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S.F. Tataurov and S.S. Tikhonov
Institute of Archaeology and Ethnography,
Siberian Branch, Russian Academy of Sciences,
Pr. Akademika Lavrentieva 17, Novosibirsk, 630090, Russia
E-mail: tatsf2008@rambler.ru; semchi957@gmail.com

Shovels Used by Russians in 17th–18th Century Siberia

The study describes types of the shovel—one of the most widely used and multifunctional tools in 17th–18th century Russian culture of Siberia. The principal collection includes more than twenty intact and fragmented specimens unearthed during 13 field seasons of excavations at Tara, in the Omsk Region. Shovels found elsewhere in Western Siberia are also described, and the role of this tool in the households of Russian pioneers in Siberia is assessed. Judging by the drawings in Semen Remezov's chronicle and excavation records from Tara, Mangazeya, and Nadym forts, we conclude that shovels were specialized for various kinds of work, and that they varied with the season. There were diverse types used for constructing fortifications, dwellings and utility structures, for digging graves, tillage, clearing snow, handling bulk materials, and baking bread; children's toy shovels are also described. Information is provided on shapes of shovels and the types of wood Siberians used for making them.

Keywords: *Tools, shovels, history, Siberia, material, form, subsistence.*

Introduction

Archaeologists carefully study various types of finds, including weaponry and tools, pottery, items of portable art, etc. However, some of them, such as wooden shovels, very rarely come to attention of scholars. This can be explained by the absence of a series of such items: at the majority of archaeological sites, wooden items very rarely survive in a state suitable for research. The evidence obtained from studying the first Russian towns in Siberia may fill this gap. Excavations at the location of the historical center of Tara—one of the first Russian towns in Western Siberia—yielded materials making it possible to reconstruct not only the town's planigraphy and wooden architecture, but also almost all aspects of life among Tara's residents, including their use of wooden shovels in everyday life.

This study is aimed at presenting the shovels of the 17th–18th centuries, found during the excavations of the Tara Fortress, and establishing the role of this tool in the subsistence system of the Russians of Siberia.

History of research into wooden shovels in Russian scholarship

As a tool for loosening and removing soil, and moving bulk materials, shovels have been used in Northern Eurasia at least since the Neolithic. In the early 20th century, at the Shigir peat-bog, near the village of Neivo-Rudyanka (Sverdlovsk Region), 32 items made of coniferous wood were discovered. These were identified as shovels with support, which were used for soil loosening (Tolmachev, 1916: 36–37, 41–42, pl. I). In 1937–1939, at the Modlona site, in Kirillovsky (formerly Charozersky) District of the Vologda Region, in the layer of the Volosovo culture of the second half of the 3rd millennium BC, a shovel with slanting shoulders

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was discovered (Bryusov, 1951: 39, fig. 11, *2*). The same kind of item was found in 1960 by G.M. Burov during the excavations at the Vis I site (the mouth of the Simva brook, the Sindor Lake system, Knyazhpogostsky District of the Komi Republic). Burov did not identify the artifact as a shovel, but considered it to be similar to the finds of Bryusov (Burov, 1966: 162). In 1954, S.I. Rudenko found seven shovels in the Tuekta burial mound 1 (Altai Republic) (1960: 112, fig. 61; 113).

The amount of information about shovels discovered at archaeological sites has increased with the appearance of studies discussing the evidence from excavations of Russian sites, primarily in Novgorod. In 1968, B.A. Kolchin described wooden items from the Nerevsky excavation area in Veliky Novgorod, Among these, there were shovels made of oak. According to Kolchin, 24 intact shovels and about 150 shafts and blades were found (1968: 15–17, fig. 5, *1–6*, *11–14*). He divided the shovels into groups according to their function: for placing bread into the oven, for doing earthworks, for working with loose materials, and for removing snow. According to Kolchin, Novgorod shovels had a platform for the foot only on the right side, which gives us a clue on the technique of earthworking: a person pressed on the shovel with his right foot, while the right hand was usually placed on the shaft of the shovel below the left hand; the soil was dumped forward to the right, sidewise to the right, or backwards to the right. In an earlier study, the scholar only mentioned wooden shovels and iron fittings found in Novgorod, Kyiv, and Suzdal (Kolchin, 1953: 88–89, fig. 51). A.V. Chernetsov, A.V. Kuza and N.A. Kiryanova, the authors of the section "Zemledeliye i promysly" ('Agriculture and Crafts') from the monograph *Drevnyaya Rus* ('Old Rus'), published in the series *Arkheologiya SSSR* ('Archaeology of the USSR'), used the findings of Kolchin and gave a description of the shovels, where they mentioned that their blades had a rectangular, trapezoidal, or triangular shape (Drevnyaya Rus…, 1985: 224, 237, pl. 85, *1–8*). In the 1990s, the publications by A.P. Borodovsky (1994) and S.S. Tikhonov (1994) showed the opportunities of studying wooden shovels and iron fittings on the basis of a wide range of material and written sources (Borodovsky, 1994: 67; Tikhonov, 1994: 63–66). Wooden shovels do not appear in the studies of Russian scholars as often as pottery or artifacts made of metal, bone, etc., but these works have laid the foundation for further research of this category of finds.

Siberian evidence and purpose of wooden shovels

Evidence from excavations of Russian archaeological complexes of the 17th–18th centuries in Siberia has made it possible to increase significantly the corpus of sources with items made of organic materials—leather, wood, and vegetable and woolen fibers. In terms of numbers, these collections are comparable to those from the most famous sites of European Russia, such as Novgorod, Ladoga, etc. The reason for the good preservation of such artifacts is special natural conditions: low temperatures in Mangazeya (Vizgalov, Parkhimovich, 2008, 2017; Kardash, 2009), or a specific type of the cultural layer; for example, in Tara it was accumulated during two centuries within the fortress walls, and frequent large fires contributed to its intensive formation up to 4 m thick (Tataurov, Chernaya, 2015; Aleksandrovsky et al., 2019).

Good preservation of wooden architecture at Siberian sites makes it possible to correlate the finds with specific housing and economic complexes, which enhances more accurate attribution of the items discovered. For example, kitchen spatulas and tools for calking log cabins with moss are similar in shape. In order to establish the functions of the tools, one needs to have information on the locations of the finds. Shovels and oars are not only quite similar in shape, but were often used for purposes other than those intended: people might row in boats with shovels, and shovel bulk materials with oars.

Drawings from the Remezov Chronicle, made at the turn of the 17th–18th centuries, help us to establish specialized purposes of shovels (Remezovskaya letopis…, 2006). In our opinion, the tools shown there have remained practically unchanged during the first century of the Russian possession of Siberia. It is important that the images of items (weaponry, tools, dishware, etc.) are rendered in detail.

In the Remezov Chronicle, shovels are mentioned in several articles, which also provide detailed drawings of them. For example, article 36 contains information about the victory of the Cossacks and capturing a large amount of booty: "…and so much booty was captured that they could not take it on the boats. And they hid that booty in the ground at the mouth of the Tura River" (Remezovskaya letopis…, 145), which is supplemented by the drawing depicting a sentry and three diggers with shovels, making a mound over the treasures (Fig. 1, *1*). One shovel is drawn in sufficient detail: it has a long, straight shaft almost as tall as human height, equal straight shoulders and a metal fitting, extending towards the working edge. The fitting is fixed to the shovel with staples.

Article 42 mentions the opposition of Khan Kuchum to the advance of Yermak's unit: "He made a tree entanglement near Chuvashy on the Irtysh, fortifying the town with trenches…" (Ibid.: 151), and provides a drawing showing two diggers and a lumberjack, holding shovels with long straight shafts. Notably, these tools are without fittings.

Article 81 provides information about the first losses of Yermak: "Yermak returned back and buried his people at the Sauskan promontory, at the royal cemetery on the edge of the promontory, so as to remember the place" (Ibid.: 178). The drawing shows the process of burying the killed Cossacks in the mass grave (Fig. 1, *3*). Three diggers are throwing earth into the grave, using large shovels. Two more shovels with long shafts, straight, equal shoulders, and fittings along the working surface are lying on the ground.

Article 98 reports: "Yermak… went up the Irtysh towards the Bukharans, and in the Agit bow he dug across the portage" (Ibid.: 193). The drawing shows the camp of the Cossacks, fenced off by a sufficiently wide and deep ditch into which the water of the Irtysh was brought (Fig. 1, *4*). There are no shovels, but the amount of work done suggests that almost the entire unit did the earthworks, and therefore a lot of shovels were available.

Article 112 mentions the burial of Yermak by the Tatars at the Begishevo cemetery (Ibid.: 202). The drawing shows two diggers making a mound over the grave; they are holding tools with long, straight shafts and slightly sloping shoulders (Fig. 1, *5*). The shovels have rounded blades without fittings.

Analysis of the drawings allows the conclusion to be drawn that both Russians and Tatars used shovels with long, straight shafts and well-marked shoulders. Tatar shovels did not have metal fittings, and had rounded edges. All Russian diggers had shovels with fittings and straight edges. These tools were used for digging and filling grave pits, and for constructing fortifications.

On the basis of the evidence found during the excavations of the Tara Fortress, as well as finds from Mangazeya and Fort Nadym, we attempted to distinguish the shovels of Siberia in accordance with such features as the purpose of the tool, its shape, and its material, relying on the typology developed by Kolchin (1968: 15–17). We should note that we do not claim to be innovative, since this typology does not require revision.

Several types of shovels have been identified in accordance with their intended purpose.

Shovels for earthworks (Fig. 2, *2*, *8*, *9*; 3, *8*, *13–14*). These have long (at least 1 m) shafts. The end of each shaft has the shape of spherical knob or is flat (sawn off), with a hole for rope. The blade is relatively small (35–45 cm long, no more than 30–35 cm wide), which made it easier to dig soil. The working edge of a shovel without fittings can be either straight or rounded. Shoulders in the shovels of this type are straight for convenient resting of the foot, or slightly slanting; when working with such tools, one could rely only on the strength of the arms. The Tara shovels were made of birch—its timber was considered one of the toughest in this forest region. The Mangazeya and Nadym tools were also made of birch.

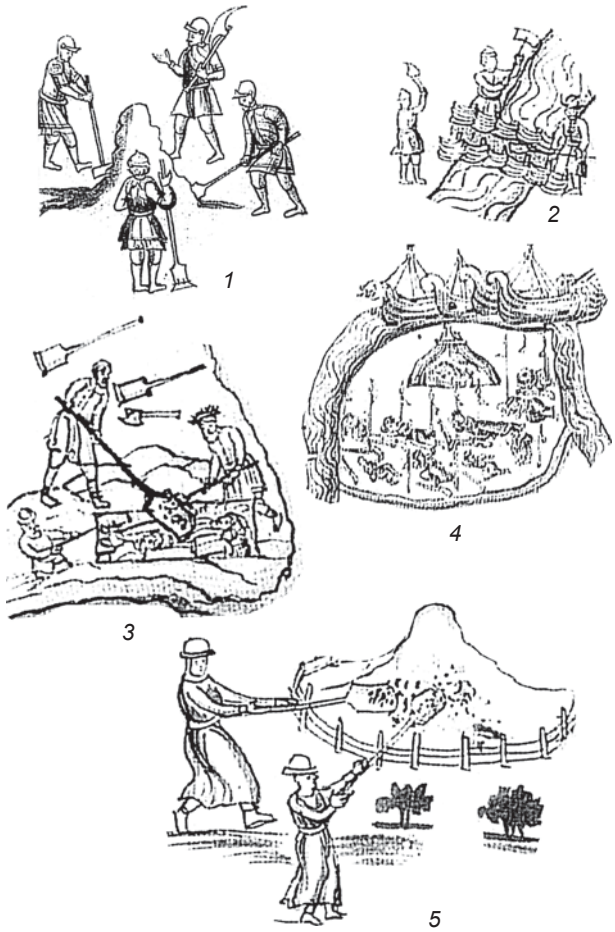

Fig. 1. Shovels in the drawings of the Remezov Chronicle (Remezovskaya letopis…, 2006).
1 – Cossacks bury treasures on the Tura River (Ibid.: 145); *2* – diggers of Khan Kuchum (Ibid.: 151); *3* – burial of Yermak's soldiers (Ibid.: 178); *4* – ditch with embankment created across the portage by Yermak (Ibid.: 193); *5* – burial of Yermak by the Tatars (Ibid.: 202).

An iron fitting was attached to the shovel blade. The drawings in the chronicle of S.U. Remezov show all Russian shovels with fittings. However, only a few such tools are present in archaeological collections; the fittings could have been recycled in forges or, if the wooden base became broken, they were reused on a new tool. For example, the specimen from Tara is well-worn. The iron fitting was made of thick rod (Fig. 3, *7*), in which a deep cut was made with a chisel, and then each side was forged using a sharp insert. This is a rather laborious method; more often, the fitting was made of two plates joined with welding by a smith.

Shovels for earthworks were used for planting, processing, and harvesting vegetables: for example, turnips. A large pot with turnips was found during the excavations in Tara. Turnips and cabbages were the most common vegetables among Russians in Siberia of that period (Tataurov, Tikhonov, Chernaya, 2016). Another use

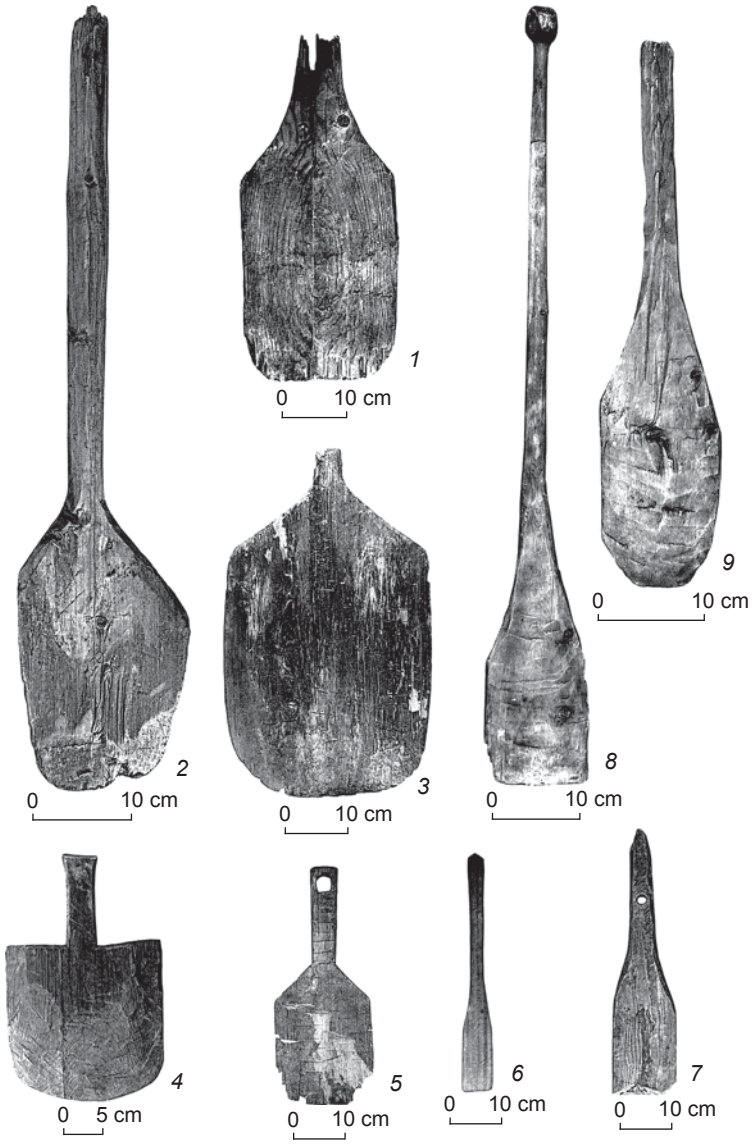

Fig. 2. Wooden shovels from excavations at Mangazeya (*1–7*) and Fort Nadym (*8*, *9*).
1, *3* – for snow removal; *2*, *8*, *9* – for earthworks; *4* – for baking bread; *5–7* – kitchen spatulas.

of shovels was associated with the need to store food—for digging cellars. Cellars were divided into compartments with ice for storing meat and fish in the warm season, and compartments for storing vegetables (Tataurov, Chernaya, Borilo, 2018). Tara, like any other fortress, had several sources of water supply. The town had both public (fortress and monastery) and private wells. Digging tools were needed for their making and routine cleaning. One of the wells was excavated in 2012.

Several clay pits for pottery and brick production have been found during the excavations of the town. The town dwellers extracted raw materials within fortress walls, using shovels for earthworks. Such shovels were also used to clean sheds where livestock were kept in winter.

An important part of Tara's life was the construction and maintenance of defensive structures. The powder magazines under the fortress and fortress towers were 3 sazhens (over 6 m) deep into the ground. The fortress walls consisted of *gorodni*—cribworks filled with soil and palisades; a ditch was dug in front of them along the entire perimeter of the town. Shovels for earthworks were indispensable.

Stirring shovels. Small shovels, which served rather as stirrers (Fig. 3, *11*, *12*), were used for mixing solutions. Their length did not exceed 1 m; in some cases, the shovel's blade constituted over a half of the item. The blade's width reached 20 cm. The working edge could be either straight or rounded. The shoulders were weakly expressed.

Fig. 3. Shovels (*1–6*, *8–14*) and iron fittings (*7*) from excavations at the Tara Fortress.
1 – kitchen spatula; *2* – toy shovel; *3–6*, *10* – shovel for snow removal; *8*, *13*, *14* – shovel for earthworks; *9* – shovel for baking bread; *11*, *12* – stirring shovels. *1–6*, *8–14* – wood; *7* – iron.

Snow shovels (see Fig. 2, *1*, *3*; 3, *3–6*, *10*) were the most numerous category among the shovels discovered during the excavations of Russian sites in Siberia. In Tara, all tools for removing snow were carved of aspen—the softest and most fragile timber, with the exception of one shovel (see Fig. 3, *3*) made of cedar pine. It is not surprising that aspen shovels often broke (usually the edges of the blade broke off); it is very rare to find intact items in collections. Unlike other tree species, aspen had the largest trunk diameter, so it was most often used to make wide shovels for snow removal. A person who had command of an axe needed a piece of log and half an hour to make it.

Snow shovels did not differ in length from digging shovels, and had the same long straight shaft. However, they had larger blades, over 40 cm in width and up to

60 cm in length. The working edge was usually straight, but it could also be rounded. Of interest is a cedar pine shovel (see Fig. 3, *3*); it is larger than others (ca 3 cm thick), and has shoulders with protrusions (like modern spades); its working edge is not straight, but slanting. The absence of wear traces suggests that the shaft broke at the very beginning of the tool's operation. The shoulders are usually strongly slanting, but there are specimens with straight shoulders. One of the shovels bears the inscription: "oCh" (see Fig. 3, *4*); this is probably a mark of belonging to a certain area of the town, or the stamp of the manufacturer or owner of the tool.

Shovels for baking bread (see Fig. 2, *4*; 3, *9*). The heads of excavations in Mangazeya identified a shovel with a short shaft as "bread" shovel (see Fig. 2, *4*) (Vizgalov, Parkhimovich, 2017: 97). The short shaft was probably made taking into account specific features of the Mangazeya ovens: these had short hearthstones, and there was no need to insert loaf-tins or sheets with bread deep into the oven. Stoves in Tara and in the surrounding settlements had long hearthstones, sometimes reaching 2 m (Adaptatsiya russkikh…, 2014: 264, fig. 63, *1*; 266, fig. 65), so shovels with long shafts were needed for baking bread (see Fig. 3, *9*). A bread shovel differed from a digging or snow shovel in shape and thickness: its shaft was thinner and had a spherical or T-shaped knob at the end, which made it easier to pull the tool with bread out of the oven. The blade was made in the form of an elongated oval with a sharp working edge. Its small thickness (no more than 2 cm) and width (ca 20 cm) corresponded to the purpose of the shovel to pull out bread, and not to lift it; such a shovel could be easily slipped under a sheet or tin with bread. If necessary, the same shovel could be used for raking charcoals and pulling out pots from the oven. Oven-forks appeared simultaneously with cast-iron pots only in the 19th century.

Kitchen spatulas (see Fig. 2, *5–7*; 3, *1*). The material evidence from Mangazeya includes dozens of these kitchen utensils (Vizgalov, Parkhimovich, 2017: 171). Among the finds from Tara, such spatulas were less numerous; this can be explained by specific features of northern cuisine, or by the fact that the Tara-dwellers used whorls to stir the prepared dish (in terms of quantity, whorls are comparable with the Mangazeya spatulas). The Tara spatula (see Fig. 3, *1*) might not only have been used for stirring: it served as a cutting-board, as evidenced by numerous knife traces. Spatulas do not exceed 50 cm in length; their shoulders are strongly slanting; the working edge is straight; the width of the blade is 10–12 cm. The spatulas used for plugging the cracks in cribworks with moss are very similar to these items; their purpose can be established more accurately only by using the data on the location of such artifacts.

Toy shovels (see Fig. 3, *2*). The toys discovered during the excavation of Tara included several children's shovels. As was shown in the study on this category of finds from Tara, they reproduced the tools used by adults (Chernaya, Tataurov, 2019: 87, fig. 3, *9*). For example, the children's shovel shown in Fig. 3, *2* was an almost exact replica of the above-described cedar pine shovel for moving snow.

Sizes and proportions of shovels (ratio of the shaft's length to the blade, and ratio of the blade's length to its width) show that shovels for placing bread into the oven were the longest. Shovels for earthworks and snow removal were almost 0.5 m shorter than those. The shortest were kitchen spatulas (see *Table*). Snow shovels had the widest blades, while bread and kitchen shovels had the narrowest blades (see *Table*). With the accumulation of new evidence, it will be possible to establish the purposes of shovels from their sizes and proportions with more confidence. It would be useful to describe some features of the ends of shafts and blades. A shaft ended with a knob or hole in a shovel designed for earthworks. A bread shovel had a T-shaped or spherical knob at the end of the shaft; the thickness of the oval blade did not exceed 2 cm. A kitchen spatula was characterized by numerous knife cuts on the blade and the presence of hole in the shaft, through which a rope was threaded for hanging the utensil. As far as the slope of the shoulders is concerned (the angle between the shaft and the shoulder), this indicator was confidently identified only for the shovels intended for earthworks or snow removal—135–160°. We did not measure the parameters of the children's shovels, since they were adjusted for the hand of a child.

Parameters of the shovels discovered in Tara

Shovel	Amount, pcs.	Shaft length, m	Blade length, m	Blade width, m	Proportion	
					shaft length to blade length	blade length to blade width
For earthworks	6	≥ 1	0.35–0.45	up to 0.35	2.2–2.85	1.0–1.3
For stirring	2	ca 0.5–0.7	up to 0.5	≤ 0.2	1	ca 2.5
For removing snow	7	1	0.6	0.45	1.5	1.5
For baking bread	3	up to 1.6	0.4–0.5	0.2–0.3	3.2–4.0	ca 2
Kitchen spatulas	3	≤ 0.5	ca 0.2	up to 0.2	1	0.2–0.25

Conclusions

It is difficult to find an aspect in the life of an inhabitant of Siberia that would not entail the use of shovel. People cultivated land using shovels, dug cellars for storing harvest and ditches surrounding fortress walls, set up defensive obstacles, and created the *gorodni* cribworks. This tool was also used to dig grave pits. In winter, the life of a town in Siberia was inconceivable without snow removal. Kitchen spatulas were indispensable in cooking.

The study of shovels that were found during the excavations in the Tara Fortress has shown that shovels were used at different times of the year, indoors and outdoors, and for specific works. The tools differed in the length of the shaft, the design of their ends, the width and possibly thickness of the blades, and the presence or absence of knife marks on the blades. A shovel for earthworks had a total length of at least 1.5 m, a straight or rounded cross-section of the blade, and slightly slanting or straight symmetrical shoulders. This indicates that a person worked with the shovel standing straight up or slightly bent, using his right or left foot while pressing the tool into the ground. To work only with the arms was possible on light soils or with bulk materials. Most likely, precisely such shovels had iron fittings. The question of what determined the presence of one or two shoulders in shovels is still open. The number of shoulders might have been an ethnic trait discovered by I. Balassa and Gy. Ortutay in the evidence from Hungary (Tikhonov, 1994: 65). It cannot be ruled out that the difference in the number of shoulders reflects specific methods of working with a shovel. Digging shovels could have been used for moving bulk materials, removing manure, rowing a boat, etc. Such tools can be considered versatile, but their main purpose was to work with soil. Snow shovels differ from those described above by their wider blades. They might have also been used for working with other materials, but in that case more effort would have been required from the worker.

At first sight, stirring shovels appeared to be tools for working in the kitchen, but in fact this was not the case. During the excavations, several dozen whorls made from a thin tree trunk, were found. Stirring shovels were different from these. Their purpose was mixing/stirring solutions, such as mortar for brickwork or clay. For the latter, there were short (no more than 50–70 cm long) shovels with narrow blades, almost without shoulders.

Bread shovels were distinguished by thin oval (in some cases rectangular) blades and long shafts. Old bread shovels were most likely also used outdoors.

Kitchen spatulas probably served as cutting-boards: they show knife marks on them and a hole for a rope at the end of each shaft-handle. Using such shovels, it was possible to pour grain or flour into containers for subsequent processing. Since kitchen spatulas did not exceed 50 cm in length, they were not used when working with soil, manure, etc. These kitchen spatulas should be distinguished from tools for calking log cabins, whose blades were 3–15 cm wide. The latter were used together with a mallet, so they often have typical marks of mallet strikes on the shafts. Such finds occur outside the dwellings, and are not considered in this study.

Shovels show traits of both specialization and versatility. A wooden shovel was one of the simplest tools to make; only a suitable log and axe—an even more necessary tool in the life of a Siberian dweller—were needed to do it. Shovels were made of various types of wood and were given different shapes; iron fittings were used for ensuring their sharpness and durability.

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