Osteological Assessment of Human Remains from Grange Farm, Manor Road, Towersey, Thame, Oxfordshire.

A Report for Benchmark Archaeology

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Abstract

An assessment of the disarticulated human remains from Grange Farm, Towersey, Thame, Oxfordshire, recovered during an evaluation carried out by Benchmark Archaeology in July 2011, was carried out in order to quantify the material excavated and to ascertain the potential of future analysis of human remains from the site.

The human skeletal material was found to be in fair condition overall, allowing an initial assessment of age, sex and pathology to be undertaken. The skeletal assemblage was found to represent both adult and sub-adult individuals and was thought likely to represent a charnel deposit. It was noted, however, that several of the sub-adult elements were possibly associated and that these may represent a disturbed secondary burial or deposit of at least one relatively complete sub-adult individual.

The assessment of the human remains excavated so far indicates that future osteological analysis would provide valuable complimentary archaeological data, though metric analyses may be restricted.
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1. Introduction

The aim of this report is to present the data collated from the osteological assessment of disarticulated human skeletal remains recovered during an evaluation of the site of Grange Farm, Towersey, Thame, Oxfordshire (Grid reference: SP 7428 0550, site reference GFT11). The evaluation was carried out by Benchmark Archaeology in July 2011 on behalf of Alistair and Kate Flanagan. The excavations revealed one context, (108) containing disarticulated human remains as well as a collection of remains that were unstratified, referred to here as context (0).

Context (108) consists of the fill of a medieval ditch (F109) and contained only one skeletal element. Context (0) contained the remainder of the assemblage. Unfortunately, there was no perceptible feature or specific cut associated with this context; rather, at excavation, the context appeared to represent an ill-defined localised deposit of skeletal material. No direct dating evidence was found in association with the remains. Two heavily truncated features that were thought to represent graves were identified during the evaluation and these were located in the vicinity of the area containing the human remains. However, it is unclear as to whether the unstratified remains are related to these features as they currently remain unexcavated.

2. The Physical Evidence

2.1 Methods and Process

The skeletal material was assessed 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).

- An inventory of the skeletal material was created on a MS Access database
The material was assessed 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 is provided.

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

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.

### 2.2 Reasons for the Analysis

Osteological analysis was carried out to ascertain:

- Total number of elements present
- Condition of bone present
- Minimum Number of Individuals
- Age Assessment
- Sex Determination
- Skeletal Pathology
- Dental Pathology

Any pelvic or skull bones were analysed for sexually dimorphic traits where preservation allowed, using the criteria set out by Buikstra and Ubelaker (1994). Age determination was carried out by assessing the stage of development of the skeletal element using epiphyseal fusion (Scheuer and Black 2004).
2.3 Quantification of Material

A total of 48 elements were recorded in the inventory, with 4 elements being reconstructed from 2 or more fragments. Forty seven of the elements belonged to context (0) with only one proximal third of a right femur [1] being recovered from context (108).

2.4 Preservation of 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 elements 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). Factors extrinsic (such as soil acidity or hydrolic action) and intrinsic (shape and density) to the bone can contribute to its preservation; it has been reported that age of the individual can also be an underlying contributory factor to state of preservation of skeletal material, with older and younger individuals more likely to have less robust and more susceptible bones (Henderson 1987).

Overall 70.8% of the fragments were observed to be in ‘fair’ condition (n = 34), 18.6% were categorised as being of ‘good’ condition (n = 9) and 10.4% were of ‘poor’ condition (n = 5). This indicates that most pathological changes should be readily observable but that there may be some limitations imposed on observability. For example, the majority of the remains were found to exhibit some degree of erosion to the cortical (outside) surfaces. Such changes are likely to have resulted from root action and water drainage. In such circumstances, it would be difficult to identify pathological processes that affected the surface of the bone only, such as periostitis. However, only a few elements exhibited complete erosion and the majority of the elements were observable for gross pathology.

Comparison of the numbers of different elements represented in the assemblage indicate that the vast majority of the elements recovered were long bones (i.e. arm and leg bones). Although several rib fragments were present, there were no vertebrae (spine) and only one pelvic element. This may be the result of tubular long bones being better preserved and more resistant to taphonomic processes than those skeletal elements having a higher composition of the more fragile spongy bone, such as vertebrae. However, it cannot be ruled out that a
selective process of the collection of particular elements had occurred historically, although it would be difficult to explain the presence of scapulae and rib fragments in this context. It was noted that many of the epiphyseal ends of the long bones had been eroded and this would have an impact on the potential for metric analysis.

2.5 Completeness of Elements

Completeness of elements is another useful indicator of how much potential data may be collated from the bones, particularly based upon metric analysis. Disarticulated elements are categorised as being <25%, 25-50%, 50-75% or 75%> complete.

Recording of the completeness of elements can allow an insight to be gained into how much post-depositional activity has occurred as well as providing an assessment as to how much information can potentially be gained from the remains.

Completeness of the skeletal elements from Grange Farm varied considerably, though overall 79.2% were classified as over 25% complete (n =28). However, only 31.3% (n=15) of elements were complete. This indicates that some aspects of osteological analysis such as metrics for stature, age and sex assessment might be compromised. Nonetheless, the relative completeness of the material would provide ample opportunity for general osteological observations to be made.

2.6 Minimum Number of Individuals

A total of 48 human skeletal fragments of disarticulated remains were subject to demographic analysis. The minimum number of individuals (MNI) represented by the assemblage is calculated from the number of repeated skeletal elements within the sample taking age into account. It can also be important to consider the context of the skeletal elements, since one context should represent a single event of deposition of skeletal material. Here, the MNI is calculated according to both contexts (108) and (0) representing separate depositional events as well as being estimated for the whole assemblage (See Table 1 below).
Since the majority of the material from context (0) is disturbed and the femur fragment from context (108) appears to be re-deposited, it is possible that elements of the same individual could have been spread between the two contexts presented here. It is considered here that the MNI estimate of 4 for the collated assemblage is, therefore, the most reliable estimate.

### 2.7 Age Assessment

There are a number of techniques available for assessing the age of both adult and juvenile remains. Subadults can be accurately assessed by observing the stage of development of skeletal growth, dental eruption and tooth formation (Scheuer and Black 2004). The assessment of adult remains is based on the changes observed in particular joints in the body, namely the auricular surface (Lovejoy et al. 1985), pubic symphysis (Brooks and Suchey 1990) and costal rib ends (İşcan 1985, after Bass 1995). These changes are consistent with the ageing of the skeleton but fall into broad age ranges.

For the purposes of age assessment of the remains from Grange Farm, each element was examined for evidence of epiphyseal fusion. This is an aging process whereby as the bone completes development, the epiphysis, or end of the bone, fuses to the diaphysis or main shaft of the bone. Therefore, in subadults, the epiphyses or ends are unfused whereas in the adult, they are fully fused on to the shaft. No dentition was observable and so tooth eruption could not be used as an indicator of age for this assessment.

Each Element was categorised as following:

- **Subadult = 0-19 years (Unfused Epiphyses)**
- **Adult = 20 years + (Fused Epiphyses)**

The results of the age assessment, whether calculated by context or from the collated data, indicate that there are the remains of least 3 sub-adult individuals in the assemblage (See
Table 2). In fact, of the elements that could be ascribed to an age category (n = 41), only 4.9% were ‘adult’ age (n = 2), with the remainder being ‘subadult’. Seven elements could not be ascribed to either ‘adult’ or ‘subadult’ categories from lack of observability of the epiphyses.

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<td>Subadult MNI</td>
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<tr>
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Table 2: Number of Individuals by Age

A considerable number of the bones appeared to form pairs of elements, being of similar size and stage of development. An initial scan suggests that several of the pairs of elements ([14], [15], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [31], [32], [35], [36], [37], [38] and [39]) may belong to one older subadult (see Plate 1) and another set of elements ([10], [11], [12], [13]) to a younger subadult (See Plate 2). Unfortunately, it is not possible to confirm this absolutely without using aDNA analysis, though metric analysis of the long bone lengths and estimation of age for each element would provide further objective evidence.
Plate 1: Possible associated elements of an older subadult
2.8  Sex Determination

Techniques employed to determine 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 aDNA 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.

Plate 2: Possible associated tibiae and femur of a younger subadult
It was not possible to carry out sex estimation for any elements, mainly due to the fact that the majority of the remains were sub-adult and it is currently not possible to assess the sex of sub-adult skeletal elements. Additionally, none of the adult elements that exhibit the diagnostic dimorphic features were present. Only one adult long bone was complete with an epiphysis but this was damaged and, therefore, unsuitable for metric analysis.

**2.9 Skeletal and Dental 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 (Roberts and Cox 2003). 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.

No skeletal pathology was observed on any elements and no dentition was present. This may be related to the high proportion of sub-adult remains, which exhibit pathological changes less frequently than adults.

**3. Discussion**

The assessment of the human remains indicates that the majority of the remains were of ‘Fair’ condition and were over 25% complete, though many elements exhibited cortical erosion from root action and drainage, which may limit the potential of observing pathological changes to the surface of the bones.

The majority of the elements were sub-adult. Erosion was noted on the majority of the epiphyses of sub-adult elements and indeed several of the diaphyseal ends were absent, which would restrict metric analysis of these remains and precise age at death estimation. Nonetheless, the sub-adult material is of sufficient preservation to allow a conservative age estimate to be made and it would be likely that sub-adult elements could be attributed to broader age sub-categories. Additionally, given the level of bone preservation, it is highly likely
that teeth would be well preserved at the site and dental formation and eruption could be used to give a closer age estimate for subadults.

Erosion of the epiphyseal ends of adult elements was also noted and again, this suggests that metric analysis, used in this case for sex determination and stature estimation (Trotter 1970), may also be similarly limited. It is envisaged, however, that any skeletal material excavated from the site in future would be of sufficient preservation to observe morphological features for age and sex assessment, should the diagnostic elements of the skeleton be recovered.

The disarticulated bones were sufficiently well preserved to provisionally suggest potential association between certain elements. The presence of several elements that may be associated and belong to the same individual suggests that the deposit of skeletal material is not entirely dispersed as is seen with most heavily disturbed, disarticulated assemblages. Compared to similar assemblages, the preservation and completeness of the potentially associated sub-adult remains from Grange Farm suggests a relatively limited level of disturbance with re-deposition of the elements in a fairly intact condition. Even in the case of the few unassociated adult elements, long bones could be reconstructed from the fragments recovered in 3 cases. The context of re-deposition is not clear due to the limited scope of the evaluation carried out but it is known that, historically, excavations have been prevalent in the area and that this may provide an explanation for the unusual composition of the assemblage recovered.

4. Conclusion

The human skeletal material recovered from Grange Farm was found to be in fair condition overall, allowing a limited initial assessment of age, sex and pathology to be undertaken. The skeletal assemblage was found to represent both adult and sub-adult individuals and was thought likely to represent a charnel deposit. It was noted, however, that several of the sub-adult elements were possibly associated and that these may represent a disturbed secondary burial or deposit of at least one sub-adult individual.

The assessment of the human remains excavated so far indicates that future osteological analysis would provide valuable complimentary archaeological data. The preservation and completeness of the remains recovered from the recent evaluation suggest that there is good potential for age and sex assessment from morphological evaluation of future remains
recovered from the site as well as pathological identification and possible re-association of elements.

The assessment has also identified, however, that metric analysis used for age assessment of sub-adults as well as for sex determination and stature in adults may be limited due to erosion of epiphyseal ends; however, only a small number of adult elements were present and these may not be indicative of preservation across the site as a whole. Cortical erosion was present on many elements limiting the observability of the surfaces of the bone but for the majority of elements, the preservation suggests that examination for gross pathological change would be possible for further skeletal elements recovered from site.

5. Future Recommendations

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

- Analysis of the human remains including age assessment by metrics of the subadult remains present

- Radiocarbon dating of the remains to confirm an absolute date in the absence of associated finds

- Documentary research to identify the extent of historical excavations carried out at the site and to establish if any historical publications or archive relating the human skeletal material exists

- Documentary research focusing on comparative sites to establish the local and regional context of the burial ground, including osteological data and evidence of funerary practices

6. Acknowledgements

Osteological assessment and report writing were carried out by Gaynor Western. Thanks are due to Richard Cherrington for the provision of context data.
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<td><em>Human Osteology; A Laboratory and Field Manual</em>. Missouri Archaeological Society, Inc., Columbia, USA</td>
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