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## **FULL ANALYSIS OF HUMAN REMAINS FROM FIELD 228 OF THE A1 WIDENING SCHEME**

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### **Introduction**

During excavations in October 2015, an inhumation was identified by Northern Archaeological Associates during excavations in Field 228, Scotch Corner, North Yorkshire. This document presents the objectives, methods and results of the analysis of these remains.

### **Objectives**

The skeletal assessment aimed to determine age and sex, as well as any manifestations of disease from which the individuals may have suffered.

### **Methodology**

The human remains were analysed in detail, assessing the preservation and completeness, as well as determining the age, sex and stature of the individual. All pathological lesions were recorded and described. A summary of the osteological and palaeopathological data for the disarticulated skeletal material is provided in the Appendix, in Table 1.

### **Osteological Analysis**

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. Preservation of human remains is assessed subjectively, depending on the severity of bone surface erosion and post-mortem breaks, but disregarding completeness.

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

Skeleton 27666 was very poorly preserved, with complete loss of bone cortex, and represented approximately 60% of the individual.

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure during osteological assessments of inhumations in order to establish how many individuals were 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, such as the hip joints and cranial elements. The human remains from Field 228 were not duplicated, representing a single individual, therefore the MNI for the human bone recovered from Field 228 was one.

Age is usually determined using standard ageing techniques, as specified in Scheuer and Black (2000a; 2000b) and Cox (2000). Age estimation in adults relies on the presence of the pelvis and uses different stages of bone development and degeneration in order to calculate the age of an individual (Lovejoy et al 1985; Meindl and Lovejoy 1989). Age is split into a number of categories, from foetus (up to 40 weeks in *utero*), neonate (around the time of birth), infant (newborn to one year), juvenile (1-12 years), adolescent (13-17 years), young adult (*ya*; 18-25 years), young middle adult (*yma*; 26-35 years), old middle adult (*oma*; 36-45 years), mature adult (*ma*; 46+) to adult (an individual whose age could not be determined more accurately as over the age of seventeen). Neither of the auricular surfaces or the pubic symphyses survived in Skeleton 27666, therefore age had to be determined using less reliable techniques, such as tooth wear. The dental attrition of Skeleton 27666 suggested the individual was a young middle adult, aged 26 to 35 years.

Sex determination is usually carried out using standard osteological techniques, such as those described by Mays and Cox (2000). Assessment of sex in both males and females relies on the preservation of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood. No skeletal criteria for the estimation of sex were present in the bone recovered from Skeleton 27666.

### **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. No pathological alterations were observed in the skeletal remains of Skeleton 27666.

### **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.

Skeleton 27666 did not have any surviving tooth sockets, however, eleven loose teeth were

present.

Calculus (mineralised dental plaque) is commonly observed in archaeological populations whose dental hygiene was not as rigorous as it is today. If plaque is not removed from the teeth effectively (or on a regular basis) then these plaque deposits mineralise and form concretions of calculus on the tooth crowns or roots, along the line of the gums (Hillson 1996). Skeleton 27666 had flecks to slight deposits of calculus on ten of their eleven teeth.

Dental caries (tooth decay) forms when bacteria in the plaque metabolise sugars in the diet and produce acid, which eventually leads to the formation of a cavity in the tooth (Zero 1999). Simple sugars can be found naturally in fruits, vegetables, dried fruits and honey, as well as processed, refined sugar; since the latter three contain the most sucrose they are most cariogenic. Complex sugars are usually less cariogenic and are found in carbohydrates, such as cereals. However, processing carbohydrates, including grinding grains into fine powders or cooking them, will usually increase their cariogenicity (Moynihan 2003). A single caries was observed on the mesial surface of a, potentially retained, deciduous second mandibular molar.

Occasionally, teeth fail to develop, leading to congenitally absent teeth. Usually only one or two teeth fail to develop, most often the third molars, followed by the upper second incisors, and upper and lower second premolars (Hillson 1996, 113-114).

The left and right mandibular second premolars of Skeleton 27666 may have failed to develop. Amongst the loose teeth were two well worn, deciduous (milk teeth) second mandibular molars, which may have been retained due to the failure of the second premolars to develop. However; because none of the individuals tooth sockets were preserved it was not possible to determine whether the teeth were congenitally absent, or if the deciduous teeth belonged to a second individual.

## References

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## Appendix

Table 1 Summary of the osteological and palaeopathological results

Skeleton No	Preservation*			Age	Sex	Stature (cm)	Dental Pathology	Pathology
	SP	F	C					
27666	5 (very poor)	Severe	60%	26-35	-	-	Calculus, caries, retained 2 <sup>nd</sup> mandibular molars	-

\* Preservation: SP = surface preservation, graded according to McKinley (2004); F = fragmentation; C = completeness

Table 2 Osteological and palaeopathological catalogue

Skeleton No	27666															
Preservation	Surface preservation = 5 (very poor); severe fragmentation															
Completeness	60%															
Age	26-35 years (young middle adult, based on tooth wear)															
Sex	-															
Stature	-															
Non-Metric Traits	-															
Pathology	-															
Dental Health	11 teeth present, calculus in 10/11 teeth, 1 caries, on one tooth., two possible retained deciduous mandibular molars															
	Right Dentition								Left Dentition							
Present	-	-	-	-	-	-	-	P	P	P	-	-	-	-	P	-
Calculus	-	-	-	-	-	-	-	Fb	Fb	Fb	-	-	-	-	Sb mld	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	-	-	-	-	-	3	3	2	-	-	-	-	4	-
Maxilla	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Mandible	8	7	6	e	4	3	2	1	1	2	3	4	e	6	7	8
Present	-	-	P	P	P	P	P	-	-	-	-	P	P	P	-	-
Calculus	-	-	Sm bd	Sl	Sm	-	Sb	-	-	-	-	-	-	Fm d	Sb Fm	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	Mm	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	3	4	2	-	2	-	-	-	-	2	4	3	-	-

**KEY:**

Present - Tooth presence; am - ante-mortem tooth loss; pm - post-mortem tooth loss; p - tooth present; - - jaw not present; o - erupting

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