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Studies of the Stone Industry at the Kyzyltau Lower Palaeolithic Site Of Southern Kazakhstan in Eurasia

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Abstract: The article deals with the unique lower Paleolithic Kyzyltau complexes found by joint Kazakh-Russian comprehensive archaeological expedition in the South of Kazakhstan. The article presents geomorphology and palaeogeography of the found site area and the technical and typological characteristics of stone products, based on the evaluation of artifacts surface integrity. It should be noted that the works on travertine sites in South Kazakhstan, due to their complexity, are critical for the reconstruction of both paleoecologic conditions of an ancient human existence and for the attempts to realize adaptive systems of human communities that existed in the arid conditions. This will allow us to be more confident when referring to time, nature and direction of human reclamation of the Eurasian continent. In September 1997, the joint Russian-Kazakh archaeological expedition continued the study of open type sites of Stone Age in the north-eastern part of the Karatau Ridge, called Kyzyltau 1. Vast areas of Kazakhstan have long attracted the attention of researchers involved in the study of the ancient past of mankind. Therefore, this article provides a brief overview of research directly related to the study of South Kazakhstan Paleolithic.

Key words: Kyzyltau site · Karatau Ridge · Central Asia · Pleistocene · Middle Paleolithic · Core · Biface

INTRODUCTION

The territory of Kazakhstan is an attractive archaeological area characterized by the large number of Paleolithic sites of open land type, located on different geomorphological levels. In the course of longstanding research in the Southern, Central, Eastern and Western Kazakhstan, hundreds of Paleolithic complexes, both with surface occurrence of artifacts and stratified objects, were discovered and studied.

Because of these circumstances, the stone implements are the only reliable source of information. Based on the analysis of industry nature and comparison with well-known industrial complexes, we can obtain data about the relative age of the archeological site and its cultural and historical ties. We can assert that an in-depth study of the Stone Age in the region will allow us to understand many of the processes that took place in this age and to link it to subsequent cultures. Stone Age is the foundation to form later subsequent cultures of Bronze Age. In this article we consider Paleolithic, which is the most ancient period of humanity, the first and the longest stage of the Stone Age.

The study of Kazakhstan Paleolithic began relatively recently (in the late 50's of XX century, starting since the revelation of the Paleolithic in the Karatau Mountains, Southern Kazakhstan). By now, a huge amount of Paleolithic artifacts have been accumulated. For example, a collection of the "Museum of the Paleolithic of Kazakhstan," al-Farabi Kazakh National University, collected in different years by H.A. Alpysbaev, A.G. Medoev, Zh.K. Taymagambetov, O.A. Artyukhova and others, numbers more than 600 thousand artifacts. However, this entire array in a large part has not been not processed yet and is still awaiting for researchers.

South Kazakhstan is a varied and challenging region in terms of archeology. A large number of artifacts belonging to different stages of the Stone Age was found and studied owing to joint efforts of the Kazakh-Russian comprehensive archaeological expedition. The predominance of arid conditions in the major part of Southern Kazakhstan in the Pleistocene hampered the process of active deposition, resulting in the fact that vast majority of Paleolithic sites lacks stratified occupation layer and artifacts at these sites occur at the surface. That is why a topical study of

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Paleolithic sites with surface occurrence of archaeological material is the most important among the main research areas of the earliest stages of human settlements both in Kazakhstan and Central Asia in general [1].

These objects include the Paleolithic complexes of Kyzyltau in the north-eastern slopes of the Lesser Karatau Ridge (Southern Kazakhstan). Here a great number of stone artifacts are concentrated over an area of tens of square kilometers. In this article we set the goal to identify development trends of techno-complexes at Kyzyltau location to accomplish the following tasks:

- To separate archaeological material depending on its surface integrity;
- To determine technical and typological characteristics of stone industries for the complexes with different integrity of artifact surfaces;
- To compare Kyzyltau industries with Paleolithic complexes of adjacent regions;
- To accomplish periodization of Kyzyltau Paleolithic complexes.

We are the first to introduce new collections of stone artifacts for scientific use and to define the main area of archaeological material concentration from the north-eastern slopes of the Lesser Karatau. Based on the detailed technical and typological analysis of stone artifacts, four cultural-historical techno-complexes were selected. They reflect different periods of the Stone Age and deduce the trend of their development. The artifacts surface integrity was determined depending on time period during which they were exposed to the destructive process due to their occurrence at the surface.

Karatau Ridge (large north-western spur of the Tien Shan) is located in Southern Kazakhstan. As such, the ridge consists of two sub-parallel spurs that extend to the north-west. South West ridge (Great Karatau) is a continuation of the Talas Alatau. A long lowland, the so-called "Jurassic band" is stretched between them. Depression areas, occupied by the valleys of the Syr Darya and Talas rivers, from which young structural plains stretch forth, are situated on both sides of the Karatau Ridge. A distinctive features of the Karatau Ridge structure are plateau-like uplands, which are high peneplains, consisting mainly of black and gray limestone beds. Kyzyltau Paleolithic complexes are located on the denudation plain adjacent to the Small Karatau Ridge from the north. It is characterized by the development of low but often continuous small hills and ridges (cuesta-type ledges) conditioned by wedging out certain more stable horizons of lower carbonic deposits, including siliceous strata. According to the geological structure of the plain, the beds, containing siliceous strata, are at different hypsometric levels. Detection of these layers, much more likely, was irregular. It can be assumed that the formation of these outcroppings in various places of the valley occurred at different time periods and was caused by a variety of natural factors, such as desquamation processes, areal and linear drift with deflation and erosion by seasonal watercourses. Absolute elevation of cuesta-type ledges in the exploration area reaches 520-530 m. Plain inclination is observed in general to the north-east. On the maps, cuesta hills are named Kyzyl Mountains [2]. Dominant hill shapes of plains are separated by shallow girder-terrestrial network as well as by non-drainable depressions occupied by snags, takyrs and alkali soils.

Kyzyltau archaeological complexes represent hilly ridge denudation plain with pronounced cuesta-type ledges, where great set of stone artifacts is accumulated within an area of tens of square kilometers. Archaeological material is found mainly in the area bounded by the Koktal River on the west, Akkol Lake in the north, the route between the Akkol settlement and Karatau town-to the east and the chain of lakes (including Kuygankol Lake)-in the south. This zone is characterized by the most severely eroded plain surface, which led to outcropping of a large area of siliceous beds, used subsequently by ancient human as a source of raw materials. Sites such as Akkol, Borykazgan, Tanirkazgan, Kainazar, Kyzylshoky, etc. are situated right here. The most massive artifacts clusters coincide with lakes, alkali soils, takyrs and low-lying topography sites. This is probably due to the fresh water that was available in certain periods and outcropping the siliceous rocks by temporary streamflows.

Archaeological material of Kyzyltau is presented by collections from ground 1 (25 m2) (10,536 specimens), ground 2 (18 m2) (4709 sp.), collections from vicinity of ground 2 (42 sp.), as well as collections from points 1-30 (824 sp.). The procedure tested earlier during the study of Silicon Valley complexes in Mongolia [5] was used when working on these grounds. Grounds were identified as relatively flat areas divided into meter square grid and oriented to the cardinal directions, where a full collection of archaeological material was carried out. When choosing the locations for grounds, the following conditions were taken into account: a high concentration of products and the lack of overlying unconsolidated sediments, as well as the minimum linear movement of

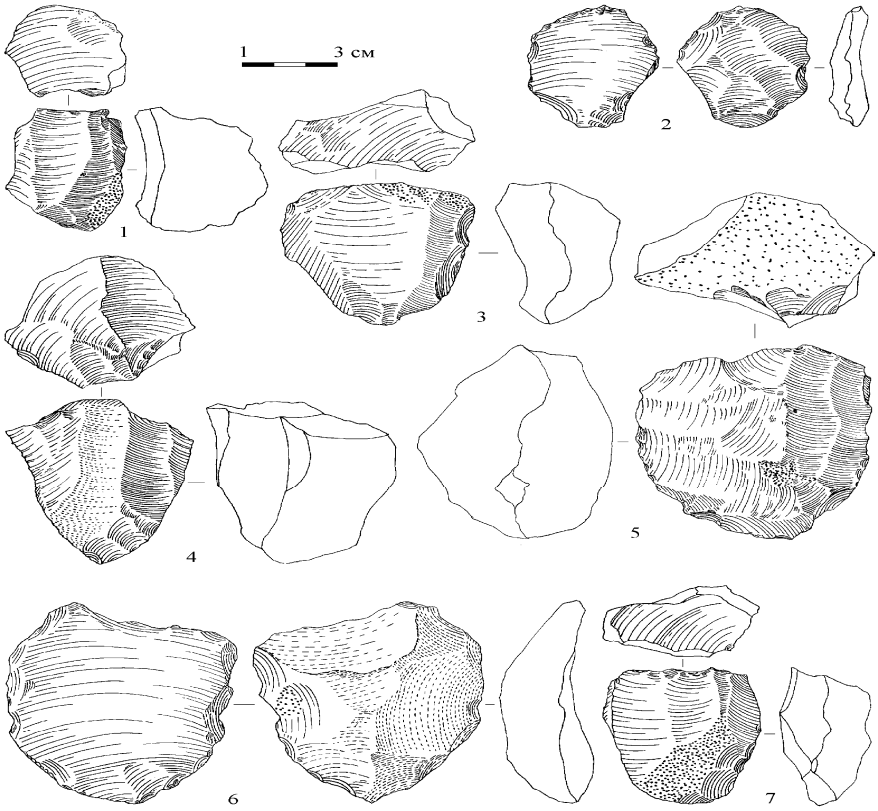

Fig. 1: Kyzyltau. 5 - point 10; 3, 4, 6, 7 - point 11; 2 - point 16; 1 - point 17; 6 - highly eroded artifact; 2, 3, 5 - moderately eroded artifacts; 1, 4 - slightly eroded artifacts; 7 - non-eroded artifact.

archeological finds. Collections of finds were made on each square (1 x 1 m) apart; at that, the most revealing finds were recorded on the plan. Items consisting of various chips and pieces of rock were not recorded on the plan due to the large number of exclusive material. They all were collected in full and then subjected to a comprehensive on-site technical, typological and statistical analysis. Collections at the ground 2 and points 1-30 were conducted on a selective basis giving priority to the most expressive products. The main purpose of collecting items from points 1-30 was to identify the areas with the most concentrated archaeological material. Given the various surface integrity, stone artifacts were divided into four main groups: highly eroded, moderately eroded, slightly eroded and non-eroded artifacts (Fig. 1). Since the products were made of a material from the same resource base and were in similar natural and geographical conditions, it seems that the surface modifications of the artifacts to a large extent are related to their age [11] (the stronger the erosion degree of artifact surface, the older its age).

Thus, the study of Kyzyltau complexes resulted in the collection numbering 16,111 artifacts. As already mentioned, depending on the surface integrity, artifacts were divided into four groups. It should be noted that the collection obtained at the first ground practically lacks items with a strong eroding degree and is well-represented by a group of non-eroded finds. Collections from the second ground showed a different picture. Here a large collection is represented by a group with strongly eroded artifacts, while non-eroded artifacts are quite rare. Comparison of complexes with different surface integrity within each ground allows assuming existence of significant differences between the complexes. At the same time, there is considerable similarity between the complexes with the same surface integrity, separated at the grounds and points [14].

At this point, technical, typological and chronological interpretation of archaeological material of the complexes located in the north-eastern slope of Small Karatau Ridge, proposed by H.A. Alpysbaev, is the subject of discussion. According to H.A. Alpysbaev,

the most ancient sites constitute a chronological group, "dated by Chellean-Acheulian Lower Paleolithic period" [3]. Their geological age is accepted as an appropriate early Pleistocene. This group includes such sites as Akkol, Borykazgan, Tanirkazgan and Kemer I - III. Almost the entire archeological material was collected at the outlier highlands surface. When describing the collection, the separation technique of the obtained artifacts depending on their surface integrity was not used, although the researcher noted that the finds were subjected to wind and chemical erosion. It is quite possible that some collections contain time transgressive samples. Artifacts are divided into seven morphological groups: "bilateral processed chopping stone implements, disc implements, hand points; unifaces; implements made of flakes; flakes; nuclear-like pieces and production wastes" (ibid.). As is mentioned, all products are characterized by archaic and primitive processing. The above mentioned sites and Kyzyltau complexes are confined to one raw materials source associated with the yield of siliceous rocks and are in the same climatic conditions, that allows the direct analogy between them. Based on the characteristic of pre-Mousterian Kyzyltau complex, as well as on the description of artifacts and pictures, it can be assumed that the finds of Borykazgan, Tanirkazgan etc. are the products of primary cleavage and comply with raw material pieces having traces of approbation, core-like debris, preforms, cores and chips. The implements are represented by a collection, insignificant in number, which includes mainly the scraper-like shapes. Most likely, these complexes were the workshops, where raw material was selected and tested. Further, suitable stone pieces were used for making cores to remove subsequently a few flakes. The issue on chronological interpretation of material remains open. It is possible that the collections of these sites are presented by artifacts belonging to different time periods.

In contrast to the Kyzyltau complex, which is strongly eroded, completely different early Paleolithic industry is represented by the material from the sites in the Koshkurgan-1 and Shoktas-1 travertines, located in the south-western slope of Karatau Ridge. Based on the technical and typological analysis of stone material, as well as a series of dates, obtained by ESR-dating technique, the researchers of these sites single out Koshkurgan-Shoktassk micro-industrial complex of early Paleolithic, dated by chronological range of 500-300 thousand years ago [4].

There are some differences between the early Kyzyltau techno-complex and complexes of strongly eroded products of Semizbugu, points 2 and 4 (North Balkhash region). These differences are associated with significant presence of Levalloisian elements in these complexes, both in the primary cleavage technique and in the set of implements [6, 7].

The gravel industries of Southern Tajikistan (Karatau 1 and Obi-Mazar 6) have different technical and typological characteristics [13]. The lack of choppers, choppings and chunks in early Kyzyltau complex, as well as availability of more advanced techniques of parallel and orthogonal cleavage comparing with a gravel industries and, consequently, the production of implements out of relatively standard chip blank parts, does not allow us to attribute it to the range of gravel industries.

Outside the Central Asian-Kazakhstan region, maximum similarity is observed between pre-Mousterian Kyzyltau and the early Silicon Valley complex (Gobi Altai), which is mainly manifested at the level of the primary cleavage. Both complexes are characterized by an archaic technique of stone cleavage aimed at obtaining short and shortcut flakes of large and medium sizes. The most representative type of cores are those of single blade mono-front type. Significant proportion of items falls to orthogonal cores. The cores, intended for making a single blank with given parameters, are distinguished particularly. According to researchers of the Silicon Valley, these cores should be considered as early manifestations of Levalloisian technology. Basically the implements consist of scrapers dominated by single forms. What significantly distinguishes the Silicon Valley complex is presence of the implements produced by bifacial knapping [5].

Dating the Kyzyltau complex, which is presented by strongly eroded artifacts, is the most difficult issue. Comparison with early Paleolithic industries of Central Asian -Kazakhstan region does not allow us to estimate precisely the chronological position of the strongly eroded Kyzyltau artifacts complex to the extent of the Lower Paleolithic. At this stage of knowledge this issue remains open [14].

Archeological sites of Tokaly I-III, Degerez, Darbaza III, Suleymensay I and IV and Daurenbek, located in the north-eastern slope of Small Karatau Ridge, were referred by H.A. Alpysbayev to the "Acheulean-Mousterian period" of Paleolithic. Typologically archaeological

material derived from the above-mentioned complexes, was divided into crude chopping implements processed from both sides, hand points, disc-like shapes, headsail type implements, cores, implements on flakes, non-processed flakes, etc. [3]. Comparing these materials with a complex of moderately eroded Kyzyltau products, we can assume that the artifacts, interpreted by A.H. Alpysbaev as bilaterally processed products, hand points, disc-like shapes, are core-like products (preforms, cores and core-like debris). The issue on the historical account of the materials, published by A.H. Alpysbaev, remains open. In general, Middle Paleolithic dating seems the most appropriate, though it's quite possible that the collection is presented by time transgressive archeological material.

The industry, represented by moderately eroded materials of the Semizbugu location (points 2 and 4), is referred to Middle Paleolithic. When comparing these materials with the Middle Paleolithic Kyzyltau complex, we can reveal significant differences for a verity of attributes. First, the Semizbugu industry illustrates a more advanced Levalloisian technique of stone cleavage. The Kyzyltau collection contains Levalloisian cores, though the Levalloisian technique itself is subordinated. Second, along with the cores of Levalloisian morphology, the Semizbugu industry is widely represented by cores of prismatic cleavage principle, which are not available in the collection of moderately eroded Kyzyltau artifacts. Third, attention should be drawn to the fact that the Semizbugu materials are represented by more impressive collection of implements as compared with the Kyzyltau complex, which includes a collection of implements of upper Paleolithic outlook. Fourth, the Semizbugu collection includes bifaces [6, 8].

When comparing moderately eroded Kyzyltau artifacts complex with Central Asian industries, the closest features can be traced with the complexes classified by V.A. Ranov as a typical Mousterian site (Teshik Tash and others). This is manifested by general trend of the industries focused on producing flakes as initial blanks for making implements. Blandes are available as well, though they are scanty. Note that radial cleavage at Kyzyltau was widely used when making cores to give convexity to cleaving edge and counter-edge [12].

When turning to the more remote areas, certain analogies with Middle Paleolithic Kyzyltau complex can be found in moderately eroded materials of Silicon Valley technical complex. First of all this applies to the primary cleavage technology. Here, together with the orthogonal and parallel cleaving principle, aimed at obtaining flakes, Levalloisian technique of the stone cleaving is noted. Number of cores for making the blandes, as well as the blandes themselves is insignificant. Scrapers of different combinations are the most widespread among the implements. Items with a "tenon" and excised shape occupy an important place. A distinctive feature in the set of implements is the availability of limases and the implements, processed from both sides [5].

Certain analogy can be traced between the Kyzyltau complexes and materials of Denisovan type industries of Altai Mousterian site (Denisova Cave, Okladnikov cave and Tyumechin 1) [5]. Primary cleavage in the industries, illustrating this type, is characterized by prevalence of parallel and radial cleaving of blanks. Despite the fact that the Levalloisian cleaving technique is presented here in a developed form, its share in the technology process is insignificant. Average-sized short-cut chips were mostly used as the initial blanks. Typological basis of the implements set consists of scrapers of various configurations and sharply excised forms.

Certain analogies can be traced between the complexes, represented by the collections of slightly eroded artifacts of Kyzyltau and Silicon Valley. The primary cleavage of Silicon Valley industry, as well as the Kyzyltau complex of slightly eroded products are characterized by the appearance of sub-prismatic and butt configurations, along with existing Levalloisian and single blade mono-front cores. When analyzing the cleaving industry, we should note a significant presence of elongated crested blades. In general, the industry retains the tradition aimed at obtaining short and short-cut flakes as a source of initial blanks. It is noted that while the products processed by bifacial knapping are lacking at Kyzyltau site, they are available at Silicon Valley [9].

Upper Paleolithic remains the least studied period in Kazakhstan. Upper Paleolithic sites in Kazakhstan are represented mainly by the complexes with surface occurrence of artifacts. Among the stratified objects, Upper Paleolithic period is illustrated, perhaps, by finds of C. Valikhanov site and Aschisay encampment.

Significant differences from the Upper Paleolithic Kyzyltau complex are observed in the industry of slightly eroded artifacts of the Semizbugu location, point 2 [6]. It is mainly manifested by the availability of the Levalloisian morphology cores, as well as in a rather wide application of the prismatic and butt cleaving principle. Also we must note the lack of bifaces at Kyzyltau, which, in turn, are well represented by the Semizbugu collection.

Outside Kazakhstan, the closest analogies of the Upper Paleolithic Kyzyltau complex are traced in the industry of non-eroded products of Silicon Valley [10]. When considering cleaving technology of this industry, we note its directivity on obtaining the blanks in the form of flakes. Single blade mono-front cores dominate among other types of cores. Levalloisian morphology cores, as well as prismatic forms, are almost completely lacking. Butt forms represented by cores and preforms, do not play a significant role. The most representative type of implements includes end-scrapers, while scrapers are represented to a lesser extent. The products processed by bifacial knapping are available as well.

In conclusion, we note that two periods of the Stone Age from early to late period are presented in the territory of South Kazakhstan. Occupancy of this territory by the ancient human was stipulated by favorable paleo-geographic and paleo-climatic conditions during certain periods of Pleistocene epoch. Very likely, that the most favorable living environment for ancient human in this area was in phase with the climate humidifying periods [15]. Availability of fresh water, combined with an easily accessible source of high-quality raw material for production of artifacts, created ideal conditions for human habitation in the foothill plains of Karatau Ridge.

Based on the analysis of archaeological material of Kyzyltau complexes we can advance hypotheses about existence of four time transgressive complexes differing from each other by various technological traditions of stone raw materials preparation and utilization. Various survival rate of artifacts also benefits to the hypotheses on time diversification of technology complexes. Since all of the artifacts were found in the same climatic conditions and made of material originating from the same raw material source, it is possible to affirm with a certain degree of confidence about the relationship between the artifacts surface integrity and their relative age.

Location of the site at close vicinity to the raw materials source, large number of core forms and production wastes at negligibly small variety of implements in the industries, leads to the conclusion that materials found at the complexes reflect stone processing stages, typical for the workshop. This conclusion allows us to consider Kyzyltau Paleolithic complexes as workshops located at the raw materials sources. Technological and typological analysis suggests that a common line of stone industry development is traced here within a long chronological period of time-from the early to the late Paleolithic.

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