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TOWARDS THE ANALYSIS OF PALEOANTHROPOLOGICAL FINDS FROM THE SELUNGUR CAVE

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К АНАЛИЗУ ПАЛЕОАНТРОПОЛОГИЧЕСКИХ НАХОДОК ИЗ ПЕЩЕРЫ СЕЛУНГУР

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Abstract. This study focuses on the paleoanthropological analysis of odontological materials recovered from the Selungur Cave site, which dates to the Upper Paleolithic period in Central Asia. The scientific interpretation of both archaeological artifacts (lithic assemblages) and organic remains from this site remains a subject of debate. In particular, the taxonomic classification of ancient human teeth recovered from the cultural layers of Selungur Cave has been contentious, leading to unresolved discussions regarding their attribution to a specific hominin group. However, recent morphological analyses conducted by the eminent anthropologist, Professor A. Zubov, have provided critical insights into this issue. Comparative odontological assessments indicate that the dental remains from Selungur Cave exhibit morphological affinities with archaic hominins, particularly Asian Homo erectus, thereby offering a more definitive classification of these remains.

Аннотация. Исследование посвящено палеоантропологическому анализу одонтологических материалов, обнаруженных в пещере Селунгур, относящейся к эпохе верхнего палеолита Центральной Азии. Научная интерпретация как археологических артефактов (каменных орудий), так и органических останков из данного памятника остается предметом дискуссий. В частности, таксономическая принадлежность древних человеческих зубов, обнаруженных в культурных слоях пещеры Селунгур, вызывает разногласия среди исследователей, что препятствует однозначному определению их физического типа. Однако недавний морфологический анализ, проведенный известным антропологом, профессором А. Зубовым, внес значительную ясность в этот вопрос. Сравнительный одонтологический анализ показал, что зубные останки из пещеры Селунгур обладают морфологическими сходствами с архаическими гоминидами, в частности с азиатским Homo erectus, что позволяет более точно классифицировать данные находки.

Keywords: Ubaidiya, Early Paleolithic, Quaternary, Acheulean, stone industry, paleoanthropology, Homo erectus.

Ключевые слова: Убайдия, ранний палеолит, четвертичный период, ашель, каменная индустрия, палеоантропология, Homo erectus.

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The Selungur Cave is located on the border of Uzbekistan and Kyrgyzstan, approximately 100 km southwest of Fergana, in the Sokh River Valley, on the western outskirts of the village of Haidarkan (Osh region) [3, 10, 11].

The site was first discovered and studied by A. P. Okladnikov in 1955, followed by brief investigations conducted by M. R. Kasimov in 1964 [10].

Later, within the framework of archaeological research, Selungur was also studied by Dr. Poshka [3, 11].

Systematic investigations of the cave began in 1980 under the initiative of the archaeologist and researcher U. I. Islomov. Under his supervision, extensive archaeological excavations were carried out throughout the 1980s and 1990s, with findings being published in a number of scientific articles and monographs [3-5].

During the excavations, nine archaeological trenches were dug, revealing five distinct cultural layers. The third layer was further divided into three micro-layers. The thickness of these layers ranges from 20–40 cm to 0.3–1 m, while the total depth of cultural deposits reaches 8.5 m. As a result of these excavations, more than 1,000 lithic artifacts, as well as paleoenvironmental materials including paleobotanical, paleontological, and paleoanthropological remains, were recovered from the site [8].

From a cultural perspective, the Selungur Cave findings are attributed to the Southern Acheulean tradition [8, 9]. To date, Selungur remains the only known site in Central Asia associated with the Asian Acheulean culture, with the Ubeidiya site often cited as a comparative reference. Absolute dating of samples obtained from Selungur's cultural layers, using the uranium-series method, has provided an age range of 1,100,000–750,000 years [8, 9].

Accordingly, the Selungur Cave is interpreted as one of the oldest known archaeological sites in Central Asia.

The research focuses on the paleoanthropological findings from the Selungur Cave, which is considered the only stratified Early Paleolithic site in Central Asia. Despite its significance, there remain unresolved debates regarding its cultural and chronological characteristics, including its precise dating and cultural attribution. The current study primarily investigates odontological materials (teeth) and other paleoanthropological remains from Selungur using morphological and comparative analyses.

Site Description and Stratigraphy. The Selungur Cave contains multiple cultural layers, with significant paleoanthropological and lithic assemblages. The most crucial human remains, including cranial and dental fragments, were recovered from the 2nd and 3rd cultural horizons, specifically from excavation trench 8, layer 2 (cranial fragment and teeth) and layer 3 (isolated teeth and a humeral fragment) [4, 6, 8]. These findings represent one of the oldest known hominin fossils in Central Asia.

Morphological and Comparative Analysis. The recovered teeth and skeletal fragments were examined using standard morphological and metric analyses to determine taxonomic classification. The comparative study involved: Crown and root morphology assessment to distinguish human teeth from faunal remains. Wear patterns and enamel conditions to assess dietary adaptations. Taxonomic comparisons with other fossil hominins, including Homo erectus, Neanderthals, and early modern humans.

Additionally, paleopathological assessments were conducted to identify any signs of dental disease or anomalies, with a specific focus on caries frequency and enamel defects [2, 4]. Given the debated chronology of Selungur, no direct radiometric dating of the human remains was performed, but the site itself was dated using the uranium-series method, providing an age range of 1,100,000–750,000 years [8, 9].

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Chronological and Cultural Attribution. The exact dating of Selungur Cave remains a subject of scholarly debate. Some researchers suggest that the site dates to the early Middle Pleistocene (first half of the Quaternary period), while others argue that it was inhabited during the later Middle Pleistocene [1, 12, 13]. The uncertainty stems from the lack of direct dating of human remains and insufficient systematic analyses of the associated lithic artifacts.

Odontological and Skeletal Findings. The Selungur hominin remains include multiple dental specimens and a humeral fragment, all exhibiting distinct morphological features:

Two heavily worn maxillary canines and one shorter-rooted upper canine likely belonged to an adult male (35-40 years old).

A smaller upper canine with shorter roots was attributed to a female individual (~40 years old).

Three lower premolars belonged to either one of the identified individuals or a separate hominin [2, 4].

The humeral fragment, identified as belonging to a juvenile (~10 years old), has been compared to Neanderthal remains from Teshik-Tash Cave, suggesting an older evolutionary lineage for the Selungur individual [4, 6, 8].

Dental Pathology and Paleoanthropological Significance. Interestingly, no signs of caries were observed in any of the examined teeth. However, a specific type of enamel defect, known as peg-shaped defects on the mesial or distal surfaces, was frequently detected. This condition, though not fully understood, suggests a high prevalence of periodontal disease in early hominin populations [4].

A. A. Zubov and T.K. Khodjaev, in their comparative morphological analyses, identified distinct traits in the Selungur teeth that separate them from both modern humans and other fossil hominins. Notably:

Crown morphology and root structure showed clear affinities with Asian Homo erectus.

Tooth robustness and vestibular curvature indicated significant evolutionary divergence from modern humans.

The absence of caries aligns with patterns observed in pre-agricultural hominin populations, reinforcing the hypothesis that dental disease prevalence increased with dietary shifts in later Homo species [4].

Table

COMPARATIVE ANALYSIS OF MORPHOLOGICAL AND CULTURAL FEATURES OF SELUNGUR HOMININS AND OTHER HOMININS

Feature	*Selungur Hominins*	*Homo erectus (East Asia)*	*Neanderthals*	*Modern Humans*
Tooth Size	Large, robust	Large, robust	Medium, robust	Small, gracile
Dental Pathology	No caries, peg-shaped defects	Rare caries, strong wear	Some caries, moderate wear	Frequent caries, light wear
Enamel Thickness	Thick	Thick	Medium	Thin
Root Morphology	Strong, thick	Strong, thick	Medium roots	Thin, delicate
Stone Tool Industry	Acheulean-like, primary & secondary processing	Acheulean	Mousterian	Various

Taxonomic Classification of the Selungur Hominins. The taxonomic classification of the Selungur hominin remains has been controversial. Some early interpretations suggested that the teeth belonged to bears or other mammals rather than hominins. However, Zubov's morphological

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analysis conclusively identified them as hominin teeth, specifically showing close resemblance to Homo erectus [2].

The canine and premolar dimensions fall within the size range of Homo erectus, differing significantly from modern human dental proportions. The tooth root thickness and premolar robustness further support an archaic hominin classification, distinguishing them from Neanderthals and modern humans. The presence of distinct vestibular curvatures and other morphological traits aligns Selungur fossils more closely with Asian Homo erectus rather than late archaic humans [2].

Evolutionary Implications. The Selungur hominins appear to represent a highly specialized, localized population of early hominins, rather than a transitional form between Homo erectus and later hominins. Zubov concluded that the Selungur individuals likely belonged to a distinct, regionally adapted group of archaic hominins, reinforcing the idea that Homo erectus populations exhibited significant regional variation in morphology and evolutionary trajectories [4, pp. 38-49].

The findings from Selungur expand our understanding of hominin dispersal in Central Asia, demonstrating that:

Homo erectus occupied diverse ecological niches, with localized adaptations.

The dental morphology of Selungur hominins suggests evolutionary divergence from classic Homo erectus populations found in East Asia.

The humeral fragment indicates that Selungur hominins were morphologically distinct from Neanderthals and early modern humans, supporting a complex pattern of hominin evolution in Eurasia.

Based on the latest research and analysis of the paleoanthropological materials (teeth) recovered from the Selungur Cave, it can be concluded that the Selungur hominins represent the ancestors of Sinanthropus and Pithecanthropus populations that inhabited East and Southeast Asia. The evidence strongly suggests that a community of Eastern, or classic Homo erectus lived at the Selungur site.

Furthermore, the technical and typological characteristics of the lithic industry at Selungur, including primary and secondary stone processing techniques, exhibit clear similarities to Early Paleolithic techno-complexes of East and Southeast Asia. This resemblance underscores the cultural and technological continuity between the Selungur site and the early Old Stone Age cultures of the mentioned regions, indicating a shared cultural and genetic heritage in the broader context of early human dispersal.

The findings from Selungur not only reinforce the importance of Central Asia in hominin evolution but also provide crucial insights into the technological and cultural adaptations of early human populations in the region. Further interdisciplinary studies, including DNA, isotopic, and micro-wear analyses, are essential to refine our understanding of the Selungur hominin lineage and its role in the broader framework of early human migration and technological evolution.

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