

PRESERVATION AND PROSPECTS FOR THE MUSEIFICATION OF THE NATURAL HERITAGE SITE “GUSSINYI PERELET”

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The protection of cultural and natural heritage is one of today's most pressing concerns. It is a global problem, as evidenced by international documents tackling the subject, and is inseparable from the study of the use of heritage objects and areas in modern society. In accordance with the Convention Concerning the Protection of the World Cultural and Natural Heritage (adopted at the 17th session of the General Conference of the United Nations in Paris, November 1972) cultural heritage is considered to include monuments, groups of buildings and noteworthy sites (works of man or the combined works of man and nature), including archaeological sites which are of outstanding universal value from a historical, aesthetic, ethnological or anthropological viewpoint. Natural heritage is considered to include natural features, geological and physiographical formations, and natural sites of outstanding universal value from the point of view of science, conservation or natural beauty. In the United Nations Charter *In Support of Culture* (adopted in Thessaloniki in June 1997) heritage is defined as the totality of natural and cultural elements, tangible and intangible.¹

The importance of cultural and natural heritage necessitates careful analysis of the threats and challenges posed to it by the modern world. The most effective ways to make use of heritage also require further study. There are several provisions based on the concept of use of heritage:

- Cultural and natural heritage is fragile, defies renewal and is an irreplaceable source of culture;

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¹ <http://whc.unesco.org/archive/convention-ru.pdf>, accessed 30 June 2014.

- The protection of this heritage should not be based on the application of only one method, such as excavations. This can lead to the destruction of cultural and natural heritage.

Current trends in the field of cultural heritage conservation are for preservation, restoration, reconstruction and museification (also written as museumification).

Museification allows the preservation and use of heritage for cognitive tourism, and is a typical model in many countries. With sites situated far enough from areas with high technogenic load, conservation and museification can be designed in such a way that the site or monument is preserved in its natural environment. Designs for the preservation of sites and monuments within the boundaries of industrial centres require a careful selection of appropriate solutions for conservation and use.

In this article, the authors propose a strategy for the conservation of natural heritage using the example of a palaeontological site of national importance known as “Gussinyi Perelet” (the “Goose Passage”). This site is located in the city of Pavlodar, a large industrial centre in Kazakhstan. Urban construction has already encroached upon the boundaries of the site, and progresses without consultation of academic experts. Due to shoreline development on the banks of the Irtysh River, anthropogenic influences have greatly affected its condition.²

Gussinyi Perelet is one of the largest and best-known localities in Eurasia for the assemblage of fossils known as the hipparion fauna. The site was discovered in 1928 by Y. A. Orlov, a novice academic researcher who went on to become director of the Palaeontological Institute of the USSR Academy of Sciences. The location, in the riverside district of Pavlodar city, is a cliff spanning 800 meters of the right bank of the Irtysh River, upstream of the railway bridge.

The most typical representative of this collection of fossilised fauna is the animal after which it was named, the three-toed horse Hipparion. However, the range of large mammal remains found in this fauna is very diverse and includes predators, rhinoceroses, hipparions, antelopes, gazelles and deer. Among the small mammals, numerous endemic forms of gerbils dominate. Remains of ancient birds are also found amongst the Gussinyi Perelet fauna; thus far nine species from six different genera have been identified and presented. All these types of birds were ground-dwelling and lived in open landscapes. The collection of fossils indicates a significant drying climate due to desertification and a diversity of landscapes

² Aliyassova et al. 2005, p. 85-86.

characterised by open spaces, wetland thickets and small woodland areas. These natural conditions were similar to the modern African savannah.³

To date more than 70 species of animals have been found on the site, and still more are being discovered. The Hipparion fauna comprises giraffes (*Palaeotragus sp.* and *Samotherium sp.*), rhinoceroses (*Chilotherium orlovi*), sabre-toothed cats (*Machairodus Irtyshensis*), hyenas (*Crocota*), ancient mastodons (*Proboscidea*), ancient deer (*Gazella deperdita*), antelope (*Tragocerus*), ostriches (*Struthio asiaticus*), turtles (*Trionychidae*) and many other animal species.⁴ Hipparions - three-toed horses of the family Equidae - are not thought to be the direct ancestors of the later monodactylus horses, which include domestic horse (*Equus caballus L.*) but a distinct line. During the second half of the Neogene Period, several types of hipparion were spread across Kazakhstan. This gregarious species was separate from the smaller Central Asian donkey. It is believed that unlike modern horses Hipparion were longer-eared and may have had zebra-like colouration. Some Hipparion, according to the bone structure of their limbs, mainly kept to damp marshy meadows, but easily moved to other spaces with more solid ground, as shown by the patterning on the surface of their teeth which suggests they ate tough prairie grasses from drier plains. It is assumed that Hipparion, like many modern ungulates, as well as associated large mammals and some birds (ostriches), migrated seasonally from south to north and back again, according to dry seasons and the growth of vegetation. It is likely that in summer the northern part of Kazakhstan provided ideal conditions for the growth of mast and pastures, while grazing land to the south was scorched by drought.

The giraffes discovered amongst the hipparion fauna were did not have such long necks and legs as those now living in Africa: most were more similar to the okapi still found in the Congo Basin. Their favoured habitat was mixed woodland and savannah.

The antelopes were generally little different from modern representatives of this group of artiodactyls today, and were mainly found in the steppe zone. They included both large species - *Tragocerus* - and smaller gazelles.

One of the most impressive representatives of predators amongst the Hipparion fauna was the sabre-toothed cat, *Machairodus*, more commonly known as the sabre-toothed tiger, which likely hunted all the ungulates of that period, including mastodons. Another predator was the hyena: a strong and active animal, to which sabre-toothed cats were indispensable

³ Shpanskiy 2005, p. 314-317.

⁴ Ibid.

companions. Sabre-toothed cats, having underdeveloped molar teeth, could not chew meat and thus could only eat the soft innards of their prey, so a significant proportion of the meat they left behind went to the hyenas. Fossilised hyenas found at Gussinyi Perelet were similar in type to modern African spotted hyenas.

No less interesting a representative of this ancient fauna was the rhinoceros, *Chilotherium*. There are currently two hypotheses regarding their ecological niche. The first is based on the structure of the chewing surfaces of their teeth, which is characteristic of animals grazing on the tough grass of the steppe. Further support for this hypothesis is provided by the middle toe of their feet, which suggests adaptation to life in open plains. The second hypothesis suggests that based on their short legs these rhinoceroses dwelt in low wetland areas, and only later forms of this species were able to adapt to the open steppe. It is believed that these rhinos lived mainly in waterside areas and spent a major part of their existence close to or in water, much like modern hippopotamuses.

The evolution of the landscape and geography of the Priirtyshja region (in which Pavlovdar is located) had to be reevaluated in 1958 after V. V. Kuznetsov discovered a fragment of another continental plate typical of the coastal area containing a rather large turtle carapace in the Gussinyi Perelet sediments.⁵ Further research of this coastal plate identified the carapace as belonging to a type of sea turtle. This made a very interesting find: Gussinyi Perelet is a long way inland, yet the remains of sea turtles were discovered amongst the mammalian bones of the *Hipparion* fauna.

The discovery of marine fauna in a continental area is an unusual phenomenon, requiring explanation. There is reason to believe that in the era the *Hipparion* fauna roamed, the territory now known as Kazakhstan had a climate similar to modern subtropical regions such as India. It is possible that during seasonal floods or periods of torrential rainfall, small lakes situated in low areas of dry land may have spread and connected with each other, perhaps even connecting down to the sea, which was a considerable distance to the west of modern Priirtyshja. Under such circumstances, individual marine animals may have been able to penetrate beyond their usual habitat through these connected reservoirs or, under certain conditions, they may have been passively carried to such places. After the waters receded, their return passage would have been cut off. Some palaeontologists suggest that floods after heavy rains could have been so powerful that they engendered turbulent flows that washed slow and weak animals into lowlands and temporary pools. There could also have

⁵ Kuznetsov 1958, p. 69-71.

been other natural flows of turbulent water that carried these animals into the main course of the ancient river.

A special place amongst the Hipparion fauna is reserved for a type of pinniped (seal) - the semantor - which has only ever been found amongst the fauna of Gussinyi Perelet. The find again begs the question of how this animal penetrated such a long way inland. Most likely, it originated where the delta system flowed into the sea, and it is possible that it migrated in the same way as the sea turtles.

Some scholars have naturally questioned whether the remains of sea turtles and semantora might have been redeposited as a result of destructive Neogene floods and other natural processes, causing the bones of marine animals to become mixed with terrestrial ones. This, however, is not supported by the evidence, as it is known that in the process of redeposition, older sediments tend to undergo significant processing, becoming rolled-up as a result of displacement, which has not been observed in this case. Thus, the presence of marine animals such as pinniped semantora and sea turtles can only be due to the fact that the river was at some point linked to the sea.

In general, however, the hipparion fauna are typically creatures that dwelt in lake and river areas in a savannah landscape.

There are thousands of items of skeletal material buried in the Neogene sand-clay depths of Pavlodar, and most are from ungulates that may have been victims of a natural disaster. The mass death could have resulted from a sudden flood caused by rains accompanied by a hurricane; a wildfire from a lightning strike in the dry summer, which spread across the steppe; or a long catastrophic drought in which animals died not only from lack of moisture and food, but attacked each other whilst crowding around the watering hole. Animals could also have been killed *en masse* by the flooding of the ancient river. Skeletal remains of fauna that lived along its shores were periodically washed away from meadows and rivers banks, and accumulated in depressions that later formed lens-shaped deposits of bone.⁶

The banks of small ponds in the Pavlodar region became burial places where half-decayed remains of dead animals were periodically covered in mud. It is interesting to note that about 80% of the hiloteriya rhinoceros bones discovered there belong to young animals. This is a possible consequence of temporary droughts which killed off younger animals that were less able to tolerate lack of water. Flooding could have caused further burial, but would not have been the cause of death: animals are killed by floods tend to be buried with their skeletons more-or-less intact, and

⁶ Orlov 1989, p. 43-44.

excavations have revealed no such finds: skeletal remains of individual bones are the most common.

In the geological time period in which the Hipparion fauna lived, their Siberian habitat is known to have contained many plants and a variety of mammals. From this it can be inferred that the vast territory of Western Siberia and Kazakhstan had a fairly mild climate and a wide variety of terrain.

Opinions amongst authors differ as to the age of the site, based on the palaeomagnetic data. Some consider it to be of the Gilbert chron (5.4-5.5 Ma), i.e. Upper Miocene (end of the Meotian stage), a view held by P. A. Tleuberdina. However, according to V. S. Zazhigina, three samples of clay taken from the Gussinyi Perelet site correspond to the sixth palaeomagnetic age (5.8-6.8 Ma).

The first major research was conducted at Gussinyi Perelet by the Institute of the Academy of Science of the USSR from 1929 and throughout the 1930s. Discovery of the Gussinyi Perelet palaeontological site, with its wealth of animal fauna of Neogene period (estimated to date from 25 to 2 million years ago) drew palaeozoologists from across the Soviet Union to the Irtysh Pavlodar region, but unfortunately all the palaeontological material they unearthed was removed from Pavlodar. At that time, the city had no scientific organisation which could have handled the research or preservation of palaeontological remains. Many palaeontological findings of that time were therefore incorporated into the collection of the Zoological Institute of the Academy of Sciences of the USSR.

The 1930s were the main period of active palaeontological research in the Pavlodar region. On the basis of materials collected during this period, a room was created in the Museum of Palaeontology of the USSR dedicated Pavlodar excavations, displaying skeletons of rhinoceroses and other animals taken from Gussinyi Perelet. Since 1946, Kazakh scientists have been studying the area of "Gussinyi Perelet" in detail.

In the early 1950s, the media began to speak of the great scientific and historical value of palaeontological burial grounds and the importance of their preservation, an issue that remains relevant to the present day. The question of the need to protect the site has been raised repeatedly by the scientific community. In 1956, the *Bulletin of the Academy of Science of the Kazakh SSR* and the *Kazakhstan Pravda* newspaper published articles by V. S. Bazhanov about the need to protect palaeontological monuments, and in particular Gussinyi Perelet.⁷ The Commission for the Conservation of

⁷ Bazhanov 1956, p. 15.

Nature, under the President of the Academy of Sciences of the Kazakh SSR, wrote to the director of the Pavlodar regional museum stating: “It is clear that Gussinyi Perelet must be declared a nature reserve and protected from despoliation.”

Excavations at Gussinyi Perelet have been conducted on numerous occasions and the results highlighted in the writings of palaeontologists A. A. Borisyak, Y. A. Orlov, V. S. Bazhanova, L. K. Gabunia, E. M. Belyaeva, V. I. Gromova, B. U. Bayshashova, P. A. Tleuberdina, L. A. Gaiduchenko, and many others.

In terms of the diversity of species found and the excellent condition of their bones, Gussinyi Perelet is considered to be among the top twenty palaeontological sites of the world. The unique set of fauna found in the Pavlodar complex is considered an international benchmark. It is difficult to overestimate the importance of the Gussinyi Perelet finds as a reference for and model of the Hipparion fauna of Siberia and Kazakhstan. The huge variety of vertebrate species allows for a broad comparison with Asian and European sites of Hipparion fauna.

The incision at the site reveals the following basic sediments:⁸

1. Light-green, massive plastic clay with interbed of white lumpy limestone and dark humus lenses, lying below the water line.

2. Ocher-yellow, medium-size granular sands with foreland, undulate-horizontal cleavage; lenses of loam 8-10 m.

3. Faltering lenses of small- and medium-sized granular, clayey sands with pinkish-grey marlaceous concretions, sometimes reaching up to 1 m (cave deposits with the bones of small animals).

4. Red-brown clay with layers of greenish-brown dense sandy clays, sometimes turning into dense sandy loam. The lower part of the interval, where the main bone-bearing horizon lies (containing bones of large animals) is more saturated with calcium carbonate. Up to 9 m.

5. Anthropogenic sands of medium brown-yellow colour 1-3 m.

(Analysis of the geological composition of the incision is based on data published by P. F. Savinova⁹ and L. L. Gaiduchenko¹⁰.)

On 7 December 1971, Gussinyi Perelet was declared a scientific site of national importance and was taken under state protection.¹¹ Excavations of the burial site could subsequently be carried out only with the permission of the Institute of Zoology of the Academy of Science of the Kazakh SSR.

⁸ Baishashov 1993, p. 21.

⁹ Savinov 1970, p. 91-134.

¹⁰ Gaduchenko 1976, p. 150.

¹¹ SAPO 1971, p. 118.

In 1979, this institution, along with the Central Council of the Kazakh Society for Nature Conservation, launched an initiative to create an “open-air museum” at Gussinyi Perelet, with the aim of saving this ‘monument of nature,’ as part of the national heritage of Kazakhstan and home to a fauna archetype resembling the African savannah, with a variety of representatives of the land’s ancient animal kingdom. The project proposed recreating the landscape of that era in the area surrounding the site, including the erection of life-sized sculptures of these ancient animals.¹²

In 2002, on the initiative of scientists of the Pavlodar Pedagogical Institute, the issue of preservation of this unique natural site was again raised. A scientific group was established involving experts from the Pavlodar Pedagogical Institute and the Institute of Zoology of the Ministry of Education and Science of the Republic of Kazakhstan. The group began to develop a work plan for the creation of an excavation pavilion to cover the palaeontological site, and a park area adjacent to the site. The pavilion would have to ensure the safety of the main outcrops of the bone layer, preserving it in its natural form, and also include auxiliary facilities, a museum gallery and a research centre for the study of Late Cenozoic vertebrates.

Around the world, there are many and varied examples of the museification of natural heritage sites of natural interest - museum-parks, museum-reserves and museum-territories. It is naive to think that all national heritage sites must be made into museums. They must be treated individually, taking into consideration their uniqueness, accessibility, entertainment potential and much more.

So before the idea of turning a natural heritage site such as Gussinyi Perelet into a museum is made a reality, a number of issues must be considered:

1. Condition of the monument or site. In most cases, the main determining factor in the state of the site is the influence of the geological environment, which has a role in both maintaining and destroying various elements of the site. Thus it is necessary to seek options for competent reconstruction, conservation and museification, especially since during excavations the established conditions may be changed for a long period, which can sometimes trigger unprecedented and rapid destruction.

In over eight decades since the first excavations, Gussinyi Perelet has undergone great changes. Major riverbank collapses have occurred repeatedly under the pressure of meltwaters, floods and sewage.

¹² Issabekov 2008, p. 24.

Furthermore, the grounds of the monument, due to the proximity of residential buildings, are constantly clogged with household debris.

2. Composition, conditions and properties of soils. When undertaking musefication, it is necessary to consider the composition, condition and properties of soils. Due to natural variation, not all soils meet the requirements for a site with a long and trouble-free existence. Any decisions on the design of a heritage site must be based on a geo-engineering study of geological conditions that may affect the way it functions.

3. Selection of optimal solutions. Construction of an open-air museum should take into account the scientific value of the site. In recent years, the bone-bearing layers in the pits have not been studied. In order to preserve the palaeo-osteological material, it is necessary to investigate the location in detail, especially to determine the location of bone-lenses. If this is not done, there is a serious risk that the sinking of piles for the foundations of any building will destroy undiscovered bone-lenses, causing many osteological materials to be forever lost to science. Thus before construction of the pavilion and park begins, it is necessary to carry out excavations and research the site thoroughly.

Along with this, the question of the expediency of a closed excavation pavilion must be decided. Creating such pavilion would involve annual excavation works after a few years. After all, it is not possible estimate the vast wealth of palaeontological material the site holds if the location of bone lenses are unknown. Furthermore, it would be better not to create excavation and exhibition hall for showing excavated material to the public because it risks destroying bones and other materials from the natural heritage site.

The process of turning a natural heritage site such as Gussinyi Perelet into a museum should be based on the following criteria: its historical and scientific significance, the safety and accessibility of the site for visitors, and the need for long-term preservation of the site in a state fit to be exhibited, from both an engineering and an aesthetic standpoint.

A further aspect of the conservation of cultural and natural heritage is reconstruction. This method is relevant to the creation of parkland adjacent to the monument area, as it is important for the discovery and understanding of the environmental conditions of past geological epochs, and for emotional transmission of Neogene period existence to visitors. Such a park would become a place of learning and leisure, facilitating in-depth cognitive tourism.

One option for the protection of cultural and natural heritage is conservation. This option would involve the complete closure of the site in order to protect the integrity of the palaeontological materials stored in the layers of earth and permit further scientific study. All the material contained in the Gussinyi Perelet site would be excavated and studied. The banks of the Irtysh River would have to be strengthened with concrete. An information block would be set alongside the site. This option may not solve the problem of preserving the heritage site for some decades, but it has great prospects as an option in the process of turning the site into a museum.

Nowadays, in addition to the detailed study of any heritage site, it is necessary to consider its protection. Palaeontological sites simply cannot be protected without solid systems in place. Museification, and its associated systems, is one way to preserve heritage. To adequately protect the site, not only the two hectares of territory which constitutes Gussinyi Perelet, but the land nearby would be required. Thus far, conservation efforts around the site have been restricted to once-off actions, such as cleaning the area of household waste. Such activities are not only insufficient, they fail to change the precarious situation the site faces.

There is a clear need for a national program to implement measures to preserve the site, which is of national significance and great scientific value. In particular, several issues must be addressed relating to the problem of creating an open-air museum: defining the responsibilities of management; legislative implementation of the inventory; research, conservation, preservation, reconstruction and organisation of information; creating facilities for visitors; and training specialists involved in the protection of natural monuments.¹³

These measures will require large investment, but protection of this palaeontological site is very complex from a number of perspectives. Firstly, Gussinyi Perelet is located in a city - a rarity for such a site. Secondly, the proposed development would be the first such facility in the country, and will provide a unique attraction not only for the city of Pavlodar, but also for Kazakhstan as a whole, embodying the idea of a science museum in the open air where visitors can experience a science-based recreation of the unique palaeolandscape of the era of the Hipparion fauna. Thirdly, through exposure to materials excavated from the site and sculptures of Neogene period animals in the park, new opportunities will be opened up in the field of tourism and leisure, relevant even at the international level.

¹³ Patrusheva 2004, p. 121.

There are many examples of the preservation of monuments through museification, such as Tomsk Pisanytza, where Siberia’s earliest examples of rock art are located;¹⁴ the Archaeological Museum of Tunlyuyshanya, a museum on the site of a disused copper mine and smeltery in China¹⁵ (1700 m² in size and visited by thousands of tourists every day); Ashfall Fossil Beds State Historical Park in North America (where excavations attract thousands of tourists); and many other equally famous museum-reserves.

Palaeomaterial from Gussinyi Perelet can be seen in the collections of various institutions and museums not only in Pavlodar but Moscow, Almaty, Georgia and in private collections. The range of species found in the palaeofauna of Gussinyi Perelet is well known, but the scientific evidence presented thus far only gives a generalised description: the opening of new parts of the site to modern research may yet lead to the discovery of new species in this location. The historical and scientific significance of this site is still profound and a new approach is required to the problem of its study and conservation. It is essential to integrate and coordinate the efforts of scientists, palaeontologists and the public in conserving this unique palaeontological heritage site.

Museums of this type contribute greatly to the preservation and evaluation of local natural and cultural heritage, and also involve local residents and visitors in the conservation of heritage, contributing to a clearer awareness of their relationship with nature. The creation of this kind of natural heritage site opens up discussion about the development of a new system - the ecological museum - in the form of a specially protected area.

In the modern era of globalisation, economic crisis and social change occurring in the world at the beginning of the 21st century, it is necessary to change society’s attitude towards heritage. Cultural heritage should be seen as a national asset, and be guaranteed sustainable development. In today’s world, heritage is a fundamental concept in determining the viability of many aspects of modern society.

Preservation and Prospects for the Musefication of the Natural Heritage Site “Gussinyi Perelet”

(Abstract)

In this article, the authors propose a strategy for the conservation of cultural heritage using the example of a palaeontological site of national importance, Gussinyi Perelet (the “Goose

¹⁴ Martynova 2003, p. 11.

¹⁵ Khu 1986, p. 55.

Passage”) in Kazakhstan. In terms of the diversity of species found and the excellent condition in which the bones have been preserved, Gussinyi Perelet is among the top twenty famous palaeontological sites of the world.

The location, in the riverside district of Pavlodar city, is a cliff spanning 800 meters of the right bank of the Irtysh River, upstream of the railway bridge. The most typical representative of the fauna discovered there was the Hipparion, a three-toed horse. Other fauna found at the site include ancient giraffes, rhinoceroses, sabre-toothed cats, hyenas, mastodons, deer, antelopes, ostriches, turtles and many other animals.

Opinions differ amongst authors as to the age of the site, based on the palaeomagnetic data. Some consider it to be of the Gilbert chron (5.4-5.5 Ma), i.e. Upper Miocene (end of the Meotian stage). However, according to others, three samples of clay taken from the site correspond to the sixth palaeomagnetic age (5.8-6.8 Ma).

This article first presents background information about Gussinyi Perelet, a world-famous palaeontological site of great historical and scientific importance. The pressing issues of its conservation, study and protection are covered and various options for its preservation through conservation and museification are proposed. The problems of the museification of Gussinyi Perelet - especially the complexity of creating an open-air museum - are considered. Finally, the need for further study and careful preservation of this unique site of natural heritage is emphasised. Museums of this type are important sanctuaries, contributing to the preservation and evaluation of local natural and cultural heritage.

It is difficult to overestimate the importance of Gussinyi Perelet as a reference for and model of the Hipparion fauna of Siberia and Kazakhstan. The variety of vertebrate species allows for a broad comparisons with Asian and European sites of similar Hipparion fauna.

Bibliographical Abbreviations

- Aliyassova et al. 2005 - Valentina Aliyassova, Assel Shaikhimova, Sergey Titov, *Strategii sobraneniya pamyatnika prirody "Gussinyi Perelet,"* in *Sobranenie i ispolzovanie objectov kulturnogo i smeshannogo naslediya sovremennoi Centralnoi Azii*, vol. 1, Almaty, 2005, p. 83-87.
- Baishashov 1993 - Bolat Baishashov, *Neogenovye nosorogi Kazakhstana*, Almaty, 1993.
- Bazhanov 1956 - Vissarion Bazhanov, *Vremya poyavleniya gipparionov v predelakh Kazakhstana*, in *Vestnik Kazak*, 11, 1956, p. 15-18.
- Gaduchenko 1976 - Leonid Gaiduchenko, *Novye dannye o strause iz mestonabojdeniya "Gussinyi Perelet,"* in *Geologiya i geofizika*, 2, 1976, p. 149-150.
- Issabekov 2008 - Rizabek Issabekov, *Kto spaset "Gussinyi Perelet,"* in *Karavan*, 17, 2008, p. 24.
- Khu 1986 - Yun Khu, *Museu na territorii drevnego rudnika*, in *MUSEUM*, 150, 1986, p. 55-59.
- Kuznetsov 1958 - Vitaly Kuznetsov, *Morskaya cherepaha iz neogena Pavlodarskogo Priirtyshiya*, in *MIFFK*, 2, 1958, p. 69-71.

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- Martynova 2003 - Galina Martynova, *Muzei-zapovednik “Tomsk Pisanytsa” kak forma sovremennogo ispolzovaniya istoriko-culturnogo naslediya*, in *HN*, 1, 2003, p. 10-11.
- Orlov 1989 - Yuri Orlov, *Sibir i Africa (gipparionovaya fauna)*, in tutorial: *V mire drevnih zivotnykh*, Academy of Science of USSR, Moscow, 1961, p. 19-56.
- Patrusheva 2004 - Galina Patrusheva, *Novye rekomendacii po formirovaniyu muzeinykh complexov pod otkrytym nebom*, in *CIS*, 3 (14), 2004, p. 121-123.
- SAPO 1971 - *State Archive of Pavlodar Oblast. Assembly Government Resolution of the Kazakh Soviet Socialist Republic*, 23, 1971.
- Savinov 1970 - Peter Savinov, *Tushkanchikoye (Dipodidae, Rodentia) neogena Kazahstana*, in *MENP*, 1, 1970 p. 91-134.
- Shpanskiy 2005 - Andrey Shpanskiy, *Gipparionovaya fauna Pavlodarskogo Priirtysnya. Obzor stratigraficheskogo rasprostraneniya*, in *EZ*, 2, 2005, p. 314-331.

Keywords: musefication, natural heritage, palaeontology, Hipparion fauna, museum.

LIST OF ABBREVIATIONS

AA	- Acta Archaeologica. Copenhagen.
AAL	- Asien Africa Lateinamerika. Zeitschrift des Zentralen Rates für Asien-, Afrika- und Lateinamerikawissenschaften in der DDR. Berlin.
AAMT	- Advances in Archaeological Method and Theory. Orlando.
AAnt	- American Antiquity. Society for American Archaeology. Washington.
ABM	- Alaska Business Monthly. Anchorage.
Acta Asiatica	- Acta Asiatica. Bulletin of the Institute of Eastern Culture. Tokyo.
AO	- Arkheologicheskiiye otkrytiya (1965-2013). Moscow.
AOASH	- Acta Orientalia Academiae Scientiarum Hungaricae. Institute of Oriental Studies. Budapest.
AP	- Arkheologiya Podmoskov'ya. Materialy nauchnogo seminara. Institute of Archaeology Russian Academy of Sciences. Moscow.
ArchOttoman	- Archivum Ottomanicum. Wiesbaden Ottoman Archives. Wiesbaden.
Ars Judaica	- Ars Judaica. Bar-Ilan University. Ramat Gan.
Art-menedzher	- Art-menedzher. Business magazine considering culture and art as a resource for the social and economic development of society and offering various technologies and methodologies of management of this process. Moscow.
Bibliosphera	- Bibliosphera. The Siberian Branch of the Russian Academy of Sciences. Novosibirsk.
BKF	- Baltiiskii filologicheskii kurer. Immanuel Kant Baltic Federal University. Kaliningrad.
BM	- Byulleten' Moskovskogo obshchestva ispytateley prirody. Otdel biologicheskyy. Moscow Society of Naturalists. Moscow.
BMMS	- Byulleten Muzeya Marka Shagala. Marc Chagall Museum. Vitebsk.
Byilyie godyi	- Byilyie godyi. Sochi State University. Sochi.
CAn	- Current Anthropology. Chicago.
CHR	- The Canadian Historical Review. University of Toronto Press. Toronto.

CIS	- Culturologicheskie issledovania Sibiri. Omsk State University. Omsk.
Comparativ	- Comparativ. Leipziger Beiträge zur Universalgeschichte und vergleichenden Gesellschaftsforschung. Universität Leipzig, Global and European Studies Institute. Leipzig.
CRJ	- Classical Reception Journal. The Open University (UK). Oxford.
Den'gi	- Den'gi. Publishing House "Kommersant." Moscow.
EDV	- Ekonomicheskaya zhizn Dalnego Vostoka. Geographic Society. Khabarovsk, Amur.
EHQ	- European History Quarterly. University of London. London.
EJNH	- European Journal of Natural History. The Russian Academy of Natural History. Moscow.
Ethnos	- Ethnos. Journal of Anthropology. London.
Études/Inuit/Studies	- Études/Inuit/Studies. Association Inuksiutiit Katimajüt Inc. Québec.
EZ	- Evolucijazni na Zemle. Tomsk State University. Tomsk.
Femida	- Femida. Media Corporation "ZAN." Almaty.
Florilegium	- Florilegium. The journal of the Canadian Society of Medievalists. Ottawa.
Forsait	- Forsait. Higher School of Economy. Moscow.
Francia	- Francia. Forschungen zur westeuropäischen Geschichte, hg. vom Deutschen Historischen Institut Paris (Institut Historique Allemand). Paris.
Fundamental Research	- Fundamental Research. Russian Academy of Natural History. Moscow.
Genetics	- Genetics. Genetics Society of America. Bethesda (USA).
Genetika	- Genetika. Russian Journal of Genetics. Moscow State University. Moscow.
Geologiya i geofizika	- Geologiya i geofizika. Institute of Geology and Geophysics of the Siberian Department of the Science Academy in the USSR, Novosibirsk. Published by the Siberian department of the Science Academy in the USSR. Novosibirsk.
Gyanovashchya	- Gyanovashchya. Dnepropetrovsk State University. Dnepropetrovsk.
HN	- Hraniteli naslediya. Altay State Pedagogical Academy. Barnaul.
HZ	- Historische Zeitschrift. Johann Wolfgang Goethe-Universität Frankfurt am Main.
Karavan	- Karavan (newspaper). Almaty.
KAS	- Der Konrad-Adenauer-Stiftung - Auslandsinformationen. Berlin.

KPZ	- Kazanskij pedagogicheskij zhurnal. Institute of Pedagogy and Psychology. Kazan.
IAIAND	- Istoriko-arkheologicheskie issledovaniya v g. Azove i na Nizhnem Donu v 2006 g., Don.
Istoriografiya	- Istoriografiya i istochnikovedenie istorii stran Azii i Afriki. Leningrad State University. Leningrad.
Istoriya i sovremennost'	- Istoriya i sovremennost'. Moscow.
Izvestia Ugo	- Izvestija Ugo-Zapadnogo Gosudarstvennogo Universiteta. Kursk.
IzvSamarsk	- Izvestiya Samarskogo nauchnogo tsentra RAN. Samara.
JBAA	- Journal of the British Archaeological Association, British Archaeological Association. London.
Kulturnoe nasledie	- Kulturnoe nasledie. Altai State University, Altai Territory, Barnaul.
Lesnoi Zhurnal	- Lesnoi Zhurnal. Izvestiia Vysshikh Uchebnykh Zavedenii. Bulletin of Higher Educational Institution. Arkhangelsk.
LKK	- Literatura i kultura v Kitae. Moscow.
LSJ	- Life Science Journal. Acta Zhengzhou University Overseas. Zhengzhou University. New York.
JAMT	- Journal of Archaeological Method and Theory. New York.
JAR	- Journal of Archaeological Research. Journal of Archaeological Research. New York.
JISV	- Jekonomicheskie i istoricheskie issledovaniya na Severo-Vostoke SSSR. Economic and historical research in the North-East of the USSR. Magadan.
KT	- Kazakhskaya tsivilizatsiya. University Kaimar Almaty. Almaty.
Marketing	- Marketing. Centre for Marketing Research and Management. Moscow.
MBD	- Molodyye v bibliotechnom dele. Youth in Library Science. Moscow.
MEJSR	- Middle-East Journal of Scientific Research. International scientific journal published by the international digital organization for scientific information (IDOSI).
Memoirs SAA	- Memoirs of the Society for American Archaeology. Society for American Archaeology. Washington DC.
MENP	- Materialy po evolyucii nazemnykh pozvochnykh. Moscow.
MIA	- Materialy po istorii i archeologii SSSR. Moscow, Saint Petersburg.
MIFFK	- Materialy po istorii fauny i flory Kazahstana. Kazakhstan.

Mir bibliografii	- Mir bibliografii. Moscow.
Mir obrazovaniya	- Mir obrazovaniya - obrazovanie v mire. Scientific-Methodological Journal. Moscow Psychology and Sociology Institute. Moscow.
MNKO	- Mir Nauki, Kul'tury, Obrazovaniya. Gorno-Altaysk.
Molodezh' Tatarstana	- Molodezh' Tatarstana. Newspaper. Kazan.
MUSEUM	- MUSEUM. UNESCO.
Narodnaya shkola	- Narodnaya shkola. Saint Petersburg.
Nauchnoye obozreniye	- Nauchnoye obozreniye, series 2, Gumanitarniye nauki. Lomonosov Moscow State University. Moscow.
Nauch.-tekhn. Inform	- Nauchnaya i tekhnicheskaya informatsiya. Russian Academy of Sciences. Moscow.
Naukovedeniye	- Naukovedeniye. Institute of History of Natural Sciences and Technics named after S. I. Vavilov of the Russian Academy of Sciences. Moscow.
Neues Leben	- Neues Leben [newspaper]. Berlin.
NIV	- Novyy istoricheskiy vestnik. Obshchestvo s ogranichennoj otvetstvennost'yu "Izdatel'stvo Ippolitova." Moscow.
NKOGK	- Obshchestvo i gosudarstvo v Kitae: XXXIX nauchnaia konferentsiia. Moscow.
NNZ	- Novgorod i Novgorodskaya zemlya. Istoriya i arkhologiya. Veliki Novgorod.
Novosti	- Russian News Agency "Novosti." Moscow.
NT	- Nauchnyi Tatarstan. Academy of Sciences of the Republic of Tatarstan. Kazan.
NTB	- Nauchnyye i tekhnicheskiye biblioteki. The State Public Scientific and Technical Library Russia. Moscow.
Odyssey	- Odyssey. Russian Academy of Sciences, Institute of Universal History. Moscow.
ONS	- Obshchestvennuyye nauki i sovremennost. Russian Academy of Sciences. Moscow.
OT	- Otechestvennyye zapiski. Saint Petersburg.
Panorama iskusstv	- Panorama iskusstv. Sovetskii khudozhnik. Moscow.
Pervye amerikancy	- Pervye amerikancy. First Americans (Almanac). Russian Society of Indianists. Saint Petersburg.
PGI	- Problemi Gumanitarnih Issledovaniy. Russian State Institute for Regional Issues in Northern Caucasus. Pyatigorsk.
Polar Record	- Polar Record. A Journal of Arctic and Antarctic Research. Scott Polar Research Institute. Cambridge (UK).
Politische Wissenschaft	- Politische Wissenschaft. Deutsche Hochschule für Politik Berlin.

Polzunovskiy vestnik	- Polzunovskiy vestnik. Altay State Technical University. Barnaul.
Pozdneplejstocenovye	- Pozdneplejstocenovye i rannegolocenovye kul'turnye svyazi Azii i Ameriki. Institute of History, Philology and Philosophy. Novosibirsk.
Prizrenie	- Prizrenie i blagotvoritel'nost' v Rossii. Izdanie Vserossijskogo sojuza uchrezhdenij, obshhestv i dejatelej po obshhestvennomu i chastnomu prizreniju. Saint Petersburg.
Problemi filosofii	- Problemi filosofii. Presidium of the Russian Academy of Sciences. Moscow.
Proceedings Volgograd	- Proceedings of the Volgograd State Pedagogical University. Volgograd.
PsZ	- Psikhologicheskij zhurnal. Institute of Psychology of the Russian Academy of Sciences. Moscow.
PT	- Perspectives on Terrorism. The Terrorism Research Initiative (TRI) headquartered in Vienna, and the Center for Terrorism and Security Studies (CTSS) headquartered at the University of Massachusetts' Lowell campus. Massachusetts.
RA	- Rossiiskaia Arkheologiya. Moscow.
Reka vremen	- Reka vremen. Moscow.
Rivista di Bizantinistica	- Rivista di Bizantinistica. Bologna.
RossEconom	- Rossiski ekonomicheski jurnal. International Academy of Business and Management. Moscow.
Rossiyskaya Gazeta	- Rossiyskaya Gazeta. Russian government daily newspaper. Moscow.
SA	- Sovetskaja Arkheologija. Institute of Archaeology, Russia, Moscow. Moscow.
SC	- Sviyazhskie chteniya. Sviyazhsk.
Scientometrics	- Scientometrics. Akadémiai Kiadó. Budapest.
Serdalo	- Obschenacionalnaya gaseta Respubliki Ingushetiya "Serdalo." Nazran.
SGV	- Saratovskie gubernskie vedomosti. Saratov.
Shagalovskii sbornik	- Shagalovskii sbornik. Marc Chagall Museum. Minsk.
SI	- Sociologicheskiye issledovaniya. Science Institute of Sociology of the Russian Academy of Sciences. Moscow.
Soziale Geschichte	- Soziale Geschichte. Zeitschrift für historische Analyse des 20. und 21. Jahrhunderts. Bremen.
Spectrum	- Spectrum. The Kazakhstan Institute for Strategic Studies. Astana.
SS	- Sibirskaya stolitsa. Tobolsk State Historical and Architectural Museum-Reserve. Tobolsk.

SSM	- Social Sciences and Modernity. The Presidium of the Russian Academy of Sciences "Science." Moscow.
SV	- Sovremennaya filologiya. Ufa.
SZ	- Sociologicheskiy zhurnal. Moscow.
Tarih Dergisi	- Istanbul Üniversitesi Edebiyat Fakültesi Tarih Dergisi. Istanbul.
TKA	- Tulski kraevedchesky almanah. Tula.
Tradizionnaya kultura	- Tradizionnaya kultura. An academic almanac representing the perspective direction in complex study of ethnoculture: national outlook, pedagogics, life, mythology, customs, ceremonies, poetry and music. Moscow.
Trudovaya pomoshch'	- Trudovaya pomoshch'. Izdanie Popechitel'stva o trudovoj pomoshhi. Saint Petersburg.
Vestnik AAJ	- Vestnik arheologii, antropologii i jetnografii. Institute of Problems of Development of the North, Russia. Tyumen.
Vestnik Chelyabinsk	- Vestnik Chelyabinskogo gosudarstvennogo universiteta, Istoriya. Publishing house of Chelyabinsk State University. Chelyabinsk.
Vestnik Chuvashskogo	- Vestnik Chuvashskogo gosudarstvennogo pedagogicheskogo universiteta im I. Ya. Yakovleva. I. Y. Yakovlev Chuvash State Pedagogical University. Cheboksary.
VestKrasno	- Vestnike Krasnoyarskogo gosudarstvennogo pedagogicheskogo universiteta imeni V. P. Astafeva. Krasnojarskiy gosudarstvennyj pedagogicheskij universitet im. V. P. Astafeva. Krasnojarsk.
Vestnik Kazak	- Vestnik Akademii nauk Kazakhskoy SSR. Academy of Science of the Kazakh SSR. Kazakhstan.
Vestnik RAN	- Vestnik Rossiyskoy Akademii Nauk. Russian Academy of Sciences. Moscow.
Vestnik Samara	- Vestnik Samarskogo gosudarstvennogo universiteta. Samara State University. Samara.
Vestn Tomsk Gos Univ.	- Vestnik Tomskogo gosudarstvennogo universiteta. Kul'turologiya i iskusstvovedeniye. Bulletin of Tomsk State University. Tomsk.
Vestnik Semej	- Vestnik gosudarstvennogo universiteta imeni Shakarima goroda Semej. Shakarim State University of Semej.
Vestnik Ufa	- Vestnik Vostochnoy ekonomiko-yuridicheskoy gumanitarnoy akademii. East Economic-Legal Humanitarian Academy. Ufa.
Vestnik VyatGGU	- Vestnik Vyatskogo gosudarstvennogo gumanitarnogo universiteta: Vyatka State University of Humanities. Kirov.

Vizantiysky vremennik	- Vizantiysky vremennik. Institute of General History of the Russian Academy of Sciences. Moscow.
Voprosy Istorii	- Voprosy Istorii. Russian academic journal for historical studies. The Institute of Russian History of the Russian Academy of Sciences. Moscow.
Voprosi Literaturny	- Voprosi Literaturny. Writer's Union of the USSR. Moscow.
Voprosy filosofii	- Voprosy filosofii. Russian Academy of Sciences. Moscow.
VTP	- Istoricheskiye, filosofskiy, politicheskiye i yuridicheskiye nauki, kul'turologiya i iskusstvovedeniye. Voprosy teorii i praktiki. Tambov.
WASJ	- World Applied Sciences Journal. International Digital Organization Scientific for Information "IDOSI Publications" UAE. Dubai.
Zapiski	- Zapiski Vostochnogo otdeleniya Russkogo arkhologicheskogo obshchestva. Archaeological Society. Saint Petersburg.
ZDMG	- Zeitschrift der Deutschen Morgenländischen Gesellschaft. Berlin Magazine of the German East Society. Berlin.