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ON STRATIFICATION GEOMORPHOLOGY AND EARLY PALAEOLITHIC MONUMENTS IN THE ARID ZONE OF KAZAKHSTAN

The territory of Kazakhstan is located between large geographical divisions in the Eurasian continent, coinciding to a certain extent with the historical and cultural areas of Eastern Europe and Central Asia. This makes issues related to the Palaeolithic in Kazakhstan globally important and going far beyond the region.

Key words: *accumulation, aridisation, artefact, geomorphology, denudation, culture, migration, Palaeolithic, Pleistocene, territory, topography.*
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ONE of the urgent fundamental academic problems in Kazakhstan is the initial occupation of the territory by man. The palaeogeographic conditions that formed in the second half of the Upper Pliocene were prerequisites for the appearance of the most ancient hominids on the territory of Kazakhstan. The earliest traces of habitation recorded on a vast territory from the African continent to Siberia testify to a fairly extensive spread of primitive hominids over the area. It is now clear that 1.5-1 million years ago, hominids already lived in similar ecological conditions in the open spaces of the Caspian Sea, in the Turanian deserts, in Mongolia and northern China. The palaeogeographic conditions of the Pliocene suggest that the Asian plains with relatively low mountains and good climate could contribute to their rapid migration far to the north. Kazakhstan, Mongolia and northern China, were apparently the northern regions of the oecumene (*Taymagambetov* 1993).

In recent years, we have discovered and studied hundreds of Stone Age sites dated from the Upper Pliocene to the Holocene. Many of them are complex and show signs of a very long stay of ancient hominids in the same geomorphological positions, often for hundreds of thousands of years. The diverse and informative Palaeolithic archaeological material from Kazakhstan makes it possible to discuss the time of the initial development of this territory by man since ancient times, as well as the interaction between the autochthonous and allochthonous cultures of the Stone Age.

The only stratified Koshkurgan-Shoktas Palaeolithic complex is a kind of link between the west and east of Eurasia in the Mindel.

The vast territories of Kazakhstan, certainly, played a most important role as intermediate areas, crossed by ancient people on their migration from the south to the north and from the east to the west, and vice versa, which predetermined the early occupation of these areas by man.

Approaches to analysis of monuments in the arid zone:

A strongly arid country, Kazakhstan has very weak Pleistocene loose deposits. Due to this circumstance, most of the complexes of Palaeolithic industries lie on the surface. This makes the methodological aspect of the study of open-type monuments and the analysis of stone goods particularly important.

The work by Korobkov (1971) is dedicated to the methods of studying monuments with a layer of deconstruction. Some approaches are reflected in works by Litvinsky, Okladnikov, Ranov (1962), Ranov (1965), Derevyanko, Petrin (1989), Amirkhanov (1991) and other researchers.

In the arid zone, the development of the cultural deposit was impossible in most monuments, which is why the same surface has accumulated traces of human activity for thousands and hundreds of thousands of years. Complexes from different periods

have been found in most of the monuments, and they occupy huge areas. We consider that, to describe the situation, the concept of a 'surface cultural horizon' proposed by Petrin (1991) is more acceptable than 'monuments with a layer of deconstruction.

Monuments with a 'surface cultural horizon' are characterised by the following features:

1. cultural remains lie on the surface;
2. mixture of cultural remains from different periods;
3. remains of bones, fires and other household items are practically absent;
4. stone goods prevail among other categories of findings.

As can be seen, the method of studying stone goods becomes particularly important. The primary indicator is the preservation state of the surface, with the type and quality of the raw materials taken into account. There are several factors responsible for the destruction of the surface:

1) mechanical erosion – corrosion, desquamation;

2) chemical erosion – dissolution, hydration, hydroxydation;

3) biological erosion – affecting by living organisms, mosses and algae. Analysing the stone industry, it is extremely important to specify the context of monuments by the nature of human activity. For the arid zone in Kazakhstan, the most characteristic are monuments that can be called workshops associated with human settlements and sites.

The approach to the study of the stratified Koshkurgan-Shokta complex is no different from the method used in the excavation of ordinary Palaeolithic burial monuments.

Some early Palaeolithic monuments from 'surface deposits':

Thanks to the research activities by Kh. A. Alpysbayeva and A. G. Medoyeva, many early Palaeolithic sites in Kazakhstan became famous in the 1950s-1970s, including Borykazgan, Tanirkazgan, Akkol (*Alpysbayev* 1979), Semizbugu, Shakhbagata (*Medoyev* 1982) and many others.

The transitional areas are characterised by fragmentation and sporadicity of events and phenomena. Thus, the Palaeolithic in the Karatau Range shows at least two evolutionary lines. The first one is typical of the cuestas of the Little Karatau Range and is based on almost black massive flints (Borykazgan, Tanirkazgan, Kyzyltau and others). The most ancient archaeological sites are associated with the tops of the cuestas – sky islands, remains of the once extensive original surface of a peneplain. Later sites – Mousterian and late Palaeolithic – are located at the foot of the cuestas and show a big chronological gap with the early Palaeolithic ones. (*Alpysbayev* 1979)

In the Shabakty area, two bifaces were found on the flat surface of an elongated sky island, among archaic flakes of the so-called Clactonian type similar to ones from Arystandy. One of the bifaces, triangular in shape, is made of greyish green siliceous limestone; its operating end is flaked on both sides and has thus the form of an arc-shaped sharp blade. The other one, oval in shape, resembles a heavy side scraper. Two more tools characteristic of this time were found. One of them is similar to rough African chopping tools with a wide operating edge and is made of a large pebble. Its arched convex operating part was pointed by chopping off large flakes on both sides; the opposite end is not worked. The other item is made from a piece of a nodule split in half. One of its edges was sharpened by chopping off large flakes, which makes the tool look like a plain biface. (*Alpysbayev* 1979).

Sites in the Borykazgan and Tanirkazgan areas are dated to the early Acheulean period. Four groups of items representing the main types of stone industry practised by primitive people that inhabited the Karatau Range were found on those sites, within a clearly isolated accumulation of cultural remains. These are rough chopping tools, uni- and bifacial, Acheulean-type bifaces with carefully processed operating blades, heavy Clactonian-type flakes and large – amorphous nodules – nuclei. All of them are strongly eroded and patinated. Similar sets of stone tools are found on other sites near Lake Akkol (*Alpysbayev* 1979).

The joint Kazakh-Russian archaeological expedition discovered numerous sites and workshops in Kazakhstan – in the Karatau Range in the south and on the Mangyshlak Peninsula and in Mugalzharakh in the west (*Derevyanko* et al. 2003)

The discovery of unique Palaeolithic complexes in Kyzyltau, southern Kazakhstan, was also very important. This part of the north-eastern slope of the Karatau Range is a denudation hilly and ridged plain with a complex of low, but pronounced stepped cuestas, slope surfaces and apron surfaces. This region is a type of arid zone in Kazakhstan where objects lie on the surface, with artefacts forming a solid cover over large areas and confined to certain forms of relief. Items may number many hundreds of thousands over areas of several square kilometres. Naturally, in huge stationary locations like this it may be problematic to clarify real and suggestive boundaries between individual sites, the projection of their materials on the ground surface, the linear movement of artifacts within the micro-landscape of the area, taking into account its plane, steepness and contrast, the division of items from various periods into separate groups and so on. It is obvious that research methods and their application in this or that area depends on specific conditions and the degree of their preservation.

The objects in Kyzyltau are far from equal. The materials found there are specific to various heights of cuesta-like elevations (4-5 levels), sloping surfaces, aprons, gullies and depressions (*Derevyanko* et al. 2007).

Importantly, the sites in Kyzyltau are not only very ancient, but also feature a unique concentration of artefacts. There are dozens of sites where cultural layers lie very close to the surface, and require further careful mapping. On some sites hundreds of square metres in area, up to 300-400 items can be found in $1m^2$, which places these Palaeolithic complexes apart from their kinds, even outside Kazakhstan.

By the degree of their corrosion, these artifacts can be divided into four chronological groups. The first two groups are particularly important for the solution of the question of the earliest man in Kazakhstan (*Derevyanko* et al. 2007).

The situation in western Kazakhstan is the same. The Shakhbagata site was discovered by A. G. Medoyev in Mangystau region. The collections of the proto-Levallois-Acheulean culture were obtained from a ravine with the Shakhbagata well and with fragments of the fourth floodplain terrace of the Shakhbagata valley. Single examples were extracted from under a loose cover over the abrasion marine terrace. The main raw material for the production of tools were layers and lenses of chalcedony, which come in large quantities to the surface in the sides of valleys and marine terraces (*Medoyev* 1982).

Composition of the proto-Levallois-Acheulean culture: nuclei of the proto-Levallois-Acheulean type; large and heavy Levallois spalls (mainly rectangular flakes); various bifaces from marginal flakes chipped along the edges; axes made with a bidorsal technique; axes from flakes; flakes made with a biventral technique, which are finished axes that have received almost zero additional processing; other items. Two artefacts made of sea pebbles – a chopper and chopping tool – deserve a special attention. The items are 'strikingly similar to the tools of the Olduvai culture' (*Medoyev* 1982). It is possible that it presents a mixture of the 'Olduvai' and ancient Acheulean cultures.

It is important to note that the eastern arid coast of the Caspian Sea, unlike the western one, has one unique feature: the limestones forming it are literally permeated with specific rocks – flint breccias, which served as sources of raw materials for primitive tools.

Early Palaeolithic complexes were found not only on the Ustyurt plateau in western Kazakhstan, but also in the Emba area on the western slopes of the Mugalzhar Mountains, as well as on the northern shore of the Aral Sea and Lake Balkhash. Numerous artefacts are found in the 'surface layers' and testify to the process of occupation of these areas by ancient man in the Pleistocene. (*Derevyanko* et al. 2003).

Our work, which continued for two seasons, resulted in the discovery and study of more than two hundred sites with surface deposits of artefacts. Dozens of artifacts per one square metre were on the sites in Mugalzhar and Mangyshlak, in the outcrops of ancient rocks and ancient material, where primitive people came to make tools for thousands of years.

At most sites in the northern portion of the Balkhash area, in particular, in Semizbugu, stone tools form a solid uncovered and undisturbed layer and dated to various periods of the Stone Age, from the Acheulean to the late Palaeolithic inclusive. The reason for that was that during the middle and late anthropogenic period, the climate of the northern part of the Balkhash area did not change strongly, and primitive communities of people from one period settled in the most convenient places, often chosen by their distant predecessors. The formation of the cultural layer, by which monuments of different eras are usually distinguished, was counteracted in these areas by intensive erosion and weathering. Only the xerothermic climate that set in there in the final phase of the late Palaeolithic made people leave the once water-abundant and blooming valleys of the northern part of the Balkhash area (*Derevyanko* et al. 1993).

Numerous Stone Age sites identified in the vast expanses of Eurasian deserts, semi-deserts and steppes are dated from the Upper Pliocene to the Holocene. Open (ground) type sites form an absolute majority among the Palaeolithic monuments of the arid zone, which is characteristic of the period. Many of them are complex and show signs of a very long stay of ancient hominids in the same geomorphological positions, often for hundreds of thousands of years.

Most of the currently known Palaeolithic sites in Kazakhstan are represented by artefactual (liftable) materials. This is the result of the natural and climatic conditions of the studied region, in particular, the predominance of denudation processes over accumulation processes. In this connection, archaeological material was accumulated for a long time on one surface. As a result, complexes from different periods gradually mixed within one site. Such monuments, where mixed archaeological materials from different periods lied outside loose deposits, were united by a common concept of 'monuments with surface artefactual deposits' (*Derevyanko* et al. 2002; *Artyukhova* et al. 2001).

As a rule, archaeologists were sceptical about the sites with surface artefactual deposits, considering these monuments to be informatively inferior and insufficiently reliable in comparison with stratified complexes. But with all their disadvantages, the sites with artefactual materials do not only complement collections of stone artefacts from stratified monuments, but are also independent and largely unique

Fig. 1. Paleolithic site of Shahbagata. Occurrence of artifacts

objects with a complex structure and abundant and specific material reflecting certain historical stages. That is why Palaeolithic monuments with 'surface artefactual deposits' are so important for the study of earliest stages of human settlement in Kazakhstan and Central Asia.

Therefore, the periodisation of the Palaeolithic in Kazakhstan is complicated by the superficial occurrence of the earliest complexes, and therefore they are very hard to date. Nevertheless, there are a number of criteria that make it possible to fairly objectively compare many sites with each other. But in any case, a reliable and indisputable periodisation of the Palaeolithic and a resultant answer to the question of the time of the initial human occupation of Kazakhstan can only be obtained on the basis of a comprehensive study of well-stratified Palaeolithic sites. This is why the only stratified monument of the early Palaeolithic in Kazakhstan, which has a precise dating (to be discussed below) is very interesting in this respect.

Stratified Koshkurgan-Shoktas Palaeolithic complex: an expedition organised for the study of the Stone Age monuments in Kazakhstan together with researchers from the Institute of Archaeology, Siberian branch of the Russian Academy of Sciences (Novosibirsk), has for many years been studying Palaeolithic sites on the south-western slope of the Karatau Range in Turkestan region (*Derevyanko* et al. 1996).

One of the goals of the expedition was to study unique Palaeolithic sites associated with the ascending springs Shoktas I-III and Koshkurgan I-II seeping through the surface of the ground. High contents of mineral compounds in such springs, which functioned for an immense period of time, from the Pleistocene to the present time, under certain environmental conditions led to the development of various types of travertine formations. This determined the specific character of the accumulation and representation of archaeological and faunal material, as well as the scientific names of such objects – 'monuments in travertines.'

The main attention in the first years of the study was paid to the Shoktas I monument (68°37 56.1 E, 43°25 38.2 N), located in Turkestan District of Turkestan region, 12.7 km from the village of Koshkorgan (azimuth 242°). Traces of the functioning of the ancient spring are currently represented by a travertine ring 26 m in diameter (*Derevyanko, Petrin, Taymagambetov* 1997).

The findings collected on the site were indicators of the existence of cultural deposits close in their genesis and in the nature of the archaeological material they contained to the Koshkurgan I monument. The excavations that were begun confirmed this assumption.

As at Koshkurgan I, most of the archaeological material found in the deposits inside the ring was actually re-deposited, although there was certain logic in the vertical distribution of obviously different-time items. In order to increase the informative value of the monument, the task was set to search for relatively undisturbed cultural remains outside the activity area of the ancient spring. For this purpose we made a number of exploration pits outside the travertine ring, arranging them in line with the inner ring excavation trench. For technical reasons, the work was suspended, since a travertine 'cloak' was found at a depth of about 2 metres, supposedly blocking access to underlying loose sediments (*Derevyanko* et al. 1997).

In subsequent years, an attempt was made to break through this cover using appropriate technical means, including hammer drills. These activities revealed that the travertine cloak covering a fairly large area was composed of several different generations. The upper layer consists of brownish grey, fractured, lumpy, spotty whitish travertines, similar in appearance to the travertines of the ring. Fragments of dark brown cast, silicified travertines with fragments of dark grey massive Palaeozoic limestones embedded in the rock, form a part of the bottom layer. The travertine cover is 1-1.2 m thick. The second, underlying generation consists of slabs of yellowish gray and yellowish brown dense, silicified travertine. They are interlaid with layers of grey travertine. The top layer of this travertine generation is leached, which means it had remained exposed for a long time until it was covered with a later layer. The uncovered silicified travertines are about 1 m thick. Lenses of clay material containing fragments of whitish travertines were revealed in the pit located directly behind the ring, between these two different travertine formations. The lenses are about 30 cm thick. Such lenses were not found in the pits located at a greater distance from the outer ring, where the upper travertines lie directly on the yellowish brown silicified travertines (*Derevyanko* et al. 2000).

The most important result was the discovery of two archaeological horizons, possibly undisturbed, in the clay material separating different generations of travertines. The range of stone artefacts is narrow, but they definitely are similar to the finds from the excavations within the ring. The similarity is seen both in the type of selected raw materials, which are small chalk pebbles and quartzites, and in the typology of the artefacts. No faunal material was found on the excavated site. Fragments of travertine from the over- and underlying layers were sampled to specify the age of these archaeological horizons.

In order to clarify the history of the formation and functioning of the spring and related processes that had a post-depositional effect on archaeological and faunal material, the work was continued within the ring of the spring, in an area directly adjacent to the travertine ring. Excavations were made downwards and under the ring. It was discovered that away from the centre of the spring the ring transforms into a cloak, referred to as the upper generation of travertine in the outer pits. The loose sediments were more than 7 m thick, starting from the ground surface. Very dense variegated clays reliably dated to the Miocene or Palaeogene were found at the base. These clays are clearly in situ or have been re-deposited for a short distance; there are lenses of re-deposited Upper Cretaceous sands. The discovery of such clays, apparently, confirms the hypothesis discussed earlier in publications about the formation of springs, according to which chalk sands lying under aquicludes collected groundwater coming from the mountains. However, more extensive work is required to specify the genesis of the springs.

It should be noted that the work in this part of the excavation within the ring helped identify two levels of, as it seems, relatively undisturbed archaeological material, one at a depth of 400-420 cm and the other 420-440 cm from the zero reference point. Stone artefacts are represented by tools of small pebbles, flakes and fragmented pebbles. The main raw materials for the artefacts were sandstone, quartz, quartzite and effusive pebbles.

Cultural remains, represented by a large number of stone artefacts and bones of fossil animals, lie at a depth of up to 9 metres from the ground surface together with subaqueous deposits and the travertines of ascending springs of karst origin.

The stone goods are a homogeneous complex from all technical and typological aspects – raw materials, surface preservation, typology, manufacturing technology and primary flaking. Small pebbles from Cretaceous breccias were widely used. The average size of the tools is 3-5 cm. The stone goods complexes from Koshkurgan and Shoktas can be referred to microindustries. The primary flaking is diverse, with Levallois, citron and radial techniques used. Short fragments are represented by flakes. Bifaces are practically absent, the collection dominated by unifaces. Secondary processing is represented by various types of retouching, hewing, cleaving, and rarely burin spalling. There are Clactonian dents, sometimes adjacent. The tools are dominated by scrapers of various sizes, some pointed, as well as toothed-and-notched items and a wide range of pebble artefacts.

Fig. 2. Paleolithic site of Koshkurgan. Excavation view

Animal bones are those of the rhinoceros, bison and ancient camel (*Derevyanko* et al. 2000).

The dating analysis of the complex from Koshkurgan I using the EPR (electron paramagnetic resonance) method for the animal bones gave the following values: 501,000 ± 22,000 years ago, 487,000 ± 20,000 years ago, 470,000 ± 48,000 years ago, which corresponds well with the dating based on palaeontological material.

We can confidently conclude about the archaism of the technical and typological appearance and the primitiveness of the stone flaking and processing methods. In addition, fragments of animal teeth of the Tiraspol faunal complex were also found. The vertical compactness in the arrangement of the artefacts and the presence of flakes from one nucleus in each level also evidences that the levels are relatively undisturbed. Stone artefacts, as well as fragments of teeth, were found both below and outside the recorded levels; however, they have undoubtedly been re-deposited. Taking into account the travertine ring covering the deposits that include these archaeological levels, as well as their elevations, these levels were supposedly associated with archaeological horizons recorded outside the ring between different travertine generations. Nevertheless, more extensive excavations are needed to reliably establish this correlation. Data obtained with the use of various analytical methods can also help solve this problem, for which necessary samples have been taken.

Less intensive excavations carried out at Koshkurgan I also showed that at this level research should cover larger areas (*Derevyanko* et al. 1998).

The activities on the Shoktas III monument were limited to two exploration pits made within the ring of the spring. The obtained stratigraphic, archaeological and faunal data indicate that it is almost completely identical to Koshkurgan I and Shoktas I.

The Koshkurgan-Shoktas industrial complex does not look very unique against the background of the Central Asian region. Similar or close complexes are found at the Kulbulak site in Uzbekistan, (*Kasymov* 1972) and in the 'loess Palaeolithic' monuments of Lahuti, Karatau and Kuldara in Tajikistan (*Ranov, Nesmeyanov* 1973). The comparison of the Koshkurgan materials with the microindustries of the Acheulean time in Europe indicate their great closeness. The European microindustries include Verteshsellesh in Hungary (*Kretzoi, Dobosi* 1990) and Bilzingsleben in Germany (*Mania* 1990). In the East, similar complexes can be found in China (Donguto) (*Wu, Olsen* 1985) and Japan (Babodan, Zazaragi) (*Derevyanko* 1984).

The Bilzingsleben monument in Germany is very close to the Koshkorgan-Shoktas complex in terms of geomorphology of the area and similarity of microindustrial artefacts and faunal remains. Earlier, we managed to acquaint ourselves with the Bilzingsleben materials, visit the site and see the work progress during an international symposium in Germany, and compare it with Kazakh materials. In our opinion, the difference lies in the absence of mammoth bones at the Kazakh site and their wide distribution at Bilzingsleben. In addition, the Koshkorgan-Shoktas complex is much older than that of Biltsinsleben. The Kazakh monuments are 510,000 years old, while the age of Biltsinsleben is about 350,000 years.

Thus, the Koshkurgan-Shoktas Palaeolithic complex is a kind of link between the west and east of Eurasia in the Mindel.

Finally, as a result of two large waves of migration from his ancient African homeland, man inhabited vast spaces in different geographical and climatic zones, where for tens and hundreds of thousands of years he formed externally different, but morphologically and genetically similar races united into one species.

Conclusion: To summarise, the territory of Kazakhstan, through which primitive people migrated, played an important role even in the Pleistocene.

The discovery of numerous Palaeolithic complexes in the Turan and Caspian deserts, in Sary-Arka, Altai, and Karatau-Syrdarya region, make it possible to address large-scale problems in the cultural history of the Palaeolithic of Eurasia.

Thanks to its location, the size of the territory, the variety of natural landscape zones, diverse topography, and the abundance of Stone Age monuments with 'surface artifactual deposits,' Kazakhstan can serve as a model for studying the Palaeolithic in the arid zone of Eurasia.

The study of various travertine objects on the territory of Kazakhstan, Uzbekistan, Hungary and Germany, as well as other similar objects showed that they developed in a single environmental, cultural and chronological context. This suggests an idea about the existence of a specific cultural adaptation tradition on this territory in the early Palaeolithic period.

All this indicates that the search for stratified Palaeolithic monuments, particularly earlier ones, should be continued.

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