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Paleolithic Personal Ornaments from Xiaogushan Cave: The Formation of Early Symbolism and Its Regional Features in Northeast China

This article presents the results of a comparative study of personal ornaments from Xiaogushan Cave in the interregional and regional context of the formation of modern behavior. Xiaogushan is a Paleolithic and Neolithic site in Northeast China. In the Upper Paleolithic layers of the site, apart from tools, personal ornaments were found—pendants made from animal teeth, and a decorated bone disc. The date of the site is a matter of debate; ornaments from layers 2 and 3 date to ~30 ka BP. Like other bone artifacts (harpoon, needles, point), and together with types of stone tools and lithic technology, they mirror the local process of Middle to Upper Paleolithic transition. We focus on similarities between the Xiaogushan ornaments and Upper Paleolithic pendants from northern China and Eurasia in general, attesting to modern behavior during the transitional period and being an important marker of the spread of Upper Paleolithic innovations from the centers to the periphery. Xiaogushan is the first Upper Paleolithic industry in Northeast China known to date, and demonstrates skills and symbolic behavior typical of the initial Upper Paleolithic. The Xiaogushan pendants follow the general tendencies, while being specific markers of the evolution of symbolic behavior in Eastern Eurasia.

Keywords: *Ornaments, symbolism, religion, Upper Paleolithic, China, Xiaogushan.*

Introduction

This article presents the results of a comparative study of personal ornaments from Xiaogushan Cave and those from other sites in Eurasia. The study was based on the materials of field research carried out by the Laboratory for Archaeology and Anthropology of the Amur State University in 2013–2014 in the area adjacent to the Xiaogushan site (Zabiyako, Wang Jianlin, 2015). The aim of the research was to study the sites of Yufoshan, Cuoshishan, Zhongxinbu, and others with cup-marks. At that stage of research, Xiaogushan Cave was regarded as an important additional site. The results of research on cup-marks have been published elsewhere (Zabiyako, Wang Jianlin, 2017). At the current stage of the study of the symbolic behavior of the ancient population of Northeast China, the research is focused on the personal ornaments from Xiaogushan Cave. The subject of the study is general trends in the formation of early symbolism, and its regional features expressed in the ornaments from Xiaogushan Cave.

In recent years, studies of Paleolithic ornaments have gained relevance primarily in connection with archaeological and anthropological discoveries, which provided the symbolic items with significantly older dates than previously thought, and assumed the involvement of different species of *Homo* in

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ornament use. These discoveries stimulate heated discussions about the genesis of modern behavior and its anthropological basis.

The history of study, lithic industries and dates of the site

Xiaogushan Cave is located in Northeast China, on the Liaodong Peninsula, 1 km southeast of the village of Xiaogushan, Haicheng county, at the Qingyunshan Mountain on the right bank of the Haichenghe River. Geomorphologically, the Liaodong Peninsula belongs to the Liaodong mountain area in Northeast China. The Qianshan ridge (Changbai mountain range), ca 500 m above sea level, runs along the peninsula. Xiaogushan is located on the western slope of the Qianshan ridge. The ridge contains a lot of karst caves in dolomite marbles.

The Xiaogushan site was discovered in 1972 after the earthquake: employees of the Administration for Historical Monuments of the Liaoning Province found an entryway to a new cavity next to the previously known cave. Xiaogushan Cave is part of the Xianrendong cave system. The cavity is 19 m long, ca 6 m wide, and up to 10 m high; the cave is situated at an altitude of 6–7 m above the river level. In 1979, a survey of the cave cavity was carried out (Zhang Xirong, Wang Xiaobin, 1981). In 1981, there began excavations of cave deposits, containing the Pleistocene and Holocene technocomplexes (Fu Renyi, 1983). In 1983, excavations of the Pleistocene deposits yielded artifacts made of stone, bone, and horn; in the Holocene layer, a burial, individual human bones, ceramics, and tools were found; stratigraphic observations showed that some parts of the Pleistocene layers contained Holocene inclusions (Zhang Zhenhong et al., 1985; Huang Weiwen et al., 1986: 264). In 1990, the cultural horizon of the site was subdivided into five layers: layers 1–4 were attributed to the Late Pleistocene, and layer 5 to the Holocene. In total, ca 10 thousand artifacts of stone and bone were recovered; the hearths, charred animal bones, and faunal remains were identified. Most of the finds were discovered in layers 1–3 (Xiaogushan…, 2009).

In layers 1–4, bone remains of ca 40 animal species were found (Jia-Fu Zhang et al., 2010: 516). The main representatives of the fauna are the northern red fox, mammoth, woolly rhinoceros, Chinese deer, northeastern roe deer, and others (Fu Bo, 2010: 552). Fragments of fish bones were also found. Fluctuations in the climate and biota of the region have been established on the basis of palynological materials. In the initial period of human habitation of the cave (ca 70 ka BP), in a relatively cold and dry climate, coniferous vegetation prevailed; ca 60–30 ka BP, in a warmer and more humid climate, coniferous-deciduous vegetation prevailed; cooling, which reached its peak ca 17 ka BP, resulted in the next phase of changes in the biota of the region (Dong Wei, Fu Renyi, Huang Weiwen, 2010).

The process of stone tool manufacturing at the site is illustrated by blanks, cores, tools, waste products, and stocks of raw materials. The raw material was mainly quartz; two items were made of jade. Along with artifacts on flakes, there are Levallois blade cores, points, and other tools manufactured using laminar technology. The toolkit includes bifaces, points of various shapes, side-scrapers, end-scrapers (including double ones), burins, discs (not exceeding 50 mm in diameter), choppers, denticulate and notched tools, perforating borers (points), spheroids, etc. In the sample of 551 implements, tools with an intentionally pointed tip in the form of a spout (spike) make up 39 %, spheroids 18 %, borers 10 %, discs 6 %, bifaces 5 %, denticulate and notched tools 5 %, pick-like tools 5 %, side-scrapers 4 %, choppers 2 %, and points 1 %. The cores were prepared mainly by bipolar reduction with a hard hammer. The pressure technique was used less often, mainly for the production of microblades and retouching. Bone artifacts are represented by a harpoon, a spearhead, three needles, and ornaments (Huang Yunping, 1993). The Xiaogushan industry suggests the coexisting of Middle and Upper Paleolithic traditions (Xiaogushan…, 2009: 113–148). This agrees with the regional trend in the development of the Upper Paleolithic technologies, which consisted in the use of "old techniques in primary reduction and use of flakes as blanks" and persisted in China till the Neolithic (Derevianko, 2011: 116).

The age of the Xiaogushan cultural layers is still a matter of debate, despite multiple age estimations through various techniques. The main problem is that some parts of the cultural deposits had shifted, so their stratigraphic position and dates are controversial.

On the basis of the dates derived earlier for layers 2–5 on charcoal and bone samples by the AMS-method, and the new OSL-dates obtained for layers 1–3, and 5, the following chronological sequence of layers was proposed: layer 1 – 70 ka BP, layer 2 – 60–30 ka BP, layer 3 – 30–20 ka BP, layer 4 – 17 ka BP, layer 5 – 10–4 ka BP. Layer 4 is related to the period of low temperatures, which, judging by the decrease in traces of human activities, forced the population to leave the cave. About 10 ka BP, humans returned to

the cave, as evidenced by layer 5, dating back to the Holocene and containing Neolithic materials. Human remains from a burial inlet from layer 5 to layer 4 date back to the period ca 6 cal ka BP (Jia-Fu Zhang et al., 2010: 523).

Description of ornaments

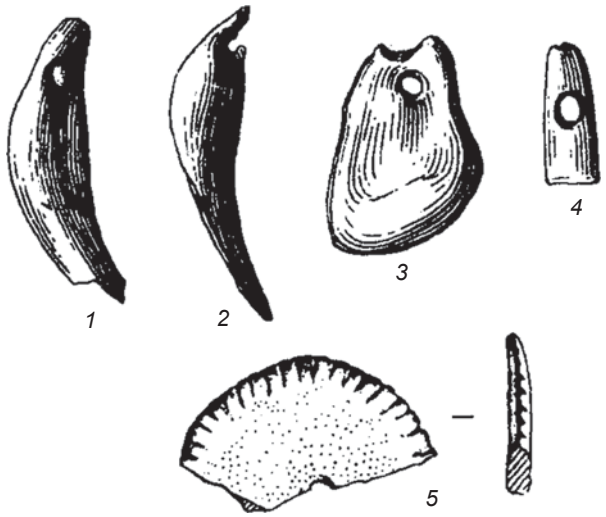
The set of personal ornaments from Xiaogushan Cave includes four pendants and a decorated disc (see *Figure*).

Pendants 1 and 2 were recovered from layer 2, sq. D9 and D8. Pendant 1 was made from the upper canine of a raccoon dog. At first, the root of the tooth was thinned by planing; then small oval-shaped depressions with uneven edges were scraped out from both sides of the tooth. Further, the ancient artisan tried to drill a hole in the recesses, but did not complete this operation. Pendant 2 was made from the upper canine of a feline. The root of the tooth was thinned; after that, a round hole was drilled in it from both sides. The upper part of the pendant is damaged: a small fragment of the drilled bone is missing.

Pendants 3 and 4 were found in layer 3, sq. G8 and F6. Pendant 3 was made from the upper canine of a deer. The root of the tooth was thinned; then a round hole was made in it from both sides. Pendant 4 was made from the upper canine of an unidentified predatory animal. It was drilled from both sides. The hole is oval; the inner surface of its walls is uneven. The lower part of the pendant is missing (Xiaogushan…, 2009: 147–148). Holes in samples 2 and 3 were made through perforation technology. Sample 4, after preparation of the surface, was drilled from both sides. Sample 1 was perforated from both sides until the depressions appeared.

The matter of whether the teeth surfaces were painted remains controversial. In a 1985 report that first presented the collection of pendants, there is no information concerning pigment on the teeth (Zhang Zhenhong et al., 1985). Later, Gu Yucai pointed out traces of red paint in the hole of pendant 3 (1994: 300). In the concluding publication of the results of the studies at the site, it is emphasized that the researchers "could not see the red paint" on the pendants made of teeth (Xiaogushan…, 2009: 151).

Half of the decorated disc was found in layer 3 in the center of the cave, sq. G6 (Huang Weiwen et al., 1986: 263). The item is made from the bone of an unidentified animal species. Its diameter is ca 25 mm, thickness is ca 2 mm. The item is polished on both sides; the edges are polished to a shine. The surface of the ivory-white



Pendants made from animal teeth (*1–4*), a decorated bone disc (*5*) found in Xiaogushan Cave (Xiaogushan…, 2009: 147, fig. 5.1).

disc is slightly convex. The opposite side is slightly concave, painted with red pigment. Short radial lines are cut with a sharp tool along one of the edges. The lines vary in depth and length and show the red pigment inside them. In the center of the disc, there is a hole 2.2 mm in diameter; the hole's edges have traces of red paint (Xiaogushan…, 2009: 148).

It was noted above that the stratigraphic sequence of the site is a matter of debate. The ornaments and bone tools were found in layers 2 and 3; nevertheless, as was noted by Zhang Jia-fu et al., the boundaries of the contact zone between layers 2 and 3 are unclear (Jia-Fu Zhang et al., 2010: 515). The authors argued that the bone artifacts should be dated to the period from 30 to 20 thousand years ago (Ibid.: 523).

Xiaogushan pendants as compared to the oldest personal ornaments from Europe, Siberia, and North China

Western Europe. The earliest pendants from animal teeth include artifacts from Fumane Cave (northern Italy). Bone remains of Neanderthals and anatomically modern humans were found in the cave. The "proto-Aurignacian" deposits, dated to ca 42 ka BP, yielded four incisors of a red deer; their upper parts had grooves for fastening (Broglio et al., 2006: 3). Sequencing of the genome extracted from a human tooth showed that the man inhabiting the cave ca 41–40 ka BP belonged to *Homo sapiens*; the "proto-Aurignacian" layers of the cave are associated exactly with this species of *Homo* (Benazzi et al., 2015).

The set of personal ornaments from Isturitz (France) contains more than 200 drilled shells, teeth, and stone pendants. Layer 4d yielding part of the ornaments belongs to the "archaic Aurignacian" ("proto-Aurignacian"), with an age more than 37 ka (White, 2015: 147).

Pendants of perforated animal teeth and shells (*Rhynchonella*) were found in Grotte du Renne Cave (France). Their age of 45–32 ka BP and their attribution to the anatomically modern humans or Neanderthals are the subject of heated debate (Vanhaeren, Julien, 2011; Caron et al., 2011; Zilhão, 2012**;** Prévost et al., 2021**).**

Central Europe. The set of Aurignacian ornaments, including 22 drilled teeth of animals (beaver, elk, etc.), was found in Mladech Cave (Moravia, Czech Republic). Some of them were recovered from burials with osteological materials of the anatomically modern humans dated to 31.5–30.68 ka BP (Oliva, 2017: 77–79). Most of the bone remains of the early inhabitants of Mladech Cave were defined as those of *H. sapiens*, but some male skulls showed archaic features close to Neanderthaloid. The ongoing discussion focuses on the issue of contacts between *H. sapiens* and Neanderthals.

Decorated discs from Brno II burial site (Czech Republic) belong to the Gravettian; they are dated to 23,680 ± 200 ka BP (Ibid.: 104).

Southeastern Europe. Mousterian artifacts from Bacho Kiro Cave (Bulgaria), inhabited by the Neanderthals, are dated by ^{14}C to a period prior to 51 ka BP (Fewlass et al., 2020). During the initial Upper Paleolithic, the cave was inhabited by representatives of *H. sapiens*—the oldest currently known in Europe. One human tooth and bone fragments were dated to 45.82–43.65 cal ka BP (Hublin et al., 2020). Among the Bacho Kiro artifacts of the initial Upper Paleolithic are the artifacts made of bone, including pendants made of animal teeth (cave bear and ungulates); some pendants are drilled and have a grooved (fluted) surface.

Eastern Europe. The collection of the Spitsyn (Kostenki-Spitsyn) culture includes early ornaments made from animal teeth (primarily polar fox) and shells. The earliest dates of the Spitsyn culture were derived from a horizon located below the "horizon in volcanic ash"; they date back to 42–36 ka BP (44–40 cal ka BP).The artifacts of this culture (layer II, Kostenki-17) include 37 pendants made from the canines and incisors of the polar fox, as well as a small series of pendants made from belemnites, corals, and calcareous worm-pipes. The initial Upper Paleolithic collection includes finds from layer IVw at Kostenki-14; among these, there is a series of ornaments made from mollusk shells (Sinitsyn, 2016: 322). Pendants made from animal teeth have been recorded at the Early Upper Paleolithic sites in the Russian Plain (Ibid.: 326–327).

Ornaments from drilled animal teeth and bone discs were found at Sungir and other sites in the Russian Plain dating back to the early (43–29 ka BP) and the next stage of the Upper Paleolithic (Zhitenev, 2007). Ornaments made from shells of the "Aurignacian" period were found at Suren I in the Crimea (Sinitsyn, 2016: 329).

The Urals. The Zaozerye site in the Middle Urals, on the border of Europe and Asia, yielded two drilled mother-of-pearl pendants from shells of the freshwater mollusk *Unio*, blanks of a similar pendant and a bead, and a bone fragment of a pendant with two drilled holes. The Zaozerye site is attributed to the initial Upper Paleolithic, with a date of 41 ka BP (Pavlov, 2009: 16).

Siberia. The earliest set of personal ornaments in the region was discovered in Denisova Cave, Altai, in the early 2000s. It includes pendants with biconical holes or cut hanging grooves, made from the teeth of fox, bison, and deer (Derevianko, Shunkov, 2004). In the course of excavations in the cave, items from mammoth tusk, soft stone, ostrich eggshell, teeth of marten, cave hyena, cave bear, and others were also found (Shunkov et al., 2016). According to direct ^{14}C dating, the earliest of these artifacts—ornaments from the teeth of red deer (*Cervus elaphus*) and elk (*Alces alces*)—were made ca 45 cal ka BP; together with bone points-borers, the complex of early artifacts is dated to 49–43 cal ka BP (Douka et al., 2019).

The article addressing the study of the assemblage of ornaments from Denisova Cave (Shunkov et al., 2020) highlights the importance of these finds for understanding the process of development of modern behavior. The ornaments from Denisova Cave refer to the Initial and Early Upper Paleolithic. Pendants with holes from animal teeth and perforated flat bone plaques found in the Main, East and South Chambers, and in the Entrance zone, were dated to 50–34 cal ka BP; according to the results of direct dating, some items date back to ca 45 cal ka BP. The collection includes some of the oldest items in Eurasia and the earliest in North and Central Asia, representing symbolic behavior. It is possible that they were produced by the Denisovans, whose traces in the cave are stratigraphically and chronologically closest to the place where the ornaments were found. The authors of that study suppose that the issue of the origins of the ornaments can be solved after investigating the archaeological and anthropological materials of the cave. The researchers believe that in East Asia the earliest

ornaments similar to Denisova artifacts have been found in the caves of Shandingdong, Shuidongou 2, and Ma'anshan (Ibid.). This is also true of the finds from Xiaogushan Cave, Shuidongou 7–9, and Zhiyu.

In Altai, Upper Paleolithic bone pendants were reported from the Maloyalomanskaya, Ust-Kanskaya, and Strashnaya cave sites, and at the Kara-Bom open-air site. Drilled pendants made from teeth (2 spec.) and a radius (1 spec.) of animals, as well as a flat pebble with traces of ocher paint from Kara-Bom, are dated to 48–46 cal ka BP (Derevianko, Rybin, 2003). The collection of stone and bone artifacts from Strashnaya Cave includes a perforated tooth of a red deer, a bone pendant, and bone needles aged ca 44 ka BP, which were found in the horizon with the Denisova technocomplex. In the same layer, in the younger horizon dating to ca 20 ka BP, other ornaments were found (Krivoshapkin et al., 2018).

Beyond the Altai, in Siberia and Mongolia, pendants made from animal teeth and other materials, as well as discs and beads, have been found at several sites of the Initial and Early Upper Paleolithic. The concluding results of their study and modern interpretations are presented in the articles by L.V. Lbova (2018, 2021).

In the Far Northeast of Eurasia, there is the site of Yanskaya (28 ka BP), which has a collection of personal ornaments, including pendants in the form of bone discs and perforated teeth of animals (the latter prevail) (Pitulko, Nikolsky, 2014).

In Transbaikalia, several sites with ornaments are known: Podzvonkovaya, Khotyk, Kamenka (over 40 ka BP), Varvarina Gora (35–28 ka BP), and Tolbaga (34–25 ka BP) (Lbova, 2021: Tab. 1). Notably, among them, only Varvaryna Gora yielded a pendant that was made from animal tooth. In Transbaikalia, pendants were made mainly from stone or ostrich eggshell. The latter are especially widespread. At Podzvonkovaya, one such item was situated in the Lower Complex (49,486–45,547 cal BP), and the rest in the Eastern Complex (45–37 cal ka BP) and Southeastern Complex (44–37 cal ka BP) (Tashak, Antonova, 2019).

East Asia, northern China. In northern China, the largest number of ornaments was found at Shandingdong and in the Zhoukoudian Upper Cave (Beijing). The stratigraphic position and dates of the layers where these items were found have been recurrently specified and corrected. After the latest correction of the stratigraphic position using the accelerator mass spectrometry technique, the following dates were derived from 11 samples of animal bones: ornaments from animal bones 39.8–34.3 cal ka BP; the youngest dates of the site layers 35.1–33.5 cal ka BP. The morphology of the artifacts and the technology of their manufacture correspond to the Early Upper Paleolithic. Li Feng and co-authors associate the emergence of the Upper Paleolithic traditions in northern China with the migration of *Homo sapiens* populations from Siberia to Northern Eurasia (Li et al., 2018). According to A.P. Derevianko, the laminar technique of stone-knapping used in tool manufacturing at Shandingdong originated in southern Siberia, and gradually spread over the adjacent regions (2011: 116).

The Shandindong archaeological materials contain 125 pendants made from animal teeth: badger 60 specimens, fox 29, deer 17, raccoon 9, yellow ferret 2, tiger 1, small carnivorous animals 5 specimens; the animal species has not been identified for 2 pendants. Holes were made in the root of the tooth with a narrow sharp tool by scraping from both sides inward until penetration into the cavity of the tooth. In some specimens, holes were made by scraping and "chipping out" small bone particles. Several holes show signs of wear. Red pigment (hematite) was traced on the surface of some of the teeth-pendants. In the Shandingdong collection of the artifacts with hanging holes, there are drilled tubular animal bones, sea shells, stone beads, and pebbles (Jia Lanpo, 1951: 64–71).

Li Feng and co-authors developed the idea of correlation of the origin of the Shandindong culture with the migration of *H. sapiens* from Siberia, and noted the similarity of the Shandindong ornaments with Kara-Bom pendants and other early items of this type from Altai (Li et al., 2018). Notably, the inhabitants of Denisova Cave and Shandindong used a similar technique for making holes in the teeth-pendants (Shunkov et al., 2017: 261; Shunkov et al., 2020: 53, fig. 5).

Southwards from Shandingdong, the Shuidongou archaeological complex is located; it consists of 12 sites (localities), of which 1, 5, 7–9, and 12 have been excavated. At localities 2, 7–9, and 12, numerous pendants and flat beads were found. Ornaments with holes are made from ostrich eggshell (they prevail) and freshwater mollusk-shells. Most of the artifacts were located near the hearth (Wang et al., 2009). The Shuidongou sites were left by the anatomically modern humans; these are attributed to the Early Upper Paleolithic and associated with the spread of the laminar industry from Siberia and Mongolia (Derevianko, 2011: 121–128). The recent AMS- and OSL-dates were obtained for the layers with ornaments. Shuidongou 2 (in layers 2 and 3, a fragment of a bone needle and more than 70 shell ornaments were found): the age of layer 2 is 30,996–29,441 cal BP, layer 3 is 32,665–30,695 cal BP;

Shuidongou 7 (blade tools and two shell beads similar to those from Shuidongou 2 were found): dated by two samples to 34,364–33,667 and 28,342–27,763 cal BP; Shuidongou 8: dated by a piece of shell bead to 31,280–30,853 cal BP (Li et al., 2019).

The absence of pendants made of animal teeth, the use of ostrich eggshell as the main material, the shape of the beads, the laminar industries, and the tool kit make Shuidongou close to the earlier Transbaikalia sites. The similarity is also supported by other evidence of symbolic activity. The Shuidongou 1 collection contains an engraved siliceous limestone tablet aged ca 30 ka BP (Peng et al., 2012). In a number of features it is similar to the older engraved tablets from the Lower and Southeastern complexes of the Podzvonkovaya site (Tashak, Antonova, 2019). These facts provide the reason to believe that the parallels in the traditions of Shuidongou and western sites are a consequence of the west-to-east migrations of human groups and the innovations they brought.

The Zhiyu site dating to 30 ka BP is situated between Shuidongou and Shandingdong. At this site, in the context of the formation of modern behavior, "especially noteworthy is a fragment of a rounded pendant made of graphite tablet", which resembles pendants from Shandingdong (Derevianko, 2011: 121).

Discussion

The earliest sites with personal ornaments make up a chain that stretches over Eurasia from west to east from Western Europe to China, and from south to north from the Middle East to the Far North. In East Asia, Xiaogushan is the most northeastern Paleolithic site with ornaments. In Asia, to the east of it, similar artifacts were found at the Yana site, located further north. In Northeast China, Xiaogushan is the only currently known Paleolithic site with ornaments.

The Xiaogushan tools and technologies are typologically close to the industries of Shuidongou, Zhiyu, and Shandingdong in northern China. Xiaogushan is one of these Upper Paleolithic sites. The similarity is explained by the spread of the laminar technology to the northeast from the older centers of northern China, of which Shandingdong is the closest to Xiaogushan; the convergence of this technology with the local flake complex; and the gradual development of an industry combining flake- and blade-based techniques of stone reduction. The emergence in Northeast China of the laminar reduction technique, production of tools from bones, and ornaments could have been the result of both contacts between local groups and the migration process. The community of Xiaogushan Cave dwellers was the first known in Northeast China to develop an Upper Paleolithic culture, formed on the basis of the working skills and symbolic behavior typical of the Early Upper Paleolithic.

Some researchers assume that the artifacts from Shandingdong and Xiaogushan layer 2 correspond to the same chronological period (Jia-Fu Zhang et al., 2010: 523). Most likely, Shandingdong was an earlier center of the Upper Paleolithic industry than Xiaogushan. Judging by the available Xiaogushan dates and the regional dynamics of the Middle to Upper Paleolithic transition, the formation of the Xiaogushan Upper Paleolithic tradition should be attributed to the period ca 30 ka BP.

The topic of *Homo* species who potentially created or practiced modern behavior is still a matter of debate for many regions of Eurasia (Prévost et al., 2021). The signs of modern behavior presented at the Xiaogushan site and within the borders of Northeast China evidence *Homo sapiens*.

In terms of raw materials, morphology, semantics, and functions, Xiaogushan ornaments correspond to the general Paleolithic tradition of manufacture and use of personal ornamentation items. However, within the boundaries of East Asia and China, these show a certain local originality. The Xiaogushan ornament collection lacks items made from ostrich eggshell, stone, or mollusk shell, typical of the Chinese sites of Shuidongou, Zhiyu, and Shandingdong, as well as of nearby sites in Transbaikalia. The Xiaogushan ornament collection is closer to the Shandingdong pendant collection, dominated by pendants from animal teeth. Xiaogushan pendants from teeth differ from Shandingdong items in the absence of pigment, as well as in the technical features of their manufacture.

In the general collection of Chinese Paleolithic ornaments, pendants made of animal teeth are quantitatively inferior to other types of personal ornaments. At the sites of northern China of the final Upper Paleolithic (Shizitan, Hutouliang), pendants from animal teeth have not been found (Gai Pei, Wei Qi, 1977: 287–300; Song Yanhua, Shi Jinming, 2013: 54–55). In terms of raw material and manufacturing technique, ornaments from these sites are close to those of the earlier period in Transbaikalia.

The Xiaogushan collection includes two jade items: a large flake and a point (10.77 × 4.5 × 2.08 cm), found in layer 3. The material was taken from the rock outcrops near the cave. The point shows traces of use and rejuvenation. According to Fu Renyi and

Zhou Xiaojing, the jade point (although it was used as a tool), along with ornaments, may indicate the emergence of aesthetic ideas among the inhabitants of the camp, who appreciated the beauty of the stone. There is no direct connection between the Xiaogushan jades and the Neolithic cultures of Xinglongwa and Hongshan, in which jade products played an important role; but it is important that as early as the Paleolithic in Northeast China, there appeared signs of a special attitude towards jade; later, a remarkable "jade culture" emerged on this basis in the region (Fu Renyi, Zhou Xiaojing, 2010). The aesthetic perception of the color and shape of the stone, and the objectification of such a value attitude in special practices of stone use, are undoubtedly two of the manifestations of symbolic behavior. In the Altai, in the Denisova collection, this special attitude reveals itself as quite early in skillfully manufactured stone decorations; in Northeast China, it was formed later, possibly during the spread of the Upper Paleolithic innovations from the adjacent territories.

It is known that in ancient China, sharp items made of jade served not only as art pieces, but also as objects for religious purposes (ritual knives, axes, etc.). It cannot be ruled out that this tradition originated in the Paleolithic.

Xiaogushan is not the only site on the Liaodong Peninsula showing the first signs of modern behavior. In the vicinity of the cave, there are Yufoshan, Cuoshishan, Zhongxinbu, and other sites with cup-marks. Cup-marks are widespread in Eurasia and North America; one part of the artifacts with such marks has been attributed to the Upper Paleolithic, the other to the Lower Paleolithic and even Mousterian (La Ferrassie). Liaodong bone ornaments and cup-marks both represent the early forms of symbolic behavior of the population of the region.

Paleolithic pendants served not only as items of personal ornamentation and symbols of social status, but also as objects associated with early forms of religion. This topic deserves a special discussion.

Conclusions

Xiaogushan is the easternmost site of the early tradition of the use of symbolic pendant objects in East Asia. Its materials mark the spatial and chronological boundaries of the distribution of modern behavior during the Middle to Upper Paleolithic transition period. These are the important markers of the spread of Upper Paleolithic innovations from the centers to the periphery. The Xiaogushan collection of pendants confirms general trends and reveals local features in the evolution of symbolic behavior in Eastern Eurasia.

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