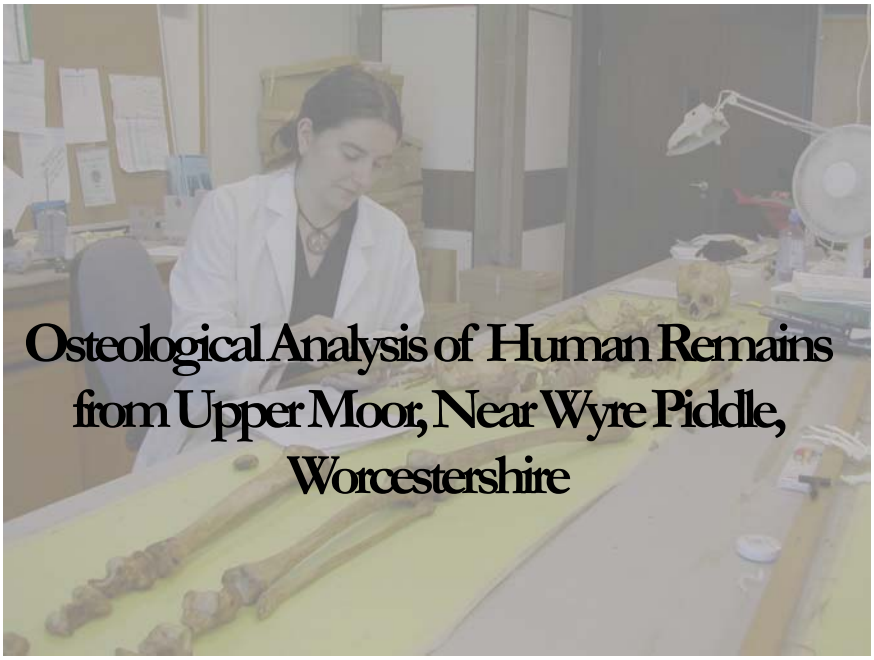

Osteological Analysis of Human Remains from Upper Moor, Near Wyre Piddle, Worcestershire

A report for Worcestershire Historic Environment and Archaeology Service

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Project: PJ 108

1. Introduction

This report contains the results of the osteological analysis of human remains recovered during an open area excavation of land at Upper Moor, near Wyre Piddle, Worcestershire (Figure 1). The excavation was carried out by Worcestershire County Council Archaeological Service between April 2002 and November 2003, for which a report is under construction (Vaughan and Jackson, forthcoming).

Two human skeletons referred to as context [384] and [387] were excavated, each from an individual inhumation grave. The fills of both graves contained ferrous metal artefacts and coloured beads were recovered from the fill of the grave containing skeleton [384]. Evidence from the excavation suggested that the graves dated from the late Roman period and had been heavily truncated by ploughing during the medieval period and possibly later.

The osteological analysis aims to provide a detailed inventory of the skeletal and dental material recovered, the condition of the bone present, completeness of the skeletons and to provide, where possible, the age, sex and stature of the individuals recovered. Any evidence of pathological changes is also noted.

2. Methods and Process

The skeletal material was analysed according to the standards laid out by the guidelines recommended by the British Association of Biological Anthropologists and Osteologists in conjunction with English Heritage (Human Bones from Archaeological Sites: Guidelines for producing assessment documents and analytical reports, 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). Copies of the recording forms used are contained in Appendix A of the report.
- 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.
- The material was analysed without prior knowledge of associated artefacts so that the assessment remained as objective as possible.

2.1. 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. Condition of the Bone Present

3.1. Introduction

The condition of the bone was assessed macroscopically and recorded according to the categories and descriptions referred to by Behrensmeyer (1978).

3.2. Observations

The surface of the bone of both skeletons was on the whole intact, although some surface damage had occurred through root action and post-depositional processes. Weathering had not penetrated into the inner cavities. However, all the material was heavily fragmented. Almost all the breaks to the bone were old and weathered.

3.3. Results

Though heavily fragmented, both skeletons [384] and [387] were found to be in good condition, both being graded as 1-3 (Behrensmeyer 1978).

4. Completeness of Skeletons

4.1 Introduction

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. This 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%

4.2 Observations

Both skeletons were observed to be significantly depleted in material content.

4.3 Results

Skeleton [384] was estimated to consist of approximately 40% of its original skeletal content and falls into the 25-50% category (Buikstra and Ubelaker 1994). Less than 25% of skeleton [387] was preserved

5. Inventory of Skeletal Material

5.1 Introduction

An inventory of the skeletal material was recorded in tabular form on Sheet B and as a pictorial schematic on Sheet C (contained in the archive). Each bone has been recorded as being absent or present. The long bones are recorded according to the presence or absence of the proximal, middle and distal sections and also the proximal and distal joint surfaces. The percentage of completeness of the bones of the axial skeleton (with the exception of the spine) is recorded in categories of > 75%, 75-50%, 50-25% and <25%. This detailed recording is necessary to understand the nature of the preservation of the skeletal material and any constraints that the condition of material may put on the ensuing analysis. From the perspective of future research, a detailed inventory also allows an accurate calculation of prevalence rates of pathological conditions such as fractures and joint diseases and should prove more fruitful for future reassessment should the skeletal material be reinterred.

5.2 Observations

Observations of material present were noted on recording sheets B and C contained in the archive. The summary sheets in Appendix A provide an outline of the bones and dentition present for each skeleton.

5.3 Results

The inventories indicate the lack of complete long bones and joint surfaces preserved in both skeletons [384] and [387]. Little survives of the cranial bones or the pelvis of either skeleton. Skeleton [384] was observed to have six lumbar vertebrae, a non-pathological congenital anomaly.

6. Age Assessment

6.1 Introduction

There are a number of techniques available for assessing the age of both adult and juvenile remains. Juveniles can be accurately assessed by observing the stage of development of skeletal growth, dental eruption and tooth formation. The assessment of adult remains is based on the changes observed in particular joints in the body, namely the auricular surface, pubic symphysis and costal rib ends. These changes are consistent with the ageing of the skeleton but fall into broad age ranges. These categories are Young Adult (20-34 years), Middle Adult (35-49 years) and Old Adult (50+ years) (Buikstra and Ubelaker 1994). Cranial suture closure and dental attrition are not considered reliable techniques for age estimation. This is due to the high level of individual variation found from the results of analyses using these techniques.

6.2 Observations

The remains of skeleton [384] were observed to be fully developed, the epiphyses of the surviving long bones being fused to the diaphyses with no evidence of fusion lines. This indicated that these remains were those of an adult. It was observed that a fragment of an auricular surface belonging to the individual had survived and that this may provide evidence of a more precise age at death.

Whilst the remains of skeleton [387] were poorly preserved, several teeth, including the mandibular molars, were recovered. This enabled a minimum age of the individual to be established. Again, all those long bones that did survive had fully fused epiphyses, indicating that the individual was an adult.

6.3 Results

Analysis of the surviving fragment of auricular surface revealed features that suggested this individual was an adult of at least 45 years of age (Lovejoy et al. 1985). This individual could be categorised as being a middle or an older adult (Buikstra and Ubelaker 1994). The lack of surviving pubic symphyses or costal rib ends meant that the age at death could not be narrowed down any further.

The surviving dentition of [387] comprised of fully formed adult teeth. This included the 3rd mandibular molar, which was observed to have slight wear to its cusps. This individual, then, had fully erupted 3rd molars. This is thought to occur generally at the age of 21 years (Ubelaker 1989). This individual then is at least 21 years old. Due to the nature of the evidence and lack of preservation of other diagnostic elements of the skeleton, it was not possible to ascribe a particular category of adulthood to this individual.

4. Sex Determination

7.1 Introduction

Techniques employed to determine of the biological sex of adult skeletal remains are well established and are largely based upon an assessment of the morphological features exhibited by the skull and the pelvis. These features reflect the sexual dimorphism displayed between males and females and develop as the individual matures. These features are, therefore, not observably marked during adolescence and there are no reliable techniques for determining the sex of juvenile remains, except for DNA analysis. Sex determination is relatively accurate, some researchers reporting a success rate of 95% of known in tests on known sex samples (Phenice 1969). Techniques generally used include descriptive methods, metric analysis and discriminant functions depending on the completeness of the skeletal material.

7.2 Observations

Small fragments of the os coxae (pelvic bones) were recovered from skeleton [384] that allowed tentative suggestions to be made about the sex of the individual from descriptive methods. Elements of the pubis and ilium were present, enabling assessment of the ventral arc, greater sciatic notch and preauricular sulcus of one side of the pelvis.

There were no morphological features surviving that may have indicated the sex of skeleton [387]. Fortunately, however, due to the recoveryl of the glenoid portion of the scapula, metric assessment of sex for skeleton [387] could be carried out. This involved measuring the length and breadth of the glenoid cavity and comparing the results to those parameters recommended by Bass (1995), which have been demonstrated to be indicative of sex.

7.3 Results

The elements of the pelvis recovered from skeleton [384] suggested that this individual was a possible female (Phenice 1969). Whilst the elements recovered were certainly indicative of belonging to a female, very few elements survived overall. The individual was, therefore, ascribed to the category of probable female (Buikstra and Ubelaker 1994).

The poor preservation of skeleton [387] prevented the sex of the individual from being determined from the analysis of morphological features, although it was noted that the elements that were present were large and robust. Metric assessment of the glenoid cavity suggested that the individual was well within the parameters of being a male individual. Since a number of teeth were recovered from this individual, it may be possible that sex could be confirmed through aDNA analysis in the future. This individual was ascribed to the category of probable male (Buikstra and Ubelaker 1994).

5. Non-Metric Traits

8.1 Introduction

Non-metric traits are morphological features that occur both in bone and dentition. These features have no 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, age and sex of the individual and by physical activity. Generally, the analysis of these traits requires a large sample size. Non-metric traits have been recorded for these skeletons in order to allow future comparisons with findings from other late Roman assemblages in the Worcestershire area.

8.2 Observations

The level of preservation of both skeletons prevented observation of many of the non-metric traits. Observations were noted on recording sheet I (contained in the archive).

8.3 Results

All non-metric traits were unobservable for skeleton [384]

Only the lack of presence of double superior atlas facets could be confirmed for skeleton [387].

6. Stature and Metric Analysis

9.1 Introduction

Stature of adult individuals can be reconstructed from measurements of long bones of the skeleton. Since the long bones of adolescents have not yet fully developed it is not possible to provide an estimate of stature for juveniles. Stature is the result of many factors including genetics and environmental influences, 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.

9.2 Observations

Neither skeleton [384] nor [387] had any complete long bones. Therefore, no measurement of long bones was possible.

9.3 Results

Estimation of stature could not be provided for either skeleton [384] or [387].

7. Skeletal Pathology

10.1 Introduction

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, infectious, traumatic, neoplastic etc. 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 be provided.

10.2 Observations

Pathological changes to 3 zygopophyseal (posterior) joints of the lumbar vertebrae were observed in skeleton [384]. As illustrated below (Plate 1), these joints were enlarged and irregular, with gross changes to the joint surface being visible. Micro- and macroporosity, osteophytic lipping and eburnation were present on 3 joint surfaces. One of these joints is known to have been between the left side of L5 and L6. Unfortunately, the location of the other two joints cannot be determined due to the fragmentary condition of the bone. Two Schmorl's nodes were also observed on the superior surfaces of T5 and L1.

Skeleton [387] exhibited no observable pathological changes.

10.3 Results

The pathological changes observed in skeleton [384] can be diagnosed as being the result of degenerative joint disease or osteoarthritis. This can be of a primary type, associated with age, or secondary to a traumatic event. The primary or idiopathic type is more common in adult women and is consistent with the findings of the age and sex of this individual; it develops spontaneously in middle age and develops slowly as the individual grows older (Salter 1999). The Schmorl's nodes observed are also the result of degenerative joint disease and occur when the intervetebral disc degenerates and part of it protrudes into the vertebral body. These changes are known clinically to be common in the lower lumbar region of the spine.

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Plate 1. *Pathological changes to zygopophyseal (posterior) joints of the lumbar vertebrae*

8. Dental Pathology

11.1 Introduction

Dental pathologies recorded can provide a wide range of information. For example, calculus, caries, abscesses and periodontal disease may be indicative of poor oral hygiene, infection or high sugar intake. Enamel hypoplasia is the product of defective enamel growth and is linked to poor nutrition and health status during childhood. Congenital abnormalities can also noted such as those that are genetic in origin or those that are the result of pathologies such as syphilis.

11.2 Observations

Skeleton [384] had no dentition surviving.

Ten mandibular teeth, 8 right side and 2 left were preserved from skeleton [387] and part of the jaw bone itself was observable. No abscesses were present. Periodontal disease was unobservable due to the condition of the surviving jaw fragment. Mandibular molars 30 (1st) and 31 (2nd) and some of the anterior dentition was observed to be quite worn. Small amounts of calculus were present on all but one of the teeth. The calculus was noticeably heavier on the anterior dentition. Three of the anterior teeth displayed minor hypoplastic defects. The 1st mandibular molar exhibited one small cary located on an interproximal surface.

11.3 Results

No inferences could be made about the dental health of skeleton [384] due to the lack of teeth.

Skeleton [387] showed no obvious signs of infection or inflammation in the jaw. Lack of any major caries and the presence of only small amounts of calculus demonstrates that oral hygiene is likely to have been reasonably good. The lack of major enamel hypoplastic defects may indicate that the individual did not suffer any sustained periods of childhood stress from malnutrition or disease.

9. Conclusion

The table below summarises the findings of the osteological analysis of skeletons [384] and [387]: -

	Skeleton [384]	**Skeleton [387]**
Condition	Good 1-3 but heavily fragmented	Good 1-3 but heavily fragmented
Completeness	40% (25-50%)	<25%
Age	45+ (middle/old adult)	21+ adult
Sex	Female?	Male?
Stature	Unobservable	Unobservable
Skeletal Pathology	Osteoarthritis in the posterior joints of the lumbar vertebrae	None observed
Dental Pathology	Unobservable	Small amount of calculus, one small cary, no major hypoplastic

Pathology		defects.

The results of the osteoarchaeological analysis confirm the suggestion that skeleton [384], found with glass beads, is likely to be female. Skeleton [387] represents the remains of a probable male. The osteological evidence indicates that both skeletons are certainly adults. Both individuals were notably robust, skeleton [387] having especially marked muscle attachments. This indicates that these were physically active individuals in life. It may be that the osteoarthritic changes seen in the lower spine of skeleton [384] were exacerbated by physical activity or trauma. However, these may, on the other hand, have been purely associated with age.

These findings should be taken into consideration with other archaeological evidence in interpreting the nature of the site. This may give us an insight into late Roman burial practices in rural areas. The location and nature of these burials raises several questions. For example:

- What is the relationship between the male and female discovered at Upper Moor?
- Why are there only two burials recovered from this area? Is this a product of post-depositional preservation or intentional burial practice?
- Are there other comparable groups of burials in the area?
- Are there any archaeological features consistently associated with such burials? Does the environmental evidence suggest that this enclosure was different from other nearby enclosures containing no burials?
- What is their relationship of these people to the surrounding area? Is there any evidence of habitation nearby?
- How do these burial practices compare with contemporary urban burial practices?
- Do these burial practices differ from earlier or later periods? Do they share anything in common?
- What is the cultural significance of the N-S alignment of these burials in this context?

Whilst many of these questions may remain unresolved, the inclusion of osteological data (such as the age and sex of the individuals as well as evidence of adaptation to the surrounding environment) in archaeological investigations can contribute significantly to our understanding of burial practices of the late Roman period in rural Worcestershire.

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THE ARCHIVE

Type	No	Type	No
Skeleton Recording Form A	2	Skeleton Recording Form M	1
Skeleton Recording Form B	2	Skeleton Elements Present Form (copies)	2
Skeleton Recording Form C	2	Compact Disc	1
Skeleton Recording Form D	2		
Skeleton Recording Form E	2		
Skeleton Recording Form H	2		
Skeleton Recording Form I	2		
Skeleton Recording Form J	2		
Skeleton Recording Form K	1		

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