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IMAGES IN THE SAKA ANIMAL STYLE OF TAUSAMALY (EASTERN ZHETYSU REGION, KAZAKHSTAN)

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Abstract: The article publishes new data on an original type of cultural heritage of the Republic of Kazakhstan, the rock art of the Early Iron Age from the territory of Eastern Zhetysu. The collection includes petroglyphs of the early Saka period, late Saka, and Hunno-Sarmatian times. These are images of predators, herbivores, anthropomorphic figures, and household items made in the technique of piquetage and engraving. According to the manner of execution, there are ornamented, contour, and silhouette images. The monuments indicate that nomadic groups living in the lowlands of the Zhetysu Alatau in the Early Iron Age had original artistic images, which, nevertheless, are part of the core of the Scythian-Siberian animal style. The petroglyphs find analogies in the art of related nomads from other regions of Zhetysu and Southern Kazakhstan, as well as tribes that settled from Ordos to the Northern Black Sea region in the middle-end of the 1st millennium BC. Many individual images were lost due to natural and climatic factors, and some are under threat of destruction.

Keywords: rock art, petroglyphs, Kazakhstan, Saka, Hunno-Sarmatian period.

INTRODUCTION

For thousands of years, Zhetysu in southeastern Kazakhstan was one of the most important centers of anthropogenesis, the formation of ancient cultures and human populations. The importance of the region for the history of Eurasia has long been recognized by archaeologists and anthropologists. The region is diverse in landscape and climate, which is clearly seen in the latitudinal direction from the semi-deserts of the Balkhash region to the alpine meadows of the Alatau, which provided ample opportunities for the existence and development of man, conducting both an appropriating economy—hunting, fishing, gathering, and a producing one—agriculture and livestock breeding. Historically and geographically, this mountainous country is located in the intra-Asian mountain corridor connecting the southern and eastern regions of Central Asia. The region was open to migrations of people and ideas, both from west to east during the Chalcolithic and Bronze Ages, and from east to west from the Early Iron Age to the Middle Ages.

Ethnocultural processes and phenomena that took place in the region are reflected in various archaeological monuments, including works of rock art. At present, petroglyph studies have taken their place in science, offering not only methods but also showing that they can, in the absence of sufficient archaeological data, answer complex historical questions. This is primarily due to the main feature of petroglyphs—representativeness. In Southeastern Kazakhstan, due to geographical conditions, with a mountainous landscape, there are some of the most significant world monuments of rock art, Tamgaly,

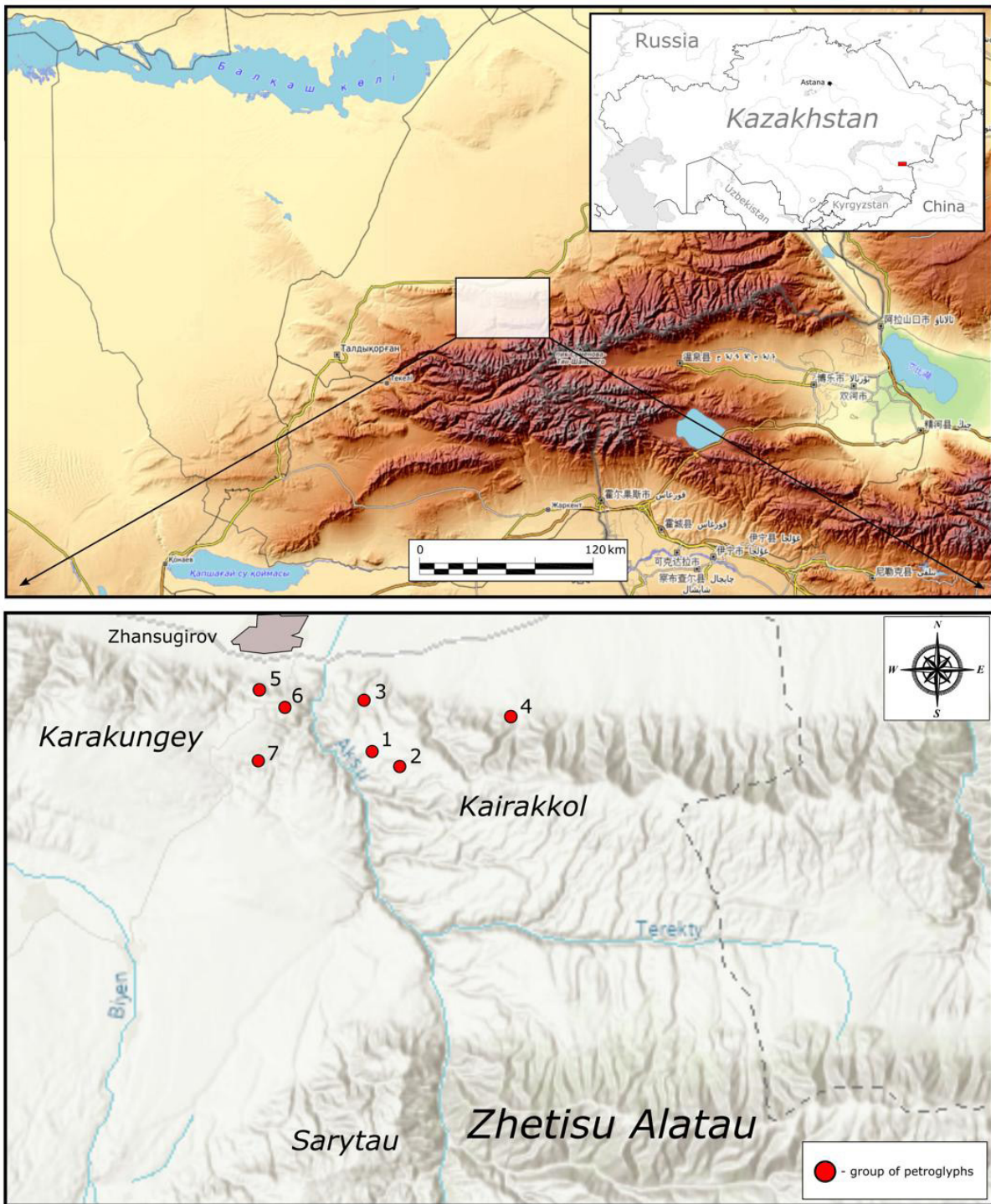


Fig. 1. Petroglyphs of the Tausamaly archaeological complex: 1. Groups No. 32, 39, 40; 2. Groups No. 46, 47, 50, 51, 55; 3. Group No. 89; 4. Group No. 103; 5. Group No. 114; 6. Group No. 120; 7. Group No. 125; 8. Group No. 137; 9. Petroglyphs in the Soldatsai Gorge area.

Kulzhabasy, Bayanzhurek and Eshkiolmes. In addition, in Zhetysu Alatau, there are several more local centers of rock art, Arkharly, Ordakul and Tausamaly, which have serious information potential and are examples of highly artistic art.

Most of the chronologically and culturally defined petroglyphs in large clusters date back to the Bronze Age. It was in the 2nd millennium BC that rock sanctuaries with images of deities, rituals, battle scenes and hunting appeared. They continued to be used in subsequent periods, standing out due to recognizable stylistic techniques. In the Early Iron Age, the Saka tribes settled in the territory of Zhetysu, where

they mastered all landscape zones suitable for cattle breeding. They were attracted by the foothills, lowlands and alpine meadows, as evidenced by thousands of burial mounds. Some of them, such as the Issyk mound, have gained worldwide fame. In the Saka period, special types of material culture, weapons and art became widespread. One of the elements of culture is the Scythian-Saka animal style, which is characterized by a unique pictorial interpretation of zoomorphic motifs, in which the mystery and suggestiveness of images played a significant role. Rock paintings, due to the material on which they are applied, are simple in execution, but are

easily recognizable and therefore serve as a reliable source on the culture of the Saka nomads. Petroglyphs of the Early Iron Age indicate traditional cattle-breeding routes, places of long-term residence of individual groups of nomads, regional specificity of artistic images, and contacts with other cattle-breeding and agricultural communities of Central Asia.

The Tausamaly archaeological complex is located in the Aksu district of the Republic of Kazakhstan, 2 km east of the village of Zhansugurov and south and east of Tausamaly village (Fig. 1), in the eastern parts of the vast historical and cultural region known as Zhetysu. According to its morphological structure, Eastern Zhetysu is divided into two parts: the flat northern part and the mountainous southern part. The plain is called the Balkhash-Alakul depression, buried under loose sediments carried down from the mountains. It is sharply separated from the mountains by a wall of high and, in places, almost vertical Paleozoic cliffs, and lies 1000–1200 m below their surface. Immediately from the steep ledges the plain begins as a flat steppe, and further towards Lake Balkhash it turns into a sandy desert. The mountains rise above the plain in three giant steps, rising one above the other to 1000 m and stretching in the latitudinal direction. These steps (morphologically, flat highlands or plateaus) are divided along their extension by two intermountain depressions. Due to this structure of the mountains, three ridges are very clearly distinguished, cut off on both sides by steep slopes. The Alatau ridges stretch from the west and southwest to the east and northeast. The total length of the mountain system is approximately 400 km.

The complex occupies the northern lowlands of Karakuney and Kayrakkol Mountains in the Aksu River basin. The total length of the Karakuney Mountains between the Buyen and Aksu Rivers is about 20 km, the length of the Kayrakkol Mountains, bordered on the west by the Aksu River, on the south by its tributary Terekty, and on the east by the Sarkan River, is about 35 km. The average width of the mountain ranges reaches 10 km. The ridges are cut by the gorges of the Buyen, Aksu and Sarkan Rivers, originating in glaciers. The rivers equally dissect both the ridges and the depressions with canyons up to 1500 m deep. The cross-section of the rivers consists of rapids and waterfalls, so from a distance they appear as white ribbons. They are adjoined by a system of rivers stretching along the depressions, flowing in the same deep crevices. Narrow gullies, corroding the flat ridges, branch off from the latter. In this way, a lattice river system is formed, deeply cut into the body of the stepped massif. Semi-desert plant associations predominate on the piedmont plain and in the foothills of the northern part. Wormwood-cereal desert steppes with a productivity of 3 c/ha of dry mass are typical on mountain gray soils. In the foothill strip, a discontinuous belt of semi-desert vegetation extends along relatively gentle slopes. It consists of a complex combination of wormwood-grass, cereal-wormwood-hodgepodge communities, under which thin skeletal mountain gray soils and light chestnut soils are formed.¹

The situation is different in the basins of the main rivers flowing through the mountain ranges, Buyen, Aksu, Sarkan

and Baskan. For the region of the Karakuney and Kayrakkol mountains, the Aksu River is of key importance. It originates in the Alatau glaciers at an altitude of about 3700–3800 m above sea level, its length is about 316 km, and the area of the basin is 5040 sq. km. On the foothill plain, below the alluvial fan of the river, there are numerous oxbow lakes that form long freshwater lakes, in some cases supported by natural springs.

The Tausamaly archaeological complex includes various burial and memorial monuments, among which the largest ones are the Tausamaly burial grounds, more than a hundred burial mounds, and the Suuk 3 burial ground, which includes about 75 burial and memorial objects.

A separate type of monuments of the historical and cultural heritage of the Tausamaly archaeological microdistrict are petroglyphs. They are located on the rocks of the Aksu River gorge, on the plateau-like peaks of the Kairakkol and Karakuney mountains, in internal ravines, on sandstone and shale outcrops that stretch in tiers along the slopes. The first monument of the complex was explored in 2019 during emergency work on the construction site of the Almaty – Ust-Kamenogorsk highway. On the eastern outskirts of the Tausamaly village, excavations were carried out on a burial mound of the Kulazhorga culture. The embankment was redeposited, but in the center of the under-mound area, in a stone box lying in a deep, well-shaped pit, a paired burial in situ was discovered. Two individuals were laid on their right sides, with their heads to the northeast. On the left side of the box, there were three accompanying burials of horses.²

The burial mound attracted scientific interest due to its unusual burial rite for the region, which is why in 2020 a search was undertaken for other monuments of this type. Based on the results of the exploration, it was determined that the 2019 mound occupied the northernmost position in a large burial ground, which was named after the nearest settlement. In the same year, excavations were carried out on two mounds, No. 33 and 34, in the center of the burial ground. Exploration was carried out on the western slopes of the Kayrakkol Mountains closest to the burial ground, as a result of which a cluster of signs and petroglyphs dating from the Bronze Age to the Middle Ages was discovered. In 2022 and 2023, mounds No. 2, 3, 25, 90–95 were explored. In 2024, archaeological excavations were carried out at Balasaz and Tastybuyen, located in the southern part of the Aksu region, which revealed burial mounds similar in planigraphy and architecture.

In 2022, a separate Tausamaly archaeological squad was formed at the A.Kh. Margulan Institute of Archaeology, which carried out a number of scientific activities until 2024. Excavations of burial mound No. 45 at the Tausamaly burial ground and reconnaissance excavations at the Suuk 3 burial ground were carried out, and two excavations were located at the Tausamaly settlement. The main task of the squad was the search for and recording of rock paintings.

In total, more than 130 groups of rock paintings were recorded during the research period, occupying the southern slope of the Suuk plateau in the western part of the Kayrakkol mountains and the eastern slopes of the

¹ CHUPAKHIN 1987, 121–123.

² YARYGIN/ILDERYAKOV 2021, 25.

Karakungey mountains in the Aksu River gorge. About ten different groups were found on the western slopes of Sarytau and in the Tastybuyen River gorge. Several small groups of images were found in the Baskan River gorge and in the Konyrtau Mountains. Different groups include from fifty to two hundred or more petroglyphs. Some of them stretch as a continuous massif along the rocky planes of the southern slopes of the plateau and gorges. The repertoire includes scenes of hunting and rituals, processions of animals, as well as images of goats, argali, camels, bulls, cows, wild boars, predators—dogs, wolves, cats. There are various anthropomorphic figures, including horsemen, archers, warriors with melee weapons. Based on analogies among the images in the petroglyph clusters of Zhetysu and Sayan-Altai, by the presence of palimpsests, by the manner of execution and by the degree of patina, petroglyphs of the Bronze Age, the Early Iron Age and the Middle Ages are distinguished.

MATERIALS

The identification of a series of petroglyphs of the Early Iron Age is largely ensured by the iconographic identity of a number of images with petroglyphs from Zhetysu to Sayan-Altai and examples of the Scythian-Siberian animal style in the applied art of early nomads. They are evenly distributed in groups of petroglyphs in the Karakungey and Kayrakkol mountains, among more widespread drawings of the Bronze Age and petroglyphs that are difficult to attribute to one period or another. They rarely form complex palimpsests and are often isolated from other petroglyphs but can also be included in compositions of different periods on large panels.

All petroglyphs of the Saka period can be divided into those made in the piquetage and engraving techniques. According to the manner of execution, they are ornamented, contour, and silhouette. In total, the published series contains thirty-eight whole and fragmentary images from twenty points in fifteen groups. These are drawings of predators—wolves and cats, herbivores—deer, elk, mountain goats and argali, images of objects—mirrors, as well as anthropomorphic characters. There are realistic and deformed figures, single and large compositions, and palimpsests. The complex records scenes of hunting and torment, confrontation or small rows of animals. In some cases, animals are accompanied by a sign or tamga.

The group of ornamented images includes only seven petroglyphs—a tiger, a deer, an elk, two wild boars, two wolves and a goat. They show some differences in the style and manner of ornamentation, which indicates a chronological interval and cultural differences in historical periods.

The first image in group No. 50 in the Kayrakkol Mountains is part of a composition with a hunting scene. It was located on the edge of a large horizontal slab. The animal is depicted crouched on its paws. The inside of the body is filled with many lines curved towards the front. The head is poorly preserved. The back thigh is highlighted and also ornamented. The legs are thin, bent and extended forward; they have claws. The tail is lowered down and bent; its lower part is shown in the form of a thick line. Above the animal, the figure of an archer with a thin body is carved, conveyed

by simple lines. The bow, presumably of a complex design, is clearly visible; the end of the bow's limb is curved on one side. The arrow is aimed at the back of the animal. Another line, probably an arrow, is shown pierced into the front part of the animal's body. The archer and the animal are depicted in the same manner (Fig. 2/1).

The second drawing is represented by a syncretic figure of an elk in group No. 46 in the Kairakkol Mountains. The animal is carved separately on a narrow horizontal plane. It has an elongated body with a large croup; three thin, straight legs, are slightly directed forward. The muzzle has an open mouth, large lips and a round cheek. The horn is short and vertical; the ear is narrow and horizontal. The tail is small and hook-shaped and has a thickening at the end. On the back, there are two humps in the form of solid triangles. The inner part of the body is decorated with seven multidirectional lines. In addition, around and in front of the body of the animal there are various engraved lines, among which arrows and a bow can be guessed (Fig. 2/2).

The third composition is carved on a collapsed cliff face with a southeastern exposure. It is located in group No. 120 in the Karakungey Mountains. The petroglyphs are of different periods; two wild boars were carved out first, followed by three mountain goats opposing them. The scene has been preserved in fragments. Only the tip of the muzzle with teeth remains from the upper boar; the lower 'goat's hind leg is missing. The lower 'boar's body is decorated with four multidirectional lines; the animal has a large, elongated mouth with large teeth. The back is arched; two thin, straight, short legs, a thick, lowered tail, and two rectangular ears are visible (Fig. 2/3).

Two patterned animals were found in group No. 114 on the northern slope of the Kayrakkol Mountains. The petroglyphs were carved into the lower tier of a vertical rock slab with a northeastern exposure. The scene consists of a complete figure of a wolf, in front of which there is a fragment of another animal (of which only the back of the body with the tail remains) and a small anthropomorphic figurine. The preserved animal is shown slightly crouched on its front paws, which is achieved by the different lengths of the front and back paws. The body is oval, the head is large, with the mouth open and a visible tongue. The ears are narrow and straight, and the eyes are in the form of small dots. The tail is long and arched. The back paw is long, straight and narrow. The front paw is wide and short, in the form of two lines. There is a small cheek loop on the muzzle. The head is separated from the body by a straight line. Inside the body, a figure of a goat is clearly seen, located between two spiral patterns. Judging by the preserved part of the front animal, its ornament differed from the patterns inside the whole figure of the wolf. In place of the back spiral, it has several curved and straight lines. The tail is made differently—it is not only narrower but also oriented with a curve in the opposite direction. The anthropomorphic image has a large head with an appendage extending to the side and lowered downwards at an angle. The arms are spread out to the sides, and the legs are short and wide apart. Above the scene there is a small amorphous knockout (Fig. 3/1).

In group No. 32 in the Kayrakkol Mountains, among the rock paintings of the Bronze Age, on a horizontal plane with



Fig. 2. Ornaments in the Kayrakkol and Karakungey mountains: 1. Scene of an archer hunting a striped animal. Group No. 50; 2. Image of an elk with two humps. Group No. 46; 3. Scene of a confrontation between a boar and goats. Group No. 120.

a southern exposure, a small petroglyph of a goat with an ornamented body, with a flower in front of its muzzle, was discovered. The animal is shown in a raised pose. The body is short, while the neck is wide in comparison. The head is triangular, the muzzle is flattened, and two large, parallel arcuate horns extend from the frontal part. The ear is triangular and short. One front leg is bent. The body is ornamented with two lines and a triangular pattern. The flower has a clearly visible bud with petals, a stem and a leaf (Fig. 3/2).

In one of the largest groups of petroglyphs, No. 51, located in the Kayrakkol Mountains, near the burial ground of the Early Iron Age, the image of a deer was found, which, with a certain conventionality, can also be classified as ornamented. It was knocked out separately from the drawings of the Bronze and Early Iron Ages on a narrow plane oriented to the southeast. The legs of the animal are tucked under the body. The horns are shown by one central line, which is crossed by four bracket-shaped branches. Their shape is similar to the shape of the horns of the schematic deer from group 2 of the same cluster. The animal shows a muzzle, with an eye, large ears, and has a triangular tail. The body is filled

with amorphous elements. The legs, the back of the croup and the front of the body are filled with continuous knock-out (Fig. 3/3)

Petroglyphs of mountain goats and argali (Fig. 4) are related to some ornamented animals and silhouette predators by a number of features. In the study region, these images are the most common; however, among the varying degrees of schematism and realism, animals gravitating towards the known examples of the Scythian-Saka animal style stand out. The majority of such drawings are recorded in groups No. 46, 47, 50, 51, 55, a total of about a hundred images. Ten figures from group No. 50, executed in two different styles, were selected as an example. Rock drawings of goats and argali can be found isolated but are most often shown in groups or strings, on separate slabs or as part of petroglyph compositions of different periods. In some scenes, the animals follow each other, while in others they are opposed to each other with their muzzles.

By the manner of execution, three main types have been identified in the region. The first includes outline drawings of animals, that is, only their outline is rendered. The second



Fig. 3. Ornamented animals: 1. Complete and fragmentary images of wolves. Group No. 114; 2. Image of a goat and a flower. Group No. 32; 3. Figure of a deer. Group No. 51.

type is figures filled with piquetage. An intermediate form are the images that combine both features: they have a back and croup widened by knocking out, there is no lower part of the body, which, in the absence of filling on the chest and neck, appears as outlines. Another iconographic detail is the shape of the horns; in most animals, they are small and loop-shaped, which most likely indicates the image of argali. Some have high horns, bending forward or backward; this is obviously an ibex. Moreover, in those cases when ibex are rendered in a pair, the animal with the horn curved forward is depicted first.

The next group is formed by individual images of predators and scenes that include them (Fig. 5). In total, five petroglyphs are given in this publication. These are mainly wolves, tigers, or creatures of syncretic appearance; there is also an image of two panthers. According to the manner of their depiction, two different approaches can be distinguished: silhouette and linear.

The first image of a predator was discovered in a group of petroglyphs located north of the Soldatsai gorge in the Karakunye Mountains. This is a figure carved out in

isolation from other images. The animal is shown in a static pose. It has a head that is disproportionately large in relation to its body, which shows two ears and a rectangular muzzle lowered downwards. Two straight limbs with distinct paws are depicted. On the front limb, the fur is shown in small triangles and a protrusion. The rump is narrowed. A narrow tail is twisted into a spiral and descends to the level of the paws (Fig. 5/1).

The second image, found in group No. 40 in the Kayrakkol Mountains, is a scene of a predator tearing apart a roe deer, which is part of a large composition with petroglyphs from different periods. The scene is placed in the northeastern corner of a large slab with a southern exposure. The predator has a large head with a big, prominent eye, and a short, triangular ear. Two paws covered with fur are shown. On the back, a small, sharp protrusion depicts a mane, below which, on the curved back, three small triangles indicate raised fur. The long and curved tail has a small, round end and a thickening in the upper part. The animal has grabbed the back of the roe deer with its mouth, the body of which is carved perpendicular to the predator. It has a trapezoid body and a

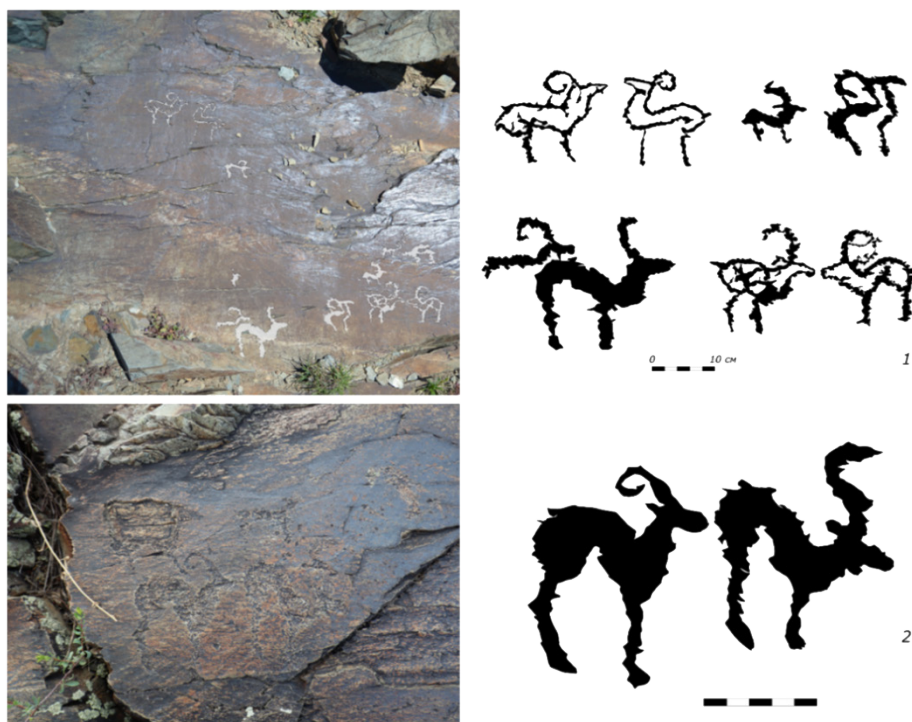


Fig. 4. Images of mountain goats and argali. Group No. 50: 1. In the form of an outline and solid piquetage; 2. Animals with horns of various shapes.

triangular head with one horn forked at the end. Two legs are visible; the front one is bent, the back one is not fully depicted (Fig. 5/2).

The next petroglyph is a lying wolf found in group No. 46 in the Kairakkol Mountains. It forms a single composition with the argali. The predator is depicted using the piquetage technique. The herbivore is placed underneath, rendered using the engraving technique. The predator has a large, elongated head with a flat muzzle and hanging hair under the mouth, and two thin and long ears that are slightly bent forward at the tips. The neck is wide and short. A large mane on the back is gathered into a long tuft in the center of the back. The legs are bent and extended forward, with paws that have long claws. The tail is thin, lowered down, with a curved edge. The chest is enlarged compared to the rump. The author gave it and the body a triangular shape. The figure of the argali is made using fine carving, repeating the pose of the predator, but the head is turned back. The animal has a thin body, but the head is large, with a small horn ring. The mouth is flat. The ear is oval and elongated. The front leg is missing; the back leg is shown by a thin line, with a triangular hoof turned out. There is an amorphous embossment on the animal's face, which is identical in degree of patina to that recorded on the predator, from which we can conclude that the drawing of the herbivore was made earlier (Fig. 5/3).

The fourth drawing with two feline predators is part of a large composition in group No. 125 in the Karakungey Mountains, on a rocky plane with a southern exposure. The animals are depicted using the piquetage technique, shown following each other in a scene of pursuit of ungulates. They have thin linear bodies; the thickness of the body and legs is the same. The necks are long. Their small heads are directed forward. The legs are slightly curved, but the paws are not highlighted. The tips of the long tails are widened. The first

animal has a slightly arched back; one oval ear is shown on the head. The second animal has a straight back, two triangular ears on the head, a highlighted eye, and an open mouth (Fig. 5/4).

Animal images made in the deformation style are considered a separate category. They are the rarest; only three petroglyphs have been recorded: one folded figure and two turned out. The first petroglyph is a hard-to-identify image of a syncretic appearance. It was found in a group of petroglyphs north of the Soldatsai gorge in the Karakungey Mountains, on a wide slab with a southern exposure. Visually, the animal has the features of a horse, a griffin, and possibly a feline predator. The body is contoured, and the outline lines are thin. It is shown with the front part of the body strongly bent downwards. The neck is long and wide. To visually separate the body, the master knocked out a steep thigh, the neck is separated by a diagonal line, and the muzzle is also shown. The animal has one leg, extended forward almost to the mouth. Between the muzzle and the neck, there is a wide rectangular process. Under the body, there is a long element, possibly a phallus. A small dot shows the eye. The tail is narrow, short, and lowered (Fig. 6/1). Judging by the degree of patina, this is the most ancient image on this rock. Later, it was surrounded by petroglyphs of goats and argali of different types.

Two other petroglyphs with varying degrees of schematization demonstrate one type of deformation, in which the back of the body (primarily the legs) is turned upward. This is most clearly demonstrated by the figure of a goat with long, arcuate, parallel horns that bend backwards, resting against the back. The image was found in group No. 47 in the Kayrakkol Mountains, on a small edge of a rock fragment with a southeastern exposure. The body of the animal is bar-shaped, the neck is narrow and long, the head is raised, and the muzzle is oval, looking forward. The upper horn is in the

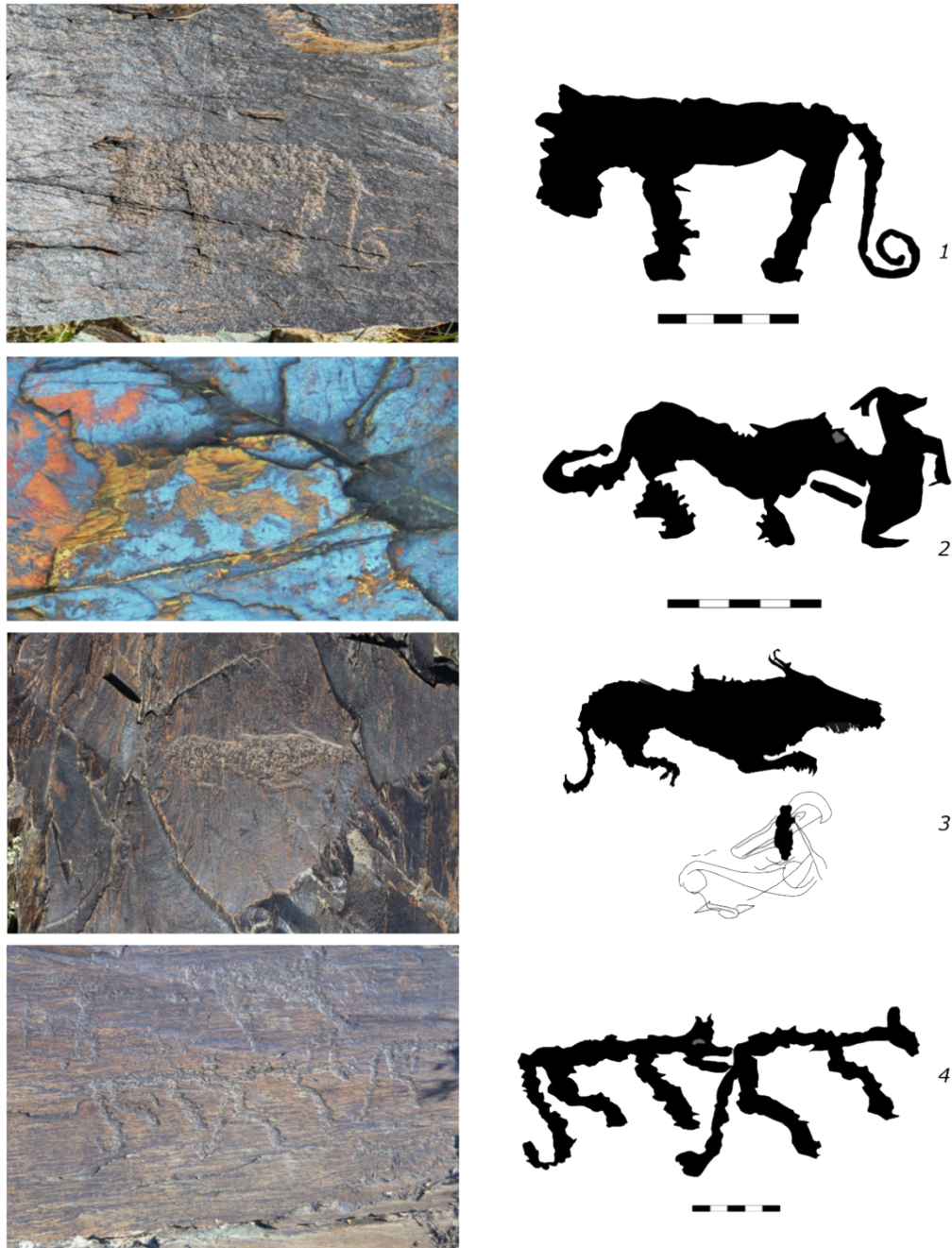


Fig. 5. Images of predators: 1. Large-headed animal in the Soldatsai petroglyph group; 2. Scene of torment. Group No. 40; 3. Lying predator and figure of a goat made in the engraving technique. Group No. 46; 4. Feline predators. Scene fragment. Group No. 125.

form of an arc, and the lower one, added later, has a characteristic break, which resulted from the desire to neatly fit it into the space between the upper horn and the body. In the area where the horns and the body join, it sharply bends upward. The animal has two legs; the front one is thin, extended forward; the back one is an extension of the body, somewhat thicker, and has a split hoof at the end. In addition, there is a tail that runs parallel to the body and joins the back part with the upper horn (Fig. 6/2).

A simpler image of an animal, similar to the previous one, was found on the eastern end of the Suuk plateau, in group No. 89 in the Kayrakkol mountains. It consists of two main elements: a tamga-shaped bespectacled symbol at the top, and a figure of a mountain goat at the bottom. The images are applied to a vertical rock surface with a western exposure;

the carving is superficial. The sign consists of two round elements connected by a thin, short line, from the center of which another vertical line goes up. There is a drawing of an animal under the sign. Apparently, this is the figure of a mountain goat, shown in the deformation style. The body is long, the back is curved, and a pair of hind legs is visible, which are shown pointing upwards. The muzzle looks down, the horns are long and parallel, and the ear is short and oval. The image of the animal and the tamga were made at the same time, as it is clearly visible by the degree of patina and shallow carving (Fig. 6/3).

The series of petroglyphs from the Early Iron Age also includes a small series of images of mirrors, of two main types: round mirrors without a handle and mirrors with a handle. The first (two) mirrors are carved in the form of

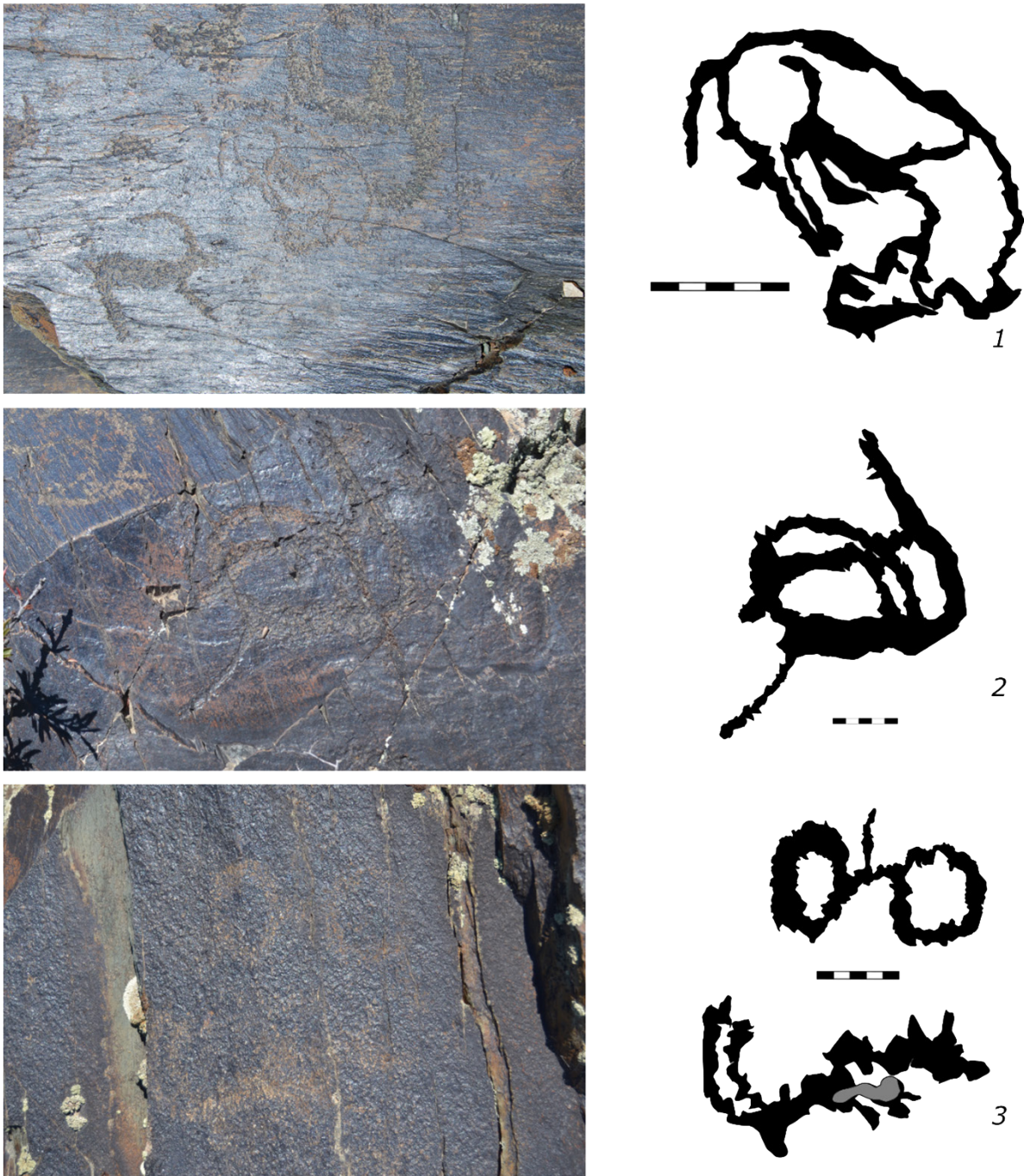


Fig. 6. Images in the deformation style: 1. Syncretic animal in the Soldatsai petroglyph group; 2. Mountain goat. Group No. 47; 3. Mountain goat under a bespectacled sign. Group No. 89.

simple rounded outlines, inside which figures of mountain goats are placed. On the first mirror, from group No. 39 in the Kayrakkol Mountains, the animal is shown crouched on its front legs. It has a triangular rump, turning into a narrow chest, a short tail, and a triangular head with a long ear. The horn is extremely long, repeating the outlines of the circle in which the figure of the goat itself is placed, forking at the end (Fig. 7/1). On the second mirror, from group No. 103 in the Karasai Gorge, the animal is shown running. It has a short body in the form of a thin line, thick legs tapering towards the end, brought together, and a protruding tail. The neck is long; the triangular muzzle is directed forward. The horn is short. A long, curved line stretches from the 'goat's back to the edge of the outline (Fig. 7/2).

The next two mirrors are more easily visually recognizable, as they have handles. In the first variant, in group No. 103, the object has a large mirror and a short handle with a round top, from which a small appendage (cord) extends. There are four images inside the large element. Three figures are placed in a vertical row, one above the other. In the center, there is a goat with a rectangular body. It has two thick legs (a hoof is visible on the front one), a tail sticking up, a rectangular head with a small beard, and a long, arched, thick horn. Below it, there is probably the figure of a horse, made in the same manner. It has a long neck with a triangular head, on which there are two ears. The tail is set to the side. Two legs are without hooves; the front one is also thicker. Above the goat, there is the figure of a deer

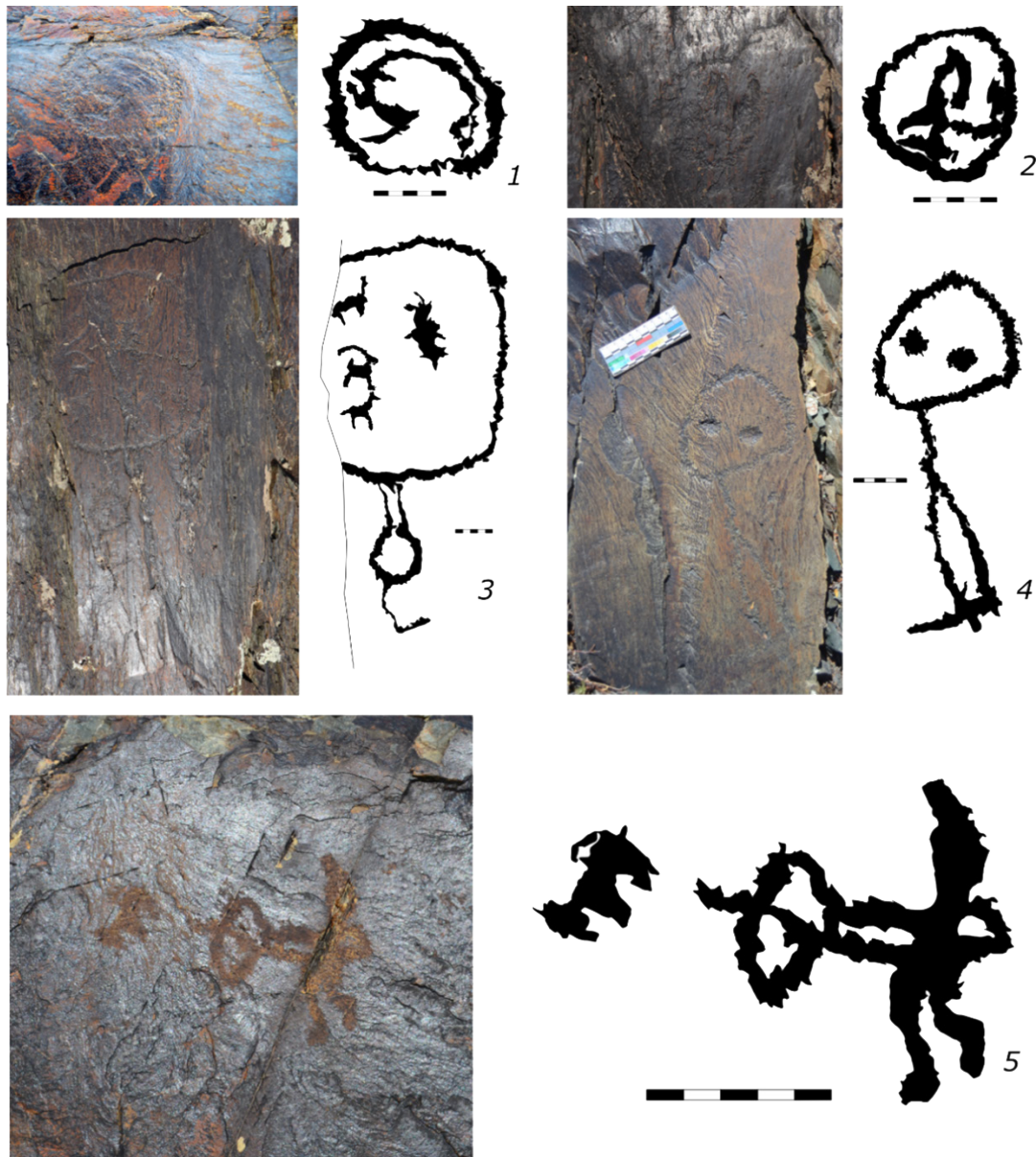


Fig. 7. Images of mirrors in the Kayrakkol Mountains and an archer in the Karakungey Mountains: 1. Mirror with a crouching goat. Group No. 39; 2. Mirror with a jumping goat. Group No. 103; 3. Mirror with a side handle and figures of four animals inside. Group No. 103; 4. Mirror with a long handle and a sign inside. Group No. 55; 6. Hunting scene of an archer in a high headdress. Group No. 137.

(or roe deer) with a massive oval body, a long neck, a short head, and two large legs. The croup and thigh are clearly visible. The fourth image is difficult to identify; it is depicted in front of the three herbivores. In its execution style, it resembles the petroglyph of a goat under a bespectacled sign on Fig. 6.3 (Fig. 7/3). The mirror from group No. 55 has a different type of handle; the handle has a long, oval shape, where an appendage (cord) stretches from the side of it. In the center of the round element, there is a sign in the form of two large dots (Fig. 7/4).

The figure of the archer deserves special attention. Archers are the most common image in the region, comparable to the petroglyphs of mountain goats and argali, which they often hunt. In group No. 137 in the Karakungey Mountains, on a plane with an eastern exposure, images of an archer in recognizable iconography were found. The archer has a large, round head, with a high cap and a short body. Legs appear with feet; the back leg is bent. The arms are long; in the

hands, there is a short oval bow with a thick arrow, which has a weakly expressed tip (Fig. 7/5).

The series of images from the Early Iron Age can be continued. This publication includes the most characteristic and recognizable petroglyphs. All of them have reliable analogies in the rock and applied art of the early nomads from the Saka to the Hunno-Sarmatian period (8th century BC–4th century AD).

DISCUSSION

Due to the paucity of archaeological finds from excavations conducted in the region, rock art is, in many cases, the only source demonstrating the cultural characteristics of the cattle breeders who lived in the vicinity of the Kayrakkol and Karakungey mountains. In addition, it shows their connections with the tribes of early nomads not only of Zhetysu, but of a wider area of the Eurasian steppe.



Fig. 8. Analogies of ornamented images: 1. Deer stone from the Toraigyr complex. Bayanaul, northeastern Kazakhstan; 2. Fragment of the image of a predator on a deer stone near Lake Toraigyr; 3. Deer stone No. 3 from Khushuut. Ulziit sumyn, Arkhangai aimag, Mongolia (after VOLKOV 2002, Tab. 19); 4. Deer stone from Kherekhuriin denj. Zhargalant sumyn, Bayankhongor aimag, Mongolia (after VOLKOV 2002, Tab. 40); 5. Bronze axe from Ordos (after SAVINOV 1998, Fig. 2.4); 6. Aksu-Zhabagyly (after BEISENOV/MARYASHEV 2014, Fig. 27); 7. Shiveet-Khairkhan. Mongolian Altai (after KUBAREV 2009, App. 862); 8. Khar-Chullu. Mongolian Altai (after KUBAREV 2009, App. 1091); 9. Sauyskandyk. Karatau, Kazakhstan (after SAMASHEV 2014, Fig. 535); 10. Khar-Salaa I. Mongolian Altai (after KUBAREV 2009, App. 14); 11. Khar-Salaa IV. Mongolian Altai (after KUBAREV 2009, App. 390); 12. Poltakov IV and Esino XIII (after SAVINOV 1994, Tab. 12–13); 13, 14. Eshkiolmes. Zhetysu, Kazakhstan (after BEISENOV/MARYASHEV 2014, Fig. 21, 22); 15. Tekturmas. Zhetysu, Kazakhstan (after BEISENOV/MARYASHEV 2014, Fig. 14); 16. Eshkiolmes (after BEISENOV/MARYASHEV 2014, Fig. 33); 17. Sukhanikha. Khakassia, Russia (after TALYAGINA 2015, Fig. 2.7)

Identical images of striped animals in hunting scenes are geographically quite extensive, from the interfluvium of the Amu Darya and Syr Darya to Ordos. The closest analogies were recorded in Northeastern Kazakhstan, to the east of Lake Toraigyr, in Bayanaul, on a deer stone (Fig. 8/1–2). The monument is a complex of steles, deer stones, and burial structures that dates back to the 9th–8th centuries BC—the transition period from the Late Bronze Age to the Early Iron Age.³ Animals with similar ornamentation are known on deer stones from Mongolia, on deer stone No. 3 from Khushuut in Ulziit sumyn, Arkhangai aimag, and on the stele from

Kherekhuriin denj in Jargalant sumyn, Bayankhongor aimag (Fig. 8/3–4).⁴ A similar type of animal is depicted on a bronze axe from Ordos, China (Fig. 8/5).⁵

Some iconographic techniques used in the embodiment of the image of the elk from group No. 46 can be compared with petroglyphs of goats and argali from Aksu-Zhabagyly in Zhetysu (Fig. 8/6).⁶ However, closer analogies are the drawings of an elk in Shiveet-Khairkhan and of a deer in a hunting scene from Khar-Chullu in the Mongolian Altai Mountains

⁴ VOLKOV 2002, 134, 155, Table 19, 40.

⁵ SAVINOV 1998, 157–158, Fig. 2.4.

⁶ BEISENOV/MARYASHEV 2014, 107, Fig. 27.

³ PERESVETOV 2010, 143–150.

(Fig. 8/7–8).⁷ It is similar to the first in the outline of the body, including the contours of the croup, head with the muzzle, and three legs, and to the second in a special striped ornament with straight and diagonal lines intersecting the body. These petroglyphs are generally dated to the Early Iron Age.

An equally common motif in the Scythian-Saka animal style is the image of a wild boar. Analogies of the Karakuney petroglyph can be found in a wide area from the Karatau Mountains to the Mongolian Altai. Outlined wild boars, in some cases ornamented with straight lines, were recorded in Sauyskandyk (Karatau, Kazakhstan) (Fig. 8/9).⁸ At the same time, following the elk, wild boars from the Mongolian Altai in the Khar-Salaa I and IV clusters demonstrate more similar types of ornamentation and a toothed mouth (Fig. 8/10–11).⁹

The image of a wolf from Kairakkol can be compared in the richness of the ornamentation with the wolf and other animals depicted on the slabs of fences of the Tagar culture burial mounds in the south of the Minusinsk Basin—Poltakov IV and Esino XIII. The images of wolves show almost identical legs, mouths, and tails. On the body of the wolf and bull from the Minusinsk Basin, there are spiral curls identical to the Tausamaly petroglyph (Fig. 8/12).¹⁰ The Kayrakkol goat is comparable in the manner of depicting the body, head, and legs to the Early Iron Age drawings of animals from the Eshkiolmes petroglyph cluster (Zhetysu, Kazakhstan) located in the same region (Fig. 8/13–14).¹¹ The figure of a deer with tucked legs from group No. 51 is close in iconography to the depiction of goats from Tekturmas and the deer from Eshkiolmes (Fig. 8/ 15–16).¹² The amorphousness of the ornamentation can be compared with the petroglyphs of the Tesinskaya culture of the Minusinsk Basin in Sukhanikh (Fig. 8/17).¹³ The next group consists of silhouette images of creatures whose bodies are filled with solid piquetage. Analogies of these petroglyphs can be found both in rock paintings and in examples of applied art of early nomads.

A series of drawings consisting of images of three predators of similar sizes and shapes was discovered in the Karakuney and Kayrakkol mountains: an animal from the feline family and two wolves, or of the wolf (canine) family with feline features. The first animal, with a large head, recorded in the Soldatsai group, has analogies among the figures of animals hunting herbivores and confronting people from Eshkiolmes (Fig. 9/ 1, 2).¹⁴ Engravings were also discovered there, including some that can be compared with the drawing of a goat from group No. 46 in the Kayrakkol mountains (Fig. 9/3).¹⁵ A rare type is the scene of torment from group No. 40, in which the predator, as well as the animal crouched to the ground from group No. 46, are similar to the “predators” and wolves recognizable by species from the

group of “post-Saka” petroglyphs of the Shu-Ili Mountains (Fig. 9/4, 5).¹⁶

The images of two feline predators from the Karakuney Mountains are close, but not identical to the petroglyphs, probably depicting leopards, from the Eshkiolmes Mountains and Gabayevka in Zhetysu (Fig. 9/6, 7).¹⁷

Other analogies appear on objects. Among them, the particularly recognizable scene of torment in group No. 40 is identical to the scene of a large-headed animal, mostly with a long and narrow tail, seizing a herbivore, duplicated on many bronze belt plates from Sayan-Altai and Ordos (Fig. 9/8–10).¹⁸ The figure of a lying wolf is known from the Northern Black Sea region to Northern China. Two relevant parallels can be pointed out in the culture of the Pazyryk tribes of the Altai Mountains, for example, a felt cape for covering a saddle from burial mound 1 of the Ak-Alakha I burial ground (Fig. 9/11).¹⁹ In the Aral Sea region, similar figures are found on the gold covering of the sword scabbard from burial mound No. 53 of the Tagisken burial ground (Fig. 9/12).²⁰

Similar panther images are well represented in the Scythian culture of the Northern Black Sea region, in particular, the shield plaque from burial mound No. 1 of the Kelermes burial ground (Fig. 9/13).²¹ However, the panthers on the handles of the Borysthenite type mirrors, dating from the 5th–4th centuries BC, are practically identical (Fig. 9/ 14, 15).²²

Such images, which existed in parallel in rock and applied art, can be found for the most common depictions of mountain goats, argali, and for the style of “expressive deformation”. In the rock paintings in the Eshkiolmes Mountains in Zhetysu and among the numerous petroglyphs of Eastern Kazakhstan, these are contour and piquetage images of goats and argali (Fig. 10/1, 2).²³ Almost identical are the images from group No. 50 in the Kairakkol Mountains, on the Tyulkune Hill in Eastern Kazakhstan, and the figurine of an argali on the butt of a pickaxe from a random find near the village of Burabai in Northern Kazakhstan (Fig. 10/3).²⁴

The petroglyph of a curled-up animal in the Karakuney Mountains is similar in type to the images that were widespread from Eastern Europe to Mongolia at different stages of the development of the culture of early nomads. In the eastern area of the Scythian-Saka culture, these are panthers on a deer stone from Khushuutiyn nuur in the Bayankhongor aimag, Mongolia, or on a gold clasp from the Siberian collection of Peter I, Saint-Petersburg, Russia.²⁵

The images of curled-up animals in groups No. 47 and 89 in the Kayrakkol Mountains characterize the art of the late Saka period, for example, the highly artistic image from the cluster of petroglyphs in Khar-Chuluu, Mongolian Altai

⁷ KUBAREV 2009, 157, 334, Appendix 862, 1091.

⁸ SAMASHEV 2014, 271, Fig. 535.

⁹ KUBAREV 2009, 53, 275, Appendix 14, 390.

¹⁰ SAVINOV 1994, Table 12, 13.

¹¹ BEISENOV/MARYASHEV 2014, 104–105, Fig. 21, 22.

¹² BEISENOV/MARYASHEV 2014, 101, 111, Fig. 14, 33.

¹³ TALYAGINA 2015, 46, Fig. 2.7.

¹⁴ BEISENOV/MARYASHEV 2014, 99, 118, Fig. 11, 46.

¹⁵ BAIPAKOV/MARYASHEV/POTAPOV/GORYACHEV 2005, 165, Fig. 154.

¹⁶ ROGOZHINSKIY 2016, 536, 541, Fig. 296.12, 298.8.

¹⁷ BEISENOV/MARYASHEV 2014, 122, 124, Fig. 53, 55.

¹⁸ BOGDANOV 2006, 158, 159, 161, Table XLV.2, XLVI.7, XLVIII.4.

¹⁹ POLOSMAK 1994, 48–49, Fig. 48.

²⁰ ARTAMONOV 1973, Fig. 18.

²¹ ARTAMONOV 1966, Table 22.

²² BAZHAN/ZUEV 2014, 23–24, Fig. 6.3, 7a.

²³ BAIPAKOV/MARYASHEV/POTAPOV/GORYACHEV 2005, 178, Fig. 198; SAMASHEV 1992, 84, Fig. 99.

²⁴ ARTAMONOV 1973, 29–30, Fig. 29.

²⁵ VOLKOV 2002, 149, Table 34. 2; ARTAMONOV 1973, 127, Fig. 174.



Fig. 9. Analogies of the depicted carnivores: 1, 2. Predators. Eshkiolmes (after BEISENOV/MARYASHEV 2014, Fig. 11, 46); 3. Animals in the engraving technique. Eshkiolmes. Zhetysu, Kazakhstan (after BAIPAKOV/MARYASHEV/POTAPOV/GORYACHEV 2005, fig 154); 4. Predator. Shu-Ili Mountains. Western Zhetysu, Kazakhstan (after ROGOZHINSKIY 2016, Fig. 296.12); 5. Image of a pack of wolves. Shu-Ili Mountains. Western Zhetysu, Kazakhstan (after ROGOZHINSKIY 2016, Fig. 298.8); 6. Predator. Fragment of a scene. Eshkiolmes. Zhetysu, Kazakhstan (after BEISENOV/MARYASHEV 2014, Fig. 53); 7. Leopard (?). Gabayevka. Zhetysu, Kazakhstan (after BEISENOV/MARYASHEV 2014, Fig. 55); 8. Bronze plate with a scene of torment. Accidental find near the village of Kemchul. Khakassia, Russia (after BOGDANOV 2006, Tab. XLV.2); 9. Bronze plate with a scene of torment. Accidental find. Ordos, China (after BOGDANOV 2006, Tab. XLVI.7); 10. Bronze plate with a scene of torment. Accidental find. Ordos, China (after BOGDANOV 2006, Tab. XLVIII.4); 11. Felt figure of a wolf – pendant on the saddle covering from burial mound 1 of the Ak-Alakha I burial ground (after POLOSMAN 1994, Fig. 48); 12. Gold lining of a sword scabbard with the image of wolves. Tagisken, burial mound No. 53. Aral region, Kazakhstan (after ARTAMONOV 1973, Fig. 18); 13. Shield plaque in the form of a panther. Mound 1 of the Kelermes burial ground (after ARTAMONOV 1966, Tab. 22); 14. The top of the handle of a bronze mirror of the Borysthenite type from the vicinity of Mariupol (after BAZHAN/ZUEV 2014, Fig. 6.3); 15. A bronze mirror with a figurine of a panther from the vicinity of Kerch (photo by N.F. Fedoseyev) (after BAZHAN/ZUEV 2014, Fig. 7a).

(Fig. 10/6).²⁶ They are also similar in type to the animals on the plaque-cover of the scabbard of a dagger from the Issyk burial mound in Zhetysu or on the belt buckle with the image of a horse from Northwestern China (Fig. 10/7–8).²⁷

²⁶ KUBAREV 2009, 327, Appendix 1060.

²⁷ AKISHEV 1978, Fig. 41; BUNKER 2002, 124, Fig. 96.

Drawings of mirrors with animals, discovered in the Kayrakkol Mountains, reflect their real embodiment in the culture of early nomads. They have been found in Central Asia since the Arzhan-Mayemir period. Mirrors with handles and figures of goats, argali, and deer are an integral part of the culture of the nomads of the Sayan-Altai, Mongolia, and



Fig. 10. Analogies of the images of mountain goats, argali, and animals in the deformation style: 1. Mountain goats. Eshkiolmes. Zhetysu, Kazakhstan (after BAIPAKOV/MARYASHEV/POTAPOV/GORYACHEV 2005, Fig. 198); 2. Petroglyphs of the Tyulkun hill. Eastern Kazakhstan (after SAMASHEV 1992, Fig. 99); 3. Bronze ram on the butt of a pickaxe. Burabai, Northern Kazakhstan (after ARTAMONOV 1973, Fig. 29); 4. Images on a deer stone from Khushuutiyn nuur. Bayankhongor aimag, Bayanbulag sumyn, Mongolia (after VOLKOV 2002, Tab. 34); 5. Gold clasp in the form of a curled-up panther. Siberian collection (after ARTAMONOV 1973, Fig. 174); 6. Petroglyph of a goat in the Khar-Chuluu cluster. Mongolian Altai (after KUBAREV 2009, App. 1060); 7. Plaque on a dagger scabbard. Zhetysu, Kazakhstan (after AKISHEV 1978, Fig. 41); 8. Belt buckle with the image of a horse. Northwestern China (after BUNKER 2002, Fig. 96).

Northern China in the 6th–4th centuries BC, as evidenced by the burial grounds of Ak-Alakha, Ulangom, Aimirlyg, Mazhalyk-Khovuzu (Fig. 11/1–8).²⁸ The shape of the mirror from group No. 103 in the Karasai gorge resembles similar objects discovered during the study of Scythian burials of the second half of the 1st millennium BC in the Chertomlyk–3

or Pervomaevka-V burial ground (Fig. 10/9, 10).²⁹ The mirror with a paired sign, and a long handle with an elliptical grip from group No. 55 can be compared with the image of the mirror from Kulzhabasy in Western Zhetysu, which the authors of the find compare with Sarmatian mirrors from the turn of the eras.³⁰ The archer's figure from Karakungey is

²⁸ TISHKIN/SEREGIN 2011, 94, Fig. 5; KUBAREV 2002, 66, Fig. 4. 2–8.

²⁹ BAZHAN/ZUEV 2014, 241, Fig. 2.

³⁰ YATSENKO/ROGOZHINSKIY 2021, Fig. 4.

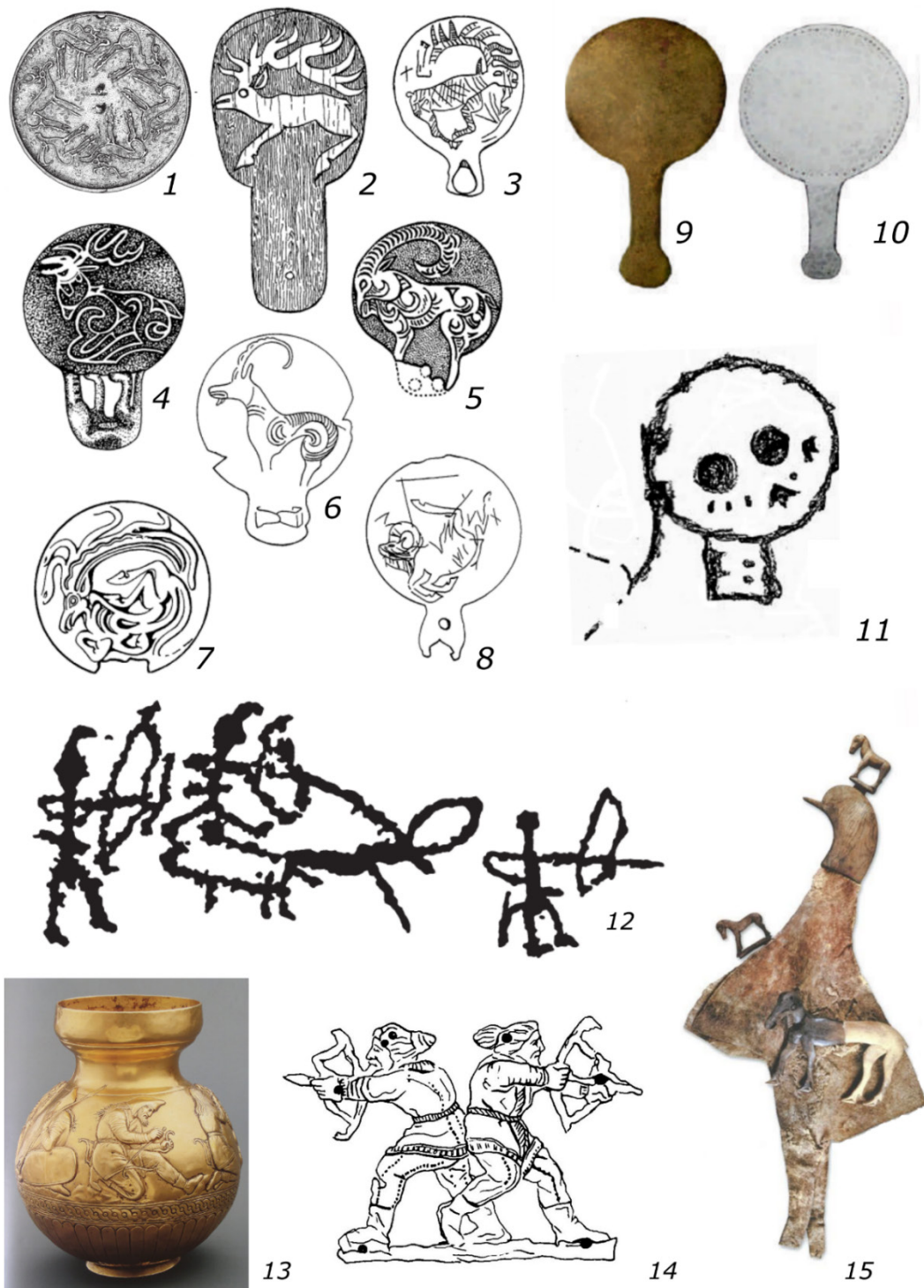


Fig. 11. Mirrors of the Early Iron Age: 1. Mirror of the Arzhan-Mayemir period with contour images. Drawing by A.L. Kungurov (after TISHKIN/SEREGIN 2011, Fig. 5); 2. Ak-Alakha. Altai, Russia; 3 and 8. Ulangom. Mongolia; 4. Ordos. Northern China; 5 and 6. Aimyrlyg. Tuva, Russia; 7. Mazhalyk-Khovuzu. Tuva, Russia (after KUBAREV 2002, Fig. 4.2–8); 9. Mirror with a handle. Burial ground Chertomlyk–3, mound 30, burial 1; 10. Mirror with a handle. Pervomaevka-V burial ground, mound 4, burial 3. Northern Black Sea region, Ukraine (after BAZHAN/ZUEV 2014, Fig. 2); 11. Image of a mirror from Kulzhabasy. Western Zhetysu, Kazakhstan (after YATSENKO/ROGOZHINSKIY 2021, Fig. 4); 12. Hunting scene. Baga-Oyгур I. Mongolian Altai (after KUBAREV/CEVEENDORZH/YAKOBSON 2005, App. 849); 13. Electrum cup from the Kul-Oba burial mound with the image of a Scythian drawing a bow (after OTKRYTAYA ARHEOLOGIYA 2025); 14. Gold figurative plaque with the image of archers from the Kul-Oba burial mound (after RAEVSKIY 1981); 15. Felt helmet from a male burial in mound 1 of the Ak-Alakha–1 burial ground. Altai, Russia (after POLOSMAN/BARKOVA 2005, Fig. 2.60).

similar in style to the archers in the hunting scene from Baga-Oyгур I in the Mongolian Altai.³¹ According to the researchers, an important attribution of the anthropomorphic images

of the Tagar period in the Minusinsk Basin is the presence of a high, side-curving headdress like a high cap or a pointed hood, which were widely used in the Scythian-Saka period.³²

³¹ KUBAREV/CEVEENDORZH/YAKOBSON 2005, 348, Appendix 849.

³² DEVLET 2012, 26, Fig. 8.

The Scythian archers depicted on the electrum cup from the Kul-Oba burial mound demonstrate significant similarities. An identical pose is shown in the archers standing with their backs to each other on a gold-figured plaque.³³ As a separate analogy to the headdress, it is possible to compare with well-preserved finds from the Pazyryk burials of Altai, for example, a felt helmet from burial mound No. 1 of the Ak-Alakha-1 burial ground.³⁴

CONCLUSION

The study of petroglyphs, along with their survey and recording, is an important aspect of subsequent analysis—dating of the images. A reliable method, in addition to the identification of analogies in the rock art of other regions, is to determine their stylistic features and compare them with chronologically defined artifacts. In the case of the monuments of the Early Iron Age of the steppe region of Eurasia, this can be done thanks to a large series of finds from the burial monuments of the Scythian-Saka cultures. The analysis of the selected series of rock paintings of Tausamaly made it possible to differentiate the chronology and preliminarily identify three main chronological stages. The first stage combines the drawings of the transitional and early Saka periods (9th–6th centuries BC). This are the images of a striped predator and a curled-up animal (Fig. 2/1, 6/1). It is possible that the petroglyph of a large-headed predator (Fig. 4/1) dates back to the same period. Unfortunately, the tiger from group No. 50 does not have a preserved muzzle; the same is true for the animal from Lake Toraigr. However, in the latter case, the animal is depicted on a deer stone as part of a burial and memorial complex, which dates to the pre-Tasmola period—the 9th–8th centuries BC. Obviously, the scene of an archer hunting a tiger in the Kayrakkol Mountains can also be placed within this time frame. The image of a curled-up animal is quite recognizable and is found both on deer stones and on objects from the very beginning of the 1st millennium BC—from the famous Arzhan panther to its later analogy from the Peter I collection of the State Hermitage Museum in Russia.

The second stage is represented by the Saka period (5th–3rd centuries BC), to which the majority of the images from the series published here belong. They are images of animals in the classic forms of the animal style: ungulates with their legs tucked in, mountain goats and argali in a pose of sudden stop, wolves crouched on the ground, feline predators, scenes of predators tearing ungulates apart.

The third stage is in the Hunno-Sarmatian period (2nd century BC–4th century AD). It includes images of an ornamented mountain goat with a bent leg (Fig. 3/2) and two goats (Fig. 6/2–3) in the style of “expressive deformation”.³⁵ Images of animals in a similar pose were widespread in the 5th–3rd centuries BC, reaching as far as Ordos, China.³⁶ The images of animals from Kairakkol are inexpressive and carelessly executed, which most likely indicates that they

belong to the Hunno-Sarmatian period.³⁷ Moreover, one of the figures is accompanied by a sign, analogy of which can be found among the tamgas in Mongolia.³⁸ This also allows us to extend the chronology to the turn of the eras. The list of Hunno-Sarmatian images includes the petroglyph of a mirror with an elliptical handle and a sign in the center (Fig. 7/4). An object of a similar type was found among the Kulzhabasy petroglyphs as part of a composition with post-Saka images of the 2nd–1st centuries BC. The authors of the publication compare the tamga consisting of two dots with the known Sarmatian signs on the slab from Kerch and the tamgas on the mirror pendants from the necropolis of Belbek IV in Scythia Minor (from 100 to 250 AD).³⁹

Stylistically, the petroglyphs of the Early Iron Age of Tausamaly are diverse, which allows us to distinguish separate groups of drawings. The most expressive are the realistic images of goats and argali, made in silhouette and contour style, as well as the figures of predators. The category of ornamented animals with bodies filled with lines, spirals and curls is quite representative. A small group of Hunno-Sarmatian images in the animal style demonstrates the fading of this tradition. A separate section includes images of mirrors that correspond to real objects. The specificity of rock paintings as immovable monuments in the presence of parallels in remote areas may indicate a common origin, migrations, and transfer of ideas. In the case of the petroglyphs of Tausamaly, there are connections with the paintings of Eshkiolmes, ensured by the kinship of the Saka groups of Eastern Zhetysu. The revealed closeness of some images with the art of Eastern Kazakhstan and Mongolian Altai additionally confirms archaeological data about the emergence of Kulazhorga population groups in the region in the late Saka period. Wider analogies show that the culture of the Zhetysu nomads was part of an unprecedentedly large community, which in the Early Iron Age covered the entire steppe region of Eurasia. Further work on documenting and attributing the Tausamaly drawings will allow us to increase the series of petroglyphs of the Early Iron Age, which, in turn, will expand our understanding of the visual traditions of this era in Eastern Zhetysu.

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- ³³ OTKRYTAYA ARHEOLOGIYA 2025; RAEVSKIY 1981, 44–45.
³⁴ POLOSMAK/BARKOVA 2005, 90, Fig. 2.60.
³⁵ KORENYAKO 2002, 150–151.
³⁶ KOVALEV 2024.
³⁷ MARYASHEV/ZHELEZNYAKOV 2013, 27–29.
³⁸ GANTULGA/ERÖÖL-ERDENE/MAGAY 2015, 269.
³⁹ YATSENKO/ROGOZHINSKIY 2021, 733–767; Fig. 4.

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