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Short fieldwork report

Human remains from Shahrak-e Firouzeh, Iran, 2012-2013

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The northwestern part of the modern city of Neyshabur hides the ruins of Shahrak-e Firouzeh (36°12′58″N, 58°47′45″E), a Middle and Late Bronze Age (2300/2200-1700 BCE) settlement with an adjacent cemetery (Rezaei & Basafa 2018, 2019). This site provides material culture evidence of the Bactria Margiana Archaeological Complex (BMAC). Similar archaeological evidence is known across Central Asia, from northern Iran, northern Afghanistan, eastern Turkmenistan, southern Uzbekistan, and western Tajikistan (Rezaei et al. 2018).

The Neyshabur Plain is delimited in the north by the slopes of the Binalud Mountains and in the south by the Molkooh massif. Many streams originate and flow southwards from this mountainous region to join the Kalshur River. Shahrak-e Firouzeh is located on the eastern side of the Faroub Rouman River. Until recent times, the streams have been responsible for the formation of a wide fan of alluvial deposits. Floods have destroyed or buried many archaeological sites in the area, including Shahrak-e Firouzeh. The site was discovered during construction work in 2008 and was excavated between 2009 and 2014. As the cultural strata were fully covered with alluvium and infrastructure of the modern city, the full extent of the site limits is not known.

Two trenches were opened at the Shahrak-e Firouzeh cemetery: X and XII, excavated respectively in 2012 and 2013 (**Figure 1**). Trench X was located in the middle of the main graveyard of the settlement and two graves were located within its range. The first burial (context no. 10) contained fine footed pottery vessels as the only cultural material; the human remains found in this grave were almost completely eroded. In the second burial (context no. 12), despite substantial erosion, the skeletal remains of the individual within this burial were identified in anatomical order. The interred individual was situated on their left side, facing east, with the lower limbs flexed at an acute angle (**Figure 2**).

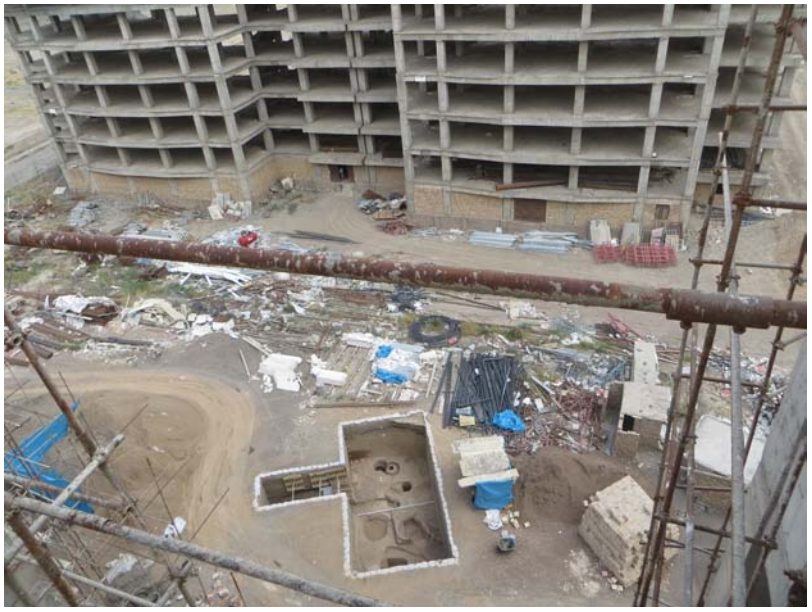

Figure 1. The location of trench XII at Shahrak-e Firouzeh.

Figure 2. Trench X, context no. 12.

Six graves were documented within trench XII, which was abutted to trench X. Within this part of the cemetery, there was one vessel grave and five hand-carved burial pits cut into the natural riverbed. Only two graves were found intact; the majority had been damaged and sometimes lacked any cultural materials. The interment position of the deceased was observed only in burial context no. 17 where, similar to context no. 12 in trench X, an adult individual was buried on their left side, facing east.

Unfortunately, most of the human remains found at the cemetery of Shahrak-e Firouzeh were highly eroded and could not have been collected from the context. In only two of the eight graves documented in trenches X and XII was the state of skeletal preservation sufficient enough to allow for full excavation and transportation: context no. 12 in trench X and context no. 22 in trench XII, both of which contained the skeletal remains of multiple individuals.

Osteological analyses of the recovered human skeletal remains were conducted in the Institute of Archaeology at the University of Kashan according to the protocol proposed by Brickley and McKinley (2004). Due to advanced fragmentation and incompleteness of the skeletons, the main goal of the study was to determine the minimum number of individuals, based on the number of bone fragments from one side (Lambacher et al. 2016), as well as to asses age-at-death, based on the morphology of bones and epiphysis fusion status (Scheuer et al. 2010). The lack of dentition, pelvic bones and well preserved crania made the sex and age-at-death assessment of adult individuals impossible.

In the grave labelled as context no. 12 (trench X) at least two individuals were buried, including one subadult in a primary context and one adult (**Figure 2**). Based on long bone epiphyseal fusion, the skeletal remains of the subadult belong to an individual who died under the age of 15 years. Few skeletal elements were sufficiently preserved for osteological analysis. Those elements included the right calcaneus, vertebral body, a fragment of the distal femur metaphysis, as well as the proximal metaphysis and epiphysis of the right femur. On the anterior aspect of the right femoral neck, a morphological variation known as Allen's fossa was present. At the location of the greater trochanter there was a tunnel (17.5×8.9mm) made by insect or rodent activity with an exit hole on the anterior part of the femoral shaft (13.7×12.3mm). Additionally, several fragmented bones of the skull were preserved. The majority of documented bones came from the cranial vault, including an almost complete left parietal bone, fragments of the occipital squama and well preserved left and right temporal bones; a sphenoid bone was also partially preserved, however it was almost completely eroded. No signs of porotic hyperostosis were observed.

The second individual buried in context no. 12 was an adult. The skeleton was only partially preserved and completely disarticulated. Among the preserved bones, there were three rib fragments, three fragments of the occipital bone, left parietal

Figure 3. Human remains in trench XII, context no. 22.

squama with an intrasutural bone in the lambdoid suture, a slightly eroded femoral head without any signs of degenerative joint disease, and several long bone shaft fragments: two fragments of a femur, including the proximal metaphysis, two fragments of the left ulna, including the distal metaphysis, as well as fragments of a radius and left humerus.

In context no. 22 (trench XII) at least two individuals were interred, including one subadult and one adult (**Figure 3** and **4**). The skeletal remains were not articulated at the time of identification. The first partially preserved skeleton belonged to a child (age-at-death <15 years) and consisted of fragments of lumbar and thoracic vertebral bodies, two sacral vertebrae, two unfused long bones epiphyses, most likely from the femur and humerus, and long bone diaphyseal fragments, including seven fragments of weathered and fractured femur shaft and two fragments of a fibula.

The second skeleton found within the same grave belonged to an adult individual. Among the observed skeletal elements, there were several parts of the cranial vault, right talus, superior articular process of a lumbar vertebra, a few rib fragments and the proximal metaphysis of a right femur. The latter showed no signs of degenerative joint disease. Based on the skeletal analyses from Tell Majnuna presented by Sołtysiak (2010), the length of the talar articular surface identified from the recovered tibia (35.7mm) suggests that the skeleton could have belonged to a male individual.

Figure 4. Artifacts from trench XII, context no. 22.

Destruction of Shahrak-e Firouzeh cemetery and high erosion of human remains do not allow for a detailed study of demography or quality of life of the individuals inhabiting the Neyshabour Plain in the Middle and Late Bronze Age. However, the osteological analyses complemented the archaeological study of burial practices in the region. In two out of eight graves, in which the anatomical order of the individuals interred was preserved, the deceased were buried on the left side and faced east. Moreover, in both graves with moderately preserved human skeletons where full excavation and osteological analyses were possible, at least two individuals were buried, in both cases an adult and a subadult. In one of the better preserved burials (context no. 12, trench X), only one skeleton was in anatomical order, while bones of the second individual were commingled. Such evidence suggests that the population of BMAC inhabiting Shahrak-e Firouzeh practiced the reopening of graves to facilitate multiple interments over extended periods of time. Such a burial practice was a common tradition in the region of Central Asia in the Late Bronze Age and Early Iron Age. On the other hand, at Tepe Chalow, a cemetery situated east of the modern town of Jajarm, c. 250km northwest from Shahrak-e Firouzeh, excavations revealed 17 individual graves associated with the BMAC (Sołtysiak et al. 2016). Such a difference in the number of individuals interred between Shahrak-e Firouzeh and Tepe Chalow suggests a diversity of burial practices within the Bactria Margiana Archaeological Complex in the region of north-western Iran.

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