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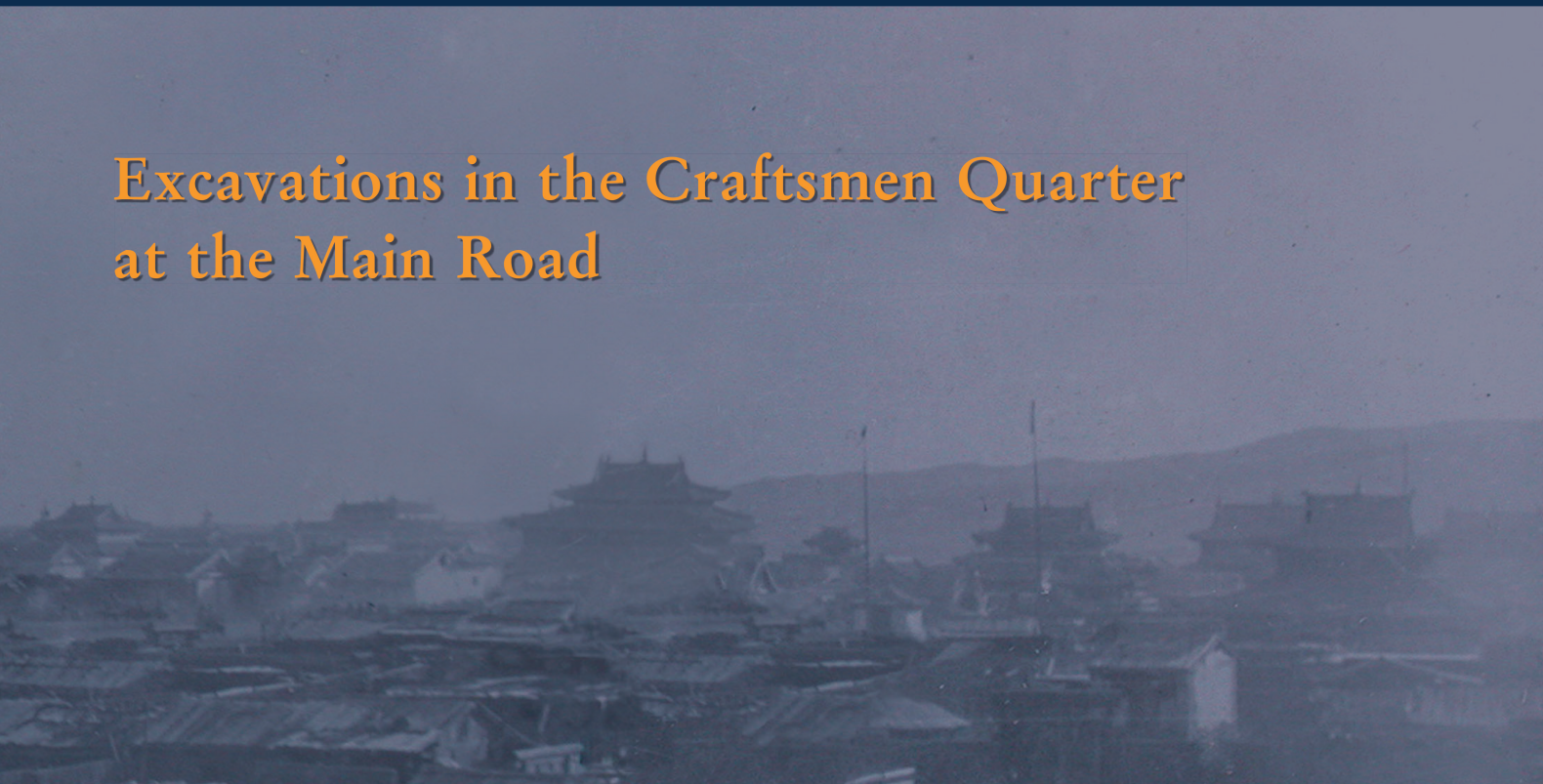
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MONGOLIAN - GERMAN KARAKORUM EXPEDITION

VOLUME 1

Excavations in the Craftsmen Quarter
at the Main Road



edited by
Jan Bemann, Ulambayar Erdenebat, & Ernst Pohl



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Außereuropäischer Kulturen
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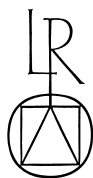
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Christine Lee

Human Skeletal Remains from the Excavations in the Craftsmen-Quarter of Karakorum (KAR-2)

INTRODUCTION

The following report is a preliminary analysis of the human skeletal material excavated from the excavation at the cross-roads of Karakorum, Övörkhangaï aimag, Mongolia. The human skeletal remains were housed in individually labelled plastic bags, within a box, along with some faunal remains. The state of bone preservation was excellent. First, the faunal bones were separated from the human bones. Then the human bones were laid out according to their original location, based on information (number, area, square, and level) written on each plastic bag. Individuals were identified through the physical proximity of whole bones within the excavation, fitting together fragmentary and anatomically adjacent bones, and relative size of each skeletal element (which can distinguish between individuals of different ages). The excavations at Karakorum yielded a minimum number of ten individuals. These individuals were then randomly assigned a number between 1 and 10. The total amount of each individual skeleton recovered was poor. Less than 20% of the total skeleton was present for analysis from each individual. The sex of adults was determined using overall cranial morphology, as no diagnostic postcranial elements were recovered. Age was estimated using rate of dental eruption, the amount of relative tooth wear, epiphyseal union, and cranial suture fusion. Biological affiliation was determined using cranial and dental morphology (Bass 1987; Brothwell 1981; Buikstra / Ubelaker 1994; Ubelaker 1989).

INVENTORY

Skeleton 1

Condition of burial: The bone preservation of this individual was excellent. The skull was represented by fragments of the right parietal and occipital bone.

Sex: Indeterminate.

Age: Child, less than 10 years old.

Skeletal pathologies and anomalies: Indeterminate.

Dental pathologies and anomalies: 0 teeth were recovered.

Skeleton 2

Condition of burial: The bone preservation of this individual was excellent. The skull was represented by fragments of both parietals and the left mandible. The mandibular teeth included the left first premolar, left second premolar, left first molar, left second molar, and left third molar.

Sex: female.

Age: Adult, 20–30 years old.

Skeletal pathologies and anomalies: Indeterminate.

Dental pathologies and anomalies: None observed.

Skeleton 3

Condition of burial: The bone preservation of this individual was excellent. The skull is represented by the left maxilla. The maxillary teeth include the left deciduous first premolar,

left deciduous second premolar, left first molar, and left second molar.

Sex: Indeterminate.

Age: Child, 9 years old.

Skeletal pathologies and anomalies: Indeterminate.

Dental pathologies and anomalies: Carabelli's cusp.

Skeleton 4

Condition of burial: The bone preservation of this skeleton was excellent. The skull is represented by the mandible. The dentition included the maxillary left first molar, complete mandibular deciduous dentition, and the mandibular left first molar, and left second molar.

Sex: Indeterminate.

Age: Child, 5 years old.

Skeletal pathologies and anomalies: Indeterminate.

Dental pathologies and anomalies: None observed.

Skeleton 5

Condition of burial: The bone preservation of this individual was excellent. The skull was represented by fragments of the right parietal and mandible. The maxillary teeth included the left first molar, and right second molar. The mandibular dentition was represented by the left canine, left third molar, right second incisor, right canine, right first premolar, right second premolar, right first molar, right second molar, and right third molar.

Sex: Female.

Age: Adult, 20–30 years old.

Skeletal pathologies and anomalies: Indeterminate.

Dental pathologies and anomalies: Hypoplasias were present on the mandibular right first premolar, mandibular right second premolar, mandibular right first molar, and mandibular right second molar. The hypoplasias occurred at about 5 years old.

Skeleton 6

Condition of burial: The bone preservation of this individual was excellent. The skull was represented by the frontal, both parietals,

fragments of the occipital, and mandible. The mandibular teeth were represented by the left first premolar, left second premolar, left first molar, left second molar, and left third molar.

Sex: Female.

Age: Adolescent, 15 years old.

Skeletal pathologies and anomalies: Active porotic hyperostosis on the left and right parietal.

Dental pathologies and anomalies: Hypoplasias on the mandibular left first molar and mandibular left second molar. The hypoplasias occurred at about 5 years old.

Skeleton 7

Condition of burial: The bone preservation of this individual was excellent. The skull was represented by both parietals, and fragments of the frontal, and occipital. The postcranial skeleton was represented by the left scapula.

Sex: Indeterminate.

Age: Adult.

Skeletal pathologies and anomalies: Healed porotic hyperostosis on both parietals and frontal.

Dental pathologies and anomalies: No teeth were recovered.

Skeleton 8

Condition of burial: The bone preservation of this individual was excellent. The skull was almost complete with a portion of both parietals missing. The mandible was complete. The maxillary teeth present included the left central incisor, left lateral incisor, both canines, right first premolar, left second premolar, both first molars, and left second molar. The mandibular teeth were represented by the right central incisor, both lateral incisors, right canine, right second premolar, both first molars, both second molars, and both third molars. The postcranial skeleton was represented by the first and second cervical vertebrae.

Sex: Female.

Age: Adult, 30–40 years old.

Skeletal pathologies and anomalies: The mandible was fractured (5.2 cm. length), displaced upwards (1 cm.), and well healed. The skull had a large paracondylar process (1.8 cm. length) which articulated with the first cervical vertebrae. The

first cervical vertebrae was unfused, probably due to the articulation with the paracondylar process. Mild arthritis present of the left and right occipital condyles.

Dental pathologies and anomalies: Moderate tooth wear.

Skeleton 9

Condition of burial: The bone preservation of this individual was excellent. The skull was represented by fragments of the frontal, both partials, occipital, both temporals, and mandible. The maxillary teeth include the right canine, both first molars, both second molars, and both third molars. The mandibular teeth include the left lateral incisor, left canine, both first premolars, both second premolars, both first molars, both second molars, and both third molars.

Sex: Female.

Age: Adolescent, 15 years old.

Skeletal pathologies and anomalies: The left eye orbit exhibited active cribra orbitalia. The sphenoid bone was porous, and there was porosity along the sagittal sulcus.

Dental pathologies and anomalies: The teeth exhibited dental calculus. The upper left central incisor and lower left lateral incisor were congenitally missing.

Skeleton 10

Condition of burial: This individual was represented by one tooth.

Sex: Indeterminate.

Age: Adult.

Skeletal pathologies and anomalies: No skeletal material was recovered.

Dental pathologies and anomalies: Indeterminate.

DEMOGRAPHIC PROFILE

Sex was identifiable in five of the ten skeletons. Of the five individuals with indeterminate sex, three were too young to assign sex. Two adults remained indeterminate, due to a lack of diagnostic skeletal elements. Every skeleton who could be assigned a sex was female. The sex ratio for the excavation was 100% female. This ratio is dramatically different from the

expected population sex ratio of 50% male and 50% female. Therefore, the skeletons excavated at Karakorum were not representative of a normal cemetery or living population.

Age was assigned for eight out of ten skeletons. The two remaining skeletons were both adults aged between 20–50 years old. The sample of individuals (8) included 3 children (38%), 2 adolescents (25%), 2 individuals from 20–30 years old (25%), and one individual from 30–40 years old (12%). Infants and older adults were not represented in this sample.

The skeletons recovered from Karakorum probably represent a specific subset of the Mongolian population, due to the exclusion of males, infants, and individuals older than 40 years old (Aufderheide/Rodriguez-Martin 1998; Waldron 1994).

PATHOLOGY

Three individuals exhibited evidence of anemia. Skeleton 6 had active porotic hyperostosis, and skeleton 7 had healed porotic hyperostosis. Skeleton 9 had cribra orbitalia, and porosity of the sphenoid, and sagittal sulcus. Both individuals with active anemia were adolescents around 15 years old. The individual with healed osteological evidence for anemia was an adult. Anemia can be caused by a number of factors, including an iron deficient diet (lack of meat?), parasitic infection, scurvy or rickets, chronic diarrhea, or breastfeeding. No other Mongol period skeletons observed by the author exhibited evidence of anemia.

Skeleton 8 suffered a mandibular fracture. The front of the mandible (5.2 cm length) was broken and displaced upward by 1 cm. There was no evidence for an attempt to set the fracture. It appeared to have healed well, with no evidence of infection, and minimal bone loss or callus formation. The injury did disfigure her appearance. This type of injury is consistent with a fall from a height, and striking the chin against a hard object. One likely scenario is a fall from a horse. The arthritis of the occipital condyles may be related to prolonged horseback riding (Aufderheide/Rodriguez-Martin 1998; Larsen 1997).

Skeleton 8 also had a paracondylar process. The paracondylar process (1.8 cm) is long enough to articulate with the first cervical vertebrae. This would have slightly limited the range of movement in the neck. The failure of the neural arch of the first cervical vertebra to fuse com-

pletely is probably caused by the paracondylar process articulation. The paracondylar process appears to be a defect in the timing of the formation of the vertebral column, which is probably genetically controlled. Variation of the vertebrae between the skull and neck occurs in 0.15% to 1.67% of any particular population worldwide. Nine individuals with a paracondylar process have been identified by the author in China and Mongolia, representing Asian (Xiongnu, Chinese) and Caucasian (Scythian, Turkic) populations, dating from the Neolithic period to the present (Barnes 1994).

Skeleton 3 had a Carabelli's cusp on the maxillary first molar. This dental trait is more common in Mongolian populations than in the Chinese. Skeleton 9 was congenitally missing one upper incisor, and one lower incisor. Congenitally missing incisors and molars are common among Northeast Asian populations (Chinese, Japanese, Mongolian) (Scott/Turner 1997).

Skeleton 5 and skeleton 6 had hypoplasias of the teeth. Hypoplasias are an indication of stress to the body during growth, causing ridges in the enamel. Hypoplasias can occur due to a period of starvation, dietary deficiency, or illness. Both individuals appeared to have experienced a period of stress around five years old. Hypoplasias often occur between two to five years of age. A dietary change from a liquid (breast milk), to a gruel or solid diet may cause chronic diarrhea in children. This is still a leading cause of death in children under five years old in the world today. Another contributing factor may have been the higher density of people at Karakorum than normally found in a nomadic lifestyle, causing a prevalence of endemic (constant) instead of epidemic (sporadic) childhood diseases. Four other Mongol period individuals were observed by the author to have enamel defects of the teeth. This is also an indicator of stress during childhood. Three of these individuals were also from Karakorum (2 female, 1 male) from a previous excavation and one from Sukhbaatar aimag (male).

No dental caries were observed in the teeth available from this sample. This is consistent with a diet lacking in carbohydrates (rice, millet), and possibly high in meat and dairy products (Aufderheide/Rodriguez-Martin 1998; Larsen 1997). This is consistent with the modern Mongolian nomad diet.

BIOLOGICAL AFFILIATION

The individuals from Karakorum were determined to be Asian, based on cranial morphology and dental nonmetric traits. The dentition of the burials was typically Sinodont. The Sinodont pattern of dental nonmetric traits (molar cusp number, root number, enamel extensions, congenitally missing teeth, etc.) is specific to populations originating from northeast Asia. One individual exhibited a Carabelli's cusp which is a trait found in modern day Mongolians more often than in the Chinese. The cranial morphology of the skulls is typically northeast Asian (facial flatness, flat nasal area, wide nose, orbit shape, parietal flare, zygomatic shape, etc.). In a visual comparison with Chinese, Xiongnu, Khidan, and Mongolian skulls, these individuals were indistinguishable from Mongolian skulls (Bass 1987; Scott/Turner 1997).

CONCLUSIONS

The excavation at the cross-roads of Karakorum yielded ten Mongolian individuals. The individuals did not represent a normal cemetery population. All of the skeletons recovered were women and children, no men were found. Four skeletons (40%) had evidence of stress in the form of anemia or hypoplasias. One individual suffered a disfiguring fall. While trauma, especially associated with horseback riding is common among Mongol period skeletons, evidence for infectious disease or dietary deficiency is rare. It is interesting that, of the four other Mongol period skeletons observed by the author with evidence of stress (dietary, infectious disease) to the skeleton, three are also from the site of Karakorum. It is possible that the rise in population density, and the interaction with foreigners at the city of Karakorum created a unique set of living conditions not experienced before by Mongolians living in a more traditional nomadic setting. In particular, the ten individuals recovered from this excavation may be from a disadvantaged portion of the population, possibly women and children without the support of male relatives, surviving on the charity of the temple or society.

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