

Developing a craft perspective on the interpretation and reconstruction of boats

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Abstract: In this article, analogue and digital methods for the surveying and reconstruction of boats are discussed from a boat builder's perspective. The examples are from an ongoing study of vernacular clinker-built boats from the Stockholm Archipelago. The craft knowledge of the contemporary boat builder can be useful in the interpretation of old boats, and their reconstruction in practice, combined with cooperation between boat builders and marine archaeologists, may lead to synergetic results that improve related research.

Keywords: boat building, craft tradition, survey methods, reconstruction, photogrammetry

1. Introduction

In my PhD project, I explore how a boat builder's interpretation of boats can enhance research that aims to reconstruct boat building skills and knowledge from an older tradition. In this article, I discuss methods for surveying and reconstructing boats and ships with a craft perspective. I am in the process of evaluating the differences in outcomes between digital photogrammetry and conventional analogue survey methods when examined from the perspective of a skilled boat builder. With experience gleaned from surveys of Nordic clinker boats, I can pinpoint specific examples concerning the use of photogrammetry versus the use of analogue tools. The advantages and possible shortcomings of digital methods need to be considered to reach good practice in the surveying of boats.

The current case study focuses on a local type of Nordic clinker boat tradition, boats from the Stockholm Archipelago that were partly built with hewed planking, a tradition discontinued in the late 1800s. During the Viking Age and until the 19th century, clinker-built boats were built with planks that were split and hewn from logs to get the right shape. In some local traditions, these archaic methods survived into the 20th century, even though most boats have long since been built with sawn planks shaped with the help of steam. Hasslöf has described this transition and examines some of the last local boat-building traditions that used hewed planking (1953).

The absence of living tradition bearers is a reflection of the craft tradition being lost, but traces of it can be deciphered from the few remaining boats. Both theoretical insights and practical experience are crucial in such surveys to accurately interpret craft objects from the past (Leijonhufvud 2022). The boat builder's perspective on the surveys and reconstruction of boats can therefore contribute significantly to maritime archaeological research. However, even if the craftsperson–researcher is highly skilled, artefacts have limitations as sources of craft knowledge, limitations that must be considered in the interpretation process. To interpret a boat built in an older tradition, one needs to be aware of one's own traditions and prejudices, as well as that one's perspective will always differ from that of boat builders from the past.

2. Case study: the Stockholm Archipelago öka clinker boat

The *öka* is a clinker-built boat from the Stockholm Archipelago, examples of which are shown in Fig. 1. These are clinker-built vernacular sailing boats with a transom. Their length was 5–8 m; the large ones were called *storöka* and the smaller ones *skötöka*. The boats were made with pine keel and planking, stem, stern and transom of oak, and timbers (*vränger*) of oak or pine. The Stockholm Archipelago *öka* is a local traditional boat within the Nordic clinker boat traditions that was included on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity in

December 2021. Similarly to some other traditional clinker boats (Hasslöf 1953), the öka is built with hewed planking from spiral-grown logs. The wood fibers in a spiral-grown pine log are twisted around the center of the log like a screw. The majority of the pines are straight-grown, and of the minority that are twisted, most are twisted to the right, similar to a common screw thread. It could therefore be difficult for the boat builder to find logs that were twisted to the left.



Fig. 1 A collage of old photos of öka boats (Nordic Museum archives and private collections)

A unique feature of the öka was a spiral hewed plank in the stern that has a carved bend in its upper edge (Fig. 2). This plank was called a karmvinda and facilitates the transition from a sharp underwater surface near the stern that is helpful for upwind sailing to an almost horizontal flat surface near the transom that makes the boat surf upon the water. It is almost the same as the karmvinda that can be found in traditional boats from the Åland islands (Törnroos 1968).

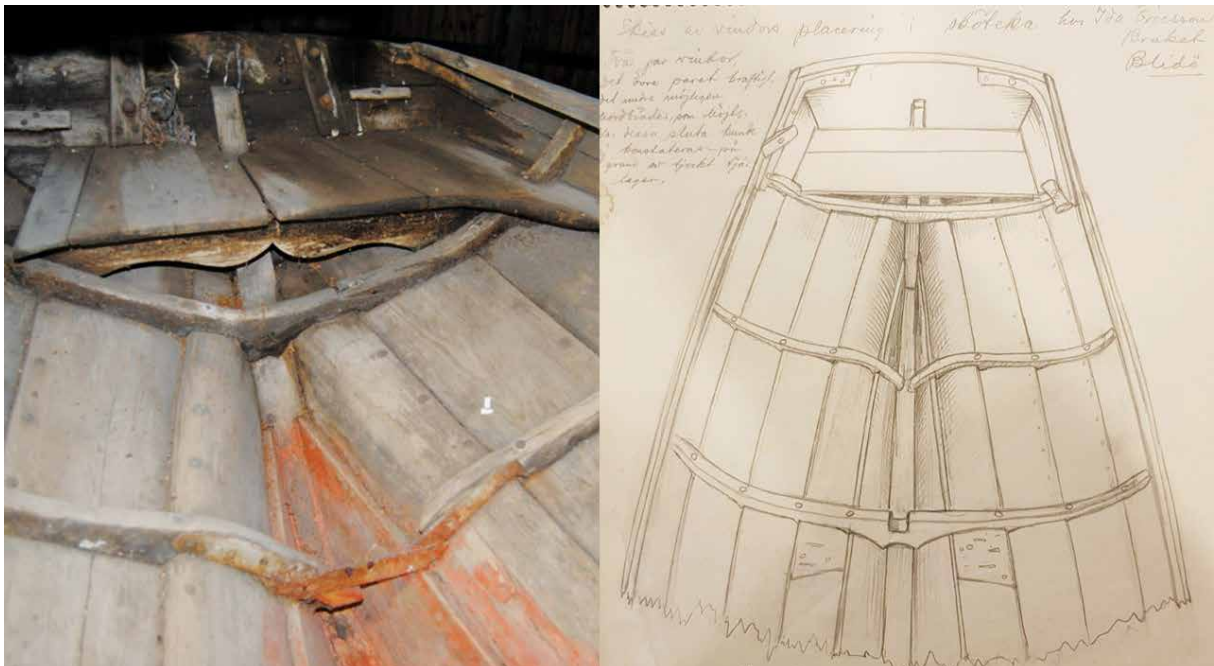


Fig. 2 The spiral-grown and hand-hewed plank called karmvinda. The author's photo of the original boat is on the left, and a sketch from the Nordic Museum is on the right (photo: F. Leijonhufvud; Nordic Museum archives).

Today, the tradition of building that produced the Stockholm Archipelago öka is lost. The last of the tradition's craftsmen are gone, and we are left with the original boats as evidence of their master craftsmanship. In my PhD project, I explore to what extent the interpretations of the original boats can be used to reconstruct broken craft traditions. There are just six known boats left, all of which are in different stages of decay, often lacking wood in the area near the keel as a result of storage that placed them standing on the shore where they were exposed to rain. My research focuses on surveying and reconstructing these boats. The reconstructions enable the interpretations to be tested in craft practice.

Currently, two boats are being reconstructed, one as an anastylosis project and the other a new-build sailing replica. The anastylosis project is based on an original boat in which some parts of the hull are missing. These parts have been refabricated as part of reconstructing the full shape of the original boat. If there is time, I will also build a third boat as 'a new original', i.e., a boat built in the revived tradition that does not replicate a specific original. Reconstructing this broken craft tradition is part of an effort to discover the system underlying the design of the boat, i.e., the ideas, shared norms and standards that constitute the craft tradition that I am researching.

3. Survey, interpretation, and reconstruction

My initial goal was to develop a workflow starting with the survey of the original boat and then moving to its reconstruction and the associated boat building skills. I have found that this goal was too optimistic, as well as being deficient in some aspects. For example, it lacked a dialogue between the original boats and their interpretations and reconstructions. The reconstruction has raised questions concerning the original boat and its interpretations, necessitating a reinterpretation. The boat's examination should instead be regarded as an ongoing dialogue or process, reminiscent of a hermeneutical circle or spiral (Fig. 3).

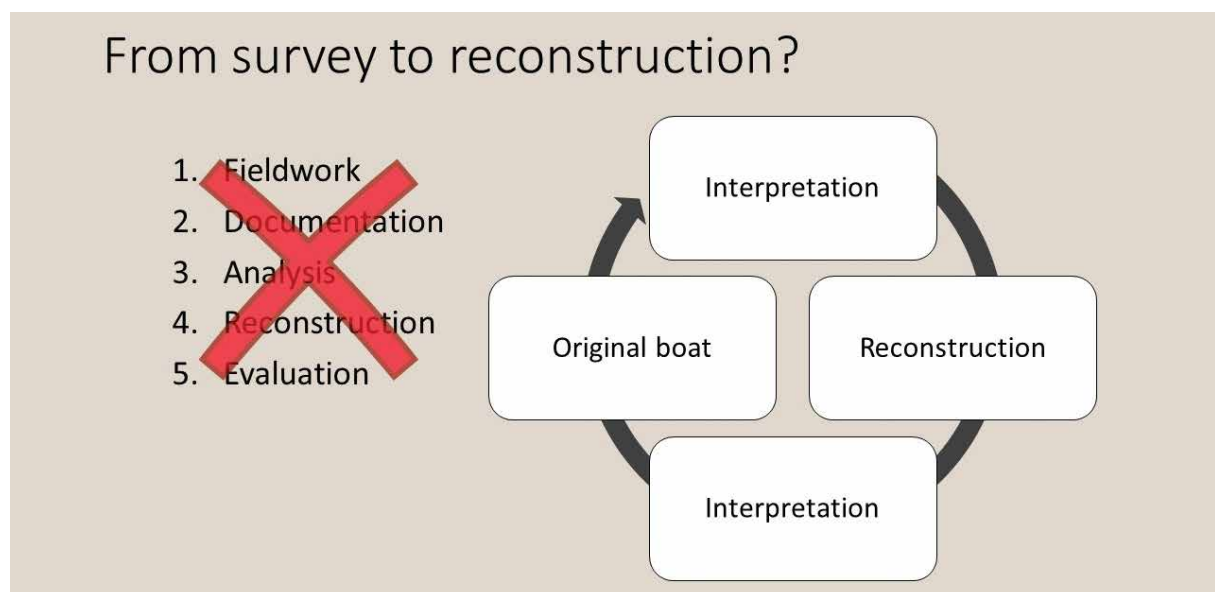


Fig. 3 Abandoning the linear process in favour of a reinterpreted dialogue between the original boat and its reconstruction (author: F. Leijonhufvud).

3.1 Approaching the original boat

My surveys are inspired by forensic methods (Almevik 2017). In my case, this means investigating the boat as it appears to me: material, form, tool traces, evidence of use, repair and alterations, and sensory impressions, as well as measurable values. The forensic method also includes documenting written and oral sources, for example older photographs, tool inventories and interviews. I use multiple sources and combine them with analogue or digital measuring tools. The original boats are of course the main source material, but I supplement them with photos from archives and private collections, as well as with archive material such as ethnological questionnaires from the early 20th century. In some cases, it can be fruitful to interview boat builders that have a closer relationship to the broken tradition, for

example a boat builder whose grandfather was active in the old tradition. When it comes to the measuring, I have used analogue methods for more than twenty years, but the last five years I have also explored the opportunities of photogrammetry as a cost-efficient digital tool.

My approach is guided by hermeneutic theory and an awareness of my own prejudices. The interpretation will be partly a result of my prejudices, which are based on my role as a researcher and craftsman, which in turn is a result of my contemporary craft tradition, that of a 21st century traditional boat builder. One of the fundamental ideas of modern hermeneutics is that methods have a limited value and cannot render the research objective or liberate the researcher from subjectivity. The truth is something that stands independent of the method, which can inadvertently obstruct the truth (Gadamer 2004).

In trying to answer my research question, it is important to switch between detailed and holistic perspectives to capture patterns that will unlock an understanding of the boat's system of design and the boat builder's abstraction of the boat. This process includes the systematic recording of details and returning to the studied boat several times. It entails spending time with the object with focus and awareness to discover new insights that were not apparent on a first or even second visit. In short videos or blog texts, I force myself to focus on the important issues and to put my interpretations into words. Art studies have shown that an observer's awareness can be trained (Bresler 2006), a fact known among boat builders. An experienced boat builder looks at boats in a different way than an untrained one does.

3.2. Some pros and cons of digital surveys

Computers are machines and, as such, can provide an honesty and directness that is hard to find in human interpretations. They have no preconceived ideas about how a boat should look, which can be a significant advantage in the recording of a boat's shape. But though computers are excellent calculating machines, they lack common sense. They can come to conclusions that are obviously wrong, something that probably all users of photogrammetry software have experienced. Working with a traditional craft and meeting craftspeople, I have encountered individuals who tend to feel that the digital output feels estranged from the tangible reality. There is also a risk that the digital model may create additional content to the object, new narratives that must be understood as not belonging to the original artefact (Gartski 2017). After a certain learning curve has been mastered, photogrammetry is time efficient. However, this time efficiency tends to reduce the time spent with the original object, resulting in a reduced sensory experience of the object. The physical distance that is possible with digital recording should also be considered. It is important to compensate for these limitations in the survey process. For a more thorough presentation regarding the pros and cons of digital methods, I refer the reader to a previous article (Leijonhufvud 2021).

From my boat building perspective, 3D models are often adequate for visualising the shape of a boat's hull, designing construction plans or making a replica that has a similar physical appearance. However, when it comes to interpreting and understanding details and how the boat builder produced them, a 3D model often lacks the level of detail that the original boat provides. This is a combination of the detail lost to insufficient resolution in digitalisation and the fact that the original object has tangible and sensible properties.

3.3. Misinterpretations

The problem mentioned above about lack of detail is not only due to digitalisation; the same problem is present in analogue boat surveys as well. I present examples of this in Fig. 4. The boats in the top of the figure are two of the original öka boats from around 1880. The next row shows the excerpts of the drawings/lines plans that were recorded from the originals for use in building replicas. The boats on the bottom line are the replicas. It is interesting to see how the characteristic shape of the stem has already been smoothed out in the lines plans. The boat to the left was recorded with a digital total station, the plans were drawn by a marine architect, and the replica was built by local professional clinker boat builders. The boat to the right was recorded by a boat building school, and the replica was built as a student project. Both replicas are well-built boats but lack some of the significant features of the original boats' hull shape. The typical stern shape of these boats was smoothed through the lens of contemporary professionals. The replicas were designed with influence from the traditional boat builders of today. This example shows that surveying and reconstruction are interpretive processes, guided by prejudice. It also shows that a photo or a digital model can often present a more authentic image of the original boat than a lines plan.

If possible, the boat builder should check the original boat for information that is lacking or is vague in the survey. That is why the ideal way to build a replica is to have the original boat nearby. If that is not possible, the survey should be performed with the craft processes and reconstruction in mind.



Fig. 4 Stem shape of original boats interpreted with the characteristic shape smoothed out by the replica builders (photo: F. Leijonhufvud).

3.4. Adding original methods of measuring to the survey

As an example, my case study of Nordic clinker boat traditions found that the individual planks in the hull are controlled by the boat builder with a tool called in local Swedish dialect a *pass*. The *pass* is a simple plumb bob level, made and used by the boat builder (Christensen 1970; Leijonhufvud 2023). Fig. 5 shows an old *pass* used by an original öka builder and my reconstructed *pass* used on the survey of an original boat. In my studies, I have compared replicas built from plans made with analogue and digital surveys and have found that the replicas have lost their original shape, especially in the parts of the boat where the original boat builder used the *pass*. This could have been avoided if the use of this tool had been included in the survey and the angle of the planks had been measured using the original boat builder's method. Integrating this boat building tool into the survey can improve the understanding of the design conventions of the tradition because it links directly to the craft processes without the detour of lines plans. The measured angles recorded with the *pass* can also be compared to those of other original boats to reveal a common system of design.

The *pass* was used as a guide for the build of the boat, but it must be emphasised that in Nordic clinker boat traditions, the boats are seldom identical, even though they have characteristic local features. The specific design for a new boat was often made in dialogue with the buyer of the boat, taking into consideration the use of the boat, the local natural conditions and what kind of wood could be provided for the build.

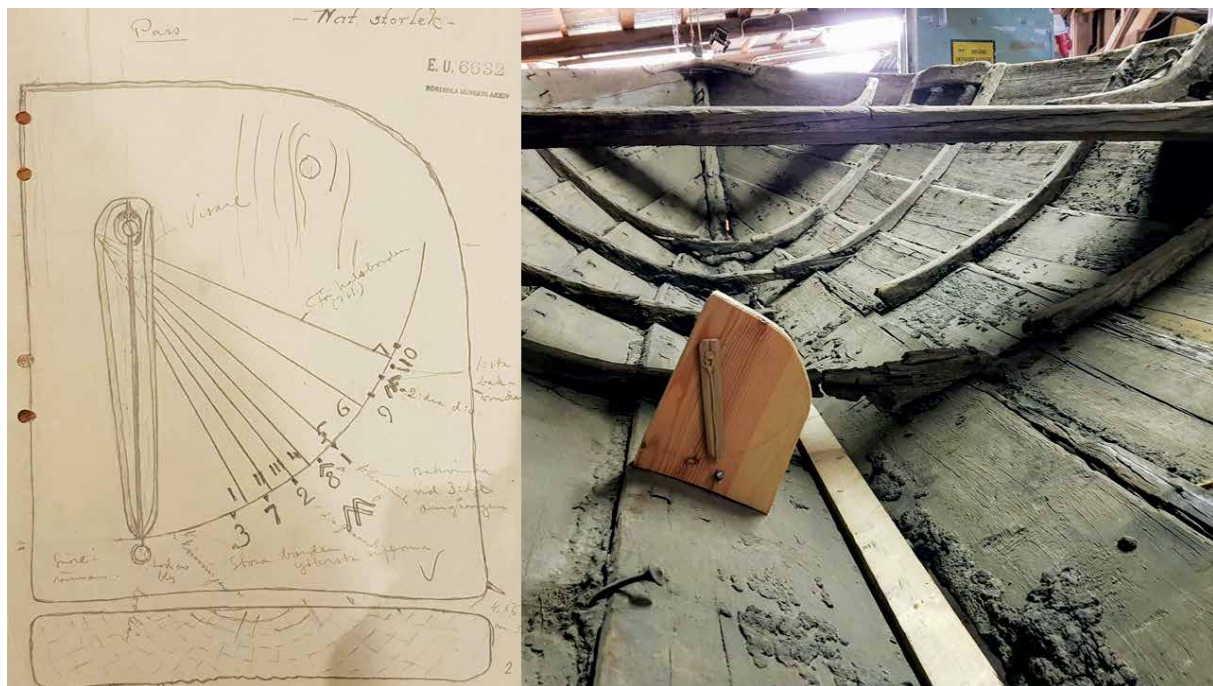


Fig. 5 The boat builder's pass. To the left is a traced sketch from the Nordic Museum and to the right is my reconstructed pass placed in an original boat (photo: F. Leijonhufvud; Nordic Museum archives).

4. Summarizing guidelines

If possible, the survey of boats should be guided by craft practice in reconstruction. The ideal situation is to make a reconstruction of the whole boat, reinterpreting the original boat throughout the process. The reconstructed boat then becomes a detailed documentation of the original. The second-best method is to reconstruct details of the original construction or to make scale models, focusing on specific design features. The reconstruction process will immediately generate new knowledge and raise new questions. If it is not possible to build reconstructions, the survey can still be guided by boat building practice, deliberately focusing on the questions that reconstruction work typically generates. I suggest calling this 'Survey with the Boat Builder's Eye'. This 'eye' of the boat builder will highlight questions about why and how the original boat was constructed, including the choice of dimensions, material, tools and design. The 'boat builder's eye' can also provide supplemental knowledge on what archaeological material to save or record, identifying sources of craft knowledge.

Boat builders and marine archaeologists should cooperate in these projects. Their complementary interpretations can provide answers to questions that their individual perspectives alone cannot solve. The results reached through their different methods and knowledge may create a synergy that creates new insights and understanding.

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