



Northamptonshire Archaeology

Archaeological Excavation and Watching Brief on land
adjacent to M1, Junction 12, Toddington, Bedfordshire
February to April 2011
Assessment Report and Updated Project Design



Northamptonshire Archaeology

2 Bolton House
Wootton Hall Park
Northampton NN4 8BE
t. 01604 700493 f. 01604 702822
e. sparry@northamptonshire.gov.uk
w. www.northantsarchaeology.co.uk



Northamptonshire
County Council

Jason Clarke

Report 11/177 revised

March 2012

Acc No: LUTNM2010.67



STAFF

Project Managers William Boismier BA MPhil MA PhD
MIfA and Jim Brown BSc PGDip MIfA

Text Jason Clarke BSc MA AIfA

Editing Andy Chapman BSc MIfA FSA

Fieldwork Jim Brown, Jason Clarke
Adrian Adams, Paul Clements BA
Sam Egan BSc, Jonathon Elston BA
Peter Haynes, Luke Jarvis BA
Dan Nagy MA, Myk Riley BA
Peter Townend BA

Flint Yvonne Wolframm-Murray BA PhD

Roman pottery Jane Timby BA PhD FSA MIfA

Medieval pottery Paul Blinkhorn B Tech

Other finds Tora Hylton

Roman coins Ian Meadows BA

Querns and worked stone Andy Chapman

Ceramic building material Pat Chapman BA CMS AIfA

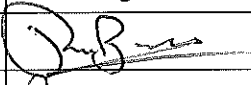
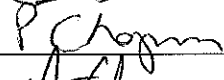
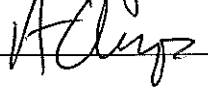
Human bone Sarah Inskip BSc MSc

Plant macrofossils Val Fryer BA MIfA

Animal bone Laszlo Lichtenstein MA

Illustrations Amir Bassir BSc

QUALITY CONTROL

	Print name	Signed	Date
Verified by	Jim Brown		15/3/12
Checked by	Pat Chapman		16/3/12
Approved by	Andy Chapman		16/3/12

OASIS REPORT FORM

PROJECT DETAILS		
Project name	Archaeological excavation and watching brief on land adjacent to M1, Junction 12, Toddington, Bedfordshire: February to April 2011: Assessment Report and Updated Project Design	
Short description (250 words maximum)	Three areas close to M1 Junction 12 were subject to open area excavation. A small cemetery in use from the late Iron Age (early 1st century AD) to the early 2nd century AD was fully excavated. It comprised some fifty urned cremation deposits in shallow pits, typically accompanied by a number of accessory vessels, and a single inhumation burial. A boundary ditch system of the same date had respected the location of the cemetery. An excavated area to the east of the M1 was crossed by a series of Roman boundary ditches spanning the 1st to 2nd/3rd centuries. A single pit contained a little burnt bone and quantities of dark soil, charcoal, burnt stones and burnt clay that may have come from a pyre. An excavated area to the west of the M1 contained an extensive layer of dumped clay which produced a quantity of pottery wasters, dated to the 12th-13th centuries and presumably from a nearby kiln. There was a clay foundation for a timber-framed building and an H-shaped stone foundation for an adjacent small structure, which is dated to the late 15th-16th centuries. This activity is probably related to the documented medieval place name of Nuppings Green, which was perhaps either a single farm or a small settlement.	
Project type	Excavation	
Site status	None	
Previous work	Trial Trench Evaluation (Walker 2010)	
Current land use	Arable	
Future work	Analysis and publication	
Monument type/period	Roman and medieval	
Significant finds	Roman cremation cemetery and medieval structures	
PROJECT LOCATION		
County	Central Bedfordshire	
Site address	M1 Junction 12	
Study area	22 ha	
OS Easting & Northing	NGR TL 0188 3016	
Height OD	90-100m aOD	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology (NA)	
Project brief originator	Martin Oake, Central Bedfordshire Council	
Project Design originator	Iain Williamson, URS Scott Wilson	
Director/Supervisor	Jason Clarke, Northamptonshire Archaeology	
Project Manager	William Boismier and Jim Brown (NA), Iain Williamson (URS Scott Wilson)	
Sponsor or funding body	URS Scott Wilson on behalf of the principal contractors Costain and Carillion joint venture, acting for the Highways Agency	
PROJECT DATE		
Start date	February 2011	
End date	April 2011	
ARCHIVES	Location	Content (eg pottery, animal bone etc)
Physical	Luton Museum Accession no LUTNM 2010.67	Worked flint, pottery, animal bone, human bone, metalwork
Paper		Context sheets, permatrace plans & sections, site registers, photographic archive, background documents
Digital		Client PDF report

Contents

1	INTRODUCTION	1
1.1	Project background	1
1.2	Topography and geology	3
1.3	Historical and archaeological background	3
1.4	Excavation strategy	4
2	SUMMARY OF EXCAVATION	6
2.1	Site A: Romano-British cemetery and ditches	6
2.2	Site B: Funerary monument and medieval ditches	12
2.3	Site C: Roman ditches and medieval structures	14
2.4	Targeted watching briefs (TWB)	17
2.5	Historic hedgerow recording	20
2.6	Quantification of the site archive	20
3	SUMMARY OF FINDS ASSESSMENTS	21
3.1	Worked flint by Yvonne Wolfram-Murray	21
3.2	Late Iron Age and Roman pottery by Jane Timby	21
3.3	Medieval pottery by Paul Blinkhorn	17
3.4	Other finds	17
4	SUMMARY OF HUMAN BONE ASSESSMENT by Sarah Inskip	21
5	SUMMARY OF FAUNAL AND ENVIRONMENTAL ASSESSMENTS	20
5.1	Animal bone by Lazlo Lichtenstein	22
5.2	Plant remains by Val Fryer	22
5.3	Charcoal by Andy Chapman	23
6	SUMMARY OF POTENTIAL AND PROPOSALS FOR ANALYSIS	23
6.1	Review of original research objectives	23
6.2	Revised research objectives	25
6.3	Proposals for further analysis	26
7	REPORTING AND ARCHIVE	30
7.1	The report	30
7.2	Provisional publication proposals	31
8	STORAGE AND CURATION	32
9	RESOURCES AND PROGRAMMING	32
9.1	Work completed	32
9.2	Proposed work and completion dates	32
9.3	Key personnel	32
	BIBLIOGRAPHY	33

APPENDIX 1: LATE IRON AGE AND ROMAN POTTERY	34
by Jane Timby	
APPENDIX 2: MEDIEVAL POTTERY	42
by Paul Blinkhorn	
APPENDIX 3: OTHER FINDS	45
by Andy Chapman, Pat Chapman, Tora Hylton and Ian Meadows	
APPENDIX 4: THE DEPOSITION OF CREMATED BONE AND PYRE DEBRIS	49
by Pat Chapman	
APPENDIX 5: OSTEOLOGICAL ASSESSMENT OF THE HUMAN REMAINS	56
by Sarah Inskip	
APPENDIX 6: ASSESSMENT OF CHARRED PLANT MACROFOSSILS	62
by Val Fryer	
APPENDIX 7: THE ANIMAL BONE	77
by Laszlo Lichtenstein	
APPENDIX 8: CONTEXT INDEX	82

Tables

Table 1:	Site A Chronology
Table 2:	Site B Chronology
Table 3:	Site C Chronology
Table 4:	Tasks and personnel
Table A1.1:	Summary of pottery grave groups from the cemetery, Site A
Table A2.2:	Sites A and C: Context spot dates
Table A3.1:	Finds quantified by material type
Table A3.2:	Finds associated with the cremation burials
Table A4.1:	Cremation deposits, recovered bone weights
Table A4.2:	Bone deposition in cremation burials
Table A4.3:	Cremation burials with pyre debris
Table A5.1:	Cremated deposits by weight, fragmentation, age and sex
Table A6.1:	Charred plant remains from the backfill of the burial pits
Table A6.2:	Charred plant remains from other Roman features
Table A6.3:	Charred plant remains from medieval features
Table A7.1:	Site A, size of the animal bone assemblage (without teeth)
Table A7.2:	Site A, species present in the animal bone assemblage by fragment count
Table A7.3:	Site A, Minimal Number of Individuals in the animal bone assemblage
Table A7.4:	Site B, size of the animal bone assemblage
Table A7.5:	Site C, species present in the animal bone assemblage by fragment count
Table A7.6:	Site C, size of the animal bone assemblage (without the teeth) in the Roman period
Table A7.7:	Site C, the ageing data after the cattle teeth in the Roman period
Table A7.8:	Site C, Minimal Number of Individuals identified in the animal bone assemblage in the Roman period
Table A7.9:	Site C, Size of the animal bone assemblage (without the teeth)
Table A7.10:	Site C, Minimal individual identified in the animal bone assemblage

Figures

- Fig 1: Site location showing location and watching brief areas
- Fig 2: Site A, Roman cremation burials and associated ditches
- Fig 3: Site A, Romano-British cremation cemetery during excavation, looking north
- Fig 4: Site A, cremation burials 38 and 49
- Fig 5: Sites B and C
- Fig 6: Site B, deposit of cremated bone and associated spread of stones, pit 5019
- Fig 7: Site C, showing medieval and later structures
- Fig 8: Site C, clay foundation for medieval building, cut into a midden
- Fig 9: Site C, post-medieval H-shaped stone building foundation
- Fig 10: The results of the watching brief in TWB2
- Fig 11: The results of the watching brief in the HRS soil storage area
- Fig A1.1: Cremation urn, left rear, and four accessory vessels deposited with the cremation burials
- Fig A2.1: The large jar, 5408 (Scale 80mm) found beneath Building 1 in Site C
- Fig A4.1: Cremation burial 21, showing typical size and condition of bone
- Fig A4.2: Cremation burial 21, showing the top of the cremation deposit (Scale 10mm)
- Fig A4.3: Cremation burial 6, vessel 2, long bone visible on side near base, left (Scale 50mm); Cremation burial 47, long bone in base (cremation inverted), right (scale 20mm)
- Fig A4.4: Cremation burial 32, with iron brooch laid on top of the bones (Scale 10mm)
- Fig A4.5: Cremation burial 23, infant cremation burial with brooch (Scale 10mm)
- Fig A4.6: Cremation burial 20, showing a long length of long bone laid across the top of the deposit (Scale 10mm)
- Fig A4.7: Cremation burial 46, accessory vessel 111, showing carbonised wood on top, left (Scale 10mm) and in the base, right (Scale 20mm)
- Fig A4.8: Cremation burial 24, carbonised wood and skull fragment (Scale 10mm)
- Fig A4.9: Cremation burial 34, urn 94 with ceramic disc (Scale 20mm)

**ARCHAEOLOGICAL EXCAVATION AND WATCHING BRIEF ON
LAND ADJACENT TO M1 JUNCTION 12
TODDINGTON, BEDFORDSHIRE
FEBRUARY TO APRIL 2011**

Assessment report and Updated Project Design

Abstract

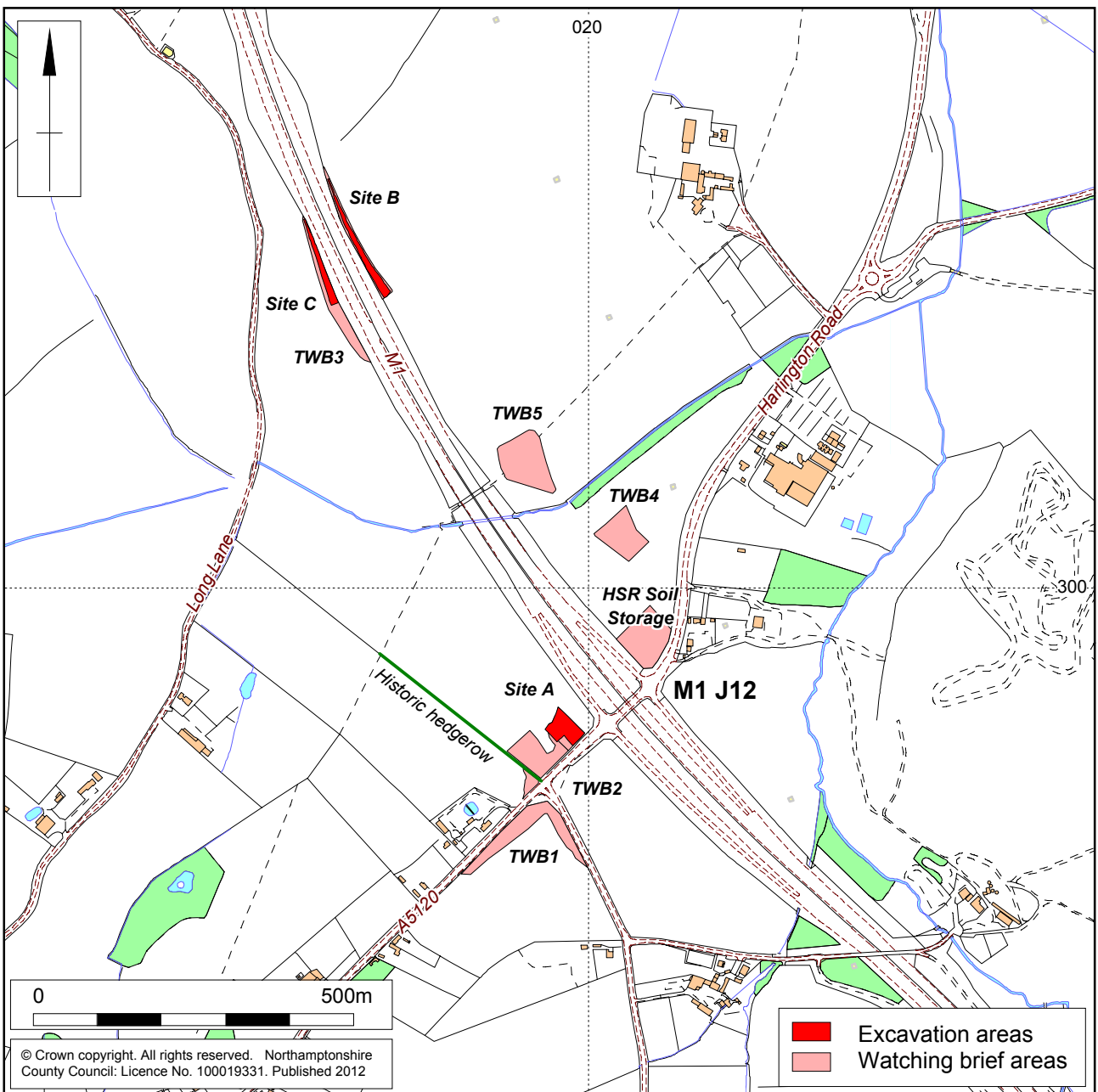
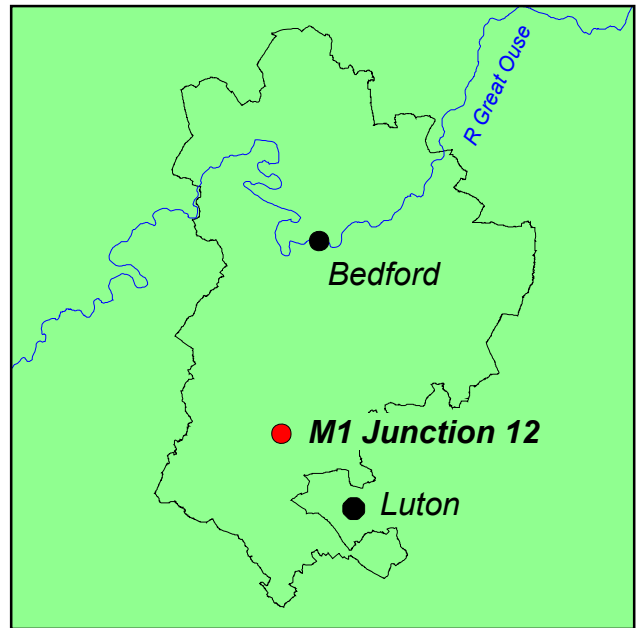
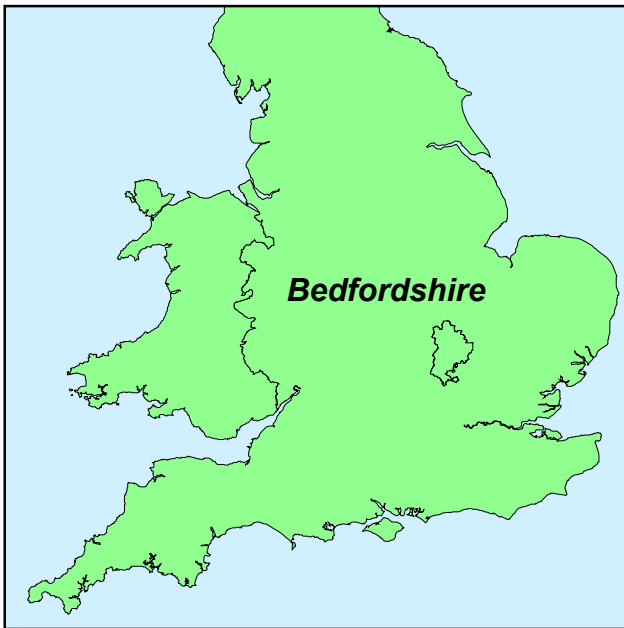
Three areas close to M1 Junction 12 were subject to open area excavation. A small cemetery in use from the late Iron Age (early 1st century AD) to the early 2nd century AD was fully excavated. It comprised forty-nine urned cremation deposits in shallow pits, typically accompanied by a number of accessory vessels, and a single inhumation burial. A boundary ditch system of the same date had respected the location of the cemetery. An excavated area to the east of the M1 was crossed by a series of Roman boundary ditches spanning the 1st to 2nd-3rd centuries. A single pit contained a little burnt bone and quantities of dark soil, charcoal, burnt stones and burnt clay that may have come from a pyre. An excavated area to the west of the M1 contained an extensive layer of dumped clay which produced a quantity of pottery wasters, dated to the 12th-13th centuries and presumably from a nearby kiln. There was a clay foundation for a timber-framed building and an H-shaped stone foundation for an adjacent small structure, which is dated to the late 15th-16th centuries. This activity is probably related to the documented medieval place name of Nuppings Green, which was perhaps either a single farm or a small settlement until the 17th to 18th century.

1 INTRODUCTION

1.1 Project background

A programme of excavation and targeted watching brief was carried out by Northamptonshire Archaeology during February to April 2011 in advance of, and during improvements to Junction 12 of the M1 at Toddington, Central Bedfordshire (Fig 1; NGR TL 0188 3016). This work was conducted as specified in the Written Scheme of Investigation (WSI) prepared by URS Scott Wilson on behalf of the principal contractors Costain and Carillion (Highways Agency 2011). The WSI and archaeological mitigation design was approved by the Central Bedfordshire Council Archaeological Officer prior to the commencement of works. The mitigation strategy had been informed by the results of archaeological evaluation (Walker 2010), which had identified the presence of archaeological remains of significance that required mitigation works in advance of construction.

Two areas of detailed archaeological excavation were undertaken where archaeological remains of regional (moderate) significance, dating to the Romano-British (Site A) and medieval period (Site B), had been located by the evaluation. Five areas of Targeted Watching Brief (TWB) were undertaken where sparse or dispersed archaeological remains had been identified. Following the identification of a possible medieval building and associated deposits at TWB3, a site specific excavation strategy was implemented (URS Scott Wilson 2011). In addition, a section of Historic Hedgerow identified in the Cultural Heritage Chapter of the Environmental Statement, was recorded before its removal (Highways Agency 2009).



Scale 1:10,000

Site location showing excavation and watching brief areas

Fig 1

Northamptonshire Archaeology is a registered organisation (RAO 48) with the Institute for Archaeologists (IfA). This report has been prepared in accordance with the method statement (Brown 2011) and *Management of Archaeological Projects* (EH 1991b, Appendix 4: Assessment report specification), *The MoRPHE Project Managers' Guide* (EH 2006) and the appropriate national standards and guidelines, as recommended by the Institute for Archaeologists (IfA 2008a-b;2010).

1.2 Topography and geology

The site is located at Junction 12 of the M1 motorway between Toddington and Harlington. The city of Luton lies c11km to the south-east. The site comprises arable fields either side of the motorway. The ground level rises gently to the north and south of a small tributary valley, at c90-100m above Ordnance Datum.

The bedrock geology is mudstone, sandstone and limestone of the Gault and Upper Greensand Formations and the superficial geology is composed of diamicton (Anglian till) deposits (BGS 1996; 2001; 2009).

1.3 Historical and archaeological background

The work follows on from a series of Environmental Impact Assessments undertaken since 1992. Initially, field surveys were undertaken for the Environmental Statement for the former modified preferred route of the M1 widening, Junctions 10-15 (Acer 1994). This was followed by a desk-based study and detailed walkover in support of Stage 2 Assessment for an updated modified preferred route. A further Stage 3 Detailed Assessment was undertaken to support the Environmental Statement for the M1 widening, Junctions 10-13 (Highways Agency 2007). This reviewed all documentary and desk-based study evidence, the archaeological analysis of LiDAR data and incorporated the results of fieldwalking and geophysical surveys by Bedfordshire County Archaeological Service (now called Albion Archaeology) and Northamptonshire Archaeology.

The following information is summarised from the background given in the WSI (Highways Agency 2011).

Neolithic to Bronze Age

Worked flint scatters were identified during fieldwalking in the vicinity of Poplars Nursery, Toddington, Junction 12, and at Redhills Farm.

Iron Age

Early to middle Iron Age settlement activity has been identified to the east of M1 and was confirmed in 1993 by trial trench excavation. Pottery indicated settlement until the 3rd century BC. Aerial photographic evidence suggested that cropmarks produced by former enclosures and settlement features may extend over a wider area.

Late prehistoric field systems and occupation in the form of linear ditches, enclosures and ring ditches were identified by geophysical survey in 2007, immediately south-west of the existing A5120 junction.

Romano-British

A walkover survey of the site by URS Scott Wilson for the previous M1 Widening Scheme noted the presence of a large fragment of Roman pottery, west of the M1, south of Long Lane Farm.

Medieval

Nuppings Green is a placename recorded east of Long Lane, adjacent to the present M1. Pottery and ceramic building materials were recovered here during fieldwalking in 1992. A domestic settlement, perhaps a small dwelling or farm, is thought to have been present nearby from the late 11th century until the 17th-18th centuries. The pottery was interpreted as a manuring scatter. Ridge and furrow field cultivation has been identified widely upon aerial photographs and geophysical survey plots. This is particularly evident south-west of the existing A5120 junction and in fields to the north.

Post-medieval

A map by Agas in 1581 records features that may have medieval origins. An oval pillow mound is depicted with rabbits and a warren. The site was located north-west of Junction 12, west of Long Lane. To the north of the junction a field between the M1 and Long Lane was labelled 'Gravelpitt Close', perhaps a former quarry. A deer park, with probable medieval origins, is also shown at Toddington Park and there is the deserted settlement of Wadelowe to the east, beyond the development.

At Nuppings Green a possible building is recorded by the 1891 Ordnance Survey, along with quarrying activity. A trackway led north from here towards Harlington Wood. The building is not depicted after 1969 but it is thought that any remains may have been destroyed by a pipeline passing nearby.

A former field boundary immediately to the west of the M1 was depicted on the 1891 Ordnance Survey and showed up on LiDAR but has not been mapped since 1982.

A possible brick wellhead was identified by geophysical survey and the subsequent walkover survey to the north of Mill Farm, Toddington, and south-west of Junction 12.

1.4 Excavation strategy

The location, extent and significance of the archaeological resource was assessed during the Environmental Impact Assessment process (Highways Agency 2005, 2007 and 2009) and confirmed by a programme of intrusive archaeological trial trench evaluation (Walker 2010). The mitigation works were undertaken as specified in the WSI prepared by URS Scott Wilson on behalf of the principal contractors Costain and Carillion (Highways Agency 2011). The WSI/archaeological mitigation design was approved by the Central Bedfordshire Council Archaeologist prior to the commencement of works.

The sites were stripped under archaeological supervision using 360° mechanical tracked excavators fitted with c2m-wide ditching buckets. Mechanical excavation continued to the upper surface of archaeological horizons, or where these were absent, the upper surface of the natural substrate. The topsoil and subsoil were removed in separate operations and stored in temporary bund at the edge of sites.

Each site was given a name and unique context sequence under the overall project accession number LUTNM2010.67. Once the site had been opened up and the archaeological surface cleaned sufficiently to enhance the features, a grid was established and a digital base plan was produced using GPS, with the grid and site datum related to the Ordnance Survey Grid and Datum. The general site plan was hand drawn at a scale of 1:50 or 1:100.

A minimum of 20% of non-structural linear features were excavated, discrete features, such as pits or postholes were 50% excavated, or 100% excavated if features were part of recognisable structures, contained deposits or artefacts of particular value or

were likely to hold significant artefact or environmental assemblages. Intersections were investigated to establish stratigraphic relationships. Special or burnt features, such as cremations were 100% excavated. Representative sections of linear and curvilinear features were sample excavated away from intersections with other features or deposits, to obtain unmixed samples of material. Features such as furrows or tree throws were investigated to characterise their form and function. Sections were drawn at a scale of 1:10 or 1:20, as appropriate. Recording followed the procedures outlined in the Northamptonshire Archaeology Fieldwork Manual (NA 2006) and requirements of the WSI (Highways Agency 2011).

Artefacts and ecofacts were collected by hand and retained, receiving appropriate care prior to removal from site. The stripped areas and spoil heaps were scanned with a metal detector to ensure maximum finds retrieval. All finds have been catalogued and boxed by material type.

Soil samples of between 10 and 40 litres (volume dependant on deposit size) were taken for floatation from dateable contexts with the potential for the recovery of charcoal and charred plant remains.

A photographic record of the project was maintained using 35mm black and white negative and colour transparency, supplemented with digital images. All records were compiled during fieldwork into a comprehensive and fully cross-referenced site archive.

All works were conducted in accordance with the method statement prepared by NA (Brown 2011). The work complied with professional standards for watching briefs, excavation and the code of conduct set by the Institute for Archaeologists (IfA 2008a-b; 2010) and the Written Scheme of Investigation (WSI) prepared by URS Scott Wilson on behalf of the principal contractors Costain and Carillion (Highways Agency 2011). All work was undertaken under the principal contractor's (CCJV's) Health and Safety policy, protocols and permits to dig, and the policies of Northamptonshire County Council.

2 SUMMARY OF EXCAVATION

2.1 Site A: Romano-British cemetery and ditches

The site was located to the north of the A5120 on a north-facing slope at c100m aOD (Fig 2). It was located in the area of evaluation Trench 3 (Walker 2010) in which an early Roman ditch and pits along with two spreads of material interpreted as evidence of industrial activity. Following the discovery of Roman cremation burials, the area was extended from the planned 0.13ha to an area of 0.18ha, measuring 50m north-west to south-east by up to 40m north-east to south-west (Fig 3).

Summary of chronology

A cremation cemetery was established in the early 1st century AD adjacent to ditches that formed a junction between possible enclosures. A large quarry pit lay nearby. As the cemetery expanded, the boundaries were moved to increase the Site Available until both it and the ditches were abandoned in the early 2nd century.

Table 1: Site A Chronology

Period	Nature of activity
Late Iron Age (early 1st century AD)	Establishment of a cremation cemetery, boundary ditches and a large quarry pit
Early Roman (mid-1st century AD)	Use and expansion of the cremation cemetery, migration of boundary ditches
Roman (late 1st century to early 2nd century AD)	Final phase of the cremation cemetery and silting of the ditches

Analysis of the pottery has broadly dated the cemetery to four phases of development (Timby, Appendix 1). A number of features lay to the east and north-east of the cemetery and appear to have developed alongside the cemetery (Fig 2).

The earliest graves were scattered mostly across the north of the cemetery and date to the late Iron Age (early 1st century AD), these consisted of fourteen burials containing a single vessel containing the cremated bone, either on its own or with a single accessory vessel.

Late Iron Age pottery was recovered from a large pit 4014 to the east of the cemetery, which was probably a quarry pit and an east to west aligned ditch 4084/4010 that may have been contemporary with the establishment of the cemetery.

The cemetery continued to develop during the late Iron Age (mid-1st century AD) with the addition of two graves, also located in the north of the cemetery.

The third phase of development was in the early Roman period (pre-Flavian, pre-69AD) with the addition of fifteen graves scattered in the middle of the cemetery. Three of the burials contained just the cremation urn, the others had between one and five accessory vessels.

Contemporary with the 3rd phase of the cemetery was the most substantial ditch 4006/4242/4237, also recorded in evaluation Trench 3. It was located to the south of the cemetery, aligned north-east to south-west, and may have been a boundary ditch. Ditches 4026 and 4065 ran north-westward from this boundary and are dated to the late 1st to early 2nd century AD, contemporary to the final phase of the cemetery. They

may have served as boundaries and for drainage, taking water down the slope to the north-west.

The final phase of the cemetery dates to the Flavio-Trajanic period (late 1st to early 2nd century AD) with the addition of another eighteen graves, almost all lying in the southern area of the cemetery. Of this group seven contained samian vessels and were examples from South Gaul and Central Gaul (Lezoux). Burial 6 appears to be the latest and may have been interred in the Hadrianic period (early 2nd century AD)

A pit containing a poorly-preserved inhumation, burial 51, was truncated, so that only the legs and pelvis survived. It was aligned north-east to south-west and the grave, which was deeper than most of the cremation burial pits, truncated cremation burial 36, indicating that the inhumation probably post-dated the use of the cremation cemetery.

The cemetery, with its late Iron Age origin, developed alongside the creation of the ditch system, which was established in the 1st century AD, respecting the cemetery area, and continuing in use through the lifetime of the cemetery, with both the cemetery and the boundary system having fallen out of use by the middle of the 2nd century AD.

The excavation appears to have located the entire extent of the cemetery. It would have served a local rural community and was probably in use for two generations before going out of use sometime in the 2nd century AD. There was no surviving boundary to the cemetery.

Romano-British cemetery

The cemetery extended over an area of 0.02ha, 20m north-south by 15m east-west, comprising a scattered group of small pits, the majority of which contained pottery urns holding cremated bone, usually with associated accessory vessels. The pits containing the pottery vessels were cut into the subsoil, with the top of the pottery vessel situated just below the topsoil. Preservation was variable, a majority of the pots were complete but many had cracked, collapsed and fragmented in antiquity.

Of 49 pits in the cemetery area, 46 pits contained deposits of cremated bone within a pottery urn. Individual cremation burials usually comprised a group of pottery vessels: a larger jar containing the cremated bone; a drinking vessel, usually a beaker; and in some assemblages there was also a flagon and a food vessel, either a bowl or platter. In some cases the bowls were Samian ware, possibly suggesting a higher status individual.

Seven pits contained two deposits of cremated bone. In one instance the second deposit was an infant, burial 23, and in two others they were juveniles. The other double cremation deposits appear to have been placed in the pit at the same time, but whether the remains come from two separate individuals, who had perhaps died close together, or were the remains of a single individual placed within more than one vessel remains to be determined, if possible, by further analysis.

Seven pits contained a single urn containing cremated bone and no accessory vessels, although burial 42 was truncated by a post-medieval land drain so accessory vessels may have been lost.

A single square-cut pit, burial 41, contained unurned cremated bone only, and another pit, burial 45, contained unurned cremated bone with a pottery accessory vessel. The remains of the base of a pottery vessel, burial 22, lying on the exposed natural geology was probably the surviving remnant of a further cremation burial.

The deposition of the human bone

The processing of the urns containing cremated bone has provided an overview of the variations in burial practices (see Appendix 1), as summarised below:

Bone was either collected as token deposits, often a handful or less, but in some instances large quantities, at least a half of the material was recovered from the pyre. The absence of burnt soils, the limited occurrence of carbonised wood, and the presence of quite large bones fragments, indicates that bone was picked from the debris piece by piece, and perhaps even washed prior to deposition. There was a strong preference for recovering the larger bone elements; skull, long bones, pelvis and scapula.

Generally there was no particular order for the deposition of this material in the urns, but in several instances care had been taken. Most typically, the long bones had been deposited first, sometimes set upright and the skull last, as if replicating the standing posture. The only infant burial may have been laid as if lying curled up on its side. Other pyre debris was rarely found, but in six instances lengths of carbonised wood had been placed in the base of the urn or on top of the bone deposit, the latter perhaps as lids to the urns. In one curious example, an urn contained only soil, a single fragment of skull and two lengths of carbonised wood.

Some of the burial pits were inter-cut, which may indicate the presence of family plots within the cemetery, for example, Burial 38 dated to the first phase of the cemetery, contained two deposits of cremated bone, and was cut by the pit containing burial 49, dating to the final phase, slightly damaging a pottery urn (Fig 4). Burial 49 is located within the earlier phase of the cemetery away from main concentration of burial pits from its contemporary final phase, suggesting it was deliberately placed in the older part of the cemetery. The only surviving indication of a marker was a small pit in the north part of the cemetery, which contained degraded wood within its backfill suggesting it once held a post; but this pit was not associated with any burial pits.

Other features

To the east of the cemetery there was a spread of material, very dark grey-black in colour containing burnt material; charcoal and burnt stone. This material was present within evaluation Trench 3 and was interpreted as the possible accumulation of material from industrial activity. With the presence of the cremation cemetery the material may instead have been pyre debris, which had been re-deposited within a natural hollow at the base of the slope. Similar material filled a pit and a group of postholes to the east. The pyre site may have lain nearby, but its location has not been established.

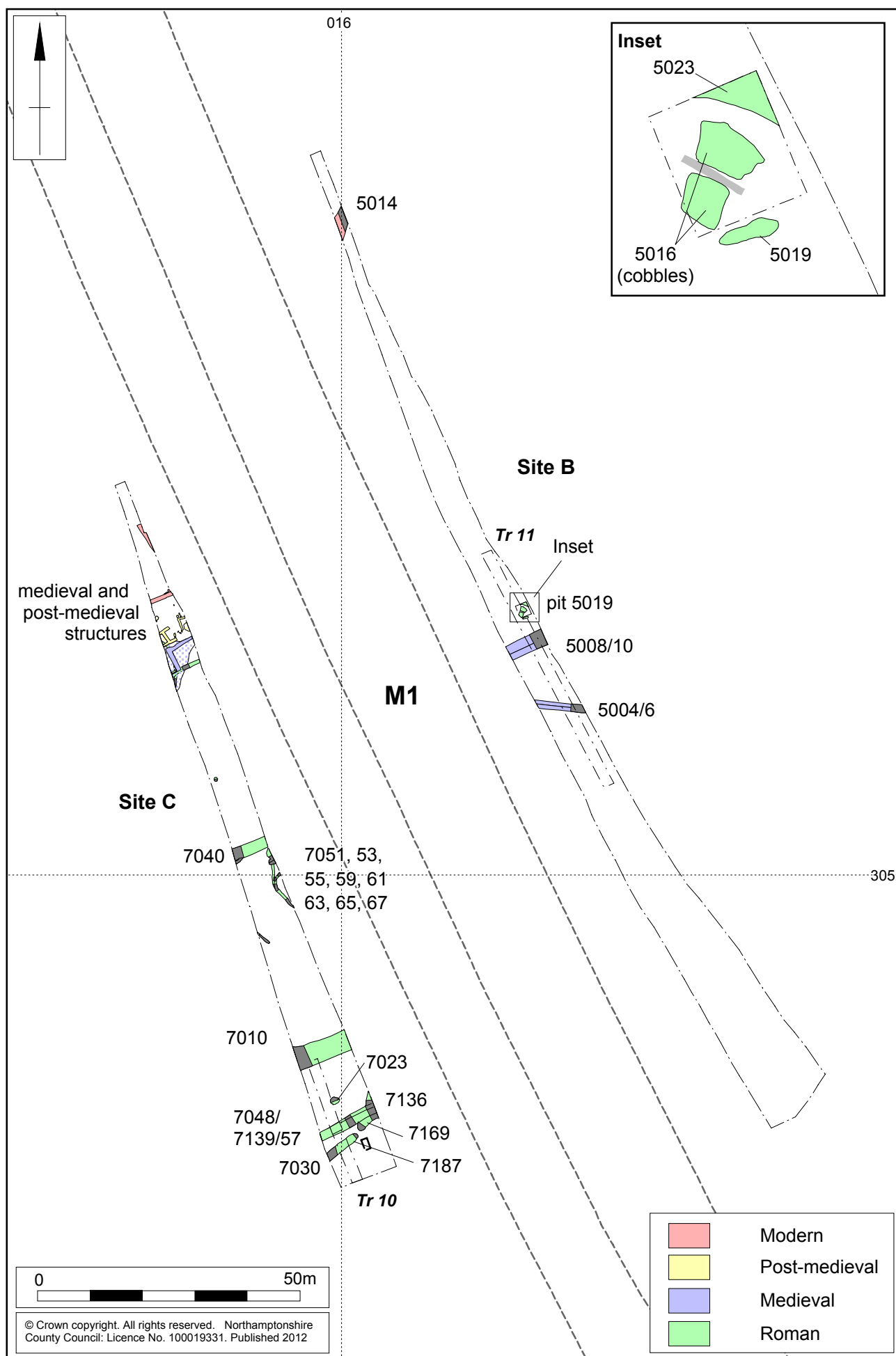
A group of postholes 4015 located to the north-east of the cemetery were filled by the possible pyre debris. The use of the group is uncertain but five of the postholes make a semi-circular shape, which may have made a small windbreak.



Site A, Romano-British cremation cemetery during excavation, looking north Fig 3



Site A, cremation burials 38 and 49 (Scale 0.5m) Fig 4



Scale 1:1000, inset 1:100

Sites B and C Fig 5

2.2 Site B: Pit 5019 and medieval ditches

This area lay on the eastern side of the M1 on the low ridge, overlooking the existing M1 Junction 12. Site B was targeted over evaluation Trench 11, which contained a Roman ditch and features thought to represent medieval settlement (Walker 2010). The excavation revealed a pit containing quantities of possible redeposited pyre debris, surrounded by a spread of stone and a possible ditch. Three other ditches were present (Fig 5).

Table 2: Site B Chronology

Period	Nature of activity
Roman (1st-2nd centuries AD)	A possible pyre deposit and burnt stone adjacent to a boundary ditch
Medieval (12th century)	Boundary ditches with associated recuts
Modern (late 19th-20th centuries)	A single boundary ditch

To the north of the stone spread, see below, a curving ditch or pit, was only partially exposed. The material that the stone spread overlay had slumped into the feature, indicating that it pre-dated the stone layer. Early Romano-British pottery was recovered from its primary fill.

Located in the middle of the site was a sub-rectangular pit 5019, aligned east to west. It measured 1.10m long, 0.35m wide and 0.20m deep. It was also recorded in evaluation Trench 11 where a large fragment of burnt wood was present within western side of the fill, possibly the remains of a post or part of pyre debris (Walker 2010). The fill was of dark grey-black silty clay that contained burnt/cremated bone (385g), charcoal (1126g), fired clay and burnt stone (Fig 6). The material may be redeposited pyre debris, including clay and stones perhaps from a constructed pyre platform. However, the cremated bone deposit is not particularly large, a fraction of the bone to be expected from a single person. It is recommended that a radiocarbon date is obtained for the possible pyre debris to define a date, so that a firm relationship can be established with the Roman ditch.

To the north, alongside the pit, was a spread of stone that appeared to be contemporary, possibly as a marker to the pit or a surface associated with it. The stones comprised rounded sandstone, mudstone, limestone and flint nodules, many of which were burnt. The stone was disturbed by later agricultural activity, but they were generally packed closely together, covering an area 2.0m wide and 1.5m long. This feature is undated, although it was sealed by a medieval plough soil and the presence of some early Romano-British pottery in the associated ditch suggests it was Roman.



Site B, deposit of cremated bone and associated spread of stones, pit 5019

Fig 6

Medieval ditches

To the south of the pit and spread of stones was a medieval ditch 5010, aligned north-west to south-east, recorded in evaluation Trench 11, 1107 (Walker 2010). It was 2.36m wide and 0.58m deep and filled with mid orange-brown silty clay 5009. Ditch 5010 was re-cut on the same alignment by ditch 5008, which had a U-shaped profile, 1.88m wide by 0.84m deep, and a fill of dark grey-brown silty clay containing 12th-century pottery. The full extent of the ditches was not known but they may have been part of a larger boundary or field system which continued beyond the excavation area.

Another ditch, 5006, was aligned east to west and was also recorded during the evaluation in Trench 11, 1104 (Walker 2010). It was 0.58m wide by 0.32m deep and was filled with mid grey-brown silty clay. The recut, 5004, was along the same alignment, measuring 1.08m wide by 0.54m deep. The dark grey-black silty clay fill contained 12th-century pottery and cereal processing waste. The full extent of the ditch is not known but it may be contemporary with features recorded at Site C to the west.

Modern ditch

Near the northern end of the excavation area was a boundary ditch, 5014. Finds recovered from the ditch deposits date it to the late 19th or early 20th centuries.

2.3 Site C: Roman ditches and medieval structures

The area was located on the western side of the M1 on the low ridge to the north of Junction 12 and to the west of Site B. It was targeted over evaluation Trench 10 which contained a Roman ditch. The excavation revealed a number of Roman ditches, gullies and pits. At the north of the site were footings of two structures dating to the medieval and early post-medieval periods (Figs 5 and 7).

Table 3: Site C Chronology

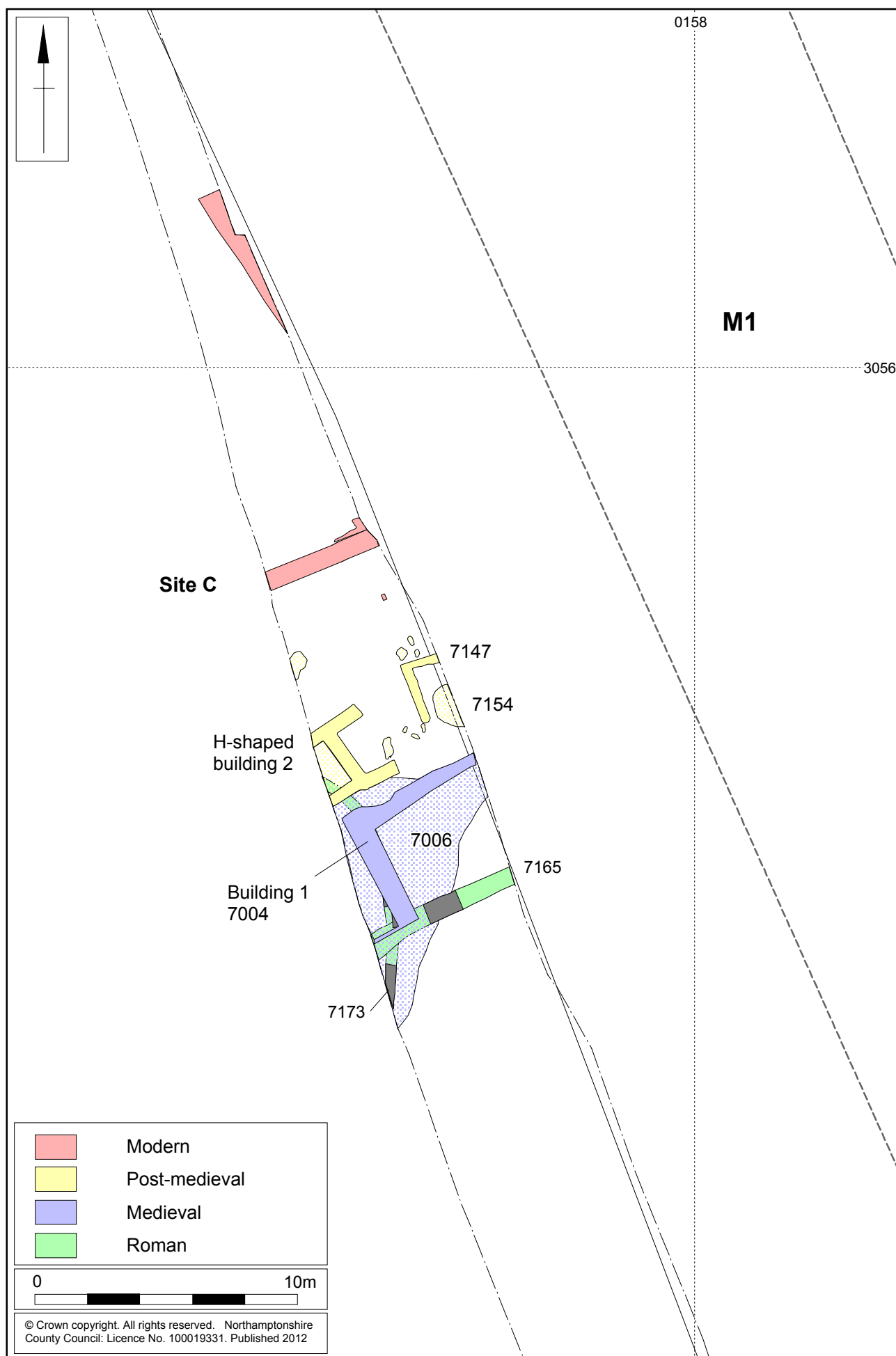
Period	Nature of activity
Roman (1st-2nd centuries AD)	Boundary ditches on a general north-east to south-west alignment
Medieval (12th-13th centuries)	Building 1 and associated spread
Post-medieval (15th-16th centuries)	Building 2 and associated floors

Roman ditch systems (1st to 2nd century AD)

At the southern end of the site, opposing ditch terminals, 1.0m apart, formed an entrance through a linear ditch (Fig 5). The western ditch 7030/7187 was 1.80m wide by 0.54m deep, with a U-shaped profile and a fill of dark orange-brown sandy clay 7186 overlain by mid orange silty clay 7185. The ditch continued to the west beyond the limits of the excavation area. The eastern ditch 7136/7169 was 1.50m wide by 0.36m deep, with a U-shaped profile, and a fill of light grey-brown silty sand 7168, from which 1st-century AD pottery was recovered. The ditch continued to the east, possibly turning northward beyond the excavation area. The boundary was re-modelled with a new ditch set a little to the north 7139/7157, blocking the former entrance, and cutting the eastern ditch. This was the same ditch recorded in evaluation Trench 10 (Walker 2010).

Evidence of domestic activity within the area was demonstrated by a number of pits. Pit 7023 was sub-circular, 1.68m wide by 0.64m deep, with a fill of re-deposited clay. The pit was filled with layers of domestic waste, including cess, overlaid with clay. Other intercutting pits 7065 and 7067, further to the north, contained a moderate amount of pig bone that showed evidence of butchery.

Another ditch 7010 lay to the north. It was 4.90m wide by 0.29m deep, with a fill of red-brown silty sand 7009 overlaid by dark grey-brown silty sand 7008. Burnt clay and 2nd-century AD pottery was recovered.



Scale 1:200

Site C, showing medieval and later structures Fig 7

Forty-metres further north there was another substantial ditch 7040, aligned east to west, with a flat-based U-shaped profile, 2.50m wide by 0.90m deep (Fig 5). The silty clay fill contained 1st-2nd century AD pottery and animal bone.

To the south of this ditch there was a curvilinear gully 7051 and other associated small features. The gully was 0.60m wide by 0.40m deep, with a shallow U-shaped profile and a fill of grey-brown silty clay that contained animal bone and 2nd-century AD pottery.

A further 35m to the north, two ditches lay beneath the medieval deposits (Fig 7). On the western edge of the excavation there was a curvilinear gully, 0.50m wide by 0.30m deep, with a shallow U-shaped profile 7173. It was cut by a ditch 7165, aligned east-west, with a shallow V-shaped profile, 0.70m wide by 0.27m deep, with a fill of mid brown silty clay 7164, which produced a little pottery, probably dating to the 1st century AD.

Medieval and post-medieval settlement

A group of features of medieval and post-medieval date lay at the northern end of Site C (Figs 5 and 7).

Building 1, medieval

Clay foundation walls 7004 for a possible cob building were identified, oriented north-west to south-east, over 5.4m long by 4.3m wide (Figs 7 and 8). A large reconstructable pottery vessel (Blinkhorn, appendix 2), in a similar fabric to 12th- and 13th-century waster sherds in the overlying deposits, was found directly below the north-west corner of the foundation. The north foundation of the building was 0.60m wide by 0.18m deep, with steep sides and a flat base, and extended east beyond the limit of excavation. It was filled with compact mid bluish-grey clay with chalky flecks 7144. There was no surviving foundation on the south side, which may have been truncated by subsequent agricultural activity. Tightly packed cobbles and a layer of gravel, seen in section at the eastern edge of excavation, may have formed a surface associated with the building. A spread of dark silty clay 7006, 10m long by 6m wide and 0.10m-0.20m deep represented a possible accumulated occupation layer that spread both within and around the building. It contained a large quantity of 12th/13th-century pottery almost exclusively comprising kiln wasters, in a fabric related to south Hertfordshire-type greywares. The presence of these wasters in high quantities implies the nearby presence of a kiln, but may also allude to an ancillary storage function for the building.

Building 2, post-medieval

Cut through the northern edge of spread 7006 was a stone wall foundation 7178 belonging to part of a later building, Building 2, with surviving walls laid out in an H-shaped arrangement (Figs 7 and 9). The walls were over 3.0m long by 3.0m wide, extending to the west of the excavated area and truncated at its east end. The foundations were 2.0m wide by 0.21m deep, constructed from rounded cobbles, chalk and flint nodules 7177 up to 250mm in diameter, bonded with orange-brown clay 7176. The overlying abandonment layer, 7099, contained traces of lime mortar adhering to roof tiles that post-date the 14th-century. The form of the building was probably built around a timber frame sat upon sill beams (or sole plates), with the stone forming the base of the walls between, and perhaps utilising cob in its upper courses. The 2.0m width of the interior indicates that the excavated portion of the building is likely to be the smaller fragment of a larger structure, such as a fireplace, or an ancillary element for storage or perhaps an extension providing for an outbuilding on one side.

Modern Construction Activity

To the north of the medieval/post-medieval buildings there were various remnant structures that were of recent origin, possible dating to the construction of the motorway itself.



Site C, clay foundation for medieval building, cut into a midden Fig 8



Site C, post-medieval H-shaped stone building foundation Fig 9

2.4 Targeted watching briefs (TWB)

Targeted watching brief area 1 (TWB1)

This area lay to the west of the M1 junction and south of the A5120 (Fig 1). It measured 5950m² and was located to investigate linear and curvilinear anomalies identified by geophysical survey. No features were present and no finds were recovered.

Targeted watching brief area 2 (TWB2)

This area lay to the west of the M1 junction, to the north of the A5120, and immediately west of Site A (Figs 1 and 10). It measured 4609m² and was located to identify the extent of medieval furrows recorded in evaluation Trench 1. The area was divided by the line of an historic hedgerow. An undated ditch, aligned north-west to south-east was cut by a furrow on its south-west side. Four furrows also aligned north-east to south-west were present to either side of the historic hedgerow, with one further furrow cut by the later hedgerow boundary.

Targeted watching brief area 3 (TWB3)

This area lay to the north of the junction and to the west of the M1 (Fig 1). It measured 2824m² and was located to record further Roman remains, where a Roman ditch had been recorded in evaluation Trench 10, along with any features associated with the adjacent medieval settlement of Nuppings Green.

The remains found during the watching brief were of sufficient significance for the northern end of the area to be upgraded to follow the methodology for detailed excavation (Highways Agency 2011 and URS Scott Wilson 2011), becoming Site C (Figs 1 and 7).

Targeted watching brief area 4 (TWB4)

This area lay to the east of the M1 (Fig 1). It measured 3549m² and was located to identify any previously unidentified archaeological remains, where an undated boundary ditch was recorded in evaluation Trench 22. The watching brief also included the monitoring of a retention pond, its associated drainage ditch and a closed public footpath. No features were present and no finds were recovered.

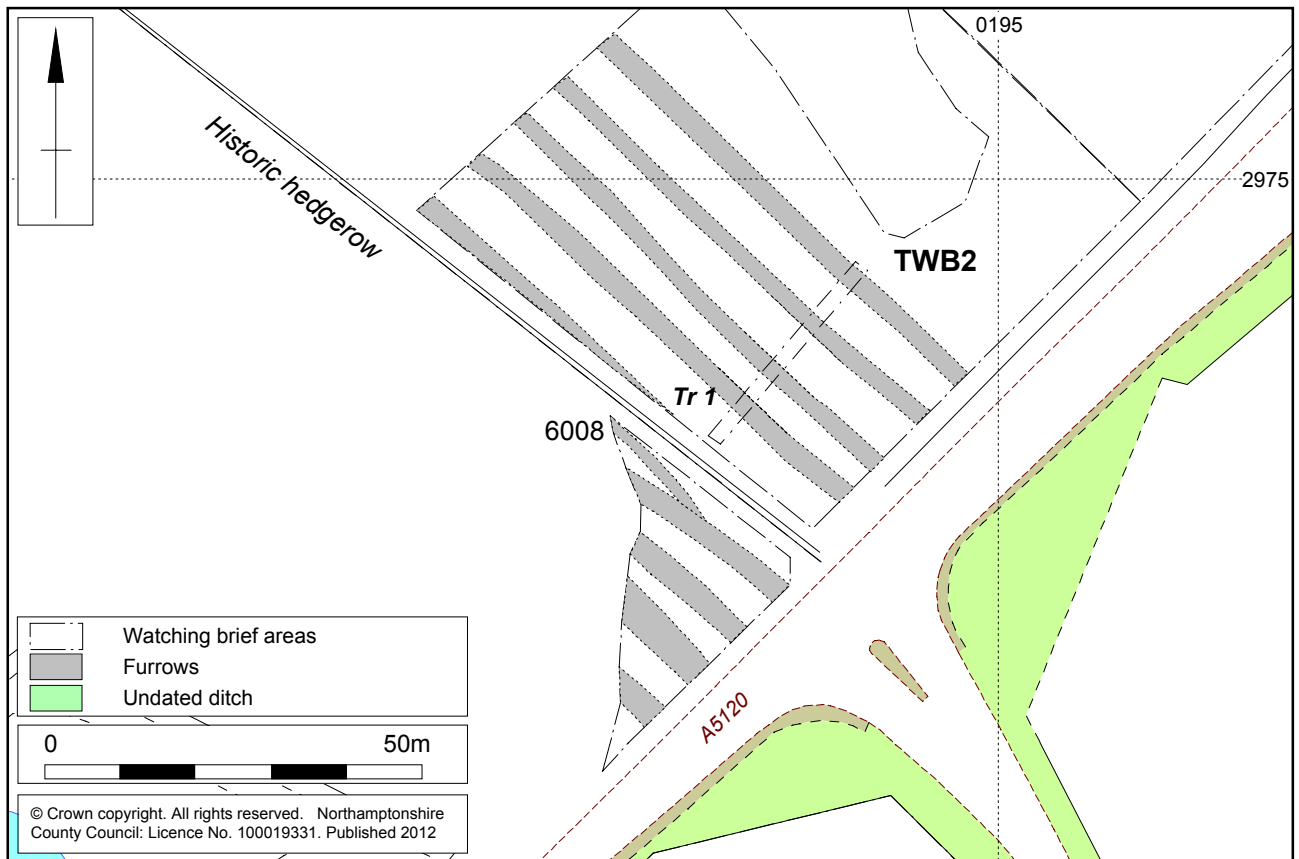
Targeted watching brief area 5 (TWB5)

This area lay to the east of the M1 (Fig 1). The area measured 5479m² and was located to identify any previously unidentified archaeological remains, where an undated drainage gully was recorded in evaluation Trench 27. No features were present and no finds were recovered.

HSR storage area watching brief

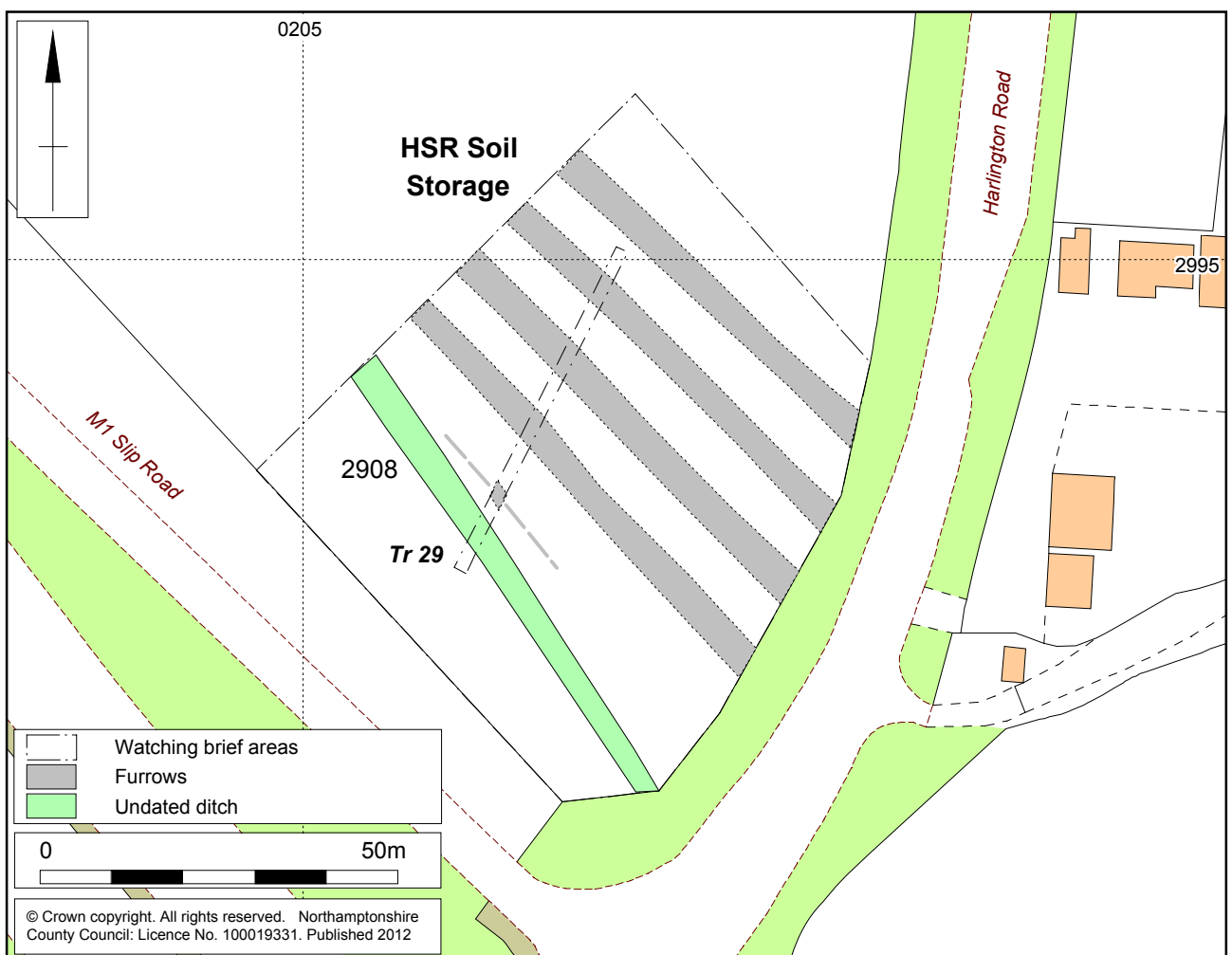
A watching brief during topsoil removal was undertaken in the area required for the storage of M1 HSR material and in the location of evaluation Trenches 25-26 and 28-29 (Fig 1 and 10).

Remnant furrows of the former medieval open field system and the undated ditch recorded in evaluation Trench 29, [2908], were identified during the watching brief. No other features were recorded and no finds were recovered.



Scale 1:1000

The results of the watching brief in TWB2 Fig 10



Scale 1:1000

The results of the watching brief in the HSR soil storage area Fig 11

2.5 Historic hedgerow recording

A section of historic hedgerow 140m long was removed to enable construction of the new junction 12 (Fig 1). The recording comprised a photographic and written description of the hedgerow, bank and ditch prior to clearance, with working shots during and following the vegetation removal. Following removal of the vegetation a topographical survey was undertaken to record the bank and ditch and this included a contour survey and drawn plan. Two trenches were excavated manually to identify, record and date the hedgerow and any buried soil horizons sealed below the bank.

Trench A at the southern end of the hedgerow, was 5m long by 2m wide. A ditch, 1.9m wide by 0.5m deep, with a light brown sandy clay fill was sealed by a bank, which was 0.3m thick. A second ditch, which was associated with the hedgerow boundary, 0.9m wide by 0.4m deep, was filled with leaf litter and standing water. No finds were recovered.

Trench B, excavated at the northern end of the hedgerow was 5m long by 2m wide. A single bank measuring 0.3m thick and associated ditch, 1.8m wide by 0.9m deep, was filled with leaf litter and standing water. No finds were recovered.

2.6 Quantification of the site archive

Site records

Plans: 18 A2 sheets at 1:100 and 1:5
Sections: 10 A2 sheets at 1:10 and 1:20
Contexts: 450 on individual *pro-forma* record sheets
Supporting records: 323 on individual *pro-forma* record sheets
Colour slides: 11 films
Black and white negatives: 11 films
Supplementary digital photographs

Finds (boxes)

Pottery: 17 boxes
Animal bone: 2 boxes
Human bone: 8 boxes
Other/mixed: 4 boxes
Small finds: 3 boxes

Environmental samples

Bulk soil samples (10-40 litres per sample): 137 processed

3 SUMMARY OF FINDS ASSESSMENT

3.1 Worked flint by Yvonne Wolframm-Murray

Nine pieces of worked flint were recovered as residual finds from Roman ditches and cremations, and a medieval spread. They comprise nine flakes, of which one was broken. The condition of the assemblage is good, and the flint shows little post-depositional edge damage. The raw material is mid grey-brown and honey coloured vitreous flint. Cortex is typically light to mid brown in colour with a generally smooth, rolled and weathered surface. The raw material was likely to have been derived from local gravel deposits. The worked flints are not directly dateable but their technological characteristics suggest a broadly Neolithic to Bronze Age date. Two pieces of burnt natural flint, weighing 13g, were recovered from a pyre deposit and a Roman ditch.

3.2 Roman pottery by Jane Timby

Forty-eight of the cremation burials in Site A were accompanied by pottery vessels ranging in date from the later Iron Age (early 1st century AD) to the early 2nd century AD. Of the 108 vessels, many are in poor condition and extremely fragmented, although there are also seven complete or almost complete vessels. The vessels are a mixture of handmade, wheel-turned and wheel-made vessels predominantly made in local fabrics, but including some imported samian.

The ditches associated with the cemetery in Site A produced a small assemblage, indicating that the ditches were broadly contemporary. The ditches in Site C also produced a small assemblage, but here the date range was from the 1st to 2nd/3rd centuries AD.

3.3 Medieval pottery by Paul Blinkhorn

Just under a half of the assemblage of 10,809 sherds, weighing 45kg comprises kiln waste in a sandy fabric which is similar to the South Buckinghamshire and Hertfordshire-type Greyware traditions, provisionally dated to the mid/late-12th – late 13th century. The other half comes from a single large jar in a similar fabric. There are very small quantities of medieval pottery in other fabrics.

3.4 Other finds

There is a small assemblage of finds, of which the only ones of significance are the grave goods from the cremation cemetery. Three late Iron Age burials produced two iron nails, an undiagnostic strip, and a large flat-sectioned iron disc, which is of interest. The other cremation burials produced four brooches, fragments of a mirror, a ceramic roundel/counter, a ring (possibly for suspension) and a selection of nails. There were a few other finds of Roman and post-medieval date. There are also small groups of querns, worked stone, metalworking debris and fired clay.

4 SUMMARY OF HUMAN BONE ASSESSMENT by Sarah Inskip

The cremated bone recovered from forty-nine pits, with some pits containing more than one bone deposit, was submitted for analysis, along with the remains of a poorly preserved inhumation. Preservation was good, and few urns had been disturbed, so little if any of the material originally deposited has been lost.

Preliminary analysis of the deposits suggests that 62 individuals are represented of which 42 are adults, 8 are juveniles and 12 are of unknown age. Three double

cremation deposits are present, all of which contain an adult and a juvenile. The single partial adult inhumation is also included in the total; the surviving femur is highly fragmented preventing any individual information from being obtained, although there are rodent gnawing marks.

The potential for further research on this group of cremated deposits is great due to the fact that over 30 of the deposits have a substantial amount of bone remaining and there are three other cemeteries for comparison in the area. Pyre conditions can be examined in order to yield information on ideas towards cremation, death and burial in the Roman period in the local and national region.

5 SUMMARY OF ENVIRONMENTAL ASSESSMENTS

5.1 Animal bone by Laszlo Lichtenstein

All three sites produced very small assemblages of poorly preserved and highly fragmented animal bone, which include the basic domestic species.

5.2 Plant macrofossils by Val Fryer

Although a comprehensive strategy of plant macrofossil sampling was followed, the potential of the recovered assemblages is low as most are very sparse and preservation is generally very poor. Although it is not possible to reach any comprehensive conclusions about the site or its component features, the following general points may be made:

- Wood appears to have been the main fuel used for the cremation pyres. Although there is some indication that dried plant materials and small roundwood may also have been utilised as kindling, this evidence is sparse, largely because of the poor rate of macrofossil retrieval resulting from the heavy mineralization and encrustation of the remains.
- The few seeds recorded within the cremation deposits appear to indicate that grassland conditions were locally prevalent.
- There does not appear to be any evidence for the deposition of food offerings within the pyres.
- The other assemblages of Roman date are a little unusual as plant remains are generally very scarce. Such a large cremation cemetery would almost certainly have been served by other features and structures, and although the everyday use of these would generate some refuse, it is very unlikely that the assemblages would be typical of those seen, for example, within either the domestic or agricultural context. However, that some evidence for midden deposits is recorded is not surprising, as those constructing the pyres and conducting the ceremonies would almost certainly leave some subsidiary waste.
- Although both hearth refuse and possible bonfire waste are noted within the assemblages of medieval date, it is impossible to place these within any particular context, as the number of features which were recorded and sampled is very limited.

5.3 Charcoal by Andy Chapman

The deposits of cremated bone from the cemetery in Site A were clean, having been carefully separated from the remainder of the pyre debris, but a small number of bone deposits had associated charcoal deposits (Pat Chapman this report). These had probably been in the form of partially burnt pieces or lengths of wood, so that the surviving charcoal often comprises thin slivers only. Six cremation deposits (Burials 8, 20, 24, 33, 35 and 46) produced quantities of charcoal ranging between 0.5-74g. In addition, from the bulk soil samples the backfill of the pits containing burials 45 and 46 also produced quantities of charcoal probably derived from the pyres (Fryer this report). In addition, there is a large quantity of charcoal, 1126g, from the pit [5019] in Site B, which may have contained a pyre deposit.

6 SUMMARY OF POTENTIAL AND PROPOSALS FOR ANALYSIS

6.1 Review of original research objectives

The general objectives of the archaeological mitigation works were to:

- make a record of the archaeological resource that were to be impacted as a result of the Junction 12 improvements as identified in the Environmental Statement and confirmed by archaeological trial trench evaluation;
- report the results of the investigations and if appropriate disseminate the results of the archaeological mitigation works by publication in a suitable popular or academic paper or journal;
- record the nature, depth, extent, character and date of archaeological deposits or features encountered;
- record and recover an adequate sample of the range, quality and quantity of artefactual and environmental evidence.

Specific aims

Specific aims of the detailed archaeological excavation of Romano-British occupation remains at Site A were to:

- record the extent, density, function, type, date, longevity and regional context of Romano-British occupation density;
- record the presence/absence, extent, type and date of any industrial activity at the site;
- recover a sufficient assemblage of industrial waste or residues to understand the industrial craft production process undertaken, sources of raw material, products and economy of the site.

Specific aims of the detailed archaeological excavation of the medieval rural occupation site at Site B were to:

- record the extent, density, form, function, type, date, longevity and regional context of medieval settlement;
- record the type, form and date of surviving structural or building remains associated with the cobbled surfaces and burnt timber identified during the trial trench evaluation;
- confirm the relationship between the medieval occupation site and the adjacent Nuppings Green settlement;
- recover a sufficient environmental assemblage from sealed contexts to inform the understanding of the economy, agricultural regimes and cereal crop processing at the site.

Specific aims of the targeted watching brief were to:

- record the extent, density, form, function and type of the archaeological features located in the trial trench evaluation across the wider landscape impacted by the scheme;
- recover suitable dating material in order to place the archaeological features of previously unknown date within the chronological framework of the archaeological resource of the Junction 12 area;
- record any previously unknown associated archaeological features revealed during ground reduction activities.

Specific aims of the historical hedgerow recording were to:

- preserve by record the extent, form, date, topography, context and historic landscape setting of the historic hedgerow and associated earthwork bank and ditch;
- provide an accurate measured record of the surface and detail of hedge bank and ditch earthwork, including large scale contour and hachured survey plans;
- record any previously unknown associated archaeological features revealed during ground reduction activities.

Revised specific aims for detailed excavation areas

The specific aims for the detailed excavation were based on the results of the evaluation by Trial Trench (Walker 2010). During the course of the subsequent excavations the original specific aims developed and changed.

At Site A the original specific aims were to focus on possible industrial activity. This changed with the discovery of a cremation cemetery and associated boundary ditches. The possible industrial activity was reinterpreted as a spread of pyre debris. This reinterpretation of Site A made the specific aims regarding possible industrial activity irrelevant and the revised aims are detailed below in the revised research objectives.

At Site B the original specific aims focused on understanding possible medieval structures, subsequent excavation discovered a possible pit of pyre debris and a Roman ditch. The revised aims for Site B are detailed below in the revised research objectives. The specific aims originally detailed for Site B subsequently became relevant to the medieval structures found at Site C and are expended and developed in the revised research objectives discussed below.

Research themes and objectives

A number of research themes and objectives for Bedfordshire and the wider East Anglian Region were relevant to the archaeological mitigation works at Junction 12 (Oake 2007; Brown and Glazebook 2000; Medlycott and Brown 2008; Medlycott 2011).

Late prehistoric

- precise dating of early field systems and their correlation with later and modern field patterns.

Romano-British period

Regional research aims for the Romano-British period were:

- improving the understanding of the site form, layout and economy, how core settlement areas relate to their contemporary landscape of fields and trackways;
- understanding how industrial activity relates to the ironworking industry of the

Chilterns;

- further work to characterising activities associated with crop cleaning, malting and storage on rural sites;
- the characterisation of rural settlement types, how does it compare with settlement types elsewhere in Bedfordshire;
- the relationship between Romano-British settlements and their hinterland;
- improving the understanding of settlement pattern with particular reference to the exploitation of the Bedfordshire claylands and the range and variation of settlement types found there;
- the use of scientific dating to redress the reliance on coin and ceramic assemblages.

Medieval period

Regional research aims for the medieval period were:

- the characterisation of settlement forms and function;
- the investigation of rural settlement type and morphology;
- undertaking environmental sampling to recover good assemblages of crop cleaning, malting and storage on rural sites;
- understanding the chronology, structure and function of medieval rural settlement
- understanding the origin and development of the ridge and furrow field systems of Bedfordshire, especially in relation to Bedfordshire's closer relationship to the midland system than the traditional East Anglian field systems.

6.2 Revised research objectives

The general research objectives of the mitigations works, watching brief and historical hedgerow were adhered to and fulfilled by the undertaking of the fieldwork.

Bronze Age/Iron Age

No material dating evidence was recovered from the excavation of the possible funerary monument at Site B. Sufficient charcoal and bone was recovered for submission for radiocarbon dating.

Romano-British

Although frequently encountered on archaeological sites in rural areas, Roman agricultural settlements are generally poorly understood in terms of their interaction with the wider landscape and their role within the economies of Roman society. Evidence for social, economic and political change can also be manifested in changing patterns of intra and inter-site settlement, but little work has been undertaken to investigate these relationships. The regional agenda recognises this need for a greater synthesis of evidence to provide understanding of how Roman rural communities interacted and functioned within societies of which they formed a part. Further work can be carried out to gain a better understanding of how settlements developed over time and investigate how they functioned and related to the wider landscape. The following research objectives are proposed:

- Using the results of previous works and information from aerial photographs, an attempt will be made to determine the full extent and character of the settlements.
- The settlement will be related to the wider Roman landscape settlement patterns and land use in the region.

- Further analysis will be undertaken on the Roman pottery and the results of this will be used to identify phases of settlement development.
- The Romano-British cremation cemetery investigated at Site A provides further evidence for early Roman settlement in the region. Further work will set the cremation cemetery within its wider context and examine its relationship with the pattern of early Roman settlement in the Site And with other cremation cemeteries. Further work has been recommended on the pottery and human bone from the cemetery that can be combined with an analysis of the distribution of finds to examine the pattern of burials.

Medieval

Following the identification of pottery-kiln wasters, structures and ditches at Sites B and C the following research objectives are proposed:

- Further analysis of the area from the results of previous work, historic maps and aerial photographs will be made to determine the full extent and character of the settlement and the location of any kilns linked to the kiln waste.
- Further analysis of the pottery recovered from midden deposit will be undertaken and is detailed below.
- Further work to establish the relationship between the medieval features and the nearby settlement of Nuppings Green.
- The settlement will be related to the wider medieval landscape settlement patterns.
- Understand the settlements interaction with the wider landscape and its economic role within the wider society.
- The charred cereal grains and processing waste from Site B will be analysed further to gain an insight into the stages of crop processing being carried out.

Historic Hedgerow recording and watching briefs

No further work is recommended on the historic hedgerow recording and the associated watching briefs, although their location and a brief description will be included in the gazetteer in the client report.

6.3 Proposals for further analysis

Worked flint No further work is required

Roman pottery by Jane Timby

The most significant component of the archaeological work is the cremation cemetery which spans the pre-Roman Iron Age (early 1st century AD) through to the early 2nd century AD. There are several contemporary cemeteries in the wider region the most noteworthy ones being the one at King Harry Lane, Verulamium (Stead and Rigby 1989) and Hinxton Rings, Cambridgeshire (Hill *et al* 1999). Other smaller rural ones are known from Bedfordshire at Salford (Dawson 2005), Biddenham Loop and Stotfold (unpub), Deepdale, Kempston and Harlington (Dawson 2001). There is thus some potential to compare cemetery traditions across the region.

It is recommended that the cemetery pots are published in full and catalogued alongside the burial groups. A total of 57 vessels have potential to be drawn whilst a further 11 could be drawn as rimsherds or lower vessels. In many cases the vessels are too fragmented to allow reconstruction whilst with others some reconstruction for drawing might be possible although perhaps a little time consuming. In some cases the photographs made before the cremations were removed are probably more informative.

Further work is needed on trying to identify and date more precisely the samian stamps and to undertake comparative research on the individual pots.

The remaining pottery recovered from the features on Sites A and C can be summarised as short publication reports. Approximately 12-15 pieces could be usefully illustrated.

Medieval pottery by Paul Blinkhorn

This group of kiln waste is an important addition to a pottery tradition which commonly occurs in the south-east midlands and London, the South Hertfordshire-type and South Buckinghamshire-Greyware traditions. Given the recent publications of a number of groups of material of this type, it will be possible to give this assemblage a thorough examination and place it in its regional context. The following work is envisaged:

Typological analysis

The material appears remarkably consistent, with a very limited range of rimforms used by the potter. These will be quantified and analysed by type and vessel form, particularly with reference to vessel size and decoration.

Refinement of the chronology

The given date of the mid/late 12th-late 13th centuries is provisional, based on very limited typological analysis and the presence of a few sherds of other pottery types. This will need to be refined, and so the material will be subject to detailed comparison with groups of kiln waste from other sites in the region, particularly in Hertfordshire and South Buckinghamshire, where the closest parallels appear likely to be.

Spatial analysis

The pot-bank was excavated by square, allowing spatial analysis of the pottery in terms of concentration per grid square, and also any groupings with regard to vessel size, type etc. The results will include distribution plots by grid square.

The assemblage in its regional context

As noted above, this seems to be an important addition to the Hertfordshire-type and/or South Buckinghamshire Greyware tradition, and a fairly large number of production centres of pottery of this type are known from around the region. This group will be compared with them in terms of fabric, typology and chronology, and the results discussed.

Selection of sherds for illustration and catalogue

Given that this is a group of kiln waste, a large number of sherds will need to be illustrated and catalogued to demonstrate the variation present.

Other finds

The iron objects will be submitted for x-ray. The three brooches will be reported on by Don Mackreth. The fragment of a mirror and the copper alloy ring, require further

research prior to final reporting. No more than two or three objects require illustration by drawings and/or photographs.

Roman coins: No further work is required; the assessment report will appear in the client report. (Meadows, Appendix 3)

Querns and other worked stone: No further work is required; the assessment report will appear in the client report (Chapman, Appendix 3).

Ceramic building material: No further work is required; the assessment report will appear in the client report (Chapman, Appendix 3).

Metalworking debris: No further work is required; the assessment report will appear in the client report (Chapman, Appendix 3)

Human bone by Sarah Inskip

There is huge potential for further research on the cremated bone. This is largely due to the fact that many of the cremated deposits have a substantial quantity of large fragments. While it is not possible to look at more traditional areas of study in osteoarchaeology (eg patterns of disease, metric/stature and migration studies), other questions can be answered by this material which assess other areas of Roman life such as mortuary practice and attitudes towards death and burial. Furthermore, Roman activity is plentiful in the immediate region. Two other Roman cremation cemeteries have been found in the area, one within 1km of the current find at Maskells Quarry (Dawson 2001) and another at Warren farm, Deepdale, Sandy (Dawson and Slowikowski 1987). These two sites should be used as comparative samples in order to assess local trends in the cremation process. Further to this a large 3rd-4th century AD Roman cremation cemetery was found at Friary field (Gardner 2004) could also act as a comparison sample to ascertain whether there are any temporal differences in the region.

The process of cremation varies by region and time. This variation can be detected in a number of ways from bone. It is possible to obtain an idea of pyre conditions from bone colour with white colouration produced in optimal conditions, high oxygen and temperature, and black in lower temperatures with poorer supplies of oxygen. Divergence from a normal pattern of burning can therefore be detected by analysing the distribution of colour throughout the skeleton. This could potentially highlight information such as whether different areas of the skeleton were differentially burnt. The results of this could then be placed into context with other Roman cremations from the Warren's Farm or Maskells Quarry.

An analysis of skeletal element representation can yield information on differential treatment of bodies whether this is when the body is put on the pyre, or selected recovery of certain elements after the cremation process (eg taking large fragments of the pyre). An ordered deposition of bones into the urns has been noted by Chapman (this document.) suggesting some deliberate selection of elements. Comparison of skeletal element representation in these individuals to the other non-ordered urns may reveal skeletal representation differences and highlight whether it was important to obtain some skeletal elements from the pyre and not others. Again, this can be compared to the three other cremation cemeteries in the region to ascertain whether the deposits conform to the local trends in skeletal representation.

While it will not be possible to age and sex all of the cremated deposits, comparison of the demographic results to the other Roman sites will be of value. This will determine whether the cemetery represents a normal cemetery population for the period.

Furthermore, with a minimum of 6 females and 9 males (which could be increased on a more detailed assessment of sex) it may permit sex comparisons which may determine whether the cremation rite differed depending on gender. Similarly, a comparison between adults and juveniles may also be able to demonstrate whether differences in the cremation process occurred depending on age. It may be possible to determine whether individuals buried with grave-goods were treated in anyway differently to those without. Also, it may be possible to determine whether certain grave-goods or vessels appear to be associated with age or sex. Final, results of analyses should be shared with other members of the project to determine whether any of the osteological categories (eg age/sex) coincide with other archaeological information such as urn type/style, position etc.

Animal bone by Lazlo Litchenstien

No further work is required; the assessment will appear in the final report.

Plant macrofossils by Val Fryer

As none of the examined assemblages contain a sufficient density of material for quantification (ie 100+ specimens) no further analysis is recommended. However, a summary of this assessment should be included within any publication of data from this site.

The fine carbonised residue from pit 5019 in Site B, possibly redeposited pyre debris, should be submitted for recovery of charred plant remains.

Charcoal by Andy Chapman

The charcoal residues from five of the cremation burials in Site A have produced sufficient quantities to be submitted for analysis of the wood species represented. The identification of the wood species will contribute to the consideration of wood usage in cremation pyres during the Roman period. Also, pit 5019 in Site B has produced 1126g of charcoal, possibly redeposited pyre debris. A sample of the wood charcoal should be submitted for species analysis, and the finer residue should be submitted for recovery of charred plant remains (see above).

Radiocarbon dating

A radiocarbon date is required to determine the date of the pit 5019 in Site B containing possible redeposited pyre debris; from which large quantities of charcoal are available for submission.

Radiocarbon dating is also recommended for the inhumation burial from the Romano-British cremation cemetery to establish its date compared to the cremation burials.

Recommended for Radiocarbon dating:

- Charcoal from fill 5018, pit 5019, Sample 12, from Site B
- Inhumation burial 51, fill 4249, cut 4250, Sample 136, from Site A

7 REPORTING AND ARCHIVE

7.1 The report

The report will present the findings from the excavations in broad chronological order.

Title page
Contents
Acknowledgements
Abstract

INTRODUCTION

Background
Topography and geology
Historical and archaeological background
Research objectives
Methodology
Summary of site chronology

THE ROMAN CEMETERY AND OTHER ACTIVITY

The cremation cemetery
Roman settlement
The Roman pottery by Jane Timby
Other Roman finds by various
The human bone by Sarah Inskip
Faunal and environmental evidence by various

MEDIEVAL AND POST-MEDIEVAL OCCUPATION

The medieval structures
Later land use
The medieval pottery by Paul Blinkhorn
Other medieval finds by various
Faunal and environmental evidence by various

RECENT ACTIVITY

Brief account of hedgerow recording
Motorway structures

DISCUSSION

The Roman cremation cemetery and rural settlement
Medieval settlement and industrial activity

SITE GAZETEER

To include a complete gazetteer of the cemetery deposits: to comprise a plan and photograph of each grave showing vessels, and pottery illustrations for reconstructed vessels.

BIBLIOGRAPHY

7.2 Provisional publication proposals

Once the assessment report and updated project design has been approved by the Central Bedfordshire Council Archaeological Officer, a full client report will be prepared following the synopsis outlined in Section 7.1.

On approval, this will be published online through the Archaeology Data Service (ADS) through OASIS and copies will be deposited with the Central Bedfordshire Historic Environment Record (HER).

There are two options for further publication:

- 1) Publication of the full client report as a Northamptonshire Archaeology monograph within the British Archaeological Report (BAR) series. If this path is followed, the presentation of the client report will follow BAR style to minimise the editorial requirements for publication. This provides the faster route to publication, and would involve less follow up work. Following completion of the client report there would be a requirement for limited editing to fully convert to BAR requirements and the cost of typesetting. There are no publication charges for standard black and white publication. Extensive use of colour would incur additional costs.
- 2) The preparation of two journal articles to be submitted to the county journal, *Bedfordshire Archaeology*, one dealing with the Roman cremation cemetery and the other with the medieval structures and the pottery assemblage. These would be report digests with the significant results from the specialist reports integrated into the site synthesis. This would take longer to reach publication. Only a single edition of *Bedfordshire Archaeology* has appeared in the past six years, and while it appears that publication is now more likely to be regular, the future of this journal is still uncertain. It is also under the editorial control of staff at *Albion Archaeology*, which may create problems of access to journal space. The preparation of report digests will take some additional time, although if this path was chosen the client report would be prepared with the need to create report digests in mind.

8 STORAGE AND CURATION

The site archive will comprise all written, drawn, photographic and digital records, all material finds and the processed sample residues recovered from the excavations. The site archive will be accompanied by the research archive which will comprise the text, tabulated data, original drawings and all other records generated in the analysis of the site archive. The archive will be fully catalogued. The archive will be deposited with Luton Museum under the accession number LUTNM2010.67.

9 RESOURCES AND PROGRAMMING

9.1 Work completed

Work completed to date includes: the consolidation of the site archive; finds and environmental sample processing; assessment of the structural evidence, finds and ecofacts; digitization of the site plans; and the preparation of the assessment report and updated project design.

9.2 Proposed work and completion dates

A breakdown of the costs for the production of the final report and publication has been provided separately. The following timetable is based on a schedule previously agreed, and is subject to approval of this UPD and the costs provided.

Table 4: Tasks and personnel

Tasks	Personnel	Timetable*
Introduction and background	Jason Clarke/Jim Brown	Oct-Nov 2012
Structural site narrative	Jason Clarke/Jim Brown	Oct-Nov 2012
Medieval pottery	Paul Blinkhorn	Dec 2012
Roman pottery	Jane Timby	Dec 2012
Small finds	Tora Hylton	Sept 2012
Human bone	Sarah Inskip	Nov-Dec 2012
Charcoal	Dana Challinor	Dec 2012
Illustrations	NA drawing office	Nov-Feb 2013
Integration of specialist reports	Jason Clarke/Jim Brown	Jan-Feb 2013
Report digest and discussion	Jason Clarke/Jim Brown	Feb-Mar 2013
Proof reading and editing	Jim Brown, Pat Chapman & Andy Chapman	Mar 2013
Preparation of research archive	Theodora Anastasiadou-Leigh	Apr 2013

9.3 Key personnel

The key personnel associated with carrying out the tasks detailed in Section 9.2 are:

Jim Brown	Project Officer (NA), project manager
Jason Clarke	Project Supervisor (NA)
Andy Chapman	Senior Archaeologist (NA): editing
Tora Hylton	Finds manager (NA)
Jane Timby	External specialist, Roman pottery
Paul Blinkhorn	External specialist, medieval pottery
Sarah Inskip	External specialist, osteoarchaeologist
Dana Challinor	External specialist, charcoal
Pat Chapman	Project Supervisor (NA): proof reading/editing
Theodora Anastasiadou-Leigh	Project Supervisor (NA): Archivist

BIBLIOGRAPHY

- Acer 1994 *M1 Motorway Junctions 10 to 15: Environmental Statement*, Acer Consultants
- AAF 2007 *Archaeological Archives: a guide to best practise in creation, compilation, transfer and creation*, Archaeological Archive Forum
- Ashworth, H, 1983 Evidence for a Medieval Pottery Industry at Potter Row, Great Missenden, Buckinghamshire, *Records of Buckinghamshire*, **25**, 153-9
- Baker, D, Baker, E, Hassall, J, and Simco, A, 1979 Excavations in Bedford 1967-1977, *Bedfordshire Archaeological Journal*, **13**
- Baker, E, and Hassall, E, 1979 The Pottery, in D Baker *et al* 1979, 147-239
- BGS 1996 *British Regional Geology: London and the Thames Valley*, British Geology Survey, London, HMSO
- BGS 2001 *Solid Geology Map, UK South Street*, British Geological Survey
- Blackmore, L, and Pearce, J, 2010 *A dated type-series of London medieval pottery: Part 5. Shelly-sandy ware and the greyware industries*, MOLA Monograph, **49**
- Blinkhorn, P, 2007 Late medieval pottery kilns, in A Hardy, *et al*, 100-111
- Blinkhorn, P, in print a) Pottery from Granary Cottage, Great Missenden, Bucks (Site GCM02), Network Archaeology
- Blinkhorn, P, in print b) Pottery from Sainsbury's Supermarket site, Bancroft, Hitchin (Site HN501) Heritage Network Ltd
- BM 2010 *Procedure for preparing archaeological archives for deposition with registered museums in Bedfordshire*, Bedford Museum
- Brown, N, and Glazebrook, J, (eds) 2000 *Research and archaeology: a framework for the eastern counties 2: research agenda and strategy*. Norwich: Scole Archaeological Committee, East Anglian Archaeol Occ Pap, **8**
- Brown, J, 2011 *Method Statement for Archaeological Mitigation Works at Junction 12, Toddington, Bedfordshire*, Northamptonshire Archaeology
- EH 1991a *Exploring our past*, English Heritage
- EH 1991b *Management of Archaeological Projects*, English Heritage
- EH 1997 *English Heritage Archaeology Division Research Agenda*, English Heritage
- EH 2002 *Environmental Archaeology: A guide to Theory and practise for Methods, from sampling to post-excavation*, English Heritage
- EH 2006 *Management of Research Projects in the Historic Environment, The MoRPHE Project Managers' Guide*, English Heritage
- Glazebrook, J, 1997 *research and Archaeology: A Framework for the Eastern Counties: Resource Assessment*, East Anglian Archaeol Occ Pap, **3**

- Gurney, D, 2003 *Standards for Field Archaeology in the East of England*, East Anglian Archaeol Occ Pap, **14**
- Hardy, A, Charles, B M, and Williams, R J, 2007 *Death and Taxes. The archaeology of a Middle Saxon estate centre at Higham Ferrers Northamptonshire*, Oxford Archaeology Monog
- Highways Agency 2005 *M1 Widening Junctions 10-13*. Environment Assessment
- Highways Agency 2007 *M1 Widening Junctions 10 to 13 Widening Environmental Statement*, Report **D110842/5/09**
- Highways Agency 2009 *M1 Junctions 11 and 12 Improvements, Environmental Statement Volume*, Report **D123846/5/03**
- Highways Agency 2010 *M1 Junctions 10 to 13 Improvement, Junctions 11 and 12. Written Scheme of Investigation for Archaeological Field Evaluation*, Report **D123846/5/16**
- Highways Agency 2011 *M1 Junctions 11 and 12 Improvements, Junction 12: Written Scheme of Investigation for Detailed Archaeological Excavation, Targeted Watching Brief, Historic Hedgerow Recording and Historic Building Recording*, Report **D123846/5/5/04**
- IfA 2008a *Standards and Guidelines for Archaeological Evaluation*, Institute for Field Archaeologists
- IfA 2008b *Standards and Guidance for Archaeological Excavation*, Institute for Field Archaeologists
- IfA 2010 *Code of Conduct*, Institute for Field Archaeologists
- NA 2006 *Archaeological Fieldwork Manual*, Northamptonshire Archaeology
- Medlycott, M, and Brown, N, 2008 *Revision of the Regional Archaeological Framework for the Eastern Region*, ALGEO
- Medlycott, M, 2011 *Research and Archaeology Revisited: A revised framework for the East of England*, East Anglian Archaeol Occ Pap, **24**
- MGC 1992 *Standards in the Museum care of Archaeological Collections*, Museums and Galleries Commission
- Oake, M, Luke, M, Dawson, M, Edgeworth, M, and Murphy, P, 2007 *Bedfordshire Archaeology: Resource Assessment, Research Agenda and Strategy*, Bedfordshire Archaeology Monograph, **9**
- Slowikowski, A, 2011 *Genius in a Cracked Pot. Late Medieval Reduced Ware: A Regional Synthesis*, Medieval Pottery Research Group Occasional Paper, **4**
- URS Scott Wilson 2011 *M1 Junction 12 Specific Excavation Methodology for Possible Medieval Building in Area TWB3*, Scott Wilson Technical Note

Walker 2010 *Archaeological Trial Trench Excavation at M1, Junction 12, Toddington, Bedfordshire*, Northamptonshire Archaeology report, **10/207**

Websites

ADS 2011 www.ads.ahds.ac.uk Archaeological Data Service (ADS) website

BGS 2009 <http://www.bgs.ac.uk/geoindex/home.html> British Geological Survey website

APPENDIX 1: LATE IRON AGE AND ROMAN POTTERY

by Jane Timby

Introduction

The archaeological work undertaken as part of the widening of the M1 at junction 12 resulted in the recovery of two groups of later prehistoric and Roman pottery: one assemblage from Site A, the site of a small cremation cemetery comprising some 50 burials with associated features and the other from Site C.

The pottery was examined macroscopically and sorted into fabrics based on the principal inclusions present in the clays and quantified by sherd count and weight. Known, named regional traded Roman wares are coded using the National Roman fabric reference collection (Tomber and Dore 1998).

The following report is divided into three sections: Site A the cremation cemetery; Site A other features and Site C.

No detailed library research has been carried out in conjunction with the assessment to place the assemblages into a local or regional context.

Cremation cemetery

Some 49 burial pits containing cremations were uncovered of which 48 were accompanied by pottery vessels either as the containers for the cremated remains or as accessory vessels (Table A1.1). Table A1.1 summarises the pottery and grave good data, while a full catalogue of all the pottery finds from the cemetery has been compiled and will form part of the final report. In the full catalogue the fabrics are broadly cross-referenced to the Bedfordshire fabric series.

The condition of many of the pots was poor, with extremely fragmented sherds and in multiple cases only the lower parts of the vessel surviving. This meant that often the most diagnostic part of the vessel, the rim, which would permit a closer dating, was missing. Whilst a significant number of the vessels are too fragmented to allow reconstruction for drawing there are a small number of less traumatised pots which can be reconstructed to allow profiles to be drawn. There are also seven complete or almost complete surviving vessels.

Chronologically the cemetery appears to span the later Iron Age through into the early 2nd century. The vessels are a mixture of handmade, wheel-turned and wheel-made vessels predominantly made in local fabrics.

Of the 48 burials with pottery, fifteen had single vessels, in all cases jars which had contained cremated remains; eleven had two vessels of which ten were accessory vessels and one had two urns; fifteen had two accessory vessels; at least four, possibly five had three accessory vessels; one of the burials (Cremation burial 38) being unurned and another (Cremation burial 6) having two cremation urns, and one had four accessory vessels. Several burials had additional odd sherds present which are presumed to be accidental incorporations into the grave backfills rather than indicating the presence of further pots, although the possibility of deliberately including individual sherds cannot be discounted.

The accessory vessels include handmade platters copying imported forms; various small jars or beakers, flasks or flagons, one bowl and in seven cases (Cremation burials 8, 9, 15, 16, 30, 38 and 39) samian dishes. There are eight flagons, all products

of the Verulamium-London pottery industry. In addition, there is a white butt beaker from the same source.

Whilst in many cases the vessels are too fragmented to assess their complete form there are several instances of repair or modification to the pots and possibly, in at least three cases, the vessels used appear to be seconds. A small jar from Cremation burial 4 has a probable firing flaw in the base; a jar from Cremation burial 31 also has a flawed base and a jar from Cremation burial 16 has firing blisters. One of the samian dishes (Cremation burial 39) has a much worn slip and three lead rivet repairs where the vessel has broken in half. Two vessels have had holes drilled through the walls after firing: one with a single hole in the lower wall from Cremation 37 and one from Cremation burial 35 which has at least three small holes through the lower wall.

Cemetery chronology

Many of the vessels can only be broadly dated at this stage although subsequent refinement may be possible through searching contemporary independently dated graves, dating from associated artefacts such as brooches or from stratigraphic information. The possibility that old vessels have been used for burial should also be considered, highlighted perhaps by the repaired samian dish in Cremation burial 39.

The earliest graves appear to date to the late Iron Age (early 1st century AD) and at least 14 burials can be identified potentially of this date. The graves are scattered across the northern half of the cemetery area. Six of the burials comprise single vessels (Burials 13, 21, 31, 35, 36, 40, 42 and 49) whilst a sixth (Burial 25) contained two cremation burials in two jars. In all cases the vessels are handmade jars with six in grog-tempered fabrics, two in sandy wares, one in a grog and sandy ware and one in a shelly ware. The vessel from Burial 31 has a slightly pedestalled foot. Two of the graves (Burials 26 and 27) have single accessory vessels, in both cases another jar with that from Burial 26 having a pedestalled foot. A further two burials (1 and 24) have three vessels; Burial 1 with a closed form and a platter and Burial 24 with a jar and bowl. Finally, Burial 33 possibly has four accessory vessels: a small pedestalled jar or goblet, a second jar and the fragments of another jar or bowl.

The second phase of burials belongs to the Later Iron Age/early Roman period (mid 1st century AD). Many late Iron Age forms tend to continue with little apparent change into the early post-conquest period in rural areas. At least two burials seem to belong here (Burials 29 and 46) also located in the northern half of the cemetery. Burial 29 has one accessory vessel, probably a black sandy ware butt beaker and Burial 46 has two accessory vessels, an oxidised sandy butt beaker and a platter imitating a moulded imported form.

The third phase dates to the early Roman period but is probably pre-Flavian (pre 69AD). Twelve burials can be provisionally placed here (Burials 2, 3, 17, 22, 23, 28, 34, 37, 43, 44, 47 and 50). Three (Burials 22, 43, 50) contain just the cremation urns, two black sandy wares and one shelly ware. A further three burials (17, 34, 47) have one accessory vessel, a jar, flagon and beaker respectively; four have two accessory vessels (Burials 2, 23, 28, 37); one (Burial 3) has four accessory vessels and one five accessory vessels.

The fourth phase dates to the Flavio-Trajanic period (late 1st to early 2nd century AD) with 18 graves all lying in the southern zone of the cemetery. This includes the seven graves with samian vessels, all different but all shallow dishes. Six of the vessels carry potter's stamps although some of these are poorly preserved and there are examples of South Gaulish and Central Gaulish (Lezoux) vessels spanning the Flavian through to the Trajanic and Hadrianic period. As noted above one vessel was repaired in antiquity.

The vessel from burial 15 was heavily pitted on the interior surface and the rosette stamp partly obliterated.

Of the 18 graves allocated to the later period; three burials (5, 14 and 45) had single vessels; a shelly ware and a grey sandy ware jar with the first two and an oxidised globular beaker decorated with ring-and-dot barbotine decoration from no. 45. Four burials (7, 8, 12 and 20) had single accessory vessels with fine grey barbotine dot decorated beakers from Burials 7 and 20; a samian dish from Burial 8 and a second black sandy ware jar from Burial 12. Seven graves (Burials 4, 9, 10, 11, 15, 30 and 38) have two accessory vessels; three with flagons or flasks and samian dishes (Burials 9, 30, 38); one with a flagon and a local dish (Burial 10); one with a samian dish and a poppyhead beaker (Burial 15); one with a flask and small jar/beaker (Burial 11) and one with two small jars/ beakers (Burial 4). Two graves (Burials 16 and 39) had three accessory vessels with a flagon, beaker and samian dish whilst one, Burial 6, had five vessels, two of which appear to be cremation urns. The latest burials appear to be 6, 9 and 15 all containing samian dishes potentially of Hadrianic date and, stratigraphically, burial 11 which cuts burial 15. Grave 6 located in the south-west corner of the site is probably one of the latest burials and is accompanied by a samian dish, flagon and beaker.

In conclusion, therefore, the cemetery appears to have developed in the northern half of the area with the later burials concentrated in the southern part. Further patterning may become apparent when the bones and other finds have been analysed and the pottery studied in more detail.

Site A – other features

A number of ditches and at least one pit located to the east and south of the cemetery produced a moderately small assemblage of some 196 sherds weighing 1756g (Table A1.2).

Apart from a possible residual sherd of coarse calcined-flint-tempered ware from ditch 4071, these features appear to be broadly contemporary with the use of the cemetery with material spanning the later Iron Age through to the 2nd century AD.

Pottery was recovered from 13 features and the subsoil so the distribution of material is quite sparse; ditch 4026 alone produced some 73 sherds, 37% of the total assemblage.

Pit 4014 appears to be one of the earlier features with just four sherds; three fine flint-tempered wares and one grog-tempered sherd. Probably contemporary with this are ditch 4084/4010 with just four sherds from a thickened rim grog and organic-tempered jar and a grog-tempered storage jar and ditch 4071 with just two sherds.

The large boundary ditch to the south of the area, 4021/4006/4008 produced just 15 sherds of pottery, none featured, with a mixture of shelly, grog-tempered and sandy wares probably suggesting an early Roman date. The western extension, 4245, produced 36 sherds from a single everted rim, cordoned jar in black sandy ware which may be a disturbed cremation vessel or probable early Roman date. Similarly multiple sherds from a bifid rim jar from ditch 4026 may have been once associated with the cemetery. Other sherds from this feature, mostly wheel-made sandy wares suggest a 2nd century date. Ditches 4004, 4026 and 4077 would also intimate an early Roman date in the later 1st or early 2nd century AD although the evidence is sparse. Ditch 4012 produced a single glazed sherd the date of which is uncertain at present; it may be Roman or post-medieval.

The incidence of material is quite low suggesting that the focus of settlement activity lay outside the investigated area. The character of the pottery suggests a fairly modest rural settlement present from the later 1st century BC or early 1st century AD which continued into the early Roman period before being abandoned.

Site C

The features excavated in Site C produced a small assemblage of 425 sherds of pottery weighing 6776g. The material is fairly well-preserved with an average sherd weight of 16.5g.

Pottery was recovered from 12 cut features, pits, gullies and ditches and appears to broadly span the 1st-2nd/3rd centuries. Most of the wares are local with grog-tempered sherds accounting for 14%; shelly wares for 33% and sandy wares for 43%. Imports are present but rare and are confined to single sherds of South and Central Gaulish samian, Verulamium region white wares and Oxfordshire white ware (mortaria and flagon). A general lack of diagnostic material or datable imports prevents close dating.

Jars dominate the form repertoire with several lid-seated and rolled rim types as might be expected from a rural assemblage of this date. Storage jars also feature.

The earlier features characterised by a moderately high proportion of grog-tempered or related wares include ditches 7039, 7165 and 7169.

One of the larger and later assemblages came from pit 7018 with 86 sherds. There are sherd links between the three defined layers suggesting a fairly rapid fill. Amongst the vessels present are flagons, flat-topped jars and an indented beaker which might suggest a date in the second half of the 2nd century or later. There are no grog-tempered wares present and few shelly wares. Ditch 7010 may similarly be one of the later features on the site. Gully group 7049 collectively produced some 88 sherds although quite fragmented in condition. Again the group suggests a provisional date in the later 2nd or 3rd century.

Potential and further work

The most significant component of the archaeological work is the cremation cemetery which appears to span the pre-Roman Iron Age through to the early 2nd century. There are several contemporary cemeteries in the wider region the most noteworthy ones being the one at King Harry Lane, Verulamium (Stead and Rigby 1989) and Hinxton Rings, Cambridgeshire (Hill *et al* 1999). Other smaller rural ones are known from Bedfordshire at Salford (Dawson 2005), Biddenham Loop and Stotfold (unpub), Deepdale, Kempston and Harlington (Dawson 2001). There is thus some potential to compare cemetery traditions across the region.

It is recommended that the cemetery pots are published in full and catalogued alongside the burial groups. A total 57 vessels have potential to be drawn whilst a further 11 could be drawn as rimsherds or lower vessels. In many cases the vessels are too fragmented to allow reconstruction whilst with others some reconstruction for drawing might be possible although perhaps a little time consuming. In some cases the photographs made before the cremations were removed are probably more informative.

Further work is needed on trying to identify and date more precisely the samian stamps and to undertake comparative research on the individual pots.

The remaining pottery recovered from the features on Sites A and C can be summarised as short publication reports. Approximately 12-15 pieces could be usefully illustrated.

References

Brulet, R, Vilvorder, F, and Delage, R, 2010 *La céramique Romaine en Gaul du Nord*, Brepols

Dawson, M, 2001 Harlington Roman cemetery, *Bedfordshire Archaeol*, **24**, 20-40

Dawson, M, 2005 *An Iron Age settlement at Salford, Bedfordshire*, Bedfordshire Archaeol monog, **6**

Hill, J D, Evans, C, and Alexander, M, 1999 The Hinxton Rings: a late Iron Age cemetery at Hinxton, Cambridgeshire with a reconsideration of the northern Aylesford-Swarling distributions, *Proc Prehistoric Soc*, **65**, 243-73

Stead, I, and Rigby, V, 1989, *Verulamium: the King Harry Lane site*, English Heritage Archaeol Rep, **12**, London

Tomber, R, and Dore, J, 1998 *The National Roman fabric reference collection: a handbook*, Museum of London / English Heritage/ British Museum



Cremation urn, left rear,
and four accessory vessels deposited with the cremation burials Fig A1.1

Table A1.1: Summary of pottery grave groups from the cemetery, Site A

Burial	No of Vessels	Urn	Accessory vessels 1 & 2	Accessory vessels 3 & 4	Grave Goods	Date
1	3	Jar	Closed platter			Late Iron Age
2	3	Jar	Jar closed			Early Roman
3	4	Jar	Closed platter	flagon	brooch, Mirror?	pre-Flavian (<69AD)
4	3	Jar	small jar/beaker small jar/beaker		2 nails	1st/2nd century
5	1	Jar				1st/2nd century
6	5	Jar x2	Beaker samian dish	Flagon		Early 2nd century
7	2	Jar	Beaker			Flavian-Traj (69-138AD)
8	2	Jar	samian dish			Flav+
9	3	Jar	samian dish Flagon			Traj (98-138AD)
10	3	Jar	Dish			Flav-Traj (69-138AD)
11	3	Jar	small jar/beaker Flask?		2 nails	1st/2nd century
12	2	Jar	Jar			1st/2nd century
13	1	Jar			2 nails	Late Iron Age
14	1	Jar				1st/2nd century
15	3	Jar	Samian dish Beaker		2 nails	Traj (98-138AD)
16	4	Jar	Samian dish Beaker	flagon		Flav+
17	2	Jar	Jar			Early Roman
18	1	Jar				1st/2nd century
19	3	Jar	Butt beaker Butt beaker			pre-Flavian (<69AD)
20	2	Jar	Beaker			Flav-Traj (69-138AD)
21	1	Jar				Late Iron Age
22	1	Jar?				1st century
23	3	Jar/beaker	Butt beaker		Brooch	pre-Flavian (<69AD)
24	3	Jar	Jar Bowl			Late Iron Age
25	2	Jar x2				Late Iron Age
26	2?	Jar	?closed			Late Iron Age?
27	2	Jar	Jar			Late Iron Age
28	3	Jar	Platter Beaker			pre-Flavian (<69AD)
29	2	Jar	Butt beaker			Late Iron Age/ Early Roman
30	3	Jar	samian dish Flask?			Traj (98-138AD)

Burial	No of Vessels	Urn	Accessory vessels 1 & 2	Accessory vessels 3 & 4	Grave Goods	Date
31	1	Jar			Fe disk	Late Iron Age
32	3	Jar	Jar		Fe brooch	Early Roman
33	3 or 4	Jar	Small jar/goblet Jar	Jar/bowl?	nail frags	Late Iron Age
34	2	Jar	Flagon		ceramic counter	Early Roman
35	1	Jar				Late Iron Age
36	1	Jar				Late Iron Age/ Early Roman
37	3	Jar	Flagon Small jar		brooch; ring	Early Roman
38	3	Unurned	samian dish Beaker	Flagon		Flav-Traj (69-138AD)
39	4	Jar	samian dish Beaker	Flagon		Flav+ (>69AD)
40	1	Jar				Late Iron Age/ Early Roman
41	0					no pot
42	1	Jar				Late Iron Age
43	1	Jar			nail frags	Early Roman
44	5	Butt beaker Unurned	Platter Jar Beaker	Beaker Beaker?	Fe frags	Early Roman
45	1					Flav-Traj (69-138AD)
46	3	butt beaker	Jar Platter			Late Iron Age/ Early Roman
47	2	Jar	Beaker			Early Roman
48	0					no pot
49	1	Jar				Late Iron Age
50	1	Jar				Early Roman

Table A2.2: Sites A and C: Context spot dates

Context	Type	Sherds	Weight (g)	Date
Site A				
4002	subsoil	3	10	1st/2nd century
4003	ditch 4004	51	357	1st/2nd century
4005	ditch 4006	5	116	Early Roman
4007	ditch 4008	2	9	Early Roman
4009	fill of ditch 4010	1	168	Late Iron Age
4011	fill of ditch 4012	1	13	Roman or p-med
4013	fill of pit 4014	4	15	Late Iron Age
4022	fill of ditch 4021 (=4006)	8	51	Early Roman
4025	ditch 4026	73	564	C2 2nd century
4062	ditch 4065	6	47	1st/2nd century
4070	ditch 4071	2	7	Late Iron Age
4076	ditch 4077	1	18	2nd century
4082	ditch 4084	3	14	Late Iron Age
4243	ditch 4245	36	367	Early Roman
sub-total		196	1756	
Site C				
7008	ditch 7010	19	359	2nd century +
7011	pit 7018	17	71	2nd century
7013	pit 7018	51	1131	2nd century
7015	pit 7018	18	130.5	2nd century
7028	ditch 7030	17	221	1st century
7037	ditch 7039	18	68.5	1st century
7041	ditch 7040	55	944	1st/2nd century
7042	ditch 7040	20	167	1st century
7047	ditch ?7059; Gp 7049	48	476	2nd century
7050	gully 7051	12	263	2nd century +
7052	gully 7053	3	38	Roman
7054	gully 7055	8	32	1st/2nd century
7064	pit 7065	3	43	1st century
7066	pit 7065	14	16	1st century
7105	medieval layer	27	506	Roman
7164	ditch 7165	9	86	1st century?
7168	ditch 7169	86	2224	1st century
sub-total		425	6776	
us	us	9	282	3rd century?
TOTAL		826	10570	

APPENDIX 2: MEDIEVAL POTTERY

by Paul Blinkhorn

The pottery assemblage comprises 10,809 sherds with a total weight of 45,500g. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference is 36.07. The bulk of the assemblage comprises kiln waste in a sandy fabric which is similar to the South Buckinghamshire and Hertfordshire-type Greyware traditions, and is provisionally dated to the mid/late-12th – late 13th century.

Fabrics

Non-kiln material

The kiln waste aside, all the pottery was processed and recorded using the codes and chronology of the Bedfordshire County Archaeology Service type-series (eg Baker and Hassall 1977) were used, as follows (the alphanumeric codes starting with an 'F' are those used in the database:

F330: B07 Medieval Shelly Ware (AD1100-1400)	7 sherds, 115g, EVE = 0.02
F360: C03 Fine sandy reduced ware (12-13th century)	6 sherds, 59g, EVE = 0
F361: C03A Fine sand and flint 12th – 13th century	9 sherds, 97g, EVE = 0.10
F321: C56: Mill green ware	1 sherd, 3g, EVE = 0
F362: C59a: Coarse sandy ware (12-13th century)	24 sherds, 239g, EVE = 0.14
F412: P06: Slip-decorated earthenware (17th century)	1 sherd, 8g, EVE = 0
F404: P12: Cistercian Ware (c AD1470-1550)	1 sherd, 11g, EVE = 0

The kiln waste

The kiln waste has been given temporary codes of F300 for the predominantly reduced sherds, and F301 for those which are mainly oxidized. The assemblage comprises 10,582 sherds weighing 58,207g (EVE 34.87), and there is also a complete, non-waster jar in a similar fabric, which had been sunk in the ground and probably used as a cistern (5408, EVE 0.90) (Fig A2.1).

The fabric is primarily heavily sand-tempered, with moderate to dense sub-angular to sub-rounded clear, reddish-brown and black quartz c0.5mm with rare grains up to 1mm, rare to sparse black iron-rich fragments up to 1mm, occasional calcareous inclusions up to 1mm, and sparse blackened areas in the core caused by burnt-out organic material. Both oxidized orange and reduced grey sherds were present, and many were also a brownish-grey. This variation in colouration was mainly restricted to the surfaces, with the core of sherds almost invariably reduced grey.

The vessels appear to have been coil-built and finished on a turn-table, with evidence of knife-trimming on the lower body. The fabric is similar to south Hertfordshire-type Greywares (Blackmore and Pearce 2010, fig 49), fabric C60 in the Bedfordshire County Type-Series, such as those from kiln sites at Hitchin (eg Blinkhorn in print b; Blackmore and Pearce 2010, 107). The Hertfordshire tradition is generally dated to the mid-12th – mid-14th century (ibid 202). Recently, (ibid and Slowikowski 2011) a number of groups of kiln waste from Hertfordshire, Bedfordshire and Buckinghamshire have been analysed and published. Their relationship with this group will be discussed at the report stage.

A number of sherds are spalled or warped, and none show any sign of use, such as sooting, other than the near-complete large jar found sunk in the ground, which appears slightly different to the rest of the pottery, although in a very similar fabric. A small number of broken and spalled, reduced tile fragments were also noted. These

may have been made at the kiln, or were perhaps used as packing during firing. All had stabbed backs.



The large jar, 5408 (Scale 80mm) found beneath Building 1 in Site C Fig A2.1

The rimsherds indicate the vessel forms are limited to jars, bowls and jugs, with jars (EVE = 28.72) by far the most common. Bowl rims (EVE = 4.09) are the next most common, with jugs (EVE = 2.06) the rarest. A number of sherds were noted which are relatively thick and have sharp carinations with thumb-frilled flanges. These seem likely to be fragments of curfews (fire-covers). All the handles (40 fragments) are from jugs, mainly strap-types, although a small number of rod handles are also present. The handles are invariably decorated, usually with combinations of thumbing, stabbing and/or slashing. Bases are mainly plain and sagging, although a small number of thumb-frilled examples, probably from jugs, are also present.

Decoration on the vessel bodies is largely restricted to applied strips, both vertical and horizontal, and sometimes both on the same vessel, and simple incised schemes. These are largely combed wavy lines or cordons, although a few sherds with incised lattice decoration are also noted. Some vessels have both applied and incised decoration. Glazing is almost non-existent. Just six glazed sherds were noted, most of which have just a few spots or dribbles of green or orange glaze, although there is a single sherd with painted vertical lines of white slip, with a patchy green and orange glaze over them.

Chronology

At this stage of analysis, the exact date of the kiln waste is uncertain, although it is certainly medieval, and appears to pre-date the mid-14th century. While the fabric has some affinities with the Late Medieval Reduced Ware tradition, which has a number of known kiln sites in Bedfordshire and Northamptonshire (Slowikowski 2011; Blinkhorn

2007), the range of vessel types from this group lacks some of the later medieval vessel types which are typical of the Reduced Ware tradition, such as bung-hole cisterns, and jars predominate here, whereas bowls are much more common amongst groups of late medieval material (see below). Earlier medieval pottery assemblages generally have a far higher proportion of jars than any other vessel type, and this group conforms to that pattern. The glazed sherd with the painted slip stripes is also more typical of the earlier medieval period, as post-AD1350, glazed jugs were generally plain.

The decorated handles from this group of material are also far more typical of the earlier medieval tradition than the post-Black Death industries. A number of groups of kiln waste in a very similar fabric to that from this kiln are known from Great Missenden in Bucks (eg Ashworth 1983). The most recently excavated group from there (Blinkhorn in print) is very similar to this. The method of manufacture is the same, the vessels were all jugs, bowls and jars apart from a few possible curfew fragments and a single skillet handle, jars were the most common vessel types, and the jug handles are all decorated with thumbing and stabbing or slashing. The assemblage was dated to the mid/late 12th – mid 13th century. This is quite a different pattern to that seen at the Late Medieval Reduced ware kilns at Higham Ferrers in Northamptonshire, which were archaeomagnetically dated to AD1385-1435. There, bowls were by far the major vessel type, with jars the least common (11.3%) by EVE, and late medieval vessel forms such as bung-hole cisterns and dripping dishes were present. Only 40 out of 310 handle fragments were decorated, and those that were had stabbing alone, with finger-tipping, which is almost universal here, entirely absent. Finger-tipping is also common in the region on jugs of shelly ware tradition of the 12th-early 13th century. The range of rim-forms here is also in keeping with the Hertfordshire-type Greyware tradition.

Here, most of the other pottery types in association are unglazed sandy and shelly coarsewares, which could date to any time in the 12th-14th centuries. The initial cleaning of the pot-bank produced a fragment of a base of a Cistercian Ware cup, which is unlikely to be earlier than the mid-15th century, but, due to its stratigraphic position, indicates that the kiln waste dates to before that time. Perhaps the most closely dateable sherd of non-kiln material came from 7085, Grid Square Q, in the form of a small sherd of Mill Green ware. The sherd is a fragment of a jug covered in a white slip with a copper-speckled glaze, and is typical of the tradition, which is dated from c. mid 13th-mid 14th century. This sherd appears crucial to the dating of the assemblage, and so its exact stratigraphic position will be considered at the report stage.

Taking all these factors into account, and given the similarity to this material with other kiln waste groups from the region, this group waste is provisionally dated to the mid/late 12th – mid/late 13th century, although it is entirely likely that this date will be revised at the report stage, once more detailed analysis has been carried out.

References

- Ashworth, H, 1983 Evidence for a Medieval Pottery Industry at Potter Row, Great Missenden, *Buckinghamshire Records of Buckinghamshire*, **25**, 153-9
- Baker, E, and Hassall, E, 1979 The Pottery, in D Baker, E Baker, J Hassall and A Simco Excavations in Bedford 1967-1977, *Bedfordshire Archaeological Journal*, **13**, 147-239
- Blackmore, L, and Pearce, J, 2010 *A dated type-series of London medieval pottery: Part 5. Shelly-sandy ware and the greyware industries*, MOLA Monograph, **49**

Blinkhorn, P, in print a) *Pottery from Granary Cottage, Great Missenden, Bucks (site GCM02)*, Network Archaeology

Blinkhorn, P, in print b) *Pottery from Sainsbury's Supermarket site, Bancroft, Hitchin (Site HN501)*, Heritage Network Ltd

Blinkhorn, P, 2007 Late medieval pottery kilns, in A Hardy, B M Charles and R J Williams *Death and Taxes. The archaeology of a Middle Saxon estate centre at Higham Ferrers Northamptonshire*, Oxford Archaeology Monograph, 100-111

Slowikowski, A, 2011 *Genius in a Cracked Pot, Late Medieval Reduced Ware: A Regional Synthesis*, Medieval Pottery Research Group Occasional Paper, 4

APPENDIX 3: OTHER FINDS

by Andy Chapman, Pat Chapman, Tora Hylton and Ian Meadows

Finds assessment by Tora Hylton

The excavations produced 32 individual and group recorded small finds (Table A3.1), comprising 43 individual objects, dating to the late Iron Age, early Roman and post-medieval periods. Of particular interest are the small group of late Iron Age/early Roman artefacts from burials in the cremation cemetery. In addition, a small number of Roman and post-medieval finds were recovered from Site C.

Table A3. 1: Finds quantified by material type

Material	Total
Copper alloy	10
Iron objects	20
Glass	1
Ceramic	1
Total	32

Condition

The copper alloy is in a stable condition, but a small number of objects, particularly the brooches may require cleaning and or x-ray to reveal forms of decoration. The ironwork is in a reasonable state of preservation, much of it is encrusted in corrosion products, making certain identification difficult. A small number of objects (c15) will need to be x-rayed, to aid identification and to reveal any features of interest.

Late Iron Age/early Roman

Cremation burials

Forty-nine individual cremation burials were recovered and 12 of these produced finds in addition to the ceramic vessels (Table A3.2). Three late Iron Age burials (13, 31 and 33) produced a small group of iron objects, including two nails and an undiagnostic strip, but of particular interest is the large flat-sectioned disc, 76mm in diameter, from cremation burial 31.

The other cremation burials that produced finds (burials 3, 4, 11, 15, 23, 32, 34, 37, 43 and 44) date to the early Roman period. These produced four brooches, one mirror, one ceramic roundel/counter and a ring (possibly for suspension) and a selection of nails.

Further Roman finds were recovered from the ditches and pits in Site C; these comprise two copper alloy coins, see Ian Meadows below, and a group of six iron hobnails.

Copper alloy

Six copper alloy objects were covered from cremation deposits: three brooches, part of a mirror, a ring and a small number of miniscule fragments of corrosion within a soil matrix were recovered from Context 114.

The brooches comprise a Late La Tene Type (Nauheim derivative) which dates to c43-100 AD, and two Colchester derivatives, which date to the mid-late 1st century AD. They will be reported on by Don Mackreth.

Of interest is the presence of part of a mirror measuring c70mm x 60mm and <1mm thick, from Cremation burial 3. Although incomplete and fragmentary, enough survives to indicate that it is an example of one of the most popular types of mirror. It is cast in bronze, and has a slightly convex reflecting side. Originally it would have been cased within a wooden frame. Further research is required on this object.

The copper alloy ring, presumably for attachment, requires further research.

Table A3.2: Finds associated with the cremation burials

Cremation burial	Context	Description (SF No)
3	4080	Copper alloy mirror (13) Copper alloy brooch (14) Nails (10, 15, 17, 137) Rod fragment (144)
4	4095	Nails x 4 (146)
11	4111	Nails x 2 (139)
13	?????	Nails x 2 (145)
15	4127	Nails x 2 (140)
23	4143	Copper alloy brooch (150)
31	4172	Iron Disc (81)
32	4173	Copper alloy brooch (143)
33	4186	Iron Strip (142)
34	4200	Ceramic roundel/counter (149)
37	4191	Copper alloy ring?
43	4217	Nail x 1 (152)

Iron

In total 20 individually or group recorded iron objects have been recovered from stratified deposits. These include a fragmentary brooch, a flat disc, 13 nails and unidentifiable fragments from Cremation deposits. In addition 6 hobnails and some undiagnostic fragments were recovered from other parts of the site. Much of the ironwork will be x-rayed, in particular the objects from cremation deposits. This will provide a permanent record and aid identification.

Glass

There is one small undiagnostic fragment, 17 x 17mm, of clear vessel glass from the medieval midden deposit in Site C, 7145/7006. No further work is required.

Ceramic

A ceramic roundel/counter manufactured from an undiagnostic body sherd in a soapy grog-tempered fabric was recovered from Cremation burial 34 (see Appendix 4, Fig A4.9). The edges of the counter have been pared down to form a disc, 29mm in diameter, with a convex underside. Such objects may have been used as gaming pieces. No further work required.

Post-medieval finds

There are two objects, an illegible half penny from topsoil and a small double-looped buckle for use on a spur, which dates to the mid 17th century. No further work is required.

Roman coins by Ian Meadows

Two coins, dating to the early to mid 4th century, were recovered from the primary deposit (7038) of ditch [7039], the final phase in a sequence of Roman boundary ditches in Site C.

SF128: A very corroded coin, 18mm diameter, the reverse type of which appears to be VOT X within a wreath, the surrounding legend and mint mark are not legible. This issue ceased to be produced at western mints, except Ticinum, prior to November 324. The obverse face clearly bears a bust from the House of Constantine but again the detail and surrounding legend are too corroded. At one point around the circumference of this coin a short slightly thicker sprue is present indicating this coin is a contemporary cast forgery.

SF129: A partial flan of a coin of Constantius. The surviving fragment has a maximum dimension of 15mm. The reverse bears the distinctive 2 soldiers 2 standard of the GLORIA EXERCITVS issue of 330-335, the legend and the mint mark are however missing owing to erosion of the flan. The obverse bears part of the bust and the end of the legend –VSNOBC indicating it was Constantius.

Querns and other worked stone by Andy Chapman

Fragments from three pieces of worked stone were recovered from fills (7013) and (7016) of a pit [7018] in Site C, containing Roman pottery. From fill (7013) there is a small block of fine-grained sandstone, up to 50mm thick by 168mm wide, with a worn slightly concave surface. The stone is 115mm long but this is only the end of a much larger piece. Its incompleteness leaves its original function unclear, but it was probably utilised as a grinding/polishing stone.

Also from fill (7013), there is a fragment from the circumference of an upper stone from a rotary quern in sandstone, 56-60mm thick, with a circumference of c700mm. The grinding surface is concave, and there are dimpled tool marks around the circumference of the stone. The size is at the upper limit of hand querns.

From fill (7016) there is a small irregular fragment of Millstone Grit, 50mm thick, from a quern or millstone.

Metalworking debris by Andy Chapman

There is a small piece of tap slag, weighing 77g, from the fill (4070) of a Roman ditch [4071] in Site A. While tap slag derives from iron smelting, the presence of only a single small piece does not necessarily indicate that smelting was being carried out nearby, as the process produces very substantial quantities of debris.

There are two very small pieces, weighing 32g, of undiagnostic ferrous slag from the fill (7028) from Roman ditch [7030] in Site C.

Ceramic building material by Pat Chapman***Roman tile***

One small sherd from a box flue tile comes from layer (7006/7081) in Site C. It is made from a hard sandy orange fabric and has the right-angled corner of a concentric square made with widely spaced narrow incisions. There is also one small possible floor type tile body sherd from fill (7047) of ditch [7048], made from a slightly soft fine orange-pink fabric, this is included in the fired clay catalogue.

Medieval/post-medieval***Tile***

These 46 roof tile sherds, weigh 2.9kg. The sherds are small, c80x60mm or less. The fabric is typically hard sandy clay in a range of colours from brown to orange-brown and red to red-brown, a few tiles are very hard and brown. Some are grey with a slightly vitrified partially white surface and a few are bloated to almost twice their original thickness, a consequence of exposure to high temperatures.

The tiles are 12-20mm thick, the majority being 12-15mm thick. Four sherds have a peghole, one 12mm square, the remaining three are circular with diameters of 11mm and 15mm. A few of the hard brown and grey vitrified tiles have been stabbed by a pointed implement c2mm in diameter. There is one join, between the sherd from (7006/7099) and that from the midden layer (7006) in Site C.

Five sherds retain some white lime mortar adhering to one or more surfaces, indicating that they had been used on a roof. However, many other of these tiles could have been used in a kiln as part of the structure or as spacers as over a third have been overfired, some to extremes, including the stabbed tiles.

The tiles are most likely medieval to post-medieval in date and possibly from the same kiln/s as the pottery wasters found on the site (Blinkhorn, this report).

Brick

The 17 bricks range from one complete brick to small fragments, altogether weighing 5.8kg. Sixteen of these, in particular six from the demolition layer of building 2, context (7154), are handmade to various levels of competence, some well mixed and others not so well, using a hard clayey sand fired to orange-brown or red-brown, with or without a grey core. The length and breadth dimensions of four of the bricks from layer (7154) are normal, but all the bricks are thinner than usual, 30-36mm (1 $\frac{1}{8}$ - 1 $\frac{3}{8}$ inches), about half the usual thickness, though not uncommon.

They are probably the remains of building walls, but it is possible that they may have been used as brick nogging in a timber building, or as flooring although there is no signs of wear. The other brick from context (7154) is made from a dense sandy bright orange clay, and is slightly thicker than the rest, at 48mm (1 $\frac{7}{8}$ inches). These bricks date from about the 15th to 17th centuries.

Modern brick

The brick fragment from the wall foundation of building 2, context (7101), is made from a dense coarse red-brown fabric that is probably from a machine-made 19th to 20th-century brick. A small fragment of modern black brick with a finely dimpled surface, weighing 69g, comes from (7006/7125) grid square AY, the building 1 layer in Site C.

Fired clay

There are 179 fragments, weighing 2.1kg, typically small with a few exceptions. Out of 27 contexts, only six have between 14 and 49 fragments, the rest comprise either one or up to seven in one context. There are a few fragments that could be from the same type of bricks described above, being made from the same hard orange-brown or red-brown clayey sand.

From ditches [7030], [7039] and [7048] and pit [7018] come 101 fragments of daub. They are typically made from fine silty sand orange-brown, red-brown or white and pink, often with flat grey surfaces. They could be structural fragments, although they have no wattle or other impressions.

APPENDIX 4: THE DEPOSITION OF CREMATED BONE AND PYRE DEBRIS

by Pat Chapman

Introduction

The urns containing cremation burials and the accessory vessels were encased in bandages on site, lifted and returned to the office for processing. The processing of the vessels led to the location of some second cremation deposits and deposits of other pyre debris within the accessory vessels. Fifty-three urned cremation burials from the cemetery were processed in the office.

Methodology

The urns, with one exception, and many of the accessory vessels, were cracked and often partially collapsed. The bandages were removed, partially or completely, depending on the state of the urns and the urns were placed in a 3.5mm-mesh sieve over a 1.0mm-mesh sieve. The pottery sherds were removed and water was used to ease the removal of the cremated bone. All bone was collected from the 3.5mm sieve and the fine residue, including small bone fragments, from the 1.0mm sieve was also retained. A photographic record was maintained to show the disposition of the bone and other pyre debris within the urns. Following excavation the cremated bone was left unwashed, and with fill left inside some of the long bones to keep them as intact as possible.

The recovered bone

The urns all contained bone deposits that represent only partial and selective recovery of the cremated bone from the pyre (Table A4.1). There appears to have been two levels of bone collection. Over a half of the deposits comprise quite token recovery, with no more than 500g taken from the pyre, and often much less. At the lowest level recovery drops to token handfuls of bone. In contrast, a third of the deposits comprise more than 750g of bone, with 1640g the largest single deposit. These represent the recovery of a significant proportion, at least a half, of cremated material from an adult.

Table A4.1: Cremation deposits, recovered bone weights

Bone weight (g)	Number	Percentage
>1500	1 (1640g)	2
1000-1500	5	9
750-1000	11	21
500-750	8	15
250-500	11	21
100-250	10	19
0-100	7	13
Totals	53	100

Body part representation will be dealt by the bone analysis, but observation during processing indicated that the skeletal material collected from the pyres preferentially comprised the larger bone elements; skull fragments, lengths of long bones, ribs and occasionally large bones such as shoulder blades (Fig A4.1). There are very few metacarpals or metatarsals, and very little in the way of vertebrae, and few teeth. The bone fragments were a reasonable size indicating careful collection from the pyre and no further crushing before deposition. The long bones still maintain some structure,

while the skull is typically in pieces c20-25mm across. The bones were typically clean, not charcoal stained, perhaps indicating that they had been washed before deposition.



Cremation burial 21, showing typical size and condition of deposited bone Fig A4.1

Deposition in pottery urns

The bone deposits typically occupied one third to one half of an urn, indicating that vessel size was not a limiting factor on the quantities of bone recovered from the pyre.

The majority of the bone deposits did not show any particular deposition of the cremated bone within the urns, with the various body parts found at all levels in no order. In cremation burial 12 (4118), although the bone was not deposited in any order, it was in separate dense clusters. In eleven instances a sequence of selective bone deposition was evident, and in a few instances other pyre debris, specifically lengths of carbonised wood were also collected. These, along with the deposition of objects, are discussed below.

The partial collapse of most urns indicates that the urns must have had an organic cover to maintain the void in the unoccupied space above the bones, leading to subsequent cracking and the partial collapse of the urns from the weight of the overlying soils. Once the covers decayed, soil, typically brown silty clay with a few small angular flint and fine gravel, could enter the remaining space within the vessels, filtering down between the bones and covering them.

Structured bone deposition

In eleven cremation burials a sequence of deposition was evident (Table A4.2).

In nine instances the larger long bone fragments had been placed vertically down the sides and/or in the base of the urn. The ribs, thinner long bones and other bone fragments filled the space between, and the skull fragments were placed on the top. A variant of this deposition, cremation burial 21, had an almost complete shoulder blade laid across the base of the urn while at the top a radius lay below a piece of skull (Fig A4.2). In cremation burial 46, the long bones were down the sides of the urn with the skull fragments on top, but with the addition of a layer of charcoal above this (deposits of other pyre debris are discussed further below). In four of these burials, special deposition was limited to just placing one or more long bones in the base or down the sides of the urn while the remaining bones were placed on top. This was seen in cremation burial 27, the one unbroken urn, and cremation burials 6 and 47 (Fig A4.3). In addition, an iron brooch was laid on top of the bone in cremation burial 32, urn 84 (Fig A4.4).



Cremation burial 21, showing the top of the cremation deposit (Scale 10mm) Fig A4.2



Cremation burial 6, vessel 2, long bone visible on side near base, left (Scale 50mm)
 Cremation burial 47, long bone in base (cremation inverted), right (scale 20mm)
 Fig A4.3

Table A4.2: Bone deposition in cremation burials

Cremation burial no	Bone weight (g)	Description
6	1090	Long bones down the side of urn
16	1122	Long bones down side of urn, skull mass on top
20	975	Skull, long bones on charcoal on base with long bone on top
21	685	Long bones angled down, skull on top, scapula on base
23 (infant)	242	Skull, long bones on top, copper alloy brooch on top
27	780	Long bone on base
32	367	Long bones on one side, iron brooch on top
39	690	Long bones on base, skull on top
46	545	Long bones on base, skull on top, charcoal over all
47	833	Long bones on base
49	910	Skull on base



Cremation burial 32, with iron brooch laid on top of the bones (Scale 10mm) Fig A4.4

The only infant burial was cremation burial 23, in urn 71. On the top of the deposit was a skull fragment and a femur, while on the opposite side lay a femur and another long bone, whilst the remaining bones filled the urn in no particular order. It is possible the bone deposition was an attempt to lay the child curled up on its side. On top of a skull fragment there was a copper alloy brooch (Fig A4.5)



Cremation burial 23, infant cremation burial with brooch (Scale 10mm) Fig A4.5

Two cremation burials showed a reversal of the more common pattern of deposition, by having the skull placed in the base of the urn, rather than at the top. This was the only element of deliberate deposition in cremation burial 49, but cremation burial 20 was more elaborate. On the base of the urn there was a very thin layer of charcoal upon which both skull and long bone fragments had been laid. Other bones were laid over these, and there was a 160mm-length of long bone laid across the top, with other long bone fragments surrounding it (Fig A4.6).



Cremation burial 20, showing a long length of long bone laid across the top of the deposit (Scale 10mm) Fig A4.6

Pyre debris deposition

In six cremation burials pyre debris, in the form of lengths of carbonised wood, had been placed either with the cremated bone, within an accessory vessel or as the only deposition in an urn (Table A4.3). In two examples lengths of carbonised wood had been laid in the base of the urn, in another on top of the burial with more in an accessory vessel. Charcoal fragments were scattered through the cremated bone in two examples, while charcoal was the only deposit for one cremation burial.

Table A4.3: Cremation burials with pyre debris

Cremation Burial no	Charcoal weight (g)	Description
8	16	Charcoal mixed with bone
20	0.5	Charcoal in base
24	4 and 2	Charcoal in 2 vessels with a few skull fragments
33	5	Charcoal in base
35	74	Charcoal mixed with bone weighing 58g
46	11 and 6	Charcoal on top of cremation and in an accessory vessel

The long bones had been placed in the base of the urn for cremation burial 46, with the skull fragments mainly on top, following a sequence of deliberate deposition. Finally, a layer of carbonised wood, perhaps part of a plank from the pyre, was laid across the top of the cremated bone. One side of this cremation urn was also blackened, the only example from the cemetery, although this may have been a result of previous use. The accessory vessel, 111, with cremation burial 46, had a mass of charcoal in the base of the urn and another mass at the top, c12mm thick, with a fill of clean soil between them (Fig A4.7). This may have comprised an urn containing a piece of carbonised wood and perhaps covered with a second piece of wood, with the soil perhaps infiltrating the void within the pot subsequently. This might suggest that the covering piece was a length of semi-burnt wood, of which only the carbonised portion survived.



Cremation burial 46, accessory vessel 111, showing carbonised wood on top, left (Scale 10mm) and in the base, right (Scale 20mm) Fig A4.7

There was a thin layer of carbonised wood in the base of the urn containing cremation burial 33, and a similar deposit in cremation burial 20, with 250g of unsorted bone laid on top. Cremated bone was deposited unsorted in the urn for cremation burial 8, but there were charcoal fragments within the fill and also patches of blackened and burnt soil. There was very little bone, mainly skull and teeth, weighing 58g, in cremation burial 35. However, a large quantity of charcoal, including roundwood up to 23mm in diameter, was mixed with the bone.

In cremation burial 24 the urn was half-filled with clean soil and on this there was just one skull fragment and two lengths of carbonised wood, 2-10mm thick (Fig A4.8). The urn split horizontally along this surface during processing. There were a few skull fragments in an accessory vessel, 63, but no charcoal.



Cremation burial 24, carbonised wood and skull fragment (Scale 10mm) Fig A4.8

Artefact deposition

The brooches with cremation burials 23 and 32 (Figs A4.4 & 5) were the only personal artefacts found within the cremation deposits during processing, and in both instances the brooches had been the final item placed in the urns, lying on top of the bone deposits. A few iron nails and an iron object were found within seven cremation burials: 3, 5, 11, 13, 15, 43, and 50, but these seemed to be fortuitous inclusions, perhaps within the bone collected from the pyre debris.

On top of cremation burial 7, there was a small accessory vessel, 25, but only the base survived. A small ceramic disc, 30mm in diameter, lay on top of the fill of cremation burial 34 (Fig A4.9).



Cremation burial 34, urn 94 with ceramic disc (Scale 20mm)

Fig A4.9

Possible flint deposition

The accessory vessel pot, 117, with cremation burial 47, had a large piece of flint, 70mm by 60mm, jammed inside it with only the top of it showing. This may have been deliberate. Within the fill of cremation burial 40 were two large angular flints, up c50mm in diameter, and four smaller pebbles in the base of the urn, which also contained 380g of cremated bone. This suggests that the flint and pebbles were placed in the urn before the cremation.

Conclusion

The evidence from the 53 urned cremation burials illustrates the variations in care taken over the collection and deposition of the cremated bone for different individuals.

Bone was either collected as token deposits, often a handful or less, but in some instances large quantities, at least a half of the material was recovered from the pyre. The absence of burnt soils, the limited occurrence of carbonised wood, and the presence of quite large bones fragments, indicates that bone was picked from the pyre debris piece by piece, and perhaps even washed prior to deposition. There was a strong preference for recovering the larger bone elements, skull, long bones, pelvis and scapular.

Generally there was no particular order for the deposition of bone in the urns, but in several instances care had been taken. Most typically, the long bones had been deposited first, sometimes set upright and the skull last, as if replicating the standing posture. However, in two burials the skull fragments had been placed in the first with the skull on top. The only infant burial may have been placed as if lying curled up on its side. Other pyre debris was rarely found, but in six instances lengths of carbonised wood had been placed in the base of the urn or on top of the bone deposit, the latter perhaps as lids to the urns. In one curious example, an urn contained only soil, a single fragment of skull and two lengths of carbonised bone.

APPENDIX 5: OSTEOLOGICAL ASSESSMENT OF THE HUMAN REMAINS

by Sarah Inskip

Summary

Preliminary analysis of cremated bone deposits from fifty pits and one partial inhumation, suggests that 62 individuals are represented of which 42 are adults, 8 are juveniles and 12 are of unknown age. Three double cremations are present, all of which contain an adult and a juvenile. The inhumed bone was that of adult, but the surviving femur is highly fragmented preventing any individual information from being obtained, although there are rodent gnawing marks

The potential for further research on this group of cremated deposits is great due to the fact that over 30 of the deposits have a substantial amount of bone remaining and three other cemeteries for comparison are in the area. Pyre conditions can be examined in order to yield information on ideas towards cremation, death and burial in the Roman period in the local and national context..

Introduction

The cremated bone recovered from fifty pits, with some pits containing more than one bone deposit, was submitted for analysis, along with the remains of a poorly preserved inhumation. Preservation was good, and few urns had been disturbed, so little if any of the material originally deposited has been lost. The urns were bandaged, removed from the site, and were processed at Northamptonshire Archaeology offices through a 3.5mm mesh sieve over a 1mm sieve (Pat Chapman, appendix 4, this document).

Methods

The cremated deposits were examined following the guidelines of the IfA (Brickley and McKinley 2004) and English Heritage (Mays, Brickley and Dodwell 2004). The following account will therefore focus on the preservation, quantity (weight), level of fragmentation, possibility to age and sex and the ability to collect pathological and non-metric data.

Preservation was assessed based on the percentage of cortical and trabecular bone still available for analysis. Weight was assessed by using a digital scale which measured to the nearest 1g. Fragmentation was assessed by passing the bones through 10mm and 5mm sieve. As it is not necessary to undertake a detailed estimate of age and sex for the purpose of an assessment (Mays, Brickley and Dodwell 2004), it was noted where individuals had sufficient bone in order that a sex estimate be possible in the future. Where some individuals had clear evidence of sex, a preliminary assessment of sex could be given. This was also the case for ageing the individuals in the deposits where a wide estimate of adult or juvenile was given. This was based on the presence of unfused bones, adult teeth or the overall size and thickness of bone.

Results

Table A5.1 presents all of the results for the preliminary assessment of the cremated deposits. In the case of accessory vessels 31 (cremated deposit 10) and 37 (cremated deposit 11), no individual was assigned due to the fact that both deposits had less than 3g of material which may originate from the primary burial.

Table A5.1: Cremated deposits by weight, fragmentation, age and sex

Burial No	Pot No	Bone weight (g)	10mm	5mm	<5mm	Age	Sex
2	2	17	0	6	11	Adult	?
2	1	140	28	75	32	?	?
3	2	57	15	28	13	Adult	?
4	A22	0.5	0	0	0.5	Infant?	-
4	-	633	241	261	131	Y Adult	?m
5	-	682	251	288	143	Adult	?
6	1	1042	378	418	250	Adult	?f
6	2	1094	422	426	246	Adult	??m
7	-	915	348	362	204	Adult and Infant	??m
8	-	369	186	132	50	Adult	?
8	-	161	0	37	122	?	?
9	-	862	283	313	266	Adult	?m
10	A31	1	0	0	1	-	-
10	-	1638	502	659	459	Adult	-
11	A37	2	2	0	0	-	-
11	-	902	294	354	254	Adult	?f
12	-	948	322	347	239	Adult	?
13	-	118	27	67	25	Juvenile?	?
14	-	495	227	176	91	Adult	-
15	-	1038	345	409	286	Adult + Juvenile	-
16	-	1128	480	425	223	Adult + Juvenile	?
17	-	718	232	284	202	Adult	-
18	-	426	155	158	113	Adult	??f
19	-	1200	454	446	299	Adult	??f
20	-	967	503	279	186	Adult	??m
21	-	686	119	212	130	Adult	?? f
23	-	57	0	0	57	?	-
23	71	242	86	95	61	Juvenile	-
23	70	217	60	113	47	?	?
23	72	122	49	51	22	?	?
24	-	7	5	2	0	?	?
25	north	954	448	313	227	Adult	?
25	south	212	40	113	59	Adult	?
26	-	397	203	140	53	Adult	?m
27	1	780	322	268	189	Adult	?f
29	-	191	77	84	31	Adult	?
30	1	424	148	198	79	Adult	?
31	-	321	118	108	95	Adult	?m
32	89	980	373	368	337	Adult	?
32	84	368	112	159	96	Adult	??m
33	C	130	32	71	27	Adult	?
33	87	250	56	113	83	Adult	?
34	-	691	316	230	142	Adult	?
35	-	57	17	31	10	Adult	?
36	-	28	13	10	5	?	-
37	-	748	181	303	242	Adult	-
37	99	474	154	191	129	Adult	-
38	-	222	103	87	33	Adult	-
39	-	692	325	275	93	Adult	??m
40	-	308	99	159	122	Adult	?
42	-	33	9	19	5	?	?
43	-	374	121	140	113	Adult	?
44	-	561	218	200	142	Adult	-

Burial No	Pot No	Bone weight (g)	10mm	5mm	<5mm	Age	Sex
45	-	1	0	1	0	?	?
46	-	547	186	182	57	Adult	?
47	-	834	395	252	185	Juvenile?	?
49	-	909	374	333	203	Adult	?
50	-	313	139	127	50	Juvenile	?
Site B [5019]	-	385	139	173	74	-	-

Preservation

Cremated bone tends to preserve well in comparison to unburnt bone. This is because bone undergoes a structural change during the cremation process which increases the crystallinity of the inorganic portion of bone. The organic component of bone, the portion of bone attacked by micro-organisms, is lost making cremated bone more resistant to diagenesis. The preservation of the cortical bone was good (meaning that most of the cortical bone surfaces was observable) and it is possible to observe pathologies on the cortical bone. However, trabecular bone tends to disintegrate after cremation. Very few epiphyseal ends and vertebral bodies were preserved meaning it would be difficult to observe joint pathologies or any spinal conditions involving the vertebral bodies. Furthermore, the os coxae, a bone largely consisting of trabecular bone, were not well preserved and this inhibits the ability to sex the cremated deposits as the most reliable indicators of sex are found on the os coxae. However, this is a normal occurrence in the analysis of cremations.

Quantity

Each cremated bone deposit was weighed to the nearest 1g. As studies have indicated that a complete modern adult cremation weighs between 1.5-3.0kg (Mays 2010, 326, McKinley 2000, 404), it seems that all of the adult cremated deposits are a little under weight. However, many of the deposits are approaching this quantity and could therefore represent more complete adult cremations. Trotter and Hixon (1974) suggest that juveniles should have around 500g of cremated bone. Of the five deposits thought to be of solely of juvenile individuals, all but one had a significant amount of bone remaining (300g+). It is difficult to assess how complete these individuals are when it is not possible to get an accurate estimation of age. For example a 2-year-old would have substantially less bone than an 8 year old. Finally, there were three cremated deposits which could contain the remains of an adult and child. At this stage there was no evidence of a cremated deposit containing two adults.

Fragmentation

The level of fragmentation was assessed because McKinley (1997, 69) suggests that the number of skeletally distinguishable elements is related to the level of fragmentation. Mays (2010, 326) further indicates that generally most of the identifiable fragments will remain in the 10mm and 5mm sieve sections (material smaller than this is notoriously difficult to identify). As such the level of fragmentation will give an idea as to how much information would be available from each deposit. Table A5.1 displays the sieve section quantities for each deposit. It is clear that 32 of the cremations have a substantial amount of bone in the 10mm and 5mm sieve sections (300g+). This means that identification of specific bones will be possible. As such the potential to obtain information from these burials is good.

Demography

Preliminary assessment indicates that 62 individuals are represented within the 50 cremated deposits (this excludes cremation burial 50 which is thought to be pyre debris, and accessory vessels 31 and 37 where a few grams of bone were present). Fifty of these individuals could be assigned an adult or juvenile age category and 42 adults and 8 juveniles are represented. More detailed age estimates will be obtainable for some individuals particularly for the 32 cremations that have substantial quantities of bone in the 10mm and 5mm sieve sections.

Initial analysis indicates that 15 cremated deposits have cranial fragments that could be used in sex determination. Table A5.1 indicates that there are 6 possible females and 9 possible males. It may be possible with a more detailed examination to firm up the sex diagnosis on these individuals and obtain sex estimations for the other adult cremated deposits.

Pathology

The extreme conditions of the cremation process take their toll on bone. Fragmentation and loss of bone during and after the cremation process inevitably leads to incomplete individuals. As diagnosis of disease relies on the examination of skeletal changes and critically, their distribution throughout the skeleton, it is notoriously difficult to identify pathology in cremated individuals. However, four individuals had evidence for osteoarthritis and one possible traumatic lesion to a finger. Further pathology may be visible on a detailed examination of the cremated deposits.

Non-metric traits

The high percentage of large fragments in some cremated deposits may make it possible to observe some non-metric traits on some individuals. Although it will not be possible to undertake a population analysis, collection of non-metric data may serve purpose to other researchers in the future.

The inhumation burial

The preservation of the inhumed bone was good (75% of the cortical surface observable). It is possible to observe pathology. A number of scrapes were observable on some of the fragments. These appear to be marks caused by rodent gnawing. The bone from the inhumation was highly fragmented but appeared to represent one femur. The fragmentation will prevent any stature or sex estimation, however, the size of the bone indicates an adult individual. There was no evidence of pathology.

Potential for further research

There is huge potential for further research on the cremated bone. This is largely due to the fact that many of the cremated deposits have a substantial quantity of large fragments. While it is not possible to look at more traditional areas of study in osteoarchaeology (eg patterns of disease, metric/stature and migration studies), other questions can be answered by this material which assess other areas of Roman life such as mortuary practice and attitudes towards death and burial. Furthermore, Roman activity is plentiful in the immediate region. Two other Roman cremation cemeteries have been found in the area, one within 1km of the current find at Maskells Quarry (Dawson 2001) and another at Warren farm, Deepdale, Sandy (Dawson and Slowikowski 1987). These two sites should be used as comparative samples in order to assess local trends in the cremation process. Further to this a large 3rd-4th-century Roman cremation cemetery was found at Friary field (Gardner 2004) could also act as a comparison sample to ascertain whether there are any temporal differences in the region.

The process of cremation varies by region and time. This variation can be detected in a number of ways from bone. It is possible to obtain an idea of pyre conditions from bone colour with white colouration produced in optimal conditions, high oxygen and temperature, and black in lower temperatures with poorer supplies of oxygen. Divergence from a normal pattern of burning can therefore be detected by analysing the distribution of colour throughout the skeleton. This could potentially highlight information such as whether different areas of the skeleton were differentially burnt. The results of this could then be placed into context with other Roman cremations from the Warren's Farm or Maskells Quarry.

An analysis of skeletal element representation can yield information on differential treatment of bodies whether this is when the body is put on the pyre, or selected recovery of certain elements after the cremation process (eg taking large fragments of the pyre). An ordered deposition of bones into the urns has been noted by Pat Chapman (this document) suggesting some deliberate selection of elements. Comparison of skeletal element representation in these individuals to the other non-ordered urns may reveal skeletal representation differences and highlight whether it was important to obtain some skeletal elements from the pyre and not others. Again, this can be compared to the three other cremation cemeteries in the region to ascertain whether the deposits conform to the local trends in skeletal representation.

While it will not be possible to age and sex all of the cremated deposits, comparison of the demographic results to the other Roman sites will be of value. This will determine whether the cemetery represents a normal cemetery population for the period. Furthermore, with a minimum of 6 females and 9 males (which could be increased on a more detailed assessment of sex) it may permit sex comparisons which may determine whether the cremation rite differed depending on gender. Similarly, a comparison between adults and juveniles may also be able to demonstrate whether differences in the cremation process occurred depending on age. It may be possible to determine whether individuals buried with grave-goods were treated in anyway differently to those without. Also, it may be possible to determine whether certain grave-goods or vessels appear to be associated with age or sex. Final, results of analyses should be shared with other members of the project to determine whether any of the osteological categories (eg age/sex) coincide with other archaeological information, such as urn type/style, position etc.

In terms of the inhumation, no further macroscopic information can be obtained from the bone. As the burial has suffered from truncation it is difficult to know if the femur was the only element deposited. The presence of gnawing marks is interesting possibly suggesting some exposure at some point. It would be interesting to know if similar odd fragments were found at Warren Farm and Maskell's Quarry. Chemical analysis remains possible (eg DNA or Isotope) but a very specific research question would be needed and there is no evidence at present to suggest that this would be a worthy venture.

References

- Brickley, M, and McKinley, J I, 2004 *Guidelines to the standards of recording human remains*, Institute for Archaeologists, **7**, 14-17
- Dawson, M, 2001 Harlington Roman Cemetery (Maskell's Quarry, Sheepwalk Hill), *Bedfordshire Archaeology*, **24**, 20-39
- Dawson, M, and Slowikowski, A, 1987 A Romano-British cemetery at Warren Farm, Deepdale, Sandy, *Bedfordshire Archaeology*, **18**, 25-33

Gardner, R, 2004 Archaeological investigations at 24 Friary Fields, Dunstable, Bedfordshire, *Bedfordshire Archaeology*, **25**, 159-189

McKinley, J I, 1997 The cremated human bone from burial and cremation-related Contexts, in Fitzpatrick AP (ed) *Archaeological Excavations on the Route of the A27 Westhampnett Bypass, West Sussex*, 1992, Vol 2, Wessex Archaeological Report, **12**, 55-72

McKinley, J I, 2000 The Analysis of Cremated bone, in Cox M and Mays S (eds) *Human Osteology in Archaeology and Forensic Science*, London, GMM Press, 439 - 454

Mays, S A, 2010 *The Archaeology of Human Bones*, London, Routledge

Mays, S, Brickley, M, and Dodwell, N, 2002 *Human bones from archaeological sites. Guidelines for producing assessment documents and analytical reports*, BABAO/English Heritage

Trotter, M, and Hixon, BB, 1974 Sequential changes in weight, density and percentage ash weight of human skeletons from early foetal periods through to old age, *Anatomical Record*, **179**, 1-18

APPENDIX 6: ASSESSMENT OF CHARRED PLANT MACROFOSSILS

by Val Fryer

Introduction and method statement

Excavations undertaken by Northamptonshire Archaeology during the widening of junction 12 of the M1 recorded features of Roman and medieval date, including a large Roman cremation cemetery. Samples for the retrieval of the plant macrofossil assemblages were taken from across the excavated Site And seventy five were submitted for assessment.

The samples were processed by manual water flotation/washover and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16 and the plant macrofossils and other remains noted are listed in Tables A6.1 – 3. Nomenclature within the tables follows Stace (1997). All plant remains were charred. Modern fibrous roots, seeds and arthropod remains were also recorded.

The non-floating residues were collected in a 1mm mesh sieve and sorted when dry. All artefacts/ecofacts, including fragments of burnt/calced bone from the cremation assemblages, were retained for further specialist analysis.

Results

With the exception of charcoal/charred wood fragments, plant macrofossils were generally scarce, occurring within only twenty-nine of the samples studied, and then frequently as single specimens within an assemblage. Preservation was mostly very poor, with many of the grains and seeds being puffed and distorted (possibly as a result of combustion at high temperatures) and fragmentary. In addition, the material within many of the assemblages was heavily impregnated within minerals and coated within fine silt and grits. This almost certainly prevented full retrieval of the macrofossils (particularly the smaller and lighter material) during processing and, in some instances, may have precluded the accurate identification of the few remains which were recovered. It should also be noted that similar concretions were recorded on some fragments of cremated bone, thereby masking their presence within some assemblages.

Oat (*Avena* sp.), barley (*Hordeum* sp.) and wheat (*Triticum* sp.) grains were noted along with a number of other cereals, which were too poorly preserved for close identification. Chaff was very scarce, but emmer (*T. dicoccum*) and spelt (*T. spelta*) wheat glume bases were noted within the assemblages from postholes [4042] (sample 96) and [4059] (sample 98) and midden pit [7018] (sample 140).

Weed seeds were extremely rare, occurring within only eleven assemblages. All were of common segetal and grassland taxa including brome (*Bromus* sp.), small legumes (Fabaceae), goosegrass (*Galium aparine*), ribwort plantain (*Plantago lanceolata*) and knotgrass (*Polygonum aviculare*). A single fragment of hazel (*Corylus avellana*) nutshell was noted within the assemblage from medieval ditch [5004] (sample 13).

Charcoal/charred wood fragments were present throughout, although rarely at a high density. Other plant macrofossils occurred infrequently, but did include pieces of charred root or stem, an indeterminate thorn and a possible tuber fragment.

The fragments of black porous and tarry material were all probable residues of the combustion of organic remains (including cereal grains and, in the case of the

cremations, the bodies of the deceased) at very high temperatures. Bone fragments, including some burnt/calced pieces, were also recorded (most particularly within the cremation deposits) although rarely at a high density. Other remains included pieces of burnt or fired clay, burnt stone fragments, small sherds of pottery and small pieces of coal, with the latter almost certainly being intrusive within the contexts from which the samples were taken.

Discussion

For the purposes of this discussion the samples have been divided by feature type and date.

The Roman cremations (Tables A6.1a – 1d)

Approximately 50 cremation burials were identified at the time of excavation and soil samples from backfill of the burial pits were submitted from forty six of these deposits. With only one exception (sample 121 from cremation 45), the recovered assemblages are all extremely small (less than 0.1 litres in volume) and sparse, with some containing only occasional flecks of charcoal. Bone fragments are particularly scarce (both within the flots and the non-floating residues) but, as has already been mentioned (see above), this may in part be the result of the high mineral content within the local soil horizon. The few charred cereals and seeds which are recorded are almost certainly present as either accidental inclusions or relicts of the flora which was burnt *in situ* beneath the pyre. The assemblages from cremations burials 45 (samples 121 and 122) and 46 (samples 119 and 120) all contain a far higher density of charcoal/charred wood than any of the other deposits studied, presumably indicating the inclusion of pyre debris within the material used to backfill the burial pits.

Other Roman features (Table A6.2)

Eighteen samples were taken from pit, posthole and ditch/gully fills of probable Roman date. The assemblages are again mostly small and sparse, and only rarely is it possible to speculate about the origin of the material within them. However, cereals, chaff and weed seeds are present within the assemblage from midden pit [7018] (sample 140), and these, along with a small number of bone fragments (including some burnt pieces) may indicate that this material is derived from a small deposit of hearth waste. The presence of possible cereal processing waste within such a context is not unusual, as similar material was commonly used as either fuel or kindling within Roman Britain (Van der Veen 1999). The assemblage from burnt spread [4055] (sample 18) may also contain a very small quantity of hearth waste, although in this instance the evidence is somewhat sparse. It is, perhaps, more likely that these remains, along with those from ditches [7040] and [7165] (samples 140 and 149 respectively) and gullies [7053] and [7057] (samples 143 and 149 respectively), are derived from scattered or wind-dispersed refuse, some or all of which was accidentally incorporated within the feature fills.

With the exception of four wheat glume bases, the eight assemblages from posthole group [4015] contain little other than charcoal/charred wood fragments.

The medieval features (Table A6.3)

Samples were taken from ditch [5004] (sample 13) and from four grid squares within burnt spread [7006] (samples 144 – 147 inclusive). Cereal grains (particularly wheat) are common within the ditch assemblage, and it would appear most likely that this material is derived from either a small, discrete deposit of cereal storage refuse or domestic hearth waste, with the latter probably being more likely as bone fragments and a piece of hazel nutshell are also recorded. It is possibly of note that the few weed seeds present within the same assemblage are all of a similar size to the grains. Such seeds, which would not have been removed by winnowing, commonly persisted in

batches of prime grain until they were removed by hand immediately prior to consumption/use.

At the time of writing, both the full extent of burnt spread [7006] and its possible association with any other features/activities is unknown. However, although a small number of cereals and weed seeds are recorded, charcoal/charred wood is predominant within all four assemblages, and it is tentatively suggested that the spread may have been generated by the regular burning of refuse and other materials within a specific area of the site.

Recommendations for further work

In summary, although a comprehensive strategy of plant macrofossil sampling was followed, the potential of the recovered assemblages is low as most are very sparse and preservation is generally very poor. Although it is not possible to reach any comprehensive conclusions about the site or its component features, the following general points may be made:

- Wood appears to have been the main fuel used for the cremation pyres. Although there is some indication that dried plant materials and small roundwood may also have been utilised as kindling, this evidence is sparse, largely because of the poor rate of macrofossil retrieval resulting from the heavy mineralization and encrustation of the remains.
- The few seeds recorded within the cremation deposits appear to indicate that grassland conditions were locally prevalent.
- There does not appear to be any evidence for the deposition of food offerings within the pyres.
- The other assemblages of Roman date are a little unusual as plant remains are generally very scarce. At the time of writing, the temporal and spatial relationship of these features to the cremation cemetery is unknown, but it is tentatively suggested that if any are broadly contemporary, this may explain the low density of material recorded. Such a large cremation cemetery would almost certainly have been served by other features and structures, and although the everyday use of these would generate some refuse, it is very unlikely that the assemblages would be typical of those seen, for example, within either the domestic or agricultural context. However, that some evidence for midden deposits is recorded is not surprising, as those constructing the pyres and conducting the ceremonies would almost certainly leave some subsidiary waste.
- Although both hearth refuse and possible bonfire waste are noted within the assemblages of medieval date, it is impossible to place these within any particular context, as the number of features which were recorded and sampled is very limited.

As none of the assemblages contain a sufficient density of material for quantification (ie 100+ specimens) no further analysis is recommended. However, a summary of this assessment should be included within any publication of data from this site.

References

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

Van der Veen, M, 1999 The economic value of chaff and straw in arid and temperate zones, *Vegetation History and Archaeobotany*, **8**, 211-224

Key to Tables

x = 1 – 10 specimens xx = 11 – 50 specimens xxx = 51 – 100 specimens xxxx = 100+ specimens

cf = compare fg = fragment b = burnt ph = post-hole coty = cotyledon
pmc = possible modern contaminant ss = sub-sample

Table A6.1a, part 1: Charred plant remains from the backfill of the burial pits

Sample No.	16	17	22	24	25	28	32	34
Context No.	4066	4068	4087	4089	4093	4091	4105	4098
Feature No.	4067	4069	4088	4090	4094	4092	4106	4099
Cremation								
Burial No.	1	2	4	5	7	6	10	8
Cereals								
<i>Avena</i> sp. (grains)	x	-	-	-	-	-	-	-
<i>Triticum</i> sp. (spikelet base)	-	-	-	-	-	-	-	-
Cereal indet. (grains)	xcf	-	-	-	x	xcffg	-	xcffg
Herbs								
<i>Bromus</i> sp.	-	-	x	-	-	-	-	-
Fabaceae indet.	-	xcf	-	-	-	-	-	-
<i>Plantago lanceolata</i> L.	-	-	-	-	-	-	-	-
Other plant macrofossils								
Charcoal <2mm	x	xxxx	xx	x	x	xx	x	x
Charcoal >2mm	x	xx	-	-	-	-	-	x
Charcoal >5mm	-	-	-	-	-	-	-	-
Charred root/stem	-	-	-	-	-	-	x	-
Indet.seed	-	-	-	-	-	-	-	x
Other remains								
Black porous 'cokey' material	-	-	x	-	x	x	x	-
Black tarry material	-	-	-	-	-	-	-	-
Bone	-	-	x	-	-	-	-	-
Burnt/fired clay		x	x	-	-	-	-	-
Burnt organic concretion	-	-	x	-	-	-	-	-
Small coal frags.	-	-	-	-	-	-	x	-
Sample volume (litres)	-	-	-	-	-	-	-	-
Volume of flot (litres)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
% flot sorted	100%	100%	100%	100%	100%	100%	100%	100%

Table A6.1a, part 2: Charred plant remains from the backfill of the burial pits

Sample No.	37	39	42	45	47	51	53	55
Context No.	4107	4103	4115	4121	4119	4133	4128	4139
Feature No.	4108	4104	4116	4122	4120	4124	4129	4140
Cremation								
Burial No.	11	9	12	14	13	18	16	21
Cereals								
<i>Avena</i> sp. (grains)	-	-	-	-	-	-	-	-
<i>Triticum</i> sp. (spikelet base)	-	-	-	-	-	-	x	-
Cereal indet. (grains)	-	-	-	-	-	-	-	-
Herbs								
<i>Bromus</i> sp.	-	-	-	-	-	-	-	-
Fabaceae indet.	-	-	-	-	-	-	xcffg	-
<i>Plantago lanceolata</i> L.	-	-	-	-	-	-	x	-
Other plant macrofossils								
Charcoal <2mm	x	x	x	x	x	x	xx	x
Charcoal >2mm	-	x	-	-	x	-	x	x
Charcoal >5mm	-	x	-	-	-	-	x	x
Charred root/stem	-	x	-	-	-	-	-	x
Indet.seed	-	-	-	-	-	-	-	-
Other remains								
Black porous 'cokey' material	-	-	-	x	-	-	-	-
Black tarry material	-	x	-	-	-	-	-	-
Bone	-	-	-	xb	-	-	x xb	-
Burnt/fired clay	-	-	-	-	-	-	x	x
Burnt organic concretion	-	-	-	-	-	-	-	-
Small coal frags.	-	x	-	-	x	x	x	-
Sample volume (litres)	-	14	16	16	-	16	28	16
Volume of flot (litres)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
% flot sorted	100%	100%	100%	100%	100%	100%	100%	100%

Table A6.1b, part 1: Charred plant remains from the backfill of the burial pits

Sample No.	57	60	61	63	65	67	69	72
Context No.	4131	4137	4159	4145	4157	4152	4143	4135
Feature No.	4132	4138	4160	4146	4158	4153	4144	4136
Cremation								
Burial No.	17	20	61	24	28	26	23	19
Cereals								
<i>Avena</i> sp. (grains)	xcf	-	-	-	-	-	-	-
Cereal indet. (grains)	-	-	-	-	-	-	-	-
Other plant macrofossils								
Charcoal <2mm	xx	xx	x	xx	x	x	xx	xx
Charcoal >2mm	x	x	-	xx	x	x	xx	xx
Charcoal >5mm	-	-	-	-	-	-	x	x
Charred root/stem	-	x	-	-	-	x	x	-
Indet.thorn (<i>Rosa</i> type)	-	-	-	-	-	-	-	x
Other remains								
Black porous 'cokey' material	-	x	-	-	-	-	x	-
Black tarry material	-	-	-	x	-	x	x	-
Bone	-	-	-		-		x xb	x
Burnt/fired clay	x	x	-	x	-	x	-	-
Small coal frags.	x	x	-	x	x	-	x	-
Small mammal/amp hibian bone	-	-	-	x	-	-	-	-
Sample volume (litres)	16	28	16	16	14	16	16	28
Volume of flot (litres)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
% flot sorted	100%	100%	100%	100%	100%	100%	100%	100%

Table 1b, part 2: Charred plant remains from the backfill of the burial pits

Sample No.	74	76	77	78	80	81	84	85
Context No.	4145	4170	4172	4173	4176	4164	4182	4177
Feature No.	4146	4171	4171	4174	4174	4165	4183	4178
Cremation								
Burial No.	27	31	31	32	32	30	35	33
Cereals								
<i>Avena</i> sp. (grains)	-	-	-	-	-	-	-	-
Cereal indet. (grains)	-	-	-	-	-	-	x	-
Other plant macrofossils								
Charcoal <2mm	xx	xx	x	x	xx	x	x	x
Charcoal >2mm	xx	xx	x	x	xx	-	x	x
Charcoal >5mm	-	x	x	-	-	-	x	-
Charred root/stem	-	x	-	x	-	-	x	-
Indet.thorn (<i>Rosa</i> type)	-	-	-	-	-	-	-	-
Other remains								
Black porous 'cokey' material	x	-	-	-	-	x	-	x
Black tarry material	x	-	-	-	-	x	-	-
Bone	x xb	xx xb	-	-	x xxb		xb	-
Burnt/fired clay	-	-	-	-	-	x	-	x
Small coal frags.	x	-	x	x	-	-	x	-
Small mammal/amp hibian bone	-	-	-	-	-	-	-	-
Sample volume (litres)	28	16	14	20	20	16	14	16
Volume of flot (litres)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
% flot sorted	100%	100%	100%	100%	100%	100%	100%	100%

Table A6.1c, part 1: Charred plant remains from the backfill of the burial pits

Sample No.	88	99	102	103	105	106	108	109
Context No.	4187	4192	4150	4179	4201	4198	4191	4205
Feature No.	4187	4193	4151	4180	4180	4199	4190	-
Cremation								
Burial No.	36	38	25	34	34	40	37	41
Cereals								
<i>Hordeum</i> sp. (grains)	-	-	-	-	-	x	-	-
Herbs								
<i>Bromus</i> sp.	-	-	-	-	-	-	-	-
Polygonaceae indet.	-	-	-	-	-	-	-	-
Other plant macrofossils								
Charcoal <2mm	x	x	x	xxx	x	xx	xx	x
Charcoal >2mm	-	x	x	xx	x	-	x	x
Charcoal >5mm	-	-	-	-	-	-	-	-
Charred root/stem	-	-	-	x	-	-	x	-
Other remains								
Black porous 'cokey' material	-	x	x	-	-	-	x	-
Black tarry material	x	-	-	-	-	x	-	-
Bone	x	xb	-	x xb	x xxb	x xb	-	xxb
Burnt/fired clay	x	-	-	-	-	-	-	x
Burnt stone	-	-	-	-	x	-	-	-
Pottery	-	-	x	-	-	-	-	-
Small coal frags.	-	x		x	-	-	-	x
Vitreous material	-	-	-	x	-	-	-	-
Sample volume (litres)	16	14	16	28	16	16	14	16
Volume of flot (litres)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
% flot sorted	100%	100%	100%	100%	100%	100%	100%	100%

Table A6.1c, part 2: Charred plant remains from the backfill of the burial pits

Sample No.	110	113	116	119	120	121	122
Context No.	4206	4213	4209	4222	4220	4218	4223
Feature No.	4208	4214	4210	4220	4221	4218	4219
Cremation							
Burial No.	42	44	43	46	46	45	45
Cereals							
<i>Hordeum</i> sp. (grains)	-	-	-	-	-	-	-
Herbs							
<i>Bromus</i> sp.	-	-	-	-	-	x	-
Polygonaceae indet.	-	-	-	-	-	-	x
Other plant macrofossils							
Charcoal <2mm	x	xx	x	xxxx	xx	xxxx	xxxx
Charcoal >2mm	x	x	-	xxxx	x	xxx	xx
Charcoal >5mm	-	x	-	-	-	x	-
Charred root/stem	-	x	-	-	-	-	x
Other remains							
Black porous 'cokey' material	-	x	-	-	-	-	x
Black tarry material	-	-	-	-	-	-	-
Bone	xb	-	xb	-	xb	x xb	x xb
Burnt/fired clay	x	-	-	-	-	-	x
Burnt stone		-	-	-	-	-	-
Pottery	x	-	-	-	-	-	-
Small coal frags.	x	x	-	x	-	x	x
Vitreous material	-	-	-	-	-	-	-
Sample volume (litres)	16	28	14	56	16	42	16
Volume of flot (litres)	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.1
% flot sorted	100%	100%	100%	100%	100%	50%	100%

Table A6.1d: Charred plant remains from the backfill of the burial pits

Sample No.	126	127	128	131	133
Context No.	4232	4194	4225	4233	4192
Feature No.	-	4195	4224	4234	4193
Cremation Burial No.	48	39	47	49	38
Cereals					
Cereal indet. (grains)	xcf	-	-	xfg	x
Other plant macrofossils					
Charcoal <2mm	x	x	xx	xx	xx
Charcoal >2mm	x	x	x	x	xxx
Charcoal >5mm	-	x	-	-	x
Charred root/stem	-	-	-	-	x
Other remains					
Black porous 'cokey' material	x	-	x	-	-
Black tarry material	-	-	-	-	-
Bone	xb	x xb	x	x xb	x xb
Burnt/fired clay	-	x	-	-	-
Pottery	-	xcf	-	-	-
Small coal frags.	-	x	-	-	x
Sample volume (litres)	20	28	20	16	14
Volume of flot (litres)	<0.1	<0.1	<0.1	<0.1	<0.1
% flot sorted	100%	100%	100%	100%	100%

Table A6.2, part 1: Charred plant remains from other Roman features

Sample No.	14	15	18	90	91	92
Context No.	4027	4045	4055	4029	4031	4033
Feature No.	4028	4046	-	4030	4032	4034
Feature type	Pit	Pit	Spread	ph	ph	ph
Group				4015	4015	4015
Cereals						
<i>Hordeum</i> sp. (grains)	-	-	-	-	-	-
<i>Triticum</i> sp. (grains)	-	-	xcf	-	-	-
(glume base)	-	-	-	-	-	-
(spikelet base)	-	-	-	-	-	-
<i>T. dicoccum</i> Schubl						
(glume bases)	-	-	-	-	-	-
<i>T. spelta</i> L. (glume bases)	-	-	-	-	-	-
Cereal indet. (grains)	-	-	x	-	-	-
Herbs						
<i>Bromus</i> sp.	-	-	-	-	-	-
Fabaceae indet.	-	-	-	-	-	-
Large Poaceae indet.	xcf	-	-	-	-	-
<i>Polygonum aviculare</i> L.	-	-	x	-	-	-
Polygonaceae indet.	-	-	x	-	-	-
Other plant macrofossils						
Charcoal <2mm	xxxx	xxxx	xxxx	xxx	xx	xx
Charcoal >2mm	xxxx	xxxx	x	xxxx	xx	xx
Charcoal >5mm	xx	x	-	-	x	x
Charred root/stem	x	x	x	x	x	x
Indet.seed	-	-	-	-	-	-
Other remains						
Black porous 'cokey' material	-	-	-	-	-	-
Black tarry material	-	-	-	-	-	-
Bone	-	-	-	-	-	-
Burnt/fired clay	-	-	-	-	-	-
Burnt soil concretions	xx					
Burnt stone	-	x	-	x	x	x
Small coal frags.	-	x	x	-	x	x
Small mammal/amphibian bone	-	-	-	-	-	-
Vitreous material	-	x	-	-	-	-
Sample volume (litres)						
	28ss	28ss	14	14	20	14
Volume of flot (litres)	0.6	0.4	<0.1	0.1	0.2	<0.1
% flot sorted	25%	25%	100%	100%	50%	100%

Table A6.2, part 2: Charred plant remains from other Roman features

Sample No.	93	94	96	97	98	118
Context No.	4035	4037	4041	4045	4058	4211
Feature No.	4036	4038	4042	4046	4059	4212
Feature type	ph	ph	ph	ph	ph	Pit
Group	4015	4015	4015	4015	4015	
Cereals						
<i>Hordeum</i> sp. (grains)	-	-	-	-	-	-
<i>Triticum</i> sp. (grains)	-	-	-	-	-	-
(glume base)	-	-	-	-	-	-
(spikelet base)	-	-	-	-	-	-
<i>T. dicoccum</i> Schubl						
(glume bases)	-	-	x	-	xcf	-
<i>T. spelta</i> L. (glume bases)	-	-	x	-	x	-
Cereal indet. (grains)	-	-	-	-	-	-
Herbs						
<i>Bromus</i> sp.	-	-	-	-	-	-
Fabaceae indet.	-	-	-	-	-	-
Large Poaceae indet.	-	-	-	-	-	-
<i>Polygonum aviculare</i> L.	-	-	-	-	-	-
Polygonaceae indet.	-	-	-	-	-	-
Other plant macrofossils						
Charcoal <2mm	xx	x	xxxx	xx	xxxx	xxxx
Charcoal >2mm	x	xx	xxxx	xxxx	xxxx	xxxx
Charcoal >5mm	-	x	xx	-	x	x
Charred root/stem	x	-	x	x	x	-
Indet.seed	-	-	-	-	-	x
Other remains						
Black porous 'cokey' material	-	-	-	-	-	-
Black tarry material	-	-	-	-	x	-
Bone	-	-	-	-	-	-
Burnt/fired clay	-	-	-	-	-	-
Burnt soil concretions	-	-	-	-	-	-
Burnt stone	-	-	-	x	-	x
Small coal frags.	x	-	-	x	x	-
Small mammal/amphibian bone	-	-	-	-	-	-
Vitreous material	-	-	-	-	-	-
Sample volume (litres)						
	16	14	16	14	14	14
Volume of flot (litres)	<0.1	<0.1	0.4	0.1	0.1	0.2
% flot sorted	100%	100%	25%	100%	100%	50%

Table A6.2, part 3: Charred plant remains from other Roman features

Sample No.	135	140	141	142	143	149
Context No.	4243	7013	7042	7052	7056	7164
Feature No.	4245	7018	7040	7053	7057	7165
Feature type	Ditch	Midden	Ditch	Gully	Gully	Ditch
Cereals						
<i>Hordeum</i> sp. (grains)	-	xcf	-	-	-	-
<i>Triticum</i> sp. (grains)	-	x	-	x	-	x
(glume base)	-	x	-	-	-	-
(spikelet base)	-	x	-	-	-	-
<i>T. dicoccum</i> Schubl						
(glume bases)	-	-	-	-	-	-
<i>T. spelta</i> L. (glume bases)	-	x	-	-	-	-
Cereal indet. (grains)	-		xfg	x	xfg	
Herbs						
<i>Bromus</i> sp.	-	xcf	-	-	-	-
	xcfcotyf					
Fabaceae indet.	g	x	-	-	-	-
Large Poaceae indet.	-	-	-	-	-	-
<i>Polygonum aviculare</i> L.	-	-	-	-	-	-
Polygonaceae indet.	-	-	-	-	-	-
Other plant macrofossils						
Charcoal <2mm	x	xx	x	xx	xfg	xx
Charcoal >2mm	-	x	x	xx	-	-
Charcoal >5mm	-	x	-	x	-	-
Charred root/stem	-	x	-	-	xfg	-
Indet.seed	-	-	-	-	-	-
Other remains						
Black porous 'cokey' material	-	x	-	-	x	x
Black tarry material	x	x	-	x	-	-
Bone	-	x xb	x	x	x	x
Burnt/fired clay	-	x	-	-	-	-
Burnt soil concretions	-	-	-	-	-	-
Burnt stone	-	-	-	-	-	-
Small coal frags.	x	x	x	-	-	-
Small mammal/amphibian bone	-	-	xpmc	-	-	-
Vitreous material	-	-	-	-	-	x
Sample volume (litres)						
	16ss	28ss	28ss	34ss	20	50ss
Volume of flot (litres)	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
% flot sorted	100%	100%	100%	50%	100%	100%

Table A6.3: Charred plant remains from medieval features

Sample No.	13	144	145	146	147
Context No.	5003	7111	7123	7124	7125
Feature No.	5004	-----	-----	-----	-----
Feature type	Ditch	Spread	Spread	Spread	Spread
Grid Square		AN	AW	AX	AY
Cereals					
<i>Avena</i> sp. (grains)	xcf	-	-	-	-
<i>Triticum</i> sp. (grains)	xx	-	-	-	x
Cereal indet. (grains)	xx		xfg	x	xfg
Herbs					
Brassicaceae indet.	-	-	-	-	xcf
<i>Bromus</i> sp.	x	-	-	-	x
Fabaceae indet.	x	-	-	-	-
<i>Fallopia convolvulus</i> (L.) A. Love	xcf	-	-	-	-
<i>Galium aparine</i> L.	-	-	-	-	xfg
Tree/shrub macrofossils					
<i>Corylus avellana</i> L.	x	-	-	-	-
Other plant macrofossils					
Charcoal <2mm	xxxx	xxxx	xxxx	xxxx	xxxx
Charcoal >2mm	xxx	xxx	xxx	xx	xxx
Charcoal >5mm	-	x	x	x	x
Charcoal >10mm	-	x	-	-	-
Indet. seed	-	-	-	-	x
Indet. tuber frag.	-	xcf	-	-	-
Other remains					
Black porous 'cokey' material	xx	x	-	-	x
Black tarry material	x	-	-	-	-
Bone	x xb	-	-	x	-
Burnt/fired clay	x	-	x	-	x
Small mammal/amphibian bones	x	-	-	-	-
Sample volume (litres)	28	20	14	16	14
Volume of flot (litres)	<0.1	0.1	0.1	0.3	0.2
% flot sorted	100%	100%	100%	50%	50%

APPENDIX 7: THE ANIMAL BONE

by Laszlo Lichtenstein

Introduction

The animal bone from Sites A, B and C was identified using Northamptonshire Archaeology's vertebrate reference collection, and further guidelines from Schmid (1972), Driesch (1979), Sisson & Grossman (1953) and Feher (1990, 25-108). Due to anatomical similarities between sheep and goat the criteria set out by J Boessneck (1969) were used to separate the two species. Ageing data and tooth eruption and wear were categorised according to Hillson (2005) with the identification of juvenilis after Amorosi (1989).

The following were recorded for each bone: species, anatomical element, fragmentation, side, fusion, cut- or animal teeth marks and sex (where applicable). Bones that could not be identified to species were, where possible, categorised according to the relative size of the animal represented (large ungulate size: cattle or horse sized, small ungulate size: sheep or goat). Ribs and vertebra were not identified to species, except the vertebrae of bos (cattle). All fragments were recorded.

Site A

The environmental evidence

The material, a total of 52 NISP (175g) hand-collected animal bone elements and fragments, was recovered from the fills of three Roman ditches: (4022) ditch [4021], (4025) ditch [4026] and (4070) ditch [4071]. Employing standard zooarchaeological methodological procedures seven specimens (13.5% of the total NISP) were identified to taxa and parts of anatomy, representing at least two mammalian species: *Bos*/cattle and *Ovis*/sheep. No avian, fish or amphibian bones were recovered.

Taphonomy

The bones were generally in very poor condition, with the bone surface severely abraded and flaking away because of the highly acidic soil conditions. The fragmentation was very high (Table A7.1), with the majority (91.5 %) being less than 50mm in size. No complete long bones were recorded because the proximal and the distal ends were damaged. Taphonomic factors affecting the material were recorded, with 50% of the total NISP showed signs of recent breaks. No evidence for burning, butchery or bone working was observed.

Table A7.1: Site A, size of the animal bone assemblage (without teeth)

Size (mm)	Count	Percentage
<20	24	51.1 %
20-50	19	40.4 %
50-100	4	8.5 %

Table A7.2 shows the fragment count of species. Due to the high fragmentation of the assemblage, only 18.2% were identified to species. The majority of bones came from cattle (16.4%).

Table A7.2: Site A, species present in the animal bone assemblage by fragment count

Species	NISP	Percentage
<i>Bos taurus</i> L. (Linné 1758)	9	16.4 %
<i>Ovis aries</i> L. (Linné 1758)	1	1.8 %
Large ungulate size	20	36.4 %
Small ungulate size	25	45.4 %

Table A7.3: Site A, Minimal Number of Individuals in the animal bone assemblage

Common name	MNI
Cattle	2
Sheep	1
Large ungulate size	1
Small ungulate size	1

Ageing

Little ageing data was available from the tooth wear and eruption data. The third molar of a *Bos* was recorded as an adult individual, younger than five years. One slightly worn down first molar of an *Ovis* was recorded as a juvenile individual.

Discussion

The state of preservation for bone on the site was generally poor. The amount of material retrieved was below the level anticipated for a site of domestic occupation. However, it can be stated that cattle and sheep were utilised at or near the site.

The assemblage was very small with only ten bones identified to species and does not warrant further analysis.

Site B

The environmental evidence

A single freshly broken bone, weighing 265g, was recovered in seven fragments from fill (5007) of ditch [5008] during the excavation. Examination showed these to be tuber scapulae, collum and spina scapulae fragments of an *equus* (horse) shoulder blade (Table A7.4).

Table A7.4: Site B, size of the animal bone assemblage

Size (mm)	Count
20-50	1
50-100	5
100-150	1

No evidence for butchery, canid gnawing, burning or pathological signs was recovered.

This very small assemblage is too small to warrant further analysis.

Site C

The environmental evidence

A total of 639 animal bone elements and fragments, weighing 6.664kg, from Roman and medieval features were analysed.

The material was recovered from fills of three Roman ditches: (7028) ditch [7030], (7041-7044) ditch [7040] and (7185) ditch [7187]; the fills of four Roman gullies: (7052) gully [7053], (7054) gully [7055], (7058) gully [7059] and (7066) gully [7067]; and one Roman pit (7064) [7065]

Further material came from a medieval spread/layer 7006 (same as 7072, 7093, 7099, 7109, 7114, 7116, 7121); a fill of hollow (7007), and a gully (7056) [7057] without datable finds (Table A7.5).

Table A7.5: Site C, species present in the animal bone assemblage by fragment count

Species/taxa	Count (Roman)	Percentage (Roman)	Count (medieval)	Percentage (medieval)
<i>Bos taurus</i> L. (Linné 1758)	249	40 %	2	13.3 %
<i>Equus caballus</i> L. (Linné 1758)	37	5.9 %	-	-
<i>Ovis aries</i> L. (Linné 1758)	7	1.1 %	1	6.7 %
Ovicaprid	4	0.7 %	-	-
<i>Sus scrofa domestica</i> B. (Brisson 1762)	5	0.8 %	-	-
Large ungulate size	240	38.7 %	7	46.7 %
Small ungulate size	39	6.3 %	2	13.3 %
Unidentified	40	6.5 %	3	20 %
Human bone	-	-	1	-
Total	621		16	

Roman period

A total of 621 NISP (6443g) hand-collected animal bone elements and fragments were analysed from the Roman period. Employing standard zooarchaeological methodological procedures 302 specimens (48.5% of the total NISP) were identified to taxa and parts of anatomy, representing at least four mammalian (*Bos*/cattle; *Equus*/horse, *Ovicaprid*/sheep or goat, *Sus*/pig) species. The majority of bones came from cattle (40%). No avian, fish, amphibian or small mammalian bones were recovered.

Taphonomy

The bones were generally in good condition, but the fragmentation was high (Table A7.6), with the majority (57.2%) being less than 50mm in size. No complete long bones recorded, because the proximal and the distal ends were damaged. Taphonomic factors affecting the material were recorded including gnawed, butchered and recently broken bones (more than 50% showed signs of fresh breaks), 3.5% (22 fragments) had been affected by butchery.

Canid gnawing was seen on 1% (six fragments) of bone. 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.

Table A7.6: Site C, size of the animal bone assemblage (without the teeth) in the Roman period

Size (mm)	Count	Percentage
<20	62	10.2 %
20-50	286	47 %
50-100	227	37.3 %
100-150	31	5.1 %
150-200	1	0.2 %
200-250	1	0.2 %

Ageing and sex

Ageing data was available because of the cattle teeth and bone fusion (Table A7.7). The most epiphyseal fusion was recorded for cattle bones; although the majority of these animals (at least four individuals) were mature at death.

Table A7.7: Site C, the ageing data after the cattle teeth in the Roman period

Context/feature	Species	Years
7041-7044 / ditch 7040	cattle	One individual younger than 2 years
7041-7044 / ditch 7040	cattle	2 individual adult
7052 / gully 7053	cattle	Older than 15 years
7064 / pit 7065	cattle	One individual younger than 2-2.5 years
7064 / pit 7065	cattle	1 individual adult

All horse teeth and bone were part of a mature animal.

In only one case can the sex be determined: where the size of the *sus* canine indicates that this individual was an adult female (7041).

Table A7.8: Site C, Minimal Number of Individuals identified in the animal bone assemblage in the Roman period

Common name	MNI
Cattle	6
Horse	2
Sheep/Goat	2
Pig	1
Large ungulate size	1
Small ungulate size	1
Unidentified	-

Discussion

More animal bone was recovered from the Roman contexts than from the medieval contexts. The fragmentation was very high. Of the assemblage, 48.5% could be identified to species. The assemblage is dominated by cattle, followed by lower numbers of horse and sheep/goat. The pig remains are moderate percentages for this period. The dog gnawing was of relatively low frequency (1% of the total NISP). None of the bones from the contexts was burnt and only 3.5% of the total NISP had been affected by butchery.

Medieval period**Introduction**

The material was recovered from spread/layer 7006 (same as 7072, 7093, 7099, 7109, 7114, 7116 & 7121). A total of 16 NISP (118g) hand-collected animal bone elements and fragments were analysed from these contexts. Employing standard zooarchaeological methodological procedures three specimens (20% of the total NISP) were identified to taxa and parts of anatomy, representing at least two mammalian (*Bos*/cattle; *Ovis*/sheep) species. No avian, fish or amphibian bones were recovered.

Taphonomy

The bones were generally in good condition. The fragmentation was high (Table A7.9), with the majority (79.7%) being less than 50mm in size. No complete long bones were recorded, because the proximal and the distal end were damaged. Taphonomic factors affecting the material were recorded recently broken bones. No evidence for burning or

bone working was observed. Two instance of butchery was noted on fragments of *bos* radius and on a large ungulate-size animal long bone fragment.

Table A7.9: Site C, Size of the animal bone assemblage (without the teeth)

Size (mm)	Count	Percentage
<20	5	33 %
20-50	7	46.7 %
50-100	2	13.4 %
100-150	1	6.9 %

Table A7.10: Site C, Minimal individual identified in the animal bone assemblage

Common name	MNI
Cattle	1
Sheep	1
Large ungulate size	1
Small ungulate size	1

Discussion

The amount of material was retrieved was below the level anticipated for a site of domestic occupation. However, it can be stated that cattle and sheep were utilised at or near the site. The species present and their relativ proportions appear to be typical for the medieval period.

The assemblage was very small with only three bones identified to species and does not warrant further analysis.

References

- Boessneck, J, 1969 Osteological Differences between Sheep (*Ovis aries* Linne) and Goat, (*Capra hircus* Linne), in Brothwell and Higgs, 331-358
- Brothwell, D, and Higgs, E S, 1969 *Science and Archaeology*, 2nd edition, Thames and Hudson, London
- Driesch, A, von den, 1976 *A guide to the measurements of animal bones from archaeological sites*, Peabody Museum Bulletin, **1**, Cambridge, Ma: Harvard University
- Feher, G, 1976 *Haziállatok funkcionális anatómiája*, Budapest
- Hillson, S, 2005 *Teeth. Cambridge manuals in archaeology*, 2nd edition Cambridge
- Amorosi, T, 1989 *A Postcranial Guide to Domestic Neo-Natal and Juvenile Mammals. The identification and Aging of Old World Species*, BAR International Series, **533**
- Sisson, S, & Grossman, J D, 1953 *The Anatomy of the domestic animals*, 4th edition, revised, Philadelphia and London
- Schmid, E, 1972 *Atlas of animal bones for prehistorians, Archaeologist and Quaternary Geologists*, Elsevier publishing company, Amsterdam-London New York



Northamptonshire County Council

Northamptonshire Archaeology



Northamptonshire Archaeology

2 Bolton House
Wootton Hall Park
Northampton NN4 8BE

t. 01604 700493 f. 01604 702822

e. sparry@northamptonshire.gov.uk

w. www.northantsarchaeology.co.uk



Northamptonshire
County Council