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Paleolithic cultures and ancient human migrations in Mongolia

Summary. As part of their ongoing evolutionary process, human ancestors made numerous migrations from the lands where they first appeared. This process depended directly on human population growth, and natural and climatic factors. Early human settlement in Central and Northeast Asia dates to the Lower Paleolithic, therefore, additional migrations in this region occurred during the Middle and Upper Paleolithic periods. This was, perhaps, due to favorable circumstances for early human settlement in Mongolia during the Pleistocene epoch. The migrations of human ancestors in Mongolia are also apparent in other areas of Asia; here we focus on the archaeological signature of ancient populations in Mongolia.

Keywords: *Mongolia, Paleolithic, Migration, Dissemination of stone tools, Levallois technique, Mousterian tools*

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Монгол нутаг дахь палеолитын соёл ба эртний хүний шилжилт хөдөлгөөн

Товчлол: Эртний хүн түүхэн хөгжлийн явцдаа анх үүсэн бий болсон нутгаас хэд хэдэн удаагийн томоохон нүүдлийг хийсэн байдаг. Энэ нь хүний өсч үржих үйл явц болон байгаль, цаг уурын хүчин шалтгаанаас шууд хамааралтай байсаар ирсэн. Төв болон Зүүн хойд Азийн бүс нутаг эртний хүн суурьшсан цаг хугацаа доод палеолитын үеэс эхлэлтэй. Харин үүнээс хойш энэ бүс нутагт дахин нүүдлэн ирсэн цаг хугацаа дунд, дээд палеолитын үед ажиглагддаг. Монгол оронд плейстоцены үед эртний хүн суурьшихад хамгийн таатай нөхцөлийг бүрдүүлсэн газруудын нэг байсантай холбоотой хэмээн үзсэн болох юм. Монгол нутагт байсан эртний хүмүүсийн их нүүдэл Ази тивийн бусад газар нутагт ч нүүдлэн суурьшсан нүүдлийн зам ажиглагдаж байна. Бидний өгүүлэн буй сэдэв нь Монгол оронд эртний хүний үлдээсэн дурсгалууд дээр тулгуурлан тархалт суурьшлын талаар өгүүлэн бичлээ.

Түлхүүр үг: *Палеолит, Шилжилт хөдөлгөөн, Чулуун зэвсгийн хэв шинж, Леваллуагийн арга, Мусьтен зэвсэг*

Introduction

Numerous Paleolithic archaeological sites with exposed artifacts as well as stratified cultural occurrences have been discovered in Mongolia where open-air loess sites are dominant while the latter are fewer in number. Although Pleistocene landscapes and environments of Mongolia often provided favorable living conditions, many Paleolithic sites have been permanently exposed due to weak soil formation in a particularly dry climate lacking significant precipitation. In the Gobi Altai and steppe regions, soil accumulation measures maximally 30-100cm, while such deposits in the Khangai and Khentii mountains reach 2-7 meters in thickness.

Judging from the geographical distribution of Paleolithic sites found thus far in Mongolia, Lower Paleolithic sites are numerous in the south and in the Gobi Altai mountain range, while Middle Paleolithic sites have been discovered in the Gobi Altai range, its branch mountains, the southern and southeastern regions of the Khangai mountain range, and in Mongolia's Gobi and steppe regions. The Upper Paleolithic period was characterized by an increase in human population exemplified by intensified settlement activity and followed by patterns of increased mobility. Thus, sites dating to this period have been discovered throughout Mongolia. Upper Paleolithic sites are found widely distributed in the Gobi Altai range and its branch mountains, in large fluvial basins in the Khangai and Khentii ranges and in the country's vast steppe regions.

Mongolian Paleolithic studies have traditionally focused on the discovery of new Paleolithic sites, environmental reconstructions, and their correlation by similarity and dissimilarity of site characteristics. However, contemporary research questions investigate ancient population migrations and the distribution of Paleolithic settlements, providing new insights into our remote ancestors' daily lives. Here, we investigate issues concerning culture and migration based on diachronic archaeological remains spanning the Lower through Upper Paleolithic periods.

Characteristics of lower paleolithic tools

In Mongolia, the main representatives of Lower Paleolithic tools are cordate bifaces (so-called hand axes), chopping tools and choppers, which form the basis of analytical units. Lower Paleolithic sites and settlements include a locality at Altantsugts in Altantsugts soum, Bayan-Ulgii province, Khatansuudal and Ehiin Gol in Bayanlig soum, Bayankhongor province, Yarkh Uul in Gurvansaikhan soum, Dundgobi province, Yorool Gobi in Delgertsogt soum, the Sainshand vicinity, Dornogovi province, Tsakhiurt in Dalanjar-galan soum, Tsakhiurt Valley in Bulgan soum, Umnugobi province (a highly eroded area), Guchin Us-4 in

Guchin-Us soum, Uvurkhangai province, Mankhan-4 and Khoit Tsenkher River -2 in Mankhan soum, Khovd province, Barlagiin Gol-1 and -5 in Altai soum, Uench-1, 4, and 6 in Uyenich soum, and Must-3 (Khalzan khoshuu) in Must soum, Khovd province.

The earliest known Lower Paleolithic site in Mongolia is Nariin Gol-17 in Bayan-Ovoo soum, Bayankhongor province. Numerous sites and settlements were discovered in the valley of the Nariin Gol River, of which seven were considered to be Lower Paleolithic. The manufacturing method of Paleolithic choppers and chopping tools is based on pebble reduction, convergent angular scrapers, and denticulate-notched tools made on large blanks. These tools are thought to date to ca. 800,000 BP in terms of the manufacturing techniques employed [Derevyanko et al., 1998].

Paleolithic sites at Yarkh Uul and Yorool Gobi yielded lithic artifacts representing a bifacial tool industry [Dorj, Tseveendorj, 1978:23]. These bifacial tools are rudimentary, made by knapping and trimming the outer edges of blanks bilaterally, creating sharper margins. This produces the same rippled surfaces seen on European bifaces. These lithic artifacts are, in terms of manufacturing techniques and other typological characteristics, virtually identical to Acheulean cordate bifaces and points that were widespread in Southwest Asia, Europe, and Africa during the earlier Paleolithic period. These artifacts are dated to ca. 300,000 BP, which defines the beginning of the utilization of such lithic implements in Mongolia. The salient feature of the Mount Yarkh assemblage is that the bifacial tool culture identified there employed a distinct method of lithic reduction by flaking bilaterally for sharper implements in the same manner as western Lower Paleolithic peoples, demonstrating that human cognitive development was ongoing at the same level. In other words, both Asian and European Paleolithic humans developed the same techniques for fabricating bifacial tools.

These Lower Paleolithic artifacts, the choppers and chopping tools unearthed in the Mongolian Altai Mountains, date to an earlier period, while bifaces discovered in the Gobi and southeastern steppe regions are later (Fig. 1).

Characteristics of middle paleolithic tools

The Middle Paleolithic spans approximately 100,000-40,000 years BP. The global climate was extremely cold during the transition from the Lower to Middle Paleolithic, including most parts of Asia and Europe. Because of Mongolia's naturally continental climate with low precipitation, glacial formations were relatively small, covering only large massifs, including the Khuvsgul, Khentii, and Altai mountain ranges [Mongol orny, 1969: 48-49].

Major Middle Paleolithic settlements discovered

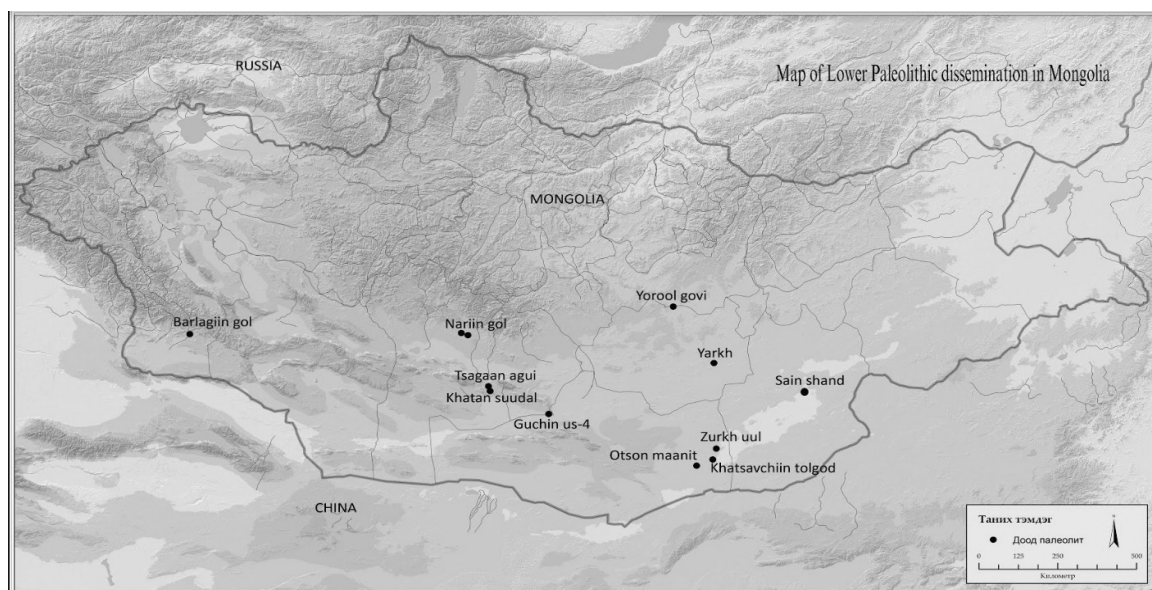


Figure 1. Map of Lower Paleolithic sites in Mongolia.

to date include Otsonmaant in Khanbogd soum and the Tsakhiurt Valley in Bulgan soum, Umnugobi province, Ikh Bogd Uul in Bogd soum, Bayankhongor province, Arts Bogd Uul in Bogd soum, Uvurkhangai province, the Orog Nuur Basin (Orog Nuur-1,2), the Orkhon River Valley in Kharkhorum soum, Uvurkhangai province (Orkhon 1; 7, lower strata), the Barlagiin Gol Valley (Barlagiin Gol-1), the Khoit Tsenkheriin Gol valley (Khoit Tsenkher-2) and Olon Nuur (Olon Nuur-1) in Khovd province [Tseveendorj et al., 2003: 48].

Middle Paleolithic artifacts in Mongolia include stone tools with rippled surfaces made on blanks detached from cores in a technique known as Mousterian, cordate bifaces, and retouched blades. Tool assemblages from this period also include pointed bifaces detached from prepared oval discoidal lithic cores, with blades on the dorsal and ventral surfaces as well as a type of pointed biface detached from the core by means of the Levallois technique. Such bifacial tools have been excavated at many sites, including Tsagaan Agui Cave in the Gobi Altai Mountains [Derevyanko et al., 1998: 136, 138], Chikhen Agui Rockshelter [Derevyanko et al., 2008: 2-12], Arts Bogd Uul [Derevyanko et al., 2001: 83], Suuzh [Derevyanko et al., 2000: 139], Tsakhiurt Valley, Nariin Gol [Derevyanko et al., 2000: 53-102], Olon Nuur, Barlagiin Gol, Uyenich, Mankhan [Derevyanko et al., 1990], Orkhon-7 in the Khangai Mountains - 7, Moiltyn-Am [Derevyanko et al., 2010: 150], Rashaan Khad in the Khentii Mountains [Bazargur, 2014: 5-20], and Ikh Khailant [Tsogtbaatar, 2003: 57-67], which demonstrate the dissemination of this archaeological culture.

We assume that the branches of the Altai Mountain range, the Great Lakes Depression, as well as the southeastern Khangai range were central for Middle Paleolithic culture in Mongolia. Human populations migrated into new habitats at the end of the Middle Paleolithic and the beginning of the Upper Paleolithic (Fig. 2).

Characteristics of upper paleolithic tools

The Upper Paleolithic period is considered the final phase of the Ice Age, dating from ca. 40,000–35,000 BP to ca. 12,000–10,000 BP; the period when modern humans first appeared. Typical Upper Paleolithic tools in Mongolia include artifacts made on lithic flakes and blades. Upper Paleolithic sites occur in most parts of Mongolia, of which the most significant include Moiltyn-Am in Kharkhorin soum, Uvurkhangai province, the lower stratum in Chikhen Agui Rockshelter in Bayan-Undur soum, Bayankhongor province, the Rashaan Khad site in Batshireet soum, Khentii province, Khanzat site, the Tuul River valley in Khutag-Undur soum, Bulgan province (Tulbur 1-29), Tsatsyn Ereg in Battsengel soum, Arkhangai province, Zараа Uul Mountain in Tuvshinshree soum, Sukhbaatar province, Arts Bogd Uul in Bogd soum, Uvurkhangai province, and Mankhan soum (Mankhan-5) in Khovd province [Tseveendorj et al., 2003: 52].

Many lithic flake tools from early Upper Paleolithic contexts were discovered at the Tulburiin Gol-4 site in Khutag-Undur soum, Bulgan province. In this valley, a total of 29 Upper Paleolithic sites have been discovered to date [Tseveendorj et al., 2007: 64-78]. This site is distinct because first, it contains

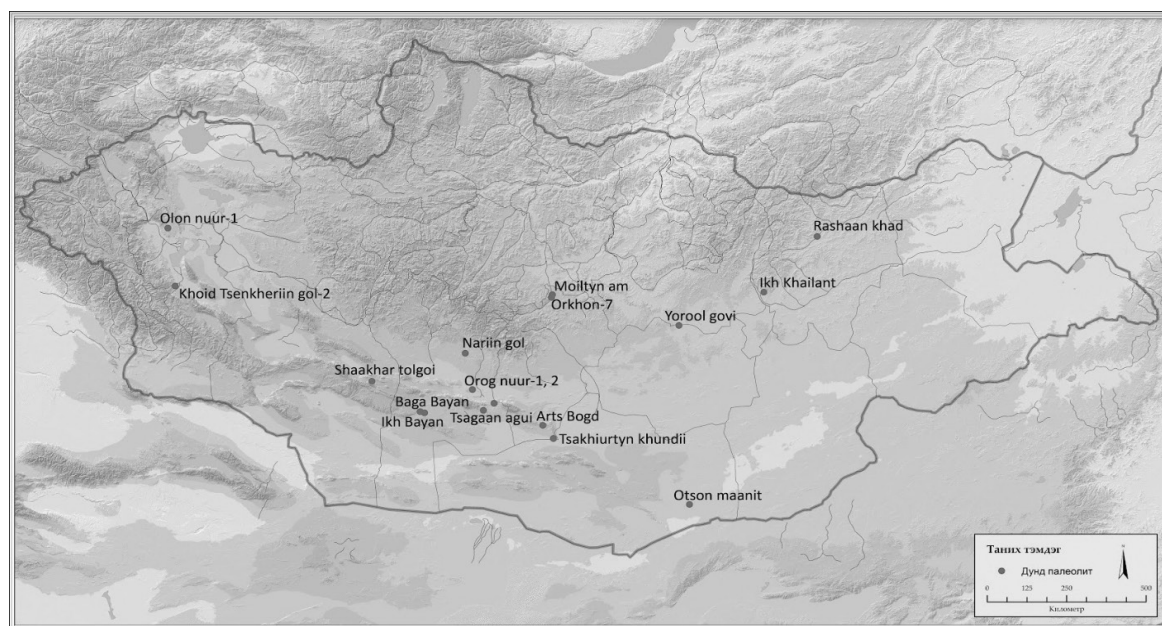


Figure 2. Map of Middle Paleolithic sites in Mongolia.

multiple stratified cultural layers that preserve long-term Upper Paleolithic manufacturing activities and, second, flake tools dominate the lithic assemblage at this site. According to radiocarbon (^{14}C) dating results from Strata 6-5, bone objects from Stratum 6 date to ca. $37,400 \pm 2,600$ BP (AA79314) and another bone object found in Strata 5 to ca. $26,700 \pm 300$ BP (AA84135) [Gladyshev et al., 2010: 33-40]. The lithic manufacturing methods revealed in Strata 6-5 demonstrate that lithic reduction techniques were developed at this site in the early Upper Paleolithic. According to S.A. Gladyshev, B. Gunchinsuren, and A.V. Tabarev, this site on the Tulburiin Gol River is the earliest engaged in lithic flake manufacturing from the early Upper Paleolithic period [Gladyshev et al., 2011: 28-43; Gladyshev et al., 2013: 82-85]. The lithic artifacts unearthed at Tulbur-4 tend to be identical to Upper Paleolithic finds in Central Asia and southern Siberia. The lithic flake assemblages duplicate Upper Paleolithic finds unearthed at Kamenka (A) and Tolbaga near Lake Baikal, in terms of their typological characteristics. The lithic flakes, cores for micro-flaking and the characteristics of the flakes and flake tools strongly resemble finds unearthed in the southern Lake Baikal region and are related to the transition period from lithic flaking to micro-flaking dating to the end of the Upper Paleolithic.

In addition to the finds from Tulbur, lithic tools have been unearthed in the Khangai Mountains, including at Tsatsyn-ereg in Battsengel soum, Arkhangai province [Simonet et al., 2011: 99-108], Emeelt Tolgoi and along the Tsagaan Turuut River in Galuut soum, Bayankhongor province, [Amgalantugs et

al., 2018: 104-110], and in the Khentii Mountains at Khanzat Uul in Delgerkhaan soum, Khentii province, and in the steppe region at Zараа Uul in Tuvshinshiree soum, Sukhbaatar province [Odsuren et al., 2016: 21-67]. These lithic artifacts display single or retouched edges on one or two sides of a long flake.

Based on the evolution, development, and advancement of Upper Paleolithic manufacturing techniques in Mongolia, Upper Paleolithic techniques can be classified into early, middle and final stages. The early stage utilized the Levallois technique based on Mousterian technology and the blank manufacturing method, originating the approach of detaching flakes of predetermined shapes. The middle stage witnessed a decrease in the use of Levallois technology of knapping split flakes and an increase in producing diverse types of lithic tools from detached flakes as well as ornamental items from animal bones and ostrich eggshells. The final stage witnessed advancement in flaking techniques and the beginning of micro-flaking with the use of pressure and percussion reduction. Additionally the indirect percussion method emerged about this time (Fig. 3).

Paleolithic human migrations and settlements in Mongolia

Judging from the results of archaeological studies conducted thus far in Mongolia, Lower Paleolithic sites have been discovered in the Mongolian Altai Mountains, the fluvial basins and valleys in its montane branches, and the southern steppe regions, while Middle Paleolithic sites are known from the southern Khangai Mountains and eastern Khentii Mountains

in addition to the above-mentioned regions. Upper Paleolithic sites have been discovered in Mongolia's larger mountains, river basins, and valleys, yet are very rare in the steppe region of eastern Mongolia [Bazargur, 2016: 20].

Following the dispersal of lithic tools and their chronology, it is possible that Mongolia's first human inhabitants may have arrived from the south. The natural environment and climate of Mongolia were favorable to humans by the beginning of the Quaternary period, roughly 800,000 years ago. The earliest human inhabitants lived in Central Mongolia, particularly in the "Valley of Big Lakes" that formed in the Pleistocene, during the Oldowan period according to global Paleolithic studies [Derevyanko, Petrin, 1995]. Following this, it is reasonable to assume that the southern regions of Mongolia accommodated its earliest human inhabitants, who later dispersed to other regions.

During the Middle Paleolithic, humans migrated from these regions towards the Khangai and Khentii mountain ranges. Judging from the natural settings at Moiltyn-Am and Orkhon-7, the region constituted a most favorable environment for humans, based on palynological studies. The climate was warmer and more humid with no extreme continental climate. River basins and grasslands were covered with grasses of the Poaceae or Gramineae family and valleys

with broad-leaved woodlands [Astashkin et al., 1993: 12]. Early human populations, having been settled for a longer period and grown in number, sought new areas for habitation. The inhabitants of the Orkhon River valley reached the confluence of the Eg and Selenge Rivers and beyond [Derevyanko et al., 2010: 27]. It is possible this migration and dispersal reached the eastern Khentii Mountains by the end of the Middle Paleolithic. Although it is too early to determine with certainty, there was possibly one other potential migration. Lithic artifacts found in the southern and central Khangai Mountains, the eastern Khentii Mountains, in Mongolia's steppe regions reflect the use of the Levallois reduction technique in the early Upper Paleolithic, while the Tulbur site in the Selenge River Basin has not yielded evidence of this technique, but displays similar flaking strategies as those employed in the southern Lake Baikal region. Therefore, the distinctions between the lithic fabrication strategies of early human populations in the Khangai Mountains and those in the southern Baikal area can be illuminated based on these lithic artifacts, particularly those from sites on the Tulburiin Gol and Egiin Gol rivers. The Tulburiin Gol sites are, in terms of location, sheltered in the north from wind and storms, have more extensive viewsheds and are oriented toward sunny exposures. The early populations living at these sites specifically selected favorable natural and geograph-

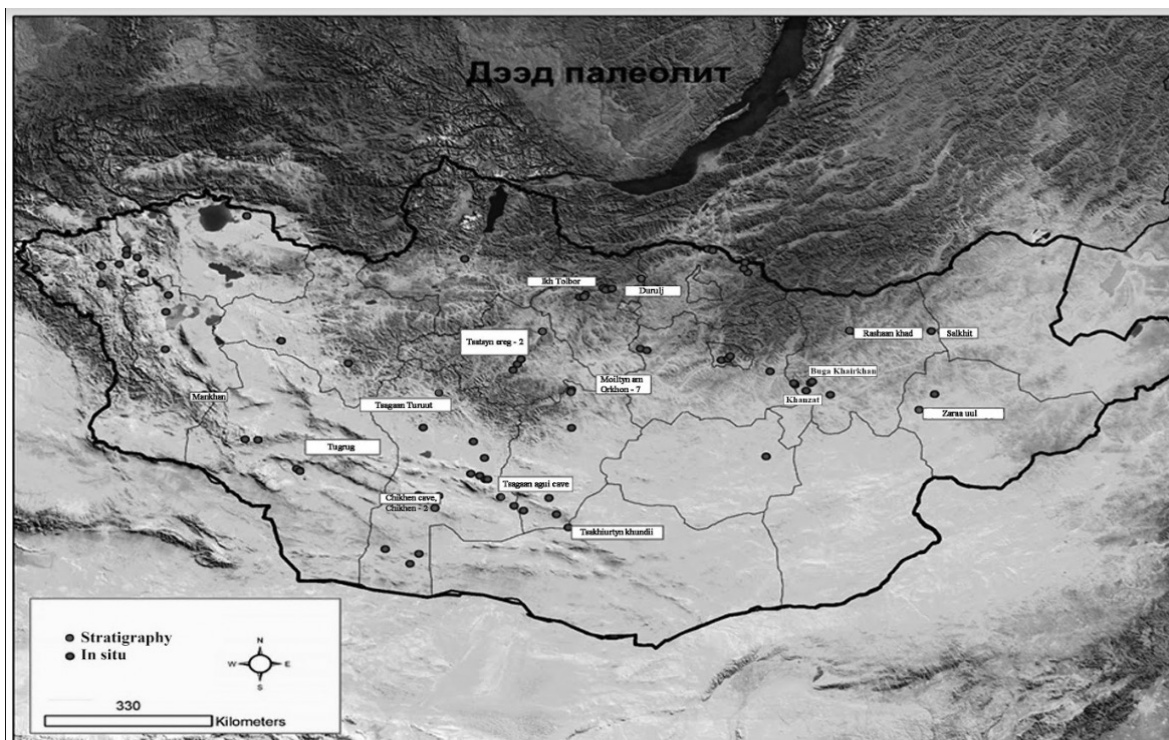


Figure 3. Map of Upper Paleolithic sites in Mongolia.

ical environments imbued with good weather, sheltered locations rich in prey, fruits, and berries as their preferred habitation locations.

Although the Tulburiin Gol sites reflect lithic production strategies identical to those defined the Moiltyn-Am site, the manufacturing techniques display dissimilarities, resembling instead those employed at Tsatsyn Ereg-2 and Emeelt Tolgoi. The Rashaan Khad site exhibits identical geographical features as the above-mentioned sites, but it is located in Mongolia's steppe region and displays the same lithic production techniques as those used in the south. Consequently, it is necessary to conduct a thorough study of the third great migration route of early human migration and settlement in Mongolia on the basis of comparative analysis of the lithic manufacturing technology employed at Paleolithic sites in the Khangai and Altai ranges and that in the Khentii Mountains. The hypothesis that human migrations intensified from the Middle Paleolithic to the early Upper Paleolithic, detoured north of the Himalayas and headed to the Khangai Mountains, Lake Baikal, and the territory of modern-day of Mongolia is still under dispute. Moreover, there was an additional Pleistocene migration route south of the Himalayas and reached India, China, and eventually Japan, which could have reached southeastern Mongolia as well. On the other hand, it is important to engage in detailed comparison of newly-discovered sites dating to the Middle and Upper Paleolithic periods with sites in the Khangai Mountains. Accordingly, we propose that there were two different migration routes that provided access to Mongolia: one traversed the Altai Mountains and the other crossed southern Mongolia's Gobi and steppe regions (Fig. 4).

Conclusions

Based on the evidence of multiple Paleolithic studies conducted in Mongolia, Lower Paleolithic sites have been discovered in the Mongolian Altai Mountains, the fluvial basins and valleys in its branch mountains, and the southern steppe regions, while Middle Paleolithic sites have been discovered in the southern Khangai Mountains and the eastern Khentii Mountains, in addition to the above-mentioned areas. Upper Paleolithic sites have been discovered in most regions of Mongolia, evincing increased human populations during this period. In the final Paleolithic, human migration to new habitats increased following the intensification of human cognitive development and enhancement of human adaptations and life skills to overcome natural challenges. Thus, it is possible to outline Pleistocene human habitation and distribution patterns in Mongolia.

We assume that some members of the earliest eastward migration of *Homo erectus* along various

corridors during the Lower Paleolithic, ca. 800,000 years ago, eventually reached the southern Khangai Mountains. These first migrants settled in the Nariin Gol Valley, producing lithic artifacts identical to some finds in northern China. Relatively favorable climatic and environmental conditions in southern Mongolia during the Paleolithic may have enabled human dispersal to other regions as well.

The next migration occurred in the Middle Paleolithic from the above-mentioned regions towards the Khangai and Khentii mountain ranges. Early human populations, having been settled for a longer period and having increased in number, acquired new areas for habitation and exploitation. The inhabitants of the Orkhon River Valley reached the confluence of the Eg and Selenge Rivers by Middle-Upper Paleolithic transition. Some of these populations reached the Khentii Mountains toward the Tuul River Valley, while another Middle Paleolithic migration settled in the steppe region of the eastern Khentii Mountains via the southern Kherlen River.

A great migration, which occurred during the final stage of the Paleolithic, headed south along the Altai Mountains, which leads us to hypothesize that human populations south of Lake Baikal may have dispersed further southward. Upper Paleolithic artifacts found in the southern Khangai Mountains display blank flake production and the Levallois technique, while lithic tools from the Selenge River Basin, particularly in the Tulburiin Gol River Valley, mainly reflect flake manufacturing, with the Levallois technique less common.

The Rashaan Khad site in the Khentii Mountains dates to the end of the Middle Paleolithic and evinces the use of Mousterian and Levallois knapping techniques, in which blank flake production is dominant with diminished utilization of flaking. Accordingly, we should consider that the Pleistocene inhabitants of this region may have migrated in from the south. However, the Khanzat site in the southern Khentii Mountains, not far from Rashaan Khad, displays a predominance of flake manufacturing, yet dates to a later period than the Rashaan Khad site. Therefore, it is reasonable to consider that the site's inhabitants migrated from the west.

In summary, Pleistocene peoples migrated from the south and settled in Mongolia during the Lower Paleolithic period, dispersed northward during the Middle Paleolithic, and spread widely to other regions during the early Upper Paleolithic. We may conclude that, concurrently during this period, the manufacturers of lithic flakes migrated from the area south of Lake Baikal and settled in the basins of the Eg and Selenge Rivers. Moreover, it is possible that the inhabitants of the eastern Khentii Mountains may have migrated into Mongolia from the south.

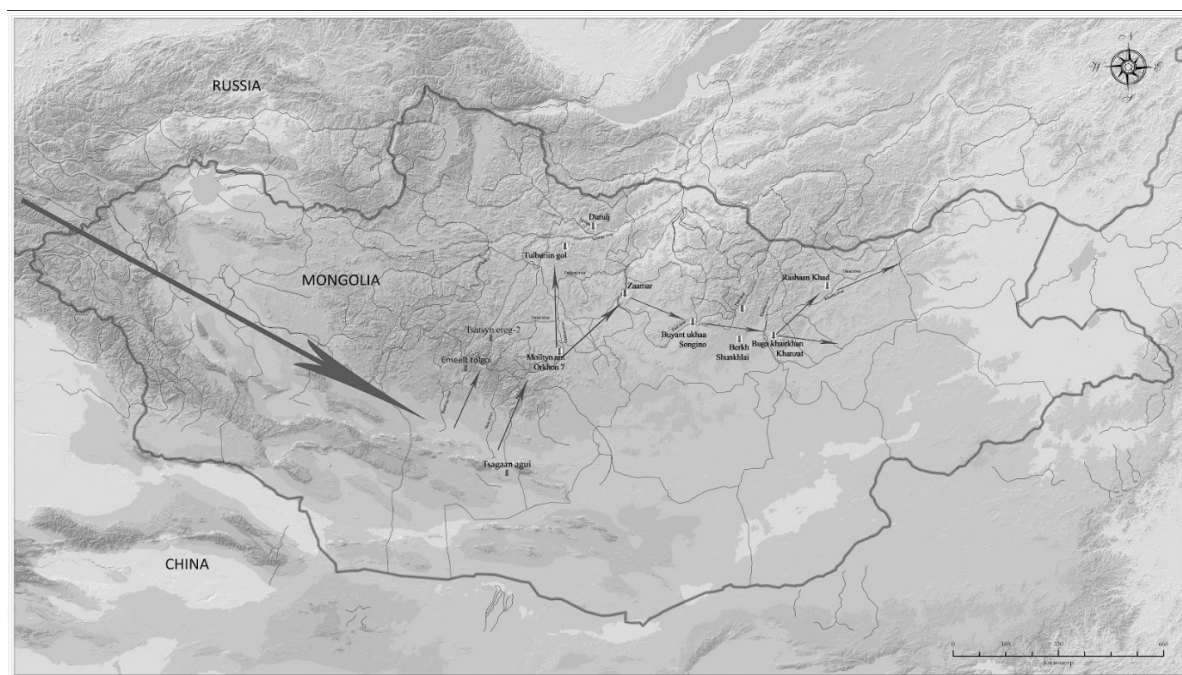


Figure 4. Map of migration routes and habitation sites from the Khangai Mountains to the northeastern Khentii Mountains during the Lower to Middle Paleolithic transition.

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