Human Skeletal Remains at Marshalls Road, Raunds

by Julie Walker

Introduction

Human Skeletal Remains were recovered during the course of excavation prior to the construction of a road on a former allotment site adjoining Marshall Road, Raunds.

The site was previously identified as the periphery of an Early Saxon Cemetery during a Time Team excavation in 2002, during which three skeletons were investigated in an adjoining garden and one disturbed human burial was identified in the current excavation area.

This Human Skeletal Remains (HSR) assessment is for the six individuals uncovered during excavation in April 2023, prior to the road construction

Method

Skeletal material was assessed according to the principles of the British Association of Biological Anthropologists and Osteologists (BABAO) and the IFA (Mitchell & Brickley 2017; Brickley & McKinley 2004), in conjunction with Historic England guidelines (Historic England 2018).

Bone preservation and skeletal completeness were recorded using anatomical diagrams produced by Buikstra and Ubelaker (1994) and a percentage off bone completeness is scored based on the amount of bone present compared to the total bone count of a skeleton that age (Bone count differs for different stages of juvenile and adult development). Dental presence is recorded using a modified version of the Zsigmondy system, substituting tooth labels for letters (eg. I^1 instead of A to denote the upper right first incisor). Surface erosion of the bone is scored using McKinley's (2004) bone erosion/abrasion scoring system.

Adult remains were sexed by cranial and pelvic morphology methods. Pelvic sexing was attempted using pubic traits recorded by Phenice (1969) with modifications by Walker (2008) and Klales et al. (2012). Morphological traits to the skull were recorded for four scorable traits identified by Buikstra and Uberlaker (1994) while mandibular sexing morphology was recorded using Brickley's (2004) methods. Ageing of adult remains was undertaken primarily on dental attrition stages following Brothwell (1981) with reference to scorable age traits highlighted by O'Connell (2004) including: medial clavicle development; sacrum fusion rates; jugular growth plate development; Pubic symphysis remodelling; Auricular surface remodelling; sternal ends of rib remodelling; and the mineralisation stage of the 3rd molar. Where possible adult stature estimation was attempted using Trotters method for long bone length (1970)

Infant and juvenile remains were aged by tooth development, bone length and epiphysial development. The stages of tooth eruption and, were visible, in crypt development was matched to formation charts outlined by Buikstra and Uberlaker (1994) with a confidence rating of ±24 Months. Complete long bone lengths were measured and aged by methods developed by Maresh *et al.* (1970) and the epiphysial union and development stages were

assessed following Scheuer and Black's (2000) methodology. Infant and juvenile remains are unsexed due to the relatively low accuracy of visually scorable traits.

Pathological and congenital conditions were identified with the aid of Barnes (1994); Mayes (2021) and Waldren (2020).

Notes on Terminology

For age assessment of individuals the author uses the terms infant, juvenile and adult to broadly refer to the individuals estimated age range. Infants are individuals in the early years of life still retaining deciduous (milk) teeth with no permanent tooth eruption. Juveniles are those between the age of infancy and adulthood; with adult being defined by either the complete eruption of the third molar or full epiphysial fusion of the long bones.

Sex assessment conducted in this research is an expression of the biological sex of the individual and not an indication of their gender or socially constructed identity.

Osteological Analysis

Skeleton 1

Preservation, Taphonomy and Completeness

Bone preservation was low for this individual with around 35-40% of the bone assemblage present. The surface of most of the bones was generally rated as a Grade 3 for abrasion and erosion, in this instance caused by rooting with many fibrous roots still attached to the spongy bone. The lower limb bones, femur and tibia sustained more significant root damage and were rated as Grades 4 and 5, respectively. Brown discolouration was observed on both tibias and is the result of soil erosion and discolouration. This individual was buried in deeper grave than the others encountered on site and has therefore suffered less agricultural damage (ploughing, tracking etc) than the other individuals recovered. No evidence of animal gnawing or animal related disturbance of the burial was evident.

Sex Estimation

Sex estimation is based on morphological changes in the pelvis and skull and scored on observable points. The pubic bone on either innominate was not preserved and this rendered sex estimation of the pelvis unattainable using the current methods.

The skull was very complete, but taphonomically crushed; this meant that many of the individual bones of the skull were quite fragmented and scoring traits such as the nuchal crest was impossible. The only scorable traits were the right mastoid process as 2 (possibly female) and the right supraorbital margin as 1 (female). Only one of the four scorable mandibular traits, Overall Size, was observable and appeared female.

The sex estimation of this individual is: Probably Female

Age Estimation

As previously seen, the fragmentation of the skull and poor preservation of the pelvis hampered the age estimation of the individual. The only available ageing was for the dentition, or more importantly, the lack thereof. Figure 1 (below) shows the alveolar bone remodelling of the right jaw after the loss of the molar teeth; the remodelling indicates that this had happened quite a while before death and places the individual in the later stage of tooth development (loss) as 45 years and over.

Figure 1: Reabsorbsion of alveolar after pre-mortem tooth loss

The age estimation of this individual is: Older Adult (45+)

Stature estimation

Due to the incompleteness of any of the long bones, stature estimation could not be undertaken.

Pathology, Non-Metric Traits, and Developmental Defects

No instances of pathology, non-metric traits or developmental defects were observable in the remains of Skeleton 1. The lack of preservation (particularly the ribs and vertebrae); the fragmentation of the bones (mainly the skull and pelvis); and the surface erosion caused by rooting, meant that the occurrence of some more common pathologies and defects could not be investigated.

Skeleton 2

Preservation, Taphonomy and Completeness

This individual, like most of the burials recovered on site, was buried in a shallow grave; the proximity to the surface has had a negative effect on the preservation of the bones. Plough damage was observed on most of the burials and while no plough line was directly observed in this burial, more modern farming methods may account for the loss of the skull. Surface abrasion to the bones caused by fibrous tree rooting was scored as Grade 4 on McKinley's scale (2004) indicating that the entire bone surface was affected by erosive action but the general profiles of the bones were maintained. The spongy bone of the vertebral bodies was severally impacted by root damage with rooting still attached and growing through the bone resulting in heavy abrasion and some profile remodelling, scoring as McKinley's Grade 5. Soil erosion was evident as brown staining of the shaft of all the limb bones, similar to that seen in Skeleton 1. No evidence of gnawing was visible on the bones indicating the individuals were not above ground or the burials opened for an extended period of time.

Bone preservation for this individual was fragmentary with no skull or dentition present. The smaller bones of the hands and feet did not survive and the larger limb bones were incomplete. Around 50% of the individual was present. The left side of the body displayed greater preservation than the right, the cause of this is unknown.

Sex Estimation

Incomplete fusion was observed in parts of the pelvis, sacrum and femur indicating that this individual was a juvenile and therefore sex estimation was not performed.

Observing morphological and metric traits in juveniles to establish sex is still relatively inaccurate and while aDNA methods are accurate it is a destructive method of research and not deemed necessary for this current study.

Age Estimation

Age estimation for juvenile remains is based on tooth development, long bone length and epiphysial fusion rates. The absence of dentition and fragmentation of the long bones meant that the fusion rates were the sole method available for ageing this individual.

Thirteen of the nineteen observable areas had achieved full fusion. Those visible in the pelvis, sacrum and femur (table 1, below) which had not achieved full fusion alongside the areas of observed fusion give an estimated age of 16 years ± 24 Months.

Body Part	Fusion Area	Extent of Fusion	Estimated Age
Humerus	Fusion of Distal	Full Union	Over 11 years
	Fusion of Medial Epicondyle	Full Union	Over 13 years
	Fusion of Superior Epiphysis	Full Union	Over 15 years

Thoracic Vertebrae	Fusion of Inferior Epiphysis	Full Union	Over 15 years
	Fusion of Neural Arches	Full Union	Over 3 years
	Neural Arches to body	Full Union	Over 8 years
Lumbar Vertebrae	Fusion of Superior Epiphysis	Full Union	Over 14 years
	Fusion of Inferior Epiphysis	Full Union	Over 14 years
	Fusion of Neural Arches	Full Union	Over 3 years
	Neural Arches to body	Full Union	Over 8 years
Pelvis	Fusion of Ischial tuberosity	Open	Under 20 years
	Ilium-pubis	Full Union	Over 11 years
	Union of Ischium-ilium	Open	Under 17 years
Sacrum	Union of 2nd & 3rd Segment	Open	Under 20 years
	Union of 3rd & 4th Segment	Open	Under 20 years
Femur	Fusion of Femoral Head	Full Union	Over 14 years
	Fusion of Greater trochanter	Open	Under 19 years
	Fusion of Lesser trochanter	Open	Under 19 years
Tibia	Fusion of Proximal	Full Union	Over 14 years

Table 1: Fusion Ageing for Skeleton 2 following methods from Scheuer & Black (2000).

Child Growth estimation

Child growth patterns are estimated using long bone measurements and age based on teeth developments; as neither teeth or complete long bones are present, the growth pattern of this individual could not be assessed.

Pathology, Non-Metric Traits, and Developmental Defects

The individual was assessed for the presence of pathological conditions, non-metric traits and developmental defects. During this study it was noted that the *linear aspera* muscle attachment of the right femur was more pronounced than the left, indicating that they were more active/reliant on their right leg. A possible non-metric trait of a foramen (hole) in the left humeral *Olecranon fossa* was observed (Figure 2, below), but this is more likely due to taphonomic destruction of the bone.

No other traits, pathologies or defects were observed.

Figure 2:Foramen in Left Humerus

Skeleton 3

Preservation, Taphonomy and Completeness

Skeleton 3 was buried in a shallow grave immediately to the left of Skeleton 2. A missing left leg (in a plough line) and the absence of the front half of the skull (Frontal, Facial and Parietal bones) are due to modern agricultural damage. Due to its proximity to the surface the skeleton was also adversely affected by root damage. Abrasion caused by root damage was visible throughout the surface of all of the bones (McKinley Grade 4), however in the lower limbs (Tibia, Tarsals and Metatarsals) the abrasion was more extensive and damage was caused to the profile/shape of the bone (McKinley Grade 5). No gnawing or discolouration was noted on any of the bones. Around 80-85% of the skeleton is present.

Sex Estimation

Sex estimation was attempted based on pelvic, mandibular and cranial morphological traits. Sexual morphology of the pelvis was unobservable due to a lack of preservation of the pubic bone and due to the absence of the frontal half of the cranium the only scorable trait present was the left and right Mastoid process which both scored as female. The mandible is small in size with a pointed chin which are both female traits

The sex estimation of this individual is: Female

Age Estimation

Four methods for ageing this individual were available based on bone preservation (Table 2, below). The Medial Clavicle and Sacral Fusion methods are used to indentify younger individuals in their late teens or twenties; as both of these methods showed full

development Skeleton 3 was not a young adult. The auricular surface development method showed moderate to advanced stages (Stage J) and indicates an individual in their early thirties. The loss of dentition (all mandibular incisors and molars) and the bone remodelling after this demonstrates that this individual was an older adult.

Skeletal Region	Observations	Phase/stage	Inference
Medial clavicle	Full fusion of epiphysis	Stage 4	Over 24
Sacrum	Full closure between all sacral bodies	Full Fusion	Over 27
Auricular surface	A bit worn, but observable	Stage J	40 – 44 years
Dental Attrition	Most mandibular teeth are ante mortem losses with alveolar reabsorbion	Senior Adult	Over 45 years

Table 2:Available age estimation methods for Skeleton 3.

The age estimation of this individual is: Older Adult (45+)

Stature estimation

Stature was estimated using Trotter and Gleeson's (1970) equation for the length of the ulna (24.5cm) an estimation of 162cm +/- 4.30cm was obtained. No other long bones were complete enough to obtain additional estimates.

Pathology, Non-Metric Traits, and Developmental Defects

No non-metric traits or developmental defects were encountered on Skeleton 3. Evidence of degenerative joint disease, possibly osteoarthritis was detected on the vertebrae, hand and femur of this individual (Figure 3, below). Osteophytes (bony outgrowths) can be seen on the margins of the thoracic vertebral bodies, this has been caused by the degeneration of the inter-vertebral disc and produces the 'skirting' effect seen in the picture. Osteophytic growth can also be seen on the left hand phalange. The right femoral head showed signs of ebernation (polishing) and is indicative of the degeneration of joint cartilage leading to osteoarthritis. This type of degenerative joint disease is often seen on individuals of advanced years in an archaeological assemblage.

Figure 3: Osteoarthritis in Skeleton 3.

Skeleton 4

Preservation, Taphonomy and Completeness

This individual was moderately preserved with around 40 – 50% of the individual present. The more spongy bones of the vertebrae and ribs were poorly preserved as were the smaller bones. Overall the surface erosion of the remains scored as Grade 4 due to root damage throughout all of the bone surfaces; the exception to this was mandible and atlas vertebrae which shows far less surface erosion to the bone surface and registered as Grade 2. As seen with the two previous burials this individual was in a shallow grave with has advanced the bone abrasion and lack of preservation.

Sex Estimation

Sex estimation was not attempted on the juvenile skeleton due to the low accuracy of morphological and metrical methods.

Age Estimation

Aging juvenile remains is based on tooth development, long bone length and epiphyseal fusion rates. The long bones were not complete enough to obtain any age estimations, so ageing this individual was based on tooth formation (Table 3, below) and fusion rates (Table 4, below).

The mandibular second incisors and second molars where visible in crypt and the eruption stages of the teeth produced an age range of: 6 Years ± 24 Months. As only four fusion

rates were observable, a larger age range of 3 – 11 years of age was obtained. The tooth development method is more accurate and has been taken as the age estimate of this individual.

Location	**Tooth**	Moorrees et al. **Formation Stage**	**Uberlaker Age Estimate**
Right Mandibular	**Second Incisor**	**CR 3/4**	**6 Years** ± 24 Months
	Second Molar	**CR 1/2**	
Left Mandibular	**Second Incisor**	**CR 3/4**	
	Second Molar	**CR 1/2**	

Table 3: Juvenile age estimate based on tooth formation.

Body Part	**Fusion Area**	**Extent of Fusion**	**Estimated Age**
Thoracic Vertebrae	Fusion of Neural Arches	Full Union	Over 3 years
Pelvis	Ilium-pubis	Open	Under 11 years
Femur	Fusion of Femoral Head	Open	Under 14 years
Tibia	Fusion of Proximal	Open	Under 14 years

Table 4: Fusion ageing for Skeleton 4, based on methods from Scheuer & Black (2000).

The age estimation of this individual is: 6 Years ± 24 Months

Child Growth estimation

Child growth estimation was not attempted as no complete long bones were available to make a comparison to dental ageing.

Pathology, Non-Metric Traits, and Developmental Defects

Skeleton 4 was assessed for the presence of pathology, non-metric traits and developmental defects. The only occurrence detectable was a caries (cavity) of the second deciduous molar on the right mandible (Figure 4, below). Although not a sign of pathology it represents a more processed diet (Mays, 2010). A rise in this type of cavity is seen when the coarse diets, which help to scour the teeth clean, were replaced with softer processed food.

Figure 4: Dental caries (cavity) on the second deciduous molar of Skeleton 4.

Skeleton 5

Preservation, Taphonomy and Completeness

The preservation of Skeleton 5 was very poor with only the left distal humerus and partial left and right long bones survived. All bones have heavy surface erosion caused by rooting damage which has changed the surface morphology (McKinley Grade 5) while the tibias also have brown discolouration from soil erosion. It is estimated that around 10% of this individual is present. The lack of bone representation in this burial is due to plough damage truncating a shallow grave.

Sex Estimation

Sex estimation was not attempted on the juvenile remains due to low accuracy of metric and morphology trait assessment.

Age Estimation

No complete long bones, dentition or fusion centres were available for analysis. The small size (width) of the long bones indicates that this individual was a juvenile. No other ageing is visually possible for these remains.

The age estimation of this individual is: Juvenile

Child Growth estimation

This analysis could not be performed due to the lack of complete long bones and dentition.

Pathology, Non-Metric Traits, and Developmental Defects

No pathology, non-metric traits or developmental defects were observable on this individual.

Skeleton 6

Preservation, Taphonomy and Completeness

This individual in remarkably well preserved in comparison to the other juvenile and infant burials on site with around 85-90% of the skeleton present. Like most of the burials it was interred in a shallow grave, but appears to have avoided agricultural damage. The skull was taphonomically crushed making it complete but fragmentary, a similar pattern was observed for the preservation of the long bones, but all-in-all the survival of bones was very good. Surface abrasion to the bones was also less severe than seen in the other burials; overall McKinley's (2004) Grade 3 was applied as most of the surface had some damage, but the bone morphology was unchanged. The vertebrae were badly affected by root damage and due to the 'spongy' nature of these bones their abrasion rate was Grade 5 as their morphology had been damaged by the abrasion. The arm and legs bones appeared lighter in colour than the rest and this may be due greater erosion in these areas. No evidence of gnawing was observed on the bones.

Sex Estimation

Sex estimation was not attempted on this individual as metric and morphological traits are often unreliable on juvenile remains.

Age Estimation

Three datasets are used to age juvenile remains; long bone length, tooth development and bone fusion rates. The long bones were all incomplete or had several breaks rendering length measurements and therefore this form of ageing unattainable.

Dental ageing followed tooth development and eruption patterns using Uberlaker's method (1994). All the teeth were permanent dentition and the third molar was in the early stages of crypt eruption. The development pattern aged this juvenile as 15 years ± 30 Months.

The degree of fusion was recorded for all the observable points of Skeleton 6 (Table 5, below). The fusion levels of the bones give an minimum age of 11 years and a maximum age of 17 years.

Body Part	Fusion Area	Extent of Fusion	Estimated Age
Humerus	Fusion of Distal	Full Union	Over 11 years
Cervical Vertebrae	Fusion of Superior Epiphysis	Open	Under 20 years
	Fusion of Inferior Epiphysis	Open	Under 20 years
	Neural Arches to body	Full Union	Over 8 years
Thoracic Vertebrae	Fusion of Superior Epiphysis	Open	Under 20 years
	Fusion of Inferior Epiphysis	Open	Under 20 Years
	Fusion of Neural Arches	Full Union	Over 3 years
	Neural Arches to body	Full Union	Over 8 years
Lumbar Vertebrae	Fusion of Superior Epiphysis	Open	Under 20 years
	Fusion of Inferior Epiphysis	Open	Under 20 years
	Neural Arches to body	Full Union	Over 8 years
Sacrum	Union of Segments 1 + 2	Open	Under 20 Years
Pelvis	Union of Ilium-pubis	Open	Under 18 years
	Union of Ischium-ilium	Open	Under 17 years
Femur	Fusion of Femoral Head	Open	Under 19 years
	Fusion of Greater trochanter	Open	Under 19 years
	Fusion of Lesser trochanter	Open	Under 19 years
	Fusion of Distal	Open	Under 20 years
Tibia	Fusion of Distal	Open	Under 18 years

Table 5: Fusion rates for Skeleton 6 based on methods from Scheurer and Black (2000).

The age estimation of this individual is: 15 years ± 30 Months.

Child Growth estimation

Child growth estimation was not attempted as no complete long bones were available to make a comparison to dental ageing.

Pathology, Non-Metric Traits, and Developmental Defects

The individual was assessed for the presence of pathology, non-metric traits and developmental defects; no occurrences were found and the individuals bones appear to be developing in a normal pattern and sequence.

Summary

The six individuals excavated from Marshalls Road were firstly assessed for preservation, taphonomy and skeletal completeness. Five of the six burials were in shallow graves and demonstrated greater disturbance due to agricultural activity; such as the loss of left leg and pelvis observed in Skeleton 3 which had a plough furrow running through this area. All of the skeletons showed surface abrasion due to rooting and in most cases this was severe enough to affect the whole surface of the bone and cause a loss of surface morphology and profile to the bone. The skulls, were present had been crushed and while complete, the bones were fragmented; the exception to this was Skeleton 3 whose frontal skull was removed, possibly due to agricultural methods. Most bones were fragmentary, rather than complete and the rate of bone survival by burial ranged from 35 – 85% with the heavily truncated Skeleton 5 having only 10% bone retention.

The demographic (age and sex) of the individuals' was considered next. The six individuals consisted of two females of senior adult age (SK1 and SK3) and four juveniles (SK2; SK4, SK5 and SK6). The older females were primarily aged by the loss of most of their permanent dentition and the subsequent bone remodelling after; meaning that they live for some time after this. The four juveniles varied in age with the youngest, Skeleton 4 being estimated as 6 Years ± 24 Months. Skeletons 2 and 6 were of a similar age (16 years ± 24 Months and 15 years ± 30 Months respectively) and Skeleton 5 was un-aged beyond Juvenile.

The sampling bias of the assemblage needs to be considered when interpreting the demographic results. This assemblage consists of the individuals' removed from the periphery of the cemetery only; therefore, it is not a representation of the entire graveyard population, but of individuals buried in a specific area. It is unclear whether this area of the cemetery was used exclusively for the burial of older women and children or if it is a bias of a very small area of the cemetery being studied.

Pathology, non-metric traits and developmental defects were investigated next. Only two instances were detected and this may be due to the general fragmentation and abrasion to the bone surfaces masking the presence of other occurrences. The senior adult female, Skeleton 3 exhibited Osteoarthritis in several of her bones and this is a common degenerative joint disease appearing in individuals of older age caused by the breakdown of cartilage around the joints. The juvenile, Skeleton 4 had a dental caries in a mandibular molar, again this is a common occurrence in Roman or later individuals and is due to a more processed diet where coarser particles no longer scour the teeth.

Relation to previous work

The cemetery had been previously excavated in the adjoining house garden during a Time Team dig in 2002, a report for this or current whereabouts of the individuals recovered cannot be found. This means that comparison has to be made following the information from the programme itself. They discussed 3 burials; 'Henry' an older male with osteoarthritis excavated by the home owner prior to their dig; a female buried with a dog and grave goods; and a juvenile (no details given beyond this). The bones seem to be much better preserved, less fragmented and less surface damage; this may be due to the differing geology they were buried in or the current sites previous use as an allotment (as stated on Time Team). Although they only have 3 individuals, they represent as wide demographic and the positioning of the bodies seems more spread out than the current individuals. They didn't seem to find any pathologies beyond osteoarthritis either, which may indicate that this was largely a healthy and well nourished population.

No further comparison can be made beyond this with the information currently available.

Potential for Further Research

This collection is part of a larger previously identified cemetery and it has further research potential for comparable analysis with other individuals from this cemetery. The location of the remains excavated by Time Team in 2002 or a copy of an osteological report for them could not be found by the current author, so no comparison could be made beyond the information on the television programme (discussed above). Future work is intended on this site as part of the development and it may result in more skeletal excavations which will generate a larger comparative assemblage.

None of the individuals in the current study are dated by artefacts and the date of Early Anglo-Saxon is ascribed due to their presence in the continuation of an already dated cemetery. A radiocarbon dating strategy for the individuals from the various phases of the cemetery would add to our understanding of the time span for this cemetery.

If this assemblage is needed by future researchers ~ The skeletal archived will be stored at the Northamptonshire Archaeological Resource Centre (ARC) and skeletal recording sheets summarising all osteological material present for the current analysis is shown in Appendix 1

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