

Experiments reconstructing and using T-shaped wooden Spades

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ABSTRACT

This article summarizes an attempt at reconstructing and using T-shaped wooden spades as well as reflecting on the connection between structures and resource use around Knudmosen near Herning. However, an important limitation on this process is that very few spades are dated. The conclusion is that the spades are relatively easy to produce and well suited to digging peat.

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Figure 1. A T-shaped spade is a composite tool formed from at least three pieces of wood: the blade, the handle, and one or more pegs that hold the blade and handle together (Photo: H. Lyngstrøm).

T-shaped wooden Spades

A T-shaped wooden spade is a composite tool formed from at least three pieces of wood: the blade, a handle, and one or more pegs that hold the blade and handle together (Figure 1). The spades' blades are preserved as long, thin pieces of wood that are sharpened or worn to a u- or v-shaped edge on one end while the other is shaped so the

handle can be attached. The blades are usually widest just under the handle: 6-14 cm. The handles are 26-44 cm long with a circumference of 6-10 cm. Only four of the almost 300 known examples are dated. The dates are between 600-400 BC (Lerche 1985, 216, 1995, 184-185 and 191). The T-shaped spades are all found in bogs and have been associated with peat digging, but their function has never been tested.



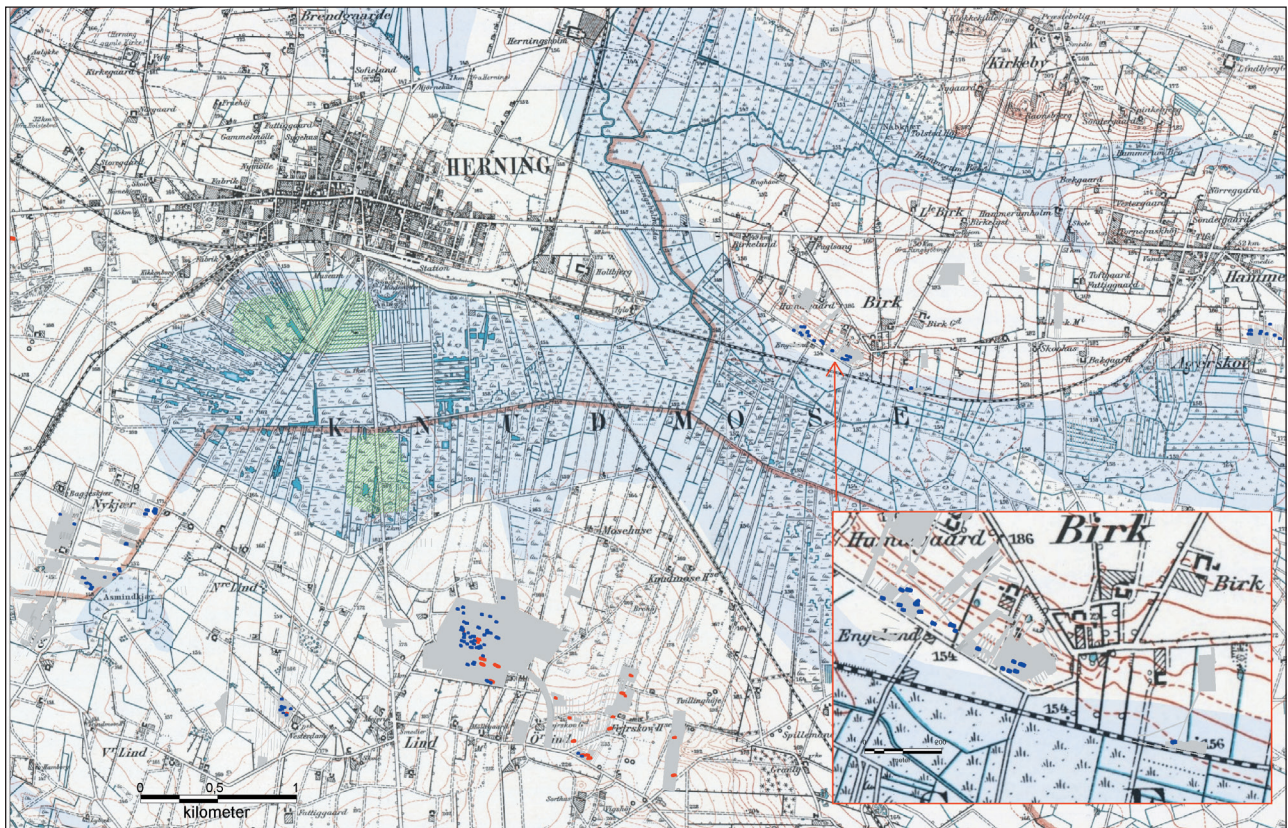


Figure 2. Historic map showing the area around Knudmosen (light blue). The find areas with the located T-shaped spades are marked with a green shading, as well as excavations with finds of houses from the Bronze Age (blue) and early pre-Roman Iron Age (red) (Map: M. W. Olesen).

The Spades from Knudmosen

Museum Midtjylland has the largest collection of T-shaped spades, at least 75, all found during modern peat digging, but almost all with only a general find location, which is often just the name of the bog where they were found. Knudmosen south of Herning is the findspot for 14 of them, making it the locality with the most finds (Lyngstrøm 2016, 102-103).

Knudmosen is an extensive bog area circa 7 km long, 1.7 km wide and covering around 890 ha. Six of the spades are known only as having come from the bog, whereas the other eight have more precise location information in the form of place or road names. One was found in the bog's south-eastern zone, three in the southwestern and four in the northwestern. Their find locations are still imprecise but coincide with areas where there was extensive peat digging at the time they were given to the museum. There are two groups: one by the northern edge of the bog and one by the southern. It is not known how far out in the bog they were

found and their distribution may reflect nothing more than where recent peat digging occurred.

One spade has both the blade and handle preserved, one has the blade and a fragmented handle, while the remaining 12 consist only of the blades. The spades are 39-45 cm long and 6-8.5 cm wide. Only a single spade varies from the others in size and choice of wood. All of them were preliminarily examined to determine the choice of wood and evaluate their suitability for dendrochronological dating. The spades were split from large oak tree trunks with the direction of the split predominantly radial and done a minimum of 10 cm from the middle of the tree. The wood was generally from older and slow-growing oaks (Larsen and Mikkelsen 2022, table 1) and the uniform quality suggests that raw material for their construction was readily available. Nine spades are suitable for dendrochronological dating and they will be critical for establishing the connection between settlements and the use of Knudmosen where building activity was intense during the Late Bronze Age and Early Pre-Roman Iron Age. Settlement is mostly spread out and high

on the moraines overlooking the bog, but along the northern edge there is a row of houses from the Early Pre-Roman Iron Age that are arranged almost linearly. Perhaps the change in settlement pattern happened because of an increased use of the bog's resources (Figure 2).

Experiments making T-shaped Spades

The experiments were aimed at investigating how a spade was constructed, the way in which it wore when used, and especially to reveal the choices made during the process – and the traces these choices leave in the material culture.

The nature of the local soils and available raw materials, in conjunction with conditions of usage, could have had an impact on the spades' form and perhaps led to regional variations of this tool as was known in historic times (Hove 1983, 79). At the same time, the person who made the spade must have had a clear picture of its function and maybe even the individual who would use it. During production there likely was a clear aim to achieve a specific length, width and thickness of the spade's blade and handle, based on how it would be used. Just as the dimensions could have been adapted to the person who would use it.

When reconstructing a prehistoric object, it becomes apparent that there are initially several points to consider. First, a thorough understanding of the raw material is required, as well as an in-depth knowledge of available tools to achieve an end result as close to the original object as possible. Secondly, it is important to search for the 'fingerprints' of the original craftspeople. These can be varied, but generally all craftspeople leave a unique signature on the work they create: e.g. an odd angle of a tool mark, a minor 'mistake' or, when similar objects are examined together, some decision in the design and craft process that creates a unique relationship between the different objects (Høgseth 2013, 72).

When looking more closely at the collection of T-shaped spades at Museum Midtjylland some initial observations became apparent.

- The quality of the timber is high.
- The surfaces are well worn from use.
- The joints have low tolerances and generally the work should be considered to be of high

quality.

- Most of the blades are radially split, a process that creates more waste, but ultimately produces a stronger plank.
- Many of the blades have been skilfully worked down to an impressive thinness.

With these overall considerations, the next job was to deconstruct the process of making a spade. Unfortunately, given the circumstances of archaeological finds, this process relies heavily on modern sensibilities and logic. Nevertheless, having said that, practical knowledge and knowledge of prehistoric geography, climate, available tools and living conditions can be superimposed onto this process, or at the very least, considered when planning the work process.

It was decided to make the spades from freshly felled wood with a relatively high moisture content. This was decided because oak wood becomes much harder when it starts to dry out. About a month prior to making the spades, an oak tree about 60 cm in diameter was felled and cut into lengths of roughly 1 m, but kept in full rounds with its bark still on. This was done to give the timber some time to relieve stresses as well as letting it mellow slightly. The oak trunks were then radially split with an axe and wooden wedges into eighths, and the weak splint wood was removed so only the strong heartwood remained. The rest of the work was done in a way that corresponded with a production run that involved making several spades at once. The lumber was roughly hewn into spade billets, then all the billets hewn and made into blades of a rough final shape. The same process was used for the handles and once a sufficient number of both blades and handles were finished, we moved on to the assembly of the spades, which required joinery. The work was primarily done using the following tools: axe, adze, knife and spokeshave (Figure 3). An interesting observation was made when the first billet was hewn with a reproduction of an Iron Age adze. The tool marks made with the adze were of similar size: a 90-degree angle on the length of the spade blade like those that could be observed on several originals from the collection of Museum Midtjylland. The tool marks made with the axe were much wider and closer to a 45-degree angle along the length of the spade billet.

Once the two parts were firmly attached together, some final work was done on both, such as



Figure 3. Wood for the blades was produced from radially split blanks that were shaped using an adze to a precise length, with, and thickness (Photo: H. Lyngstrøm).

smoothing out rough bits with a knife and spokeshave. A good deal of attention was devoted to the handles, to allow for personalized handle shapes and sizes, for differently shaped and sized hands.

Experiments digging Peat with T-shaped Spades

Digging peat with a spade is regarded as a simple process that requires a low degree of knowledge and skill. Therefore, many members of the community could do it: women and men, young and old. However, digging requires a variety of levels of physical skill depending on the nature of the peat and the pit's size and depth. Knowledge of both the simple process of digging a pit and the integration of it into the more complex operational scheme of harvesting peat was learned through participation in daily life

through observation and imitation (Wenger 1998). Experience from earlier digging experiments showed that the material being dug has an important impact on how a wooden spade wears (Lyngstrøm 2015, 190). However, the way in which it is used also affects the usewear.

The T-shaped spade from Nr. Smedeby was the first example to be published as 'en Tørvespade, en Art Stikspade' (Becker 1948, 96). The very thin blade of the spade points to use in a relatively soft material and the handle would have enabled precise control of the tool while digging (Lerche 1097, 150). Many have compared them to 19th-century peat spades (Hove 1983, 81, Rasmussen 1970, fig. 3) but in contrast with T-shaped spades they had longer shafts and broader blades. Assuming the T-shaped spades were used to dig peat, they would have required a different working stance and produced shorter and narrower slices of peat.

Figure 4. The diggers chose which of the 13 spades they used and when they reflected on what influenced their decision. It was especially the handle that guided their choices (Photo: H. Lyngstrøm).



In the attempt to dig peat in Knudmosen, the spade was both pressed down into the peat and inserted under the peat block. This was done after the turf was removed using modern tools so a clean and moist peat surface was exposed over $c.15 \text{ m}^2$. Seven people dug for $6\frac{1}{2}$ hours with very few pauses along a clearly visible edge where peat was dug in the 1940s. A small, oblong pit was dug that did not reach the bottom, exactly like the digging strategy documented in Aldersro I and Fuglsøgårds Mose (Christensen and Fiedel 2003, 86-87; Mortensen et al. 2020, 12). The diggers chose which of the 13 spades they used and when they reflected on what influenced their decision it was especially the handle that was important to them (Figure 4). One spade broke at a knot after $c.450$ strokes but otherwise the day's work did not produce any real wear and tear on the spades.

Conclusion

The experiments revealed T-shaped spades to be a specialized tool produced from uniform, carefully selected oak. Wood for the blades was produced from radially split blanks that were shaped using an adze to a precise length, width, and thickness, while handles were more varied to suit the individual who would use them. Two people produced 13 spades in 24 hours. The spades were well-suited to digging peat after the turf had been removed and there were no signs of wear and tear after $6\frac{1}{2}$ hours of use.

The attempts generated a host of new questions, both in relation to dating but also how they were used, as a fragment of a T-shaped spade was also found near the pit zone alignment at Brændgårds Hede.³

Notes

- 1) The reproduction of the spades was undertaken at Sagnlandet in Lejre on May 26th-28th, 2022, by Lucas Overvad, Lindy Wilhardt, Martin Winther Olesen, Sidsel Wåhlin and Henriette Lyngstrøm. Prior to this, the type of wood used in the archaeological specimens was determined at the Department of Archaeological Science and Conservation at Moesgaard Museum and they were examined by Lucas Overvad for traces of the woodworking that had been used to shape them. The spades were used to dig peat in Knudmose near Herning on August 13th, 2022, by Agnete Høj Jensen, Sara Prang, Line Schnoor, Christina Schultze, Sidsel Wåhlin, Mathilde Lundberg Friis, Kathrine Knudsen, Martin Winther Olesen and Henriette Lyngstrøm. The technical reports are archived at Sagnlandet Lejre under HAF journal number 002/2022.
- 2) The spade HEM 30/42 differs from others as it is made from birch, is 12 cm wide and the wood has been penetrated by insects.
- 3) The spade RSM 10.010x1012 from Ringkøbing-Skjern Museum.

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