Osteological Analysis

Broughton Moor

North Yorkshire

Site Code: BR10
NGR: SE 476845 473645

Report No 1512
June 2012

Prepared for

Melanie Partlett
22 Emerald Street
Saltburn
Cleveland
TS12 1ED

Prepared by

Malin Holst
York Osteoarchaeology Ltd
Ivy Cottage
75 Main Street
Bishop Wilton
York YO42 1PQ

TABLE OF CONTENTS

	CONTENTS	Page
	Summary	iii
	Acknowledgements	iii
1.0	**INTRODUCTION**	**1**
1.1	AIMS AND OBJECTIVES	1
1.2	METHODOLOGY	1
2.0	**OSTEOLOGICAL ANALYSIS**	**1**
2.1	PRESERVATION	1
2.2	MINIMUM NUMBER OF INDIVIDUALS	2
2.3	ASSESSMENT OF AGE	2
2.4	SEX DETERMINATION	3
2.5	METRIC ANALYSIS AND NON-METRIC TRAITS	3
2.6	CONCLUSION	4
3.0	**PATHOLOGICAL ANALYSIS**	**4**
3.1	INFECTIOUS DISEASE	4
3.1.1	Periosteal Reactions	4
3.1.2	Endocranial New Bone Formation	5
4.0	**DENTAL HEALTH**	**5**
5.0	**MORTUARY PRACTICE**	**6**
6.0	**DISCUSSION AND SUMMARY**	**6**
	References	**8**
	Tables	
1	Summary of osteological and palaeopathological analysis	2
	Plates	
1	Left tibia of Sk4218 with woven bone deposit	5

2	Cranial fragment of Sk4336 with internal woven bone formation	5
	Appendices	
A	Osteological and Palaeopathological Catalogue	A

Summary

York Osteoarchaeology Ltd was commissioned by Friends of Active Archaeology to carry out the osteological analysis of two human skeletons recovered from Broughton Moor, near Malton, North Yorkshire (SE 476845 473645). The skeletons were interred in oval pits. Skeleton 4336 was interred in a north to south orientation, while the orientation of Skeleton 4218 was not seen during excavation. It is thought that the skeletons date to the Romano-British period.

One skeleton (4336) was 80% complete and was in a good condition, while the second skeleton (4218) was 45% complete and poorly preserved. Both skeletons were neonates, aged between birth and three months old. Skeleton 4336showed evidence for infection in the form of woven bone on the endocranial (inner part of skull) surface, while the second skeleton had woven bone on the left femur and both tibiae. Although woven bone deposits can be part of normal growth, in this instance the deposits were too thick and irregular to represent growth and they are thought to be pathological. However, the cause of the lesions could not be positively identified.

Previously, a female skeleton aged between 26 and 35 years had been interred in a supine extended position in a north to south orientation within a cist with hob nails and a brooch. She had suffered from stress during the first years of childhood, chronic sinusitis and inflammatory lesions on the left tibia. Her dental health was moderate, with widespread plaque deposits on the teeth, mild periodontal disease and one cavity.

Acknowledgements

York Osteoarchaeology Ltd would like to thank Liddy Dalesman and Melanie Partlett of Friends of Active Archaeology for their help and support.

1.0 INTRODUCTION

In May 2012 York Osteoarchaeology Ltd was commissioned by Friends of Active Archaeology to carry out the osteological analysis of two skeletons. The skeletons had been recovered in 2010 during archaeological excavations at Broughton Moor, near Malton, North Yorkshire (SE 476845 473645).

The skeletons had been interred in small oval pits, with Skeleton 4336 being interred in a north to south orientation, while the orientation of Skeleton 4218 could not be observed. The positions of both skeletons were not seen during the excavation. However, it is thought that the burials date to the Romano-British period.

Previous excavations revealed a skeleton that had been buried in a cist on its back in an extended position, with the right forearm across the pelvis and the left arm extended beside the skeleton in a north to south direction. The individual had been buried wearing hob nail shoes, as suggested by the nails found in the foot area. A fibula brooch on the right shoulder suggests that the skeleton may also have been wearing clothing.

1.1 AIMS AND OBJECTIVES

The aim of the skeletal analysis was to determine the age, sex and stature of the skeletons, as well as to record and diagnose any skeletal manifestations of disease and trauma.

1.2 METHODOLOGY

The skeletons were analysed in detail, assessing the preservation and completeness, calculating the minimum number of individuals present as well as determining the age, sex and stature of the individuals. All pathological lesions were recorded and described.

2.0 OSTEOLOGICAL ANALYSIS

Osteological analysis is concerned with the determination of the identity of a skeleton, by estimating its age, sex and stature. Robusticity and non-metric traits can provide further information on the appearance and familial affinities of the individual studied. This information is essential in order to determine the prevalence of disease types and age-related changes. It is crucial for identifying sex dimorphism in occupation, lifestyle and diet, as well as the role of different age groups in society.

2.1 PRESERVATION

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition (Henderson 1987, Garland and Janaway 1989, Janaway 1996, Spriggs 1989). Preservation of human skeletal remains is assessed subjectively, depending upon the severity of bone surface erosion and post-mortem breaks, but disregarding completeness. Preservation is important, as it can have a large impact on the quantity and quality of information that it is possible to obtain from the skeletal remains.

Preservation was assessed using a grading system of five categories: very poor, poor, moderate, good and excellent. Excellent preservation implied no bone surface erosion and very few or no breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation.

Skeleton 4218 was in a poor condition, with moderate erosion and was very fragmentary (Table 1). Skeleton 4336 was well-preserved, with little surface erosion or fragmentation.

Table 1 Summary of osteological and palaeopathological results

Skeleton No	**Preservation**	**Completeness**	**Age**	**Sex**	**Stature**	**Pathology**
4218	Poor	45%	0-3 months	-	-	Woven bone on the left femur and both tibiae
4336	Good	80%	0-3 months	-	-	Woven bone on endocranial surface or frontal and at orbits

Skeleton 4218 was only 45% complete, while Skeleton 4336 was 80% complete (see Table 1).

2.2 MINIMUM NUMBER OF INDIVIDUALS

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure in osteological reports on inhumations in order to establish how many individuals are represented by the articulated and disarticulated human bones (without taking the archaeologically defined graves into account). The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements recovered. The largest number of these is then taken as the MNI. The MNI is likely to be lower than the actual number of skeletons which would have been interred on the site, but represents the minimum number of individuals which can be scientifically proven to be present.

There were two left femora, two tibiae and two proximal left ulnae, suggesting a MNI of two individuals.

2.3 ASSESSMENT OF AGE

Age was determined using standard ageing techniques, as specified in Scheuer and Black (2000a; 2000b) and Cox (2000). For non-adults age was estimated using the stage of dental development (Moorrees *et al.* 1963a; 1963b), dental eruption (Ubelaker 1989), measurements of long bones and other appropriate elements, and the development and fusion of bones (Scheuer and Black 2000b). In adults, age was estimated from stages of bone development and degeneration in the pelvis (Brooks and Suchey 1990, Lovejoy *et al.* 1985) and ribs (modified version of methods developed by İşcan *et al.* 1984; 1985 and İşcan and Loth 1986 provided in Ubelaker 1989), supplemented through examination of patterns of dental wear (Brothwell 1981, Miles 1962).

The individuals were divided into a number of age categories. Non-adults were subdivided into 'foetus' (f: where the age estimate clearly fell below 38-40 *weeks in utero*), 'perinate' (p: where the age estimates

converged around birth), 'neonate' (n: where the age estimate suggested 0-1 month), 'infant' (i; 1-12 months), juvenile (j; 1-12 years), and adolescent (ad; 13-17 years). Adults were divided into 'young adult' (ya; 18-25 years), young middle adult (yma; 26-35 years), old middle adult (oma; 36-45 years), and mature adult (46+ years). A category of 'adult' (a) was used to designate those individuals whose age could not be determined beyond the fact that they were eighteen or older. However, it is important to note that several studies (for example Molleson and Cox 1993, Molleson 1995, Miles *et al.* 2008) have highlighted the difficulty of accurately determining the age-at-death of adults from their skeletal remains, with age-at-death frequently being underestimated for older individuals. The categories defined here should be taken as a general guide to the relative physiological age of the adult, rather than being an accurate portrayal of the real chronological age.

For each skeleton as many criteria as possible (preservation allowing) were used to estimate age. Age estimation was more challenging in the cremation burials due to the incompleteness of the remains and the amount of fragmentation present, which meant that often the necessary parts for age estimation were not present. Age estimates for the cremation burials should therefore be viewed with caution.

The age of Skeleton 4336 could be determined relatively accurately, using the dental development, long bone measurements and fusion, suggesting a neonatal age, from birth to three months (see Table 1). It was much more difficult to determine age in Skeleton 4218, as no complete long bones survived. However, comparison with Skeleton 4336 suggests that both individuals were the same size and age.

2.4 SEX DETERMINATION

Sex determination was carried out using standard osteological techniques, such as those described by Mays and Cox (2000). Assessment of sex involves examination of the shape of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood. Evidence from the pelvis was favoured as its shape is directly linked to biological sex (the requirements of childbirth in females) whereas the shape of the skull can be influenced by factors such as age (Walker 1995). Measurements of certain bones were used to supplement the morphological assessment (Bass 1987).

It is not possible to determine sex in non-adult skeletons.

2.5 METRIC ANALYSIS AND NON-METRIC TRAITS

Stature depends on two main factors, heredity and environment; it can also fluctuate between chronological periods. Stature can only be established in skeletons if at least one complete and fully fused long bone is present, but preferably using the combined femur and tibia. The bone is measured on an osteometric board, and stature is then calculated using a regression formula developed upon individuals of known stature (Trotter 1970). Where possible, bones from the legs were used in preference to those of the upper limb as these carry the lowest error margin (*ibid*).

It is not possible to determine stature for non-adults.

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are believed to suggest hereditary affiliation between skeletons (Saunders 1989). The origins of

non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Trinkhaus 1978). A total of thirty cranial (skull) and thirty post-cranial (bones of the body and limbs) non-metric traits were selected from the osteological literature (Buikstra and Ubelaker 1994; Finnegan 1978; Berry and Berry 1967) and recorded.

Non-metric traits were not observed.

2.6 CONCLUSION

Osteological analysis of the two skeletons established that one skeleton was a well-preserved and 80% complete neonate, while the second skeleton was a poorly preserved 45% complete neonate.

3.0 PATHOLOGICAL ANALYSIS

Pathological conditions (disease) can manifest themselves on the skeleton, especially when these are chronic conditions or the result of trauma to the bone. The bone elements to which muscles attach can also provide information on muscle trauma and excessive use of muscles. All bones were examined macroscopically for evidence of pathological changes. Fuller descriptions of the pathological lesions observed can be found in Appendix A.

3.1 INFECTIOUS DISEASE

Infectious disease can involve the skeleton, but since bone cannot respond quickly only evidence for chronic, longstanding infections can be observed in archaeological skeletal remains (Roberts and Manchester 2005). Acute conditions, where the patient either recovers or dies within a short space of time will not be seen. Initial bone formation in response to infection is disorganised (woven bone), but with time, as healing takes place, woven bone is remodelled and transformed into lamellar bone. Consequently, woven bone presence indicates an infection that was active at the time the person died, whilst lamellar bone indicates an infection that had healed; a combination of both suggests a recurring or longstanding infection (*ibid*). Although specific diseases may cause new bone to be deposited on the skeleton, it is almost always impossible to diagnose these from the bones alone. Hence, evidence for infection is discussed as 'non-specific' infection.

3.1.1 Periosteal Reactions

New bone deposits on the surfaces of the bones can indicate inflammation of a sheath of tissue (the periosteum) which surrounds all bones (Ortner 2003). Inflammation may be due to infection, but low-grade trauma and chronic ulceration can also lead to new bone formation (Roberts and Manchester 2005; Ortner 2003). Periosteal reactions are commonly observed in archaeological populations, particularly on the tibiae (Roberts and Manchester 2005), and their prevalence has been used as a general measure of stress in past populations (Ortner 2003).

The left femur and both tibiae of Skeleton 4218 showed evidence for thick grey woven bone deposits (Plate 1). The problem with woven bone deposits in non-adults is that this is how bones grow and as a result, normal growth-related deposition of woven bone on the long bone cortical surface is very difficult to distinguish from pathology-related deposition of woven bone (Lewis 2007, 135). Research has shown that growth-related new bone deposits are bilateral. On the tibia, they tend to be located on the medial surface of the bone, although in other long bones, such as the femur, humerus, ulna and radius, the bone formation tended to be concentric (Shopfner 1966).

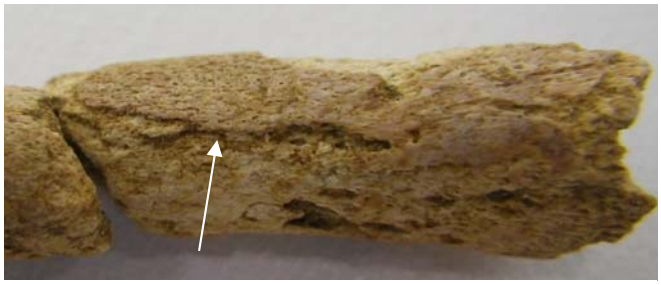

Plate 1 Left tibia of Sk4218 with woven bone deposit

In this instance, there was no new bone formation on the humerus or ulna, and the woven bone formation on the tibiae was concentric, rather than only being located on the medial surface, suggesting that this was probably not growth-related. Additionally, the deposits were thick and apparently made up of a number of layers of bone. There are a number of conditions that can cause new bone formation in neonates. These include scurvy and rickets, however, the bone tends to have a different appearance in these cases, being more porous, especially at the long bone metaphyses (the growth ends of the shaft), which was not the case in Skeleton 4218 at Broughton. Another cause for the lesions includes syphilis, which would be a highly unlikely differential diagnosis in the Roman period. Alternative causes can be birth trauma or child abuse trauma, infantile cortical hyperostosis (the cause of which is still unknown) or hypervitaminosis A (Lewis 2007, 136). It is unlikely that the aetiology of the lesions can be determined precisely, but it is clear that this neonate suffered from a condition or trauma that caused extensive new bone deposits on the leg bones.

3.1.2 Endocranial New Bone Formation

Skeleton 4336 (neonate) showed evidence for thick grey woven bone deposits on the endocranial surface of the frontal (Plate 2), particularly around the orbits. Bone formation on the internal surfaces of the cranium is more commonly seen in infants and young children rather than in adults. It has been associated with inflammation or haemorrhage of the meningeal blood vessels, but the potential causes of these lesions are not clear at present. In children, possible causes identified include chronic meningitis, tuberculosis, trauma, neoplastic conditions, metabolic diseases (scurvy, anaemia and rickets) and venous drainage disorders (Lewis 2007 141).

Plate 2 Cranial fragment of Sk4336 with internal woven bone formation

4.0 DENTAL HEALTH

Analysis of the teeth from archaeological populations provides vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions (Roberts and Manchester 2005). All teeth

and jaws were examined macroscopically for evidence of pathological changes.

Only one tooth was recovered from Skeleton 4336. This would not yet have erupted and showed not wear or evidence for pathology.

5.0 MORTUARY PRACTICE

The two neonates were interred in oval pits. It is not clear whether these were graves or the pits had other uses prior to them being used as graves. Burials of young children are common in the Romano-British period, particularly in domestic features. At Wattle Syke, West Yorkshire, for example, thirteen foetuses/perinates/neonates had been interred in domestic features in the Late Iron Age, and were often associated with buildings (Caffell and Holst 2010). Ten Early Roman non-adults from Wattle Syke had all died around birth, and were buried in ditches, gullies, postholes or pits. During the Late Roman period, a number of young babies were also interred in domestic features at Wattle Syke (*ibid*).

The single female skeleton had been interred in a cist grave, which cut the backfill of a Romano-British ditch. The woman lay on her back in an extended position in a north to south orientation. The left arm lay beside the torso and the right forearm lay across the pelvis.

6.0 DISCUSSION AND SUMMARY

Two neonatal skeletons were recovered from the 2010 phase of excavations at Broughton. Both skeletons were aged between birth and three months old. Because neonates usually suffer from acute rather than chronic conditions, pathological lesions are rarely seen in young children. Unusually, both neonates showed evidence for pathology.

Skeleton 4218 was 45% complete and in a poor state of preservation. This individual had thick new bone formation on the shafts of a femur and both tibiae (leg bones). Although such lesions can be associated with normal growth, in this instance the thickness and appearance of the lesions suggests that these were pathological. A variety of conditions could have caused the lesions, including trauma or infantile cortical hyperostosis, among others.

Skeleton 4336 was 80% complete and in a good condition. This neonate also suffered from new bone formation on the inside of the skull, particularly the frontal region and orbits. Again, a number of conditions could have caused these lesions, including chronic meningitis, tuberculosis and trauma.

During previous excavations at Broughton, a single young middle adult female skeleton was excavated. She had been interred in a supine extended position in a cist grave that cut the backfill of a Romano-British ditch. Lines on her teeth suggested that she had experienced episodes of physical stress during the first years of childhood, probably caused by malnutrition or disease. She had suffered from chronic infection in her right sinus. Inflammatory lesions on her left shin were indicative of receding inflammation, perhaps caused by ulcers, varicose veins or trauma to the shin. Her dental health was moderate, with widespread mineralised

plaque, mild periodontal disease and one cavity. It is not clear whether she was contemporary or in any way associated with the neonates.

References

Bass, W. M. 1987. *Human Osteology: A Laboratory and Field Manual* (Columbia)Berry, A.C. and Berry, R.J. 1967. 'Epigenetic variation in the human cranium', *Journal of Anatomy* 101 (2): 361-379

Berry, A. C. and Berry, R. J. 1967. 'Epigenetic variation in the human cranium' *Journal of Anatomy* 101: 361-379

Brooks, S. T. and Suchey, J. M. 1990. 'Skeletal age determination based on the os pubis: a comparison of the Acsádi-Nemeskéri and Suchey-Brooks methods' *Human Evolution* 5: 227-238

Brothwell, D. R. 1981. *Digging Up Bones* (New York)

Buikstra, J.E. and Ubelaker D.H. (eds) 1994. *Standards for Data Collection from Human Skeletal Remains* (Fayetteville)

Cox, M. 2000. 'Ageing adults from the skeleton', in M. Cox and S. Mays (eds), *Human Osteology in Archaeology and Forensic Science* (London): 61-82

Finnegan, M. 1978. 'Non-metric variation of the infracranial skeleton', *Journal of Anatomy* 125: 23-37

Garland, A. N. and Janaway, R. C. 1989. 'The taphonomy of inhumation burials', in C. A. Roberts, F. Lee and J. Bintliff (eds) *Burial Archaeology: Current Research, Methods and Developments. British Archaeological Reports British Series* 211 (Oxford): 15-37

Henderson, J. 1987. 'Factors determining the state of preservation of human remains', in A. Boddington, A. N. Garland and R. C. Janaway (eds) *Death, Decay and Reconstruction: Approaches to Archaeology and Forensic Science* (Manchester): 43-54

İşcan, M. Y. and Loth, S. R. 1986. 'Determination of age from the sternal rib in white females: a test of the phase method' *Journal of Forensic Sciences* 31: 990-999

İşcan, M. Y., Loth, S. R. and Wright, R. K. 1984. 'Age estimation from the rib by phase analysis: white males' *Journal of Forensic Sciences* 29: 1094-1104

İşcan, M. Y., Loth, S. R. and Wright, R. K. 1985. 'Age estimation from the rib by phase analysis: white females' *Journal of Forensic Sciences* 30: 853-863

Janaway, R. C. 1996. 'The decay of buried human remains and their associated materials', in J. Hunter, C. A. Roberts and A. Martin (eds) *Studies in Crime: An Introduction to Forensic Archaeology* (London): 58-85

Kennedy, K.A.R. 1989. 'Skeletal markers of occupational stress', in M.Y. Işcan. and K.A.R. Kennedy (eds), *Reconstruction of Life from the Skeleton* (New York):129-160

Lewis, M. E. 2007. *The Bioarchaeology of Children: Perspectives from Biological and Forensic Anthropology* (Cambridge)

Lovejoy, C. O., Meindl, R. S., Pryzbeck, T. R. and Mensforth, R. P. 1985. 'Chronological metamorphosis of the auricular surface of the ilium: a new method for the determination of adult skeletal age at death' *American Journal of Physical Anthropology* 68: 15-28

Mays, S. and Cox, M. 2000. 'Sex determination in skeletal remains', in M. Cox and S. Mays (eds), *Human Osteology in Archaeology and Forensic Science* (London): 117-130

Miles, A. E. W. 1962. 'Assessment of the ages of a population of Anglo-Saxons from their dentitions' *Proceedings of the Royal Society of Medicine* 55: 881-886

Miles, A., Powers, N., Wroe-Brown, R. and Walker, D. 2008. *St Marylebone Church and Burial Ground in the 18th to 19th Centuries: Excavations at St Marylebone School, 1992 and 2004-6* (London)

Molleson, T. 1995. 'Rates of ageing in the eighteenth century', in S. R. Saunders and A. Herring (eds) *Grave Reflections: Portraying the Past Through Cemetery Studies* (Toronto): 199-222

Molleson, T. and Cox, M. 1993. *The Spitalfields Project. Vol 2. The Anthropology: The Middling Sort*, CBA Research Report 86 (York)

Moorrees, C. F. A., Fanning, E. A. and Hunt, E. E. 1963a 'Formation and resorption of three deciduous teeth in children' *American Journal of Physical Anthropology* 21: 205-213

Moorrees, C. F. A., Fanning, E. A. and Hunt, E. E. 1963b 'Age variation of formation stages for ten permanent teeth' *Journal of Dental Research* 42: 1490-1502

Ortner, D. J. 2003. *Identification of Pathological Conditions in Human Skeletal Remains* (Amsterdam)

Roberts, C.A. and Manchester, K. 2005. *The Archaeology of Disease* (Stroud)

Saunders, S.R. 1989. 'Non-metric variation', in M.Y. Işcan and K.A.R. Kennedy (eds) *Reconstruction of Life from the Skeleton* (New York): 95-108

Scheuer, L. and Black, S. 2000a. 'Development and ageing of the juvenile skeleton', in M. Cox and S. Mays (eds), *Human Osteology in Archaeology and Forensic Science* (London): 9-22

Scheuer, L. and Black, S. 2000b. *Developmental Juvenile Osteology* (San Diego)

Shopfner, C.E. 1966. 'Periosteal bone growth in normal infants: a preliminary report', *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine* 97: 154-163

Spriggs, J. A. 1989. 'On and off-site conservation of bone', in C. A. Roberts, F. Lee and J. Bintliff (eds) *Burial Archaeology: Current Research, Methods and Developments. British Archaeological Reports British Series* 211 (Oxford): 39-45

Trinkhaus, E. 1978. 'Bilateral asymmetry of human skeletal non-metric traits', *American Journal of Physical Anthropology* 49: 315-318

Trotter, M. 1970. 'Estimation of stature from intact long limb bones', in T. D. Stewart (ed) *Personal Identification in Mass Disasters* (Washington DC): 71-83

Ubelaker, D. H. 1989. *Human Skeletal Remains; Excavation, Analysis, Interpretation* (Washington)

Walker, P. L. 1995. 'Problems of preservation and sexism in sexing: some lessons from historical collections for palaeodemographers', in S. R. Saunders and A. Herring (eds) *Grave Reflections: Portraying the Past Through Cemetery Studies* (Toronto): 31-47

APPENDIX A: OSTEOLOGICAL AND PALAEOPATHOLOGICAL CATALOGUE

Skeleton Number	**4218**
Preservation	Poor – very fragmented, moderate surface preservation
Completeness	45%, parts of the cranium, the right humerus, proximal left ulna, the right ilium, most of the left femur, both tibiae and fragments of both fibulae
Age	0-3 months, neonate
Sex	-
Stature	-
Non-Metric Traits	-
Pathology	Woven bone deposits on the left femur and both tibiae
Dental Health	0 teeth

Skeleton Number	**4336**
Preservation	Good – little fragmentation or erosion
Completeness	80%, parts of the cranium, both clavicles, both arms, right ilium, both legs, both scapulae, several vertebral arches and bodies and most ribs
Age	0-3 months, neonate
Sex	-
Stature	-
Non-Metric Traits	-
Pathology	Woven bone deposits on the endocranial surface of the skull, particularly the frontal bone and orbits
Dental Health	1 right upper first deciduous molar crown

KEY:
Present - Tooth presence; am - ante-mortem tooth loss; pm - post-mortem tooth loss; p - tooth present; - - jaw not present
Caries - Calculus; F - flecks of calculus; S - slight calculus; M - moderate calculus; H - heavy calculus; a - all surfaces; b - buccal surface; d - distal surface; m - mesial surface; l - lingual surface; o - occlusal surface
DEH - dental enamel *hypoplasia*; l - lines; g - grooves; p - pits
Caries - caries; s - small lesions; m - moderate lesions; l - large lesions
Wear - dental wear; numbers from 1-8 - slight to severe wear