Osteological Analysis of the Human Remains from Yazor Brook, Credenhill, Herefordshire.

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Abstract

An analysis of the human remains from Yazor Brook (at the land east of Magna Castra Farm), Credenhill, Herefordshire recovered during an excavation undertaken by Worcestershire Historic Environment and Archaeology Services from 23rd March to 30th July 2010*, was carried out in order to quantify the material excavated and to record the relevant osteological data from the skeletal assemblage. A total of three graves were identified during the excavation, all of which were excavated. Articulated human skeletal remains were recovered from all three graves. An additional fourth grave had also been excavated nearby during an evaluation of the area for development carried out by AI (2009). A summary of the findings from this skeleton as reported by AI (2009) are also included here. The remains were situated in the area of the eastern suburb of the Roman small town Magnis (Kenchester) outside the boundary walls.*

The skeletal remains from all three inhumations were fragmentary and were either in a 'fair' or 'poor' state of preservation. One young adult female was interred in a rare example of an Early Roman chest burial, fitted with hinges and elaborate metalwork, accompanied by a meat offering and a pottery vessel. The remains indicated that this individual had experienced dental issues during life and some inflammation of the lower limbs. Another female of middle adult age was interred in close proximity but along a perpendicular alignment and these remains exhibited two well healed fractures to the right arm as well as inflammation to the lower limbs and osteoarthritis. This individual was interred with hobnail footwear and also with a pottery vessel. Both graves were dated to the early Roman period. The remains of another individual were also excavated and dated to the prehistoric period, identified as possibly belonging to the Iron Age. These remains were poorly preserved and osteological analysis was limited by the completeness of the remains. The grave was located in the vicinity of a third Roman burial, excavated during the evaluation carried out by AI (2009). As assessed by AI, the remains were thought to belong to those of a male individual possibly aged between 25 and 35 years at death who had been interred in a coffin.

The discovery and analysis of inhumated skeletal remains has provided a rare insight into burial practices in the region of Magnis before and during its occupation as well as into the lifestyle and health of individuals from the prehistoric and early Roman period in Herefordshire.

1. Introduction

The aim of this report is to present the data collated from the osteological analysis of human skeletal remains recovered during an excavation at the site at Yazor Brook (land to the east of Magna Castra Farm), Credenhill, Herefordshire (Grid reference: SO34455 24282 to SO3449 24259, site reference HSM51615). The excavation was carried out by Worcestershire Archive and Archaeology Services from 23rd March to 30th July 2010 on behalf of Amey Consulting in advance of flood defence work in the area. The excavations identified three inhumation burials [2030], [2162] and [2165] as well as a small amount of re-deposited human bone. An additional grave [112] was also discovered during an evaluation of the area nearby carried out by AI (2009) along with numerous disarticulated human skeletal elements. Features dating to the Late Bronze Age and Iron Age are present in the region but of significance to the current archaeological investigations is the site's location in the area of the eastern extra-mural suburb of the Roman small town of Kenchester (*Magnis*). All four inhumations were situated in Area 1 of the excavations, which focussed on activity to the north of the east-west Roman Road. In addition, a small number of disarticulated skeletal elements were recovered from here as well as from Area 3, which comprised of the road itself. No burials were located in Area 2, south of the road.

2. Yazor Brook: Contextual Evidence

2.1 Archaeological and Historical Background

The site of excavation is primarily associated with a suburb of the Roman small town of Kenchester (*Magnis*) that developed along the road of an important trade route between Gloucester and Wales (Webster 2011). The recent excavations carried out on the north side of the Roman road, east of the walled town, revealed evidence of industrial activity including large quantities of slag and clinker in addition to the presence of a large aisled building, subsequently replaced by a larger version, used for storing and preparing grain. A series of smaller wooden buildings or units are thought to have been packed along a cobbled street nearby. A cemetery is believed to be located to the north of this industrial area, where a feature, possibly representing a mausoleum, is situated surrounded by smaller rectangular features that appear to represent graves. The cemetery is understood to be bounded by a large ditch [2065]. All the inhumations excavated were located on the outskirts of the purported Roman cemetery and are reasonably dispersed in location, forming two foci of burial in the excavation area. Prior to this evaluation and excavation, six graves had also been discovered south-west of the excavated area, containing two infant and four adult individuals, in 1920 (AI 2009: 9). Two of these were thought

to belong to a male and female and were located within a few feet of the road outside the town (HER 12214). These graves were dated to the 3rd century by associated pottery finds. The skeletal remains of a further individual, lying prone on the road surface, was also excavated but was undated, although identified as post-Roman stratigraphically. A number of dispersed cremation burials and inhumations have also been identified within the town walls (AI 2009: 9). The burials discovered during the recent evaluation and excavation formed two foci of burial, one in the north east of the Area 1 (Burials [2030] and [112]) and one in the south west (Burials [2162] and [2165]).

Burial [2030] (See Plate 1) is believed to pre-date the other inhumations and has provisionally been attributed to the Iron Age. This burial consisted of a supine flexed inhumation aligned approximately north-south (head at the south end), with the interred remains partially covered by a degraded wood deposit [2031]. No other finds were associated with the remains. This burial was in close proximity to burial [112], though pre-dating it.

Plate 1: *Prehistoric Burial [2030]*

Burials [112], [2162] and [2165] were all dated to the early Roman period. Burials [112] and [2165] were both aligned north-east to south-west, with the head at the north-east end, and both contained coffin furniture. Burial [112] contained coffin nails and the incumbent was lying supine with the arms crossed over the chest (See Plate 2).

Plate 2: *Early Roman Burial [112] (AI 2009)*

In contrast, the body in burial [2165] was laid on its right hand side with the right hand resting under the head. Three large metal straps or bands, were found lying across the body (See Plate 3). Radiographic analysis revealed that two of the metal bands were hinges of a rare type for the Roman period, providing evidence for a unique example of an early Roman chest (Cool 2011).

Other, purely decorative metalwork was also recovered. The chest had been placed on large flat stones used to line the base of the grave. Grave goods included in the burial consisted of a pottery vessel and a cut of cow leg placed in the south-west corner of the grave on a stone plinth. Hobnails were also recovered from grave fill [2163]. This burial is thought to date to the early Roman period (1st-3rd century AD) and burial [112] has been identified as belonging to a similar date (AI 2009).

Plate 3: *Early Roman Chest burial [2165]*

Chest burial [2165] was located in close proximity to burial [2162]. The two burials, however, were quite different in nature. Burial [2162] was aligned south-east to north-west axis with the head at the south-east end, perpendicular to the alignment of chest burial [2165]. A pot had been placed adjacent to the left side of the mid-body area, on the outside of the left arm and hobnails were found at the feet (See Plate 4). The body was in an unusual position within the grave; the body, although supine, was laterally flexed at the pelvis to the left so that the upper body was angulated with the head placed against the cut in the south-east corner of the grave, rotated and lying on its left hand side. Post-depositional rotation of the left leg has occurred at the hip whilst the femur and tibia were still articulated at the knee i.e. when soft tissues were

still present. The pottery vessel indicates that this burial was early Roman in date as is also evident from the horizontal truncation by the later Roman building, structure A.

Plate 4: *Early Roman Burial [2162]*

None of the burials are associated with any contemporary features, such as enclosure ditches or buildings. The reasons behind the selection of these specific locations for the burials, how they may relate to contemporary use of the site and to each other are currently poorly understood. However, all the burials are north of the fence line [2347], apparently delineating the extent of industrial activity on the site from the early 2nd century AD (Webster 2011).

2.2 Burial Practices

Despite to the diverse nature of cultural origins and traditions of the population of Britain during the Roman period, there are several recurring elements to burial rites that have been observed. Planned cemeteries were laid out in tandem with the development of new settlements outside of the boundary walls. The location of Roman burial sites are almost always near boundaries due to the fundamental Roman belief in the existence of 'ghosts' or 'spirits of the dead' that should not be disturbed by the living (Macdonald 1977, Henig 1995), thus making it imperative to physically separate the dead from the living in clearly bounded areas (Esmonde Cleary 2000: 128-9).

Cremation was a more popular funerary practice in the 1st century AD and was replaced by inhumation from the mid-second century onwards (Philpott 1991:223), at which point the use of grave furniture such as coffins, sarcophagi and grave stones were introduced and there was a tendency for bodies to be laid out in an extended position, with a preference for north-south orientation until the 4th century when west-east became more common (Watts 1998: 123). Coffins generally appear to have been made of planks pegged together, a few examples of which also occur in the Iron Age. Approximately one third of rural Roman burials from Hampshire had been furnished with wooden coffins, some of which appear to have been substantial structures (Pearce 1999: 99). It is generally assumed that more elaborate burials, including interment in lead coffins or sarcophagi, were restricted to those individuals of higher status and that these are most commonly located in urban cemeteries (Watts 1998: 123), although Pearce (1999: 132) suggests that elaborate coffins, distinguished by the numbers of fittings, occur in some rural contexts in Hampshire and that stone and lead coffins are often found in association with villas. The adoption of Roman burial traditions is complex and funerary practices during this period in Britain do not necessarily directly relate to ethnic affinities or prescribed religious beliefs. For example, a grave stone found at Templebrough Fort, Yorkshire is inscribed with 'To the spirits of the departed: Verecunda Rufilia, a tribeswoman of the Dobunni, aged 35' (Watts 1998: 124). Burial practice during the Early Roman period is heterogeneous and reflects the mosaic nature of the Romanisation of, already diverse, native British funerary customs.

Some individuals are interred with grave goods and quite commonly hobnail boots; in Hampshire, for example, hobnails and vessels are the commonest associated finds (Pearce 1999: 99). The provision of footwear for the dead to allow them to undertake their journey to the afterlife appears to have been an important aspect of Roman funerary ritual, with footwear on

occasion being placed beside the body as well as more commonly on the feet, as was noted at The Roman Cemetery at Jesus Lane, Cambridge (Alexander *et al.* 2004). It has been noted that hobnailed footwear is recorded more frequently on rural sites (Philpott 1991) and may be associated with a physically demanding agricultural lifestyle (Simmonds *et al.* 2008). There are numerous exceptions to the claimed rural:urban dichotomy and Simmonds *et al*. (2008) found that both male and female individuals associated with hobnails at the cemetery serving the *colonia* at Gloucester (120-122, London Road) were all adult and all young or middle-aged adults, suggesting that the choice of footwear worn by the dead may have reflected status or occupation during life. It is unclear, however, to what extent fashion and individual tastes would have influenced choice, which is similarly influenced by age. The provision of ornate and perhaps more personal grave goods in Hampshire was found to be more common in urban cemeteries (Pearce 1999: 99).

Another common Roman burial practice at other cemetery sites is for bodies to be laid out in a prone position. This has been noted to occur in 1st-early 2nd century as well as in 3rd-4th century burials (Simmonds *et al*. 2008). This practice is found in many Roman cemeteries (Philpott 1991) and in some cemeteries (i.e. Bath Gate, Cirencester) occurs in up to 8% of the burials although a figure of around 3% is more commonly reported (i.e. East Cemetery of Roman London, Lankhills School, Winchester) (Simmonds *et al*. 2008). Decapitation burial is also a fairly common practice of the period, with an estimate of approximately 2.5% of all Roman burials containing decapitated remains (Watts 1998). Osteological evidence suggests that although some of these decapitations result from execution, others may be associated with aspects of ritual behaviour. While it has been demonstrated by Philpott (1991) that there is an increase in this practice by the 4th century and that it tends to be found in more rural areas, there are again many exceptions to this (i.e. Lankhills, Winchester and East Cemetery of Roman London). Watts (1998: 88) has observed that decapitations tend to occur in areas that are highly Romanised and that where there are decapitations there seems to be little evidence of Christianity. There appears to be no association of the practice with a particular sex or age group but rather than representing a purposeful denigration of the body, it is now believed, in at least some cases, to have consisted of a carefully carried out procedure requiring some skill. Many decapitated skeletal remains reveal no evidence of cutmarks (i.e. at the East Cemetery of Roman London) but those that do indicate that the head was removed from the front (Simmonds *et al*. 2008), with the head subsequently being placed back in the grave in a variety of locations. There is little differentiation between decapitated burials and other Roman inhumations regarding the

provision of grave goods and the remains themselves appear to have been laid out with equal care. Some authors suggest that the ritual of decapitation may be associated with placating 'ghosts' or 'souls' of the individuals who died in inauspicious circumstances (Simmonds *et al*. 2008).

2.3 Health, Disease and Medical Treatment in the Roman Period

The understanding of health and causes of disease during the Roman period in Britain is underpinned by a complex of ethnic diversity and historical traditions. Understanding of the body in terms of precise anatomical functions was limited by the lack of practical dissection of human cadavers during this period and this, in part, contributed to the great scope for interpretations of the symptoms of physical ailments in the setting of a variety of inter-related medico-religious belief systems. The main focus of evidence for medical understanding during the Roman period comes from a series of texts written by medical practitioners of the time, such as Celsus (AD 14-37), Scribonius Largus (AD 1-50), Dioscorides (AD 40-90), Soranus of Ephesus (AD 40-90) and Galen (AD 131-201), probably the most influential on the development of medicine as a discipline. It is clear that many of the beliefs and approaches to medicine closely follow Ancient Greek traditions and it is generally thought, furthermore, that many of the practitioners themselves were actually Greek. The main groups of medical philosophies, the Dogmatists and Empiricists strove to elucidate the causes of diseases either through observing physical manifestations and hypothesizing scenarios of their origins or by relying purely on previous experience (Cruse 2006: 197). Both approaches followed a humoral, holistic approach advocated by Hippocrates whereby good health was maintained through keeping the 4 humors in balance, whether through physical or spiritual means. Later, Methodism rejected this paradigm, favouring a new classification of diseases including 'acute' and 'chronic' states brought about by atomic disarrangement (Cruse 2006: 198). Patients might be believed to be excessively dry and constricted, excessively fluid and atomic or it was possible for both conditions to co-exist. Methodists sought to advance their understanding of disease by revising their current knowledge with new cases, unlike the Empiricists and, additionally, experimented with practical applications of their theories, contrary to the Dogmatists.

In Roman Britain, it is likely by the 3rd and 4th centuries that the Methodist approach was the most commonly observed among the formal practitioners. Still, however, the prescription of many herbal remedies for certain ailments would have been long established. Roman authors

extolled the medicinal benefits of many plants and clearly had access to a well-tested pharmacopeia. Silphium (likely to have been *Fenula tingitana*) was valued enough by the Romans to be stored in the public treasury along with gold and silver (Cruse 2006: 63); its leaves were used to purge the uterus and bring away the still-born, its root for soreness of the windpipe and in distilled form was a panacea, used in treatments of chills, afflictions of the sinews, promoting menstruation, as a diuretic and for corns. Pain relief was achieved through administration of henbane, datura (or thornapple), mandrake and deadly nightshade (Roberts and Cox 2003: 161). These are now known to contain the relaxant drug hyoscine, which is a source of scopolamine used in anaesthesia today. Other more common plants such as opium, mugwort, rue, willow, rose, myrtle and valerian were also employed. Flax was noted by Celsus to make good bandages. Additionally, medicines could contain minerals composed from copper flakes and iron scrapings, as well as animal fats, insects, pine resins (Cruse 2006: 67) as well as ingredients that would now be considered to be a health hazard, such as lead and arsenic (Summerton 2007: 31).

Access to such medicines may have varied according to location and availability, although recovery of pharmaceutical vessels and medical equipment from Roman ship-wrecks confirms that drugs were traded throughout the Empire and were quite likely easily accessible in urban centres. Environmental archaeology has provided evidence suggesting that non-native botanical species were also introduced to Britain during the early Roman period. Cruse (2006: 56) considers rural peoples to have been more likely to produce their own medicinal crops. Here, it is likely that inhabitants would have sought the assistance of a herbalist (also known as root-cutters) as well as itinerant healers, part of a raft of less formally recognized medical practitioners such as pharmacists, schoolmasters and the head of the household (Summerton 2007: 17). Although evidence of hospital buildings have been excavated on the Continent and some propose that they may be present at Chester, Vindolanda, Hod Hill and along Hadrian's Wall at Housesteads, Benwell and Wallsend, it is generally believed that hospitals only existed for military personnel and slaves, not for civilians (Cruse 2006: 94, Roberts and Cox 2003: 160). Thus, in addition to some of the medical equipment found at these hospital sites associated with military occupation, surgical instruments are sometimes excavated from domiciliary sites, believed to have been misplaced by itinerant healers, probably providing civilians with their only opportunity to undergo specialist operations.

Archaeological evidence for therapeutic intervention and surgery is present but rare; at Hockwold-cum-Wilton, in Norfolk, a uterine sound was discovered, thought to be used for

'foeticide'. In addition, finds from the Stanway Doctor's burial, Silchester and Corbridge, including scalpels, tweezers, forceps, needles, saws, ointment spoons, scoops and probes, provide physical evidence that at least some people would also have had access to surgical treatment (Cruse 2006: 161). Evidence for trepanation has been found at five sites in Roman Britain while amputation is very rare and has been observed only in one case at Arlington Avenue, Dorchester (Roberts and Cox 2003: 161). Surgery may also have been undertaken in the case of obstetric complications causing a medical emergency; peri-mortem cutmarks on foetal bones from Hambledon Roman villa (Mays et al. 2012) and from Poundbury, Dorset (Roberts and Cox, 2003:161) suggest that embryotomy was practised at this time.

In additional to pharmaceutical and surgical therapy, a very important aspect of healing was ritual. In Britain, some medical instruments but more often votive offerings have been recovered from a number of shrine sites. The gods and divine intervention were widely believed to be both the cause of ill-health and to have the ability to heal through supplication. For example, to ensure the safe delivery of a baby, a pantheon of goddesses were prayed to, each with their own specific role. Allemona (Guardian of the Foetus), Partula (presiding over the delivery), Vagitanus (ensuring the first cry of the baby), Cunina (watching over the cradle) and Rumina (safeguarding breast-feeding) could all be called upon to assist in promoting the health of an infant. Cruse (2006: 109) suggests that the existence of these goddesses testifies to the belief in a divine origin in the fate of infants and it can perhaps be surmised that medico-religious practices filled the void created by contemporary pharmaceutical and surgical failings in striving to prevent disease and heal the sick. Both the stylised form of medical instruments recovered and inscriptions indicate that in Britain, traditional Roman values were inextricably intertwined with more native 'Celtic' belief systems, where deities are part Roman and part Celtic, such as Sulis-Minerva at Roman Bath. In Britain, several shrine or healing sanctuary sites have been discovered and contain stone anatomical votive offerings, representing a wide range of body parts, from eyes, to feet and internal organs such as the womb. The practice of making votive offerings carried on throughout the late Roman period in Britain.

3. The Physical Evidence: The people

3.1 Part 1: The Articulated Assemblage

3.1.1 Introduction

Excavations at the site of Excavations at the site of Yazor Brook (land to the east of Magna Castra Farm), Credenhill, Herefordshire, revealed three inhumation burials [2030], [2162] and [2165], each containing the skeletal remains of one individual. A small number of disarticulated human remains were also retrieved and are reported upon separately (See 3.2 Part 2).

3.1.2 The Articulated Assemblage: Methods and Process

The skeletal material was analysed according to the standards laid out in the guidelines recommended by the British Association of Biological Anthropologists and Osteologists in conjunction with the IFA (Guidelines to the Standards for Recording Human Remains, Brickley and McKinley (eds) 2004) as well as by English Heritage (Human Bones from Archaeological Sites: Guidelines for producing assessment documents and analytical reports, Centre for Archaeology Guidelines, 2002).

- Recording of the material was carried out using the recognised descriptions contained in Standards for Data Collection from Human Skeletal Remains by Buikstra and Ubelaker (1994). Full recording forms are supplied separately to be archived with any other archaeological recording forms. All skeletal data has been recorded using an MS-Access database(s) which can be found on the CD-Rom provided.

- The material was analysed macroscopically and where necessary with the aid of a magnifying glass for identification purposes. Where relevant, digital photographs have been used for illustration and a full digital image archive of all pathologies and any other features of interest has been provided on the CD-Rom enclosed with this report.

- The material was analysed without prior knowledge of associated artefacts so that the assessment remained as objective as possible.

3.1.3 Reasons for the Analysis

Osteological analysis was carried out to ascertain:

- Condition of bone present
- Completeness of the skeleton
- Inventory of the skeletal material
- Sex Determination
- Age Assessment
- Non-metric Traits
- Stature
- Skeletal Pathology
- Dental Pathology

3.1.4 The Physical Evidence in Summary

A total number of 3 individuals were exhumed from the site of Yazor Brook, Credenhill, Herefordshire. SK[2030] is associated with grave cut [2032], SK[2161] with grave cut [2162] and SK[2164] with grave cut [2165].

3.1.5 Condition of the skeletal material

The condition of the skeletal material was analysed macroscopically assessed and graded according to those guidelines set out by Brickley and McKinley (eds) (2004). Since most of the skeletons exhibited more than one grade of state of preservation, these categories were simplified into 4 main groups of preservation: Good (grades 0-2), Fair (grades 2-4), Poor (grades 4-5+) and Varied (more than 4 grades of condition).

3.1.5.1 Observations

The condition of the skeletal remains varied but all were fragmented. SK [2161] and [2164] were given scores of 2-3 in bone condition, although a minority of skeletal elements from SK[2164] were also scored as 1. Generally the bone surfaces were reasonably well preserved and observable but there was an under-representation of elements consisting mostly of cancellous bone (i.e. ribs, epiphyseal ends, foot bones etc) and smaller elements, which are more vulnerable to taphonomic processes (Henderson 1997).

SK[2030], however, was signifinantly more depleted in skeletal content, with few cancellous bone elements surviving and only the most robust elements present, generally with an absence of epiphyseal ends. This skeleton was scored from grades 3-5.

3.1.5.2 Results

Overall, the remains were classified as follows:

SK[2030]:	Poor
SK[2161]:	Fair
SK[2164]:	Fair

3.1.6 Completeness of the Individuals

This is a guide to the overall completeness of the individual's skeletal remains and is calculated according to the percentage of the bones present in relation the total number of bones in a complete human skeleton. Completeness of remains is gauged through an assessment of the amount of material representing different areas of the body. A complete skeleton comprises of:

Skull =	20%
Torso =	40%
Arms =	20%
Legs =	20%

Each area of the skeleton was assessed and then placed into the following four categories of completeness: 75%>, 50-75%, 25-50%, <25% (Buikstra and Ubelaker 1994).

3.1.6.1 Observations

The completeness of each individual varied according to the state of bone preservation, with some horizontal truncation was noted to have resulted in damage mainly to the left side of the cranium of SK[2164]. No substantial truncation was observed to have occurred to SK [2030] or SK [2161].

3.1.6.2 Results

The completeness of each skeleton was recorded as follows:

SK[2030]:	25-50%
SK[2161]:	50-75%
SK[2164]:	75%>

3.1.7 Age Assessment

Establishing the age and sex of individuals from an archaeological assemblage not only provides an insight into the demographic profile of the population but can also be used to inform us of patterns in pathological distributions in the group. The age of sub-adults is assessed using both dental development (Smith 1991) and eruption (Ubelaker 1989) as well as long bone lengths (Schaefer *et al*. 2009) and epiphyseal fusion (Scheuer & Black 2004). These methods can usually provide a reasonably accurate age estimation due to a relatively narrow range of variation in normal sub-adult development. Thus, sub-adults can be placed into the following age categories: Foetal (<36 weeks), Neonate (0-1 month), Young Infant (1-6 months), Older Infant (6-12 months), Child (1-5 years), Juvenile (6-12 years) and Adolescent (13-19 years).

Assessment of adult age at death, unfortunately, results in much less specific age estimates due to a much greater individual variation in the features exhibited by the examined elements at particular ages. A systematic trend for underestimating the true age at death of known adults from their skeletal remains has been noted (Cox 2000). Age estimation of adults was assessed from analysis of the auricular surface (Lovejoy *et al.* 1985) and the pubic symphysis (Brookes and Suchey 1990). Each of these methods examines the deterioration of these surfaces and categorises them accordingly. This deterioration is due in part to due to the health status of the individual but can also be influenced by life-style and so the variation produced by these factors results in much wider age categories: Young Adult (20-34), Middle Adult (35-49) and Old Adult

(50+) (Buikstra and Ubelaker, 1984). Grading of dental attrition was also used as a supplementary age assessment technique using the Miles method (1963) where dentition sets were complete enough to allow fair observation.

3.1.7.1 Observations

The skeletal remains from all contexts were noted to be fully developed and therefore were assessed using adult age assessment techniques. Preservation and completeness of the remains had a substantial impact on the techniques that could be applied due to the lack of complete auricular and pubic symphyseal surfaces. Dentition could be used for assessment in all three burials, though some caution was taken with interpreting the results in some cases due to absent teeth and dental pathology.

3.1.7.2 Results

The age assessment for SK[2030] was based upon dental attrition alone. The total age range from this method was 20-35 years at death and the remains were therefore considered to represent those of a young adult individual.

Age at death for SK[2161] was estimated from dental attrition and from observation of the auricular surface. Dental attrition suggested an age of between 30 and 40 years, whereas the auricular surfaces appeared to belong to an individual of slightly older age, between 40 and 55 years, giving an average age range of 35-50 years. Palaeopathological changes in the skeletal remains suggested that this individual had a condition called Hyperostosis Frontalis Interna (HFI), which most commonly occurs in females over 40 years old (See 3.1.11). These remains are likely to represent an individual of at least middle adult age at death.

Only part of the right auricular surface in addition to the dentition was present in SK[2164] for age assessment. Aging from the partially observable auricular surface suggested a possible age of between 25 and 35 years at death, corroborating the estimate from dental attrition of 25-35 years. This was despite heavy calculus deposits on the surfaces of some molars and the ante-mortem loss of one third molar, indicating that mastication was restricted to the left hand side of the jaw and that dental attrition would have been affected as a result. Overall, the remains appear to represent a young adult individual.

3.1.8 Sex Assessment

Sex was assessed using the criteria laid out by Buikstra and Ubelaker (1984) in the analysis of morphological features of the adult skull and pelvis. In addition, metric data was also used where possible, taking measurements of sexually dimorphic elements such as the femoral and humeral head (Bass 1995). Categories ascribed to individuals on the basis of this data were 'Male', Possible Male', 'Indeterminate', 'Possible Female', 'Female' and 'Unobservable'. Sex was ascribed on the basis of metrics alone where no sexually dimorphic traits were observable. Where sex was not observable through either metric or morphological observations, it was recorded as 'Unobservable'. No sexing of sub-adult material can be attempted due to the lack of reliable dimorphic features available for observation prior to puberty.

3.1.8.1 Observations

Sex assessment was restricted by bone preservation and fragmentation, particularly in the case of SK[2030], which was heavily fragmented once lifted.

3.1.8.2 Results

Only one dimorphic feature was available for observation from the remains of SK[2030] for sex assessment (the occipital protuberance/nuchal crest) and this feature was characteristic of a female. However, the lack of corroborating evidence from these poorly preserved remains prohibited an overall estimation of sex being made and the skeleton was, therefore, categorised as 'unobservable'.

The remains of SK[2161] and [2164] were more complete allowing an assessment of sex to be undertaken. Observations made of both the pelvis and the skull of SK[2161] suggested that this individual was female. Metric assessment of the femoral and humeral heads gave a sex estimation of possible female, whilst the circumference at the nutrient foramen of the tibia was indeterminate. Similar observations were made of SK[2164], which also suggested that these were the remains of a second female.

The demographic results are summarised below in Table 1 below:

	Age	Age Category	Sex
SK[2030]	20-35	Young adult	Unobservable
SK[2161]	35-45	Middle adult	Female
SK[2164]	25-35	Young Adult	Female

Table 1: Age and Sex Assessment

3.1.9 Non-metric Traits

Non-metric traits are morphological features that occur both in bone and dentition. These features have no specific functional purpose and occur in some individuals and not in others. The origins of non-metric traits have now been shown to be highly complex, each having its own aetiology and each being influenced to differing extents by genetics, the environment and by physical activity. A review of the current literature suggests that the undetermined specific origins of these traits and the fact that there is more genetic variation within populations than between them can prevent useful conclusions regarding their presence or absence in skeletal remains from being drawn (Tyrell 2000).

The observability and presence of any non-metric traits observed in the assemblage have been recorded in the database provided on the enclosed CD-Rom. The small sample size limited the analysis of these results. Non-metric traits have been recorded for these skeletons in order to allow future comparisons with findings from other Roman burial grounds.

3.1.10 Stature and Metric Analysis

Stature of adult individuals can be reconstructed from measurements of long bones of the skeleton. Since the long bones of sub-adults have not yet fully developed it is not possible to provide an estimate of stature for immature remains. Stature is the result of many factors including genetics and environmental influences (Floud *et al*. 1990), such as malnutrition and poor health. Height can be used as an indicator of health status and there is a wide range of literature on the relationships between height, health and social status. Estimated stature was calculated by taking the measurements of the individual long bones and using the formula provided by Trotter (1970). Variation in estimated stature can be up to 3cm.

Metric analysis of the cranium is also undertaken, primarily to allow comparison of measurements from pathological crania that may exhibit variation in shape pathognomic of particular congenital syndromes or artificial modifications, as well as to assess population

variation in morphology. Metric analysis of the long bones, in particular the femora and tibia, also serve to provide information on morphological variation in populations. Platymeric (of the femora) and platycnemic (of the tibiae) indices are calculated from Bass (1995) as indicators of variation in shape.

3.1.10.1 Observations

The analysis of stature here was severely restricted due to the limited number of complete long bones present. Only in the remains of one individual, SK[2161] were long bones complete enough to allow stature estimation.

No craniometric data was recorded due to the fragmentation of the crania present.

Measurements used as the basis for calculating the platymeric and platycnemic indices were taken on SK[2161] and SK[2164] where possible. No such measurements could be taken for SK[2030] due to poor preservation of the bone.

3.1.10.2 Results

Stature of the female skeleton SK[2161] was estimated from the right humerus to be 1.62m. This is just above the average of 1.59cm for females from the Roman period (Roberts and Cox 2003:163).

The platymeric index for SK[2161] was calculated as 77.1 and is categorised as 'platymeric' (flattened from front to back).

The platycnemic index for SK[2161] was calculated as 66.5 and for SK[2164] as 64.9. Both these values fall in the 'mesocnemic' range.

3.1.11 Skeletal Pathology

Palaeopathology is the study of diseases of past peoples and can be used to infer the health status of groups of individuals within a population as well as indicate the overall success of the adaptation of a population to its surrounding environment. Pathologies are categorised according to their aetiologies; e.g. congenital, metabolic, inflammatory, traumatic, neoplastic etc. (Roberts and Manchester 1997). Any pathological modifications to the bone are described.

The size and location of any lesion is also noted. Distribution of lesions about the skeleton should be noted to allow diagnosis. A differential diagnosis for any pathological lesions should also be provided. This report presents a summary and discussion of the pathological changes observed; detailed observations recorded for each pathology can be found on the CD-ROM included.

An insight into the nature of skeletal disease present in a population can be gained through examination of the prevalence rates of each type of disease. Prevalence rates can be calculated as a percentage of the count of each case of pathology recorded in relation to the total number of individuals present, known as the Crude Prevalence Rate (CPR) or in relation to the total number of the same, observable skeletal elements present that could have potentially been affected by the condition, known as the True Prevalence Rate (TPR). Prevalence rates are only useful indicators in larger assemblages and are not presented in this report due to the small sample size.

Not only must be the condition of skeletal remains be taken into account when considering evidence for pathology in archaeological populations but also the fact that more skeletal pathologies are likely to be present in older individuals, who have lived long enough to sustain chronic disease processes. This relates to the phenomenon known as the 'osteological paradox' whereby those exhibiting skeletal lesions are thought, in actual fact, to represent comparatively 'healthier' individuals in life than those individuals exhibiting no lesions who may well have succumbed to either more virulent diseases that leave no trace in the skeleton or to have died before a potentially observable disease affected the skeleton (Wood *et al.* 1992).

3.1.11.1 Observations

The preservation and incompleteness of the skeletal remains restricted the potential to observe skeletal pathological conditions, particularly in the case of SK[2030]. Any pathological lesions were recorded on the MS Access database, giving full descriptions and measurements as well as recording pathologies using digital images provided on the CD-Rom.

3.1.11.2 Results

A summary of the skeletal pathology is given for each skeleton below:

SK[2030]: No skeletal pathology observed.

SK[2161]: Nodular and ill-defined dense lamellar bone deposits were noted on the endocranial surface of the frontal bone, with minor lesions occurring on the anterior aspect of the parietal bone (See Plate 5). These lesions are frequently associated with Hyperostosis Frontalis Interna (HFI). It is more commonly found in post-menopausal females and has been attributed to disturbances in the function of the pituitary gland (Roberts and Manchester 1997). However, more recent studies identify the impeded function of the gonads, resulting in faulty oestrogen stimulation or abnormal progesterone effect on the ovaries, as the primary aetiological factor of HFI in females (Herschkovitz *et al*. 1999: 322). From a historical perspective, this prolonged oestrogen stimulus resulting in such bony accretions on the frontal bone is interpreted as relating to modern changes in female fertility and restricted child-bearing, hence being a rarely observed condition in archaeological populations. In modern populations, it is estimated that over 40% of women aged over 50 years present with the condition (Freyschmidt *et al*. 2003: 378) and the asymptomic condition is most frequently observed in females over 40 years old, though it has been noted in a small percentage of males who often present with testicular under-development or atrophy (Herschkovitz *et al*. 1999; 322). It is twice as common in diabetics as non-diabetics (Freyschmidt *et al*. 2003: 378).

Plate 5: *Irregular and nodular appearance of the endocranial surface of the frontal bone, SK[2161]*

Two cases of trauma were observed. The first consisted of a fracture to the distal third of the right radius, representing a well healed Colles' fracture denoted by a transverse raised ridge of bone running across the anterior surface of the peri-articular diaphysis (See Plate 6). It was not possible to observe any angulation and displacement of the fractured bone due to lack of preservation. Very minor osteophyte formation was present around the radio-ulnar joint surface and posterior aspect of the distal articular surface of the radius, likely to represent degenerative joint disease secondary to the fracture. A second fracture was noted in right clavicle, which was only partially preserved (See Plate 7). The fracture site was at the border of the mid to lateral third of the diaphysis and was well healed as indicated by the smooth lamellar bone callus present. An overlap of approximately 2cm had occurred between the fractured ends of the bone, with posterior displacement of the lateral portion and concomitant anterior displacement of the medial portion. Fractures to the clavicle and radius are not frequently observed in Roman populations, as is indicated by a TPR of only 1.7% and 1.3% respectively (Roberts and Cox 2003: 154-5), and both types of fracture are more commonly observed in males.

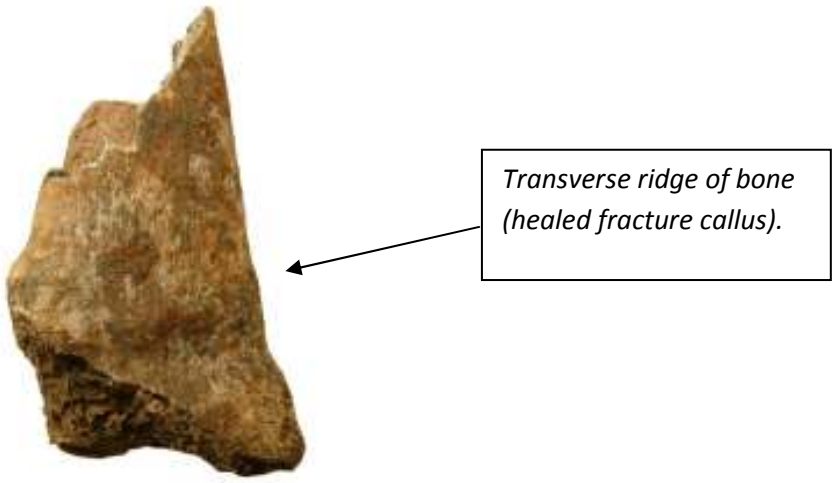

Plate 6: *Colles' fracture of the right radius, SK[2161]*

Clincially, both types of fractures are associated with a fall on an outstretched hand (Salter 1999: 571, 594). Colles' fractures of the wrist primarily occur in adults over the age of 50 and are more frequent in females than males, often being associated with the underlying condition of senile or post-menopausal osteoporosis. The well-healed state of the fracture with a lack of gross displacement evident suggests that immobilisation of the wrist would have been sufficient to

allow the fracture to heal. Fractures of the clavicle typically occur from a fall on the hand with the forces being transmitted up to the shoulder through the arm. The fracture commonly occurs in the mid third with displacement of the lateral fragment, as is seen in SK[2161]. Again, reduction of the fractured clavicle is generally not required to achieve adequate healing; although malunion is common, it does not impede the function of the shoulder. The fracture in adults is less common than in children due to the strength of the bone and it is likely that only reasonably substantial force i.e. falling at velocity would result in its fracturing.

Plate 7: *Well healed fracture of the right clavicle, SK[2161]*

Further degenerative joint disease was observed on the costal facet of a left rib head which exhibited osteophyte formation, microporosity and eburnation, indicative of osteoarthritis. The lack of preservation of contiguous skeletal element prevents any conclusions being drawn as to the nature of this joint disease, though it should be noted that the location is unusual (only having been reported for three Roman sites in Britain; see Roberts and Cox 2003: 150) and can be associated with trauma to the thorax or may be part of the ageing process. Osteoarthritis with eburnation and microporosity of the joint surface was also noted in the sacro-iliac joint (possibly right side) of the pelvis and the lumbar-sacral joint in the spine.

Inflammation was exhibited in the skeletal remains through extensive remodelled lamellar bone periostitis along the interosseous border of the distal third of the right fibula as well as by a smaller area of smooth but irregular lamellar bone deposit on the lateral surface of the mid third of the same element. Enthesophytes were also present on the left patella as well as prominent muscle attachment sites along the gluteal lines of the femora, ischial tuberosities of the pelvis and the deltoid tuberosities of the humerii.

SK[2164]: Inflammation was also observed in the lower legs of this individual, with porotic lamellar bone periostitis located bilaterally on the tibiae and fibulae. The bone deposit was diffuse and ill-defined, with a striated appearance. The changes were quite extensive on the left side with the deposit measuring approximately 15cm superior-inferiorly. The right side was less extensively involved. Very mild cribra orbitalia was also noted bilaterally in the orbits of the crania and was scored as grade 1 (Stuart-Macadam 1991). This is a metabolic condition generally associated with megaloblastic or haemolytic anaemias (Walker *et al*. 2009), though it can also occur as a result of inflammation. Cribra orbitalia is recorded fairly frequently in Roman populations, affecting between 2.1% and 25% of individuals. A minor amount of degenerative joint disease was also observed in the spine, on the zygapophyseal joints of the lower cervical and upper thoracic vertebrae (C7-T1 and T1-T2) as well as the lumbar spine (L5-S1). Observations were limited due to poor preservation of vertebrae, however. Moderate development of the muscle attachment sites were also noted about the long bones.

3.1.12 Dental Disease

Dental diseases include conditions that not only directly affect the teeth but also the soft tissue surrounding them, sometimes observable in changes to the underlying alveolar bone. Each condition can give an indication of different aspects of lifestyle and health of the individual. For example, caries is associated with diets high in sucrose content. The presence of calculus can inform us about dental hygiene whilst enamel hypoplastic defects testify to developmental stresses that an individual has undergone in childhood. The analysis of dental disease, therefore, not only informs us of specific oral conditions but provides complimentary data regarding overall health status and cultural practices.

No prevalence rates are reported here due to small sample size, though total numbers of teeth, sockets and those affected by dental pathologies are listed per individual in Table 2 below.

Evidence of whether dental care was employed regularly can be inferred from the relative presence of calculus or mineralised plaque in an archaeological population. Although, as Roberts and Cox (2003, p.131) point out, calculus can also relate to a diet high in protein it is generally assumed that high levels of calculus relate to poor oral hygiene. Calculus has been observed in Iron Age individuals, though examples of Iron Age inhumation burials are rare and evidence as to overall prevalence is extremely limited. In Roman populations, true prevalence ranges from

13.2% to 58.5%.Calculus was observed on the dentition of all three individuals but for SK[2030] and SK[2161], calculus was limited to very small flecks and was unlikely to have been of any medical significance to the individuals. However, substantial deposits were observed in

	SK[2030]	***SK[2161]***	***SK[2164]***
Caries	0	2	0
Calculus	17	30	29
Ante-Mortem Loss	0	2	1
Abscess	0	0	1
Enamel Hypoplasia	6	2	0
Periodontal Disease	Unobs.	26	11
Total Number Observable Teeth	24	30	31
Total Number Observable Sockets	1	29	21

Table 2: *Prevalence rates of Dental Disease*

SK[2164], particularly on the right side maxillary and mandibular molars and premolars (See Plate 8). The deposits were not only found on the buccal and labial sides of the teeth but also on the occlusal surfaces, indicating that the individual abstained from chewing on the right side of the mouth. The calculus build up on one side of the dentition suggests that there was an underlying medical issue causing the individual to chew on the left side only. No abscess or caries were observed associated with the heavy calculus deposits (though it should be noted that some abscesses occurring within the bone would not be observable macroscopically) but ante-mortem loss (or absence) of the right 3rd maxillary molar was noted.

Calculus builds up as a deposit on the teeth along the lines of the gums and when sufficient is present, irritation to the neighbouring gums is caused. This irritation is known as gingivitis, or gum disease, which can lead to changes observed in the underlying alveolar bone, known as periodontal disease. Eventually, the gum and the underlying bone may recede, causing teeth to become loose. Grade 2 periodontal disease was observed associated with the right mandibular 2nd and 3rd molars that were also affected by heavy calculus deposits in SK[2164] and it is likely that the two conditions were inter-related. Periodontal disease was also found in the left hand

side of the mouth, so it appears that the condition was not localised in this individual. One abscess was also found in the dentition of SK[2164] associated with the left maxillary 2nd premolar, indicative of a localised infection. Overall, the dental health of this young individual was poor.

Plate 8: *Substantial Calculus deposits on the right side posterior dentition of SK[2164], including the occlusal surfaces.*

No alvelolar bone was observable in SK[2030] due to poor preservation so no assessment of disease affecting the bone could be undertaken. Mild periodontal disease (grade 1) was observed in SK[2161] thoughout the maxilla and mandible, with two sockets being more severely affected (grade 2). This individual was middle aged and the mild periodontal disease in this individual is likely, at least in part, to have been contributed to by age.

As periodontal disease progresses, teeth become loose and can be lost as a result. Ante-mortem tooth loss can also occur as a result of caries and ensuing abscesses, with individuals likely to have undergone extraction of affected teeth (for example, in some individuals from the Roman

population at the Hoplands, Sleaford, the very tips of broken tooth roots were found *in situ* in the jaw, presumably having snapped off as a result of extraction of the tooth). Interproximal caries were found in SK[2161] on the maxillary 2nd and 3rd molars. No caries were observed in either SK[2030] or SK[2164]. Caries are linked to diets high in sucrose and to poor oral hygiene and are reported by Roberts and Cox (2003: 132) to significantly increase in prevalence from the Iron Age to the Roman period, whereafter they decrease, as is also the case for dental abscess and ante-mortem tooth loss, highlighting the inter-related nature of the aetiology of these dental diseases.

Caries and abscesses would have caused individuals great discomfort. No reference to dental fillings as a therapeutic procedure exists in Roman literature but there is other medical advice on how to treat painful teeth and gums with herbal poultices and rinses, such as washes of parietal root cooked in wine, pellitory and cypress berries, hyoscyamus root or seed, and purslane held or chewed in the mouth amongst other suggestions. Cautery and surgery were only recommended as a last resort (Cruse 2006:182). Caries were believed to be caused by 'little worms' and their removal required fumigation. Although prosthetic teeth have been found amongst Estrucan assemblages, little evidence of such modifications or fillings has been found amongst Roman populations in Britain (Cruse 2006: 183).

The prevalence rate of enamel hypoplasia was also recorded and is interpreted in many archaeological analyses to indicate physiological stress during development. Hypoplastic defects in the teeth, usually more common in the anterior dentition, are caused by bouts of childhood illness or severe malnutrition and are often used as an indicator of stress to health in childhood (Goodman and Armelagos, 1985). These defects appear to occur most often around the age of three years (Dobney and Goodman, 1991) and it is believed that only one person in 14,000 is affected by a hereditary hypoplastic condition (Hillson, 1986). Many ethnographic studies have found correlations between low socio-economic status and a higher rate of hypoplastic defects (eg Dobney and Goodman, 1991) and diachronic increases in observations of such defects have also been observed in archaeological populations, thought to be related to lifestyle changes and increased stress following colonisation (Hutchinson and Larsen, 1988). It should be borne in mind, however, that many of the people who are subjects in ethnographic studies live in conditions of the extreme poverty where there is little scope for social mobility and that we should expect to see more variance and less of a clear-cut picture in populations where the nutritional standard is over the critical nutritional threshold and where social mobility is more likely.

Only evidence for minor enamel hypoplastic defects were observed, mainly manifest through pitting observed in SK[2030]. No hypoplastic defects were observed in SK[2164] and were limited to two teeth in SK[2161]. This suggests that none of the individuals experienced any major episodes of stress during childhood that might have resulted in such defects. Enamel hypoplasia has been noted in Iron Age individuals (See Roberts and Cox, 2003: 101-2) but samples sizes are very small. True prevalence rates are recorded as between 5.1% and 29% for Roman populations in Britain (Roberts and Cox, 2003: 140-1).

3.1.13 The Articulated Assemblage: Conclusions

The remains of a total of four individuals were exhumed from the Yazor Brook site, three of which were analysed here following their recovery during the excavation stage of archaeological investigations at the site. The results of the analysis are presented below in Table 3. Data pertaining to the fourth individual is also presented in summary following the results of the earlier field evaluation undertaken by AI (2009:42).

SK[2030] was dated to the prehistoric period and considered likely to belong to the Iron Age. The remains were found in a flexed position in the grave orientated approximately north-south and covered by a wood deposit. The skeletal remains were poorly preserved, with only 25-50% of the remains present, but were confirmed as representing an adult of an age estimated between 25 and 35 years old at death. The sex of the skeleton was unobservable overall due to a lack of morphological features but one trait was scored as female. No skeletal pathology was recorded with observation for lesions highly restricted by the lack of bone preservation, though minor enamel hypoplastic defects and calculus was noted on the dentition.

SK[2161], SK[2164] and SK[112] were all identified as dating to the early Roman period as indicated by accompanying small finds.

SK[2161] was orientated south-east to north-west axis. These remains were supine but flexed laterally at the hip, either representing post-deposition movement of the body while articulated (as appears to have occurred to left leg) or positioning of the body within the grave at the time of interment. Although one rib head exhibited osteoarthritis, due to the lack of bone preservation it is not possible to assess if any associated pathological condition might have caused a spinal deformity in this individual that may have contributed to this positioning of the

	Skeleton [2030]	Skeleton [2161]	Skeleton [2164]	Skeleton [112]
Date	Prehistoric	Early Roman: 1st-3rd Century	Early Roman: 1st-3rd Century	Early Roman: ?2nd-3rd Century
Condition	3-5, Poor	2-3, Fair	1-3, Fair	Poor
Completeness	25-50%	50-75%	75>%	75%>
Age	Young Adult 20-35	Middle Adult 35-50	Young Adult 25-35	Young Adult 25-35
Sex	Unobservable (??F)	Female	Female	Male
Stature	Unobservable	1.62m	Unobservable	?1.65m
Skeletal Pathology	None	Fractured clavicle, Fractured radius (Colles'), Osteoarthritis and DJD, Enthesophytes, Periostitis.	Bilateral periostitis lower legs, Minor DJD spine	Not Examined
Dental Pathology	Minor calculus, Minor enamel hypoplasia	Calculus, Ante-mortem tooth loss. Minor enamel hypoplasia.	Substantial calculus, Abscess, Periodontal disease.	Not Examined

Table 3: *Summary of the Osteological Analysis*

body in the grave. The remains were represented by 50-75% of the original skeletal elements, the majority of which were in fair condition. The osteological analysis revealed that this individual was likely to have been female of an age estimated between 35-50 years, representing a middle aged adult. The disparity was noted between the age estimated from dental attrition and that from auricular surface observation may indicate that this individual may have enjoyed a comparatively refined diet. Numerous pathologies were present that may have directly

attributable to or have been a corollary of her age. Lesions attributed to Hyperosotis Frontalis Interna were observed, which are most commonly found in post-menopausal females. Two fractures of the right upper limb were observed, the first a Colles' fracture of the right radius and the second, a fracture of the right clavicle. Both fractures are associated with a fall onto an outstretched hand. Colles' fractures occur frequently in the elderly and are clinically associated with underlying senile or post-menopausal osteoporosis. Degenerative joint disease and osteoarthritis was evident in one rib and in the lumbar and sacral region of the spine, and minor enthesophytes were present at several muscle attachment sites around the body. In addition, periostitis was also observed on the right fibula. Stature was estimated at 1.62m, which was just above average height for females during this period.

SK[2164] was orientated on a north-east to south-west alignment and was interred in a chest with iron straps/hinges. The skeletal remains of SK[2164] were in fair condition and over 75% of the skeleton had survived. The analysis of this individual indicated that the remains belonged to a young adult aged between 25 and 35 years at death. The remains exhibited minor cribra orbitalia, possibly relating to megaloblastic or haemolytic anaemia in childhood and inflammation of the lower legs manifested by bilateral periostitis in the tibiae and fibulae. Minor degenerative joint disease was observed in the spine. This individual also appears to have been suffering from poor dental health and substantial calculus deposits were present on one side of the maxillary and mandibular dentition, including the occlusal surfaces, in addition to an abscess and periodontal disease.

SK[112] was also aligned approximately north-east to south-west and had been interred in a coffin in a supine, extended position. A preliminary analysis of the dentition and pelvis carried out by AI (2009) suggested that the remains belonged to a young adult male. An approximate stature estimation of 1.65m was calculated from the remains in situ as the elements were poorly preserved, though over 75% of the skeleton appeared to be present. The remains were not analysed for any signs of pathology.

3.2 Part 2: The Disarticulated Assemblage

3.2.1 Methods and Process

The disarticulated assemblage was analysed macroscopically and recorded using a Microsoft Access database, which can be found on the CD-Rom enclosed. Each element recorded was given a unique identification number and recorded by context.

In each instance, the identification, side and portion of the bone was noted, along with completeness, taphonomy and observable joint surfaces. Any metrics that could be used to provide an estimation of sex or of stature were taken where possible. The pelvic or skull bones were also analysed for sexually dimorphic traits where preservation allowed, using the criteria set out by Buikstra and Ubelaker (1994). Age determination was carried out using epiphyseal fusion, analysis of the pubic symphysis and of the auricular surface, where appropriate, and classified according to Brookes and Suchey (1990) and Lovejoy *et al.* (1985). Grading of dental attrition was also used as a supplementary age assessment technique using the Miles method (1963) where dentition sets were complete enough to allow fair observation.

Age of sub-adults was assessed using both dental development (Smith, 1991) and eruption (Ubelaker, 1989) as well as long bone lengths (Schaefer *et al.*, 2009) and epiphyseal fusion (Scheuer and Black, 2004). The same methods of assessment were applied to the disarticulated as to the articulated assemblage so that fair comparisons could be made between the two samples.

3.2.2 Observations

Only 3 disarticulated elements could be positively identified as human and all were recovered from separate contexts, [2006], [2239] and [4018]. Context [2006] formed an unphased layer sealing a surface of cobbles and stones, context [2239] formed a fill in a fire-pit and context [4018] was associated with context [4019], which was a disturbed Roman layer. All the contexts were located in the northern half of Area 1 in the location of the purported Roman cemetery and mausoleum with the exception of context 4018, which was located in Area 3.

3.2.3 Results

Context [2006] contained three associated fragments of a left parietal bone. The bone was well preserved and exhibited peri-mortem fragmentation or fracturing. The fragment edges were irregular but smooth and features hinging and spalling. One short incomplete fracture line also ran perpendicular to one of fractured edges. These features indicate that the fracturing of the cranial element occurred when collagen content was high i.e. the bone was relatively fresh. Unfortunately, the timing of the fragmentation or fracture cannot be accurately estimated due to the variation of collagen content in bone over time caused by differing taphonomic and associated preservation conditions. The endocranial surface of the element was also highly polished or burnished in appearance.

Context [2239] contained a portion of left adult mandible. Two teeth, the 3rd and 1st molar teeth were present and a tentative age estimate of 20-30 years at death was made, though this could not be corroborated due to the lack of the remainder of the original dentition. The mandible was large and robust but no sexually dimorphic features were available for observation. The bone and teeth were well preserved.

Context [4018] contained a complete mandible in good condition. The sex of the mandible was indeterminate; the tooth row was parabolic and the gonions flared, suggestive of a male but overall the mandible was gracile and the mentum (chin) rounded. Periodontal disease was present throughout with substantial porosity of the alveolar margin. A total of seven mandibular teeth were present. Five teeth were carious and two abscesses were observed, as well as calculus on two teeth. Two teeth had been lost ante-mortem. The high number of caries may be indicative of a diet high in sucrose and/or lack of oral hygiene. Age assessment could not be reliably undertaken due to the caries and ante-mortem tooth loss, though the individual was an adult. A developmental anomaly was also noted of the jaw, manifested by a partially bifid or bifurcated mandibular condyle on the right hand side (Type 1: See Barnes 1994:167). The condyle was broader and flatter than normal and a furrow or partial cleft was present in the midline with incomplete separation of the medial and lateral halves (See Plate 8). Micorporosity and a minor amount of osteophyte formation was presnt on the medial aspect of the condyle as a secondary change to the joint. One right maxillary first premolar was also present in this context.

Plate 8: *Partially Bifurcated Mandibular Condyle [4018]*

4. Conclusion: Funerary Practice at Yazor Brook, Credenhill.

The discovery of the inhumated remains from Yazor Brook has revealed important and rare information pertaining to prehistoric and early Roman burial practice in Herefordshire. Little evidence for burial during this period exists in Herefordshire itself and the discovery of an early Roman chest burial [2165] is not only unique within the region but also rare in Britain. Chest burials, differentiated from coffin burials by the presence of hinges, are more frequently recorded for the Anglo-Saxon period (Craig-Atkins 2012). One similar chest burial of Roman origins is recorded from the Roman Eastern Cemetery, London (Barber and Bowsher 2000: 94) where the fittings, including a handle or lid and a large number of nails, suggesting that the container for the inhumated skeletal remains may have been a re-used chest. The burial of the chest at Yazor Brook on a stone layer at the base of the grave accompanied by a pottery vessel and a cut of cow leg placed in the south-west corner of the grave on a stone plinth indicates a significant investment in the burial of this individual and perhaps is suggestive of social status or particular religious beliefs.

Recent stable isotopic investigations into the origins and migrations of Roman people has provided valuable information aiding our understanding of burial rites and population composition throughout Roman Britain, though this has mainly concentrated on late period

urban assemblages (See Eckhardt *et al*. 2010). The evidence suggests a complex relationship between migration and enculturation manifested by material items recovered from funerary contexts, with unusual furnishings or grave goods accompanying individuals of both local and non-local origins. Of non-military urban sites, including the burial ground serving the *colonia* at nearby Gloucester, approximately half of the individuals analysed were local, between 15-20% were from elsewhere in Britain whilst the remainder, between 20% and 35%, were long-distance migrants; of migrants from overseas, the most frequent origins were Gaul, Italy and Germany as well as a significant number from the Danubian provinces, Spain and Africa (Eckhardt *et al*. 2010: 106, 122). Osteological analysis revealed the incumbent of the chest burial [2165] from Yazor Brook to be a female of 25-35 years of age at death, with some dental issues and inflammation of the lower legs. Such periostitis, in combination with developed muscle attachments and minor degenerative joint disease, suggests that this female was physically active during life, though she was of a more gracile build than the female in burial [2162].

The burials excavated, including finds of hobnails, an offering of meat and pottery vessels, are typical of Roman interments in the area and are similar to the burials recently excavated from a number of sites near Wyre Piddle, Worcestershire (Western 2003, 2004) and St. Johns, Worcester (Western 2009). Hobnails are particularly characteristic of rural Roman burials and may be associated with a physically demanding agricultural lifestyle (Simmonds *et al*. 2008). The skeletal remains of SK[2161], found with hobnails around the feet, was much more robust than those of SK[2164] described above and exhibited two traumatic fractures. The fracture to the clavicle is likely to have occurred at velocity and may, along with the osteoarthritis, degenerative joint disease, periostitis and pronounced muscle attachments, again indicate an active lifestyle. Some of these changes may, however, relate to age as this female was older than SK[2164], being 35-50 years at death. Recent research suggests that females played an important role in Roman agriculture on the Continent; a female slave known as a *vilica* was traditionally employed as a non-sedentary supervisor and manager of the domestic and industrial production at the farmstead or villa that formed a focus of intensive economic activity (Roth 2003: 9, 11). Female labourers are also likely to have been employed in work on farmsteads, possibly involving the preparation of food, pastoralism and the manufacture of wool, cloth and textiles, the latter a lucrative trade (Roth 2009: 25.26). Females also took on the roles of *officinatrices* in the tile and brick manufacturing industry (Roth 2003: 61). Roth (2003) argues thereby that females not only contributed considerably to the economic productivity of rural farmsteads and villa estates but that females performing professional roles such as the *vilica* could achieve social status, possibly

rewarded with private property allowances. The organisation of labour on farmsteads in Britain is not discussed but it is credible that females carried out equivalent labour and management roles on rural Roman settlements, perhaps reflected by the osteological and funerary evidence from Yazor Brook.

The presence of a prehistoric burial [2030] in close proximity to these early Roman burials suggests some continuity of burial practice at the site, reflected also by the dispersed nature of the burials pre-dating the purported later cemetery associated with the development of the eastern suburb of *Magnis*. Early Roman rural burials and their relationship to associated settlements may not be well understood due to a lack of evidence compared to the later Roman period, such as is the case in East Hampshire, though here burials with large or unusual artefact assemblages have been found most frequently associated with extra-mural or non-villa enclosed settlements that are often earlier in their origins and are closely linked to the road network (Pearce 1999: 99). Interpretation is made difficult by a lack of contextual evidence but these burials appear to be separate from other rural burials (Pearce 1999: 112). Here, often the orientation of graves was highly varied and it has been suggested that this was due to alignment with features in the immediate local vicinity (Pearce 1999: 100), evidence for which may not survive. Radiocarbon dating of seemingly isolated or dispersed burials in Hertfordshire have returned dates of Roman, late and sub-Roman as well as middle Saxon periods (Pearce 1999:116); it is imperative that independent dating of such remains is undertaken given the evidence for the use of the same topographical locations for intermittent burial over many periods in time.

In a comprehensive overview of provincial funerary evidence, rural burials grounds in Hampshire and Hertfordshire were found to contain only a few individual graves and the majority of burials were associated with boundary features, commonly ditches and gullies defining enclosures on settlement peripheries, most often in or close to site entrances (Pearce 1999: 100-1). Often, though not exclusively, deposits of infant skeletal remains were recovered from within settlements whereas adults tended to be located outside settlement boundaries (Pearce 1999: 102). Pearce infers from the form and location of rural burials in the provinces that they were no less formal than urban burials (Pearce 1999: 113) and that burials 'could form an integral part of boundary formation' (Pearce 1999:115). Platt (2012) also argues that the Roman tombs and sarcophagi are inherently liminal objects and materialise the intersection between life and death, an inference that may naturally be extended to the status of graves.

However, given the small numbers of interments recorded, often these rural burial grounds seemed to be short lived and there was little evidence of inter-generational continuity of burial or for it playing a role in demarcating the landscape. This is in accord with the literary evidence suggests that graves were designated as a *locus religiosus*, protecting them from destruction in order to permit access to ancestral graves on land that may not have belonged to living descendants (Robinson 1975, after Pearson 1999: 120; Platt 2012: 216-7). It appears that land in this context belonged to individuals as an economic asset rather than primarily representing ancestral ties or a sense of belonging, even though the right to visit graves, commemorate ancestors and to honour the *genii loci* (resident spirit) of people and places was clearly important. Though it is not clear to what extent Roman law applied to occupation in Britain in the early period, burials may in this context relate to and reflect land ownership or tenancy in dispersed rural settlement. Scheidel (2004: 24) also argues that migration within the Roman Empire would have resulted in high rates of relocation, putting emphasis on the nuclear family as a primary unit of social organisation and identity while ties to extended kin became diminished. This pattern may also apply to Worcestershire and its environs, where small groups of individual graves dating to the late Iron age, Roman and Transition periods have been excavated from bounded enclosures, usually near ditches or in banks, associated with nearby occupation in farmsteads and settlements i.e. Sainsbury's site, St. Johns, Worcester (See Western 2009); George Lane and Furzen Farm, as well as Upper Moor, Wyre Piddle, Worcestershire (Western 2004, 2003). Beyond the inhumations discovered in the environs of Kenchester, only 2 other Roman burials, one cremated bone, are recorded in Herefordshire at Bromyard and Winslow (HER 5473) and Vowchurch (HER 8481). Burials from the Iron Age are similarly unusual, though one double inhumation was recorded at Wellington Quarry (HER 51633).

The recovery of disarticulated and re-deposited human skeletal remains at Yazor Brook, in addition to the disturbance of one of the graves by later Roman construction, indicates that the site underwent considerable development and re-use; perhaps, as testified by peri-mortem fragmentation of some skeletal elements, not a great length of time after the deposition of some of the human remains in the area. The economic development of the town and the need to establish a new formal cemetery clearly superseded any pre-existing burial traditions at the site, evidence for which to date has been scant. The excavation at Yazor Brook and the discovery of inhumated remains *in situ*, therefore, has provided a rare insight into prehistoric and early

Roman funerary practices near the small town of Kenchester in Herefordshire, before and during its occupation.

5. Future Recommendations

Further specialist analysis is recommended to enhance the data currently recorded for the human remains:

- Stable isotope analysis of the dentition to establish the origins and migration of individuals, particularly focussing on the Roman chest burial [2165], which is very rare in Britain.
- Stable isotope analysis to identify diet of the individuals.
- AMS dating of the skeletal material to establish a more precise date of the prehistoric skeleton [2030] and also to corroborate the dates of skeletons [2161], [2164] and [112].

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