Exploring the Origins of Horse Herding and Riding in the Mongolian Steppe

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Around the globe, the introduction of domestic horses transformed human societies — changing the way we subsist, communicate, and interact. In the steppes of Mongolia and eastern Eurasia, horses are the key to traditional nomadic herding life, and are both an important livestock animal and the primary form of transportation. First domesticated nearly 6000 years ago in the steppes of Kazakhstan and western Central Asia, as archaeological data suggest, horses were used for meat, dairy products, and pulling chariots. However, the questions of when and why people first began mounted horseback riding, and its role in major social developments in subsequent centuries are much less clearly understood. Over the last 16 years, Arctic Studies Center (Smithsonian Institution) (ASC) researchers (in cooperation with the National Museum of Mongolia and Eastern Tennessee State University) collected detailed archaeological data from one of the earliest nomadic cultures in eastern Eurasia: the late Bronze Age Deer Stone–Khirigsuur (DSK) Complex. Although sites from this culture are not linked with historical records, and produce few artifacts illustrating how the animals were used, they have yielded a rich record of equine skeletal remains — including the head, hooves, and neck bones of sacrificed horses. These horse bones are among the oldest evidence for domestic horses in eastern Eurasia.

Combining the large sample of bones previously excavated by the ASC and National Museum with new specimens collected from targeted excavations in northern and central Mongolia, we have sought to use these skeletal remains to understand how horses were used in eastern Eurasia during the late Bronze Age. By studying the skulls of contemporary domestic and wild horses, along with archaeological horse bones from the great nomadic empires of Mongolian history, we developed criteria for animals that had been bridled and heavily exerted on the basis of cranial features. Using a 3D scanner and digital measurement, we identified diagnostic changes to the nasal bones and premaxilla of Deer Stone–Khirigsuur horses caused by horseback riding or pulling chariots and carts. Demographic (age and sex) patterns among these Bronze Age archaeological specimens indicate that they were part of a managed livestock herd, and modifications to the teeth and maxilla show that herders practiced veterinary care and began experimenting with equine dentistry. A precision radiocarbon model suggests that a rapid expansion of horse ritual across Mongolia and adjoining regions took place around 1200 BCE.

Together, these results indicate that Deer Stone–Khirigsuur people managed horses and used them for transport, and that a major change in domestic horse use took place towards the end of the second millennium BCE. Based on unique cranial features linked with riding and the rapid increase in the visibility of horses in archaeological sites at this time, it appears likely that the Deer Stone–Khirigsuur period (ca. 1200–700 BCE) saw the first mounted horseback riding in eastern Eurasia — and perhaps the world. This period was a time of wetter, ameliorated climate, casting doubt on hypothesized links between drought and the development of horsemanship or nomadic life. Instead, horse riding and improved grasslands may have prompted steppe peoples to expand into further regions of the arid steppes, bringing DSK herders (and their horses) into contact with the settled peoples of China.

During the fieldwork, we also documented several new rock art sites in central Bayankhongor using drone photography and 3D photogrammetry under

the leadership of Dr. Julia Clark at the American Center for Mongolian Studies. Using the 3D models collected during this project, as well as those of nearly 100 Bronze and Iron Age horse specimens which were obtained, we hope to produce a publicly accessible on-line database of ancient horse remains useful for education and research.
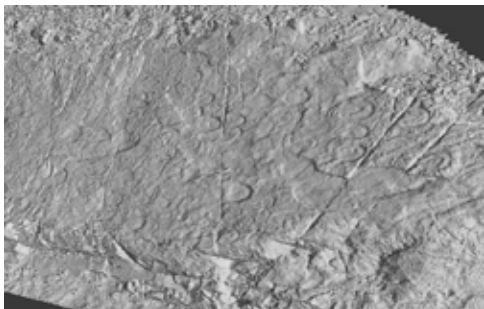

Fig. 1. (Above right): Excavation of a horse-head burial mound at a deer stone site in Bayankhongor, central Mongolia.

Fig. 2. (Below left): 3D scan of rock art panel showing dozens of horse hoof imprints from Morin Mort, northern Bayankhongor province, Mongolia, produced using 3D photogrammetry.

Fig. 3. (Below middle): 3D model of equine skull from an archaeological horse burial in Bayan-Ulgii province, western Mongolia, excavated by the Smithsonian-National Museum of Mongolia team in 2011.

Fig. 4. (Below right): A modern horse skull next to a Bronze Age deer stone in Bayankhongor, central Mongolia.

Acknowledgements

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