

## SCIENTIFIC AUDIT OF THE RESULTS OF THE PARTNERS IN KHAZAKHISTAN

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### Scientific audit and illustrations (G. Campitelli, S. Raspagliesi)

For the end of the PICASP project, a meeting was planned for Kazakhstan (November 18–23, 2024) which included all the partners. The meeting was held across the cities of Aktau and Almaty.

The opening session took place in Aktau, where the Yessenov University presented the new courses launched and the enhancements made to existing ones as a result of the PICASP project. Notably, three new tourism-related programs were introduced: Basics of Kazakh Hospitality, Business Planning in Hospitality, and RHB: Restaurant and Hotel Marketing. Students also presented three innovative projects: "Finding Joy in Every Bite," "Nomad Ethno-tourism," and "Ethno-glamping Shanyraq." The visit continued with a visit of the university campus before and after to the Mangystau State Historical and Cultural Reserve Museum<sup>1</sup>, followed by a journey across the Mangystau region to reach Kulzabasy and Boszhyra in the Kyzylkup and Bokty Massif areas.

The second part of the meeting took place in Almaty. Upon arrival, the participants explored the city on a visit led by a student from UIB University, which included a visit to the State Museum of the Republic of Kazakhstan<sup>2</sup>. The following day was dedicated to meetings between the partners and UIB University, as well as a visit to the Symbulak ski resort and the Medeu skating ring. During the morning session, students and academics presentations, including: "Pilot Courses in Practice Enterprise to Implement University-Enterprise Cooperation for the Development of the Caspian Area PICASP," "Ecological Catastrophe as a Tool for Attracting Tourists," "Introduction of the Case Study into the Educational Program," "Central Asia Rock Art Sites as Communication Centers," and "Practice-Oriented Teaching in Cultural Studies."<sup>3</sup> The final day concluded with a visit to the UNESCO-listed archaeological site of Tamgaly.

The courses developed at both institutions were shown to be in continuous expansion, supported by the increasing number of enrolled students and growing interest in the programs. This has led to the launch of additional courses in response to rising demand. The collaboration and methodological approach shared by the partners from different countries and fields, have been instrumental in enabling Kazakh universities to emerge as leaders in education and career-oriented fields. The institutions have successfully developed tailored courses and integrated initiatives thanks to this cooperative effort.

The development of these programs within the PICASP framework has involved an increasing number of faculty members and professionals from various disciplines, underscoring the importance of interdisciplinary approaches in such studies. This initiative aims to prepare future professionals capable of designing and implementing projects that promote and enhance the wealth of well-known and lesser-known sites across Kazakhstan.

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<sup>1</sup> <https://mangystaukorygy.kz/en/>

<sup>2</sup> <https://csmrk.kz/en/home/>

<sup>3</sup> All student and course presentations of both Universities can be consulted in this volume.

The presentations emphasized the significance of adopting a socio-economic and cultural perspective. Students demonstrated strong skills in developing and presenting (both thematically and linguistically) ecotourism projects that extended beyond mere economic planning. Effective communication strategies were also employed, particularly through the use of social media, which is essential these days for promotion.

The projects clearly showed a commitment to moving beyond the concept of simple “summer camps” by promoting historical and cultural elements through activities rooted in Kazakh culture and history, such as ethno-gastronomy, archery, and equestrianism. Examples include the student-led projects "Finding Joy in Every Bite" and "Nomads," initiated at Yessenov University. Additionally, a strong focus on environmental sustainability emerged as a key feature, reflecting the historical importance of environmental respect in Kazakhstan. Students proposed innovative solutions, including partnerships with companies, to create eco-friendly structures. Sustainability was a central theme across the various projects presented by students from both Yessenov University and UIB University.

The visits organized by both universities highlighted the landscapes and cultural aspects introduced in the students’ presentations. In some instances, the students themselves acted as guides, offering in-depth insights into natural, anthropological, and societal relationships with these environments. The visit to the State Museum of the Republic of Kazakhstan in Almaty proved particularly valuable, with each floor dedicated to different aspects of Kazakh culture, including history, archaeology, and traditional customs.

Geotourism was another notable focus, with significant growth observed in recent years, as demonstrated by sites such as Kyzylkup and Boszhyra in the Mangystau region. On-site visits provided concrete examples of how preservation and promotion efforts are being developed in alignment with appropriate guidelines. A prime example is the UNESCO-listed archaeological park of Tamgaly, a veritable open-air museum that allows visitors to engage with the site’s historical, archaeological, and sacred significance through a multisensory experience. Visiting the site during spring or summer enhances the appreciation of its natural beauty. Moreover, the nearby museum offers a comprehensive presentation of the site’s archaeological features, including a DEM-style layout, artifacts, and additional petroglyphs, as well as a detailed chronological overview. The museum also features informative panels on the region's flora and fauna, facilitating a deeper understanding of the site’s environmental evolution and the interplay between humans and their environment over time, including responses to climate changes that have shaped the area.

## **1. Kazakhstan and the Mangystau region (S. Raspagliesi<sup>4</sup>)**

Kazakhstan is a country that boasts breathtaking landscapes and a rich natural diversity. From arid deserts to towering mountains, from endless steppes to the shores of lakes and rivers, its scenic assets represent a heritage of extraordinary value. These places are not only a testimony to the untouched beauty of nature but also to the unique ecosystems that host diverse flora and fauna, many of which

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are rare or endangered. Such landscapes bear witness to a deep connection between the country's culture and its natural environment, which is a central element of its identity.

Among the less populated regions that nevertheless play a key role for the country, there is Mangystau.

The first well-documented reference to the region dates back to the 9th century, when the Arab geographer Al-Istakhri introduced it under the name Siyah-Kuh, meaning "Black Mountain." The region was an important hub along one of the branches of the Silk Road, as evidenced by the ruins of various fortifications and mosques, including underground ones, that characterize the area.

One of the most important mosques is Shakpak-Ata (Figg. 1-2). The underground Shakpak-Ata Mosque is a significant religious landmark in Mangystau. Despite being called "underground," it is actually carved into limestone on a slight elevation, visible from the canyon below. The mosque's architecture is a testimony to the skill of local craftsmen active since the 13th century. The history of the mosque spans approximately 600 years. It is believed that its construction could have occurred between the 14th and 13th centuries, with continuous use extending into the late Middle Ages, as evidenced by graffiti left by pilgrims from across Asia. The mosque served as a key site for sacred rituals, dances, and healing practices.

The exterior of the mosque features areas where the limestone is highly porous, in contrast to the interior, which is more compact and uniform. The inner walls are adorned with niches, inscriptions, and drawings that reflect Islamic culture.



Fig.1- Shakpak-Ata Mosque: external facade



Fig. 2-Shakpak-Ata Mosque: internal view

However, following the invasion of Genghis Khan, this trade route was gradually abandoned, leading to the region's decline and its disappearance from historical records.

Only in the 18th century, in the context of Russian imperial expansions in Central Asia, Mangystau re-emerged as a strategically important point, becoming a stronghold for military expeditions directed southward. The 20th century marked a turning point for the region with the discovery of vast deposits of uranium, oil and gas, resources that radically transformed the economy and the geopolitical significance of the area.

Aktau, located on the coast of the Caspian Sea in the Mangystau region, is today recognized as the "oil capital" of the country and serves as the urban and administrative center of the region. It has a relatively recent history but is of great interest due to its strategic position and economic development. The city was founded in the early 1960s as an important port and industrial center, intended to support

the extraction activities of natural resources in the surrounding region, particularly coal and oil (Fig. 3).

The post-Soviet period marked a phase of modest urban expansion and a diversification of its economic activities, though they remained primarily tied to the extractive industry. To this day, the city continues to play a crucial role in Kazakhstan's economy, particularly in the energy sector, thanks to its proximity to the oil and gas fields of the Caspian Sea. Nevertheless, Aktau has also sought to develop as a tourist destination due to its location along the Caspian Sea coast and its proximity to natural reserves and the scenic beauty of the region.



Fig. 3- View of Aktau Port

Not all the scenic wonders in the Mangystau area, though unique in their kind, have been recognized as UNESCO sites. One example is the Kyzylkup formation (Figs. 4-5), whose name derives from a mineral-rich iron water basin that once existed in the area but has since disappeared.

Like almost all attractions in Mangystau, the formation of the Kyzylkup tract is attributed to the ancient Tethys Ocean. This natural feature is unique and demonstrates how the original ocean floor layer, once emerged, was the periodically covered by colluvial as well as alluvial and wind deposits, alternating whitish layers rich in gypsum and limestone, typical of dry climatic phases, with layers of bright reddish 'paleosols', more typical of a rainy climatic phase. These latter layers were rich in iron, giving them a characteristic reddish colour that blends with yellow and brown, indicating the presence of various minerals (Fig.6). Throughout the centuries, the erosion due to waterflows and rain, has eroded these stratified formations, creating the spectacular view that characterise this area.

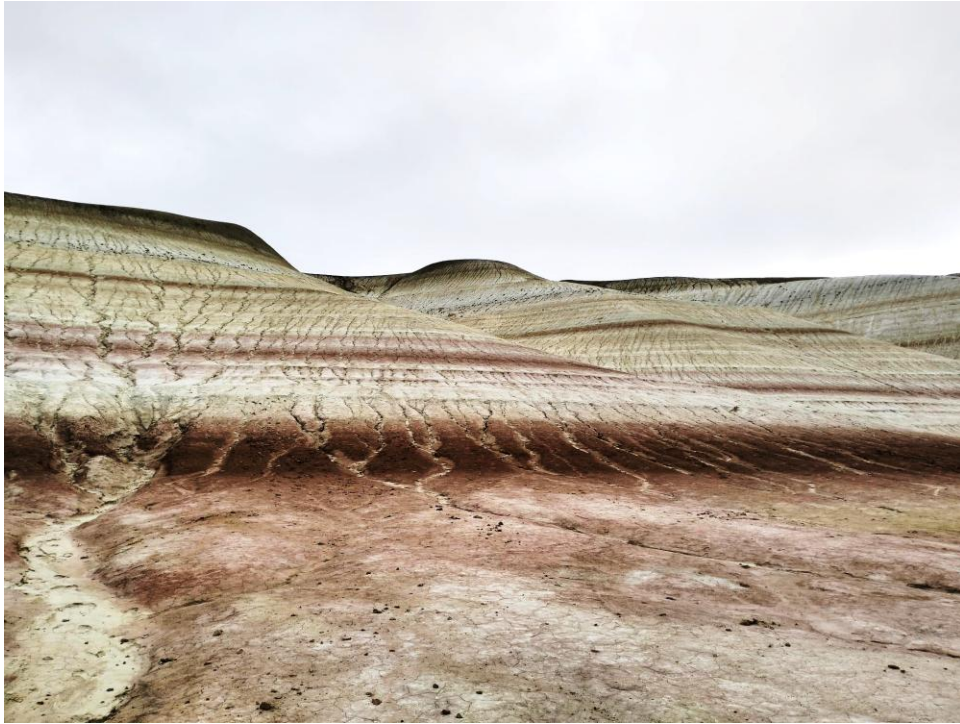


Fig.4- Kyzylkum Valley (photo by S. Raspagliesi)



Fig.5- Kyzylkum Valley (photo by S. Raspagliesi)



Fig.6- Details of the mineralizations present in the area

Nearby is the Bokty elevation (Fig. 7), a truncated pyramid formation that rises to about 150 meters in height. It is here very clear how the stratification is alternating reddish layers with white gypsy limestone (calcarenites).

Not far away lies the Boszhyra Valley (Fig. 8), known for its towering and spectacular rock formations, which include stone towers, pinnacles, and conical massifs that rise majestically from the vast desert expanses. These extraordinary reliefs are the result of complex erosive processes, where water and mainly wind are the ‘artists’ that have sculpted limestone and claystone formations, shaping natural structures of unparalleled beauty.

Similar to what is observed in the Kyzylkup region, the landscape of Boszhyra is characterized, again, by a succession of geological layers, with rocks displaying shades ranging from white and gray to red, giving the landscape a unique and scenic appearance.

Among the most striking natural formations is Sherkala Mountain (Fig. 9), which rises majestically above the arid desert that surrounds it. Its unique shape as an isolated rock is the result of centuries of erosion, which has deeply carved the limestone, shaping a structure reminiscent of an ancient, fortified citadel. Its walls, characterized by shades ranging from white to gray and pale yellow, blend with the desolate landscape, creating an extraordinary visual contrast.

Considered one of the most remote yet invaluable natural wonders, Sherkala captivates with its unparalleled geological beauty and historical significance.

The mountain is tied to a history that intertwines geology with local cultural traditions. Its castle-like shape has inspired popular imagination, and the surrounding area has been the subject of many legends and stories linked to its role as a refuge and sanctuary.

Unfortunately, these scenic wonders are not yet UNESCO-recognized geo-parks and natural sites and therefore lack any protective regulations. This leads to inevitable damages caused by tourist activities, which, fortunately, is still limited in the area, likely also “thanks” to the complexity of this territory, which is certainly not yet open to mass tourism. However, in future the tourism could become wider and more regular, and it is important that local authorities start now thinking and planning how to

reach and visit these places without creating damages to this unique landscape. At the moment to reach these contexts there are not proper roads, but just several off-road tracks, which for their numerosity are damaging the landscape.



Fig. 7- Bokty Mountain (photo by S. Raspagliesi)



Fig. 8- Boszhyra Valley (photo by S.Raspagliesi)



Fig. 9- Sherkala Mountain (photo credit e-history.kz)

## 2.II Kazakhstan e la regione di Almaty (G. Campitelli<sup>5</sup>)

### The Silk Way Roads in Kazakhstan

Living without communication it's impossible for people. It is an intrinsic necessity of our physiology, a natural state that constantly drives us to create communication networks and paths.

Writing, dance, painting, music, and arts are the most important communication systems developed by humanity during history. To these, we can add ways and networks of commercial exchange, such as land, maritime, and air routes.

A striking example is the Silk Road, a transcontinental transport corridor between East and West, connecting geographically, culturally, and technologically distant areas. Kazakhstan serves as its commercial heart.

Nomadic peoples transformed into great civilizations precisely in the territories traversed by the Silk Road, and the intensity of trade exchanges was largely tied to their formation and development. However, with the rise of maritime trade, the significance of the Silk Road faded into obscurity<sup>6</sup>, because it lost its main meaning.

The modern population distribution system is linked to the ancient routes of the Silk Road on the territory of Kazakhstan. The geographic position of Kazakhstan also determines the richness and diversity of its natural resources.

Following the dissolution of the Soviet Union, the transition to a market economy profoundly impacted the cultural heritage of the five Central Asian republics<sup>7</sup>, influencing the funding, management, and enhancement of cultural heritage. With the independence of the former Soviet republics, funding for the cultural sector in general—and cultural heritage in particular—decreased. During the communist era, the cultural sector enjoyed state funding, occupied a central role in state planning, and held a certain prestige. However, with the introduction of the market economy, this situation changed dramatically.

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<sup>6</sup> ТИТОВ 1982, pp. 89-145, 1988, pp. 47-123; КЛЕЈН 1974, pp. 7-55; ОЛХОВСКИЙ 1992, pp. 30-33; ГУМИЛЕВ 2007.

<sup>7</sup> Kazakstan, Kirghizistan, Tagikistan, Turkmenistan and Uzbekistan.



In recent years, UNESCO's Cultural Heritage Division, in close collaboration with the UNESCO Almaty Cluster Office, and with the support of the UNESCO/Japan Funds-in-Trust for the Preservation of the World Cultural Heritage and the UNESCO/Norway Funds-in-Trust, has initiated a series of operational projects in the region<sup>8</sup>; out of them, there is the project for the management, conservation, and promotion of the Tamgaly petroglyph site<sup>9</sup>.

### **Tamgaly, rock art and petroglyphs between archaeology and ethno-anthropology**

The communication paths used in antiquity were different from today. Ancient societies were more deeply rooted in forms of communication tied to traditions, mythology, and rituals (following ashamanic practices and culture).

The symbol, as in all ancient writing systems (as Sumerian, Egyptian, Hittite, Chinese, and other pictograms), was based on signs and images, often using schematic or linear-geometric forms. Numerous studies on primitive art demonstrate that *"over time, drawings became more and more schematized until they acquired forms that are impossible to recognize as the original image."*<sup>10</sup>.

Writing thus evolved into a system of communication between groups using conventional and visible signs<sup>11</sup>.

It is, therefore, crucial to study and analyse the communicative potential of petroglyphs, not only from an archaeological perspective but also from an ethno-anthropological approach.

The primary function of petroglyphs as a form of communication, lies in the fact that the "message" is not expressed through syllables or phonetic forms but was initially presented as *"...miraculous mythological images and their combinations."*<sup>12</sup>.

One of the main sites in Central Asia, which will be the focus of this paper, is Tamgaly.

The analyses and studies of petroglyphs, which have been carried out by numerous scholars, past and present, are based on the comparative-historical method and the principles of historicism<sup>13</sup>, in combination with methodological studies<sup>14</sup>.

In the past, a series of studies were implemented to facilitate a more targeted technological "specialization" for work on petroglyphs<sup>15</sup>, including: recording information, methods for classifying and interpreting images, and a well-defined and detailed methodological framework for documenting and describing petroglyphs<sup>16</sup>.

Gradually, new areas of application in the study of petroglyphs emerged. A new GIS approach has been developed, thanks to new software and improved computer based technologies. These

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<sup>8</sup> OTRAR 2005, pp. 36-37.

<sup>9</sup> Not to mention other projects such as the conservation and restoration of Otrar Tobe, in Kazakhstan; the project for the preservation of the sites of the Silk Road in the Upper Chuy valley, in Kyrgyzstan; the project for the restoration of the ruins of Fayaz-TawzahTepa, in Termez, Uzbekistan; and the project for the conservation and restoration of the ruins of Ajina Tepe, in Tajikistan.

<sup>10</sup> GELB 1982, p.37.

<sup>11</sup> GELB 1982, p. 23.

<sup>12</sup> MAKSIMOVA, ERMOLAEVA, MARIASHEV 1985, pp. 7-17; NOVOZHENOV 2012, p. 19.

<sup>13</sup> GARDIN 1958, 1960, 1963, 1965, 1967, 1968, 1974; SHER 1977.

<sup>14</sup> GARDIN 1971, 1974; SHER 1970, 1977; KAMENETSKY *et alii* 1975.

<sup>15</sup> ANATI 1968, pp. 133-155, 1969, pp. 63-71, 1970, pp. 255-261, 1977; SHER 1977.

<sup>16</sup> ANATI 1977, pp. 35-61; SHER 1980.

improvements have opened new possibilities for mapping with greater precision, detail, speed, and efficiency, allowing more and more advanced applications —such as 3D modeling, for example<sup>17</sup>.

In Central Asia there are numerous rock art sites, widespread between Uzbekistan (e.g., Sarmishsai), Kyrgyzstan (e.g., Saimaluu-Tash, Cholpon-Ata) and Kazakhstan.

In Kazakhstan, the main sites are located mainly in the southern areas, particularly between the Karatau mountain range (e.g., Arpauzen) and the Chinese border (e.g., Eshkiolmes, Bayan Zhurek, Usek) (fig. 10). At the center of this vast area there are two prominent sites: Kulzhabasy, which contains approximately 4,000 petroglyphs, and Tamgaly, located 50 km further east, with about 5,000. This location of the sites with petroglyphs is certainly peculiar and some possible explanations for these strange dislocations with internal areas completely lacking them, could probably be due to a more suitable geology in specific areas, or also to the lack of mapping and information in some of the contexts. So, geology or *argumentum ex silentio*? probably both.



Fig. 10 Documented rock art and petroglyph sites in the southern region of Kazakhstan: (1. Arpauzen; 2. Kulzhabasy; 3. Gorny; 4. Karakyr; 5. Tamgaly; 6. Sholak; 7. Eshkiolmes; 8. Bayan Zhurek; 9. Usek; 10. Saimaluu-Tash)

Tamgaly site, which is located about 125 km to northwest of Almaty, was discovered in 1957 by Anna Maksimova (1923–2002).

Tamgaly lies at an altitude between 870 and 950 meters in the Chu-Ili mountains, bordering the steppes. This mid-altitude mountain range features fertile land and natural springs: all features which attracted in antiquity an exploitation of the territory.

The main canyon of Tamgaly is north-south oriented, with a flat and regular floor and it is between 20 and 100 meters large and stretching approximately 1,200 meters in length (Fig. 11): practically a natural track, easy to walk through and also suitable for settling. During spring and autumn, a small stream flows through the center of the canyon, which also gives the opportunity of constant water, which favours travels, exploitation of the land and of the local resources, as well as suitable for seasonal or long staying settling.

<sup>17</sup> REILLY 1988; POYKALAYNEN, TALPSEPP 1990, pp. 30-33; ROGOZHINSKIY, KHOROSH, CHARLINA 2004, pp. 156-161; SHVETS 2005, pp. 275-276; EPIMAKHOV, CHECHUSHKOV 2008, 2010.



Fig. 11 Tamgaly Canyon and the location of the five main petroglyph groups.

Approximately 3,000 rock engravings are concentrated within five groups distributed over an area of about 200,000 square meters, while an additional 2,000 petroglyphs are located in the peripheral area of the Tamgaly site. The rocks in the area are composed of clayey sandstone.<sup>18</sup>

The engravings were created on rocks with dark patinas, using stone or metal tools — a technique employed from the Bronze Age to the medieval Turkic period.

In 2004, Tamgaly was included on the UNESCO World Heritage List due to its cultural, historical, and artistic significance "*The dense and coherent group of petroglyphs, with sacred images, altars and cult areas, together with their associated settlements and burial sites, provide a substantial testimony to the lives and beliefs of pastoral peoples of the central Asian steppes from the Bronze Age to the present day.*"<sup>19</sup>.

The five main groups of petroglyphs are concentrated in the northern part of the central canyon.

- Group I: which includes about 100 petroglyphs, is located on the upper slopes, just at the canyon entrance. Between this group and Group II, there are some sporadic representations of human beings, likely shamans, dressed in animal skins (Fig. 12 I-B-D-H). Other panels feature hunting scenes and animals such as goats, horses, wolves, and an onager.
- Group II: includes approximately 400 engravings, this group is located on the lower part of the hill. The petroglyphs are distributed over two or three levels, with most of them easily visible especially from below, that is from the natural path that was followed in ancient times. Moreover, representations of worshippers and shamans (Fig. 12 C) appear hidden among the engravings, along with two representations of sexual intercourse (Fig. 13 A-D). The main

<sup>18</sup> FRANCFORT *et alii* 1995, p. 169.

<sup>19</sup> Da "Convention concerning the protection of the World Cultural and Natural Heritage", 28 session Suzhou, China 28 June - 7 July 2004, 28 COM 14B.29, p. 32.

representations of animals in this group include deer, goats, bulls, and horses, which are also interesting insights for an archaeo-zoological reconstruction of the ancient local fauna, including wild animals and types of breeding and domestication.

- Group III: is located on the lower part of the hill, at the entrance of a small secondary canyon, this group includes around 800 petroglyphs, located on three levels. The engravings are highly visible (Fig. 12 E-F-G-I). Key motifs include scenes of worship and representations of bulls. The main panels show humans dancing or performing rituals related to a bull or horned horse (Fig. 15 A-B), including a solar deity standing on a bull (Fig. 16). Other scenes include hunting, dogs, goats, a cart, and a calf depicted inside a cow's body (Fig. 17).
- Group IV: counts about 700 petroglyphs, mostly located at the top of the hill and, again, very visible from the canyon below. A path leads to a platform with a panel showing anthropomorphic figures dancing around a woman in childbirth, arranged beneath seven solar deities (Fig. 18). This scene may represent a cult ritual involving dances at the hill's base, with the symbolic presence of deities at the summit.
- Group V: is certainly the most significant group, including about 1,000 petroglyphs, and it is located on an eastern hill, just in front of the Group IV, near to the canyon's mouth which offers an easy passage to a broader valley. The engravings are distributed from the hill's base to its summit. Panels at the lower levels testify worshippers and shamans (Fig. 18), with two solar deities slightly above. Just below the summit, a panel shows solar deities (Fig. 19 A) and a cart (Fig. 19 B). Most of the represented animals are, again, bulls, goats, deer, horses, and onagers (Fig. 19 C)<sup>20</sup>.
- Peripheral Area: about 700 meters to the northwest of the Tamgaly site, in a small and narrow valley, there are approximately 150 panels featuring over 500 representations. These are mainly concentrated in the lower areas, with very few examples in the upper part of the hill. In this case the representations include camels and Turkic horsemen with banners (Fig. 20). Intermediate panels depict hunting scenes, such as a Turkic horseman hunting with a falcon (Fig. 21).

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<sup>20</sup> Subspecies of the wild donkey, typical of southern Asia.

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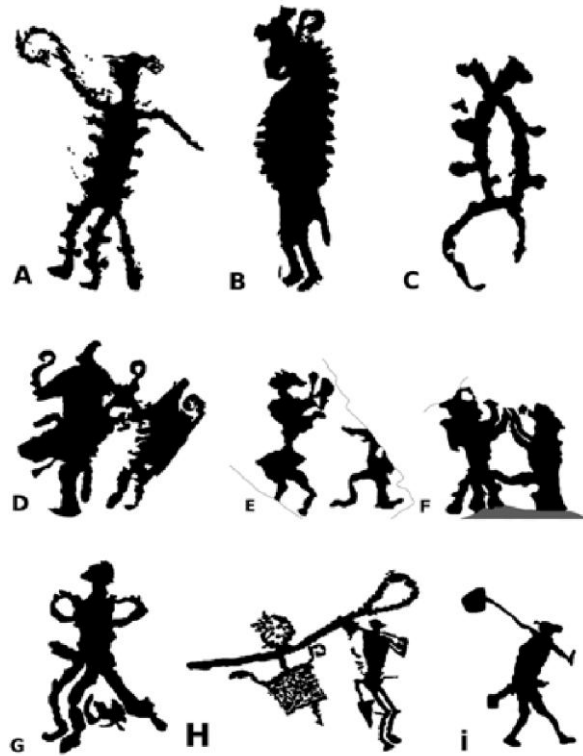


Fig. 12 Anthropomorphic figures from Tamgaly: A - Group I; B, D, H - Group II; C - Group III; E, F, G, I - Group V

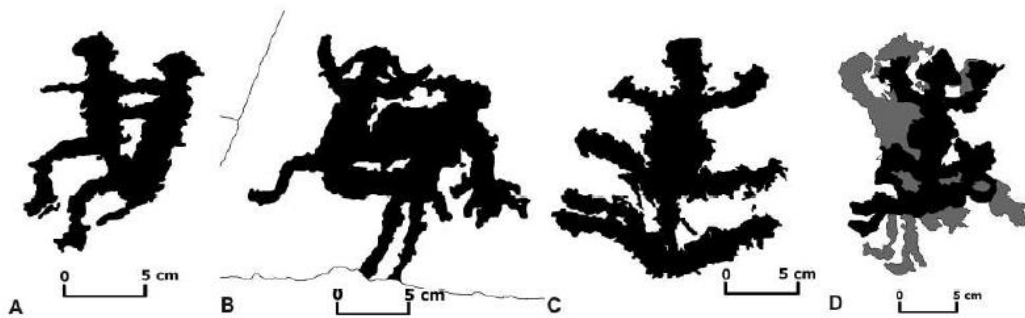


Fig. 13 Sexuality scenes from Tamgaly (Group II)



Fig. 14 Cultural scene with anthropomorphic figures, Group III

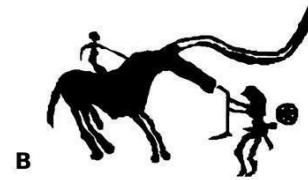


Fig. 15 Horned horses and bulls, from Group III



Fig. 16 Solar head riding a bull, Group III



Fig. 17 Group III, puppy in a cow

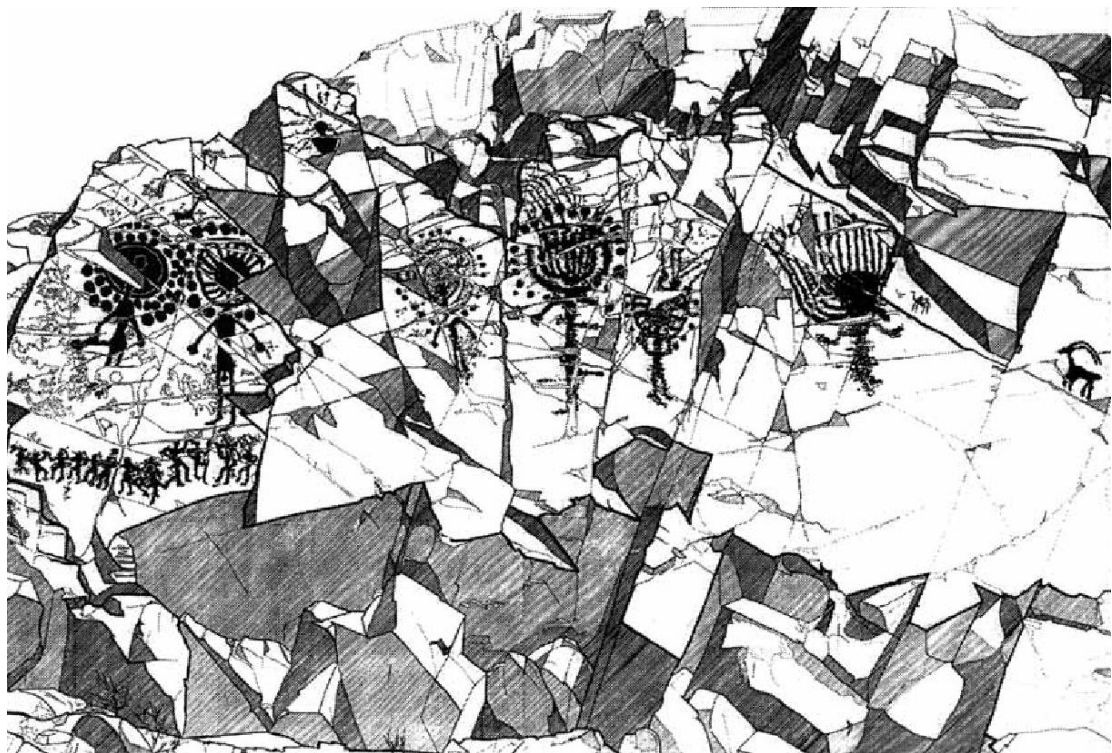


Fig. 18 Representation with 7 solar-heads and dancers around a woman giving birth

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Fig. 19 Group V (A: Horse-mounted solar heads; B: Chariot; C: Group of animals)



Fig. 20 Representations of camels and  
Turkish knights with banners



Fig. 21 Turkish knight hunting with a  
hawk



## Chronological issues

Tamgaly rock art can be organised from the chronological point of view into four or five macro-periods, from the Middle Bronze to modern times. However, it reached its peak during the Bronze Age, and then declined slowly in the Iron Age, but it is attested also in the Medieval period.

- Bronze Age: Most of the petroglyphs in the main canyon date back to the Bronze Age, with no clear distinction between Middle and Late Bronze, as styles and motifs overlap. Some motifs, such as horned horses, share the same style of the Middle Bronze bulls, making precise periodization difficult<sup>21</sup>.
- Iron Age (800-300 BC): during this period, new sites were chosen for rock art, often without attention to the quality of the rock. Larger panels became popular, with the repetition of the same motifs to create a dynamic effect. The repertoire was limited to hunting scenes, goats and deer with horns in the shape of a tree (Fig. 22). The style was characterized by spirals or by the reduction of the figures to a few lines.
- Medieval Turkish period (700-1300 AD): it is characterized by the use of polishing technique, but also the renovation of older petroglyphs is attested in this later period. Sometimes the engraving technique was still used, creating sort of 'palinsests', with new petroglyphs superimposed on older ones, without trying to preserve them. The new representations included knights with banners, horses or camels, hunters with hawks and tribal signs called "tamga". Moreover, goats and dogs have become more common, to the detriment of bulls, horses or wolves.
- Modern period (1500-1960): in this later period there are few petroglyphs. There are some inscriptions from the period of the Dzhungar Khanate (early 18th century), engravings of horses and goats made by Kazakh shepherds in the 19th century and inscriptions from the Soviet period, such as names, references to Lenin and depictions of soldiers, airplanes, red stars, Tanks and cars.



Fig. 22 Deer with horns in the shape of a tree

<sup>21</sup> BAIPAKOV *et alii* 2005, p.70.

## Main themes

Some themes recur more frequently at Tamgaly during the Bronze Age, such as the bull, the solar head, and the worshipper<sup>22</sup>.

For the Iron Age period, hunting scenes are the most recurring theme. This reflects the importance of hunting as both a survival activity and a symbolic or ritualistic practice during this era. The depiction of animals and hunting scenes likely highlights the connection between humans and nature, as well as the central role hunting played in the social and spiritual life of the people.

Similarly, during the Turkic period, the most frequent motifs are horsemen with banners and hunting scenes. The depiction of riders with banners suggests the significance of cavalry and warfare in Turkic culture, while hunting scenes continue to reflect the importance of this activity, possibly also in a symbolic or ritual context. These motifs emphasize the connection between the Turkic people and their nomadic, warrior-based lifestyle<sup>23</sup>.

- Solar-head

At Tamgaly, 30 representations of deities with solar heads have been counted, but only 26 are still preserved.

The solar heads are depicted in various forms, often with different circular designs. One common representation includes circles with rays or points both inside and outside the circle, while others feature a solid circle with rays or points extending outward. These representations emphasize the symbolic significance of the sun and its connection to divine or celestial power<sup>24</sup>.

- Bulls

Numerous depictions of bulls are present at Tamgaly<sup>25</sup>. They are easily recognizable due to their horns but are always shown without ears, distinguishing them from horned horses.

The bulls are associated with solar heads on four occasions (for example, as seen in Fig. 16 and 19 C). The connection between the bull and the solar head can be interpreted as an antagonism between darkness and light, represented respectively by the dark skin of the animal and the solar rays of the deity<sup>26</sup>.

- Horned-horses

At Tamgaly, at least eleven representations have been identified that can be interpreted as horned horses (for example, fig. 15 A-C)<sup>27</sup>. Some distinctive features indicate that they represent a horse: the tail, the ears (unlike the bull), the position of the penis, and sometimes the presence of reins.<sup>28</sup>

Moreover, the horned horse could be associated with the bull cult, as it could be ridden and controlled during rituals by a person wearing the bull's mask, thus symbolizing opposition to the bull itself.<sup>29</sup>

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<sup>22</sup> In contrast, chariots are rare compared to other Kazakh sites such as Arpauzen (KADYRBAEV, MARYASHEV 2007, p. 44), Eshkiolmes (MARYASHEV, GORYATSHEV 2002, pp. 28-29) or Usek (HERMANN 2011b, p. 13).

<sup>23</sup> SALA, DEOM 2005, pp. 56-57.

<sup>24</sup> ROGOZHINSKY 2009, p. 53.

<sup>25</sup> Especially for Groups II, III e V.

<sup>26</sup> BRU 1992.

<sup>27</sup> Appear in Groups I, III, IV, V.

<sup>28</sup> FRANCFORT *et alii* 1995. p.185.

<sup>29</sup> FRANCFORT *et alii* 1995, p. 191.

- Fertility

Some panels attest the importance of the concept of fertility at Tamgaly.

- Two representations of sexual intercourse in Group II (Fig. 13).
- A calf inside the body of a cow in Group III (Fig. 17).
- A woman in labor beneath solar heads in Group IV (Fig. 18).
- There are no representations of sexual intercourse at Tamgaly<sup>30</sup>.

- **Shamans and other figures (dancers)**

- Shamans

At Tamgaly, there are several recurrences of anthropomorphic figures directly related to cult scenes.

In Groups I and II, the human figures are likely dressed in animal skins with a tail (fig. 12 A-B-D). They are commonly interpreted as shamans. These figures lack obvious sexual characteristics, their hands are elongated, and they hold a curved staff<sup>31</sup>.

The curved hands could represent a pastoral staff, commonly used by shepherds in Central Asia<sup>32</sup>, or a staff that functions as a scepter<sup>33</sup>.

- Dancers

The two groups of dancers in Group III (fig. 14 A) and IV (fig. 18) are interpreted as dancers because of the position of their legs. They have raised hands and can be identified as men. This type of scene is very rare, but it is attested in a site near Tamgaly, such as Arpaufen and the mountains of Sholak<sup>34</sup>, 200 km east of Tamgaly (fig. 10).

### **Anthropological overview of Petroglyphs - Music and Dance**

Apparently, art of sounds and music should be antinomial to rock art. However, the creation of engravings involves tapping rocks, which generates sounds. In addition, the rock art sites are located in an environment rich in sounds: water flowing, locusts and birds, wind, thunder. Rock art sites may also have been places of worship with ceremonies involving dance and music. It is impossible to prove this today, but the presence of dance and music scenes on some panels strongly suggests it. If it is possible to identify the representations of musical instruments, it is more difficult to interpret some scenes with peoples in action: do they dance or worship?

From the studies of Hermann L.<sup>35</sup> a plausible interpretation as dancers can be given when they have, at least, one bent leg and an arm away from the body, that is in a position which cannot be explained by hunting activity or another activity. People with their arms crossed to the sky might be interpreted as worshippers, but not automatically as dancers. If their legs are bent, we consider them dancers and worshippers. However, both activities are not contradictory: a ceremony is a cult activity and it may

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<sup>30</sup> They are, on the other hand, well known in other sites of Central Asia, such as Bayan Zhurek (SALA, DEOM 2005, p. 133), 330 km north-east of Tamgaly, Eshkiolmes (BAIPAKOV, MARYASHEV 2004, p. 185), 250 km north-east of Tamgaly, or Saimaluu-Tash (DYADUCHENKO 2008, p. 10).

<sup>31</sup> MARYASHEV, GORYATSHEV 2002, p. 50.

<sup>32</sup> ROZWADOWSKI 2004, p. 115.

<sup>33</sup> BAIPAKOV *et alii* 2006, p. 79.

<sup>34</sup> BAIPAKOV, MARYASHEV 2004, p. 234.

<sup>35</sup> HERMANN 2019°, p. 27-28.

also include dancing as part of the ritual. Some panels show anthropomorphic figures which are represented as in a row, holding their hands, with a strong suggestion to some kind of ritual dance. As there is no clear reference to possible movements, these scenes are not always considered dance scenes, although some authors consider them a kind of chain dance<sup>36</sup>.

In the area of south-eastern Kazakhstan, 12 sites were documented and inventoried (fig. 23). Five panels with seven musicians (of which only one at Tamgaly) and fourteen panels with fifty-five dancers (of which only two at Tamgaly).



Fig. 23 Main sites in Kazakhstan with depictions of Musicians and Dancers (1. Akterek; 2. Kulzhabasy; 3. Akkainar; 4. Karakyr; 5. Tamgaly; 6. Degeres; 7. Eshkiolmes; 8. Bayan Zhurek; 9. Kaishi)

There are also finds and inventories of other cases, always related to panels containing scenes related to music and dance, at sites in the region of Kulzhabasy-Tamgaly, such as the sites of Akterek, Degeres, Akkainar (approximately 50-60km north and northwest of Tamgaly respectively), whose bronze age engravings seem to be thematically influenced by Tamgaly<sup>37</sup>.

From Tamgaly comes the representation of an anthropomorphic figure with a wolf's head, probably associated with a musician who carries a kind of bow (fig. 24). Instead of the arrow there is a large stick that ends with a massive head. Also, this bow is not used in a hunting scene. For these reasons this bow and this stick with the head are interpreted as a *kylkobyz*, a traditional Kazakh instrument similar to the violin.

<sup>36</sup> CLODORÉ-TISSOT, KERSALÉ 2010, p. 95; FOSSATI, RAGAZZI 2001, pp. 48-49; RAGAZZI 2012, p. 232.

<sup>37</sup> HERMANN, ZHELEZNYAKOV 2016, pp. 18-19.

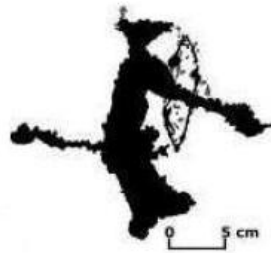


Fig. 24 Petroglyph with an anthropomorphic musician figure

Sixteen dancers were documented at the Tamgaly site, which is one of the largest records for Kazakhstan (about 85%). Out of the total sixteen, four are identifiable and have been therefore listed as males for the evident indication of his gender.

Similar scenes can be found also in neighboring sites, with groups of at least 3 figures, which confirm the possibility that Tamgaly may have been a centre of dissemination of models and ideas, at least in short and medium-range<sup>38</sup>.

The largest groups are in Tamgaly (one group with ten dancers, the second with six people, fig. 25 H-I) and in Kulzhabasy with nine people dancing with weapons (fig. 26 B).



Fig. 25 Groups of dancers, from Tamgaly

<sup>38</sup> HERMANN 2018, p. 28.

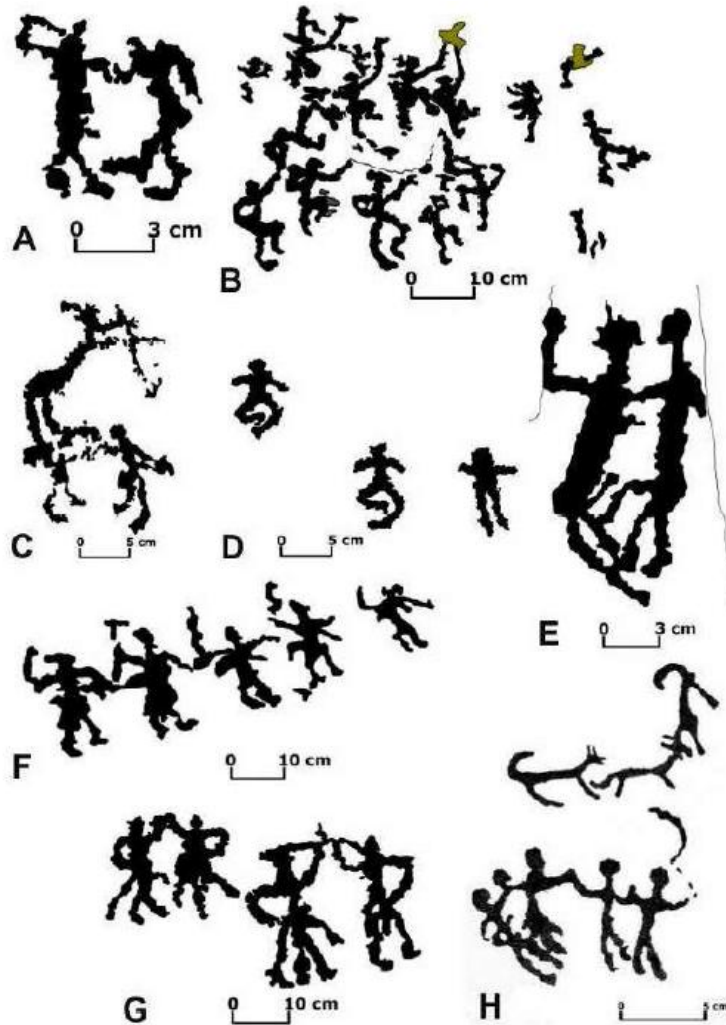


Fig. 26 Group of dancers from Kulzhabasy A-D; Obo E; Ornok F-G; Eshkiolmes H

Smaller groups are found in Kazakhstan at Akkainar (twice with four people), at Akterek (three dancers) and at Eshkiolmes with four people (fig. 20 H).

The association of dance and music with fertility is certainly very interesting. An important case is attested near Tamgaly, with a scene including ten dancers, which are arranged in a row, and with a woman giving birth which is represented in the centre of the scene (fig. 27).



Fig. 27 Representation of a woman giving birth with a procession of dancers (photo by G. Campitelli)

Petroglyphs are sounds of essence, because tapping a rock to draw something on it automatically includes the production of sounds. However, musicians' recordings are often absent while those of dancers are very rare. One very important thing is that the dancers are often not in association with musicians. Dancers and musicians in combination are mainly attested at the sites of Bayan Zhurek, Kulzhabasy and Tamgaly. This could mean that these sites were places of worship and ritual ceremonial, which may have included dance and music as part of the ceremonies.

Dancers are sometimes associated with animals, mainly goats and bulls, but also with sunheads and parturient women. About 25% of the dancers have evident male features and are associated with solar heads, although not in the same panel but always in a neighbouring position. However, no dancer associated with parturient presents a clear representation of male genitals.

These results suggest that the dancers were partly linked to the fertility cult and that generally dancers with male genitals are not associated with these fertility cults: dancers with women who are giving birth in the same panel with sunheads do not show or flaunt their gender<sup>39</sup>. This suggests that the presence of the representation of the phallus has nothing to do with fertility, but rather with power.

Dancers who worship a woman giving birth or a solar head are asexual, because they are the woman and the solar head that have the power to bring to life<sup>40</sup>. On the contrary, dancers with goats and bulls very often flaunt their phallus as a manly attribute that should be compared to the horns of the animals. The representations in which the dancers are placed with animals, also symbolize power: man placed on the animal symbolically suggests as humanity dominates nature.

Music and dance in cultic ceremonies have a dual representation of power: their purpose is to gain power over the gods and nature by influencing them (as it happens for instance with the rain dance), so that nature and the gods have power over human life. The presence and absence of the phallus among the dancers seems to be a manifestation of the ambiguity of dance and music: humans are

<sup>39</sup> HERMANN 2015b.

<sup>40</sup> BAIPAKOV, MARYASHEV 2009, p. 37.

aware of the power of natural elements and animals, but they are also aware that they can partly dominate nature and animals through agriculture, and the world of sounds and silence through musical instruments.

### Modern petroglyphs in Kazakhstan

Most of the new engravings were made in the same technique as the older ones, using a large stone as an instrument. Some recent examples, on the other hand, have narrower and less deep engravings. The engravings are made in a naturalistic style, sometimes with many details. The reasons can be identified without difficulty, from flora and fauna to military scenes, portraits, etc<sup>41</sup>.

The natural environment, especially the mountains and the sun, is often depicted (Fig. 28), an element which is never found in the oldest drawings. It seems that this type of representation has appeared in the last forty or fifty years<sup>42</sup>.



Fig. 28 Representation of a landscape and a skyline which appears clearly anthropized.

Animals, especially goats and horses, sometimes dogs, constitute the majority of the representations, as in ancient times, and obviously a particular attention is paid to horses (Fig. 29). This animal is an important symbol for the Kazakh people and the representation reflects the social status which derived from its possession. New animals such as eagles, domestic cats and sharks also appear (Fig. 30). However, cows and bulls completely disappear.

<sup>41</sup> NOVOZHENOV *et alii* 2020, p. 208.

<sup>42</sup> NOVOZHENOV *et alii* 2020, p. 209.





Fig. 29 Engraving depicting a horse and an inscription with date



Fig. 30 Depiction of an eagle and sun (also in honor of the flag of Kazakhstan)

Another major theme of the modern graffiti is represented by new means of transport, such as cars and aircraft (Fig. 28). From an anthropological point of view the representation of cars in the 20th century can be compared to that of wagons in the Bronze Age.

Military subjects, such as weapons or tanks (Fig. 31), became important in the second half of the 20th century. Most of these kinds of representations are, de facto, a kind of commemoration of the end of military service: in these cases, the former soldier writes down the name of the place where he served, together with the dates (Figg. 31-32).



Fig. 31 Cyrillic inscription with a tank



Fig. 32 Representation of a soldier (probably an aviator)

The study of new rock carvings allows numerous comparisons with the petroglyphs of the Bronze Age (and other epochs). The new representations reflect both the continuity in the use of this form of communication, as well as the birth of a new "mythology".

Tamgaly is an important site for understanding the meaning and importance of rock art in such a particular cultural context. Its occupation from the Bronze Age to the present day allows us to see the evolution of the ideology of local populations and their perception of the environment and of the world. The structure and iconography of this sanctuary illuminate the conceptual world of the Bronze Age and demonstrate the need for an analysis of rock art within a spatial and structural dynamic, rather than in isolated images. The diversity and large number of sites in Central Asia in general, and in Kazakhstan in particular, allow to place Tamgaly in a geographical context. Central Asian rock art shows reciprocal influences between the various regions, and these influences should be analysed to understand economic exchanges and population changes. Tamgaly can be analysed as a particular site, but it should also be analysed in relation to other major sites at the micro-regional level, such as Karakyr and Kulzhabasy, and at the macro-regional level, such as Arpauzen, Saimaluu-Tash or Bayan Zhurek. Tamgaly can therefore be understood as a site of intersection between the West (Arpauzen) and the East (Bayan Zhurek, Usek) and between the North with the Russian Altai and the South, with Saimaluu-Tash.

Although cooperation between UNESCO and the Norwegian Directorate for Cultural Heritage from 2000 to 2003 has allowed the implementation of protective measures for the site<sup>43</sup> engravings are still generally in poor condition. The climatic conditions of the steppe, which include high temperature variations between day and night and summer and winter, cause thermal stress and frost that can damage the rocky surfaces. The region is also a seismic zone and small earthquakes have already destroyed or heavily damaged some slabs. Furthermore, the size of the site does not allow for surveillance of all visitors, who sometimes climb rocks damaging the petroglyphs and even write modern graffiti<sup>44</sup>, with the risk of vandalising the old representations.

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<sup>43</sup> HYGÉN 2001; SALA, DEOM 2005, p. 101.

<sup>44</sup> HERMANN 2012, p. 39.

## **Results and Discussions** (G. Campitelli, S. Raspagliesi)

Kazakhstan, though relatively young in the context of global environmental and cultural protection, has begun to gain recognition for its efforts in conserving natural landscapes and in managing in a sustainable way its resources.

The Central Asian and Euro-Asian territory today, as in ancient times, represents a significant market for production and trade. The development of land transport and logistics along this region could significantly expand product markets for all participants in international trade, reducing transport and logistics costs and, subsequently, lowering the prices of consumer goods. The revival of the Silk Road may facilitate the growth of new markets, new opportunities, and the development of transportation networks.

To transform Kazakhstan into a Eurasian hub, it is necessary not only to create the conditions for technical implementation (infrastructure) but also to establish economic and political conditions to reorient the direction of trade flows. However, transforming the country into a true hub requires a liberal fiscal policy, adherence to established international trade rules, and alignment with the World Trade Organization (WTO).

A key aspect of the work of public and private organizations responsible for tourism development at the local level is beginning to focus on the design and implementation of specific programs that aim to include various areas of intervention. However, it would be necessary to start with political, legal, and methodological support.

In fact, a clear regulatory framework for tourism regulation should be defined, based on a comprehensive development strategy for the sector at the local level. Such a strategy should take into account the strengths and weaknesses of tourist areas, adopting a scientific and systematic approach that integrates economic, marketing, and social aspects to promote well-rounded, 360-degree development.

The country has recently begun to understand the fundamental importance of financial support and investments, which are essential for tourism development. Sources of support should be identified, and clear guidelines for the effective use of available resources should be provided, ensuring that investments are targeted and sustainable in the long term.

One area where the country appears to be well on track is in organizational, advertising, and informational support. There is a growing awareness of the importance of providing consultancy services to tourism businesses, promoting population training, and spreading best practices from travel agencies to elevate the quality of services offered. This is evident in the results achieved to date, which include an increase in training courses in the tourism field (ranging from conservation to ecotourism, hotel sector business planning, and enhanced advertising marketing for restaurants and hotels).

In summary, the creation of well-structured and integrated programs can promote balanced, sustainable, and beneficial tourism development for local communities while simultaneously fostering the conservation of natural and cultural resources.

It should be noted that this is a country that has only recently decided to embrace tourism in all its aspects. Therefore, there are elements that could be improved. For example, the linguistic aspect should be revisited in relation to the concept of linguistic inclusivity. Tourists still face challenges, as although the guides had an excellent command of English, signage was often absent or limited to Kazakh/Cyrillic, making it neither easy nor immediately accessible.

Another area for improvement is road infrastructure, especially in the Mangystau region. Travel is lengthy and rough (e.g., Kulzabasy and Boszhyra), often not allowing full accessibility for everyone, including children, the elderly, and people with disabilities. Despite this, the country has several tour operators that plan and organize these trips, which seem to be more like expeditions due to the limited accessibility in various respects (lack of signage, proper roads, clear directions, etc.).

The final results achieved through the project can be considered fully accomplished. This is evident from the excellent progress in university courses and positive student feedback, as well as the tangible results showcased in their presentations. In these, they clearly demonstrated an approach to developing eco-sustainable geotourism while maintaining a focus on the country's culture and history.

## **Bibliografia**

Alff H. 2013. Renegotiating Integration: Dual Citizenship and the Mobilisation of Social Networks of Mongolia's Kazakhs. *Inner Asia* 15, pp. 101-119.

Anati E. 1968. I metodi di analisi e di archivio dell'arte rupestre. *Bollettino del Centro Camuno di Studi Preistorici*, Capo di Ponte Vol.II, pp. 133-155.

Anati E. 1969. Per un metodo di studio dell'arte megalitica. *Bollettino del Centro Camuno di Studi Preistorici*, Capo di Ponte Vol. IV, pp. 63-71.

Anati E. 1970. Methode d'etude de l'art megalithique. *L'Anthropologie* Vol. 74, n.3-4, pp. 255-261.

Anati E. 1977. Methods of recording and analysing rock engravings. *Camunian Studies* vol.7 (edizioni del Centro) Capo di Ponte, pp. 35-61.

Baipakov K.M., and Mariashev A.N. 2004. *Petroglyphy v gorakh Kulzhabasy*. (Ed. By Novozhenov V.A.). Almaty, p. 185.

Baipakov K.M., and Mariashev A.N. 2009. *Petroglyphy Ak Kainara*. Almaty.

Baipakov K.M., Mariashev A.N., and Potapov, S.A. 2006. *Petroglyphy Tamgaly*. Almaty.

Baipakov K.M., Mariashev A.N., Potapov S.A., and Goryatshev A.A. 2005. *Petroglyphy v gorakh Eshkiolmes*. Almaty.

Bru M. 1992. *The Bull: Myth and Representation. Rock Art in the old World*. New Delhi.

Chechushkov I.V., and Epimakhov A.V. 2010. Kolesnitsy i upriazh' kak kul'turnyi indikator evolutsii konevodstva. Kolesnich'nyi kompleks Uralo-Kazakhstanskikh stepei. Koni, kolesnitsy i kolesnichie stepei Evrazii. *Ekaterinburg: institut ekologii rastenii i zivotnykh*. 2010.

Clodoré-Tissot T., and Kersalé P. 2010. *Instruments et "musiques" de la préhistorie*, Lyon.

Coleman H., Gulyamova J., and Thomas A. 2005. *National Development, Education and Language. Central Asia and Beyond*, British Council, pp. 64-77.

- Dyaduchenko L.B. 2008. *Mystic Saimaluu-Tash*. Bishkek.
- Epimakhov A.V., and Chechushkov I.V. 2008. *K voprosu o sposobakh upravleniia parokonnoi kolesnitsei bronzovogo veka*. Proiskhozhdenie i rasprostranenie kolesnichestva.
- Fossati A., and Ragazzi G. 2001. Musik und Tanzdarstellungen in den Felszeichnungen der Valcamonica und des Veltlins, by Drexel K., Fink M. Innsbruck, pp. 48-49.
- Francfort H.P., Soleilhavoup F., Bozellec, J.P., Vidal, P., D'Errico, F., Sacchi, D., Samashev, Z., and Rogozhinsky, A. 1995. Les pétroglyphes de Tamgaly. *Bulletin of the Asia Institute*, New Series Vol.9, Bloomfield Hills, p. 169-191.
- Francfort H.P., and Jacobson E. 2004. Approaches to the Study of Petroglyphs of North and Central Asia. *Archaeology, Ethnology Anthropology of Eurasia*, 18, pp. 149-163.
- Gardin J.K. 1958. *Four Codes for the Description of Archaeological Artefacts*. *American Anthropologist*, Vol. 60, 2.
- Gardin J.K. 1960. *Les applications de la mecanographie dans la documentation archaeologique*. *Bulletin des Bibliothèques de France*. Vol.5.
- Gardin J.K. 1963. *Problemes d'analyse descriptive en archaeologiques*. *Etudes archeologiques*. Paris.
- Gardin J.K. 1965. *A Typology of Computer Uses*. *Antropology*. La Haye.
- Gardin J.K. 1967. *Methods for the Descriptive Analyses of Archaeological Material*. *American Antiquity*. Vol.32.
- Gardin J.K. 1968. *On some reciprocal requirements of scholars and computers in the fine art and arhaeology*. *Computers and this potential application in museums*. New York.
- Gardin J.K. 1974. *Le projets de banques de donnees archeologiques. Problemes methodologiques, technologiques et institutionels*. BDA. Paris.
- Gelb I.E. 1982. *Opyt izuchenia pisma*.
- Gumilev L.N. 2007. *Drevniaia Rus' i Velikaia step'*.
- Hermann L. 2011a. *Die Petroglyphen von Tamgaly in Kasachstan*. Paris.
- Hermann L. 2011b. *Die Petroglyphen vom Usektal in Kasachstan*. Paris.
- Hermann L. 2012. *Rock Art of Tamgaly in Kazakhstan*.
- Hermann L. 2015a. L'art rupestre de l'Akkainar au Kazakhstan (oblys d'Almaty) / Rock art of the Akkainar in Kazakhstan (Almaty Oblys). *INORA*, 73, pp. 5-13.
- Hermann L. 2015b. *La sexualité dans l'art rupestre d'Asie centrale*. *Notae Praehistoricae*, 35/2015.
- Hermann L. 2016a. *L'évolution thématique de l'art rupestre au Kazakhstan*. *Bulletin de l'ASLIRA* 28.
- Hermann L. 2018. L'art rupestre de la vallée de Kenkol (oblast de Talas) au Kirghizstan. *INORA* 80, p. 28.
- Hermann L. 2019a. Music and Dance in rock art from Southern Kazakhstan and Kyrgyzstan. *Expression*, 25, pp. 27-28.

- Hermann L. 2020. *New (modern) rock carvings in Kazakhstan*. in Jacobson-Tepfer, E., and Novozhenov, V.A. (eds.), *Rock Art Chronicles of Golden Steppe from Karatau to Altai*, 2, Almaty, pp. 208-211.
- Hermann L. 2020. Les cultes du soleil et du taureau dans l'art rupestre de l'âge du Bronze en Asie centrale (Kazakhstan et Kirghizstan). *Praehistoria*. University of Miskolc, pp. 303-327.
- Hermann L. 2020. Sexuality in rock art from Southeastern Kazakhstan and Kyrgyzstan. *Expression*, 27, Capo di Ponte, pp. 38-55.
- Hermann L., Zheleznyakov, B., and Zhanko, A. 2014b. The rock art site of Degeres (Almaty oblys), Kazakhstan. *INORA* 70, pp. 13-17.
- Hermann L., Beisenov, A.Z., and Zheleznyakov, B. 2016. *The rock art of Kulzhabasy, Kazakhstan (Otar, Djamboul Oblys)*. *INORA*, 74, pp. 6-11.
- Hermann L., and Zheleznyakov, B. 2016. *Le site d'art rupestre d'Akterek au Kazakhstan (oblys d'Almaty)*. *INORA* 76, pp. 18-19.
- Hermann L., Zheleznyakov, B., and Oryntaevitch, M. 2021. *L'art rupestre de Shoshkali à Tamgaly (oblys d'Almaty) au Kazakhstan*. *INORA*, 89, pp. 15-19.
- Hygen A.S. 2001. *Tamgaly Gorge – Sanctuary in the Steppes of Kazakhstan*. Adoranten 2001. Tanumshede, p. 101.
- Kadyrbaev M.K., and Maryashev, A.N. 2007. *Petroglyphy chrebita Karatau*. Almaty.
- Kamenetsky, I.S., Marshak, B.I., and Sher, J.A. 1975. *Analiz arkheologicheskikh istochnikov (vozmozhnosti formalizovannogo podkhoda)*.
- Klejn L.S. 1974. *Kossina im abstand von vierzig Jahren. Jahresschichte mitteldeutsch Vorgeschichte*, n° 58. Halle/Saale, pp.7-55.
- Kozhin P.M. 1987. *Kolesnichnye syzhety v naskalnom isskustve Tsentralnoi Azii. Arkheologia, ethnographia i antropologia Mongolii*, Novosibirsk.
- Lin Chin-Hung R. 2025. UNESCO Cultural Heritage Preservation Projects along the Silk Roads in China and in Central Asia. In *Conservation and management of archaeological and earthen structures and sites*, Otrar/Turkestan, Kazakhstan, pp.36-37.
- Maksimova A.G., Ermolaeva, A.S., and Mariashev, A.N. 1985. *Naskalnye izobrazhenia urotshitsha Tamgaly*, Almaty.
- Maryashev A.N., and Goryatshev, A.A. 2002. *Naskalnie izobrazheniya Semiretschya*, Almaty.
- Medeu A., Askarova M., Plokhikh R., Skorintseva I., and Bekkuliyeva A. 2015. *Great silk roads on the territory of Kazakhstan: from past to future*, in *Journal of Resources and Ecology*, Vol. 6 (2), March 2015, Beijing China.
- Mukhamediyev B., Spankulova L., and Kerimbayev A. 2019. Innovation and Regional Growth in Kazakhstan. 34th IBIMA Conference, 13-14 November 2019, Madrid.
- Novgorodova E.A. 1989. *Drevniaia Mongolia*.
- Novozhenov V.A. 2012. *Tshudo kommunikatsii i drevneishii kolesnyi transport Evrazii*. TAUS Publishing, Moscou, p. 19.

- Novozhenov V.A., Jacobson-Tepfer E., Rogozhinskiy, A., Cheremisin D., and Hermann, L. 2020. *Rock Art Chronicles of the Golden Steppe: from Karatau to Altai*. Vol. 2. Collective monograph. Almaty: UNESCO Center for the Rapprochement of Cultures, pp. 208-209.
- Novozhenov V.A., and Bedelbayeva, M. 2018. Figurative monuments and rock art traditions of the Kazakh Steppes, in *Art of the Orient*, vol.7, Torun.
- Ragazzi G. 2012. Iconografia preistorica e danza: osservazioni preliminari, in *Danza e Ricerca. Laboratorio di Studi, Scritture, Visioni*, anno IV (3), p. 232.
- Reilly P. 1988. *Data visualisation: Recent Advances in the Graphic Systems to Archaeology*, Winchester: IBM UK Scientific Centre.
- Rogozhinsky A.E. 2009. *Naskal'nye izobrazhenia «solntsegolovykh» iz Tamgaly v kontekste izobrazitel'nykh traditsii bronzovogo veka Kazakhstana i Srednei Azii. Materialy i issledovania po arkheologii Kyrgyzstana*, Bishkek.
- Rogozhinsky A.E. 2011. *Petroglyphs within the archaeological landscape of Tamgaly*, Almaty.
- Rogozhinskaya E., Khorosh E.Kh., and Charlina L.F. 2004. *O standarte dokumentatsii pamiatnikov naskal'nogo iskusstva sentral'noi Azii. Pamiatniki naskal'nogo iskusstva Tsentral'noi Azii. Obtshestvennoe uchastie, menagement, konservatsia, dokumentatsia*, Almaty, pp. 156-161.
- Rozwadowski A. 2004. *Symbols through time. Interpreting the Rock Art of Central Asia*, Poznan.
- Sala R., and Deom J.M. 2005 *Petroglyphs of South Kazakhstan*, Almaty.
- Sher J.A. 1970. *Pamiatniki drevnego iskusstva na Yenisee*.
- Sher J.A. 1977. *Algorithm raspoznavania stylisticheskikh tipov v petroglifakh. K teorii stilia v pervobytnom iskusstve. Matematicheskie metody v istoriko-kulturnykh i istoriko ekonomicheskikh issledovaniakh*.
- Sher J.A. 1980. *Petroglyphy Srednei i Tsentral'noi Azii*.
- Shvets I.N. 1999. *Antropomorfnyy personazh v petroglifakh Tsentral'noi Azii: aftoref...kand. ist. nauk*, Almaty.
- Shvets I.N. 2005. Nekotorye aspekty sovremennogo sostoiania izucheniia naskal'nogo iskusstva Tsentral'noi Azii, *AEAE*, n°3, (23), Novosibirsk, pp. 275-276.
- Titov V.S. 1982. K izucheniyu migratsii bronzovogo veka. *Arkheologia Starogo i Novogo Sveta*, Mosow.
- Titov V.S. 1988. *Evropa v kamennom i bronzovom veke. Istoria Evropy*.
- Usmanova E. R. 2010. *Kostyum zhenshchiny epohi bronzy*. Karaganda.