immediately beside the watercourse. The site had been settled at a time when the land appeared to have been relatively easy to drain. Within a very short space of time this situation changed and the ground became increasingly wet, requiring extensive drainage channels that were eventually overwhelmed by localised flooding. The site at Fenny Lock, despite its morphological dissimilarities, was also located on low ground (Ford and Taylor 2001). It lay upon the west side of the River Ouzel upon alluvium and river terrace gravel and would have been subject to the same episodes of flooding, further downstream from the site at Newton Leys. Both of the sites were located on marginal land and, whereas Fenny Lock was resettled during the Roman period, Newton Leys remained marshland.

Many sites that have been excavated were upon gravel and sand ridges forming raised ground, away from the flood margins. These sites have generally exhibited longer periods of settlement, better conditions for agricultural practise and represent preferred locations. The site at Pennyland lay upon a low gravel spur projecting from the Boulder Clay ridge between two smaller tributaries of the River Ouzel. The land was level, with ground dropping away at the

settlement margins (Williams 1993a, 4). At Hartigans the prehistoric occupation was located upon the second gravel terrace of the eastern flood plain of the River Ouzel (Williams 1993a, 178). This was some distance away from the present watercourse and upon higher, better drained ground than at Newton Leys. Remnants of prehistoric settlement activity at Caldecotte (MK117) were located in a similar fashion to Hartigans on the second gravel terrace, east of the River Ouzel (Zeepvat 1994a, 30-35). Later features indicated that there was continued use during the Roman period, and this site too seemed to avoid the effects of increased alluviation. At Wavendon Gate late Iron Age occupation was located on the northern downslope of a low glacial sand and gravel ridge overlooking the floodplain to the east of the River Ouzel (Williams *et al* 1996, 9).

Other sites in the area lay upon predominantly clay slopes overlooking the floodplain. Whilst exhibiting some difficulties with drainage, these sites were not subject to inundation as seemed to be the case at Newton Leys. They were, however, subject to wetter conditions and poorer drainage. At Bancroft Iron Age settlement was focused upon the Boulder Clay and glacial sand and gravel ridge and across its north-east face towards the River Great Ouse (Zeepvat 1994b, 12). Early to middle Iron Age settlement along the route of the modern Stoke Hammond bypass occupied a low ridge of Boulder Clay overlooking the River Ouzel to the east (Edgeworth *et al* 2006, 120, fig 1). It was found within a principal area of the development located *c*1.2-1.4km east-north-east of the site at Newton Leys. Excavations at Tattenhoe Park in 2005 uncovered extensive Iron Age settlement located upon a Boulder Clay ridge and extending down the slope towards one of the headland tributaries of the Loughton Brook (Taylor 2006). On this basis it is perhaps more than coincidence that the sites at Bancroft and Tattenhoe share similarities in their morphology with the presence of four post structures.

Settlement morphology

The settlement at Newton Leys was principally a large family farmstead comprising 2-3 roundhouses at any one time, a small enclosure and a larger outfield. The site expanded over a period of 3-6 generations to include better drainage and additional dwelling space, probably proportional to the size of the family group. The agricultural activities appeared to expand, increasing the size of the outfield and would probably have extended over a larger area than at its inception. Its abandonment and subsequent flooding took place over a relatively short period of time.

The pattern of enclosure at Newton Leys bears many similarities with other sites in the Milton Keynes area. At Pennylands the composition of settlement largely comprised enclosures and roundhouses arranged in conjunction with a principal droveway (Williams 1993a). Although at Newton Leys there was no droveway, small enclosures of similar proportions to Enclosure E2 comprising ditches with a greater number of recuts than at Newton Leys, were an integral part of that layout. Due to a longer sequence of development, associations visible between feature groups were constantly changing, as opposed to a relatively short sequence at Newton Leys.

The principal features of the Iron Age occupation at Hartigans included an enclosure of similar proportions to Enclosure E2 at Newton Leys. It was attached to a roundhouse, much in the same way that the final phase of Roundhouse R5 was attached to Enclosure E2 (Williams 1993a, 180-1). Similar enclosures joined to adjacent roundhouses have been excavated at Pennylands, Hartigans and at Westcroft (Williams 1993a; Anthony 2003). In all or these instances they are thought to have been stock enclosures. These principal occupation features were also set within a wider arrangement of narrow linear ditches that emerged early in the sequence of occupation similar to Enclosure E1. Whilst the topography of the site at Hartigans was very different, it would appear that both shared very similar morphological developments that characterise their settlement dynamics. Such similarities continue to be present throughout the Iron Age period, a later example being that of the roundhouse and small adjoining enclosure at Cranborne Avenue, Westcroft (Anthony 2003, 39-46). Although little has been done to assess whether the attached

roundhouse represented an ancillary structure or a domestic dwelling, at Newton Leys the evidence suggests that Roundhouse R5 was probably an ancillary structure rather than a principal dwelling.

The continuity and consistency in native form of ring ditches and probable roundhouses was evident at Newton Leys, just as it had been at Wavendon Gate (Williams *et al* 1996, 15). The common characteristic of many roundhouses of the region is the lack of internal postholes (Williams 1993a, 28). In the case of some of the roundhouses at Newton Leys a better level of survival meant that the partial curvature of wall slots, some pits and postholes were present, although not all of the roundhouses exhibited the exact same features. In the case of Roundhouse R6 a substantial entrance could be examined that none of the others possessed. This was by no means a departure from the regional trend as in most cases the internal features did not exhibit an arrangement of post supports beyond paired door posts and for the most part earthfast foundations were not used. Variations in the tradition of roundhouse construction between post-built structures and wattle and daub structures without post foundations was seen at Fenny Lock where broadly contemporary features identified the presence of circular post arrangements as opposed to ring gullies (Ford and Taylor 2001, fig 5). At Fenny Lock, the site was unenclosed and probably subject to the same seasonal flooding as at Newton Leys. There was no apparent discussion of the possible relationship between flood horizons and the post-built structures. There appears to have been a break of occupation spanning the late Iron Age before it was reoccupied in the Roman period and fresh ditch systems were laid out to provide adequate drainage (Ford and Taylor 2001, 89-90).

Newton Leys was morphologically very different to Bancroft (Williams and Zeepvat 1994) or Tattenhoe Park (Taylor, in prep). At Newton Leys there was a complete lack of four-post structures, whilst Bancroft and Tattenhoe Park exhibited a distinct absence of enclosures and even minor ditch systems. Tattenhoe Park had a dense concentration of largely unenclosed settlement comprising numerous roundhouses with several associated four-post structures spread across the area (Taylor 2006). The Iron Age occupation was very similar to that at Bancroft and it is likely that the arrangement represents a migration of settlement over an extended period of time (Williams and Zeepvat 1994). The current favoured theory for four-post structures is that they were small grain stores with raised floors (Williams and Zeepvat 1994, 54; Poole 1984, 94-95). If this was the case it lends further credence to the idea that the primary form of subsistence at Newton Leys was unlikely to have been arable cultivation

Bancroft had been occupied by a single extended family occupying the same site for many centuries. At any one time there were probably no more than two or three roundhouses present on the site, with structures continually being rebuilt or replaced in such a way that the settlement focus gradually migrated over time (Williams and Zeepvat 1994, 56). At Newton Leys the window of time was shorter and migration of settlement was not evident over the potential 3-6 generations that it was occupied. Roundhouse R5 in particular had many rearrangements in form occupying the same space. That the settlement expanded seems clear, but the area of land was only a fraction of that covered at Bancroft, indicative that the site at Newton Leys may have been confined by its topographical location. Whilst the middle Iron Age was a period in which many new settlements emerged across southern Britain, data for the intensity and demand for land is still being revealed. The site at Newton Leys occupied land that was marginal in later periods. Only a broad study of Iron Age settlement across the region could confirm the strong probability that it was marginal settlement during the middle Iron Age.

Economy and environment

The pattern of ditches visible within a very small area of the access road suggested that the upper slopes of the valley contained well drained land, probably cleared for agriculture. The channels were consistent and generally uniform but may have represented several recuts following the same basic pattern, rather than a single episode drainage system. There was little

evidence from the settlement site to support arable farming practises, and the site along Stoke Hammond bypass, *c*1.2-1.4km to the east, is consistent with that view (Edgeworth *et al* 2006). Arable practises are suggested in the Milton Keynes area, evidence from sites at Tattenhoe Park and Bancroft both suggest the presence of four-post structures often interpreted as raised grain stores (Taylor 2006; Williams and Zeepvat 1994, 54). In contrast sites that are comparable to Newton Leys at Pennylands, Hartigans and Westcroft have all been associated with pastoral practices (Williams 1993a; Anthony 2003). Both pasture and arable land can benefit from good drainage and the overall landscape of the Milton Keynes area during the middle Iron Age appears to have contained elements of both farming economies. The presence of drainage channels of the kind excavated on the upper slopes at Newton Leys cannot demonstrate a specific land use other than to indicate the benefit of land improvement.

The principal features at Stoke Hammond incorporated two roundhouses in proximity to droveways, a larger enclosure and a pit alignment. Its interpretation presented the broader view that the site formed part of a larger landscape given over to largely pastoral stock rearing and that evidence for cultivation was absent since the heavy clay soils precluded arable farming (Edgeworth *et al* 2006, 143). This last point is one with which Wendy Carruthers disagrees, pointing out that spelt wheat can be grown very well on heavy clay soils. At Newton Leys the evidence for charred seeds did produce small quantities of cereals, demonstrating that barley and emmer/spelt wheat was being consumed by the occupants. Limited evidence was present for chaff or cereal processing, but hardly enough to indicate that it was being cultivated. This is consistent with other sites in the region where a low incidence of cultivated foodstuffs, often with fodder crops as secondary components occur (Kidd 2007, 7). The layout of Newton Leys and its comparison to local sites maintains the view that stock rearing was the primary mode of subsistence. The upper slopes indicated a largely cleared landscape consistent with the site at Stoke Hammond bypass (Edgeworth *et al* 2006). Elsewhere in the region molluscan analyses have continually presented evidence for open grassland landscapes (Kidd 2007, 4). Some cultivation could well have been likely nearby as a mixed farming economy is suggested by the potential evidence for grain stores at Tattenhoe and Bancroft (Taylor 2006; Williams and Zeepvat 1994, 54). The site at Stoke Hammond did not exhibit occupation into the Roman period and its abandonment may have been within the same period as that at Newton Leys. At Newton Leys the abandonment was followed by the encroaching marshland, whilst along the route of the modern Stoke Hammond bypass there was evidence for a period of woodland regeneration (Edgeworth *et al* 2006, 134-135). Given its close proximity this phenomenon may well indicate that similar woodland regeneration might be expected on the upper slopes, south of the site at Newton Leys providing uniformity in the regeneration of the natural environment in the wider landscape.

Summary

In summary, the site at Newton Leys was probably occupied by a single family for a period of 3-6 generations during which time they made various minor improvements and rearrangements to the settlement by rebuilding old structures, extending their domestic or agricultural space and modifying the spatial use of different parts of the settlement. Although they may have cultivated on a small scale, it seems likely that cereal produce was largely brought onto the site from elsewhere. There was no evidence that they were manufacturing pottery, processing large amounts of cereal or working hides themselves. Weaving and metalworking activities were present on the site, supplementing the needs of the households and stock rearing activities. They were not likely to be on a large scale and no specific features could be assigned to these activities. Stray finds indicating such activities are common amongst sites in the region such as the metalworking crucibles found along the Stoke Hammond bypass (Kidd 2007, 15; Edgeworth *et al* 2006). The inhabitants appeared to have kept some stock on the site, cattle, sheep/goat, pig and horse bones were all represented and there were five instances of young animals present amongst the assemblage of animal bone. Butchery marks were present for cattle, sheep/goat and horse and much of the bone had been fragmented prior to deposition, suggesting a desire not to

waste any resources that were available. Much of their rubbish may have been burned and the burnt residue turned over into the soil or buried, since very little material was actually deposited in pits. The occupation of a waterside location appeared not to migrate, as at other sites, and this may have been the result of a constraining topographical landscape in which more desirable neighbouring land was unavailable to them. In its latter stages of occupation the site was subject to seasonal inundation from the watercourse. The initial response to this was to improve the drainage network. It would seem, however, that this strategy was unable to keep pace with increasingly wet conditions and the final abandonment of the site was followed by rapid regeneration of the marshland along the waterside. Sites nearby at Fenny Lock and Stoke Hammond bypass shared a similar period of abandonment, whilst occupation at Tattenhoe Park, Pennyland, Hartigans, Wavendon Gate and Bancroft all continued well into the late Iron Age or Roman periods. The topographical variance of these sites begins to suggest that a significant change in environmental conditions may have been coupled with social and economic changes reflected in the availability of more attractive land and which gave rise to changing patterns of settlement.

BIBLIOGRAPHY

Amorosi, T, 1989 *A postcranial guide to domestic neo-natal and juvenile mammals,* British Archaeological Reports, International Series, **533**

Anthony, S, 2003 Iron Age settlement at Cranborne Avenue, Westcroft, Milton Keynes, *Records of Buckinghamshire*, **43**, 39-46

Boardman, S J, 1995 Charcoal and charred macrofossils, in Branigan and Foster (eds) 1995, 149-157

Bourn, R, 2006 *Specification for an archaeological excavation: Newton Leys, Milton Keynes, CgMs Consulting Ltd*

Branigan, K, and Foster, P, (eds) *Barra: archaeological research on Ben Tangaval*, Sheffield: SEARCH, Vol **1**

Britnell, W, 1972 An Iron Age Comb from Stanton Low, *Records of Buckinghamshire*, **19**, 214-215

Brothwell, D R, and Higgs, E S, 1965 *Science and Archaeology*, London, Thames and Hudson

Brown, J, 2008 A *Middle Iron Age waterside settlement on land at Newton Leys, Newton Longville Milton Keynes,* Northamptonshire Archaeology Report, **08/77**

Burrow, A, 2006 *An archaeological evaluation at Newton Leys, Milton Keynes, Buckinghamshire,* Northamptonshire Archaeology Report, **06/139**

Carruthers, W, 2007 Environmental Evidence in Brown 2007, 29-32

Carruthers, W 2007a Charred Plant Remains, in Mudd 2007, 147-156

Carruthers, W, 2007b Charred Plant remains, in Timby *et al* 2007

Carruthers, W J, forthcoming The Charred, Mineralised and Waterlogged Plant Remains, in *The Willington to Steppingley Pipeline*, Network Archaeology

Chapman, A, 2008 Metalworking debris, in Morris 2008

Chapman, A, forthcoming *An Iron Age Settlement at Coton Park, Rugby, Warwickshire*, Northamptonshire Archaeology report

Clutton-Brock, J, 1989 Five thousand years of livestock in Britain, *Biological Journal of the Linnean Society*, **38**, 31-37

Croft, R A, and Mynard, D C, 1993 *The Changing Landscape of Milton Keynes*, Buckinghamshire Archaeol Soc Monog, **5**

Cunliffe, B W, 1984 *Danbury An Iron Age Hillfort in Hampshire*, CBA Research Report, **52**

Cunliffe, B W, 1991 *Iron Age communities in Britain*, 3rd edition, London

Dawson, M, 2005 *An Iron Age settlement at Salford, Bedfordshire*, British Archaeological Reports, British Series, **373**, Bedfordshire Archaeol Monog, **4**, Oxford

Edgeworth, M, Maltby, M, Robinson, J, and Wells, J, 2006 Changes in the Landscape: Archaeological Investigation of an Iron Age Enclosure on the Stoke Hammond Bypass, *Records of Buckinghamshire*, **46**, 119-148

EH 1995 *Geophysical Survey in Archaeological Field Evaluation*, English Heritage Research and Professional Services Guideline, **1**

EH 2001 *Archaeometallurgy*, English Heritage, Centre for Archaeology Guidelines, **1**

Elsdon, S, 1992 East Midlands scored ware, *Trans Leicestershire Archaeol Hist Soc*, **66**, 83-91

Evans, E, 2000 *The Caerleon Canabae: Excavations in the Civil Settlement 1984-90*, Britannia Monog, **16**

Ford, S, and Taylor, K, 2001 Iron Age and Roman settlements, with Prehistoric and Saxon features, at Fenny lock, Milton Keynes, *Records of Buckinghamshire*, **41**, 78-123

Gaffney, C, Gater, J, and Ovendon, S, 2002 *The use of geophysical techniques in archaeological evaluations*, Institute of Field Archaeologists Technical Paper, **6**

Gale, R, and Cutler, D, 2000 *Plants in Archaeology*, Otley: Westbury Publishing

Grant, A, 1982 The use of toothwear as a guide to the age of domestic ungulates, in Wilson *et al* 1982, 91-108

Greep, S, 2000 Objects of Shale, in Evans 2000, 444-448

Gregory, T, 1992 Excavations in Thetford, 1980–1982, Fison Way, Vol 1, *East Anglian Archaeol*, **53**, 175-181

Grogan, E, O'Donnell, L, and Johnston, P, 2007 *The Bronze Age landscapes of the Pipeline to the West, an integrated archaeological and environmental assessment*, Wicklow

Harding, D W, 1975 The Iron Age pottery, in Jackson 1975, 31-93

Hastorf, C A, and Popper, V S, 1998 *Current Palaeobotany*, Chicago and London, University of Chicago Press

Hather, J G, 2000 *The identification of the Northern European Woods: a guide for archaeologists and conservators*, London: Archetype Books

Helbaek, H, 1953 Early crops in Southern England, *Proc Prehist Soc*, **18**, 194-233

Hillson, S, 1992 *Mammal Bones and Teeth*, London, Institute of Archaeology

Holmes, M, 2006 *Geophysical Survey of land at Newton Leys, Milton Keynes, Buckinghamshire*, Northamptonshire Archaeology Report, **06/71**

Holmes, M, and Chapman, P, 2005 Iron Age Settlement at Swan Valley Business Park near Rothersthorpe, Northampton, *Northamptonshire Archaeol*, **33**, 19-46

IfA 2001 *Code of Conduct and Standards and Guidelines for Archaeological Evaluation*, Institute for Archaeologists

Ivens, R, Busby, P, and Shepherd, N, 1995 *Tattenhoe and Westbury, two deserted medieval settlements in Milton Keynes*, Buckinghamshire Archaeol Soc Monog, **8**

Jackson, D A, 1975 An Iron Age site at Twywell, Northamptonshire, *Northamptonshire Archaeol*, **10**, 31-93

Jackson, D, 2005 The Iron Age pottery, in Holmes and Chapman 2005, 35-40

Jewell, P A, 1962 Changes in size and type of cattle from Prehistoric to Medieval times in Britain, *Zietschrift fur Tierzuchtung und Zuchtungsbiologie*, **77 (2)**, 159-167

Jones, M, and Dimbleby, G, (eds) 1994 *The Environment of Man: the Iron Age to the Anglo-Saxon Period*, British Archaeological Report British Series, **87**, Oxford

Kidd, S, 2007 Buckinghamshire Later Bronze Age and Iron Age Historic Environment Record Assessment, www.buckscc.gov.uk/bcc/get/assets/docs/archaeology/BucksIronAgeFINAL.pdf

Knight, D, 1993 Later Bronze Age and Iron Age pottery from Pennyland; Late Bronze Age and Iron Age pottery from Hartigans, in Williams 1993a, 219-38

Lloyd-Morgan, G, 2000 Other Jewellery and Dress Accessories in Gold, Silver and Copper Alloy, in Evans 2000, 328-344

Lyman, R L, 1994 *Vertebrate Taphonomy*, Cambridge, Cambridge University Press

Maltby, M, 1981 *Iron Age, Romano-British and Anglo-Saxon animal husbandry: a review of the faunal evidence*

Morris, S, 2008 *A Roman Rural Settlement at Newport Pagnell, Milton Keynes, Buckinghamshir*e, Northamptonshire Archaeology report

Mudd, A, 2007 *Iron Age and Roman settlement on the Northamptonshire uplands: Archaeological work on the A43 Towcester to M40 road improvement scheme in Northamptonshire and Oxfordshire*, Northamptonshire Archaeology Monog, **1**

Murphy, P, 1990 *Stansted Airport, Essex: carbonised plant remains*, Ancient Monuments Laboratory Report, **129/90**, English Heritage, London

Murphy, P, 1992 Plant remains and the environment, in Gregory 1992, 175-181

NA 2006 *Newton Leys, Milton Keynes: Written scheme of investigation for archaeological excavation and strip, map and Sample exercise*, Northamptonshire Archaeology

Needham, S, and Spence, T, (eds) 1996 *Refuse and disposal at area 16 East Runnymeade.* Runnymede Bridge Research Excavations, **2**

OAA 2002 *Newton Leys, Environmental Statement Technical Appendix VII Cultural Heritage*, Oxford Archaeological Associates

Payne, S, 1985 Morphological distinctions between the mandibular teeth of young sheep and goats, *J Archaeol Science*, **12**, 139-147

PCRG 1997 *The study of later prehistoric pottery: general policies and guidelines for publication*, Prehist Ceramics Research Group, Occasional paper, **1**

PCRG 1997 *The study of later prehistoric pottery: general policies and guidelines for publication (revised)*, Prehist Ceramics Research Group, Occasional paper, **2**

Poole, C, 1984 The structural use of daub, clay and timber, in Cunliffe 1984

Prummel, W, and Frisch, H, 1986 A guide for the distinction of species, sex and body side in bones of sheep and goat, *J Archaeol Science*, **13**, 567-577

Reitz, E J, and Wing, E S, 1999 *Zooarchaeology*, Cambridge Manuals in Archaeology, Cambridge: Cambridge University Press

Schmid, E, 1972 *Atlas of Animal Bones*, Elsevier

Schoch, W, Heller, I, Schweingruber, F H, and Kienast, F, 2004 *Wood Anatomy of Central European Species*, http://www.woodanatomy.ch/

Serjeantson, D, 1996 The animal bones, in Needham and Spence (eds) 1996

Silver, I A, 1969 The ageing of domestic animals, in Brothwell and Higgs 1965

Skellern, C, 2000 *The AIE Firewood Burning Guide*, http://www.aie.org.uk

Slowikowski, A M, 2005 The pottery, in Dawson 2005, 95-117

Smart, T L, and Hoffman, E S, 1988 Environmental Interpretation of Archaeological Charcoal, in Hastorf and Popper 1988

SSEW 1983 *Soils of Southern England and Wales*, **4**, Scale 1:250 000

Stace, C, 1997 *New Flora of the British Isles*, Second edition, Cambridge University Press

Stead, I M, and Rigby, V, 1986 *Baldock, the excavation of a Roman and pre-Roman settlement, 1968-72*, Britannia Monog, **7**

Taylor, E, 2006 *An assessment report for archaeological excavations at Tattenhoe Park, Milton Keynes, Buckinghamshire*, Northamptonshire Archaeology Report, **06/57**

Thomas, R C, 1993 Waterlogged wood and charcoal, in Williams 1993a

Timby, J, Brown, R, Biddulph, E, Hardy, A, and Powell, A, 2007 *A Slice of Rural Essex. Archaeological discoveries from the A120 between Stansted Airport and Braintree.* Oxford Wessex Archaeology Monog, **1**, CD-ROM

von den Driesch, A, 1976 *A guide to the measurement of animal bones from archaeological sites*, Cambridge, Massachusettes, Harvard University Press

Wheeler, R E M, 1943 *Maiden Castle, Dorset*, Report of the Research Committee of the Soc Antiquaries, **12**

Williams, R J, 1993a *Pennyland Hartigans: Two Iron Age and Saxon sites in Milton Keynes*, Buckinghamshire Archaeol Soc Monog, **4**

Williams, R J, 1993b Prehistoric landscape, in Croft and Mynard 1993, 5-18

Williams, R J, and Hart, P J, forthcoming *A late Iron Age site at Furzton, Milton Keynes*

Williams, R J, Hart, P J, and Williams, A T L, 1996 *Wavendon Gate: A late Iron Age and Roman settlement in Milton Keynes,* Buckinghamshire Archaeol Soc Monog, **10**

Williams, R J, and Zeepvat, R J, 1994 *Bancroft: A late Bronze Age/Iron Age settlement, Roman villa and temple-mausoleum, Volume 1: Excavations and building materials,* Buckinghamshire Archaeol Soc Monog, **7**

Wilson, B, Grigson, C, and Payne, S, 1982 *Ageing and Sexing Animal Bones from Archaeological Sites*, British Archaeological Reports, British Series, **109**, 91-108

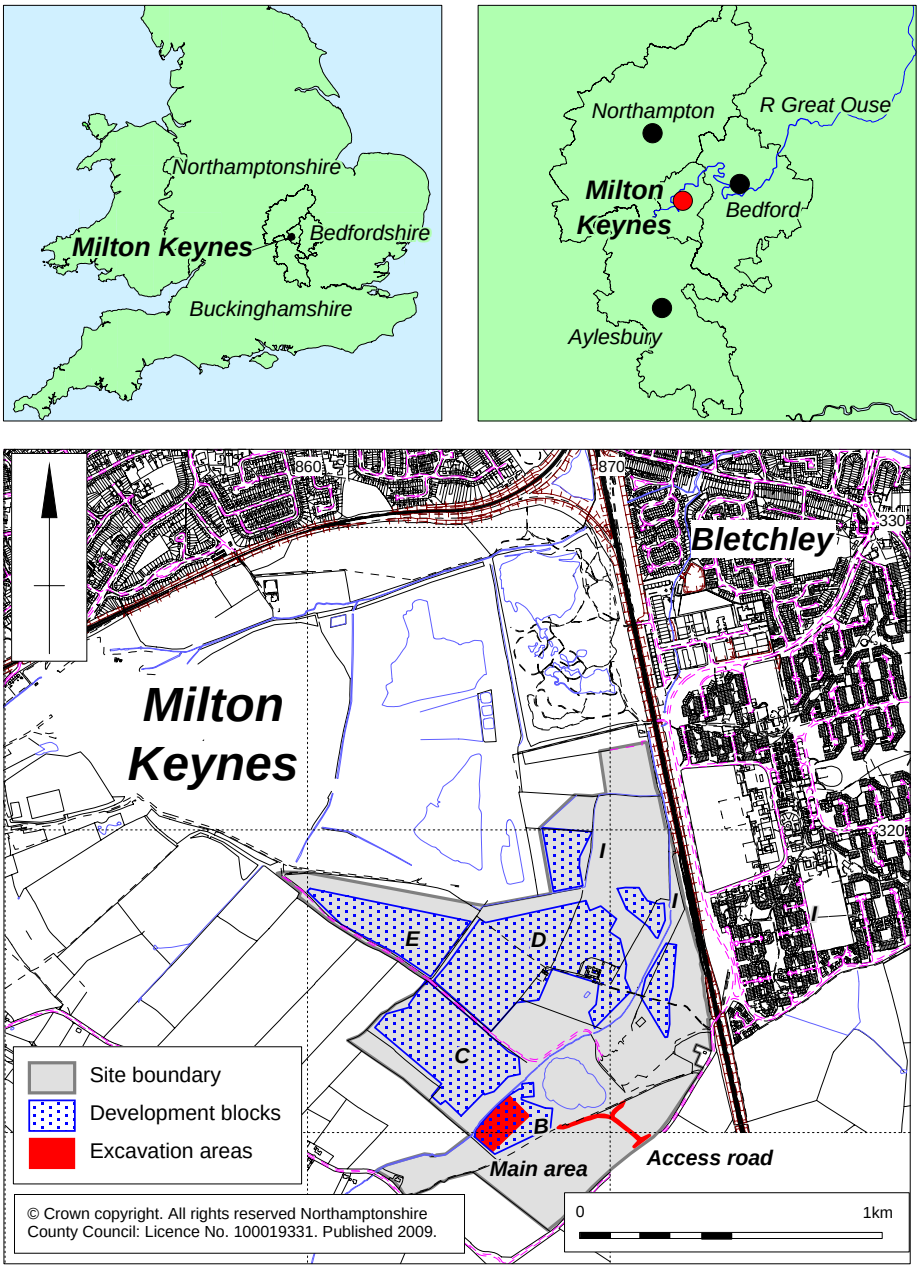
Zeepvat, R J, 1993a Geology and Topography, in Croft and Mynard 1993, 1-3

Zeepvat, R J, 1993b The 1989 Evaluation (MK318 & 330), in Williams 1993a

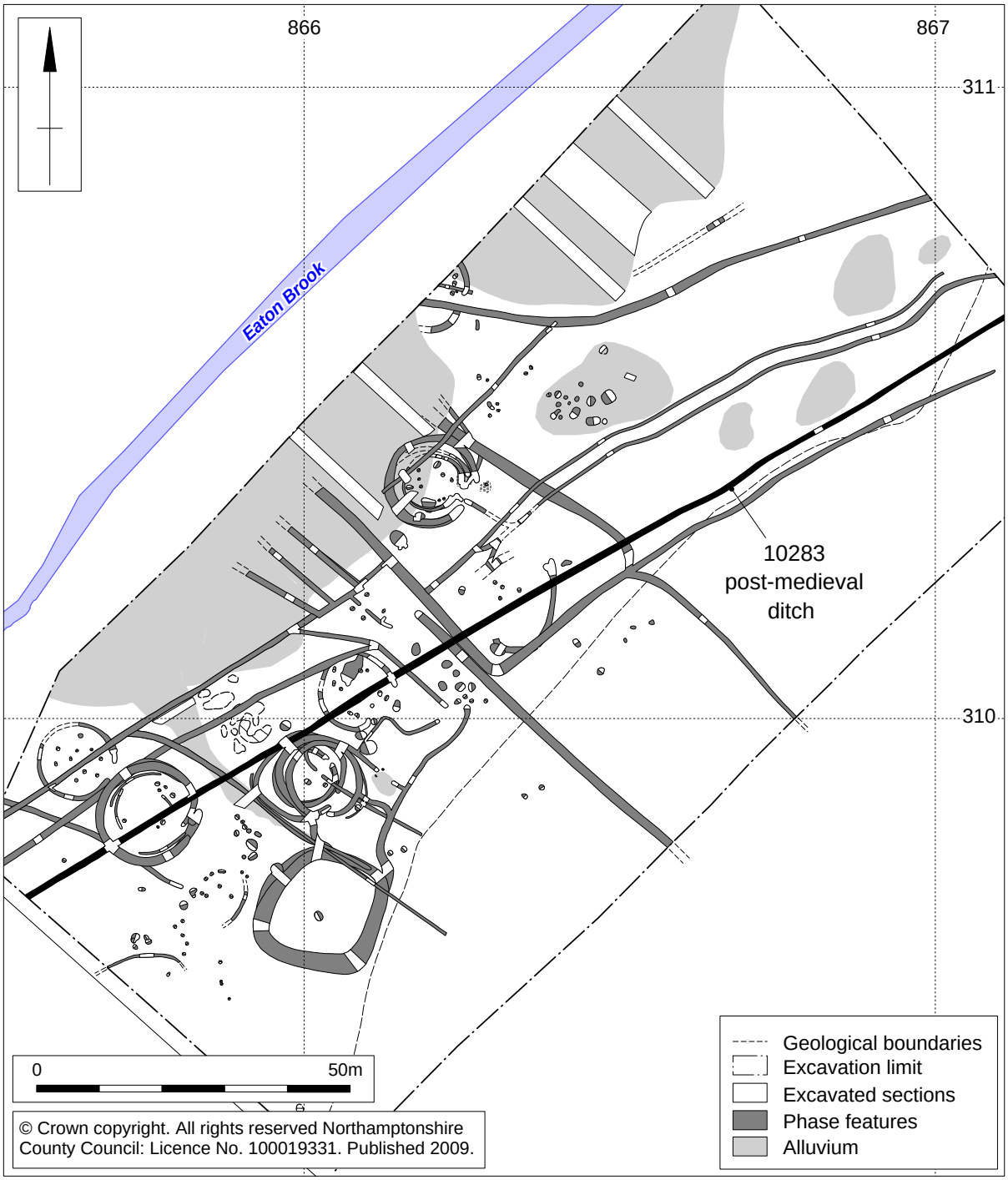
Zeepvat, R J, 1994a Mill Close Enclosure (MK117), in Zeepvat *et al* 1994, 30-35

Zeepvat, R J, 1994b Geology and Topography, in Williams and Zeepvat 1994, 12

Zeepvat, R J, Roberts, J S, and King, N A, 1994 *Caldecotte, Milton Keynes: Excavation and fieldwork 1966-91,* Buckinghamshire Archaeol Soc Monog, **9**



Scale 1:25,000 Site location Fig 1



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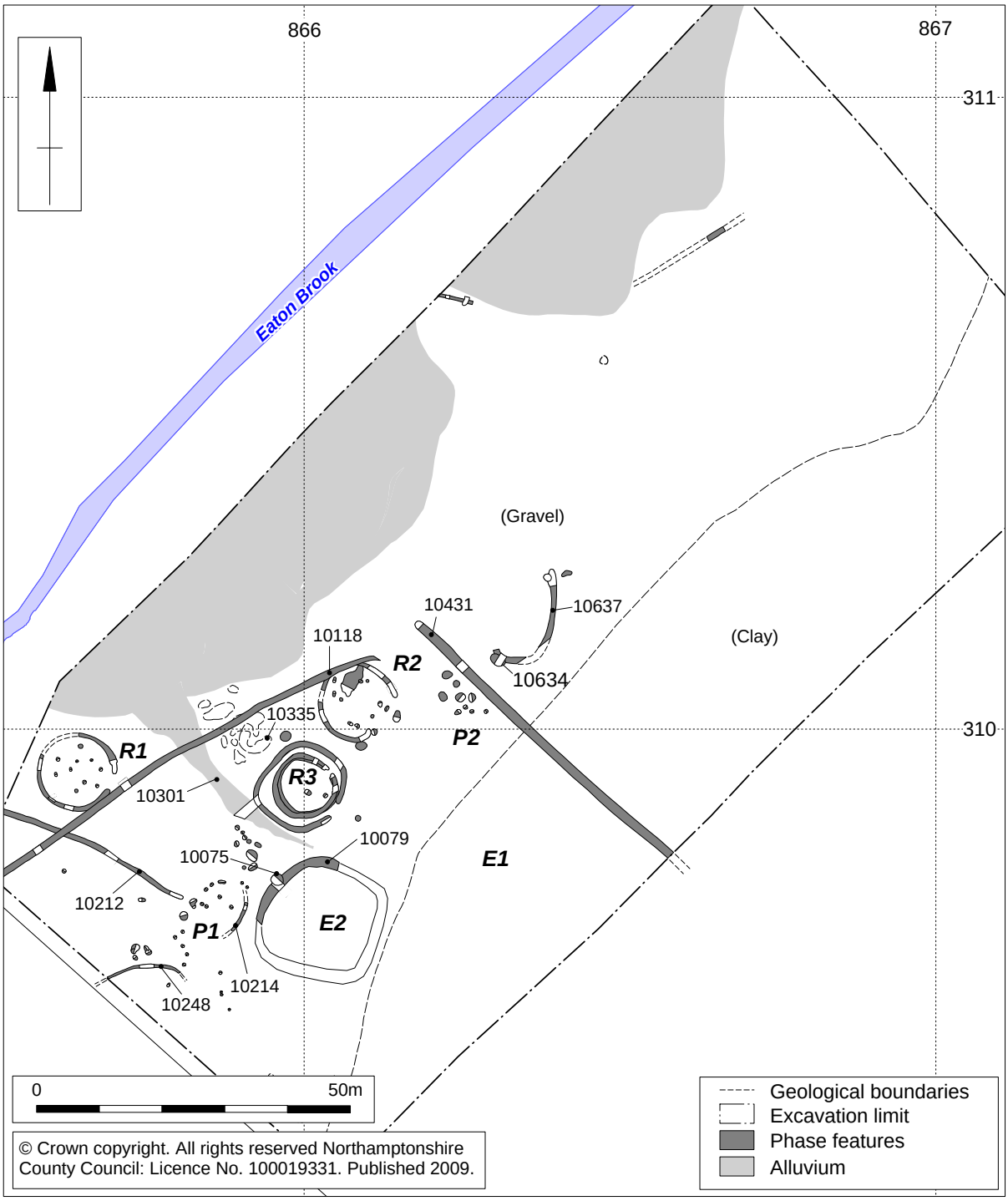
General plan Fig 2



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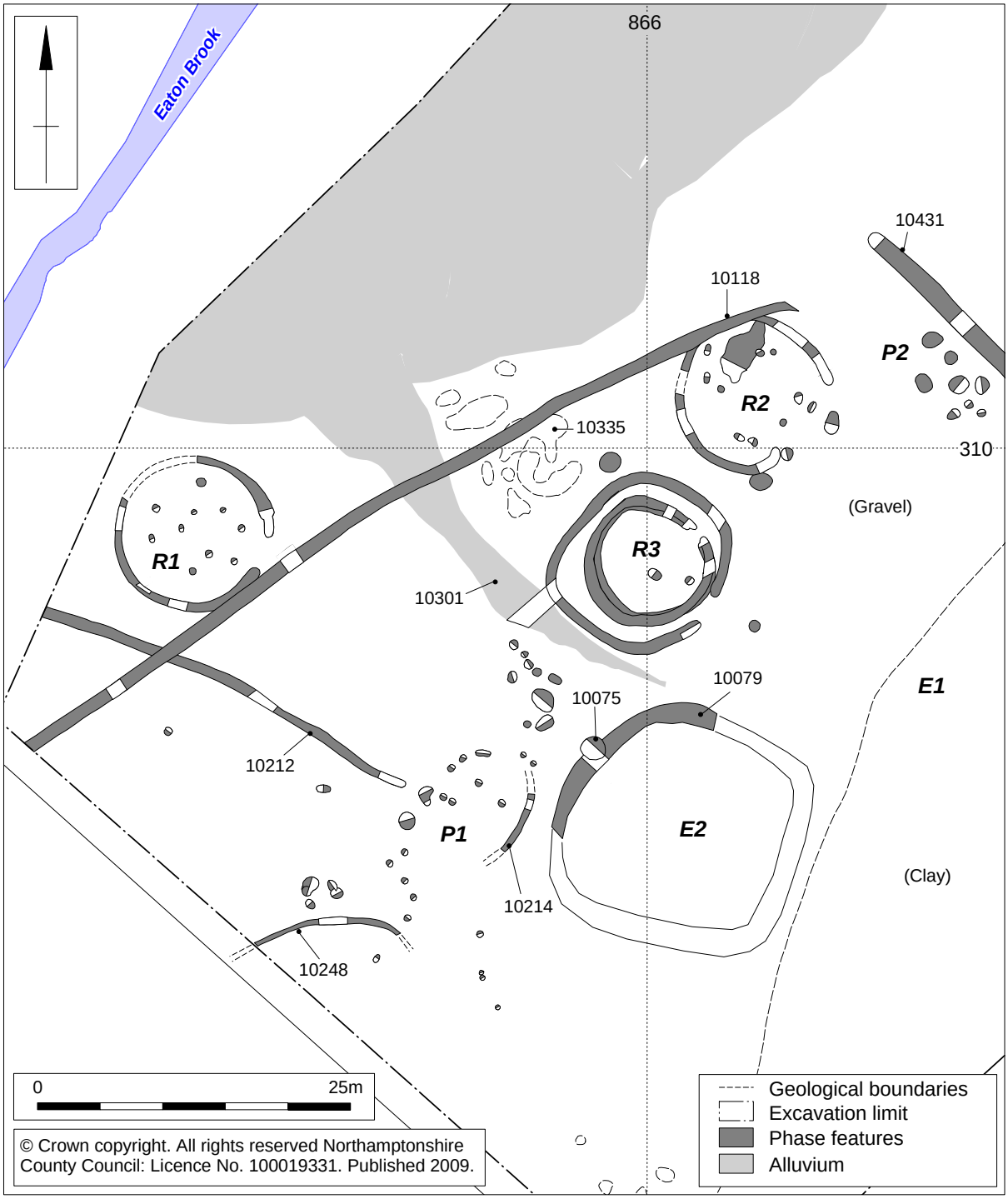
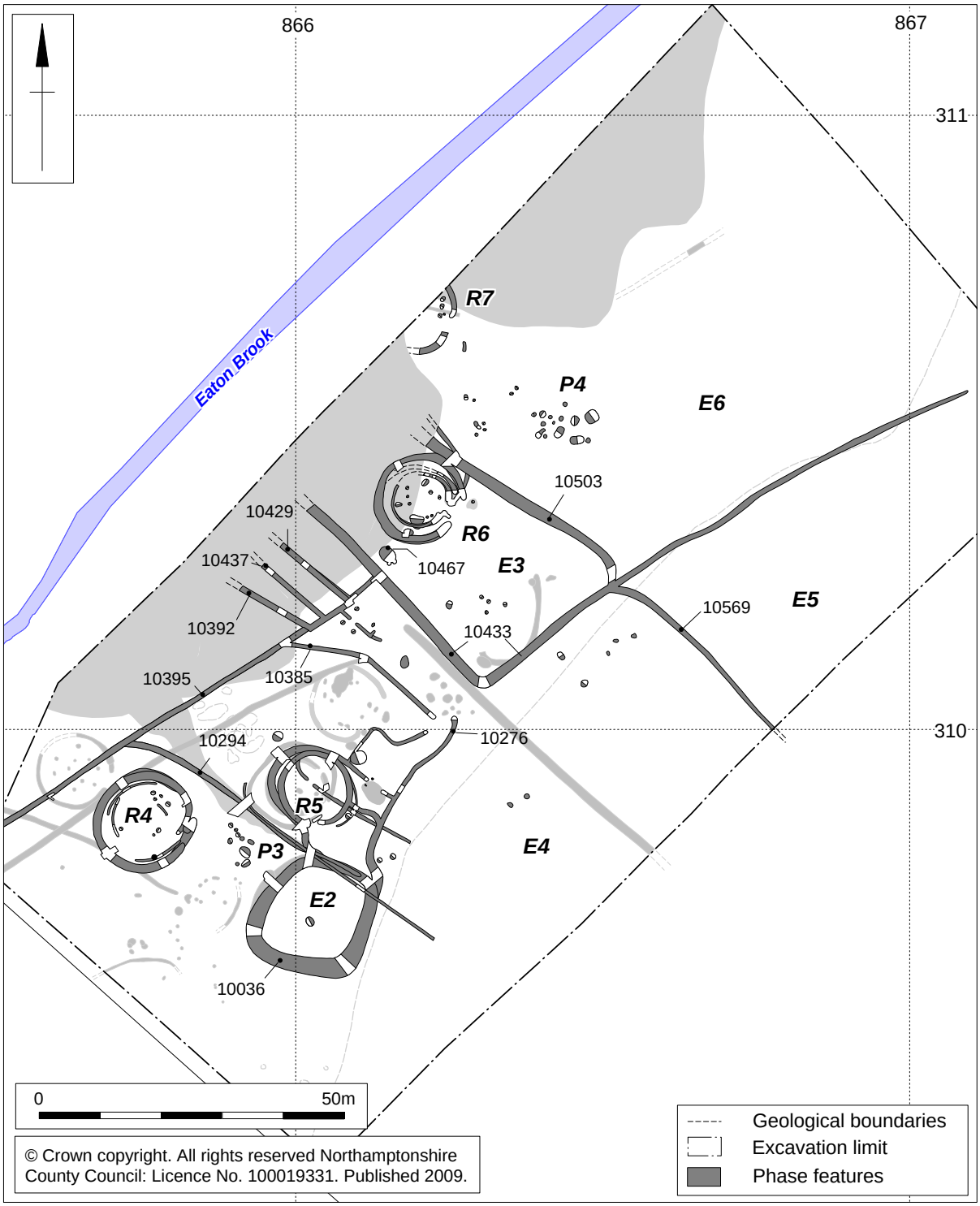
Phase 1, Middle Iron Age settlement Fig 3



Scale 1:500 Phase 1, Roundhouses R1-R3 and associated features Fig 4



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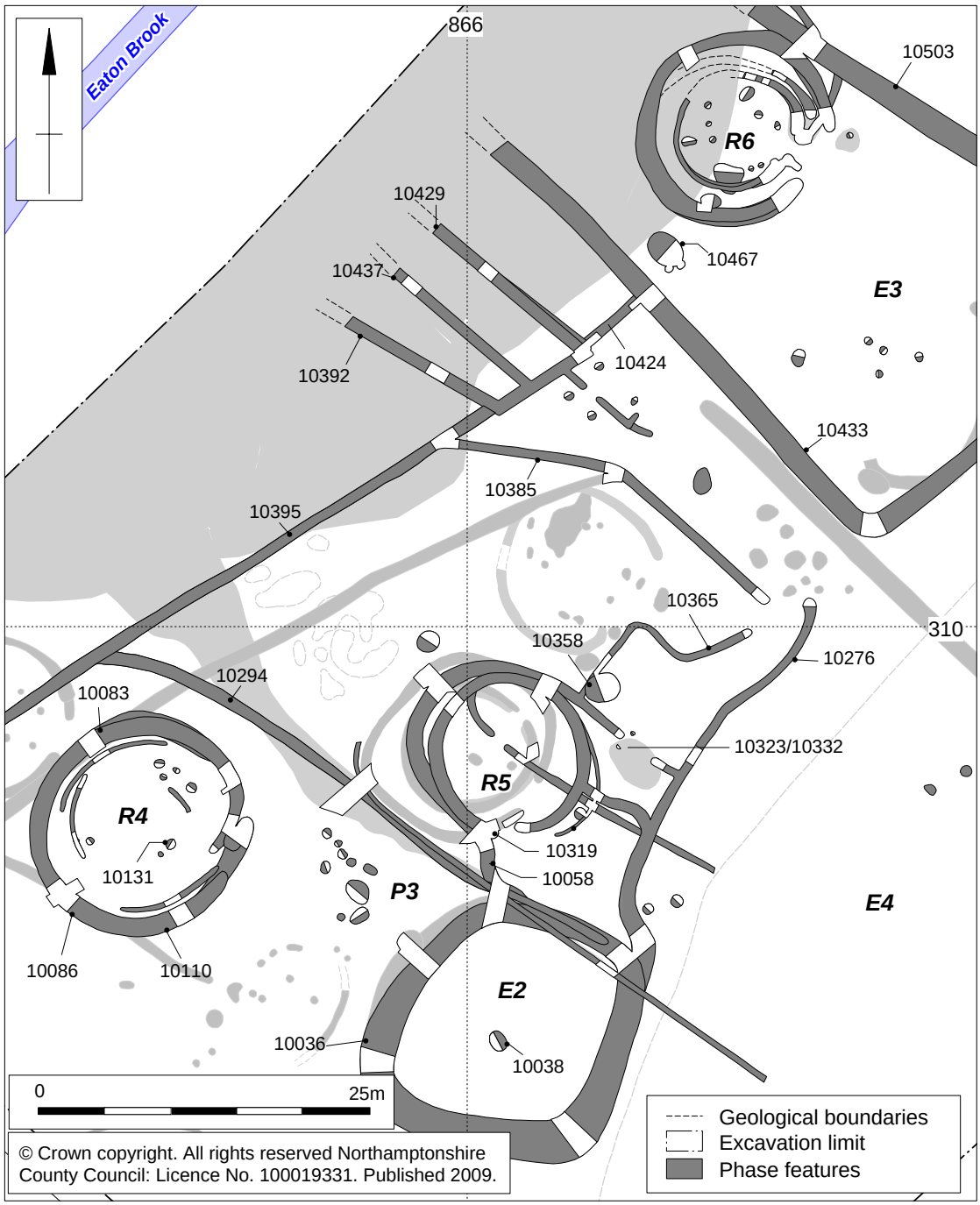
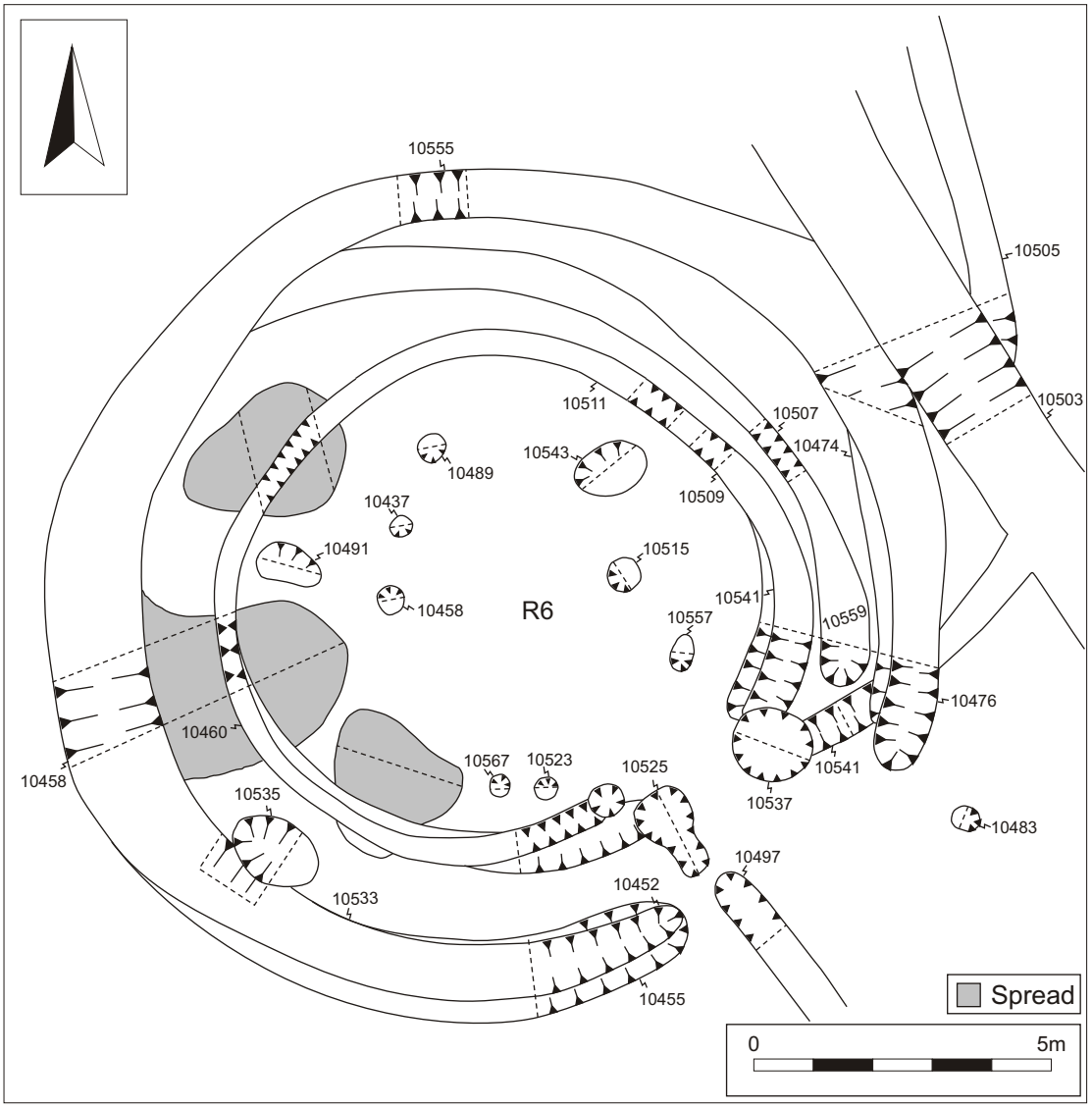
Phase 2, Middle Iron Age expansion Fig 5

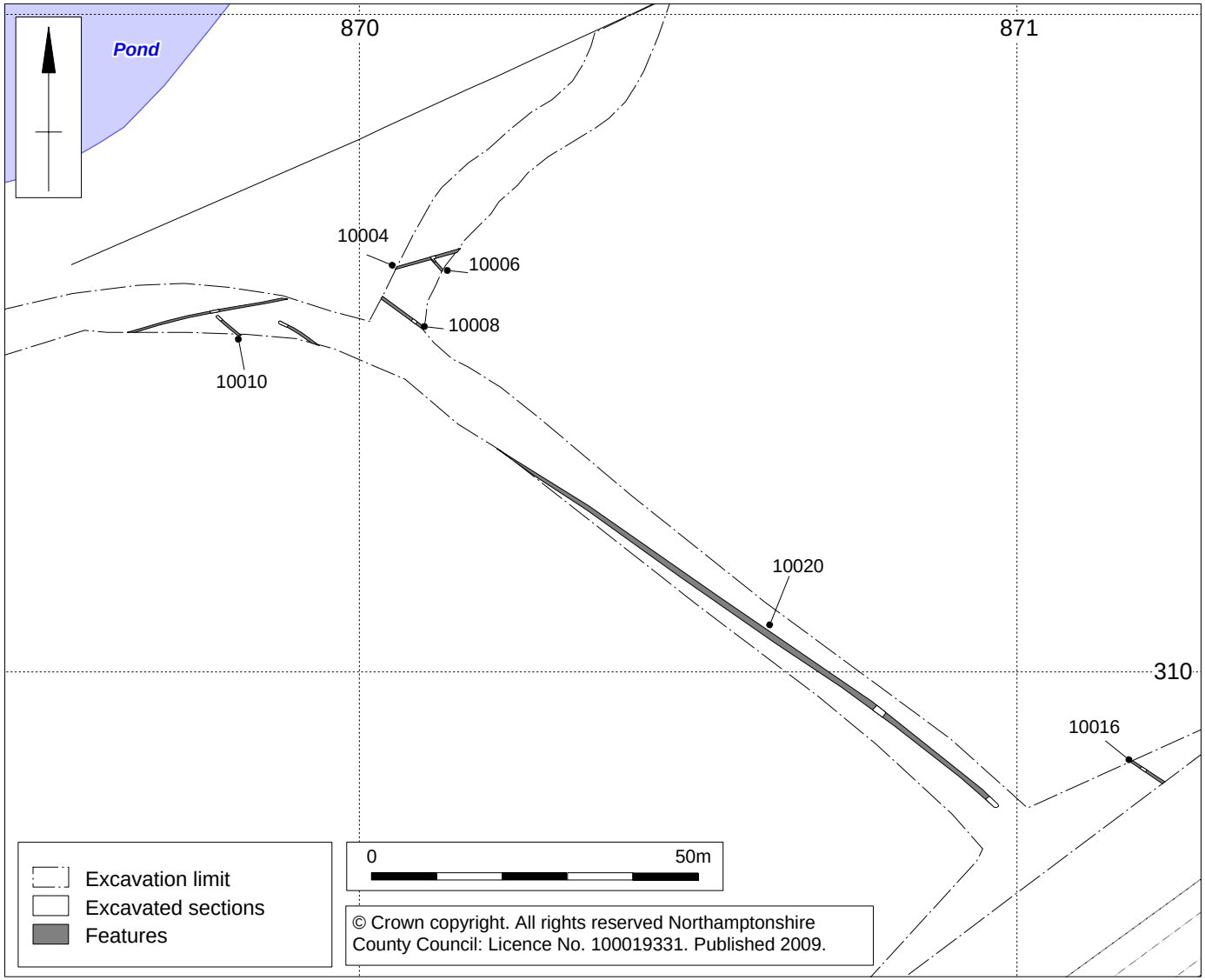


Scale 1:500 Phase 2, Roundhouses R4-R6 and associated features Fig 6

Scale 1:500 Development of Enclosure E2 and Roundhouse R3/R5 Fig 7



Scale 1:125 Roundhouse R6 and associated features Fig 8



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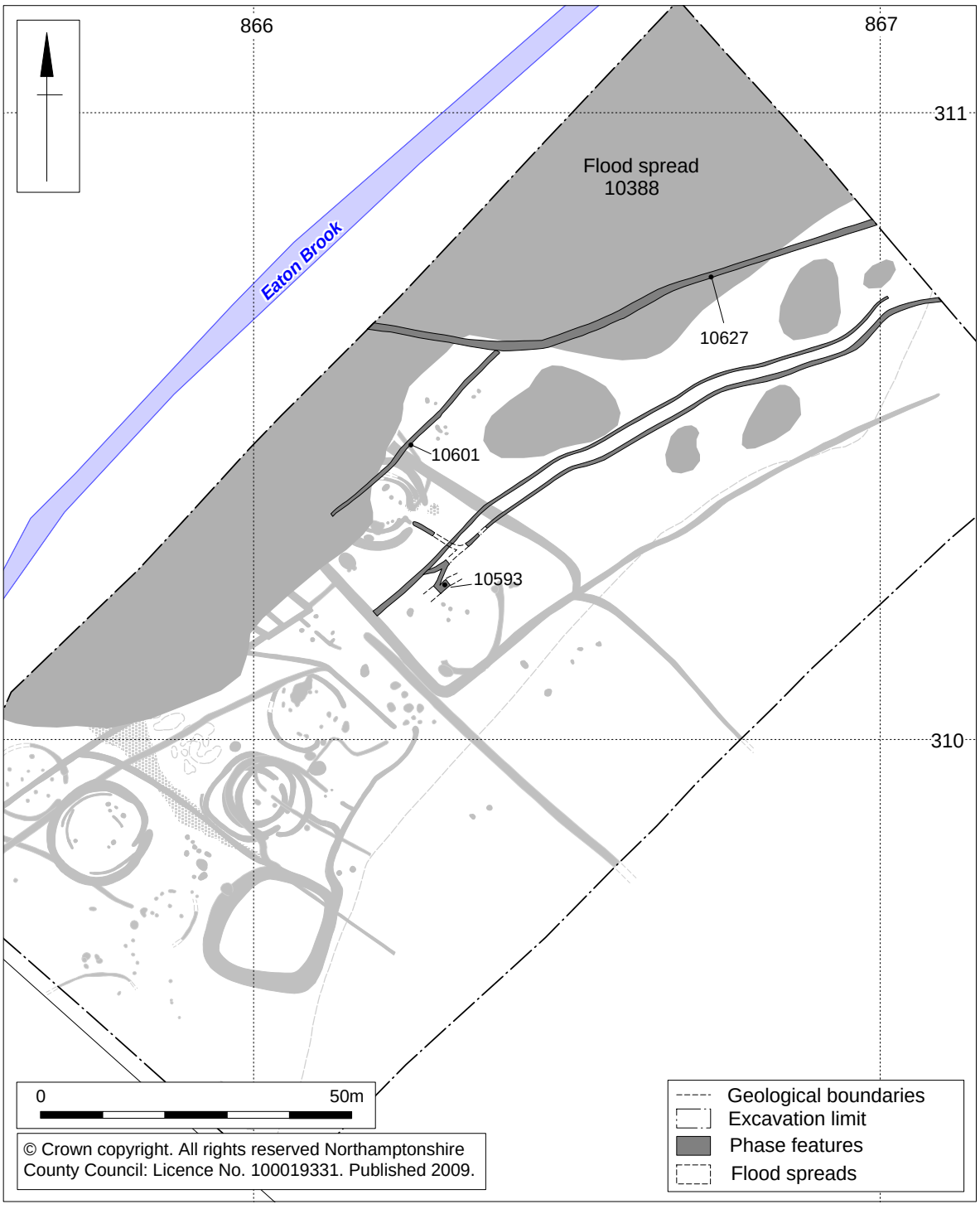
Ditches in the access road Fig 9



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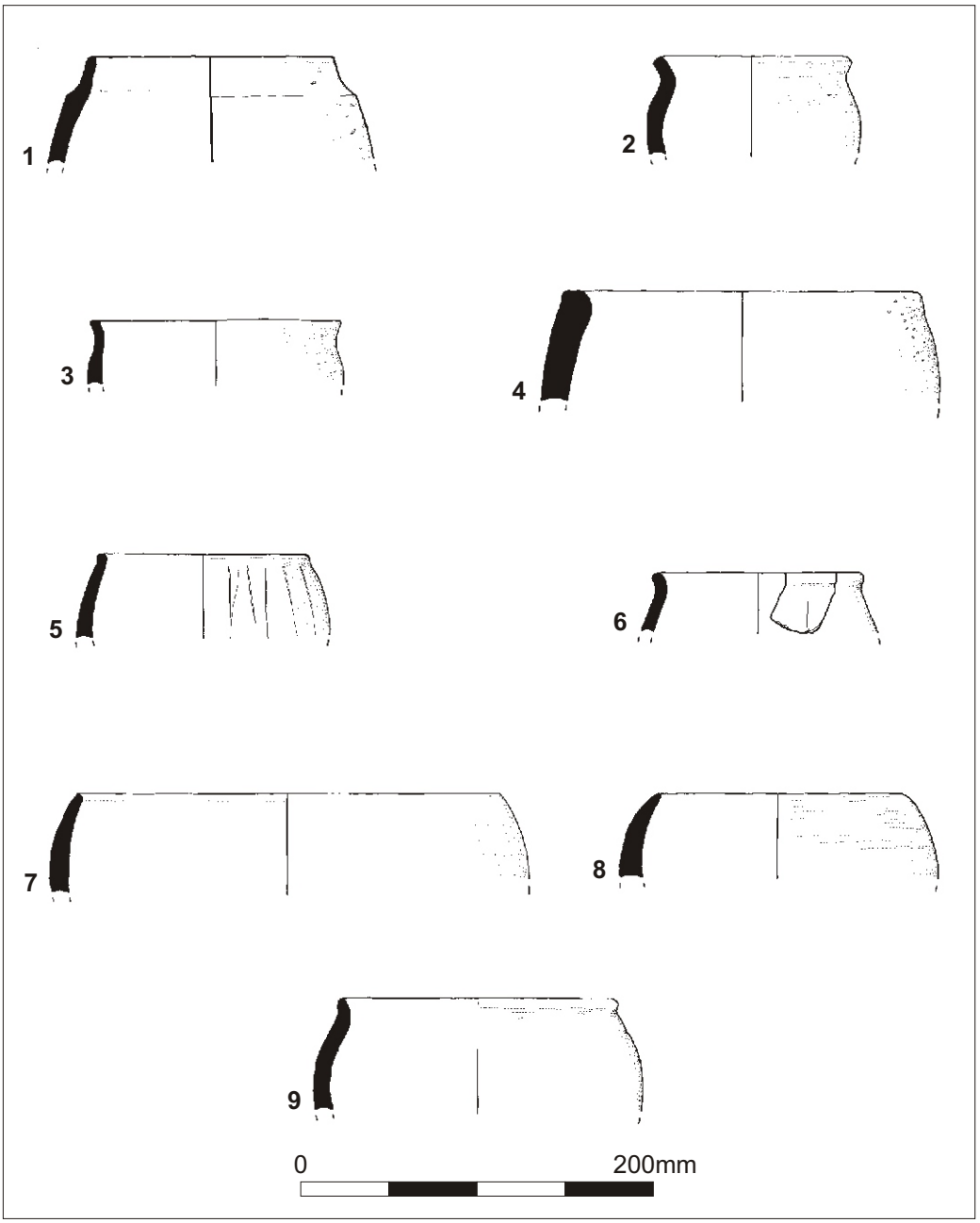
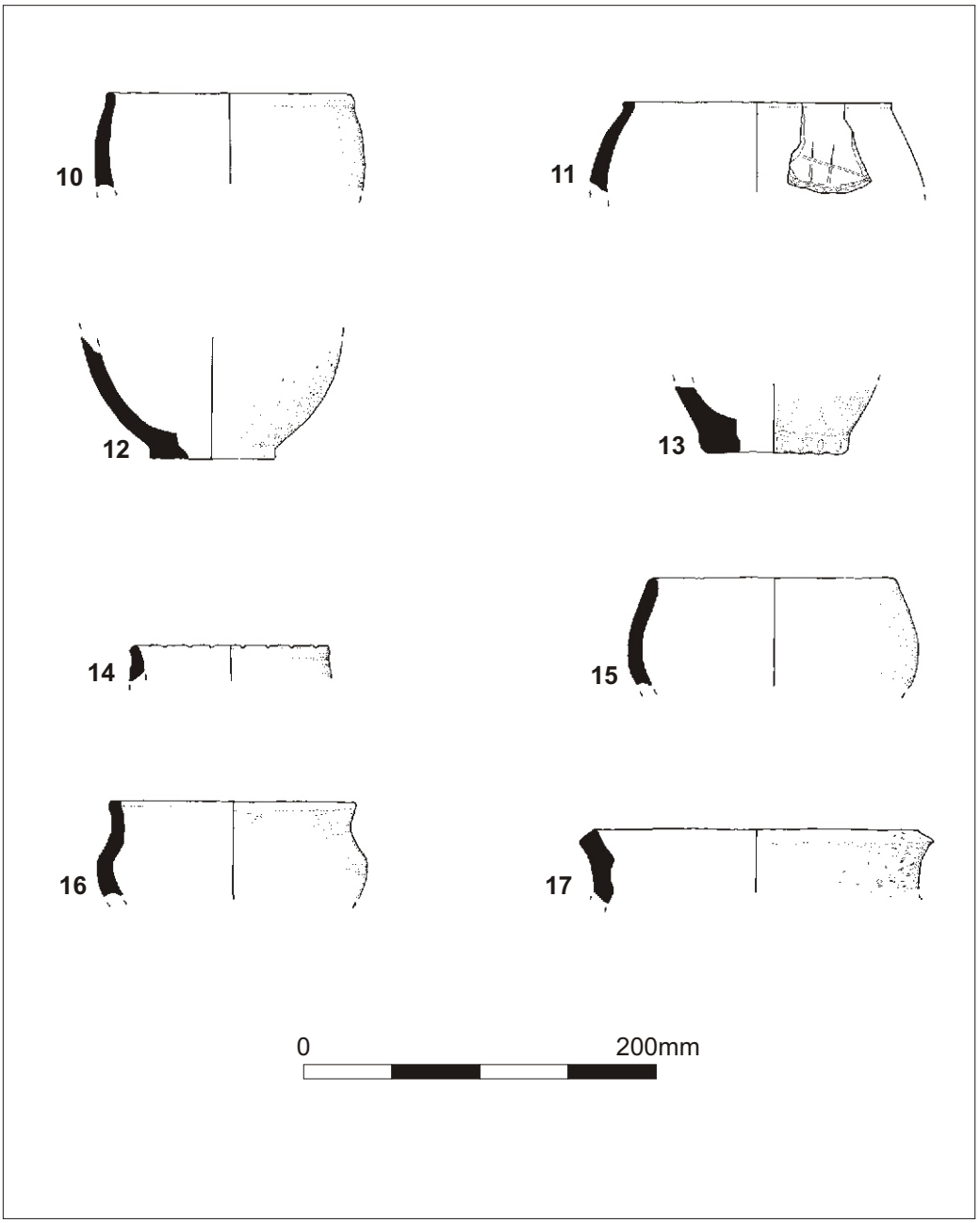
Phase 3, Middle Iron Age abandonment Fig 10

Fig 11 Alluvial deposits sealed by dark abandonment flood spreads

Fig 12 Charcoal-filled pit [10467], view of section



Iron Age pottery, 1-9 Fig 13



Iron Age pottery, 10-17 Fig 14

Fig 15 Iron Age finds, 1-4 (50mm scale)

Fig 16 Roman plate brooch, 2nd century AD (50mm scale)

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