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On the Date of the Great Shigir Idol

The Great Shigir Idol is the largest anthropomorphic wooden sculpture in the world, a unique work of Stone Age art, and a valuable source for reconstructing the material culture and worldview of the ancient population of Northern Eurasia. Although study of it began more than 100 years ago, a number of issues, such as the place of discovery, context, date, methods of exhibition, etc., remain controversial. This article analyses archival documents relevant to the location and time of discovery of the Great Shigir Idol, and on the accompanying finds. The results of a recent comprehensive study conducted by Russian and German archaeologists and scientists in 2014 are outlined. The focus is on the analysis of AMS radiocarbon dates, spanning a period from the Late Pleistocene (~10,500 cal BC) to the Late Mesolithic/Early Neolithic (~6000 cal BC). These dates show a considerable range of variation, and they disagree with those derived from the conventional radiocarbon dating in 1997. Paleogeographic and archaeological data from the Trans-Urals do not support the early (9600–9000 cal BC) estimates of the time of the idol's creation, but rather correspond to later ones, derived from the AMS ^{14}C analysis conducted in 2014. Therefore, it is necessary to continue the study of Mesolithic sites and paleoclimate of the Urals, determine the nature of primary peat formation at the Ural peatlands, and assess their age and that of the microremains of peat in early cracks in the idol, etc.

Keywords: *Trans-Urals, Mesolithic, paleogeography, Great Shigir Idol.*

Introduction

The Middle Trans-Urals is located within two geographical areas—the Ural Range and the West Siberian Plain. Cultural layers of almost all peat-bog sites in this region have been found in lakes and peaty paleolakes, in the coastal strips of the onshore sites and settlements. The banks and bottoms of the peat massifs of the Trans-Urals are composed of loams and sandy loams. The mineral bottom is overlain by multi-colored sapropels, indicating the lacustrine stage of development of the reservoir (the cultural layer was formed in water sediments). The artifacts found here are most often redeposited. The sapropels are overlain by peat of various colors and thickness. The recorded cultural layers form the habitation horizons. This is a stage of reservoir waterlogging and the formation of peat massifs. The simultaneity of the artifacts and the peat and sapropel enclosing them should be verified with ^{14}C-dates.

More than 150 Mesolithic sites have been reported from the Middle Trans-Urals; most of these non-stratified sites are located on mineral grounds, and provided quite a few ^{14}C-dates. A significant contribution to the study of the Trans-Urals Mesolithic was made by Y.B. Serikov (2000), who identified the Middle Trans-Urals Mesolithic culture, determined its origin and chronology, and outlined the specific

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features of the stone and bone tools. In recent decades, the search for and study of Mesolithic peat-bog sites in this area have been carried out by M.G. Zhilin and S.N. Savchenko. At present, seven, perhaps ten, peat-bog sites with Mesolithic cultural layers are known in the Trans-Urals. Only four of these have been excavated.

The Koksharovo-Yuryinsk I and II sites are located on the Koksharovo peat bog (Fig. 1, A); the sites were discovered and explored by Y.B. Serikov (Ibid.: 87–89). In 2007, M.G. Zhilin, S.N. Savchenko, and Y.B. Serikov studied the peaty part of the Koksharovo-Yuryinsk II site (Zhilin et al., 2012: 62–97). Both sites are multilayered; the cultural layers of the Mesolithic are embedded in the mineral ground, overlain by peat, and are not clearly separated from the Neolithic strata. These layers contain quite numerous artifacts made of stone, bone, and horn. At Koksharovo-Yuryinsk I, several fragments of arrow-shafts, two pegs, and a pine-bark float were found.

The Beregovaya I and II (peat-bog) sites are located at the Gorbunovo peat bog (Fig. 1, *A*), and were investigated by M.G. Zhilin and S.N. Savchenko (Zhilin et al., 2020: 16–87). In the peaty part of Beregovaya I, layers from the Early, Middle (two), and Late Mesolithic, and Chalcolithic were recorded (Ibid.: 16–20). The mineral bottom and the overlying peaty sapropel were covered by the Early Mesolithic layer, ca 9224–8288 cal BC (Table 1). The finds included animal- and fish-bones, a few lithic artifacts, a fragment of a wooden dart, and a bone arrowhead. In the middle part of the sapropel layer, there was a layer dated to the Early Middle Mesolithic, 8417–7741 cal BC (Table 1). Here, bones of animals, birds, and fish, four flakes, a blade, a hammerstone, and a haft element from a bone harpoon-head were discovered. In the top part of the

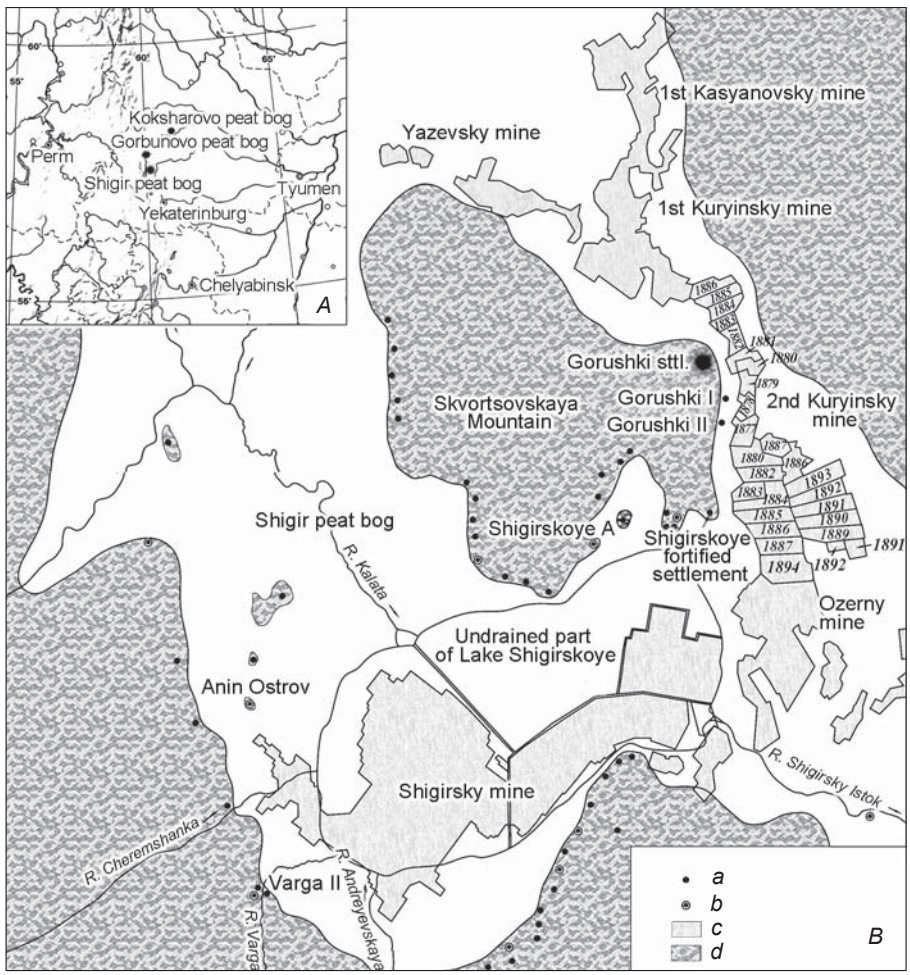

Fig. 1. Location of the Shigir peat bog (*A*), archaeological sites, and gold mining section (*B*) (after (Tolmachev, 1914) as supplemented).

a – archaeological objects; *b* – sites with the Mesolithic cultural layer; *c* – mines (the years of development are indicated); *d* – indigenous coast, islands.

Table 1. **Results of the dating of the Gorbunovo and Shigir peat bog sites**

Site	Material	Lab code	^{14}C-date, yrs BP	Calibrated date, cal yrs BC
1	2	3	4	5
Beregovaya I, Late Mesolithic	Peat	GIN-15104	8660 ± 40	7748–7590
Ditto, Middle Mesolithic	Charcoal	GIN-14775	8780 ± 40	8167–7659
	Peaty sapropel	SPb-1793	8587 ± 60	7738–7530
Ditto, Early Middle Mesolithic	Larch trunk	GIN-14773	8940 ± 30	8251–7970
	Burnt picket	GIN-15034	8400 ± 50*	7571–7352
	Sapropel	SPb-1792	8850 ± 70	8234–7741
	"	SPb-1791	8995 ± 80	8417–7841
Ditto, Early Mesolithic	Charcoal	GIN-14776	9590 ± 70	9224–8774
	Larch branch or trunk	GIN-14774	9320 ± 60	8743–8349
	Thin picket	SPb-1794	9200 ± 60	8567–8288
	Peaty sapropel	Spb-1790	9340 ± 70	8777–8409
Beregovaya II, Late Mesolithic	Plank No. 3 from flooring	GIN-14134	7960 ± 30	7028–6930, 6921–6877
	Plank No. 5 from flooring	GIN-14133	7990 ± 30	6971–6912, 6884–6830
	Plank No. 6 from flooring	GIN-14087	7990 ± 40	7042–6983, 6973–6911, 6885–6829
	Knife of elk scapula	AAR-14549	7989 ± 36	6972–6911, 6884–6829
	Burnt trunk	GIN-14085	8120 ± 50	7144–7057
	Burnt picket	GIN-14086	8350 ± 40	7490–7446, 7414–7356
	Elk antler (animal head image)	AAR-24230	8399 ± 40	7524–7416
	Sedge peat (embedding layer)	GIN-14126	7990 ± 40	7042–6983, 6973–6911, 6885–6829
	"	GIN-14080	8360 ± 40	7511–7449, 7410–7362
Ditto, Middle Mesolithic	Sinker wrap	AAR-14834	8405 ± 40	7540–7460
	Willow bark (sinker wrap)	KIA-42075	8445 ± 50	7569–7494
	Dog's coprolite	POZ-46389	8480 ± 40	7575–7530
	Wooden picket	GIN-14137	8490 ± 40	7578–7535
	Small board	GIN-14089	8670 ± 40	7683–7601
	Elk antler	GIN-14207	8840 ± 70	8198–8110, 8002–7821
	Larch branch with traces of felling	GIN-14090	8970 ± 60	8278–8183, 8042–7994
	Larch picket	GIN-14136	9010 ± 40	8278–8234
	Red deer scapula**	GIN-14208	10,200 ± 100	10,140–9754
	Sapropel (embedding layer)	GIN-14130	8520 ± 100	7651–7474
	"	GIN-14082	8970 ± 40	8275–8202
	"	GIN-14131	9170 ± 90	8475–8289

Table 1 (end)

1	2	3	4	5
Ditto, Early Mesolithic, early series	Hewn larch picket	GIN-14088	9800 ± 40	9289–9253
	Elk bones	GIN-14210	9830 ± 70	9356–9241
	Knife of a scapula	KIA-42076	9835 ± 50	9316–9255
	Charred chipped pine log	GIN-14135	9850 ± 40	9317–9266
	Knife blank of red deer scapula**	GIN-14209	10,060 ± 80	9815–9446
Beregovaya II, Early Mesolithic, late series	Picket 1, larch (pickets 1–3 from a single construction)	GIN-14251	8980 ± 90*	8285–8170, 8116–8053, 8047–7981
	Picket, larch	GIN-14248	9200 ± 40	8542–8300
	Bone tool blank	KIA-42077	9215 ± 40	8474–8337
	Picket 2, larch	GIN-14249	9230 ± 50	8489–8419, 8410–8346
	Picket 3, larch	GIN-14250	9230 ± 60	8491–8417, 8414–8344
	Peat-like sapropel (overlying or embedding layer)	GIN-14132	9210 ± 40	8469–8328
	"	GIN-14140	9390 ± 40	8724–8624
	"	GIN-14084	9610 ± 40	9011–8912, 8904–8845
Ditto, sterile interlayers	Sphagnum peat	GIN-14124	6390 ± 110	5478–5295
	"	GIN-14125	6990 ± 40	5975–5950, 5918–5837
	Charred board	SPb-2677	6929 ± 70	5933–5706
	Sedge peat	GIN-14127	8190 ± 40	7261–7225, 7193–7128
	Reed peat	GIN-14128	8200 ± 40	7301–7219, 7199–7139
	Sapropel	GIN-14129	8480 ± 40	7575–7530
	"	GIN-14081	8620 ± 40	7654–7585
	"	GIN-14083	9140 ± 40	8349–8285
Anin Ostrov	Peat-like sapropel	GIN-13869	4280 ± 60	3011–2977, 2943–2870
	Sapropel, Mesolithic layer	GIN-13872	8620 ± 130	7830–7527
Varga-2	Peaty sapropel	GIN-13863	7790 ± 40	6658–6589
	"	GIN-13860	7010 ± 50	5980–5944, 5925–5844

Note. The sites of Beregovaya I and II after (Zhilin et al., 2020: Tab. 1, 3), Anin Ostrov and Varga-2 after (Zaretskaya et al., 2014: Tab. 1).

*Invalid dates (Zhilin et al., 2020: 19, 69).

**Older fossils (Zhilin et al., 2020: 49, 69).

sapropel, there was a Middle Mesolithic layer, 8167–7530 cal BC (Table 1). The layer contained a few animal bones, lithic artifacts, and a branch with signs of processing. Late Mesolithic materials, 7748–7590 cal BC (Table 1), were found in the lower part of the peat. These include elk bones and 15 lithic artifacts.

In the peaty part of Beregovaya II, cultural layers attributable to the Early, Middle, and Late Mesolithic, Early Neolithic, and Chalcolithic were recorded (Ibid.: 21–87). The Early Mesolithic cultural layer was embedded inside the interlayer of peaty sapropel (9011–8328 cal BC) or under it, on the lake

bottom. Available radiocarbon dates form two groups (Table 1)—an early one (9356–9241 cal BC) and a late one (8542–8300 cal BC), which suggests double occupation of the site in the Early and Late pre-Boreal period. The lithic inventory included 107 items, the bone and horn collection 25 items (arrowheads; fragments of harpoons, daggers, and knives; a fishing hook; an awl, etc.); the wooden collection included fragments of a spear and a dart, five pickets, a small stick, a sliver, and a split log.

The Middle Mesolithic layer from the first half of the Boreal period, 8475–7460 cal BC (Table 1), was recorded in the upper part of the sapropel layer, which contained animal- and fish-bones and a "hoard" of bone arrowheads. The lithic inventory included 965 items, the bone and horn collection 86 items (knives, a wedge, awls, arrowheads and harpoon-heads, daggers, etc.); wooden items included a spear, four fragments of darts, an arrow-shaft fragment, a rod with a groove, a trunk with a pointed end, 14 fragments of pickets, a board, two planed sticks, 14 fragments of wooden products, two fragments with chopping marks, and chips.

A late Mesolithic layer, dated to the range of 7524–6829 cal BC (Table 1), with a footway of massive split planks, was embedded in the lower portion of the peat. The lithic inventory included 604 items, the bone and horn collection 35 items (a sculpture, an arrowhead, fragments of a dagger and a chisel, a plow, awls, a drill, a pendant blank of a wolf's or dog's fang); wooden items included a dart (?), a shaft fragment, an accumulation of thin trunks, a fragment or a blank of arrowhead, a segment-shaped product, a picket head, two sharpened sticks, fragments of two products, a paddle blade, and a rod for making fire (Ibid.: 27, tab. 3, p. 35–48).

In sum, the cultural layers of the Mesolithic peat-bog sites found in the Trans-Urals are located in the coastal strip of the onshore settlements. The Early Mesolithic layers were deposited in the lowermost portions of the sapropel, in a thin interlayer of peaty sapropel, and/or on the mineral bottom during the pre-Boreal period, ca 9400–8300 cal BC; the Middle Mesolithic layers were formed in sapropel during the Boreal period, ca 8500–7500 cal BC; the Late Mesolithic layers, in the lower portions of the peat at the turn of the Boreal and Atlantic periods, ca 7700–6800 cal BC.

The Shigir peat bog is located in the Sverdlovsk Region, 70 km northwest of Yekaterinburg (Fig. 1, *A*). In the mid- 19th century, gravel deposits of gold were discovered here. Gold lay at a depth of 7–8 m and was mined by hand in more than 20 prospector sections, with the pit's upper layers yielding ancient artifacts. The artifacts that were found during the uncovering of a large area of the peat bog were kept in various museums in Russia, in the National Museum of Natural History in Paris, and in private collections. The Shigir collection of the Sverdlovsk Regional Museum of Local Lore (SRML) includes more than two thousand items made of bone and horn, stone and metal, wood (including the Great Shigir Idol), and ceramics. The data on the age and exact location of these items are scarce and not always reliable. Judging by the ceramics dating to a wide range from the Neolithic to the Iron Age, and taking into account the rather large area where the artifacts were collected, it can be assumed that they came from non-contemporaneous sites, which probably had different functions.

In ancient times, on the territory of the Shigir peat massif, there was a water reservoir, whose initial boundaries are traceable by the outlines of the distribution of peat and sapropel deposits on the maps of 1939 compiled by the Seltorfstroy trust. However, their identification in certain areas of the peat bog is hampered by anthropogenic destructions, namely sections for peat- and gold-mining (at present, these are quarries flooded with water or stratigraphically redeposited areas).

In the Mesolithic, the Shigir peat massif was a vast lake basin cut by the Shurala, Kalata, and Shigirsky Istok rivers. Almost in the center of it, there is the so-called Skvortsovskaya Mountain (Fig. 1, *B*), known by this name in the works of V.Y. Tolmachev (1914). In fact, it is a large island, which during the Mesolithic, (judging by the sapropel deposits) was surrounded by a lake on the western, northern, and southern sides, and by separate coves on the northeastern and southeastern sides. The Kurya River flowed along the eastern coast of the Skvortsovskaya Mountain. Its floodplain was completely destroyed by the 1st and 2nd Kuryinsky mines, where in the late 19th century the Great Shigir Idol was discovered. No archaeological sites have yet been found on the eastern shore of Shigirskoye paleolake. The shallow Kurya River was probably less popular among the people than the northeastern and southeastern coves of Skvortsovskaya Mountain.

Today, 67 archaeological sites have been established at the Shigir peat bog, with nine sites containing Mesolithic cultural layers (Chairkina et al., 2001: 135–138). A large number of bone artifacts, a significant proportion of which are attributed to the Mesolithic, were found in the mines of Novy Shigirsky, Ozerny or Old Shigirsky, and 1st and 2nd Kuryinsky; this suggests the extensive development of the paleolake

water area and human habitation at its southern and southwestern coast and Skvortsovskaya Mountain during that period (Fig. 1, *B*).

Time, place, and context of the Great Shigir Idol's discovery

The first mention of a wooden idol found at the Shigir peat bog was probably made at the meeting of the Ural Society of Natural Science Lovers (UOLE) in 1890 (Tolmachev, 1914: 179). In the list of the newest acquisitions of the UOLE Museum, dated January 8, 1893, D.I. Lobanov gave information about the finds from the 2nd Kuryinsky mine, which were delivered to the museum on October 30, 1890:

"– a stone tool *in the sand under black peat**, at a depth of 5 arshins**; three wooden spoons *found on the sand* during the 4.5–5.0 arshins [3.20–3.55 m – *N.C.*]; a uncovering of the peat at a depth of wooden paddle, broken, found together with the spoons;

– a wooden idol, consisting of several pieces. When it was assembled, there were several extra pieces left, which probably belonged to another similar item, since on one of the pieces, some facial features were still visible. The idol, made up of parts, was up to 4.5 arshins [3.2 m – *N.C.*] high. *Found in the same place as the paddle and spoons*" (1893: 201–202).

Tolmachev, referring to the Lobanov's information, wrote that at the 2nd Kuryinsky mine, in the section of the "*late 1880s* at a depth of 3.5 m 'on a gold-bearing layer', three bone arrowheads with flint inserts in the blade were found. *In sections from approximately same time, at a depth of 4 m*, one wooden paddle, one large wooden idol, fragments of another idol, two stone tools, and three wooden spoons were found" (Tolmachev, 1914: 178–179). "No information was available concerning the position in which the idol was found; it is only known that it was not possible to take it intact *out of the peat*, because the wood was poorly preserved by the time of discovery, it was cracked and heavily deformed… Ten fragments of this idol have survived" (Tolmachev, 1916: 94).

Later references to the place and time of the Shigir Idol's discovery are provided in the catalog of archaeological collections of SRML, compiled by E.M. Bers: "No. 53. Wooden idol and fragments of another idol (No. 1–802). Found at the 2nd Kuryinsky mine, to the northeast of Lake Shigirskoye, *in one of the 1880 sections at a depth of 4 m*. The find is listed under No. 93 in Lobanov's catalog" (1959: 33). In the collective monograph dedicated to the archaeological sites of the Shigir peat bog, with reference to Tolmachev, it is noted that the Shigir Idol was *discovered in 1880* in the eastern part of the Shigir peat bog, in one of the sections of the 2nd Kuryinsky mine, in the peat layer *at a depth of 4 m* (Chairkina et al., 2001: 108).

The above discrepancies in the determination of the year and, consequently, the location of the section in which the sculpture was found, the depth of its deposition, and its original dimensions are understandable. The most complete information about the mines, thickness and features of the lithological layers of the 19th to early 20th centuries prospector sections, as well as information about the history of the study of the Shigir peat bog and the description of the items found there, are available in Tolmachev's publication (1914). The information he cites is taken from the works of his predecessors, including Lobanov, which is supported by the relevant links. However, it is obvious that during the first publication of the initial information about the place and context of the idol's discovery, Tolmachev made minor errors. Subsequent researchers, referring to his text as the most complete and relatively accessible source on the history of the Shigir peat bog, repeated these inaccuracies. According to the primary information sources, data from the UOLE and D.I. Lobanov, the Great Shigir Idol was discovered in the 1890 section at the 2nd Kuryinsky mine, at a depth of 3.20–3.55 m (Fig. 1, *B*). All researchers are unanimous in classifying the collection of artifacts found together with the idol. However, given the unreliability of the information about the context of discovery of artifacts in the Shigir peat bog, as well as the recent dating of the Trans-Urals wooden spoons and paddles to the Chalcolithic to Early Bronze Age (Kashina, Chairkina, 2011, 2017), the contemporaneity of this set of finds is doubtful.

The second Kuryinsky mine, with an area of ca 1 km^2, is located in the peaty-boggy valley of the Kurya River (Fig. 1, *B*). The works here were carried out through sections from the late 1870s till the early 1890s. Information on the stratigraphy, thickness of peat and mineral deposits of these sections is fragmentary. For example, according to the data from test pits, the thickness of the archaeologically sterile layers overlying the gold-bearing layer in the northern sections of 1880–1882 is 7.5–9.0 m; in the sections of 1878 and 1879, 6.0–7.5 m; and to the west of the 1877 section, 4.5–6.0 m. On both sides of the valley and

*Hereinafter, italics mine.

**1 arshin – 71.12 cm.

further south, the thickness decreases to 3.5–4.5 m; in the eastern sections of 1889–1893, to 2.5–3.5 m; in the southern sections of 1891 and 1892, to 1.5–2.5 m. In the sections of 1883–1885, located to the west of the 1890 section, the following stratigraphic layers were recorded: peat (thickness up to 1.2 m), dark gray clay (1.2 m), yellowish-gray layered clay (0.22 m), dark gray clay with quartz pebbles and shells (thickness unknown), greenish-gray gold-bearing clay (1.7 m), chlorite-mica schist (Tolmachev, 1914: 177–178). In general, the stratigraphy of the 2nd Kuryinsky mine and the section of 1890, where the idol was found, is somewhat different from that of other mines and the studied sites of the Shigir peat bog. There are neither thick layers of peat, nor sapropel, which suggests its location in the floodplain of the Kurya.

At the 1st and 2nd Kuryinsky mines, in addition to the above-mentioned finds, in one of the sections of 1883–1885 at a depth of 3.9 m, under the peat layer, in the "silt", a wooden vessel was found; in 1887, at a depth of 3.5 m, and 0.17 m above the gold-bearing layer, a human skull, fragments of a wooden paddle and a clay vessel, and bone tools (?) were found (Ibid). The sections of 1883–1887 were located on the bank of the lake bay enveloping the southeastern edge of Skvortsovskaya Mountain. Some artifacts found in the southern part of the 2nd Kuryinsky mine possibly came from local sites. The finds from the southern part of the 1st and northern part of the 2nd Kuryinsky mine, could have originated from camps and settlements located on several islands (Gorushki I and II sites) or from the now partially destroyed eastern edge of Skvortsovskaya Mountain.

Idol study results

The Great Shigir Idol, with a height of approximately 530 cm, consists of an anthropomorphic head 21 × × 34 cm in size, a board 23.0–25.5 cm wide with carved schematic anthropomorphic images, and a separate wooden piece 66 cm long, which is the base of the sculpture; the middle part, ca 200 cm, is missing (Fig. 2). In 2014, archaeologists and experts in the field of natural sciences from Russia and Germany carried out a comprehensive study of the sculpture, including an analysis of the anatomy of the wood, traces of woodworking, and tree rings, and generated a series of AMS-dates.

The ancient surface of the sculpture is covered with a dark peat patina. The patina is also present on the surface of the ancient cracks, which were filled with peat. No traces of sapropel, silt, or mineral bottom deposits were recorded on the surface or in the cracks of the figure. Researchers believe that peat formation processes took place in the Middle Trans-Urals in the Early Holocene. The burial of the Great Shigir Idol dates back to that period, when the peat layer was already partially deposited and continued to accumulate at the place of discovery, in the eastern part of the Shigir peat bog (Savchenko et al., 2018: 13, 15).

At first glance, the authors' conclusions seem logical. However, the question inevitably arises of the thickness of the already accumulated peat on which the monumental sculpture was buried, and which it couldn't have "pushed down" to the sapropel or muddy deposits at the bottom. At the bottom of some lakes and peat bogs in the Trans-Urals, there is an interlayer of peat or peaty sapropel (containing peat with a large amount of plant remains); this interlayer indicates the period of drying up of water reservoirs in the early post-glacial period.

At the Gorbunovo peat bog, at a depth of 4.4–4.5 m, the sapropel deposits overlay a peat layer 10 cm thick, which in turn covered another sapropel layer at a depth of 4.50–4.75 m, lying on clay (Khotinsky, 1977: 77). This interlayer corresponds to the period of drying-up of the reservoir in the Early pre-Boreal. The thickness of the peaty sapropel dating from 8777 to 8409 cal BC (Table 1) and overlying the sandy loam on the lake bottom at Beregovaya I is 2–5 cm (Zhilin et al., 2020: 17), and that of the peaty sapropel dating from of 9011 to 8328 cal BC (Table 1) and overlying the mineral ground at Beregovaya II is 1–6 cm (Ibid.: 25–26).

The borehole near the Anin Ostrov site, at the Shigir peat bog, showed a layer of peaty sapropel 26 cm thick, interlying the peat and sapropel strata, and dated to 3011–2870 cal BC; and also the Mesolithic layer, which was noted in the sapropel below, dated to 7830–7527 cal BC (Table 1) (Zaretskaya et al., 2014: 88, tab. 1; p. 91). At the Varga-2 site, at the same peat bog, peaty sapropel up to 30 cm thick was recorded, dated to 6658–6589 cal BC. The peaty sapropel at the eastern end of excavation 2 at the same site was dated to 5980–5844 cal BC (Table 1) (Ibid.).

The above data have shown that thickness of the interlayers of peaty sapropel, attributable to the Mesolithic, at the peat bogs under discussion does not exceed 10 cm, and the earliest date of the sapropel's formation is ca 9010–8330 cal BC. A thin layer of peat underlying the sapropel deposit obviously could not have been a layer "containing" a monumental sculpture; moreover, peaty sapropel would inevitably have been accumulated in its old cracks. The peat

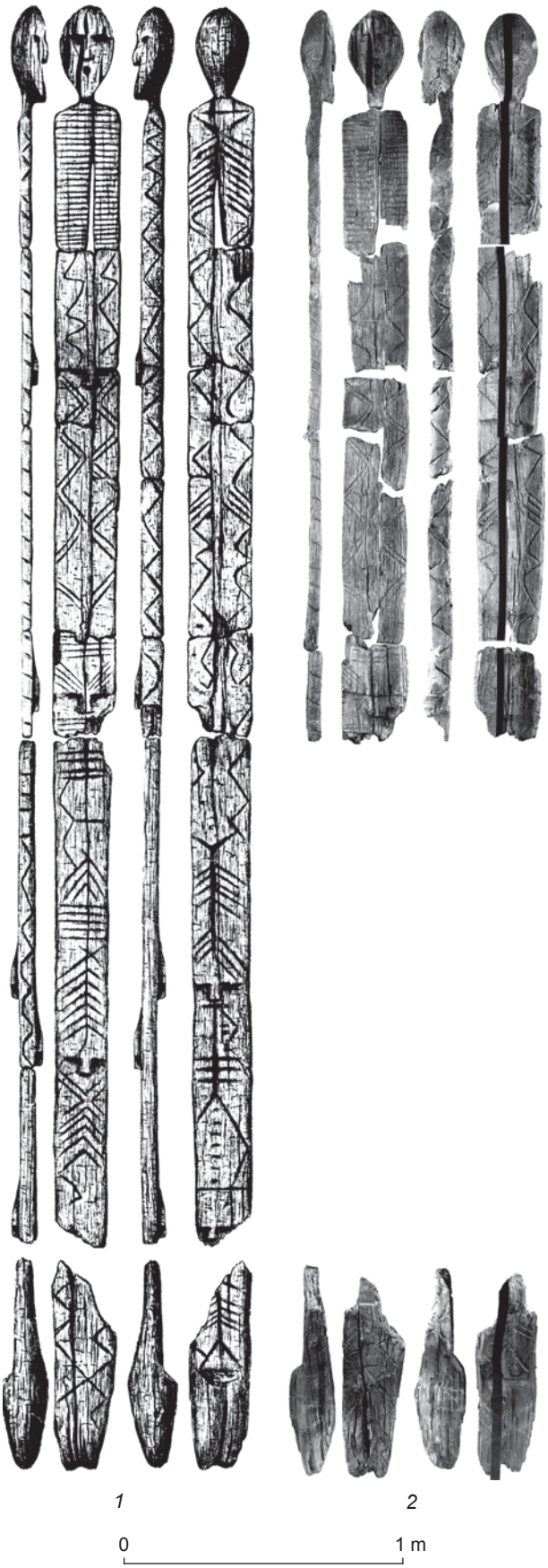

Fig. 2. Great Shigir Idol.
1 – Idol drawing after (Tolmachev, 1914); *2* – preserved part of the figure.

thickness sufficient for the immersion of the Shigir Idol ("…the idol sank in the coastal zone at a depth of less than one meter, where peat is deposited" (Savchenko et al., 2018: 13)) could not have been formed in open, and even shallow, water reservoirs: the sapropel deposit located in the lake near the shores turns into peaty sapropel, and not peat.

The idol could have been buried in the relatively thick peat layer. The rate of its accumulation in various periods of the Holocene varied: in Varga-2 section at the Shigir peat bog, in the range from 7500 ± 40 (GIN-13861) to 4870 ± 40 BP (GIN-13858), it was not more than 0.2 mm/year; and in the period from 8750 ± 70 (GIN-13865) to 7500 ± 40 BP (GIN-13861) ca 0.8 mm/year (Zaretskaya et al., 2014: 95).

The start of the waterlogging process and the formation of the earliest deposits of monolithic (not interlayers) peat on the studied peat-bog sites, including Mesolithic ones, were recorded at Beregovaya II of the Gorbunovo peat bog: in section 1 – 7511–7362 cal BC; in section 2 – 7261–7128 and 7301–7139 cal BC, i.e., ca 7500–7130 cal BC. These deposits contain the Late Mesolithic cultural layer (Ibid.: 89, 95). Waterlogging and peat formation in various parts of Lake Shigirskoye was not simultaneous: in the southwestern part at the Varga-2 site ca 7500 years ago, in the Varga section ca 6300 years ago, and in the northeastern part (Shigirskoye A settlement and Shigirskoye fortified settlement) ca 4500 years ago (Ibid.: 106).

Judging by the stratigraphy and chronology of the Mesolithic sites, as well as by the data from the palynological analysis, the accumulation of organogenic sediments (sapropels) in the paleolakes of the Trans-Urals began in the pre-Boreal period. At some of the lakes, in the Early pre-Boreal, a drier and warmer phase is recorded, which was associated with a relatively short-term drying-out of water reservoirs, leading to the formation of thin layers of peat or peaty sapropel traced on or over the mineral bottom. Peat formation in some Trans-Urals water reservoirs began in the Late Boreal or at the turn of the Boreal to Atlantic period, in the Late Mesolithic; and widespread waterlogging and peat formation as a result of a sharp dry cooling in most of the lakes occurred at the turn of the Atlantic to sub-Boreal period.

The information that there is only peat on the surface and in the cracks of the Shigir Idol, given this is correct, suggests that its "burial" took place at least

in the Late Mesolithic, when some parts of the Trans-Urals water reservoirs and paleolake Shigirskoye began to dry out and peat was formed.

Exhibition options

The researchers believe that the Shigir Idol was made with stone tools from a freshly cut and split larch trunk. The protrusions at its base are flattened, owing to contact with a hard surface. Probably, for some time, the idol stood upright on a stone, and was neither dug into nor touched the ground (Savchenko et al., 2018: 12). Other traces indicating the options for fixing the sculpture were not recorded.

The ways of exhibiting the Shigir Idol are not obvious, and can hardly be limited to the option proposed by the authors of this study. The protrusions at its base could have also been smoothed down during installing the idol into a shallow pit in the solid bedrock, which underlies the thin soft sediments almost everywhere in the Trans-Urals. The sheer absence of traces of decay, which could have disappeared on the surface, is also not a strong argument in favor of the fact that the idol was neither dug into nor touched the ground.

The lowermost part of the idol, 20–30 cm long, is slightly pointed and was probably intended for digging into the ground and/or embedding, possibly with stones. Its upper part, which is now only 25 cm wide, and initially was at least 530 cm high, should have experienced tremendous loads from atmospheric effects. The stability of the sculpture could have been ensured in different ways: it could have stood on a stone pedestal with a foundation laid by stones, leaning against a tree; inserted in a special pole construction fixed between trees; strengthened with counterweights, etc.

It cannot be excluded that the idol was not intended for vertical exhibition, and possibly nor for viewing in general, but was specially made to be immersed in water or placed on a marshy surface. These assumptions are partly consonant with the scholars' opinion that the sculpture was installed on the shore and fell into water soon after that: slight traces of rounding were noted on its surface, indicating that the item was afloat for a short period (Ibid.: 12–13).

Time of creation

In 1997, the age of the Shigir Idol was assessed by the conventional method. The available dates are well correlated with one other in the intervals of 7950–7580 (1σ) and 8210–7530 (2σ) cal BC. The AMS-data generated in 2014 differ from the above and from one another (Table 2). Samples 1 and 4 produced the youngest dates (~7000–6700 cal BC), corresponding to the Early Atlantic period. The results of dating samples 5, 3, and 7 (8700–8100 cal BC) attribute the sculpture to the pre-Boreal and Early Boreal period. Dates obtained for samples 2 and 6 (10,500–

Table 2. **Results of the dating of the Great Shigir Idol (Savchenko et al., 2018; Zhilin et al., 2018)**

Sample	Lab code	^{14}C-date, yrs BP	Calibrated date, cal yrs BC	^{13}C, ‰
		1997		
1	GIN-9467/1	8680 ± 140	7950–7590, 8210–7530	…
2	GIN-9467/2	8750 ± 60	7940–7680, 8170–7600	…
3	LE-5303	8620 ± 70	7710–7580, 7910–7530	…
		2014		
1, annual rings 1–4	MAN-21895	7930 ± 36	6854 ± 120	–26.1
5, annual rings 28–22	MAN-22436	8957 ± 28	8137 ± 104	–21.9
2, annual rings 48–52	MAN-21896	10,238 ± 43	10,020 ± 138	–29.6
6, annual rings 58–62	MAN-22437	10,518 ± 32	10,523 ± 156	–22.1
7, annual rings 88–92	MAN-22438	9262 ± 29	8503 ± 47	–21.8
3, annual rings 98–102	MAN-21897	9450 ± 40	8727 ± 56	–31.6
4, annual rings 148–152	MAN-21898	7864 ± 36	6713 ± 48	–25.7

10,000 cal BC) indicate the Late Pleistocene. Such a wide range is explicable by the repeated conservation of the idol; such traces were probably not completely removed during the preparation of the samples, which fact is confirmed by the correlation between their distances from the surface of the sculpture and the results of AMS-dating. Samples 1 and 4, the closest to the surface, were exposed to preservatives to the greatest extent; the earliest dates were obtained for the samples from the interior of the sculpture. The researchers argued that the most reliable AMS-dates from samples 2 and 6 indicated that the idol was created ca 11,000 cal BP, which is close to the boundary between the Late Dryas and pre-Boreal. However, the strong fluctuation of the calibration curve at the transition to the Holocene makes it impossible to date this time interval more accurately. The series of AMS-dates, with the greatest probability, attributes the Shigir Idol to 9600–9000 cal BC, i.e., the Pleistocene-to-Holocene transition (Ibid.: 13–15).

Conclusions

The comprehensive study has shown that the Great Shigir Idol is dated to the end of the pre-Boreal period. The choice of such early dates (9600–9000 cal BC) is not obvious; it does not correspond to the calibrated values of any of the dates obtained by the AMS-method. The issues of methods of sampling and dating of the idol are the responsibility of the experts. However, the reasons for the significant discrepancy between the dates of samples 2 and 5, 6 and 7 are unclear; moreover, judging by the figure given by the authors (Savchenko et al., 2018: 13, fig. 4), the samples are almost at the same distance from the outer surface of the trunk. It is reasonable to assume that they should have experienced approximately the same effect from preservatives.

The assumptions about the possible discrepancy between the dates of the samples that have been and have not been subjected to conservation seem justified. Our few studies of this topic did not reveal a significant difference in dates for some samples (Chairkina, Kuzmin, Burr, 2013). However, there are also anomalous (by more than five millennia!) discrepancies between the dates obtained for the samples from the objects subjected to conservation and for their archaeological context*.

*This concerns two ornithomorphic sculptures from section VI of the Gorbunovo peat bog. The data are not published.

Another indirect counterargument to the supposed early date of the Great Shigir Idol is the almost complete absence of wooden items in the Early Mesolithic layers of the Trans-Urals peat-bog sites, along with the significant number of artifacts made of stone, bone, and horn. Such an ancient age of the Shigir Idol is also disconfirmed by the previously mentioned context of its discovery. A thin interlayer of peat or peaty sapropel recorded in the sapropel or on the mineral bottom of some peat massifs in the Trans-Urals of the Early pre-Boreal period could not have been a layer "containing" the monumental sculpture. The amount of peat sufficient for its "burial" could have been deposited in the eastern part of paleolake Shigirskoye in the Boreal or at the turn of the Boreal and Atlantic, in the Middle (?) to Late Mesolithic, 7700–7100 cal BC, which conforms to the conventional dates obtained in 1997, prior to the conservation of the sculpture with butyl acrylate, dissolved in acetone and white spirit.

Thus, the paleogeographic and archaeological data suggest the need to continue research on the Great Shigir Idol in order to obtain new information about the paleoclimate, age, and nature of the primary processes of peat formation in the Ural water reservoirs; it also seems reasonable to date the micro-remains of the peat that filled deep ancient cracks in the sculpture, which were possibly not affected by the preservatives, as well as to develop clearer criteria for determining the influence of the preservatives on the results of dating the items.

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