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ROCK ART AND THE RECONSTRUCTION OF A PALAEOENVIRONMENT: THE CASE OF *ALCES* *ALCES* IN THE MONGOLIAN ALTAI

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Abstract. The rock art complexes of Baga Oigor and Tsagaan Gol valleys in northwestern Mongolia are part of the largest, most ancient, and best-preserved body of rock art in the Altai-Sayan mountainous region. Within this massive compendium, the image of the moose (*Alces alces*) has received no attention. However, as much as any other representation, this image reveals the radical transformation of the environment and its cultural implications over several thousand years. The examination of *Alces alces* and its pictorial contexts sheds light on the world by ancient hunters, foragers and early herders and sharpens our understanding of the dynamics of cultural change.

Introduction

The Baga Oigor complex encompasses the extensive petroglyphic rock art concentrations of Baga Oigor Gol (river) and its chief tributary, Tsagaan Salaa. These conjoined valleys lie on the western edge of Mongolia's far northwestern border, within Bayan Ölgii aimag, and at the edge of the divide between that country and the Russian Altai Republic. Together with two complexes to the south—those in the long valley of Tsagaan Gol and on the hill of Aral Tolgoi, at the west end of Khoton Nuur—the Baga Oigor complex includes thousands of individual images and multi-image compositions spanning a period of approximately 12,000 years. These several complexes thus offer a vast and priceless storehouse of artistic and cultural documentation within the Altai Mountains. The very quantity and quality of pictorial materials in the Baga Oigor and Tsagaan Gol complexes allow the possibility of considering the aesthetic significance and the reflection of social values and lifeways over several thousand years. However, this discussion will focus on one particular image type, that of *Alces alces* (moose) and how its appearance and pictorial contexts reveal significant aspects of a radically changing palaeoenvironment. That material, hitherto largely ignored, should clarify our understanding of the character and dating of cultural change at the heart of Inner Asia.

The materials on which this study is based were gathered over approximately twenty years of fieldwork in the Altai Mountains of Mongolia and Russia. Working within the context of two major projects—the Joint Mongolian/American/Russian Project, Altai, and

the Mongolian Altai Inventory Project—the author and her colleagues identified, recorded, and ultimately mapped the rich cultural heritage of the Baga Oigor and Tsagaan Gol valleys, as well as of several other valleys in Bayan Ölgii aimag. At this time, Mongolian scholars are continuing to enlarge the rock art record of this region; to date, however, there have been no other attempts to reconsider the palaeoenvironment and culture in the northern Altai region and no consideration at all of the image of the moose and its signification.

Alces alces, its habitat, and appearance in Inner Asian rock art

Alces alces, otherwise known in North America as moose—and, confusingly, in Europe, as elk—is the largest cervid inhabiting the Northern Hemisphere (see *Wikipedia*: Moose). (Throughout this paper, moose will refer specifically to *Alces alces*, while the term elk will refer to *Cervus elaphus sibiricus*.) Although specific aspects of the moose vary according to geographical region, it is everywhere of considerable height and weight. When mature, a male may weigh more than 380 kg and stand at the shoulder more than 2.0 m. The bulls annually regrow huge antlers that may be either palmate or cervine in character. They also carry a distinctive 'bell' hanging from their throats. Both sexes are distinguished by a heavy head, large ears that offer stereophonic hearing, and a large and prehensile upper lip with which they grab and tear at vegetation and branches. Both males and females have high shoulders, which in males have the appearance of a substantial hump. Moose are the only cervids

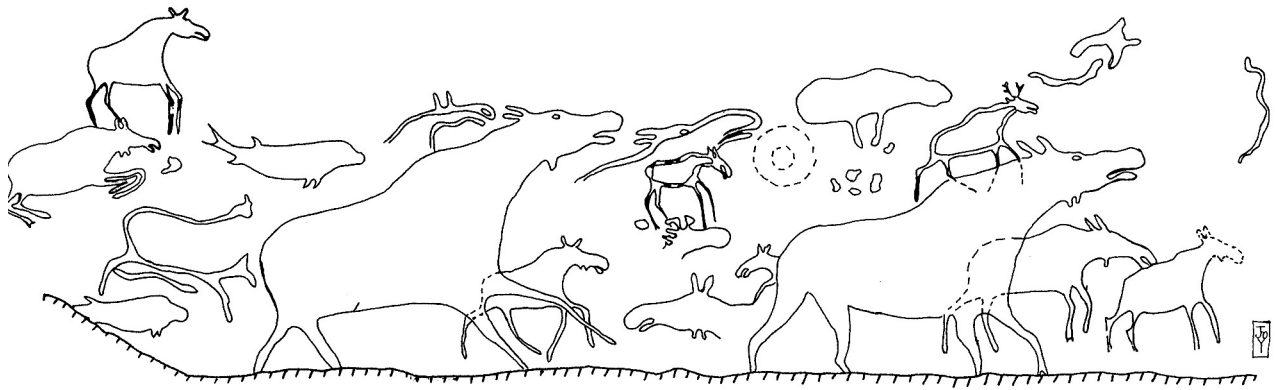


Figure 1. Petroglyphic images of female moose and seals. Second Stone Island, Angara River, Irkutsk Oblast. Present location of stones unknown (drawing: L.-M. Kara).

capable of submerging deep into water to feed on bottom-growing plants and escape ubiquitous biting insects. In general, only female animals and their offspring form small groups; by contrast, the male *Alces alces* is a fairly solitary animal except during the fall rut. Despite their great size, within the area of south Siberia, they are prey to animals such as wolves and brown bears. This is particularly the case with young animals.

In the deep past and up to the present, *Alces alces* inhabited the northern taiga zone of Inner Asia extending from the Russian Altai, east across present-day Tuva, and further east across the valleys of the upper Angara and Lena rivers as far as Lake Baikal. Within this northern habitat, moose were traditionally found in riparian zones rich in deciduous foliage such as willows and birches from which they could browse leaves and twigs; they also foraged on the new growth of pines and extensively on aquatic plant growth. Now, as then, moose avoid areas with little or no snow since they offer less of the animals' essential riparian habitat and a greater risk of predation by wolves, but moose also retreat from areas of deep snow where forage is radically decreased (Dussault et al. 2005).

Throughout their habitat, moose movement is directed by a need for food and protection; they typically move between the forest edge, with its riparian vegetation, and deeper forests, which offer protection and cooler temperatures. This was unquestionably as true in the Bronze Age as it is now.

Within Inner Asian rock, the earliest images of moose are dated between the Eneolithic and the Early Bronze Age (4th – early 3rd millennia BCE). The most famous concentrations were pounded into the cliffs above the Siberian rivers Tom', Angara and Lena (Jacobson-Tepfer 2015: 28–41). The earliest stage of moose imagery, probably dating to that same period, was represented by the panels overlooking the Angara River as it flowed to the north (Fig. 1). However, these have all been destroyed or lost in the creation of the Bratsk Reservoir (Okladnikov 1966). Other equally impressive concentrations of moose imagery are still visible along the Tom' River before its confluence with the north-flowing Ob'. These sites include small concentrations at Tatal'sk 1 and 2 sites and at the once spectacular site now named Tomskaya Pisanitsa (Okladnikov and Martynov 1972). Here, as along the Angara River, the animals are almost all female,

and they are represented as if striding up-river (Fig. 2). Unfortunately, these once impressive sites have been badly damaged by time, the elements, and most unfortunately, by eager archaeologists and amateur rock art lovers.

Nevertheless, other important concentrations of moose imagery dating to a similarly early period have been identified at sites along the Tuba River in the eastern Sayan Mountains (Pyatkin and Martynov 1985; Blednova et al. 1995), while several appear among the badly damaged painted and pecked images at Shishkin, on the upper

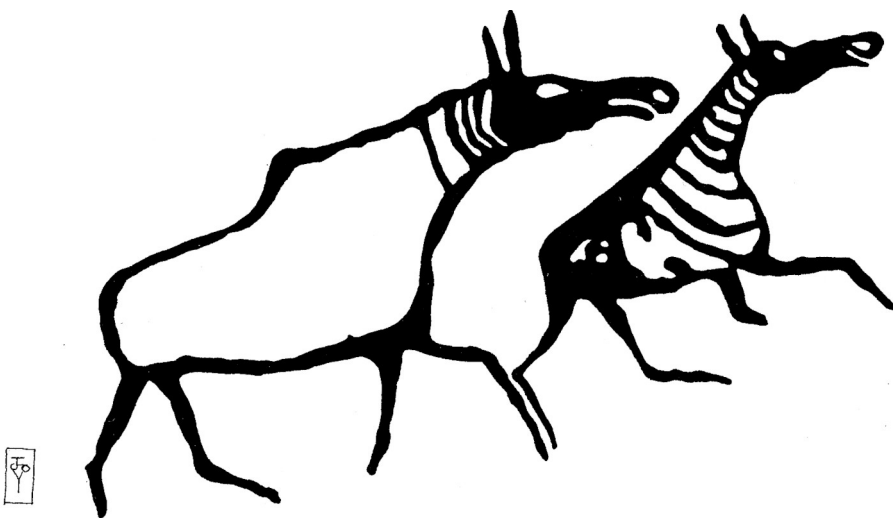


Figure 2. Two female moose from a larger group at Tomskaya Pisanitsa (drawing: L.-M. Kara).

Proposed Concordance of Palaeoenvironment, Fauna, & Culture in Altai Mts			Cultural Dating
Cal Years BP			
1000		1000 CE	
2000		First millennium CE	Turkic Period (fifth–ninth c.) Iron Age Tagar, Pazyryk (c. 500–250) Transition to Iron Age (c. 800–500) Khirgisuur-Deer Stone Culture Karasuk (1300–800) Late Bronze Age (c. 1400–800) Sagsai (c. 1500–950)
3000	Present climate		
		*End aurochs, wild horses	
		Bactrian camels	
		Wolves, dogs	
4000	Expanding cool steppe Retreating forests	*End moose, bear	
		Domesticated yak (<i>Bos grunniens</i>)	
	Falling lake levels	Aurochs, elk, moose, bear	
	Climate transition	Reappearance wild horses	
5000	Onset Late Holocene	Moose, elk, wild horses, aurochs, ibex, argali	
		Wild yak (<i>Bos mutus</i>)	
6000	Forested slopes	Moose, elk, bear, aurochs	
7000	Rising lake levels Expanding boreal forests	*Temporary end wild horses	
8000	Mid-Holocene		
9000	<i>Picea</i> (spruce) <i>Pinus sibirica</i> (Siberian pine) <i>Larix</i> (larch)	Bear, elk, ibex, aurochs, wild horses	
10,000	Cool grass/shrub/cool steppe	*End megafauna Ibex, argali, wild horses, aurochs, elk striches	
11,000	Scattered tree growth Xeric vegetation	Mammoths, aurochs, wild horses, ibex, argali	
11,700	Onset Early Holocene		
	Climate transition		
13,000	Late Pleistocene Dry, cold steppe	Mammoths, rhinoceros, aurochs	
		10,000 BCE	Palaeolithic

Dating concordance adapted from: Jacobson-Tepfer, Meacham, Tepfer 2010, based on: Dorofeyuk and Tarasov 1998; Gunin et al. 1999; Grunert et al. 2000; Tarasov et al. 2000; An et al. 2008; Rudaya et al. 2009; Jeong et al. 2020.

Table 1. Concordance of palaeoenvironment, fauna, and culture in the northern Altai Mountains

Lena River (Mel'nikova et al. 2011). At these sites, the moose are both female and male. Individual images of female moose—again represented as if striding with deliberation to the right—have been found at Turochak on Lake Teletskoe in the Russian Altai (Okladnikov and Molodin 1978) and on slabs recovered from the Okunev burials at Karakol, also in the Russian Altai (Kubarev 1988). In this last case, the moose figures are again represented as powerful animals striding to the right. On these slabs, the realistic images of moose and caprids belong to a layer of imagery underlying that generally identified as Okunev in date and seemingly related to the cultural impulse reflected in the Tom' and Angara images. Most importantly, perhaps, these images are all of female animals, and none is part of a larger scene, such as a hunt. They reflect a powerful mythic tradition (Jacobson-Tepfer 2015) found across eastern Siberia.

By contrast, the rock art images of moose in the Mongolian Altai complexes are all of male animals, and almost all are involved in hunting scenes or compositions, including other animals and humans. Beyond these are no other known images of moose south of the northern Mongolian border: none in the southern Altai mountains, none in the Tianshan, and certainly none in the Pamirs. In other words, the moose images we will consider in the Mongolian complexes represent the southern edge of a great tradition that once stretched across the taiga to the north. However, they also reflect a very different worldview than that seen in the Tom' or Angara imagery.

Chronology, palaeoenvironment, geography

Before presenting the pictorial material that centres this discussion, the markers used here for considering dating must be mentioned. These comments are necessarily brief since the subject of dating Altai rock art is complex and multi-layered. Here, we summarise

what has been discussed at much greater length in other publications (Jacobson-Tepfer 2015, 2019). Within this chronological framework, the pre-Bronze Age includes the Late Pleistocene, the Early Holocene and the Middle Holocene (Table 1). That long period may be dated from about 13,000 years before the present to approximately 5000 years before the present. The Late Holocene, characterised by a drying and cooling climate, evolved approximately 4500 years before the present, and the transition to a climate of the near past emerged about 3000 years ago. By then, the Altai region we will be considering had reverted to its present-day mountain steppe, although the glaciers were then much more extensive than is the case today, and water courses were much more extensive. Because of the lack of excavated material within the Altai region, the onset of the Bronze Age is uncertain. Within this discussion, however, the Bronze Age should be understood to have encompassed the late fourth millennium BCE down into the first third of the first millennium BCE. Those estimations are approximate; however, they are all associated with the transformation of the larger palaeoenvironment and the emergence of major cultural changes. In the study of rock art, there are many indicators of chronology; these must be integrated and consulted together as an indivisible gestalt. The most important indicators here include the subject and its stylistic rendering, the technical manner in which it is executed, the activities in which it is contextualised, and details of weaponry and other realia. In addition, the environmental implications of animal types and human activities must be considered with reference to the prehistory of vegetation and faunal regimes (Klinge and Sauer 2019). Within the Altai region, these are known primarily through numerous lakebed sediment studies conducted over the last several decades (e.g. Gunin et al. 1999; An et al. 2008; Rudaya et al. 2009). Animal types and the human activities of hunting, transhumant pastoralism and riding all implicate a larger environmental context involving climate change and the resulting evolution of vegetation and faunal regimes, which will be considered in the following discussion.

The Baga Oigor valley lies at the northwesternmost edge of Mongolia, where the Altai Mountains divide that country from its neighbour to the northwest, the Altai Republic of Russia (Map 1). That ridge, known as Sailiugem or, in Mongolian, Siilkhem Nuuru, is the source of several rivers flowing to the south and east. The primary river in this discussion, Baga Oigor, is enlarged at the centre of its course by Tsagaan Salaa, which is an outflow of two higher streams, Aksei and Usei Gol. After meandering eastward for approximately 25 km, the Baga Oigor is joined by both Shetya and Ikh Oigor Gol to form Oigor Gol, one of the larger rivers in Bayan Ölgii aimag. The confluence of Tsagaan Salaa and Baga Oigor (Fig. 3) marks the western end of the main valley; at that point, its elevation is approximately 2394 m. Further



Map 1. The northwest edge of Mongolia, at the borders with Russia and China. The grey rectangle indicates the Baga Oigor complex (Altai Mapping Project, InfoGraphics Lab, University of Oregon).

to the east, where the river leaves the broad Baga Oigor valley and enters a narrow canyon, the elevation is approximately 2288 m. Virtually all the bedrock and boulders in the valley reveal the abrasive passage of ancient glaciers. The petrology of this region is overwhelmingly sedimentary, dominated by greywacke, shale and mudstone.

The Tsagaan Gol valley, located approximately 30 km south of the Baga Oigor valley, is defined by the conjoined streams, Khar Salaa and Tsagaan Salaa, both rising in the glaciers of Tavan Bogd, the massif marking the juncture of Mongolia, Russia, and China. The valley today is even more evocative of its glacial origins than is that of Baga Oigor (Jacobson-Tepfer 2020), but the wealth of rock art along its upper reaches is no less impressive. However, because most of the moose imagery in this part of the Altai is found in the Baga Oigor complex, the following discussion of topography will focus on that valley.

At present, the dominant impression one has of the Baga Oigor valley is its extreme emptiness: while a few winter dwellings appear in protected folds of the slopes on both the north and south sides of the valley, there are neither towns nor any population concentration within the valley proper and nothing of any size above the administrative centre of Khökh Khötel, many kilometres to the east at the end of Oigor Gol. The treeless aspect of the valley and, indeed, of the whole surrounding region certainly reflects millennia of grazing animals, but that would not account for the absolute lack of vegetation higher than shrubs. It is rather probable that this glacier-ploughed valley, like those to the north (Khar Yamaa) and south (Tsagaan Gol), has been essentially treeless for thousands of years, beginning with the gradual drying of the environment with the onset of the Late Holocene. At present, there are few surviving forests in northern Bayan Ölgii. Those that do exist include forest cover on north-facing slopes along the boundary with north China, south and west of Khoton Nuur. Larch forests also cover the steep, north-facing slope of Shiveet Khairkhan in the upper Tsagaan Gol. Otherwise, a few remnant larch groves cling to small draws on north-facing slopes above Khovd Gol and a few other rivers (Jacobson-Tepfer et al. 2010).

Related to the present-day treeless aspect of the Baga Oigor valley is the nature of the river course and its tributary streams. A view over the valley (Fig. 4) indicates how, at present, the river winds through formerly marshy areas, fed by streams descending from the higher slopes and leaving small ponds along its course. It is also apparent that none of the streams are bordered by signs of riparian growth. It is probable that animals, including yaks, horses, camels, sheep



Figure 3. View west over the confluence of Baga Oigor and Tsagaan Salaa and up the Tsagaan Salaa valley towards the boundary with the Russian Altai Republic.



Figure 4. View east down Baga Oigor valley, from the Great Circle (foreground). TS IV.



Figure 5. Hidden winter dwelling. BO IV. View to the west.

and goats, have thoroughly degraded the plant life marking the margins of streams and ponds, but that has certainly been the case for many hundreds of years, perhaps since the valley was inhabited by nomadic pastoralists in the early Iron Age.

The record embedded in rock art

Despite the discouraging environmental conditions, this valley's rock art record, like valleys to the north and south, indicates the existence of vital cultural layers over several



Figure 6. View across the mouth of Tsagaan Salaa northwest to TS II (left of centre) and TS IV (right of centre). The view here encompasses some of the finest panels with moose imagery in the Baga Oigor complex.

thousand years. That record reveals the coming of hunters to the valleys before the Bronze Age and the kinds of animals they hunted; it reflects the emergence of transhumance and pastoral nomadism and the herding of large and small animals into the mountains in the second millennium BCE. It documents, finally, the appearance of full mounted nomadism by about 2700 years before the present. That same rock art is a record of the kinds of large animals found in these mountains—elks, yaks, moose, bears, aurochs, wild horses, argali, ibex, wolves and leopards—as well as how the valley's inhabitants hunted their large game. Within that pictorial record is visible the rich bird life of an earlier period, including not only large raptors but also ptarmigans, cranes and a variety of water birds indicative of an extensive riparian environment. The contrast between the valley's empty, relatively dry aspect today and the life of people and animals in the past, as they are revealed on boulders and bedrock,

is stark. That seeming conflict between the lived present and the envisioned past behoves us to attempt to reconstruct what this region looked like in the Bronze Age—the period most fully documented in the petroglyphic record.

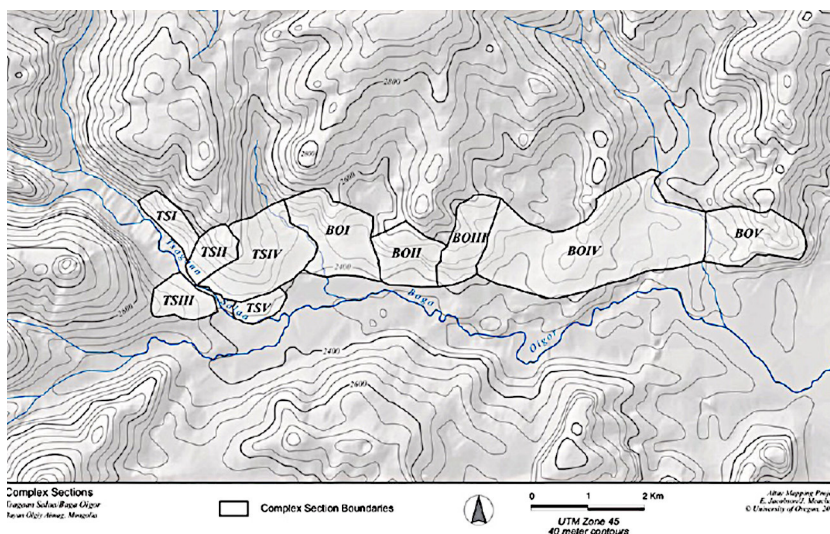
Comparing the present-day environment of northwest Mongolia and the description of habitat essential for *Alces alces*, it is to be wondered whether there were ever any moose in the Altai region on which we are focusing. No tree is in sight around the mouth of the Tsagaan Salaa (Fig. 6), and the river has been reduced to a slender stream. And yet to judge from the location of surfaces decorated with images of moose, this area, at the juncture of TS II, III and IV (Map 2), was once rich in the kind of riparian and forest growth on which *Alces alces* depends. The surviving imagery indicates that moose were commonly seen and hunted here over several hundred years in the middle to late Holocene. The Baga Oigor valley must have had a vastly different aspect than what we see today, the now treeless slopes covered with forest and its riverine plains much richer in streams, ponds and all the vegetation characteristic of such habitats.

With this overview of the physical characteristics of the region, both in the present and in the past, consideration of the pictorial material from the Baga Oigor and Tsagaan Gol valleys stretches our understanding of the life of their inhabitants and of the changing aspect of the vegetation and faunal regimes on which they depended. The image of the moose, in particular, focuses our attention on ancient environments as a significant factor in species sustainability.

Within the two large complexes considered here, we have recorded approximately thirty images of moose. One of the oldest images within the Baga Oigor complex is found with an archaic horse on a sloping surface in TS I (MAIC: RA_PETR_OI_0034).

Both images are executed in contours with heavy direct blows, and despite their contiguity, both animals are treated as if unrelated to any other elements on the panel. A similarly archaic aspect appears on a panel in the upper Tsagaan Gol complex (MAIC: RA_PETR_TG0067). The archaic aspect of its execution also indicates its pre- or Early Bronze Age date: pounded with direct blows, in contour, and a static position.

The earliest hunting scene involving a moose appears on a split boulder located at the southwest end of TS IV (Fig. 7). The boulder is rounded, heavily scraped by glacial action, and much of its surface is spalling, revealing the dull matrix of the stone under the warm-brown surface layer. The animal's body, pounded onto



Map 2. Baga Oigor complex with main rivers and sections. TS refers to sections along the Tsagaan Salaa River; BO refers to sections along the main river, Baga Oigor Gol.

the side of the boulder, is only partially indicated by a roughly hammered contour, but its head and large palmate antler have been fully depicted, again with rough blows. Under the animal's throat is visible its characteristic hairy bell. The use of a contour line for the animal and the direct (as opposed to indirect) blows of a hammer stone indicate a very early date for this image. This is also true of the anthropomorph visible across the upper split of the stone. His frontal posture and the heavy weapon in his hand are best compared with the earliest images of hunters in the region, from Aral Tolgoi, the small complex further to the south. These are almost all frontal, all directly pounded, and many are armed with clubs rather than bows and arrows (Tseveendorj et al. 2005). For a number of reasons, the compositions from Aral Tolgoi must be dated to the late Pleistocene or early Holocene, while the boulder from TS IV is certainly later (Jacobson-Tepfer 2019). However, the boulder is found in immediate proximity to several images of wild horses, aurochs, a mammoth, and a bear that can be confidently dated to a period within the Early Holocene or earlier (Jacobson-Tepfer 2013).

On a boulder further to the east, in BO II, are several images executed at different dates (Fig. 8). Based on execution and style, that of a large profile moose was the earliest: its heavy, contoured body was pecked out with rough, direct blows; and the animal demonstrates a degree of static realism that is of a pre-Bronze Age date. The artist has indicated the animal's bell, soft dew lip and palmate antlers. No hunters are associated with the bull moose in this case, but on the adjoining, south-facing plane of the boulder is a scene of a hunt in which two diminutive archers attack another, clumsily detailed bull moose. The body of this animal and its small palmate antlers were executed with indirect blows, as were the two small hunters. The hunters' slight build, rounded headdresses, and composite bows are sure signs of an Early Bronze Age date. In effect, the two very different panels on this one boulder offer a virtual measure of geological time during which this valley offered habitat for moose.

On a boulder from BO I are visible three bull moose, several wild horses and a variety of other animals (Fig. 9). All the animals have been pounded in silhouette style, thus indicating a Bronze Age date, but the moose stand stoically still while being attacked by small wolves or dogs. The appearance here of several mature bull moose—which would ordinarily not be seen together—raises questions about the artist's conception: whether he intended to simply duplicate the image of the bull moose or to represent the period of the rut. If that remains uncertain, the very repetition of this animal image, executed with a considerable degree of realism, forces us to recognise that the large moose were familiar to the hunters here, at least within this valley, and that there had to have been the habitat to support them.

No less interesting are the images on a massive,



Figure 7. Split boulder with frontal hunter and upper body of a moose. Pre-Bronze Age. TS IV.



Figure 8. Bull moose on the east-facing panel; a second moose and small hunters on the south-facing panel. Pre-Bronze Age and Bronze Age. BO II.



Figure 9. Three bull moose, wild horses, and other animals. Bronze Age. BO I.

table-like boulder that stands on the terrace of the hidden winter dwelling in Figure 5. This boulder was deeply scraped and polished by glacial action; and to judge from the style and uniform re-patination of all the figures on the upper surface, it must have been decorated within a limited span of time, perhaps that marked by a single family's use of the protected terrace over several years. On the side of the boulder (not visible here) is a clumsy moose, but on the upper surface (Fig. 10), amid a welter of figures including



Figure 10. Section of a large surface of a table-like boulder: elk, moose, two frontal figures, and other images. Bronze Age. BO IV.



Figure 12. Boulder with two moose images. East end, TS II.



Figure 14. Bull moose attacked by a canine, on the sloping surface of the boulder in Figure 12. Bronze Age.

a handsome buck, a wild horse and many canids, is a fine bull moose with small palmate antlers and a well-defined bell. This animal is in motion as if to ward off the small canines surrounding it. On this surface are visible two human figures: one is frontal, with arms raised in the position of a birthing woman (Jacobson-Tepfer 2015); the other walks toward the moose, his right arm raised and holding a hammer-like object. The appearance here of a figure with that kind



Figure 11. View from TS III east down the Baga Oigor valley with the juncture between TS II and IV in the left midground and the river course of Baga Oigor in the upper right. The circular dips in the nearby landscape were washed out by flooding water in the distant past. In the upper right, the plain can be seen, covered by a shallow lake at one time.



Figure 13. Bull moose on the upper surface of the boulder seen in Figure 12. Bronze Age.

of artefact and the frontal figure indicate a date no later than the mid-Bronze Age.

The greatest concentration of surviving moose images is where TS II and IV converge (Fig. 11), just overlooking the confluence of the stream Tsagaan Salaa and the river, Baga Oigor. The aspect of that region is now completely treeless; but around the confluence and in the adjoining large plain of Baga Oigor, rippled topography and water-worn boulders indicate a time in the past when there was considerable moving water, enough even to create a shallow lake (Jacobson-Tepfer 2020). Just above the present stream bed and within TS II is a worn boulder deeply embedded in the rocky soil (Fig. 12). This boulder has been decorated with two highly realistic bull moose, one on the upper surface and one attacked by a canine on the south-facing surface (Figs 13, 14).

Not far above the boulder in Figure 12, a large winter dwelling is tucked into a terrace between TS II and IV and backs up to a protective, rocky rise (Fig. 15). The photograph of the terrace makes clear the utter treelessness of the topography in the present. In one of several corridors leading back through this rocky rise is a vertical surface on which a hunting scene was executed, including a massive moose surrounded by wolves or dogs, followed by a walking hunter. Al-



Figure 15. View of a large winter dwelling between TS II and TS IV.



Figure 17. Moose surrounded by wolves and a small hunter in the lower left. Bronze Age. TS II.

though his weaponry is not evident, the hunter does have two canids on long leads (Fig. 16).

Another hunting scene, this one at the base of TS II and just above the stream Tsagaan Salaa, is centred on the powerful image of a bull moose (Fig. 17). Its size in relation to all the other images on the stone suggests that the moose is an animal of mythic significance. It is surrounded by wolves or dogs, while off to the left is a small hunter. He holds what appears to be a bow and aims at a goat-like animal rather than at the moose. The surface of the stone is highly worn and its imagery much darkened. That, together with the realistic style of the images, the suggestion of a reference to a mythic narrative, and the treatment of the human figure indicates, also, a date in the Mid Bronze Age.

On a high surface at the western edge of TS II is another hunting scene with two large elk, one confronting a powerful moose (Fig. 18). The largest elk is surrounded by canids, a variety of other animals, and at least three small hunters. The size of the elk and moose, the diminutive character of the human figures, and the small frontal figure standing on the hip of the large elk suggest that this scene may also refer to a mythic tale in which large antlered cervids, improbably together, centre the narrative landscape.

TS IV is a large section and one of the most richly decorated within the whole Baga Oigor complex. On its west end, it includes a deep and protected terrace



Figure 16. Moose hunt with leashed dogs. On the left is the hunter with his dogs, on the right is a large moose within a herd of horses. Mid Bronze Age. TS II.



Figure 18. Mythic (?) scene: moose and elk, hunters and dogs. Bronze Age. TS II.



Figure 19. Moose hunt, with wild horses attacked by dogs or wolves. Late Bronze Age. TS IV.

on which several surfaces are found covered with imagery. One large outcrop on the west side of the terrace includes the scene of a complex hunt involving wild horses (upper right argali (left) and two antlered moose, one massive and the other relatively small (Figs 19, 20). These images are much more awkward in shape and execution than those in the previously mentioned hunting scenes: they seem to stand passively as if tolerating the attack of dogs and human hunters. The latter are variously defined, including one large hunter on the far right. Nonetheless, their dress and weaponry help to establish a date within the Mid to Late Bronze Age. All the figures carry composite



Figure 20. Detail of Figure 19: two bull moose, five hunters, several dogs or wolves.



Figure 21. Loaded yak, moose, and other images. Bronze Age. BO II.

bows. At least three of the figures carry a large round object from their waists; these were probably throwing stones (Jacobson-Tepfer 2019, IV.28). Elsewhere in this complex and in that of Tsagaan Gol, these objects are associated with a number of elements that indicate a late Bronze Age date: a time when people were beginning to handle horses but not yet a period of mounted nomadism. At least three of the figures in this large scene from TS IV also wear what look like horned headdresses but were almost certainly the skins of animal heads worn by hunters (even today) as a kind of disguise (Jacobson-Tepfer 2019, IX.11–IX.15). The images of wild horses, as opposed to domesticated horses, reaffirm a date no later than the Late Bronze Age.

One last image from the Baga Oigor complex must be mentioned; even though it is more modest than the others, it may be more culturally significant. This is a small scene on a hidden vertical face in BO II (Fig. 21). The composition includes a yak loaded with a large basket with two small figures visible. Around this group are another smaller yak, a goat, two indeterminate animals, and a bull moose. This last stands quietly behind the loaded yak as if it were a benign observer of newcomers passing through the landscape. The moose has large antlers, a soft and swollen nose and

what appears to be a messy bell. This figure has been scraped and scratched after its original execution, so the pounded surface has a smoothed whitish-brown, lacquer-like appearance and deep gouges over its legs. Its long tail was added well after the execution of the animal, probably by the same person who gouged out its front leg.

For all its modesty, this scene offers significant clues regarding its temporal and cultural context. The colouration of the images, seemingly in transition between the original white of the crushed rock and the brown of re-patination, indicates that the scene was executed in the latter half of the second millennium BCE. The images' modesty and directness are typical of many petroglyphic compositions in that period. Most important is the image of the loaded yak. These patient, heavily burdened animals, often shown carrying both the children and the gear of the household, attest to a time when hunters and herders began to move into the higher mountains with their families in search of good summer pasture. There are many such images in the Baga Oigor and Tsagaan Gol complexes, all reflecting a new cultural phase in the second millennium BCE. In none of those scenes, however, are there ever any figures on horseback, although there are a few in which horses are included as a part of the animal caravan (Jacobson-Tepfer 2019, X.3). In this case, the loaded yak signals a time when the valley must have become sufficiently dry to allow the passage of such heavy animals. The moose, on the other hand, reflects an earlier, more riparian environment. In other words, this little composition, balanced between moose and loaded yak, suggests a world in decisive environmental and cultural flux.

The appearance of a moose in the BO II panel adds a distinctive narrative impulse and a firmer sense of the larger context in which this presumed family caravan was occurring. The moose infers the wild world through which the caravan was moving, but a world far different from the rocky, dry landscape of today's valley. It evokes a forested, marshy environment in the Baga Oigor valley. This scene and all the others featuring individual moose, or the hunting of moose, should correct our understanding of the world here in the Bronze Age before the advent of horse riding, and this, in turn, should reshape our understanding of that cultural period transitional between the environment of the middle Holocene and the early late Holocene.

There are no moose images in Baga Oigor later than those discussed above, and there are very few within the petroglyphic record of the Tsagaan Gol complex. Two may be mentioned here. One is a small scene on a lacquered brown surface involving two scenes of predation (Fig. 22). On the left is a large 'wolf' leaping at the hindquarters of an elegant stag. On the right, and dominating the surface, is a scene of another 'wolf' attacking the leg of a large animal with the palmate antler and shoulder hump of a moose. The two pairs of animals were executed by different hands and at



Figure 22. Double predation: 'wolf' on elk, 'wolf' on 'moose'. Bronze Age and later. TG_04167.



Figure 24. Small hunter, detail from the far-right side of the moose hunt in Figure 23.

various times, and the second 'moose' is even unclear, identifiable as such only by the animal's antlers.

However, within the Tsagaan Gol valley, one other scene makes absolutely clear the nature of the large animals and their probable presence at some time in the valley. This composition was found on a fragmentary boulder (Fig. 23) at the edge of the vast, rocky moraine filling the middle section of the Tsagaan Gol complex. The scene is dominated by three large moose, two of which have strange palmate antlers, but all three of which inexplicably have two or more bells hanging from their necks. Despite these odd elements, these animals are easily recognisable as moose, but they are static despite being followed by a group of 'wolves'. At either end of the remaining surface are two small hunters, one (extreme left) partially hidden by lichen and the other (right) almost lost between two of the larger animals. This little figure (Fig. 24) has the slender body type of many other figures from the Mid Bronze Age. He also carries the long quiver and composite bow indicative of that approximate date, and from the waists of both figures hang the wand-like *daluur* used for distracting prey animals. In addition, both figures wear a form of rounded fur headdress found in many other petroglyphs indicative of the full Bronze Age, well before the advent of riding.

This small scene is puzzling in many respects. It is the only clear image of a moose hunt that has hitherto been located and recorded within the huge Tsagaan Gol complex. But it is also in an anomalous place, on the edge of the rocky moraine, close by a small area



Figure 23. Two bull moose, one cow moose, 'dogs' and two hunters. Bronze Age. TG_H1.



Figure 25. View down to a marshy section of the Tsagaan Gol valley, where the panel with moose and hunters was located (Fig. 23). The large moraine and the main river are visible across the midground of the image.

that is still marshy with the inflow of a small stream from the slopes above (Fig. 25). Despite the forbidding aspect of the moraine today, the marshy area infers an earlier, wetter environment; and the images of small figures hunting moose also imply that at some point in the Bronze Age, this valley was still wet enough and forested enough to support moose.

Conclusion

The image of *Alces alces* in the Baga Oigor and Tsagaan Gol valleys is unusual within the rock art record of western Mongolia and, indeed, within that of the larger Altai uplift. It may be considered together with that of another animal requiring a somewhat similar environment, the brown bear (*Ursus arctos collaris*). Together, these animals, moose and bear, implicate a more heavily forested and significantly wetter habitat. The moose images located in northwestern Bayan Ölgii indicate that this region was at one time the southern edge of the Siberian taiga habitat, where moose and bears are still found in the more heavily forested zones. The ancient imagery of moose from cliffs over the Tom', Angara and Lena rivers of Siberia reflect the extent to which that animal was previously

hunted and even revered in prehistory, possibly as a symbol of the source of life (Jacobson-Tepfer 2015). That complex status does not seem to have been the case in northwestern Mongolia. To judge from the compositions in which it appears, *Alces alces* seems to have been understood primarily as a prey animal. However, its occasional appearance in compositions suggesting mythic tales may indicate that even as a prey animal, it carried references to spirit figures or heroic narratives.

Most important, however, is the degree to which the images of moose force us to rethink the environment of northwestern Mongolia, to recalibrate, as it were, the lives of ancient hunters and foragers in that region during the third to late second millennia BCE. Given its required environment, *Alces alces* serves as a marker of major cultural stages. Its early imagery reflects a period in the late pre-Bronze and early Bronze Ages when hunters and gatherers moved temporarily into the mountains for prey. Its late imagery marks that point in the mid-to-late Bronze Age when people moved their flocks and households into higher elevations, no longer inhibited by the wet, forested environment on which moose depended. There are no signs of riding horses in any of the moose panels, thus reaffirming that the large cervids, together with the environment on which the species depended, must have disappeared long before the appearance of riding, with its powerful effects on the culture of Inner Asia. Indeed, the image of a moose 'quietly watching a small family caravan' in Figure 21 evokes the end of a cultural era. The apparent association here of one faunal species and its required habitat indicates how such correspondences can be used to calibrate the interconnections between palaeoenvironments and prehistoric culture.

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Conflicts of interest

There are no conflicts of interest.

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