

Northamptonshire Archaeology

An Archaeological Watching Brief and Excavation
North-West of Irchester Roman Town,
Northamptonshire
March 2006



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OASIS REPORT FORM

PROJECT DETAILS		
Project name	An Archaeological Watching brief and Excavation North-west of Irchester Roman Town, Northamptonshire	
Short description (250 words maximum)	In March 2006 Northamptonshire Archaeology conducted a watching brief whilst ground was prepared for the construction of a car park and access road to the north-west of Irchester Roman town. Ten human skeletons, of probable early-mid 4th century date, were exposed and excavated as a result of the work. Anomalous bone growth inside the skull of one of the skeletons may be the result of meningitis.	
Project type	Watching brief/Excavation	
Site status		
Previous work	Evaluation (Mason 2005)	
Current Land use	Meadow	
Future work	N/A	
Monument type/ period	Roman	
Significant finds	Human skeletons	
PROJECT LOCATION		
County	Northamptonshire	
Site address	Irchester	
Study area (sq.m or ha)		
OS Easting & Northing	494244 267793	
Height OD	42m	
PROJECT CREATORS		
Organisation	English Heritage/NCC	
Project brief originator	Michel Kerrou	
Project Design originator		
Director/Supervisor	Paul Mason	
Project Manager	Steve Parry	
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AN ARCHAEOLOGICAL WATCHING BRIEF AND EXCAVATION

**NORTH-WEST OF IRCHESTER ROMAN TOWN,
NORTHAMPTONSHIRE**

MARCH 2006

ABSTRACT

In March 2006 Northamptonshire Archaeology conducted a watching brief whilst ground was prepared for the construction of a car park and access road to the north-west of Irchester Roman town. Ten human skeletons, of probable early-mid 4th century date, were exposed and excavated as a result of the work. Anomalous bone growth inside the skull of one of the skeletons may be the result of meningitis.

1 INTRODUCTION

Northamptonshire Archaeology was commissioned by Northamptonshire County Council to undertake a watching brief on land to the north-west of Irchester Roman town (NGR 494244 267793, Fig 1). The fieldwork was undertaken in March 2006 in advance of groundworks relating to the construction of an access road and car park for the proposed Chester Farm Heritage Park. As a result of the watching brief, ten Roman burials were located and excavated.

2 BACKGROUND

2.1 Historical and archaeological

The earliest evidence for human activity in the vicinity of the site comes from a series of Mesolithic flints. Roman occupation at Irchester dates from the 1st century AD, possibly replacing an earlier Iron Age settlement. The Roman town was subsequently enclosed by an earthen rampart that was later topped by a stone wall which defined an area of c8ha. The extra mural settlement covered at least 14ha.

A series of specialist conservation investigations were undertaken in 2005 to inform a Conservation Management Plan (CMP) for a proposed Heritage Park at Chester Farm. As part of this study a comprehensive appraisal of the historical and archaeological background of the Roman settlement at Irchester was made (Meadows 2005). Geophysical and earthworks surveys were also undertaken

(Butler and Yates 2005), although the present study area to the north-west of the town was excluded as it had previously been surveyed in 1990/91 (Dix 1991).

The 1990/91 geophysical survey revealed a series of rectilinear enclosures to the east of the excavation area comprising the present study. They appeared to predate the north-western ramparts of the Roman town and were bounded to the west by a curvilinear trackway. The excavation site lies to the north of the track and to the north-east of the largest of the enclosures (Fig 2). Fieldwalking here produced a dense scatter of 1st to 4th century pottery sherds. Trial trenching in close vicinity revealed track-side ditches and other shallow ditches (Dix 1991, 3).

To the east of the town, as part of the 2005 Survey the main access route to Chester Farm was evaluated (Upson-Smith 2005). A series of test pits were excavated along the length of the track and skeletons were found at its southern end. Due to the small scale of the excavations, it is unclear whether they represent the remains of a cemetery but, if Roman, they provide further evidence of the eastern extent of the extra mural settlement at Irchester.

In March 2005 Northamptonshire Archaeology conducted an evaluation comprising three test pits in the vicinity of the new car park and access road. A subsoil containing sherds of 1st to 4th century pottery sherds was observed below the topsoil (Mason 2005).

2.2 Topography and geology

The site lies towards the base of the southern side of the Nene Valley at *c* 42m OD on a scarp marking the edge of the solid geology where it gives way to the glacial gravels and alluvial clays of the flood plain. The solid geology of the valley side comprises a lower deposit of Upper Lias Clay under Northampton Sand and Ironstone that in turn is capped by clay and limestone of the Upper Estuarine series. This is overlain by ferrite brown earths of the Banbury association.

The site is currently occupied by meadowland bounded by Victoria Business Park to the west and the ramparts of the Roman town to the east. To the north lies the River Nene and the A45 is located to the south. Chester Farm and its outbuildings lie some 400m to the east.

3 OBJECTIVES AND METHODOLOGY

A watching brief was undertaken whilst localised reductions of the ground level were made prior to the construction of a car park and access road to the north-west of Irchester Roman town. The objective of the fieldwork was to record and, if necessary, excavate any archaeological remains that would be affected by the development. The groundworks revealed a number of human burials which were subsequently excavated under licence issued by the Department for Constitutional Affairs (Licence no 06-0037).

The fieldwork was carried out in accordance with the Institute of Field Archaeologists (IFA) standards and guidance for watching briefs. The works were conducted in accordance with the Health and Safety Policy of Northamptonshire County Council. A full risk assessment was prepared for the work, and the methods of working conformed to the Health and Safety policy of the principal contractor on the site.

Records were made on standard Northamptonshire Archaeology pro-forma watching brief forms, context sheets and burial sheets. Plans of the excavated areas and features were made at scales of 1:20, 1:100 and 1:500. A photographic record was maintained in colour slide, monochrome print and digital formats.

The site code ICP06 was allocated to the site.

4 THE EXCAVATED EVIDENCE

4.1 The access road

Observations were made whilst the ground level was reduced over the route of the new access road leading from Victoria Business Park to the north-west corner of the Roman town. A linear strip measuring some 55m in length and up to 7m wide was excavated revealing a reddish brown sandy loam subsoil c0.2-0.5m below the existing ground level. This was overlain by a mid greyish brown sandy loam topsoil which contained fragmentary building materials and the occasional sherd of heavily abraded Roman pottery which was discarded on site. No archaeological features were present.

4.2 **The car park** (Fig 3)

Adjoining the southern side of the access road, a rectangular area measuring *c*70m x 15m was reduced to a depth of up to 0.5m exposing sand and ironstone geology (1003) beneath *c*0.2-0.5m of topsoil. A wide band of reddish brown subsoil or colluvium (1002) crossed the centre of the stripped area on a north-south alignment. To the east of this, close to the northern edge of the area, two large pits [1019] and [1021] were cut into the ironstone. Although they were not excavated, sherds of pottery dating from the 1st/2nd century were recovered from the surface fills (1020) and (1022).

Lying over, and in some instances, cut into the ironstone at the eastern end of the stripped area (at *c*42m OD) were ten human inhumations whose levels of preservation varied considerably (Fig 4). Thirty two sherds from a large storage jar of possible 2nd century date were found compressed onto the surface of the ironstone geology in the vicinity of the burials along with two possible postholes [1028] and [1030].

Burial 1

Burial 1 (1004) comprised a reasonably complete, highly fragmented, skeleton of an adult (45-60 years old), probably male. It was orientated WNW-ESE.

Burial 2

Burial 2 (1007) lay within a visible grave cut [1006]. It comprised the reasonably complete, moderately fragmented skeleton of an adult (45-60 years old), probably female. It was orientated WSW-ENE. A small copper alloy coin of probable early 4th century date lay over the right pelvis (Plate 1). The grave fill (1008), a reddish sandy loam, contained heavily abraded pottery sherds of 1st to 4th century date.

Burial 3

Burial 3 (1009) comprised the partial, highly fragmented remains of a young adult of indeterminate sex. It was orientated NNE-SSW.

Burial 4

Burial 4 (1010) comprised the partial, highly fragmented remains of a young adult of indeterminate sex. It was orientated WSW-ESE.

Burial 5

Burial 5 (1011) comprised the partial, highly fragmented remains of young adult, probably female. It was orientated WNW-ESE.

Burial 6

Burial 6 (1012) comprised the partial, highly fragmented remains of a young adult. It was orientated W-E.

Burial 7

Burial 7 (1014) lay within a visible grave cut [1013]. It was a reasonably complete, highly fragmented skeleton of a mature adult, probably male. It was orientated WNW-ESE. Sherds of highly abraded Roman pottery were present in the reddish sandy loam fill of the grave (1015).

Burial 8

Burial 8 (1016) comprised the partial, very fragmented lower skeleton and vertebrae of a young/mature adult. It was orientated WNW-ESE.

Burial 9

Burial 9 (1017) comprised the partial, highly fragmented skeleton of an adult. It was orientated WNW-ESE.

Burial 10

Burial 10 (1018) comprised the near complete, highly fragmented skeleton of a female aged 18-21 years. The presence of extensive endocranial new bone formation may indicate that the individual suffered from meningitis (see below, Plate 2). The burial was orientated SSW-NNE and overlay the earlier pit [1021].

Modern Features

A land drain [1024] bisected the stripped area on a N-S axis and a furrow [1033] was aligned NW-SE to the west. Poorly preserved fragments of unidentifiable animal bone were found in the fill of the furrow (1023).

5 THE FINDS

5.1 Pottery by Tora Hylton

The evaluation produced a small group of pottery spanning the mid-late 1st-4th centuries. A total of eighty five sherds with a combined weight of 1.359kg were recovered from seven individual deposits in the area designated as a car park. A small number of residual sherds were recovered from grave fills associated with Burials 2 (1008) and 7 (1015), while much of the remainder were recovered from two adjoining pits (1020, 1022), lying beneath Burial 10.

Much of the assemblage is extremely abraded, with sherds displaying very few diagnostic features. This suggests that they may have been lying around for sometime prior to deposition. The analysis included sherd count and weight by fabric type.

Table 1: Pottery quantification

FABRIC TYPE	CONTEXT/FEATURE NUMBER													
	1001		1008		1015		1020		1022		1026		1027	
	Topsoil		Burial 2		Burial 7		Pit fill		Pit fill		Land drain		Pot spread	
	No/Wg		No/Wg		No/Wg		No/Wg		No/Wg		No/Wg		No/Wg	
Roman Pottery														
Greyware			3	23	2	11	4	41	6	49				
Grog-tempered ware					2	21	2	29	8	100				
Nene Valley CC					1	9								
Oxidised Ware	1	12					1	3	1	5				
Samian					1	3			1	14				
Sand tempered ware							1	2	8	134				
Shell-gritted			1	3			8	79					32	787
Whiteware					1	32								
Post-medieval pottery											1	2		
Total	1	12	4	26	7	76	16	154	24	302	1	2	32	787

Chronologically the earliest identifiable form is represented by two grog-tempered sherds, recovered from one of two pits [1021] underlying Burial 10. The sherds are furnished with a carination, a feature characteristic of ‘Belgic’ type wares. It is possible that they may originally have been part of a small cup that dates to the second half of the 1st century.

The assemblage is dominated by kitchen and storage wares in locally manufactured coarseware fabrics. These include shell-gritted wares (64% by weight), grog-

tempered wares (12%) and greyware fabrics (9%). Shell-gritted wares are dominated by a group of thirty two sherds from a large storage jar, which were found compressed on iron stone, just beneath the subsoil (1027). Other diagnostic forms include a storage jar in grog-tempered ware and a possible bowl in greyware. Much of this material appears to be of 2nd century date.

Fine wares are represented by a single very small, undiagnostic sherd of Samian ornamented with moulded decoration (1st-2nd century) and a single sherd of Nene Valley Colour Coat which dates to the 3rd/4th century; both were recovered from the grave fill of Burial 7.

In addition, a single sherd of post-medieval Yellow Ware was recovered from a field drain.

General comments

The majority of individual sherds derive from the two pits [1019] and [1021], the fabrics and forms recovered suggest a mid-late 1st /2nd century date. The pottery recovered from grave fills surrounding Burials 2 and 7 is highly abraded and the date range (1st to 4th century) suggests that it is residual.

5.2 Metalwork by Ian Meadows

SF 1 1008 (Burial 2) A small, 10mm diameter, AE4 copper alloy coin. The flan was in a poor condition but on the obverse the profile of a 4th century bust was apparent. The bust was large in proportion to the flan suggesting it belonged to the earlier part of the 4th century. The reverse of the coin was also poorly defined but may bear a standing winged victory facing left. This is a common motif in many reverse types and therefore is not closely dateable in the absence of better definition or recognisable fragments of either obverse or reverse legends. The coin is probably of the first half of the 4th century.

SF 2 1002 (Subsoil/colluvium) A copper alloy bar 45mm long, pointed at both ends. The bar has a circular section at one end but about 25mm of the length has a tapered square cross section. The date and original function of this piece is unclear but it may originally have been an awl of some type. A similar item in iron was recovered from Norwich (Margeson, item 1478 1993).

5.3 Animal Bone by Karen Deighton

Thirty five fragments of animal bone were collected from the fill (1023) of a furrow [1024] by hand during the course of excavation. Preservation was poor, the bones being heavily fragmented with abraded surfaces which were powdery to the touch. No evidence of butchery, burning or canid gnawing was observed which was probably due to the poor bone surface condition. Unfortunately due to this poor preservation, only two fragments of bone could be identified to element, these were vertebra. Again these could only be classified to group and are large ungulate (i.e. large hooved mammal). The remainder of the assemblage is classified as indeterminate large mammal (i.e. rabbit to horse size).

5.4 The Human skeletal remains by Teresa Hawtin*Introduction*

Macroscopic osteological analysis was undertaken on ten skeletons recovered from the Roman town of Irchester in Northamptonshire. The work conformed to the relevant sections of the Institute of Field Archaeologists' Guidelines to the Standards for Recording Human Remains (Brickley & McKinley 2004) and English Heritage's Human Bones from Archaeological Sites: Guidelines for Producing Assessment Documents and Analytical Reports (Mays, Brickley & Dodwell 2004) and to the relevant sections of ASC's own Operations Manual.

The skeletons have been examined for several criteria: state of preservation, demographic attributes including age and sex, normal metric and non-metric variation, and state of health. Methodologies used will be detailed in the relevant sections.

Due to the fragmentary nature of the skeletal remains, metric analysis was rarely possible. Bones were reconstructed wherever practicable, but measurements taken from reconstructed bones are considered to be less accurate and so the data presented here should be taken as an approximate guide only. No metric analysis of reconstructed skulls was attempted because of the increased likelihood of inaccuracy.

The levels of fragmentation and surface erosion of the bones may also limit the identification of abnormal variations, such as pathological changes.

Skeletal Completeness and Preservation

Table 2 shows the completeness and levels of fragmentation and weathering of the skeletons and details any additional bones associated with them.

In this table the skeletons are split into sections: skull, thorax, abdomen, upper limb and lower limb. ‘Thorax’ includes the shoulder girdle as well as the ribs and cervical and thoracic vertebrae. ‘Abdomen’ includes the pelvic girdle and lumbar vertebrae. ‘Upper limb’ and ‘lower limb’ both consist of the relevant long bones, wrist/ankle bones and hand/foot bones. All figures are approximations.

All bones were assessed for preservation using the weathering stages given by Brickley & McKinley (2004, 15-17), and an average grade was assigned to each skeleton. In this system Grade 0 represents no perceptible damage and Grade 5+ represents extensive erosion.

All of the skeletons analysed were highly fragmented and all were affected by surface erosion (weathering) to some extent, generally grades 2-3, with Burials 1, 7 and 9 showing slightly higher levels of weathering. No evidence of cut marks or animal gnawing were identified.

Burial 2 included three fragments of animal bone, which were re-bagged and labelled accordingly. Only Burial 9 contained any identifiable additional human bone, which consisted of a single metacarpal. This was distinguishable from the main adult skeleton as it had an unfused proximal epiphysis, indicating that it belonged to an individual of less than sixteen years of age (Scheuer & Black 2000, 334).

Demographic Attributes

Wherever possible the human remains were assigned to age categories. In juveniles this was based on epiphyseal fusion (Scheuer & Black 2000) and tooth eruption (Ubelaker 1978). In adults ageing was based on examinations of auricular surface morphology (Lovejoy *et al* 1985; Buckberry & Chamberlain 2002), pubic symphysis morphology (Katz & Suchey 1986), cranial suture closure (Meindl & Lovejoy 1985), sternal rib end morphology (Schwartz 1995), or tooth wear (Miles 1962; Brothwell 1981), depending on which elements were available. Table 3 shows the results of this assessment.

Table 2: Level of completeness and fragmentation of skeletons

Burial number	Skull %	Thorax %	Abdomen %	Upper limb %	Lower limb %	Additional bones	Preservation
1	25-50	50	75	50-75	>75	-	Fragmentation: high. Weathering: 2-3
2	25-50	50-75	>75	90	50-75	3x animal bones	Fragmentation: high. Weathering: 3
3	0	5	10	5	10	-	Fragmentation: high. Weathering: 2-3
4	0	5	10	5	5	-	Fragmentation: high. Weathering: 2
5	<25	<25	50	25	10	-	Fragmentation: high. Weathering: 4
6	<25	<25	0	0	0	-	Fragmentation: high. Weathering: 2-3
7	5	<25	25-50	25-50	75	-	Fragmentation: high. Weathering: 4
8	0	0	5	0	5	-	Fragmentation: high. Weathering: 2-3
9	0	0	0	5	10	Juvenile hand phalanx	Fragmentation: high. Weathering: 3-4
10	75	25-50	25	50	25	-	Fragmentation: high. Weathering: 2-3

Most individuals could be assigned to an age category, although the ageing of individuals with fewer skeletal elements present will be less accurate. For example, none of the elements necessary for age estimation had survived in Burial 9 and so the individual could only be assigned to the adult category, based on the fact that all epiphyses present were fused.

Most age ranges are represented within the sample from adolescents up to more mature adults. The absence of younger children, with the exception of the additional bone in Burial 9, cannot be seen as significant because of the small size of the assemblage and high levels of disturbance.

Table 3: Demographic attributes of individuals within the sample

Burial number	Age	Sex
1	45-60 years	Probable Male
2	45-60 years	Possible Female
3	Young adult	Undeterminable
4	16-18 years	Undeterminable
5	15-25 years	Probable Female
6	Young adult	Possible Male
7	40-50 years	Probable Male
8	Young-mid adult	Undeterminable
9 (additional bone)	Adult (Juvenile <16)	Undeterminable (Undeterminable)
10	18-21 years	Female

Sex

The skeletons were also examined for sexually dimorphic characteristics, the results of which are shown in Table 3. This analysis was based on sexually dimorphic features of the skull and pelvis, such as the greater sciatic notch, mastoid process, mandible shape and overall robusticity (Schwartz 1995; Phenice 1969; Krogman & İşcan 1986; Ferembach *et al* 1980; Loth & Henneberg 1996).

The fragmentary nature of the skeletons meant that accurate sex estimation was difficult and only Burial 10 could be assigned to a category with confidence. Estimations were possible for Burials 1, 2, 5, 6 and 7, but sex could not be determined for Burials 3, 4, 8 or 9 due to the absence of any sexually dimorphic elements. Based on these estimations it appears that the ratio of males to females is approximately 1:1, suggesting that there was no segregation within this cemetery.

Statistical analysis

Unfortunately, due to the small size of this collection and the extremely fragmentary nature of many of the skeletons, no meaningful statistical analysis is possible and it is unlikely that any significant patterns would be revealed.

Health and Disease

Dental pathologies

Dental pathologies, including ante-mortem tooth loss, caries, abscesses and

periodontal disease, were recorded for each skeleton. Calculus and hypoplasia were recorded according to the stages illustrated by Knußmann (1988) and dental attrition was recorded after the system developed by Murphy (1959, reprinted in Smith 1984).

Burial 1, 5, 6, 7 and 10 had teeth present, although only Burials 5 and 10 had near-complete dentitions. All individuals exhibited dental attrition (tooth wear) at levels commensurate with their ages, with Burial 1, aged 45-60 years, displaying attrition at level 6 (on a scale of 1-8) and Burials 5, 6 and 10, all young adults, exhibiting average dental wear of level 2-3.

Most teeth had small amounts of dental calculus adhering to their surfaces (grades 1-2 on a scale of 0-5), indicating low levels of dental hygiene, but only Burial 5 had been affected by dental caries. No periodontal disease, abscesses or ante-mortem tooth loss were identified.

Individuals 5, 6, 7 and 10 exhibited enamel hypoplasia, generally at grades 1-2 (on a scale of 0-5), although Burial 5 had a few teeth with grade 3 hypoplasia. This is a condition associated with episodes of childhood stress, nutritional deficiencies or illness during the period of enamel formation, but the generally low grades of hypoplasia recorded here do not suggest any significant levels of disruption.

Bone pathologies

The human remains were examined for any pathological or abnormal changes. The high fragmentation and levels of surface erosion of the skeletons is likely to have hindered the identification of some of the pathological changes that could have been present. No pathological changes were observed in Burials 3, 4, 5, 6 and 9.

Age-related degenerative changes were identified in Burials 1, 2 and 7, in the form of osteophytes (new bone formation) or lipping of the articular surfaces at various joints. Burial 2 was affected in the right hand, right ankle, left ribs and upper vertebrae and Burial 7 was affected in the distal condyles of the right femur (at the knee joint).

Burial 1 exhibited more extensive degeneration, affecting the clavicles, right scapula, os coxae (hip bones), ribs, left tibia, right calcaneus (ankle) and right lunate (wrist). Eburnation and porosity, caused by bones wearing against each other after

degeneration of the cartilage normally covering the joint, was present in the right first metacarpal (thumb) and right clavicle.

This individual also exhibited extensive spinal joint disease, in the form of osteophytes, eburnation and porosity, with all vertebrae present extensively affected. Schmorl's nodes were seen in the lower thoracic and upper lumbar vertebrae (T7-L3), which are thought to indicate intervertebral disk hernias and are frequently found in individuals over forty five years of age (Aufderheide & Rodríguez-Martín 2003, 97). Schmorl's nodes were also visible in the lower thoracic vertebrae (T7-12) of Burial 2.

Crease-like indentations were identified in the medial condyles of both femora (in the region of the knee joint) of Burial 7. These did not appear to be pathological in nature and there were no corresponding defects in the tibiae, so they are likely to be developmental defects and would have had little, if any, affect on the individual during their life.

One instance of possible periostitis was observed in the left fibula of Burial 8, but the levels of surface erosion and fragmentation meant that no confident identification could be made. Periostitis is associated with many diseases but is not always pathological, and can be caused by low-grade infections of the overlying soft tissues or varicose ulceration.

Burial 10 exhibited the most unusual pathological changes identified within this assemblage, in the form of extensive endocranial (inside the skull) new bone formation (Plate 2). This was pale, woven bone overlying the natural bone surface, similar in appearance to other forms of active periostitis, with visible capillary impressions (indentations representing a fine network of blood vessels). Most of the cranial vault was affected, from the frontal bone superior to the orbits, across the parietal bones to the occipital bone at the back of the skull, and the temporal bone superior to the left ear. Numerous unidentifiable fragments of skull were also affected. A few areas of smoother new bone growth near to the lambdoid suture of the occipital bone may be indicative of healing.

These lesions appear to have been caused by inflammation of the meninges of the brain, which would have had to be ongoing for 2-3 weeks to cause such extensive changes and would normally cause the individual to descend into a coma quite

quickly. This form of inflammation can result from bacterial or viral infection, sometimes in association with specific infections such as tuberculosis, syphilis or leprosy, but can also be caused by tumours or trauma to the skull (Roberts & Manchester 2005, 178-9). In this case the changes are very extensive and discrete trauma or tumours can be ruled out as causes with reasonable confidence. There are no other pathological changes within the skeleton indicative of diseases such as tuberculosis, syphilis or leprosy, but only DNA analysis would confirm the presence or absence of these infections.

Additional new bone formation was identified on the right zygomatic bone, within the orbit. This bone had a more solid appearance and may represent an old injury or infection that has healed.

There is current debate about whether an individual with infectious/viral meningitis could have survived for the length of time required to cause such extensive new bone formation. It has been suggested that the organism may have been less virulent in the past (Roberts & Manchester 2005, 178). Unfortunately it is impossible to confidently assign any specific cause to the new bone formation without the use of further scientific analysis, and the amount of disturbance that this skeleton has suffered will severely limit the chances of retrieving significant results.

Very little research has been undertaken into the causes of endocranial new bone formation, and what does exist concentrates on juveniles. Mary Lewis (2004) investigated juvenile skeletons (below the age of seventeen years) from several medieval sites in England and found this condition in individuals from Raunds Furnells, Northamptonshire, Wharram Percy, North Yorkshire and St. Helen-on-the-Walls, York as well as the post-medieval collection from Christ Church, Spitalfields, London. There were sixty three juveniles with endocranial lesions, with an overall prevalence rate of 12.2%, however, the vast majority of these were below the age of two and a half years, with only six of the sixty three individuals above six and a half years of age, and none above the age of fourteen years (Lewis 2004, 91)

One contemporary example of endocranial new bone formation has recently been identified in a disarticulated cranium excavated from the Roman cemetery at Spitalfields, London. This individual was also a female in her late teens, but the appearance of the new bone was quite different to that present in Burial 10 (Natasha

Powers, MoLSS, pers comm.).

Other abnormal changes

The right ilium of Burial 2 exhibited a large green stain (Plate 1), indicating that a copper-alloy object had been deposited in close proximity to the bone, probably at the time of burial.

Musculo-skeletal stress markers

The skeletons analysed here are too fragmentary for any meaningful analysis of musculo-skeletal stress markers. However, the more severe examples of stress indicators were recorded according to the guidelines set out by Hawkey & Merbs (1995).

In Burial 1 the conoid tubercle of the left clavicle was enlarged, reaching a length of *c*5mm. This is the attachment point of the conoid ligament, which attaches the clavicle to the scapula and helps to stabilise the joint. The defect noted may indicate damage to this ligament at some point during the individual's life.

Both humeri of Burial 10 exhibited cortical defects (stress lesions) at the point of attachment of the Pectoralis major muscle. On the right humerus this defect was level 2 (on a scale of 0-3) and on the left humerus level 3.

Normal Metric and Non-metric Variation

Stature Estimation

Due to the fragmentary nature of the skeletal remains, metric analysis was rarely possible. Bones were reconstructed wherever practicable, but measurements taken from reconstructed bones are considered to be less accurate and so the data presented here should be taken as an approximate guide only. No metric analysis of reconstructed skulls was attempted because of the increased likelihood of inaccuracy.

Stature has been estimated using the methods developed by Trotter (1970), and the femur/stature ratio calculation developed by Feldesman (*et al*) (1990). All bones were measured according to the definitions given for each method and to the nearest millimetre. Where more than one complete long bone was present, the measurements deemed to produce the most accurate results were used to calculate

stature. These are, in order of accuracy, femur + tibia, femur, fibula and tibia. Stature estimations obtained from measurements of the bones of the arms are considered the least accurate as the arms do not directly contribute to an individual's stature. The results obtained were then adjusted for age using the following formula:

$$\text{Adjustment} = - 0.06 \times (\text{age in years} - 30)$$

Only four skeletons were complete enough to take long bone measurements and thus estimate stature. The male skeletons were estimated to be 162cm (Burial 1) and 177cm (Burial 7) in height, and the female skeletons were estimated to be 166cm (Burial 2) and 159cm (Burial 10) tall. All of these figures fall within the normal stature ranges for the period, which are specified by Roberts & Cox (2003, 142) as 159-178cm for males (average 169cm) and 150-168cm for females (average 159cm). Although Burial 1 is below average height for males, Burials 2 and 7 are well above the average statures for the Roman period. The bones of burial 2 were considered to be very robust for a female, but in this case sex estimation was based on several characteristics of the pelvis and so should be reasonably accurate.

Non-metric Traits

The skeletons were assessed for thirty cranial and thirty post-cranial non-metric traits, after the work of Berry and Berry (1967) and Finnegan (1978) respectively. Most congenital conditions generally cause little or no effect to the individual during life, however many of them are considered to be genetically inherited. Familial relationships can be proposed, but not proven unless DNA analysis is undertaken.

Most of the non-metric traits identified were relatively common, such as the presence of cranial ossicles (islands of bone within the skull sutures), accessory, absence of, or unusual location of foramina, circumflex sulcus in the scapulae and septal apertures of the distal humerus. Three individuals exhibited Poirier's facets of the femoral heads (extension of the articular surface onto the neck of the femur) and Burial 2 exhibited a vastus notch of the patella. Unfortunately, too few skeletons are present or complete enough to warrant further statistical analysis of the significance of the prevalence rates.

Conclusions

The funerary archaeology and artefacts recovered in association with the burials suggest that this cemetery dates to the late Roman period, which is when extended inhumations orientated approximately west-east became popular. The burials had all been affected by more recent disturbance, probably in the form of ploughing or other agricultural activities. All of the skeletons were highly fragmented and erosion of the surface of the bone may have masked some pathological conditions that had been present. The small number of individuals and low levels of completeness of the skeletons meant that statistical analysis would not produce any significant results.

Most adult age categories were represented, from adolescents to mature adults. The absence of younger children is not deemed to be significant due to the small size of the collection and high levels of later disturbance. Sex estimation of the individuals was hindered by the incomplete nature of many of the skeletons, but overall there appears to be a roughly equal proportion of males and females, spread evenly across each age category. This suggests that there was no segregation within this cemetery.

Various common dental pathologies were recorded, including caries, calculus and enamel hypoplasia, but none were unusual for the period. All individuals exhibited dental attrition at levels considered normal for their ages.

Age-related degenerative changes were identified in three individuals, with Burial 1 displaying extensive degeneration throughout the body and particularly severe spinal joint disease. This individual was estimated to be 45-60 years of age and the degenerative changes observed here are not unusual in an individual of this age during the Roman period.

Burial 10 exhibited extensive endocranial new bone formation throughout the cranium, affecting most of the bone fragments present. There are many possible causes of new bone formation within the skull, but the extent of the lesions observed suggests inflammation of the meninges of the brain over a period of 2-3 weeks. This could be related to a specific bacterial or viral infection, such as tuberculosis, syphilis or leprosy, but the absence of any other significant pathological changes within the skeleton means that this could only be confirmed by DNA analysis.

The fact that this burial was orientated approximately south-north, rather than the more usual west-east orientation, may also be significant. It provides us with an insight into the possible reasons for variation in burial practices during the late Roman period, and may be related to the fact that this individual had suffered so severely and had possibly descended into a comatose state. At this time there was a lot of superstition surrounding funerary practices and the fear of ghosts rising from the grave was widespread.

Only four of the skeletons were suitable for stature estimation. One was average height for the period, another was below average, and two were significantly above average, although all fell within the ranges considered normal for the Roman period.

6 DISCUSSION

This small group of inhumations, situated to the north-west of the walled town, appear to be of a relatively late date. The presence of early 4th century pottery sherds in the grave fills of three individuals, a coin dating to the first half of the 4th century and the relatively uniform E-W orientation of the majority of the burials is suggestive of an early-mid 4th century date. The two examples that do not conform to this orientation may indicate that the cemetery was receiving burials at the time of the transition to Christian rites.

Examination of the geophysical survey interpretation suggests that the burials occupy the north-west corner of a larger, sub rectangular enclosure with a linear pathway connecting its north-eastern corner with the edge of the town. As such the excavated burials could be part of a much larger cemetery. Previous fieldwork has located burials in another peripheral area of the settlement, where to the east of the town undated inhumations were discovered beneath the track that approaches Chester Farm.

Although highly fragmented and largely incomplete, skeletal analysis of the excavated remains suggests that their physiology is fairly standard for the Roman period. It has, however, been suggested that the occurrence of anomalous bone growth inside the skull of Burial 10 may be indicative of meningitis. Perhaps significantly, elements of this individual's burial differ from the others. Its south-north orientation is one of only two that do not conform to the prevailing east-west

orientation. Furthermore, if the identification of the cemetery boundary is correct, this individual was interred in its extreme north-west corner at a point furthest away from the extra-mural enclosures skirting the western ramparts of the town. These characteristics might suggest that, in death, the individual was treated differently, perhaps because of superstition connected with the symptoms of disease.

BIBLIOGRAPHY

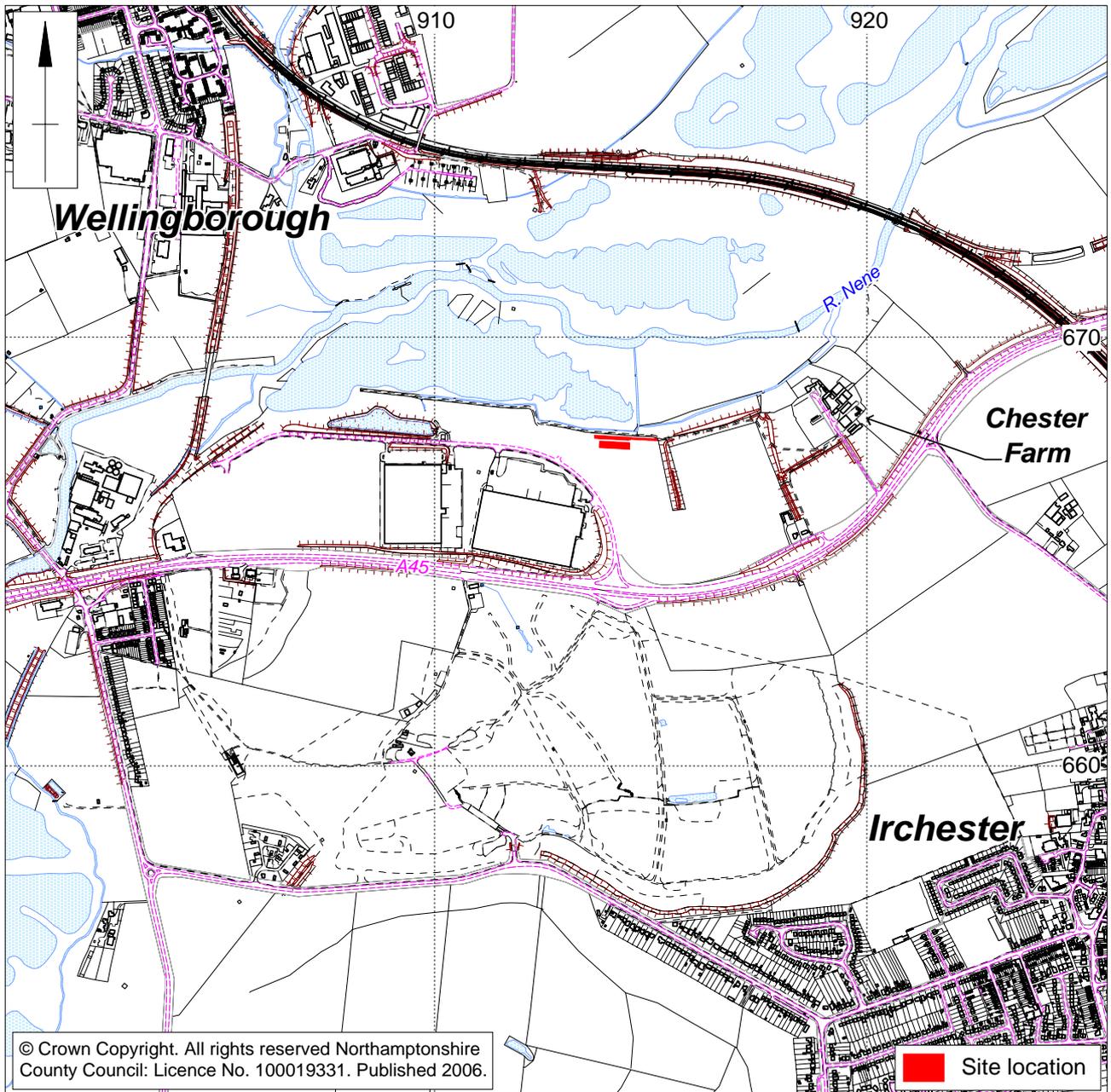
- Aufderheide, A C, & Rodríguez-Martín, C, 2003 *The Cambridge Encyclopedia of Human Paleopathology*, Cambridge
- Berry, A C, & Berry, R J, 1967 Epigenetic variation in the human cranium, *Journal of Anatomy*, **101**, 361-379
- Brickley, M, & McKinley, J I, (eds) 2004 *Guidelines to the Standards for Recording Human Remains*, IFA Paper, **7**
- Brothwell, D, 1981 *Digging up Bones*, London
- Buckberry, J L, & Chamberlain, A T, 2002 Age estimation from the auricular surface of the ilium: a revised method, *American Journal of Physical Anthropology*, **119**, 231-239
- Butler, A, and Yates, A, 2006 *Archaeological Survey at Chester Farm, Irchester, Northamptonshire (Module 5)*, Northamptonshire Archaeology Report 6/019
- Dix, B, 1991 *Archaeological Evaluation at Irchester Northants 1990-91*, Northamptonshire Archaeology Report
- Feldesman, M R, Kleckner, J G, & Lundy, J K, 1990 Femur/stature ratio and estimates of stature in mid- and late- Pleistocene fossil hominids, *American Journal of Physical Anthropology*, **83**, 359-72
- Ferembach, D, Schwidetzky, I, & Stloukal, M, 1980 Recommendations for Age and Sex Diagnoses of Skeletons, *Journal of Human Evolution*, **9**, 517-549
- Finnegan, M, 1978 Non-metric variation of the infracranial skeleton, *Journal of Anatomy*, **125**, 23-37
- Hawkey, D E, & Merbs, C F, 1995 Activity-induced musculoskeletal stress markers (MSM) and subsistence strategy changes among ancient Hudson Bay Eskimos, *International Journal of Osteoarchaeology*, **5**, 324-338
- İşcan, M Y, & Kennedy, K A R, (eds), 1989 *Reconstruction of Life from the Skeleton*, New York
- Katz, D & Suchey, J M, 1986 Age determination of the male os pubis, *American Journal of Physical Anthropology*, **69**, 427-436
- Knußmann, R, 1988 *Anthropologie: Handbuch der vergleichenden Biologie des Menschen*, Stuttgart
- Krogman, W M, & İşcan, M Y, 1986 *The Human Skeleton in Forensic Medicine*, 2nd edition, Springfield
- Lewis, M, 2004 Endocranial Lesions in Non-adult Skeletons: Understanding their Aetiology, *International Journal of Osteoarchaeology*, **14**, 82-97
- Loth, S R, & Henneberg, M, 1996 Mandibular ramus flexure: a new morphologic

- indicator of sexual dimorphism in the human skeleton, *American Journal of Physical Anthropology*, **99**, 473-485
- Lovejoy, C O, Meindl, R S, Pryzbeck, T R, & Mensforth, R P 1985 Chronological metamorphosis of the auricular surface of the ilium: A new method for the determination of adult skeletal age at death, *American Journal of Physical Anthropology*, **68**, 15-28
- Mason, P, 2006 Archaeological Test Pits North-West of Irchester Roman Town, Northamptonshire, Northamptonshire Archaeology Report 06/40
- Margeson S *et al* 1993 Norwich households: The medieval and post medieval finds from Norwich survey excavations 1971-1978, *East Anglian Archaeology* **58**
- Mays, S, Brickley, M & Dodwell, N, 2004 *Human Bones from Archaeological Sites: Guidelines for Producing Assessment Documents and Analytical Reports*, Swindon
- Meadows, I D, 2005 *Archaeological desk based assessment of land around Chester Farm, Irchester (Module 2)*, Northamptonshire Archaeology Report
- Meindl, R S, & Lovejoy, C O, 1985 Ectocranial suture closure: A revised method for the determination of skeletal age at death based on the lateral anterior sutures, *American Journal of Physical Anthropology*, **68**, 57-66
- Miles, A E W, 1962 Assessment of age from the dentition, *Proceedings of the Royal Society of Medicine*, **51**, 1057-1050
- Murphy, T, 1959 Gradients of dentine exposure in human molar tooth attrition, *American Journal of Physical Anthropology*, **17**, 179-186
- Phenice, T W, 1969 A newly developed visual method of sexing the os pubis, *American Journal of Physical Anthropology*, **30**, 297-302
- RCHME, 1979 *An Inventory of the Historical Monuments in the County of Northampton; II: Archaeological Sites in Central Northamptonshire*, Royal Commission on Historical Monuments England
- Roberts, C, & Cox, M, 2003 *Health and Disease in Britain from Prehistory to the Present Day*, Stroud
- Roberts, C, & Manchester, K, 2005 *The Archaeology of Disease*, 3rd edition, Stroud
- Saunders, S R, 1989 Nonmetrical skeletal variation, in İşcan, 1989, 95-108
- Scheuer, L, & Black, S, 2000 *Developmental Juvenile Osteology*, London
- Schwartz, J H, 1995 *Skeleton Keys: An Introduction to Human Skeletal Morphology, Development and Analysis*, Oxford
- Smith, B H, 1984 Patterns of molar wear in hunter-gatherers and agriculturalists, *American Journal of Physical Anthropology*, **63**, 39-56
- Stewart, T D, (ed), 1970 Personal Identification in Mass Disasters, *Washington D.C., National Museum of Natural History*
- Trotter, M, 1970 Estimation of stature from intact long limb bones, in Stewart, 1970

(ed), 71-84

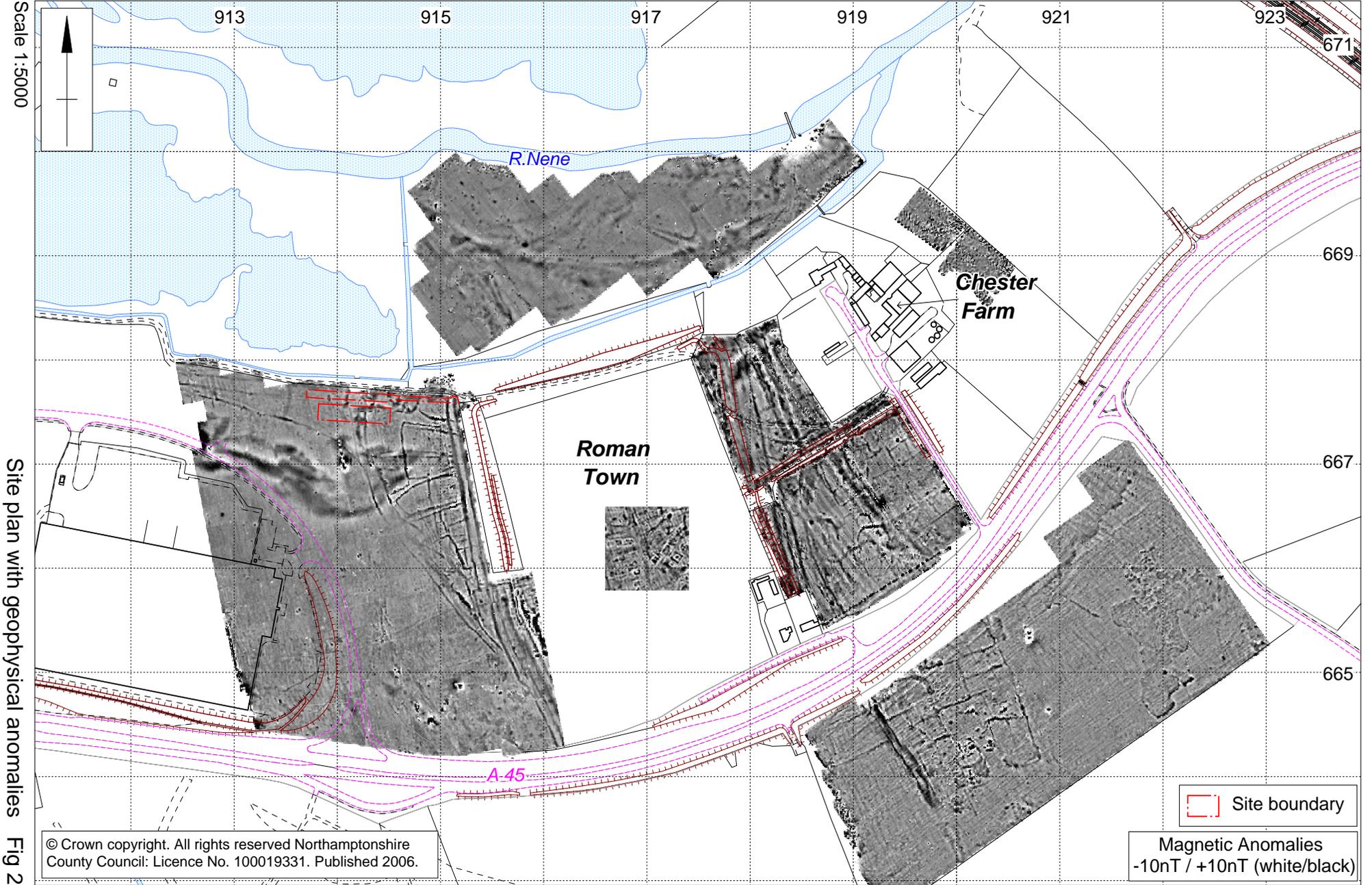
Ubelaker, D H, 1978 *Human Skeletal Remains: Excavation, Analysis, Interpretation*, Washington

Upton-Smith, T 2005 *Archaeological Evaluation of Main Access at Chester House Farm (Module 6), Irchester, Northamptonshire*, Northamptonshire Archaeology Report 05/058



Scale 1:15,000

Site location Fig 1

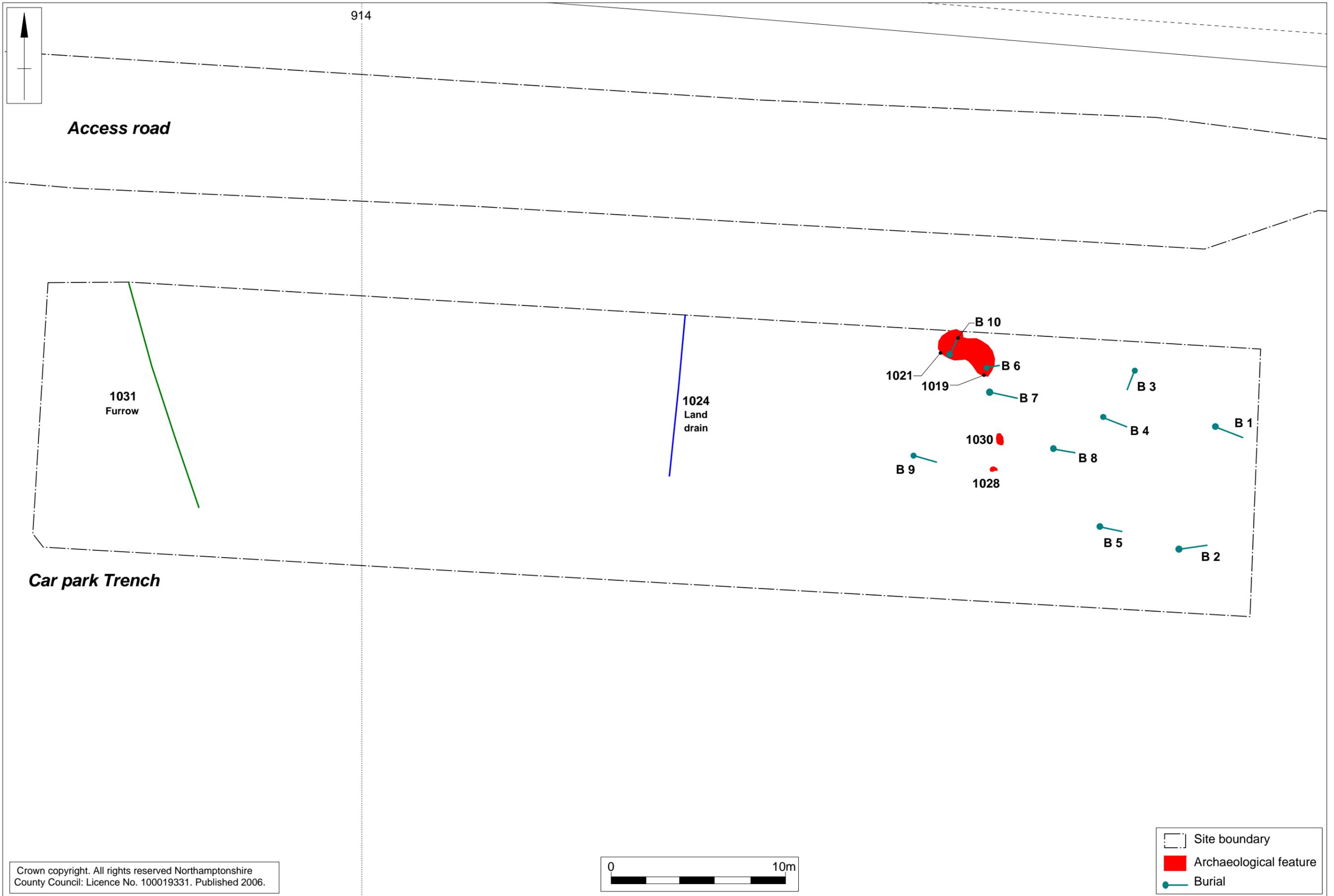


Site plan with geophysical anomalies Fig 2

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Site boundary

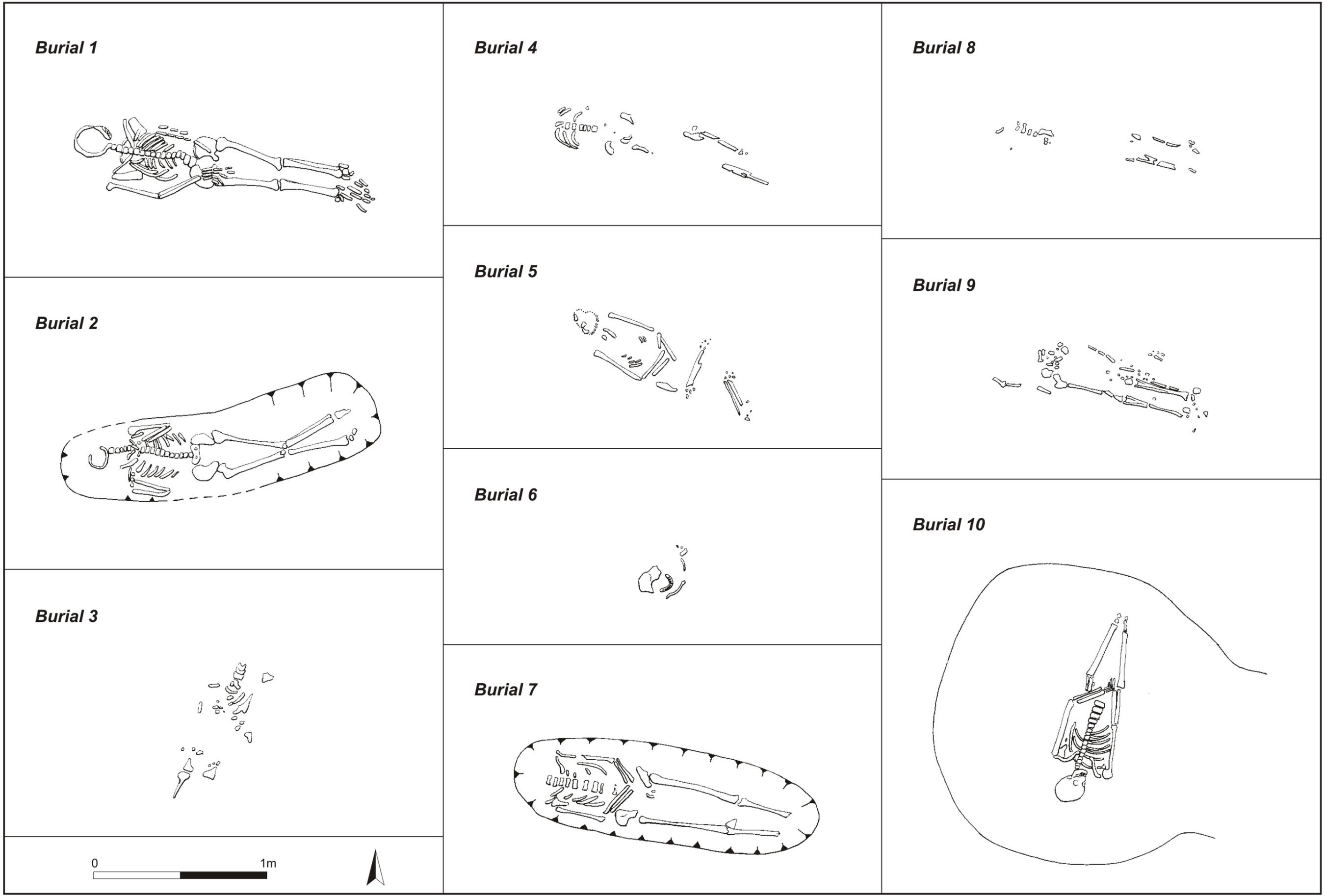
Magnetic Anomalies
-10nT / +10nT (white/black)



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Scale 1:200

Detailed plan of the car park trench Fig 3



Plans of burials 1 - 10 Fig 4

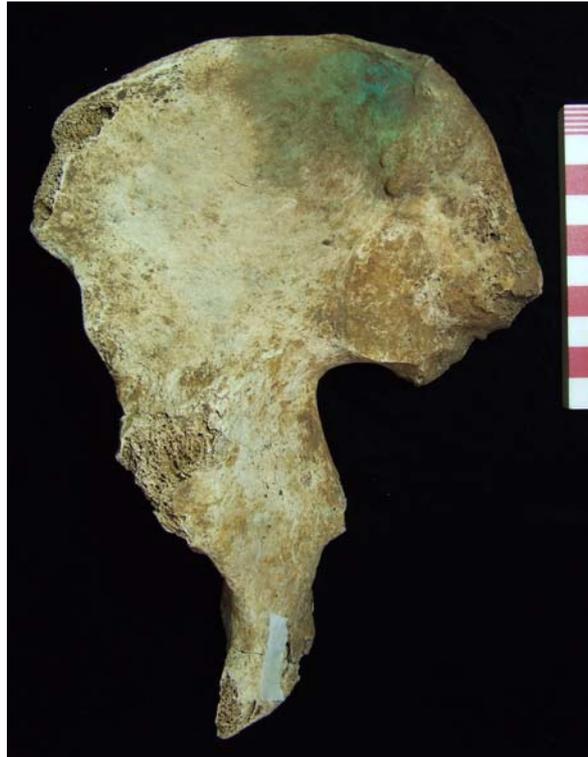


Plate 1: Coin staining on right hip bone (Burial 2) (Scale 10mm intervals)



Plate 2: Endo-cranial bone growth (Burial 10) (Scale 10mm intervals)