

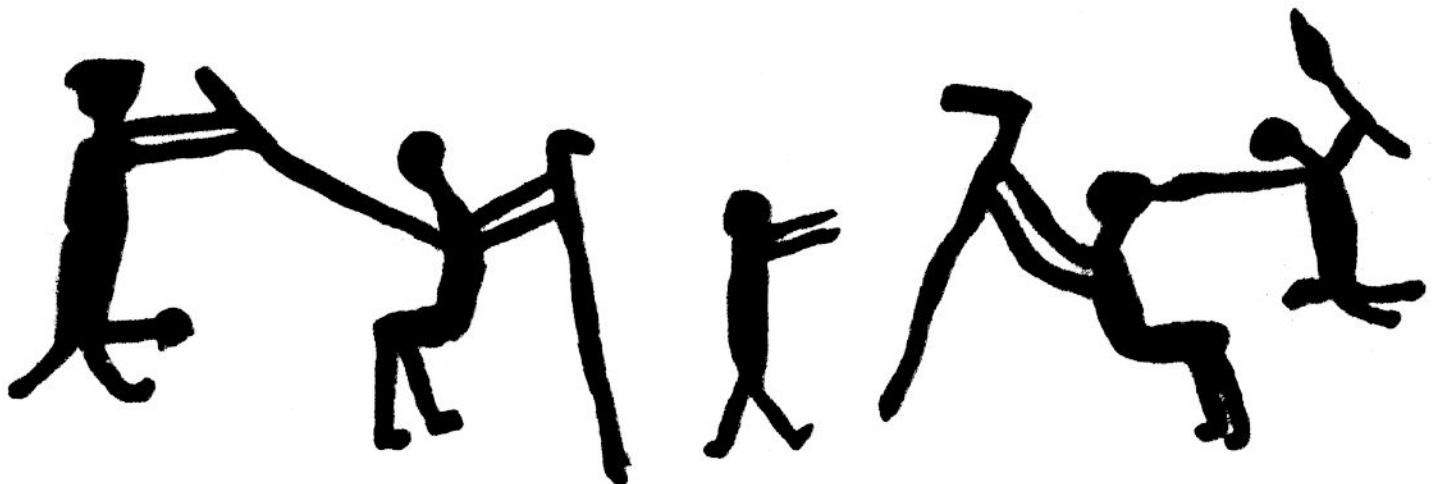
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ROCK ART FROM THE WESTERN EDGE OF THE STEPPE: ENGRAVINGS INSIDE THE BULL GROTTO AT THE KAMYANA MOHYLA SITE

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Introduction

The rock art of the Eurasian steppe is a well-known phenomenon in rock art science. Sites of the eastern steppe regions have been studied for a long time and much data and interpretations have been collected. On the other hand, the ancient art of the western steppe has been insufficiently presented in scientific literature. The rock art of the Circum-Pontic area on the western border of steppe zone is associated with the unique site of Kamyana Mohyla. The site is situated in the south of Ukraine, on the bank of the Molochnaya River, near the village of Terpinnia in the Zaporizhzhya region (Fig. 1). It is known for 67 sites (Mykhailov 2017, 13) and hundreds of rock art engravings dated from Late Palaeolithic to modern history, that have never been thoroughly counted or catalogued.

Kamyana Mohyla and the history of study

Kamyana Mohyla is a mound of accumulated sandstone slabs. Presumably, these slabs were previously a monolithic sandstone megalith, formed on the bottom of the Sarmatic Sea during the tertiary period, approximately 14 million years ago. The stone slab cracked apart into numerous blocks because of long-term erosion (Fig. 2). Nowadays, the process continues actively, causing the destruction of grottoes and blocks containing rock art. Such a situation defines the urgency and relevance of the Kamyana Mohyla engravings study, the need for thorough documentation and the creation of full digital copies.

Besides the numerous engravings, Kamyana Mohyla is also known for multilayered settlement dated from the Mesolithic to the Iron Age. It was studied by O. Bader, V. Danilenko (1986), D. Telegin (Telegin 1985, 184) and N. Kotova (Kotova et al. 2017) for many years.



Fig. 1. The location of Kamyana Mohyla

The site is not only the one with the richest finds one among many other sites around, but also draws attention as an important point on the map of Ukrainian Neolithization and domestication processes. During the 2016 fieldwork season, two ophidian head-shaped sculptures were found in the Mesolithic layer of the settlement (Fig. 3) (Kotova et al. 2018). These are the first rock art examples that create a strong and direct connection between the settlement population and the Kamyana Mohyla mound. The finds form a substantial way of improving our understanding of this population, extremely significant for Ukrainian prehistory.

Most of the Kamyana Mohyla engravings were made on the grottoes' ceilings and walls, created by the stone slabs' accumulation. One of the most famous grottoes in the mound is Bull Grotto. Its engravings' creation date (Late Palaeolithic or Early Bronze Age) has been

an object of discussion, although the discussable images were never studied with digital methods or metrical drawings. We will try to implement 3D-methods to interpret the images and propose an explanation concerning the engravings of this grotto, their dating and analogies.

The Bull Grotto is located in the northern part of Kamyana Mohyla (Fig. 4.1). The shape of the grotto that was created by a lot of huge sandstone blocks is complex and begins with a narrow entrance. Presumably, this entrance was much bigger a few thousand years ago and allowed people to enter the grotto at full height. The images in the grotto form several groups in different places of the grotto. Many linear-geometric compositions are located there, but animal engravings are of special interest. Most of them are usually interpreted as bulls.

The images in Bull Grotto were discovered among the



Fig. 2. Aerial view of Kamyana Mohyla (made by D. Nykonenko)

first engravings on the Kamyana Mohyla by M. Veselovskiy at the end of the 19th century. However, the discovery was not considered to be interesting (Bobrinskoy 1893, 2–4). In the 1930s Kamyana Mohyla was intensively investigated by V. Danilenko and O. Bader (Bader 1941). Although the researchers had found the flint complex of the Eneolithic–Early Bronze Age period, they dated the engravings to the Upper Palaeolithic. They named this place the Mammoth's Grotto because of the controversial interpretation of one of the images. This interpretation caused doubts among their colleagues, so that B. Zemlyakov in 1939 attempted to consider the picture as a bull image (Zemlyakov 1939). In turn, the mammoth version was supported by M. Rudinskiy (Rudinskiy 1952). Since then both interpretations and two different grotto names have formed the basis of the engravings' dating.

In the 1960s research on Kamyana Mohyla was headed by Gladilin and Mykhailov (Danilenko 1986, 8). Gladilin studied the Bull Grotto and dated some engravings to the Mesolithic and Early Neolithic periods. Thus, he formed the third version of this grotto

engraving dating, that was disputed by Mykhailov and Danilenko (Fig. 5). This long discussion was based on one engraving interpretation and was not supported by accurate study or digital investigation, after which these researchers died before the answer was found and the question remained open.

Engravings inside the Bull Grotto

All the above interpretations and the art from the grotto have already been published in Ukraine. However, there were no metrical drawings or any accurate images of the engravings. Thus, detailed study and scientific discussion were barely possible. Publications on some engraved blocks were made by V. Gladilin (Gladilin 1969), but a large part of the most important engravings were published only in Russian or Ukrainian. The engraving groups in the Bull Grotto have been quite informative during the attempts on the Kamyana Mohyla rock art dating and typologization. They can also give information about the technical features of engravings. However, interpretation is complicated by the lack of information sources (a common situation in rock art study). Following the P. Tacon and



Fig. 3. Ophidian shape-head sculptures from the Kamyana Mohyla 1 settlement. 1, Older figurine, dated to 8379 ± 160 cal BC; 2, Younger figurine, dated 7424 ± 46 cal BC

C. Chippindale's (1998) concept, we should state that the analysis of these groups is possible only through a formal approach. There is no possibility of getting the absolute date, since there are no materials for analysis, although we hope that this obstacle can be overcome soon. We also do not have any sources. The only methods available are stratigraphic study and Harris matrices for relative dating (following Chippindale et al. 2000), and a search for analogies; both require detailed drawings. Drawings and 3D reconstruction are also needed for technical and typological study. Only three scenes from the Bull Grotto can be examined entirely without the risk of destroying the grotto. Our study is an attempt to create accurate drawings, plans, and models, targeted on the clarification of a number of different problems. The standard deviation of the drawings' measurement is less than 0.35 mm.

The first of three scenes is traditionally called the "Bulls in circular defense" (Fig. 4.2). This image is the most interpretation-friendly and shows a very interesting chronological sequence. Four bulls are placed on the cornice (Fig. 6), covered by ochre and numerous cupmarks. They are made of entire silhouettes (the whole figures are engraved (deepened)) wiped on their whole area, later contoured by wide lines (Fig. 7). The chronological sequence reconstructed from stratigraphy is as follows:

- A) A few wide lines, filled with ochre, that do not form any obvious pattern;
- B) Wiped silhouettes of the four bulls;
- C) Wide lines that contour the bulls and create the horns, tails, legs etc;
- D) Cupmarks partially filled with ochre;
- E) Partial destruction of the cornice (Fig. 7.3).

Important information appears from this sequence: some lines were painted with ochre before the creation of the engravings. Since ochre in the steppes of Ukraine was not used during the Palaeolithic, we can finally withdraw Danilenko's idea of Late Palaeolithic dating of the Bull Grotto engravings.

This scene was partially drawn and published by Mykhailov (2005, 202, fig. 9). 3D modeling allows us to differentiate the natural cracks and scratches from engravings and makes us reconsider the description of Mykhailov and Danilenko. Although the clarified drawing contains a few more lines and completes the contour of the left bull, the semantic interpretation of the scene has not changed.

The second group of engravings is very similar technically to the first one. It consists of four animals, standing (moving?) in one direction (Fig. 4.3; 8). All of them are made by wiping and contouring, the same as the "Bulls in circular defense"; the chronological sequence of the engravings repeats the previous one.



Fig. 4. The Bull Grotto. 1, Entrance to the site; 2, Part of the “Bull in circular defense” engraving; 3, “Row of animals” engraving.



Fig. 5. V. Danilenko and B. Mykhailov during the Kamyana Mohyla excavation in the early 1970s

After the figures were engraved, the area was marked with numerous cupmarks; part was made right on the animals' contour (Fig. 9). Later, part of the cornice collapsed.

One of the animals was mostly destroyed when the cornice broke, so it cannot be recognized. The second one is much smaller and probably was not noticed by previous researchers. It is less detailed and can hardly be called any species. The next one seems to be too gracile for a bull. It has small horns, long legs, and no hump on its back, which is non-typical of a bull. Instead, this engraving reveals similar features with a female deer (Mykhailova 2017, 96, fig. 33) or a horse. The last one is pictured in the same manner as the "Bulls in circular defense".

Besides the four engravings, this cornice also contains a picture of a creature that Mykhailov interprets as a dog (2005, 201, fig. 8).

The third and the last scene depicts the so-called "Rain bull." This group contains four different engravings with a controversial interpretation (Figs. 10, 11). The group of engravings is placed on the block that broke off the wall of the Bull Grotto during the prehistoric period. During his research in 1948, Danilenko decided to move the block to the Kyiv Archaeological Museum. According to his records, the whole block was covered by red ochre that was lost during trans-

portation (Danilenko 1986, 56–57). The block is now stored in the museum. The painting was covered with ochre again according to the Danilenko drawings, so today it is impossible to distinguish the real paintings from imagined ones (Fig. 12). The only valid evidence of the picture's existence is the block relief. Two pictures are small and created with a few lines. Presumably, both of them depict deer. Although they were drawn by Danilenko in the middle of the 20th century, they were never published or described in details. The third engraving on this block belongs to the same technical group. It shows a part of a huge animal. The shape of the head and nose gives a hint that this animal is also a bull.

The central engraving shows a large creature with a trunk. This feature was the reason for a long discussion concerning the dating of this engraving. Since Danilenko was assured that the engraving shows a mammoth, he insisted on the Late Palaeolithic nature of the creature. However, Mykhailov considered this creature to be a mythological being called the "Rain bull" or at least the bull with a trunk, that meets numerous analogies in the rock art of Kazakhstan. The creature's silhouette is more likely a bull than a mammoth mostly because of the shape of his back and legs. The head of the creature is bent down and the horns are directed in a straight line with the body. We doubt

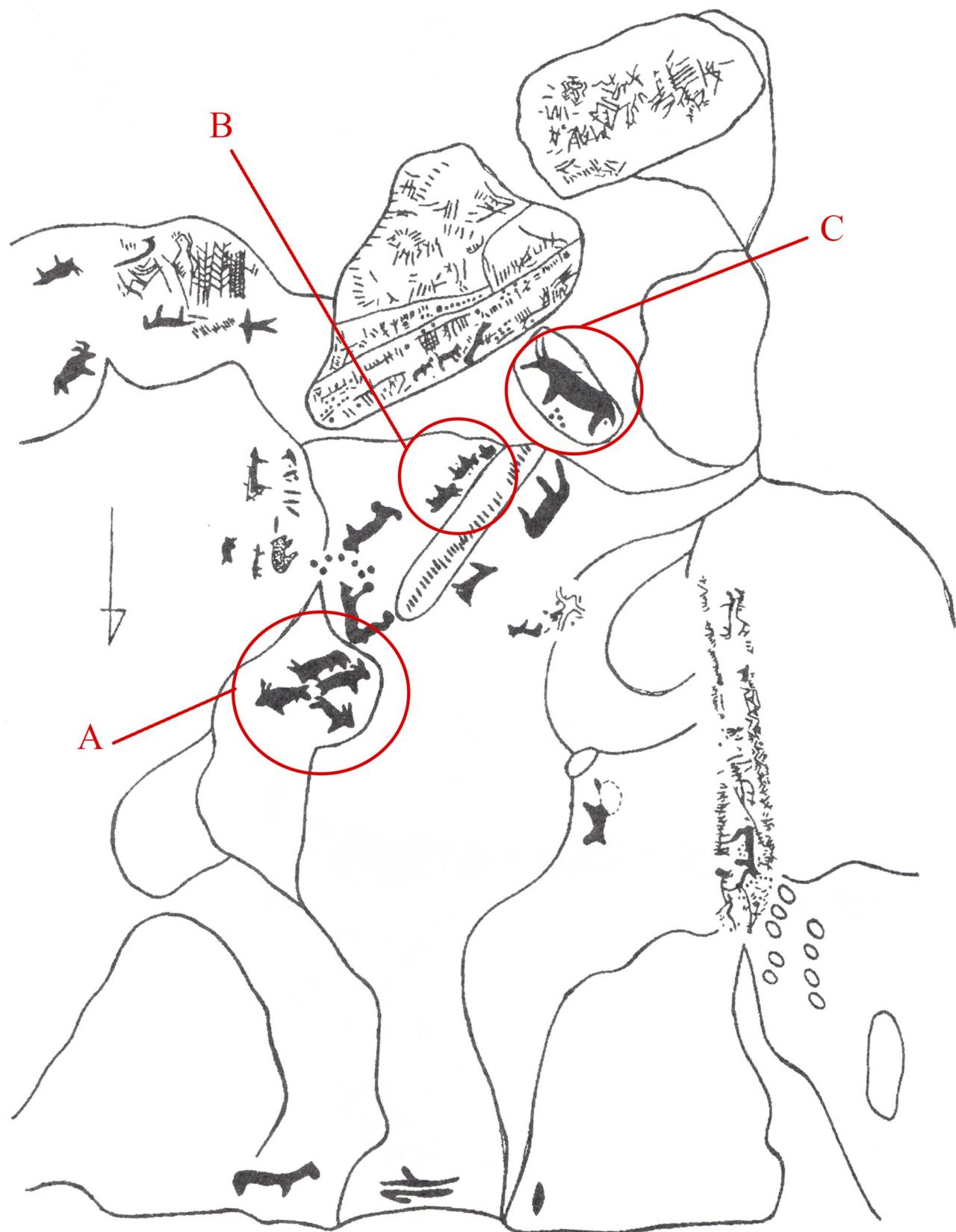


Fig. 6. Scheme of the Bull Grotto. A, image of "Bulls in circular defense"; B, "Row of animals"; C, "Rain bull" (after Mykhailov, 2005, 277, fig. 115)

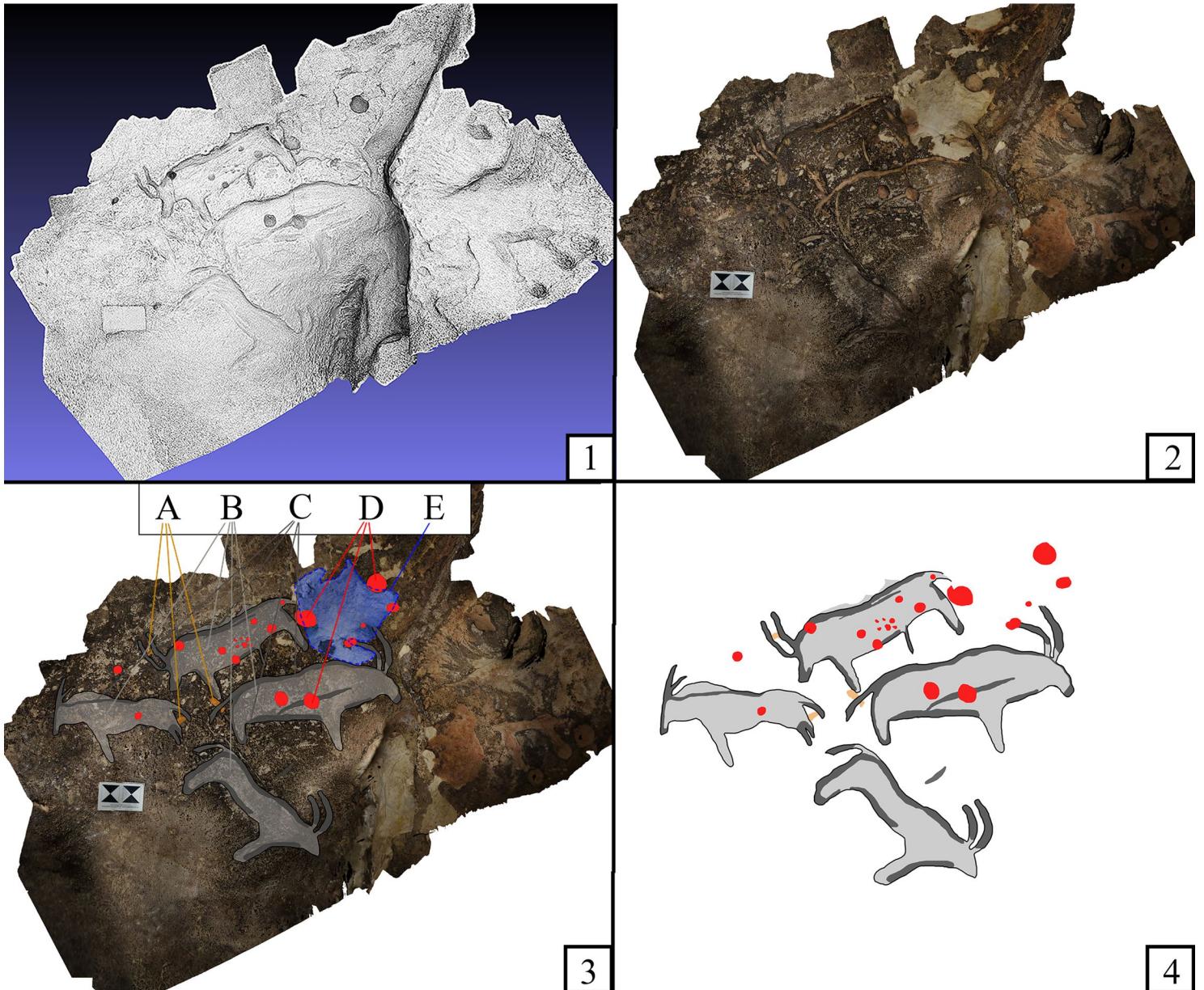


Fig. 7. “Bulls in circular defense,” Kamyana Mohyla. 1, 3D mesh of the plate. 2, Orthophoto. 3, Chronological sequence of the plate change on the orthophoto. 4, Drawing of the engraving (made by S. Radchenko)

the version of a trunk because of anatomical reasons: it is much closer to the horns than it should be. Taking into account two lines that cross the bull’s back almost perpendicularly and are interpreted as spears that pierce him, we assume that the so-called trunk is, in fact, a spear that pierces the head of the creature. This approach allows us to consider the engraving as an image of an ordinary bull¹.

The picture is much closer to engravings of bulls than to mammoths from Kamyana Mohyla. Besides, the technique of engraving is the same for two other

groups (“Circular defense” and “Row of animals”). Assuming that the same-technique in one grotto was used during the same epoch, we can find the stratigraphic proof of non-Palaeolithic chronology of the “Bulls in circular defense” engraving, where the ochre-painted lines were cut by the bull engravings. In addition, the Rain bull shows the same chronological sequence as the previous engravings: picturing the silhouette, contouring it, creating the numerous cupmarks, block with engravings breaks off. Other evidences of Bronze Age dating were shown by Mykhailov (2005, 118–119): a complex of Bronze Age flint tools found near the block; a number of Eneolithic and Bronze

¹ Decimated model is available at: <https://sketchfab.com/simon.radchenko>

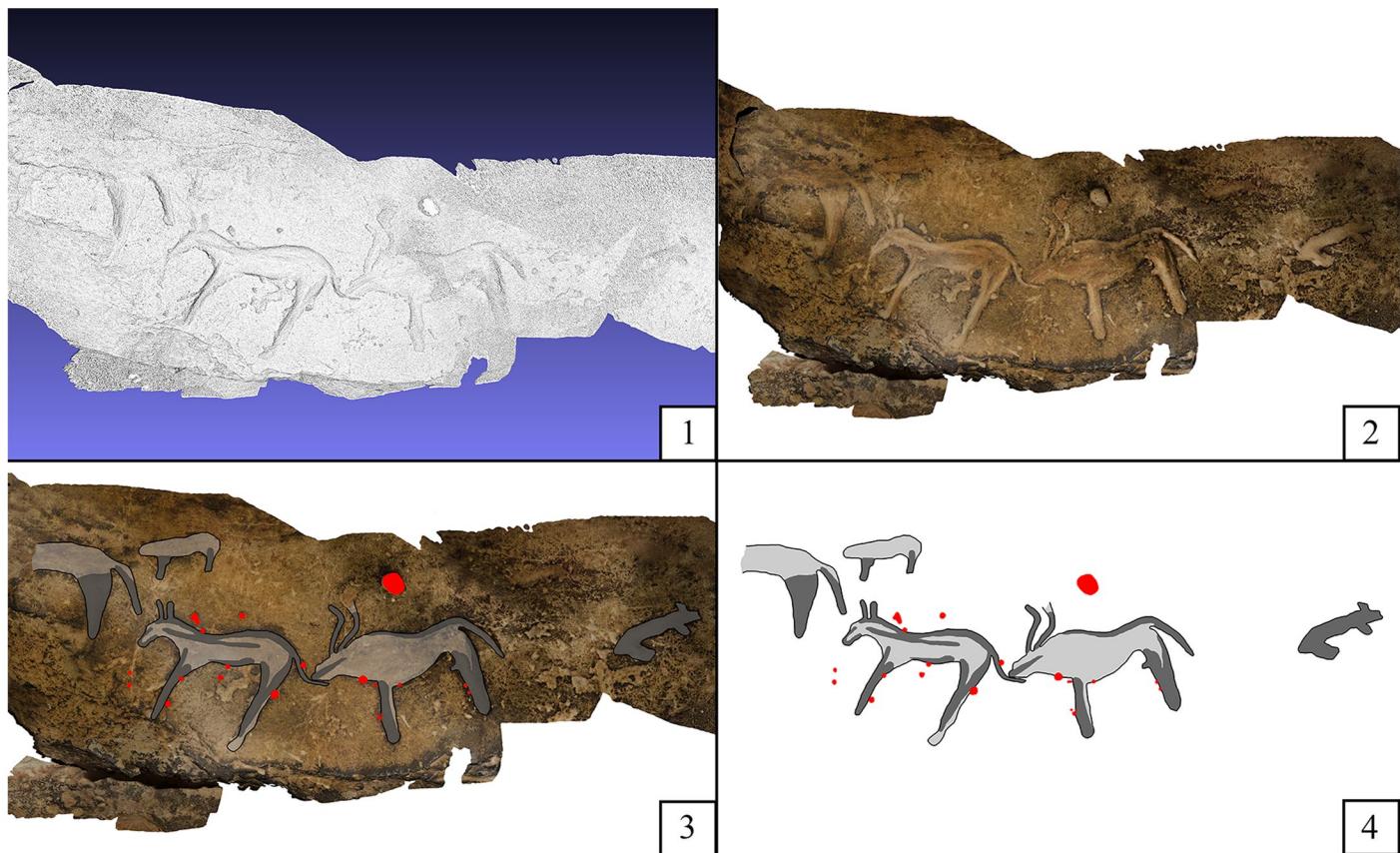


Fig. 8. “Row of animals,” Kamyana Mohyla. 1, 3D mesh of the plate. 2, Orthophoto. 3, Drawing on the orthophoto. 4 , Drawing of the engraving (made by S. Radchenko)

Age analogies in the Caucasian and Eurasian steppe. Taking into consideration the existing proofs as well as the new stratigraphic information, we can end the discussion about the Rain bull’s origin soon.

Analogy and conclusions

Numerous analogies to the engravings of Kamyana Mohyla can be found in the rock art of Kazakhstan. There are also natural stone formations similar to Kamyana Mohyla in the Kazakhstan steppes. The most similar is Toleubulak in the Aktobe region, which also consists of sandstone blocks forming grottoes, some of them covered with engravings (Samashov 2006, 21–22).

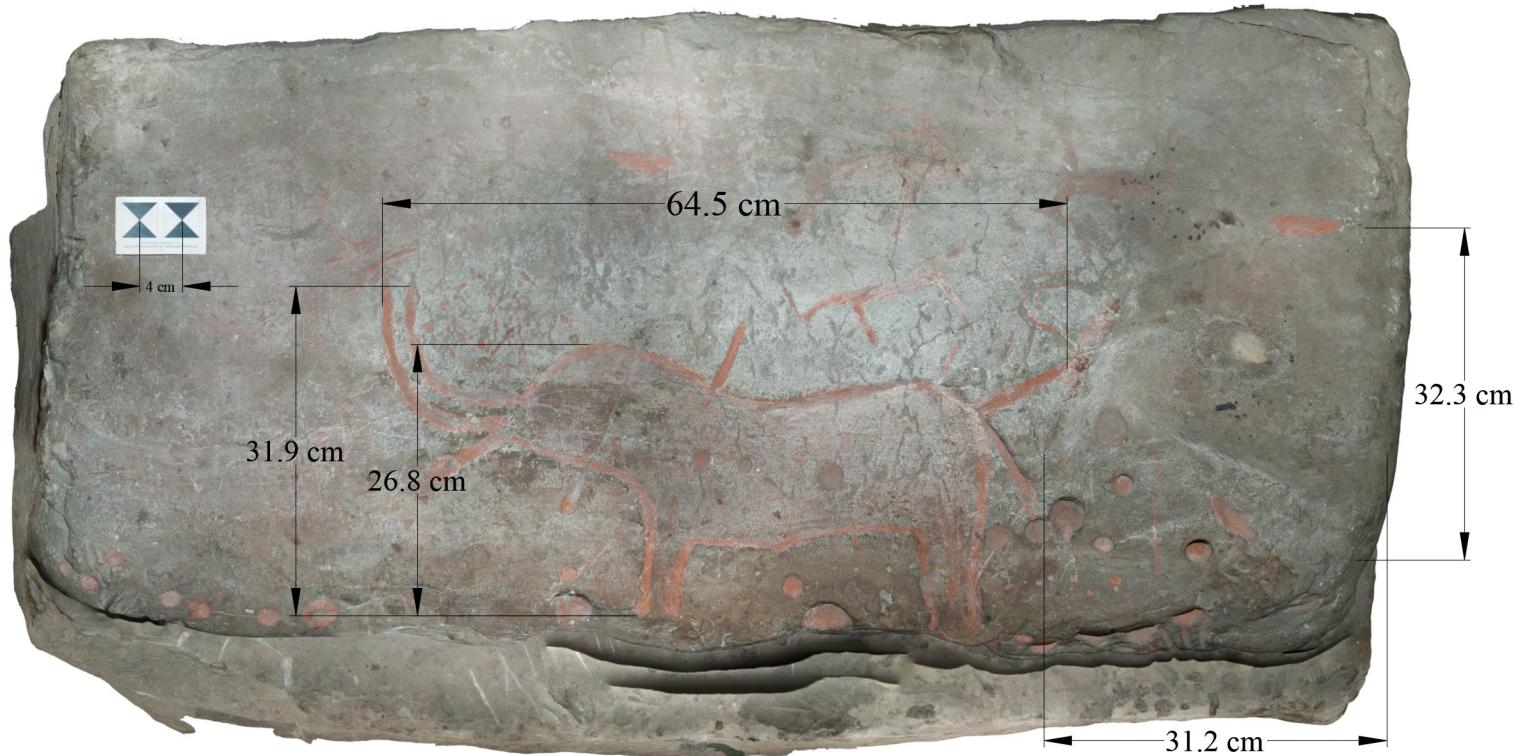
The rock art of Kazakhstan has a lot of scenes and images that are similar to Kamyana Mohyla ones. Many scenes and engravings that typologically and technologically correspond to the pictures from the Bull Grotto can be found at numerous Kazakhstan rock art sites. Tamgaly, Eshkiolmes, Akkaynar, Arpa-Uzen, Karakyr, Kuljabasi, Terekty-Auliye, Chokpar, Karasay,

Sauyskandyk, and many others are among them (Fig. 13). Besides, Kamyana Mohyla is connected to these sites by some stylistic features: unnaturally elongated and curved horns and a hollow hump, marked on a massive body. Such signs are known as the markers of the Tamgaly tradition engravings, originating from the name of the Tamgaly rock art monument (Maksimova et al. 1985).

Traditionally, researchers date these images to the Bronze Age, indicating that they are among the most ancient and most popular in this region. Taking into the consideration that the wild bull population in the steppe at the end of Bronze Age decreased significantly, the rarity of their images in the Iron Age looks quite logical (Khuzhanazarov 1995, 66–67). This observation is based on the scant number of corresponding osteological material findings on the monuments of the early Iron Age (relative to the previous period). The bull images’ prevalence in Kazakhstan, Mongolia, and Altai rock art shows the active role this animal acquired in human economy and lifestyle (Shvets 2011,



Fig. 10. The engraving of the “Rain bull” from Kamyan Mohyla. 1,— Rain bull. 2, The figure behind the rain bull considered by V. Danilenko to be a mammoth. 3, Dimensions of these engravings



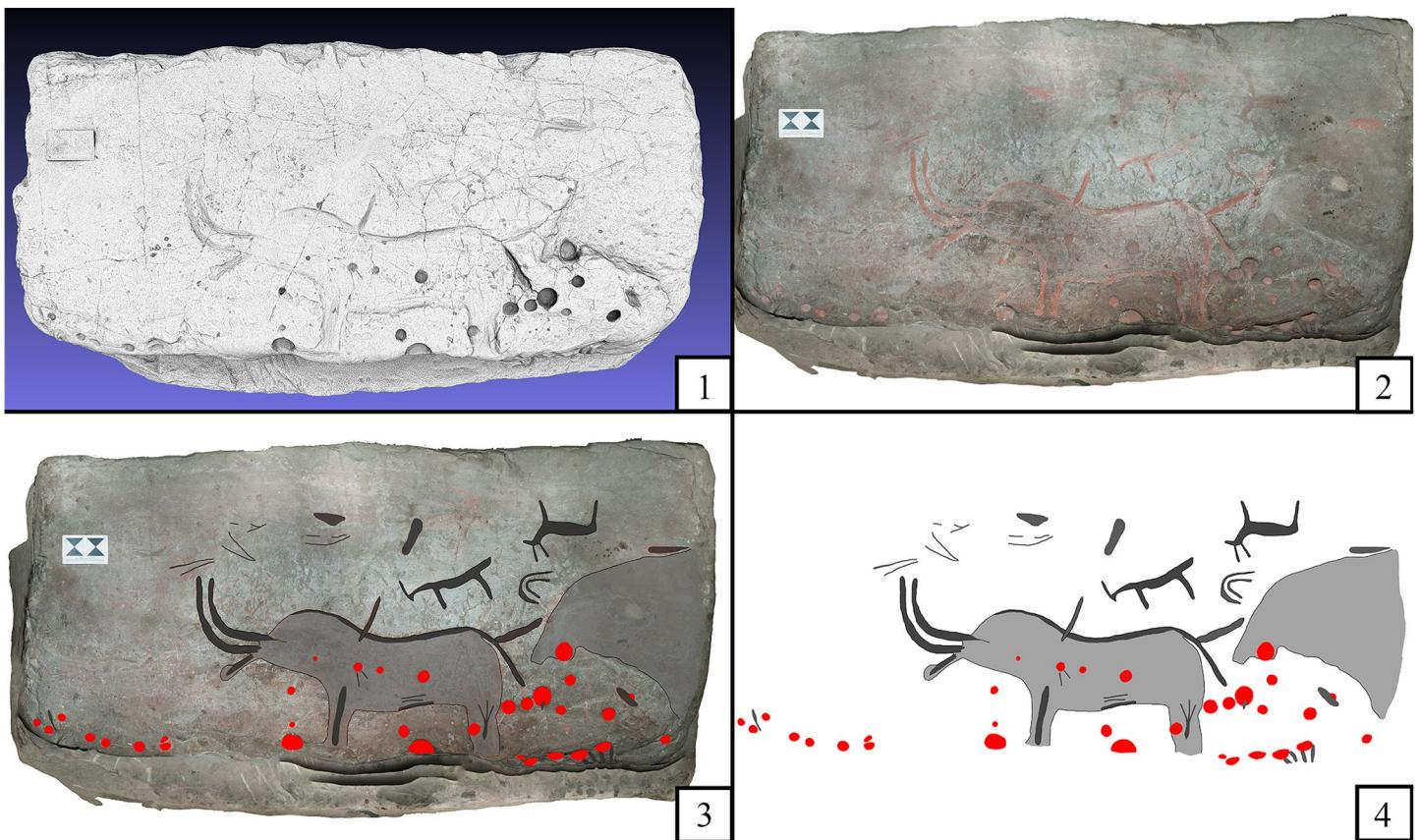


Fig. 11. “Rain bull,” Kamyana Mohyla. 1, 3D mesh of the plate. 2, Orthophoto, 3, Drawing of the orthophoto. 4, Drawing of the engraving (made by S. Radchenko)

135; Baypakov et al. 2005, 74).

All of the studied scenes, comparative to the other engravings of Kamyana Mohyla, have a lot in common; besides, they are typical of steppe rock art. To begin with, all of them are made using the same technique, which is present only in the Bull Grotto. Besides technique and location, we assume that the dates of engravings are the same, in the Eneolithic or Early Bronze Age. A large part of engravings shows the images of bulls. It marks the period of their creation as the time when the bull becomes an important part of artists’ lives. Indeed, during the Eneolithic and Early Bronze Age the Ukrainian steppe was the kingdom of ancient pastoralists; bulls and cows were the main part of their economy, so the these images must have been created exactly during this period. Later, in the Iron Age, they were replaced by engravings of horses, important animals for the Scythian and Sarmatian people. During the Palaeolithic the set of pictured animals was also different: mammoths, bison, lions, etc. (Mykhailov, 2005, 102–103). In this sequence, Eneolithic and Early Bronze Age people were the ones the

depicting bulls they depended on. Their way of living and economy made them consider these creatures to be important and to picture them in rock art – and they did.

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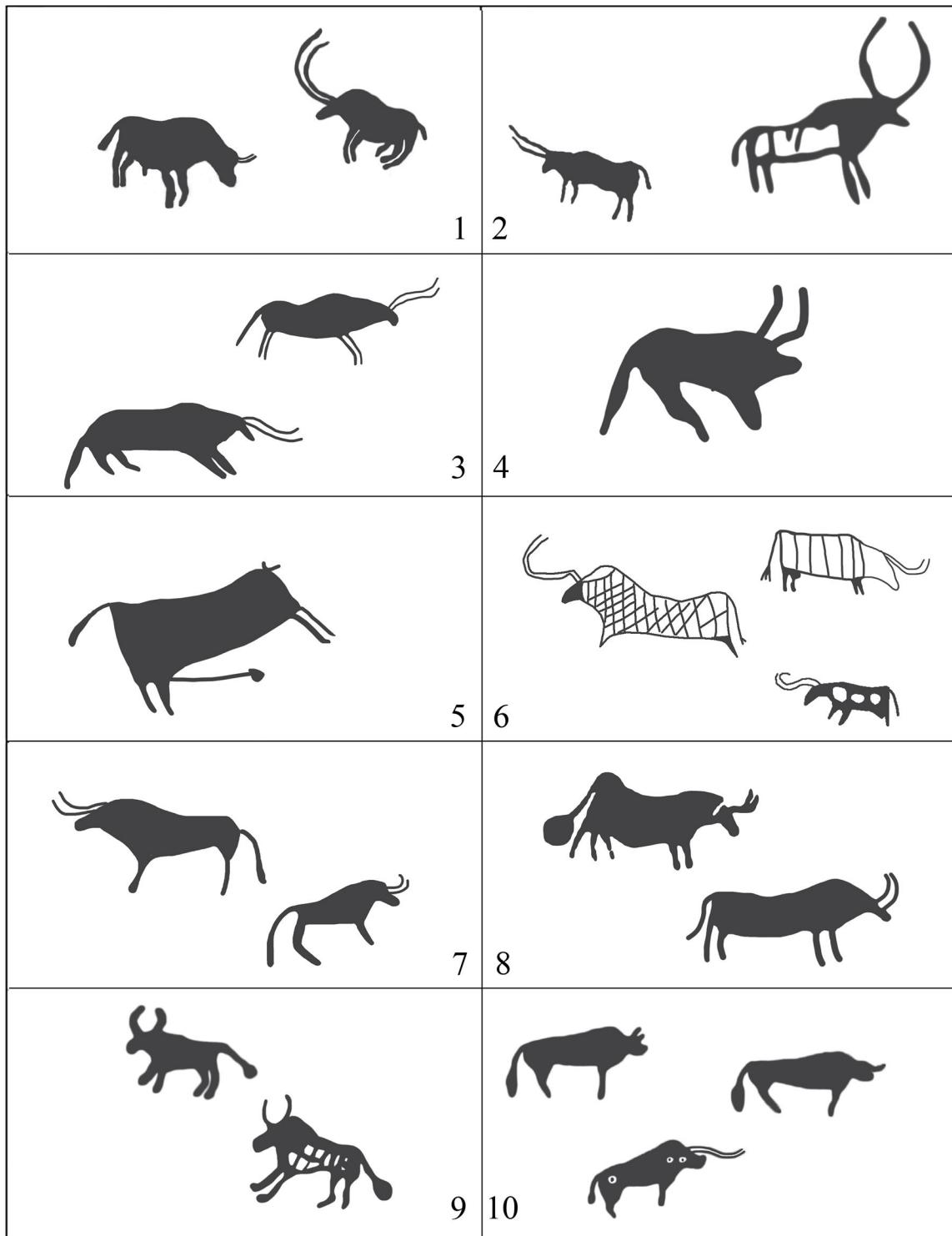


Fig. 13. Images of bulls in Kazakhstan rock art. 1, Tamgaly, 2. Eshkiolmes. 3, Akkaynar. 4, Arpa-Uzen. 5, Karakyr. 6, Kuljabasi. 7, Terekty-Auliye. 8, Chokpar. 9, Karasay. 10, Sauyskandyk



Fig. 12. Drawing of “Rain bull” plate by V. Danilenko (1986, 54, fig. 17)



Fig. 9. Cupmark cuts on the contour of an animal (picture made by A. Volkov)

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