Visible and invisible water transport components of the East European Plain and Trans-Urals in prehistory

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Abstract: In this paper we briefly discuss the direct and indirect evidence of the diverse watercraft in existence in the East European and the Trans-Ural forest zone since the Mesolithic until the Bronze Age. Two Bronze Age logboats have been investigated in Lithuania and Russia. The presence of skin and bark boats is hypothetically based on the unique find of a ceramic canoe sculpture from the Central Russia dated to the 3rd millennium BC. The group of lightweight, short wooden paddles and of the rare two-blade paddles gives us the indirect evidence of frame/bark boat extensive use since the Mesolithic Age.

Keywords: prehistory, watercraft, logboat, skin boat, birch-bark canoe

Introduction

Until recently the East European watercraft archaeological cultural heritage was not represented properly to the English-speaking audience. In the framework of the project funded by the Russian Foundation for Basic Research (No. 19-09-00301) we have built a database consisting of nearly 100 logboats from all over Eastern Europe. For the very first time we have made more than 20 AMS-radiocarbon dates of logboats from Russia and Belarus. The final publication with the full database of vessels, their contexts, and radiocarbon dates will be prepared in the future. The preliminary catalog of East European excavated logboats is already available in Russian (Kashina, Gak, Okorokov 2021).

During the project we have become involved in a separate topic – the light boats, namely the bark/frame boats in Eastern Europe: what do we know about them in prehistory? This investigation would be impossible without the kind help of my co-author, Aleksandr Shutikhin – an independent researcher and artisan, who has studied the Siberian birch-bark boat indigenous heritage for many years and has already built more than twenty birch-bark boats (Shutikhin 2019).

The aim of this paper is to clarify the existence of boat types other than logboats based on the archaeological sources, which are unfortunately extremely poor and questionable when we speak about the forest hunter-gatherer-fishers of the East European and Siberian Stone and Bronze Ages. We will subsequently analyze the available sources starting from logboats, then turn to skin boats and bark boats, and finally will pay attention to paddles. As a result, conclusions will be made about the water transport peculiarities in the East European and Trans-Ural Stone and Bronze Ages.

Logboats

Archaeological finds of Stone Age (Mesolithic and Neolithic) logboats are known in Western Europe (Arnold 1995). The most ancient surviving logboat in Eastern Europe is made of oak, dated to the Early Bronze Age, and belongs to the Corded Ware culture (around 2800–2600 cal BC), its representatives were both hunter-gatherers and herders. It was found at the Sventoji 58 site in Lithuania in 2015, measuring 6 m in length, and probably was supplied with a 2 m long outrigger, found together with the logboat (Piličiauskas *et al.* 2020). The most ancient logboat in Russia was made of oak, 7.5 m long, dated to the 18th–17th centuries BC, the Middle Bronze Age, and belongs to the Srubnaya (Timber Grave) culture. These inhabitants of the Middle Don River (Voronezh region) were semi-sedentary pastoralists of the forest-steppe and steppe zones (Gak *et al.* 2021). The rest of the surviving East European logboats belong to the Early Iron Age and later epochs (Kashina, Gak, Okorokov 2021).

Skin and bark boats

As for the extrapolation of frame boat and birch-bark canoe existence to the Stone and Bronze Ages, there is a known mismatch between our assumptions inspired by the Siberian ethnographical watercraft materials and the set of the available archaeological finds which can be firmly attributed to such vessels. We can suppose the frame boat existence in parallel with logboats. In Arctic and tundra zones the skin of sea animals could have been used. In taiga/forest zones the skin of large mammals, birch bark, or bark of some other wood taxa were likely materials, as the choice depended on the resource availability. The light weight and the ease of manufacture are the most wonderful properties which ancient people could not neglect. Unfortunately, there is still no archaeological evidence of skin boat usage in the Stone and Bronze Ages of North Eurasia. The only supposition could be made by judging Scandinavian and North Russian Stone and Bronze Age petroglyphs. The boat images involved in the sea-mammal hunting scenes cannot represent logboats, and most probably depict frame boats (Kolpakov, Shumkin 2012, 320).

According to the personal boat-building and travel experience of A. Shutikhin, the comparison of the bark canoe and the logboat gives advantage to the first one. Bark is widely available in the forest zone, but for the logboat the straight tree, healthy and of large diameter is required, so the choice was quite narrow. For the bark boat only the bark and branches are sufficient, so the choice was wide for the production of ribs, beams and stringers with the minimal labor input. The only instrument for its making is a good knife. It is light: the individual canoe can be moved by one person, as it weights from 12 to 16 kg. Oppositely the lightest modern logboat cannot weight less than 35 kg.

The written sources from the New Age (*carnet de passages* of the year AD 1655) give us the evidence of wide birch-bark boat usage in Northern Russian Arkhangelsk region as individual river transport (Shutikhin 2019: 116). In the European part of North Russia they seemingly vanished at the end of the 17th century AD. By the beginning of the 20th century the birch-bark canoe had almost vanished as well among the Siberian indigenous peoples and was mostly replaced by Russian plank boats.

Very few birch-bark vessels and their models went to museum collections. The Yenisey, Lena and Amur types (the Eastern Siberian variations, named according to the largest river basins) can be studied through existing vessels and models, but the Ob' type (the Western Siberian one) had completely disappeared even before the start of the ethnographical studies (Fitzhugh, Luukkanen 2019). The Siberian birch-bark boat typology can be traced back only for several centuries, but the general principles of the hull making were similar, with differences found mainly in the forms of the bow and stern.

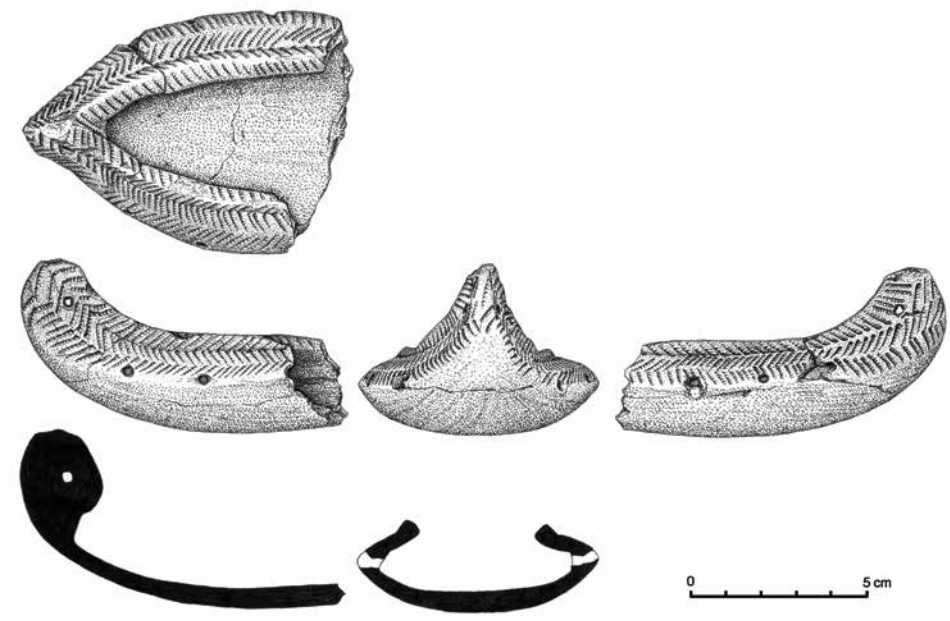

Fig. 1 The ceramic model of a birch-bark (?) canoe. End of the 3rd millennium BC, Shagara burial ground, Ryazan region, Russia (drawing: S. Konnova, State Historical Museum)

The most ancient evidence of the skin/bark boat existence comes from the Central Russia Ryazan' region, and dates to the end of the 3rd millennium BC, the Middle Bronze Age (Fig. 1). At the Shagara burial ground in one grave, four skeletons were found, and near one of them, a child, a ceramic boat model fragment was found, 8.2 cm length (Kaverzneva 2011). The paired holes for wooden beams are visible, made in the raw clay. The stamped decoration is reminiscent of ceramic vessels used by these forest communities, known as the Shagara archaeological culture, who were still hunter-gatherer-fishers at that time period, but the decoration could represent the binding. According to A. Shutikhin's view, the prototype of this model could have had five to six beams, been around 6–8 m long, and probably carried two persons. We are prone to interpret this find as a model of a birch-bark canoe, as in the forest zone the use of birch-bark instead of skin seems simpler and more logical. Its silhouette recalls the canoe of the Eastern Cree Native Americans (Arnold 2021: 94).

The Prehistoric archaeological finds of large mats of spruce and elm bark are known in Dąbki, Poland (dated to the beginning of 4th mill BC, measuring 4 × 3 m) and Byslätt, Sweden (dated to 900 BC, measuring 3.5 × 1 m; also, four wooden ribs have survived) (Kotula *et al.* 2018; von Arbin, Lindberg 2017). Both are interpreted as the remains of boats because of their size, morphological peculiarities, and archaeological context.

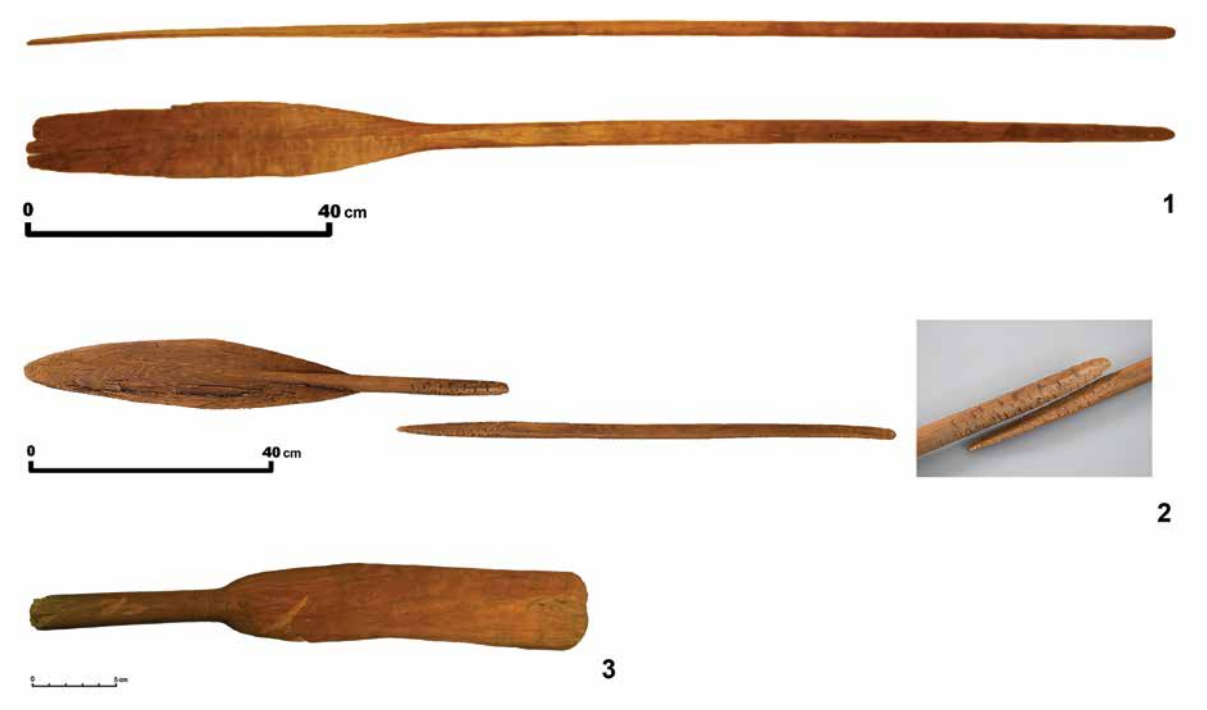

Fig. 2 Wooden paddles from the Trans-Urals peat-bog sites, Russia. 1 – simple paddle (Gorbunovo), 2 – details of a composite paddle, paddle and handle (Shuvakish 1), 3 – short paddle (Gorbunovo) (photos: 1-3 – E. Kashina, State Historical Museum, 2 – N. Chairkina, Scientific Production Center, Ekaterinburg)

Paddles

In Middle Trans-Ural (Sverdlovsk Region, Russia) the multi-period peat-bog site Gorbunovo and many other settlements situated in the lake depressions dated to the 4th and the 3rd millenniums BC have yielded a wide series of wooden paddles, both intact and fragmented. Most of them are light, thin, and rather short, measuring from 130 to 150 cm, with weight only up to half a kg (Kashina, Chairkina 2017) (Fig. 2.1). They could have been used to paddle a bark canoe or skin boat, but also a logboat.

The Mesolithic paddle finds from Northern Germany have the same features. For example, the Duvensee paddle dated 6500 cal BC is 1.5 m long and weighs 300 g (Groß *et al.* 2019). There exist some other finds of light paddles from Northern Germany and Denmark Ertebølle sites, as well as from Central Russia (Andersen 1986; Lozovski *et al.* 2013). These finds could point at the existence of Mesolithic bark canoes.

Among the Trans-Ural paddles, curious composite ones exist, designed to be assembled as a double-paddle (having two blades) or used as a simple one (Fig. 2.2). The double-paddle fits exclusively the skin-boat or the bark canoe. The Siberian ethnographical data show the wide use of double-paddles together with birch-bark canoes (Chepelev 2004). The main function of this device was to add some balance to small individual vessels.

Some extra-short paddles of around 35 cm length found in Gorbunovo have parallels in Siberian ethnography (Kashina, Chairkina 2017) (Fig. 2.3). The purpose of such paddles was to approach game quietly while hunting in the water, or to push the canoe more effectively in shallow waters.

Fig. 3 Aleksandr Shutikhin and Aleksandr Martynov during their experimental sailing in a birch-bark canoe, the White Sea (photo: A. Shutikhin)

Discussion

The strand/riparian areas of peat-bog archaeological sites usually contain such artifacts as the remains of paddles and other wooden waste, as well as discarded fishing equipment. The canoe or frame boat debris could have been left there, or the area itself could have been used for canoe repair. Some elongated pieces of worked wood, kept in museum collections, hypothetically could have been the canoe framing details, such as stringers, ribs, and beams. It should be noted that unlike the Inuit vessels *kayak* and *umiak*, birch-bark canoes do not have such well identifiable and recognizable details (Anichtchenko 2016). Birch-bark canoes often utilized materials taken literally 'right from the forest', with minimal treatment. Additionally, the Inuit normally did not discard those materials: they were always re-used in the situation where the wood was rare and precious.

According to the Siberian ethnographical data, the birch-bark canoe could serve for a maximum of five to- six seasons. Being mainly an individual transport, it was used every day. All details could have been easily replaced (Shutikhin 2019). During one experimental journey, led by A. Shutikhin in 2008, his birch-bark canoe traveled 600 km by river in twelve days and required no repair at all. In the year 2009, a 60 km White Sea travel was performed by him from the mainland to the Solovetsky Islands, where the birch-bark canoe performed perfectly in salt water (Martynov *et al.* 2011) (Fig. 3). These experimental data allow us to suppose that some petroglyphic images found in Northern Russia could represent birch-bark vessels involved in sea-mammal hunting (Kolpakov, Shumkin 2012: 335).

Even more convincing archaeological evidence of birch-bark canoe existence in Prehistoric forest belt settlements could be the finds of birch-bark mats, sewn with spruce or some other kind of roots, and also having some traces of tar sealing. In this case the diameter of holes should be from 2 to 4 mm. Such finds are still not known to us. Nevertheless, continued searches among peat-bog archaeological materials should be continued in order to locate more probable wooden frame details, which could fit the bark or skin vessels. Also, the future peat-bog settlement excavations could provide new finds.

The multiple forms of light vessels and paddles reflect a deep spiritual background in Prehistoric and traditional societies. The vessel was perceived as a living being, which required worshipping, offering and decoration. Not only vessels but also paddles were sometimes decorated or marked to show the kinship, social position, or ethnicity of their owners. They could have been used in rituals or to give signals (Andersen 1986). For example, the fragmented tip from a light paddle found in the Modlona Northern Russian hunter-gatherer-fisher' peat-bog site dated to the second half of the 4th millennium BC, was decorated along the edge with triangles painted by red color (Fig. 4).

Fig. 4 The tip fragment of a painted paddle from the Modlona site, Vologda region, Northern Russia, second half of the 4th millennium BC, Late Neolithic (photo: E. Kashina, State Historical Museum)

Conclusion

The existence of dugouts in Western Europe is well documented since the Mesolithic period, but in Eastern Europe the archaeological finds of dugout remains belong to the end of the Stone and to the beginning of the Bronze Age. The existence of frame boats and bark canoes already in the Mesolithic and Neolithic is proved by the archaeological finds of light and quite small wooden paddles at peat-bog sites across Europe and in Western Siberia. The rare finds of probable bark canoe remains as well as the ceramic model of a canoe are dated the Bronze Age. There is still a chance for new discoveries of even more ancient bark boat remains. The Stone Age petroglyphs of Northern Russia and Scandinavia show diverse watercraft images, but unfortunately, they do not help much to identify the particular vessel types. This state of affairs certainly deserves more investigation and precise observation of old and new archaeological materials, as well as the international exchange of experimental results.[1]

Acknowledgments

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[1] The presentation of this topic made at the ISBSA 16 congress in Zadar can be downloaded here: https://www.academia.edu/53655692

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