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THE TOOLS AND THE TRADE

Interpreting Pre-Industrial Craftsmanship Through the Joinery of Daniel Knutsson

Björn Svantesson

Degree project for Master of Science with a major in Conservation

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Cover image: German depiction from 1669 of the joiner Hanns Omeiß working in a workshop. From: Die Hausbücher der Nürnberger Zwölfbrüderstiftungen. *Stadtbibliothek im Bildungscampus Nürnberg, Amb. 279.2°, [Sheet 142, Page*

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ABSTRACT

This thesis aims to explore the craftsmanship, skill, and context of the joiner Daniel Knutsson, who was active in the construction of Skokloster Castle during the 17th century. The basis for the study is scholar Erik Andrén's previous research concerning the construction of the castle, as well as material sources in the form of products and tools connected to Knutsson's practice as a joiner. By employing a theoretical framework grounded in Material Culture Studies and a methodology based on microhistory, source-pluralism, and forensic analysis, Knutsson's craft practice is investigated through three sub-studies.

The first focuses on his context and analyzes his professional as well as private life at Skokloster. The second explores the tool collection at Skokloster Castle and its possible link to Knutsson's products. The third is an in-depth analysis of the Leyden mantlepiece, built by Knutsson in 1676.

The results of the study emphasize Knutsson's role as a craftsman entrusted with the construction of prominent parts of the castle's interior, despite lacking a formal certificate of proficiency in his trade. Furthermore, the study discusses the relationship between guild-affiliated and non-guild craftsmanship, as well as Knutsson's skill in relation to the professional standards of the time.

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A sincere thank you to the staff at Skokloster Castle who welcomed and assisted me during the fieldwork in February and March. During the off-season, most parts of the castle are cold and dark, making examination and documentation a challenging task. But Lotta, Inger, and Jonas aided me, kept me company and lifted my spirits while I carried out my examinations, and supplied me with warming coffee and cake during the breaks.

Another heartfelt thank you to my good friend Näs Olov Tranberg, who also assisted me during the fieldwork in March and conducted a thorough review of the Skokloster church records, providing the investigation with valuable information.

And lastly, a big thank you to Kajsa for supporting and cheering me on through the ups and downs of writing this thesis.

1. Introduction

> *"Ytterst anar man dock tidsandan. De här åren efter det lyckligen slutförda tyska äventyret hade uppenbarligen ett slags eufori gripit de styrande. Sverige var stort och skulle nu leva upp till sin nyvunna storhet. Och euforin rörde villigt på sig, tog kropp, blev till rosetter, siden och gyllenläder, blev till kareter, banketter, fyrverkerier och annan roande eller iögonenfallande lyx, blev till tegel och koppartak, blev till nya herrgårdar och magnifika slott, byggda i imponerande likgiltighet för alla vettiga ekonomiska kalkyler…" (Englund, 2000 p.112)*

History is full of unknown craftspeople. But the present is full of the products of their labor. From ancient buildings to the miscellaneous objects on a flea market shelf, if they originate from a time before industrial production, each one is made by the hands and tools of a craftsperson. These anonymous craftspeople have literally shaped our inherently anachronistic world, and the material evidence of their activities can spark our imagination about the past, inform our perception of the diversity of the human experience, and prompt historical research. As a craftsman working with traditional joinery, carpentry, and sloyd techniques, I find that the wealth of historical wooden objects still in existence today both informs my craft practices and deepens my understanding of the past. Sometimes, when studying these objects, it feels almost as if I am engaged in a silent dialogue with the anonymous craftsperson who made them. I observe and ask questions — and they respond through the traces left in their work. But when the craftsperson behind the objects is unknown, the amount of information that can be obtained from the object is limited. At the fortunate event of an extensive documentation paired with the preserved works of a craftsperson from the past, the possibilities for research are however significantly expanded.

1.1 Background and problem

This study is inspired by the unusually rich source material related to the craftsman Daniel Knutsson. Knutsson worked as a joiner during the construction of Skokloster Castle, and his activities can be traced through the 24 years between 1654 and 1678. Preserved bills, letters and other documents from the time of the construction – accessible through Erik Andrén's previous research (Andrén, 1939; 1948) – together with Knutssons joinery work, and a collection of tools dating from the same time, allows the researcher to follow him through the progression of the construction. The castle itself, Skokloster Castle (Figure 1.), located on the Sko- peninsula in lake Mälaren in the county of Uppland, was built by the wealthy Swedish aristocrat Carl Gustav Wrangel, who made a successful military career during and after the Thirty Years' War. The construction of the castle – initiated in 1654 – ended in 1677 after Wrangel's death the year before (Andrén, 1948). At this point, a few rooms, including a large banquet hall (Figure 2.), were not yet finished and remain unfinished today. Since 1967, the castle has been state-owned and functions as a museum open to the public. It is considered one of the best-preserved Baroque castles in the world (Skoklosters Slott, n.d.).

Figure 1. Skokloster Castle photographed from the northeast. Photograph by the author.

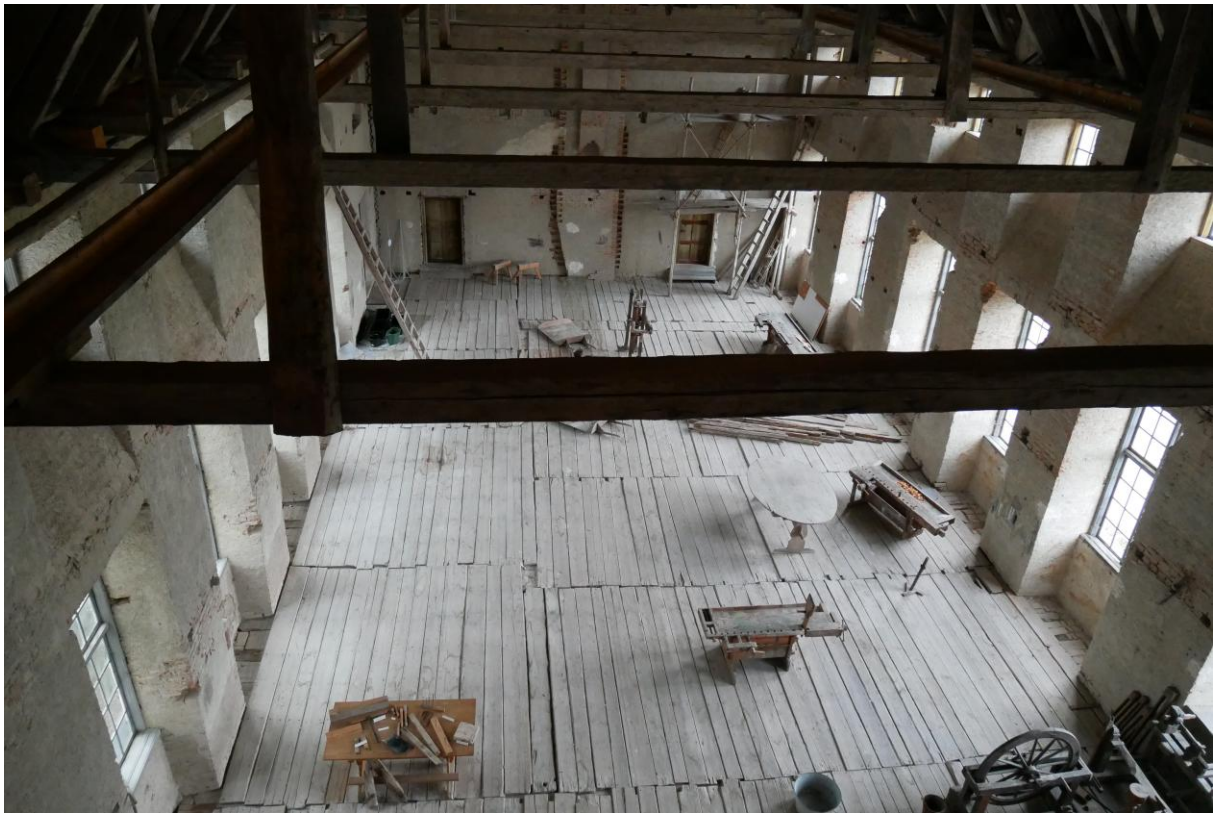


Figure 2. The unfinished banquet hall on the third floor at Skokloster Castle, where the construction work was halted in 1677. Photograph by the author.

A large collection of woodworking tools dating to the time of construction are kept at Skokloster Castle. This unusually well-preserved set of tools has been noticed and described by researchers several times through the years (Boonstra & Bruijs, 2022; Hugstmyr, 2008; Knutsson, 1986; Knutsson & Kylsberg, 2000; Rangström et al., 1980). The focus has mostly been on the large set of tools ordered by Wrangel from the Dutch tool maker Jan Arendsz Wissing in 1664, but other hand planes of unknown origin are also included in the collection. Some of the profiles of the moulding planes have been found to match parts of the interior woodwork of the castle (Knutsson, 1986), possibly linking the planes to the craftspeople involved in the construction of the castle.

The 23 years long construction process of Skokloster Castle has been researched and described by Erik Andrén in *Skokloster – Ett slottsbygge under stormaktstiden* (Andrén, 1948). Through Andrén's research, based on the preserved records from the time of the construction, individual craftspeople involved in the construction of the castle can be identified. One of them is the joiner Daniel Knutsson. Over the years, his production and salary for different parts of the exterior and interior of the castle are described in the documents. Andrén's book is, however, written from an art- and architecture-historical perspective, and no deeper analysis of the workmanship and skill of the craftspeople involved is conducted.

1.2 Objectives

The aim of this study is to uncover and portray the craft practices, working conditions, and professional as well as private context of a 17th-century Swedish joiner by tracing material and documentary evidence found in tools, products, archives, and literature. Portrayals of individual craftspeople from the past are – as previously noted – uncommon, most of them remain anonymous. As in the field of conservation, where the focus has traditionally been on the preservation of monuments, historical narratives have also had a tendency to emphasize what historian Peter Englund refers to as 'The Grand History' (Englund, 1993 p. 8.), in which the general population is typically represented as statistics rather than as individuals. One objective of this thesis is to make a small contribution to the representation of the everyday people of the past in historical narratives. This aim of depicting earlier overlooked narratives – a kind of filling in of blank spots in history – gives the study a cumulative relevance (Dahlgren, 1996; Götlind & Kåks, 2014).

Earlier research on the interior of Skokloster Castle specifically and pre-industrial joinery products in general have typically not been written from a craft-scientific, but from an art- or architectural-historical perspective. These descriptions of historical furniture and interiors are, as Professor Johan Knutsson puts it, written from the perspective of the *user* rather than the *maker* of the pieces(Knutsson, 2019). The unique and well preserved character of the interior and the collections of the castle, supported by extensive archival sources, has however sparked craft scientific surveys and research at Skokloster (Boonstra & Bruijs, 2022; Hugstmyr, 2008; Karlsson, 2013b; Knutsson, 1986, 2019; Knutsson & Kylsberg, 2000). This study aims to make further use of the source material connected to Skokloster Castle and continue the initiated craft research on the site.

An investigation of the workmanship, skills, and context of the joiner Daniel Knutsson has different types of relevance for the field of conservation. Research into a single craftsperson during the 17th century serves as a specific example of professional practice in joinery, relevant if craft- and technology-historical research. The examination of the traces of Knutssons craft practice in the specific environment of Skokloster Castle falls within the scope of building history and building archaeology, also parts of the field of conservation (Karlsson, 2013a). Lastly, the study can be seen as a contribution to the development of the theory and methodology of conservation, through its interdisciplinary approach.

1.3 Research questions

The following research questions lead the investigation:

- What can be understood about the joiner Daniel Knutsson's skill, craftsmanship and context through the available source material?
- To what extent can the dedicated moulding planes in the tool collection at Skokloster Castle be linked to the documented joinery work of Daniel Knutsson?
- What insights do the preserved tools and the joinery work made by Daniel Knutsson offer into the professional standards and practices of 17th-century craftsmanship?

The study is structured in three parts, focusing respectively on Knutsson's biography, tools and preserved products. The first, more general question is the overall inquiry, guiding the entirety of the investigation. All three parts of the study approaches this question from different angles, although the first part of the investigation has the clearest focus on the first question. The second question is specifically studied in the second part of the investigation, while the third question gets the most attention in the third part of the investigation.

1.4 Material/Case

The point of departure for this study is on one hand the physical Skokloster Castle and its well-preserved interiors, and on the other hand Erik Andrén's previously conducted research concerning the construction of the castle. These material, as well as written sources, inform each other in the research process.

1.4.1 Written sources – published and un-published

This study is based on own investigations of material sources, but the written accounts from Skokloster set off from previous empirical studies and excerpts of archival material. The main secondary source is Andrén's book *Skokloster – Ett slottsbygge under stormaktstiden* (Andrén, 1948). The book consists of an art-historical investigation of the building and its interiors, but the most important contribution in Andrén's research is perhaps the detailed account of the 23-year-long building process of Skokloster Castle from 1654 to 1677. Andrén has made a thorough review of the extensive archive material connected to the castle – the so called Wrangel archives – consisting of

correspondence between Carl Gustaf Wrangel and the engineer responsible for the building project on site, as well as bills, contracts, pay rolls, drawings, and more. The accounts or the building process are published as detailed descriptions of how the erection of the castle proceeded year after year, many times with mentions of the specific crafts people who carried out the construction of different parts of the building. One chapter focuses on the management of the building site, the organization of the workforce and logistics, and the economic aspects of the projects.

A source material connected to Andrén's research is his preserved excerpts (Andrén, 1939) from the making of *Skokloster – Ett slottsbygge under stormaktstiden*. This material is kept at Skokloster in the castle archives and consists of transcripts of the extensive archive material that Andrén studied as he collected material for the book. Large parts of the data found in the excerpts are also found in *Skokloster – Ett slottsbygge under stormaktstiden*, but the review of the excerpts conducted in this study revealed more details about Daniel Knutsson's work and life at Skokloster than what made it to the book. Based on *Skokloster – Ett slottsbygge under stormaktstiden* and Andrén's excerpts, a list of all the work described as made by Knutsson has been compiled as a basis for the investigations in the field work.

Both *Skokloster – Ett slottsbygge under stormaktstiden* and Andrén's excerpts of the archive material are secondary sources, but both have been deemed as reliable sources in this study. The book is written within an art-historical academic context, and the work seems to have been reviewed by scholars active in that field during the 1930s and -40s. Andrén gives thorough accounts of the archival sources he studied in the book, as well as references to other literature supporting his claims. His excerpts are written in an orderly manner with detailed accounts of where in the archives the information transcribed originates from.

In the first part of this investigation, where Daniel Knutsson's life, work, and context are studied, Andrén's previous research and his excerpts of the original documents are complemented with information from church archives and 18th century sources on joinery. Furthermore, a review of literature on craft guilds and economic history has been conducted and complementing literature on the history of Skokloster Castle has informed the investigations.

1.4.2 Material sources – producing and produced

The material sources examined in this study are of two different types. The first being the preserved products of Daniel Knutssons work. The attribution of these products to Knutsson's hand is done through Andrén's book and excerpts, as mentioned above. These physical evidences of Knutssons activity constitute the basis for part two and three of the study, where they are investigated through a forensic approach.

The second type of material source in the study is the dedicated moulding planes from the tool collections at Skokloster, examined in part two of the investigation. These objects have no written evidence connecting them to Knutsson, instead the possible connection between the tools and Knutsson's activity is researched within the study. What the dedicated moulding planes have – in contrast to the other planes – is a highly specific shape of the steel and sole. Hence, when using

them, they produce a moulding with a “signature” shape specific to the plane (Bickford, 2012). This opens for the possibility to connect moulding planes to the preserved products of Knutssons work. In the investigation, these planes are documented through photography and measurements, as well as through gauging their soles. Based on the gauging, templates are made that are used for examinations of Knutsson’s products.

These two types of material sources inform each other and can be understood as *produced* and *producing* objects, according to scholar Roald Renmælmo´s definitions (Jarefjäll et al., 2017). The produced objects, the products made by Knutsson, carry information about the tools used to make them. The producing objects, the dedicated moulding planes, carry information about the craft procedures they are intended for. This is further discussed in the next chapter. The planes are an interesting source material as they are both producing and produced objects, meaning that they have information about the craft procedures involved in their production as well as in the production they can achieve.

In craft research involving interpretations of historical craft practices through produced and producing objects, it is crucial that the practitioner-researcher has a relevant preunderstanding of the crafts in question (Jarefjäll et al., 2017; Karlsson, 2013a; Seiler, 2022). In this study, my 15 years of experience within traditional craft techniques in wood are my basis of understanding for the interpretations made. In my professional career as well as through my studies, I have worked with pre-industrial joinery techniques and reconstruction attempts, historical house restoration, and sloyd techniques. My interest and approach to my craft practice has always been based on interpretations of historical products and techniques. This does not make me a pre-industrial professional joiner, like Daniel Knutsson, but it enhances my chances for correct interpretations of the source material in this study. This topic is discussed further in the next chapter.

1.5 Theory, methods and approaches

1.5.1 Material culture studies, art theoretical interpretations of materials, and affordances

A main theoretical concept in this study is the understanding of objects as sources of information about more than the objects themselves (Nyström et al., 2021). This idea is central within *Material Culture Studies* (MCS), a field of research emerging in the 1980s with a new gaze on material objects. Within MCS, material artefacts are studied as reflections of social, cultural, and historical processes. Through analysis, an artefact can act as a source of information about how and why it was produced, what norms, ideals, and values that shaped the artefacts and its production, the social and societal context it was produced and/or used in, and the power relations connected to the artefact (Coltman, 2015b; Nylander, 2024). The concept was initially mainly employed by archeologists and anthropologists, whose research many times lacks written sources, but has also proven useful within the field of craft research (Nylander, 2024; Nyström et al., 2021; Palmsköld, 2007).

When studying historical craft traditions, written sources are often scarce, leading the researcher to focus on the material artefacts as primary sources of information. In her dissertation on historical textile craft traditions in the county of Halland in Sweden, Anneli Palmsköld argues that craft objects

have an inherent communicative aspect – that they indeed possess a kind of language that can be interpreted (Palmsköld, 2007). By interpreting the language expressed in historical material artefacts, access can be gained to parts of the population that did not express itself through written texts.

The idea of crafts and craft knowledge as a form of language that can be expressed and understood is shared by other researchers. Ceramicist and researcher Mårten Medbo describe the language of his craft (wheel-throwing) as a "clay-based linguality" (Medbo, 2022 p.324). Medbo furthermore states that the experienced craftsperson has an "amplified potential to interpret the artefacts related to the craft." (Medbo, 2022 p.322) This idea is supported by other craft researchers with a focus on historical material culture (Botwid, 2022; Karlsson, 2013a; Knutsson, 2019; Nyström et al., 2021). Recurring in these argumentations is the notion of the tacit knowledge of the craftsperson/researcher as key in the interpretation of material artefacts. An important consideration when drawing on one's own experiential knowledge for interpretation is, as craft researcher Karl-Magnus Melin points out (Karl-Magnus, 2022), the need to remain aware of personal biases. However, through critical deconstruction, experiential knowledge can still serve as a valuable tool.

The focus on the material as an important source of information, and the crafts person as a potential researcher through the skills of their trade are however relatively recent concepts in the theoretical study of arts and crafts. In traditional art theory, the material of the studied objects has many times been seen as the mere physical carrier of the ideas of the artist, and thus of minor interest. This intrinsically hierarchical perception of mind and matter in the process of creation goes back to the Aristotelian hylomorphic paradigm where the "meaningful conception of art" is seen as to occur "prior to its respective materialization into concrete works of art." (Lehman, 2015 p. 22). The artist's – or crafts person's – mind is in this theoretical tradition seen as somewhat separated from their medium.

Art historian Ann-Sophie Lehman exemplifies the theoretical lack of interest in the materiality of art with the case of linseed oil in traditional oil paintings. Oil has undergone extensive research in the field of technical art history, where the chemical compositions of oils in historical paintings are investigated. But from an art-theoretical perspective, oil has had little recognition as a carrier of meaning – in fact, Lehman describes oil as "barely recognized as a material as such." (Lehman, 2015 p. 27). As an example, the source of the development of visual realism – an artistic style closely related to traditional oil painting – is always attributed to something else than the oil, like religious, cultural, or social conditions. The oil is seen as the substance that makes this type of painting possible, but not as a starting point for the creative process.

One perspective that can enrich the art-theoretical discussion of materiality is the concept of affordances (Lehman, 2015). This theory – developed by the psychologist James J. Gibson – articulates how the properties of different elements of our material surroundings govern our engagements with them (Gibson, 1979). Lehman argues that the unique set of abilities that linseed oil possesses – its transparency, plasticity, viscosity, its slow-drying properties, and its ability to polymerize – leads to a number of affordances with a direct link to the development of the style of

visual realism (Lehman, 2015). Hence, the concept of affordances questions the order in which a creative process works. For a skilled artist or crafts person familiar with the affordances of the materials and tools of their trade, the hylomorphic order of creation, where idea is followed by material might seem like an insufficient model of explanation.

In this study, Daniel Knutsson's craft practice as a professional joiner is investigated through his products, tools, materials, techniques, and context. Pre-industrial joinery can be described as a technology of tools and procedures that can be varied and arranged to fit the production of an intended product (Hugstmyr, 2008; Karlsson, 2013a). With the concept of affordances in mind, one could theorize that pre-industrial woodworking tools are shaped in accordance with the affordances of wood, steel, and the human body. One of the main affordances of most species of wood is that it can be cut with something hard and sharp, and this is what most of the hand tools for processing wood does – like the axe, the plane, and the saw. The hard and sharp cutting edge has for a long time been made of steel, a material possible to manipulate to an ideal balance between flexibility and hardness. The affordances of the human body – the force it can produce, the shape of the hands and so on – are considered in the shaping of the tools. But the tools themselves also offer affordances to the practitioner (Seiler, 2022).

1.5.2 Forensic perspective and source pluralism

Beyond the MCS-theoretical approach of utilizing objects as sources, this study is more specifically aligned with the scholarly tradition of using historical buildings as central sources of information in an investigation. An important approach within this type of research is the *forensic perspective* on investigations of historical products and procedures (Almevik, 2012, 2017). With a methodology inspired by forensic investigations of crime scenes, this approach has proved useful when attempting to reconstruct a scenario from the past. By approaching a place with the question "what has happened here" and directing the attention towards the traces; of tools, use, material properties, changes, and other factors, the researcher can start to puzzle together a hypothetical timeline and order of operations of a longer or shorter process.

Through the addition of complementing knowledge; written sources or archive material, historical maps, paintings, and photographs, interpretations of other objects, interviews with "witnesses", or personal craft skills in related areas, the investigation takes on a *source-pluralistic* character. The source-pluralistic approach can be seen as a research method through which all possible sources are considered and valued in an investigation (Myrdal, 2007). These approaches, the forensic and the source-pluralistic, are intertwined research processes that help to inform each other in a deepening, *hermeneutic* process of finding answers and raising questions (Almevik, 2012, 2017; Knutsson, 2019; Nyström et al., 2021; Seiler, 2020). This explorative research process has been described as *heuristic* in its nature by scholar Peter Sjömar (2017), when he describes how the knowledge and skills of a crafts person become researcher can help inform the knowledge formation. By a continuing formulation of assumptions based on experience, and a follow-up of adjustments in the assumptions if they are not supported through the progressing interpretations, hypotheses can be formulated.

In this study, these perspectives and approaches shape the methodology of the research. In the fieldwork carried out at Skokloster Castle, the interpretations of traces are a key part of the investigations and perhaps the closest a researcher can get to the craftsman Daniel Knutsson today. My interpretations are largely informed by my personal practice as a joiner and craftsman. My experience of similar craft procedures as those of a 17th century joiner are my "amplified potential" for interpretation (Medbo, 2022 p.322). But my research is also source-pluralistic as it is dependent on complementing sources for the identification of Knutssons work and for the understanding of his context.

1.5.3 Micro-history and biographies of craftspeople

The investigation of a single person in history – especially when that person is one from the large, anonymous crowd of common people – can be aided by another approach from the studies of history, namely *micro-history*. The focus within this methodology is steered away from the grand, transformative events and people of history, and zoomed in on the everyday life of the common people, places, or phenomena. In the essay collection *Förflutenhetens Landskap*, Englund discusses these different areas of focus in a simplified way as The Grand History and The Small History ("Den Stora Historien" and "Den Lilla Historien" (Englund, 1993 p. 8.)). He theorizes that the rhythmic phases and subtle shifts of the everyday life of common people is what makes up a significant part of history.

Micro-historical research ascribes two central meanings to the studies of singled out people or places in history. The first of them is the concretization and exemplification of larger history (Götlind & Kåks, 2014). Through the lives and experiences of the specific people in history, the grand history can become tangible, accessible, and perhaps easier to relate to. An example of this is Englund's *Stridens skönhet och sorg: Första världskriget i 212 korta kapitel* (Englund, 2009), depicting the first world war through the personal experiences of a heterogenous group of people who lived their lives and wrote diaries and letters between 1914 and 1918. Through the experiences of these people – portrayed day-by-day as they go about their lives in shifting contexts – the turbulent and transformative first world war is broken down into relatable pieces of human experience. The second type of meaning within the micro-historical approach ascribes value to the individual experiences of historical people, not as examples or concretization of larges events, but as contributions to the portrayal of the diversity of the human experience. By lifting up the single person and the individual variations and nuances of their lives, the picture of what it has meant to be human in different times and contexts is broadened (Götlind & Kåks, 2014). Both of these meanings can also help to problematize depictions of history on different scales.

The different approaches guiding the investigation: the MCS theoretical framework, the forensic and source pluralistic perspectives, and the micro-history approach are combined within this study to shape an interdisciplinary approach and set of methods fit for the source material as well as the aim of the investigation. Similar research design can be found in the works of Klein (2018) and Tarule (2007), both of whom have written biographies of historical joiners and their contexts. Read more about their works under the next paragraph.

1.6 Positioning

Professor Gunnar Almevik's dissertation *Byggnaden som kunskapskälla* (Almevik, 2012) explores how historical buildings can act as a source of knowledge in an investigation, side by side with traditional written sources. Through three different perspectives – the forensic, the source pluralistic, and the actor perspective – the methodology and possibilities of research through the physical buildings are studied. The forensic approach to investigations of historical environments is now a commonly referred to and used method within craft research and a useful tool in this investigation of the products made by Daniel Knutsson at Skokloster Castle.

In the licentiate thesis *Ramverksdörr – en studie i bänksnickeri* (Karlsson, 2013a), Tomas Karlsson investigates the practice and skills of professional joinery before the industrial revolution. Karlsson's research utilizes reconstruction of craft procedures as a research method when he attempts to answer the question about how a frame door was manufactured in a pre-industrial setting. He formulates a hypothesis about the process of manufacturing based on documentation and analysis of a historical door, and a 19th century description of door joinery. His hypothesis is then tested through practice-based experiments as he attempts to reconstruct the procedures. An important aspect in Karlssons research is his practical experience in joinery, which lays a foundation for both the interpretations of sources (the historical door and description) as well as his ability to carry out the practice-based experiments testing the hypothesis. Similar to Karlsson's research, my practical experience in joinery is my knowledge base for the interpretations of Knutsson's work.

Another practitioner researcher working with reconstruction as a research method and his own craft skills as an active part in the study is Jarle Hugstmyr, who investigates how complex baroque and rococo mouldings were produced by hand (Hugstmyr, 2008). Hugstmyr describes this knowledge as lost and aims his research on trying to reconstruct the main procedures of making complex mouldings. The research has as much focus on the reconstruction of the tools needed to produce mouldings – different kinds of planes – as the procedures of making the mouldings themselves. Hugstmyr bases his hypotheses about the craft procedures on investigations of historical mouldings, preserved tools, and historical descriptions and depictions of joinery and relies on his craft skills as reference and preunderstanding in the interpretations of sources. This focus on the tools and the products as two complementing sources, informing each other is a relevant approach for the investigations of Knutsson's work.

Hantverkarens val – Material teknik, och form genom möbelhistorien, written by Johan Knutsson, professor in furniture culture, takes a kind of material culture-turn on furniture history (Knutsson, 2019). Knutsson – who earlier worked as curator at Skoklosters slott – identifies a knowledge gap in traditional literature concerning furniture history, most of which is written from an art historical perspective. In this book the constructions and materials, and their relation to form, design, style, and the expressions and choices of the craftsperson behind the furniture are investigated. Knutsson presents documentation, descriptions and contextualization of furniture from urban and rural settings and moves on to analyze and interpret the pieces. He also discusses how ideals and attitudes towards quality, versatility, knowledge, and skill are reflected in the furniture he analyzes. Knutsson's

theoretical approach and understanding of pre-industrial joinery products helps to inform the analysis conducted in this study.

Lars Nylanders dissertation on 18th century decorative interior paintings from Hälsingland county in Sweden (Nylander, 2024) approaches historical interiors with a MCS-theoretical methodology. Nylander choses to see the interior paintings as movable objects rather than as integrated parts of the architecture and uses Igor Kopytoffs concept of cultural biography of things (Kopytoff, 1986) as well as Viccy Coltmans model for object studies where an art object is approached with questions in the four categories: production, objecthood, consumption, and afterlife (Coltman, 2015a). In the study, a wide scope of inquiry about the contexts (at the time of creation and up until today), people (painters, buyers, and owners), similarities and differences between paintings, functions, and motifs of the paintings are investigated through the paintings and other sources. Nylander's source-pluralistic methodology and adoption of an MCS-theoretical approach on interiors relates to the theoretical perspectives and the methodology of this study.

The Dutch researchers Jaap Boonstra and Pol Bruijs have published an interesting study on some of the planes from the tool collection at Skokloster Castle (Boonstra & Bruijs, 2022). Boonstra and Bruijs are investigating seventeen of the moulding planes from the collection of tools ordered by Carl Gustaf Wrangel from the Dutch tool maker Jan Arendsz Wissing in 1664. In the study, the planes are thoroughly documented and reproduced, and the finished planes are used to make test pieces of mouldings. Since very few late renaissance and early baroque planes are preserved in Holland, the Skokloster planes are a unique source material for mouldings from this time. One aim of the study is to use the produced test pieces, as well as templates (negative shapes of the sole) of the planes as comparisons or references in studies of historical furniture and interior architectural details in wood in Holland. The study sheds light on the double nature of planes as source material –connecting to Renmælmo´s definition of artefacts as producing or produced and Boonstra and Bruijs' focus on dedicated moulding planes as sources of information is adopted in this study.

Roald Renmælmo´s research (Jarefjäll et al., 2017) focuses on the 19th century Norwegian carpenter and joiner Knut Larsen Høis (1799-1882). Høis can perhaps be seen as representative for a type of crafts person during the early modern era; the skilled – but not guild trained – rural carpenter/joiner working mainly for farmers and the church. In his research, Renmælmo traces the footsteps of Høis´ practice through the preserved products of his work as well as his preserved tools. Renmælmo categorizes these sources as *producing* and *produced* artefacts and theorizes that they carry complementing types of information about work processes. The design and technology of the producing artefacts (tools and aids for carpentry/joinery) can tell the researcher something about the craft procedures they are made for. While the produced objects carry information about the crafts procedures that have produced them through traces from tools. Renmælmo furthermore describes his research as a form of hermeneutic circle where artefacts (producing as well as produced) are analyzed and interpreted based on his craft knowledge within the field of carpentry/joiner. The interpretations are then tested through reconstruction or copying of the artefacts, increasing the knowledge and skill of the crafts person/researcher, leading to new

interpretations of the artefacts. Renmælmo's concept of producing and produced acts as an explanatory tool for the different types of material sources within this study.

The American joiner and writer Joshua Klein have written a pair of complementing books with the titles *Joined – A Bench Guide to Furniture Joinery* (Klein, 2020) and *Worked - A Bench Guide to Hand-Tool Efficiency* (Klein, 2022). The books are – as the titles describe – bench guides, in the meaning that they are meant to be used as a teaching aid, in a workshop, for craftspeople interested in pre-industrial woodworking techniques. Through step-by-step manuals, the reader is taught how to dimension wood and how to do joinery by hand, through the technology of professional, pre-industrial joinery. Kleins skills and knowledge in the subject derives from his own craft research. Through close inspection of period furniture, experiments and reconstruction attempts, and studies of historical sources, he has been able to connect the threads of tools, tool traces, and practice to hypothesis about craft procedure behind the historical furniture of his scope. The research process is similar to the hermeneutic craft research conducted by scholars like Tomas Karlsson and Roald Renmælmo and further informs the approaches to examinations of material sources in this study. Klein's research is also linked to Robert Tarule's concept of *shop-based research* (Tarule, 2007), more on that below.

Klein has also written the book *Hands Employed Aright – The furniture Making of Jonathan Fisher (1768-1847*) (Klein, 2018). This work is a biographical depiction of the craftsman Jonathan Fisher, who Klein approaches through studies of Fishers diaries, his preserved tools and furniture, as well as through shop-based research where reconstruction of products and procedures are carried out. The multidisciplinary approach is an attempt to make use of all aspects of the rich source material on Fisher and portray the craftsman and person in as complete a way as possible. Klein's source-pluralistic methodology is adopted in the investigations in this thesis. The book features a portrait of Fishers private as well as professional life, from the study years at Harvard university to the life as a settler, joiner and minister in the frontier in early 19th century Maine. It also features an inventory of Fishers preserved tool kit, relating the tools and technology of his practice to history, norms, and traditions. Furthermore, depictions and analysis of Fishers furniture and descriptions of Kleins methodology in his shop-based research are found in the book.

Robert Tarule, an American joiner and historian have written *The Artisan of Ipswich – Craftsmanship and Community in Colonial New England* (Tarule, 2007). Tarule's research sets out from a joined oak chest, made in New England in the middle of the 17th century, and attributed to the joiner Thomas Dennis. Through close investigation of the chest and archival document from 17th century New England, the joiner Dennis and his context are thoroughly researched. Tarule refers to the critical part of his investigation as *shop-based research* and explains a methodology of reconstruction attempts performed in his workshop – which he describes as a research tool or a laboratory – based on observations of the original chest. He describes how the reconstruction work done in the shop raises new questions, aimed at both the archival documents and at the piece in focus for reconstruction, which leads to new reconstruction attempts, in turn raising new questions about the Dennis' craft. In the case of Thomas Dennis' joined chest, Tarule describes how his research led to a deep understanding of Dennis *shop traditions*, meaning the specific methods that Dennis used to

perform certain procedures and tackle certain problems. In the end, Tarule felt that he could work *with* Dennis, he could climb inside his mind, use his gaze, and perform joinery in Dennis' shop traditions. In many ways, Tarule describes a hermeneutic research process recognizable in other craft researchers' methodology. Tarule's close attention to the details in the preserved products of a single craftsperson, and the way in which he builds his hypothesis based on these interpretations are similar to the methodology adopted within this study.

1.7 Delimitations

The main decision in delimitating the study is not to study the original archive material concerning the construction of Skokloster Castle. This is an extensive material of letters, bills, inventories, maps, sketches, drawings, and other documents kept at the national archives in Stockholm. Going through this material might have produced even more information on Daniel Knutsson in particular and his context in general but the lack of time in combination with my insufficient experience in working with archive material and reading 17th century handwriting ruled this out. Instead, the investigation relies on Andrén's previous research in the archive material, accounted for both in *Skokloster – Ett slottsbygge understormaktstiden* (Andrén, 1948) and in his excerpts from the making of the book. These are of course secondary sources that has been handled with appropriate source criticism.

The second delimitation is that not all products made by Knutsson will be probed for matches with the dedicated moulding planes in part two of the investigation. Ideally, an examination of every preserved piece of interior and exterior woodwork made by Daniel Knutsson would have been preferred, this has however not been possible. The products not investigated are primarily exterior, large mouldings on the eaves and on the towers. Daniel Knutsson delivered a total of 176 meters of large exterior moldings from 1665-1669, much of it for the southwest and northwest towers (Andrén, 1948). The scope of the investigations has instead been limited to the interior of the castle and the doors in the main entrance.

2. Part one – Knutsson and his context

Through a micro-history and source pluralistic approach, this chapter attempts to understand Daniel Knutsson—both as a person and a craftsman—within the context of his time. The central question guiding this investigation is: What did his private and professional life look like? The prerequisites for Knutsson's living and working conditions are sketched, through a review of Andrén's research, local church records, and literature on the conditions and legal regulations for guild and non-guild craftsmen. A brief study of Knutsson's possible workbench is also conducted through a forensic investigation of traces on one of the hand planes linked to Knutsson's practice and earlier research on pre-industrial woodworking technology. Finaly, Knutsson's wages and contemporary costs of living are compared.

2.1 Knutsson at Skokloster

Daniel Knutsson can be traced through 24 years – from the 25th of August 1654 when he is first mentioned in a letter (Andrén, 1939) up until the 21st of July 1678 when his burial is noted in the local church records (Skoklosters Kyrkoarkiv (AB, C), 1661a). His birth year and age at death are unknown, but since his wife is mentioned in 1654, it can be assumed that he was at least over 21 years old—the age of majority at the time—which would make him around 45 at the youngest when he died. He could of course just as well have been married for a long time when he came to Skokloster in 1654 and an old man when he died. The name of Knutssons wife is not mentioned either in church records or in Andrén's excerpts of the archive material concerning the construction of the castle. Church records however tell us that she and Daniel had two children – Isak and Abraham– born in 1661 (Skoklosters Kyrkoarkiv (AB, C), 1661b) and 1663 (Skoklosters Kyrkoarkiv (AB, C), 1661c). The same church records also note the death of two of their sons, in 1661 (Skoklosters Kyrkoarkiv (AB, C), 1661b) and 1665 (Skoklosters Kyrkoarkiv (AB, C), 1661d). The names of the deceased sons are not noted, it could have been Isak and Abraham but records of born and deceased first occur in their parish in 1661, consequently Daniel and his wife could have had sons before that could have been the ones who died in 1661 and 1663.

The part of the letter concerning Daniel Knutsson is worth quoting in full as it gives several insights into him and his context. It was written on the 25th of August 1654 by Hendrich Anundhsson, engineer and site manager at Skokloster to Carl Gustav Wrangel.

> *"Snickaren Daniel haver sig till denna tiden här uppehållit, och synes ställa sig helt flitig, ty jag haver som oftast brukat honom till ett och annat arbete som här stundom förefallit är, och eljest haver jag honom uti sin konst proberat, och förnimmer det han sitt ämbete väl förstår och tämmeligen nätt arbete göra kan, varföre han framdeles nödigt kunna behövas E.G.E arbeta att förrätta som han nu och med flit arbetar uppå de ekeplankorna som över fönsterkarmarne komma till att sitta (i krogen sitter en gl gumma i vars ställe Daniels hustru kunde sitta o. sälja W:s öl och båda sål. tjäna W.)" (Andrén, 1939)*
>
> *"The joiner Daniel has, until this time, been staying here, and seems to be quite diligent, as I have often employed him for various tasks that have occasionally arisen here, and*

otherwise I have tested him in his craft and I perceive that he understands his trade well and can do reasonably neat work, which is why he may be needed in the future to perform work for Your Grace as he is now doing, and diligently working on the oak boards that will go over the window frames (at the inn, an old woman sits, in whose place Daniel's wife could sit and sell W's beer, and both could thus serve W.)." [Translation by the author]

Engineer Anundhsson led the construction work on site up until his death in 1665 (Andrén, 1948) and had a lively correspondence with Carl Gustaf Wrangel – who for most of the time was not present at Skokloster – about questions regarding the construction work. This letter was written at the end of the summer of the first year of construction. Digging for the foundation started in the winter and Anundhsson mentions in the same letter that the walls of the south-east part of the castle were built 16 feet in height and the window frames of the bottom floor installed (Andrén, 1939).

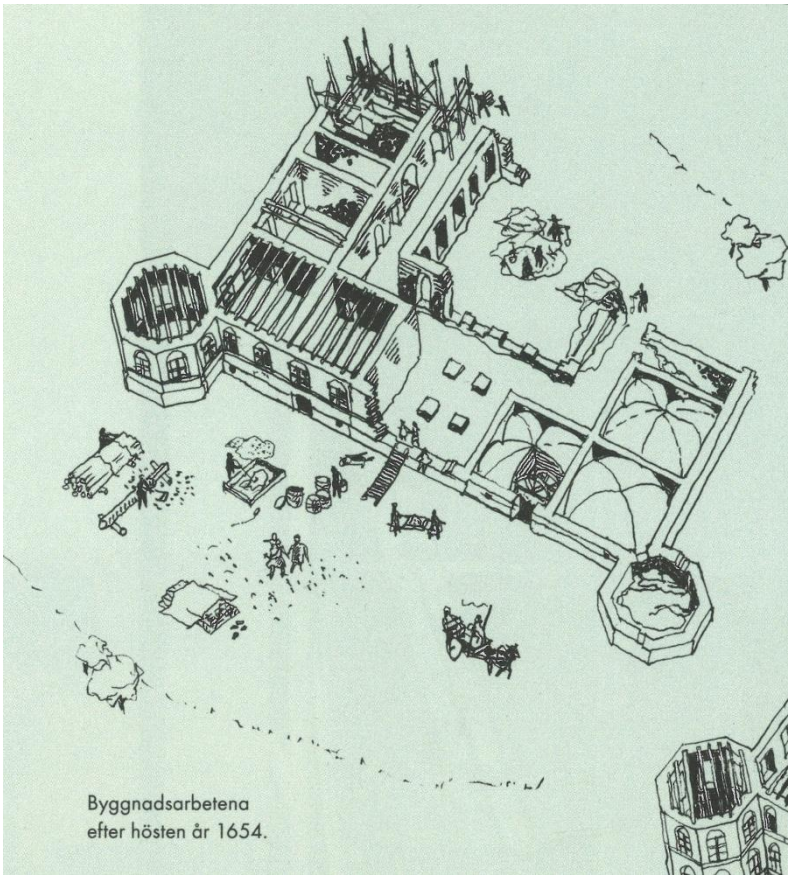


Figure 3. The building site as it might have appeared in late 1654. Somewhere here, Knutsson would have been found working on the oak boards mentioned in the letter. Cut-out from a larger illustration by Ove Hidemark. Adapted from *Slottsbyggnaden berättar* (Hidemark, 2004), Copyright 2004 by Ove Hidemark.

The phrasing in Anundhsson's letter implies that Knutsson had stayed and worked at the construction site (Figure 3.)(Hidemark, 2004) for some time, perhaps the whole summer, perhaps only a couple of weeks, at least long enough for Anundhsson to get an understanding of the quality of his work. He mentions both that he has employed him for different types of work and that he has tested him in his craft, without further explanations of what this test consisted of. Anundhsson's reason for testing Knutssons craft skills could have been prompted by the fact that he had no formal certificate of proficiency. Daniel Knutsson was not a guild craftsman, in every mention of him – both in the Skokloster archives and in the church records – he is either described as Daniel Knutsson Snickare [joiner], Daniel Snickare, Snickaren Daniel Knutsson, or just Daniel. Many of the other craftsmen involved in the construction of the castle are mentioned with the prefix Mäster (Master) or Gesäll (journyman), it seems as if these titles were used if the person in question was a craftsman of the

guild. The matter of Knutssons employment and how it related to the joiners' guilds and the guild regulations of the time will be discussed further on in a separate chapter.

Where Knutsson came from, how he learned his trade, what he did before 1654, and how he heard of the newly initiated construction of Skokloster castle remains unclear. He could have been a local resident, but there are no church records from Skokloster parish from this time so he cannot be traced there. He could have been an unemployed joiner from anywhere in the region, or further away, who took the chance of seeking out the construction site to try his luck. And it appears as if his luck stood the test. Anundsson seems happy with his skills in the trade and appears to have taken a liking to both Daniel and his wife, as he suggests that the old woman who sells beer at the inn should be replaced by Daniels wife.

Daniel and his wife seem to have found housing under the same roof as the inn. Two years after the initial letter, Knutsson is again mentioned by Anundhsson as "snickaren här neder i krogen Daniel" ("the joiner here down at the inn Daniel") (Andrén, 1939). A map from 1674 (Andrén, 1948) illustrates the buildings at Skokloster in detail (Figure 4.) and portraits the inn – situated north of the church between the schoolhouse and the lake shore – as connected to a smaller room through a shared entryway. This room would have been the living quarters for the innkeeper and would become Daniel and his wife's home for the years to come. The building had a built-on sheep house as well as a pig sty closer to the lake. According to an inventory of the number of glass panes in the houses at Skokloster, Daniel Knutssons cottage had nine panes. These could have been fitted within the same frame or in separate frames, meaning that Knutsson would have had at least one, perhaps several windows in the cottage.

There are some clues as to how Daniel and his wife's household might have looked. Many of the people employed at Skokloster Castle – from engineer Anundhsson down to the farm hands – had daily meals included in their wages and ate together at *fritavlan*, the dining hall in the southern end of *fogdebyggningen* (Figure 4.), the stewards building. Among the craftsmen, the stone dresser and the blacksmith ate there (Andrén, 1948). Daniel, however, did not. He and his wife seem to have had a separate household at the innkeeper's cottage. On several occasions, Daniel was compensated in goods instead of money. He received different types of grain and meat, malt for brewing, and fish (Andrén, 1939). All of which most likely were preserved and prepared into meals and beer in Daniel and his wife's home. Judging by the amount of meat they had access to; they seem to have lived a life without poverty. It is not noted in the sources if Daniel's wife had an income from managing the inn, but it is perhaps likely that she was compensated for the work in some way. Wrangel had a hop garden and an employed hop master managing it and brewed beer at Skokloster intended for the inns at Skokloster and Stavsund. He earned 400 d.k.m. (daler kopparmynt, further explained on page 29) yearly on the sale of beer in the inn at Skokloster (Andrén, 1948), perhaps a part of the income from the beer sale went to Daniel's wife.

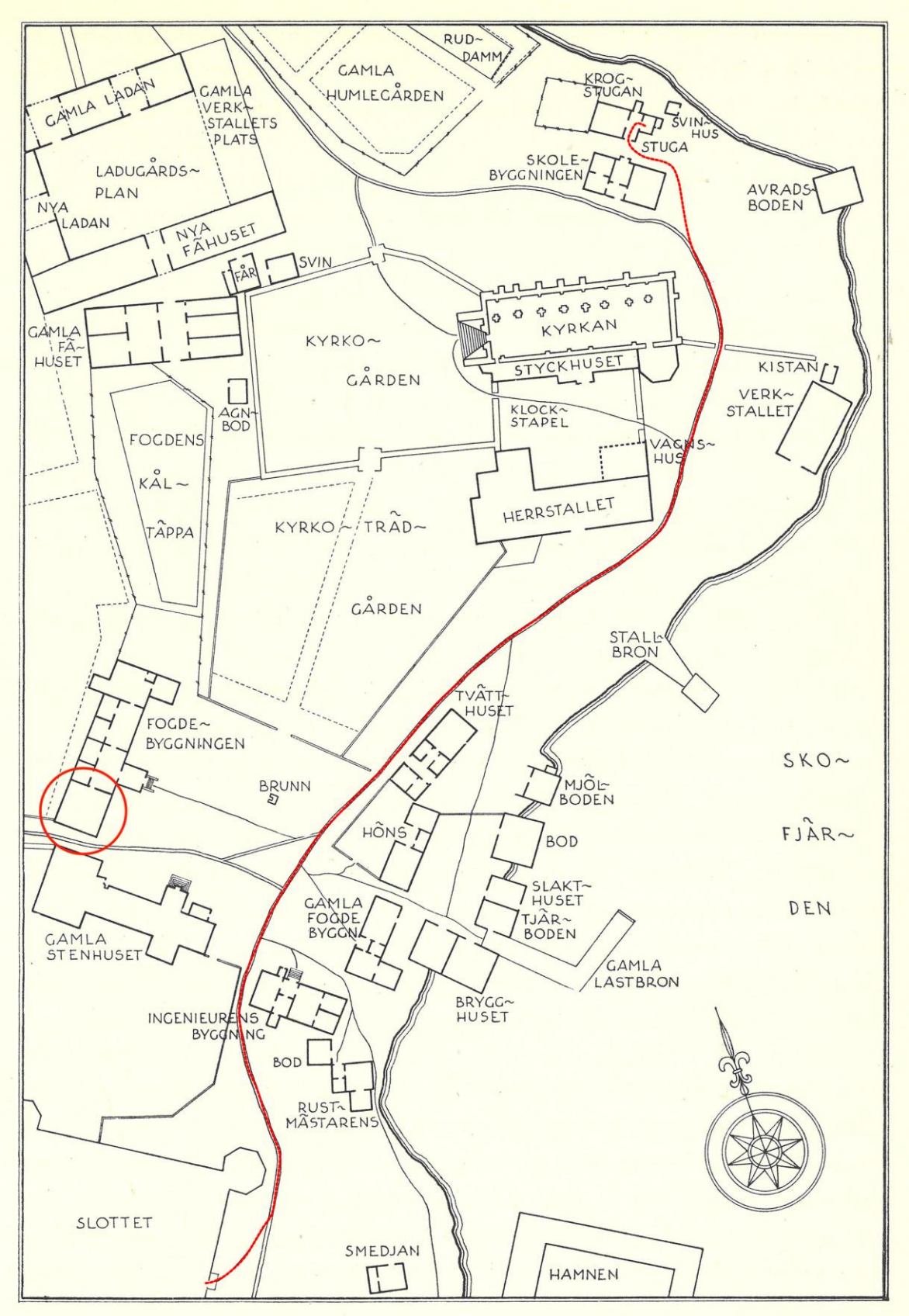


Figure 4. Erik Andrén's re-drawn map of Skokloster in 1674. The castle in the bottom left corner and the inn (krogstugan) with the innkeeper's cottage (stuga) and the pig stie (svinhus) in the top right corner. The steward's building (fogdebyggningen) on the left with the dining hall circled. Knutsson's most likely route from his home to the workplace in the castle drawn in red. Adapted from *Skokloster—Ett slottsbygge under stormaktstiden* (Andrén, 1948), Copyright 1948 by Erik Andrén.

2.2 Knutsson and the joiner's guild

As mentioned before, Daniel Knutsson does not seem to have had a formal connection to the crafts guild system of the time. His name is never found within the source material together with a guild title, like journeyman or master. Many of the other craftsmen have guild titles or other evidence of formal education. Among his colleagues in the joiners and woodcarvers trade in the construction project, two journeymen (Hans Sivers and Mattias Slange, joiners), three masters (Diderich Funck, and Berendt Sifwersson, joiners, and Marcus Hebel, woodcarver), and two others who likely were educated within a guild, but abroad (Berendt Gnau, woodcarver, and Louis Gillis, joiner) are recorded, while only two other joiners without formal titles are found (Olof Nilsson and Johan Svensson)(Andrén, 1948). In this chapter, the legal aspects of Knutssons employment and his relation to the crafts guild will be discussed.

The guild systems, locally organizing craftsmen within their professions, were formed in the late Middle Ages in Sweden with influence from German guilds (Hellner, 1944). These associations of artisans served several purposes. In towns where guilds were established, they claimed monopoly over the right to practice their craft, only guild members were allowed to make and sell the products specific to the guilds trade. The guild would also regulate the quality of the products produced by the guild craftsmen by specifying professional standards to which the members must abide. Education within the trades was regulated and formalized by the guild's system of learning, starting with apprenticeship at a young age, completed through a journeyman's test and acceptance to the rank of journeyman. After a certain number of years, the journeyman was allowed to submit a masterpiece for evaluation by the guild, eventually becoming a master within the trade (Hellner, 1944). The guild would, however, regulate the number of masters within a town. As becoming a master meant setting up your own shop and employing journeymen it also meant an increase in competition for the already established masters. It also required economic resources to start up a company, and above salaries, workshop and tools, also fees and provisioning to the guild. This left many journeymen with poor opportunities to become masters, prompting some to seek employment or set up businesses elsewhere. Apart from the purposes mentioned above, the guild would also serve as social safety nets for the members, providing help in the case of illness, old age or unemployment (Andrén, 1948; Hellner, 1944).

The monopoly held by the guilds on the markets was debated and criticized throughout the 17th and 18th centuries, but legally strong. The question of who was and who was not allowed to practice craft trades was however more complicated than complete monopoly by the guilds. The oldest legal document concerning a joiner's guild in Sweden – the Stockholm joiner's guild regulation of 1574 – was sanctioned by the king. This regulation, as well as the updated version of it from 1622 and the general guild regulation concerning all guilds in Sweden and Finland from 1669, indeed emphasizes that only guild craftsmen were allowed to practice their trade (Andrén, 1973). There are however several exceptions to this rule, the first of them concerning craftsmen serving the rural population with necessary products, such as shoemakers, tailors, and blacksmiths. These craftsmen, called *gärningsmän* (deed men) or *sockenhantverkare* (parish craftsmen) supplied a different market than the guild craftsmen – who mainly served the townspeople – and had legal rights to do so (Hellner,

1944). The other group excepted from the guild regulations were the craftsmen serving the king, the Crown, or the nobility. The royal and noble privileges included freedom to hire whatever craftsman they wanted, guild member or not (Andrén, 1973; Granlund, 1944; Hellner, 1944). Journeymen with poor prospects of becoming a master within the guilds were found within both of these groups of craftsmen (Hellner, 1944).

The non-guild craftsmen hired by nobility through their privileges were called *försvarskarlar* (protection-men), a somewhat confusing title connected to another regulation during this time – the vagrancy act. This law stipulated unemployment or vagrancy as a criminal act, punishable by forced labor or forced military service. Employment by a nobleman – as a farm-laborer, craftsman, or any other profession – ensured protection (försvar) from this law, hence the word *försvarskarl*. This type of employment was referred to as being taken under *legal protection* (laga försvar) by the employer. The combination of the vagrancy act's criminalization of unemployment and the noble privileges of freedom to hire non-guild craftsmen came to shape the understanding of the word *försvarskarl* into the meaning of craftsmen working for the nobility.

This form of employment seems to have come with some issues during the 17th century. It stirred up heated emotions among the guild craftsmen, who many times did not hesitate to call it out as *bönhaseri* (illegal work performed by unauthorized craftsmen) and harass the craftsmen employed by the nobility. This, in turn, angered the nobility who had the law on their side (Andrén, 1973). The recurring wars (The Thirty Years' War 1618-48, The Polish Wars 1655-50, and The Swedish Russian War 1656-58) during the 17th century contributed to the issues of employment through noble privileges. The army demanded a continuous replenishment of new soldier for the perpetually thinning ranks. As an example, during The Estates Assembly of 1657 it was decided that one in every ten adult men between the ages of 15 and 60 was to be called in to serve in the army, and the vagrant, unemployed men were first in line (Englund, 2000). This very real threat of forced military service for the unemployed gave the nobility – with the possibility to provide legal protection – considerable leverage to provide unfairly low wages or unjust working conditions for the employees (Granlund, 1944).

Daniel Knutsson is nowhere mentioned as a *försvarskarl*, but his employment would most likely have classified him as one. He was employed at the estate of a nobleman which would grant him legal protection against the vagrancy act, and his employment as a joiner would have been legal through the noble privileges. Two other factors also support this theory. The first of them being that Daniel and his wife were provided with a cottage – the innkeepers cottage – where they lived (Andrén, 1948), this was common practice for married workers for the nobility (Granlund, 1944). The other factor is that *försvarskarlar* were not allowed to have apprentices or journeymen working for them (Andrén, 1973). Knutsson worked side by side with the other joiners and craftsmen but seem to have been working without helpers for most of the time. Only on two occasions is he mentioned having a journeyman working for him, in November of 1660 when he and his journeyman are charged for board at the worker's dining hall on Skokloster for one week (Andrén, 1939). This is out of the ordinary since he had a separate household where he mostly seems to have eaten his meals, perhaps he had the journeyman employed only for a week and decided to dine with him. The other occasion

is in May 1662 when Knutsson is mentioned in a letter written by Anundhsson as working on mantlepieces with the help of a journeyman (Andrén, 1939).

The matter of where Knutsson acquired his competence and skill within the joiner's trade is an intriguing question with many possible answers. How much, and what type of experience and education he had in his profession when he started working at Skokloster remains unclear. The only conclusion that can be drawn about his competence at that time is that Anundhsson describes him as "diligent" and that he "understands his trade well and can do reasonably neat work" (Andrén, 1939). It was not uncommon that craftsmen working as *försvarskarlar* were journeymen (Hellner, 1944), this seems to have been the case with Hans Sivers and Mattias Slange, two journeymen who worked at Skokloster between 1671 and 1674 (Andrén, 1948). They are usually mentioned together, with their titles, and do not seem to have worked under a master but as free craftsmen employed by Wrangel. Knutsson may have once been a member of a joiner's guild, but for some reason expelled and forced to seek employment elsewhere (Hellner, 1944), although his surname suggests otherwise. It was usual practice when achieving the rank of journeyman that people with patronymic surnames changed them to something else to mark their elevation in the class system (Andrén, 1973). He could of course have trained as an apprentice within a guild without taking the step up to journeyman, and thus never changed his name. There are also the possibilities that he trained with a *gärningsman*, a legally practicing rural craftsman, with a *bönhas*, an illegally practicing craftsman, or that he illegally trained as the apprentice of another *försvarskarl*.

An interesting part of Knutsson's competence is that he was literate. According to Andrén's excerpts of the original documents from the time of construction, Knutsson ability to write is evident on several occasions. In 1657, Knutsson writes a receipt with his own hand after receiving foodstuffs from the employer. (Andrén, 1939) On the 5th of August 1668, Knutsson writes a letter to the treasurer of the estate, Hindrich Schulze, asking to be re-employed after having been dismissed from his position due to misconduct (Andrén, 1939). (This is of course interesting on its own, what was this incident?) Lastly, many of the craftsmen working at Skokloster signed their contracts or receipts with house marks instead of written signatures. Andrén has compiled a list of the house marks used by various craftsmen, along with notes on those who signed with written signatures instead. Knutsson is found among the latter. An interesting aspect of the list of craftsmen using house marks is that it includes several guild members, both journeymen and masters (Andrén, 1939).

2.3 Colleagues, workplace, and technology

Daniel Knutsson worked alongside a wide range of craftspeople during the construction of Skokloster Castle. Some of them were, like him, joiners by profession (Table 1.). Others were also woodworkers but with slightly different competences, like carpenters, woodcarvers and the woodturner. Many of them worked with other materials, like the many masons and their helpers, the stone dressers, the painters, the plasterers, the blacksmiths and tin smiths, the glazier, and the brickmakers. Some worked for many years at the construction site, while others only were there for a limited time. Knutsson worked alongside and sometimes together with several of the other woodworkers. In the autumn of 1664, he worked together with the woodcarver Carsten Ericksson Holsk, building two small balconies for the eastern façade. In 1666 and 1667 he worked on the construction of the new kitchen – a separate building south of the castle – together with the carpenters. In 1668, Knutsson, master joiner Berendt Sifwersson, and a few of his journeymen worked together making window frames, doors, and baluster blanks for the woodturner (Andrén, 1948).

*Table 1. Joiners active in the construction of Skokloster Castle 1654-1676, * indicate guild connection*

Year 16-	***54***	***55***	***56***	***57***	***58***	***59***	***60***	***61***	***62***	***63***	***64***	***65***	***66***	***67***	***68***	***69***	***70***	***71***	***72***	***73***	***74***	***75***	***76***
Slange & Sivers *																							
B. Sifwersson *																							
J. Svensson																							
D. Funck *																							
L. Gillis *																							
O. Nilsson																							
D. Knutsson																							

On several occasions, Knutsson received payment for things he made for the other craftsmen. In August 1657 he was paid 1 d.k.m. for two wooden mallets for the stone mason Jonas Larsson (Andrén, 1939) (d.k.m. represents daler kopparmynt, the common currency that workers received their pay in at the time, 1 d.k.m. was equal to two thirds of a daily wage for a joiner at Skokloster at the time). In 1665 he made one spirit level each for the master mason and the stone mason, and four brick molds for the brickmakers (Andrén, 1939). Molds are recurringly made by Knutsson, in 1670 he made five smaller and one bigger one for the plasterer, and two floor tile molds for the brickmakers, and in 1671 he made another mold for the plasterer (Andrén, 1939). In 1672 Knutsson improved the woodturners lathe for 3 d.k.m. Another item that Knutsson is mentioned making for the other workers on two occasions are coffins. In 1665 he built one for Päder Matson, a migrant worker from the county of Dalarna, and in 1670 he builds another one for a Henrich Mårtensson (Andrén, 1939).

The work performed by Knutsson and the other joiners is traditionally done in a workshop, by a workbench. There are three older workbenches preserved at Skokloster, one of them (Figure 5. & 6.) have been analyzed by scholars Tomas Karlsson and Roald Renmælmo who believe that it might date back to the end of the 18th century (Karlsson, 2013b) which could mean that it is one of the two benches mentioned in an inventory from the castle from 1794 (Knutsson & Kylsberg, 2000). It is however unlikely that any of the workbenches preserved at Skokloster date from the 17th century, as they are all a German type of bench that emerges during the late 18th century. What type of benches Knutsson and the other joiners would have used cannot be determined for certain, but the workbench technology of the time would typically not involve the two vices found on later German benches (Knutsson & Kylsberg, 2000).

Figure 1. One of the German type of workbenches with two vices at Skokloster Castle. Possibly from the late 18th century. Photo adapted from *Hyvelbänk på Skokloster* (Karlsson, 2013), Copyright 2013 by Tomas Karlsson.

Figure 6. Underside of the same workbench. This German type of bench – with two vices where workpieces can be fastened – became popular in the late 18th century and is to this day a standard model of workbench in Scandinavia. Adapted from *Hyvelbänk på Skokloster* (Renmælmo, 2013), Copyright 2013 by Roald Renmælmo.

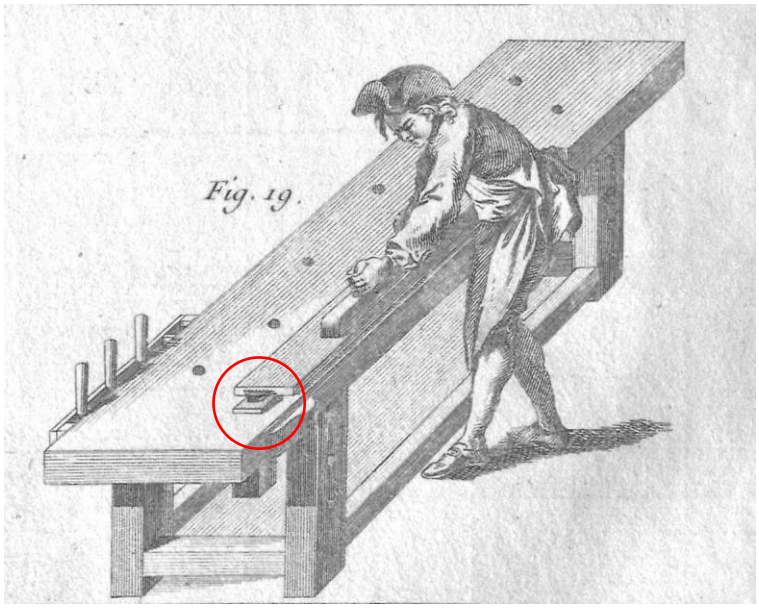


Figure 7. Workbench without vices but holes for holdfasts and a plane stop (circled) towards the end. Adapted from *L'Art du menuisier* (Roubo, 2014), Public domain.

Figure 8. Plane stop. Adapted from *Fleire norske hakar, ronghake og høvelbit* (Renmælmo, 2015) Copyright 2015 by Roald Renmælmo.

An interesting example of 17th century workbench technology is the bench (Figure 9.) found on the Vasa ship that sank in Stockholm in 1628. It belongs to another, older tradition of bench technology without vises, but instead fitted with metal holdfasts pinching the workpiece to the bench and a plane-stop (Figure 8.) towards the end of the bench. A depiction of a similar bench (Figure 7.) can be found in Roubos L' Art de menuisier from 1769 (Roubo, 2014). The Vasa bench is worn and has probably seen a lot of use before it was fitted on the ship. Karlsson and Renmælmo theorizes that the bench could have been a joiner's bench, used during the construction of the ship and put on the ship with the intention of completing the interior fittings, as they were not finished when the ship sailed on its maiden voyage. The ship featured many frame-doors and other typical examples of joiner's work, possibly connecting the Vasa bench with the joinery tradition of the time (Renmælmo,

2013). It is not unlikely that this type of bench could have been used during the construction of Skokloster Castle. In fact, traces on one of the planes indicate that it has been held against a plane stop of the same type as on the Vasa or Roubo benches (Figure 10.). The marks in the end grain of the plane are typical for how it looks when a workpiece has been handled on a workbench with a plane stop. The piece is flipped on different sides and pushed into the plane stop as it is worked with a plane, creating the distinctive indentations in the end grain.

Figure 9. The workbench from the Vasa ship with holes for holdfasts and a small hole for a plane stop. Adapted from *Høvelbenken i Vasaskipet* (Renmælmo, 2013) Copyright 2013 by Roald Renmælmo.

Figure 10. The end grain of one of the planes (5240) used by Daniel Knutsson displaying indentations, possibly from a plane stop. Photograph by the author.

Where the joiners workshop at Skokloster was situated cannot be said for certain, but in 1671 *the joiners vault* ("snickarnas valv" (Andrén, 1948)) is mentioned as being located in one of the rooms on the first floor (Figure 11.) of the castle (the room called 1:R). This part of the castle was built in 1664 and room 1:R might have served as the joiners workshop from this year. There is also a mention of *the old joiners cottage* ("gamla snickarestugan" (Andrén, 1948)) in 1671. This might have been a workshop outside of the castle, but it could just as well have been living quarters for joiners. Since the castle is big and a lot of the fitting of interior woodwork would have been done is situ in the rooms, there could also have been a kind of ambulating workshop, moving around in the castle as the construction proceeded (Knutsson & Kylsberg, 2000).

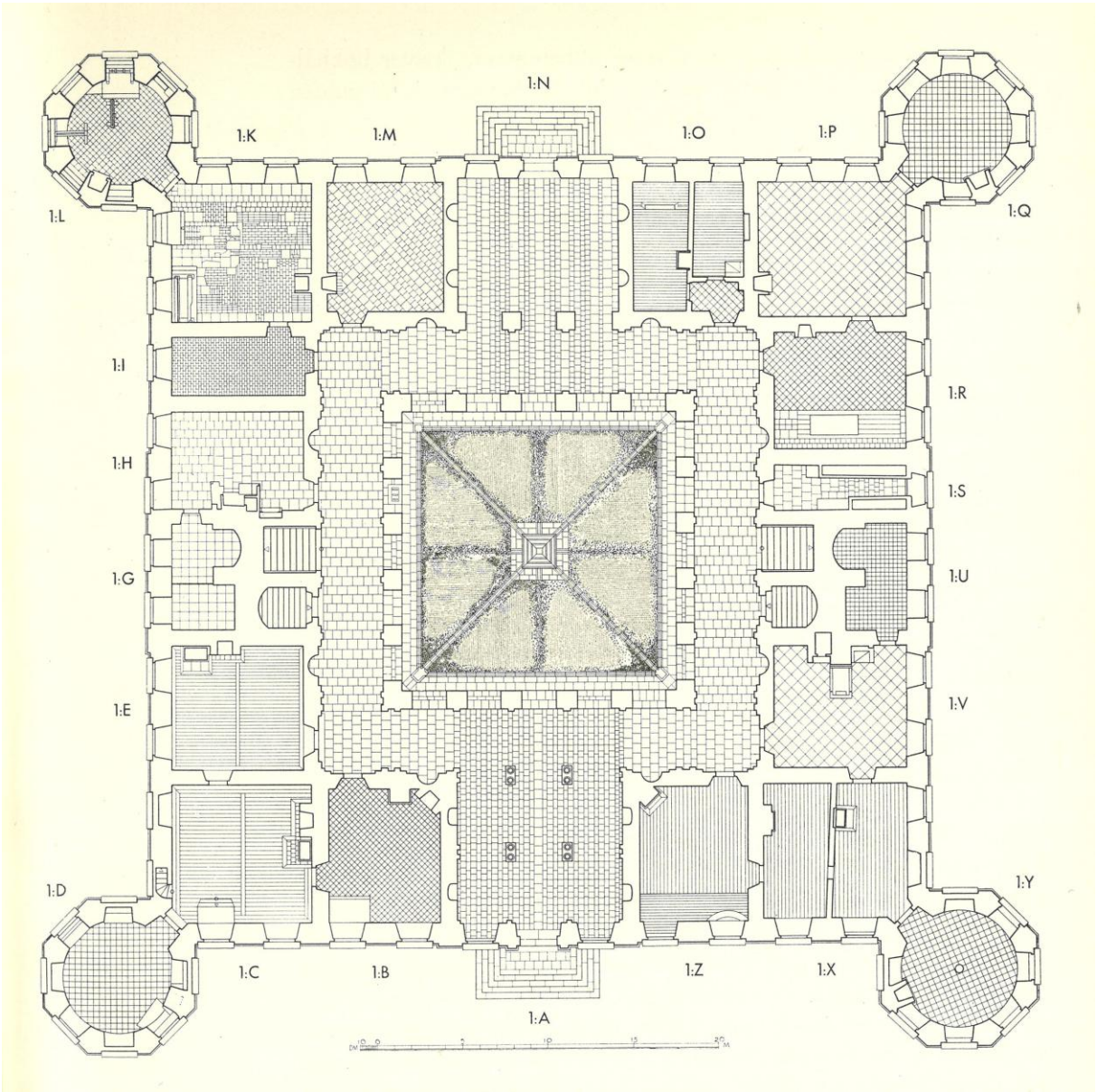


Figure 11. Plan of the ground floor. The main entrance, where Knutsson and the other craftsmen would have entered the castle, marked 1:A at the bottom of the picture and room 1:R *the joiners vault* on the top right side. Drawing by Sander Rosén 1942. From *Skokloster – Ett slottsbygge under stormaktstiden* (Andrén, 1948), Copyright 1948 by Erik Andrén.

2.4 Wages and prices

The economic side of Knutssons work can be traced through Andrén's research in the payrolls and other documents from the construction of the castle (Andrén, 1939, 1948). Through them, an understanding of the financial situation for a joiner during the 17th century can be gained. According to preserved correspondence between Carl Gustaf Wrangel and the site manager Hendrich Anundhsson, Wrangel preferred a fixed price for the products made by the craftsmen, as he was convinced that it would make them work harder than if they were paid a daily, weekly, monthly or yearly salary (Andrén, 1948). Knutsson was paid a fixed price for much of his work, but on some occasions, he received a daily rate instead. A recurring daily rate for the joiners were 1:16 d.k.m., (Andrén, 1948) meaning 1 daler kopparmynt and 16 öre, which equals 1,5 daler kopparmynt (1 daler = 32 öre). In 1674 for example, Knutsson did finishing work on the third floor for two days and received 3 d.k.m (Andrén, 1939) in payment. A normal working day would have been 13-14 hours including breaks (Andrén, 1948). As the source material has information about both Knutssons daily wage and the fixed payments he received for different products, an attempt can be made to estimate how many days it would have taken him to build the things he was paid for. In the third chapter of this essay, the mantlepiece in the room called Leyden, finished by Knutsson in 1676 for 100 d.k.m. is subjected to this type of calculation.

To understand what the daily wage of 1,5 d.k.m. would have covered, a comparison can be made with the prices of some common goods during this period. In 1663, the stone mason Jonas Larsson is paid 10 d.k.m. specifically intended for a pair of shoes and a shirt, with 4 covering the shoes and 6 the shirt (Andrén, 1939). A barrel (125,6 liters) of salted herring, a staple food for many people, cost 14 d.k.m. and 16 öre in 1665. In 1660, a lispund (8,5 kilograms) of butter cost 3 d.k.m. and 4 öre while the same amount of salt cost 1 d.k.m. and 16 öre, or the same as the daily wage (Lagerqvist, 2011).

Apart from the monetary compensation paid for products or labor, Knutsson was also occasionally paid in in kind, mostly in the form of foodstuffs, but on one occasion in leather or ox hide. On three occasions, he receives grain in the form of a barrel of rye or barley. The rye was probably intended for bread baking, and the barley – as it is mentioned together with malt that he also receives – was most likely meant for the brewing of beer. He was also paid in meat and fish. In 1662, he receives a whole slaughtered ox, as well as a whole slaughtered sheep, and on another occasion, he gets 3 lispund (1 lispund=8 ½ kilograms) of unspecified meat and 1 skålpund (425 grams) of "saltgröna giäddor", which would be northern pike preserved with salt in some way (Andrén, 1939).

2.5 Summary

In this chapter, the private and professional life of Daniel Knutsson, along with his context during his 24 years at Skokloster, have been investigated through micro-history and source-pluralistic approaches. The professional side of Knutsson's life started with engineer Anundhsson's firsthand description of him in 1654 as "diligent", that he "understands his trade well", and that he could do "reasonably neat work" (Andrén, 1939). Knutsson was most likely not a guild craftsman and was probably employed at Skokloster Castle through the noble privileges allowing for the employment of

craftsmen under the title of *försvarskarl*. Through this form of employment, Knutsson could perform his trade under some restrictions and was granted legal protection against forced military service. In accordance with the regulations for the *försvarskarl*-type of employment, he seems to have worked without apprentices or journeymen under him for most of his time. He did, however, work alongside, and occasionally together with other joiners as well as craftsmen of other trades. Unlike many of the other craftsmen – even guild members - at Skokloster, Knutsson was literate. The joinery workshops at the construction site, where Knutsson performed his craft, seem to have been situated in a room on the ground floor of the castle from 1664 and onwards, but Knutsson could also have worked with an ambulating workshop in the castle. For most of the time, Knutsson was paid a fixed price for the work he performed but occasionally he was paid a daily rate of 1:16 d.k.m. His wages were paid both in money and in kinds.

Concerning his private life, the source material tells us that Knutsson lived with his wife and children in the innkeeper's cottage north of the castle. His wife took on the job as innkeeper, replacing the old lady that managed it until 1654. Knutsson and his wife had at least two children of whom two died over the course of four years. Their cottage shared entranced with the inn and consisted of one room with at least one window. In addition to the cottage, Knutsson and his wife had a pig stie and a sheep house where they raised sheep and pigs. Unlike some of the other workers employed at Skokloster, they had a separate household where they prepared their own meals. They ate rye products – most likely bread – beef, pork, and lamb or mutton meat, as well as pike, and they most likely brewed beer that they drank with their meals.

3. Part two – Tracing Knutsson through the Skokloster tool collection

This part of the investigation sets out from the idea of hand planes as sources of information about craft practices, connecting to the understanding of objects as sources of information about more than the objects themselves, central in Material Culture Studies (Nyström et al., 2021). According to Renmælmo, hand planes have a double nature as source material as they are both *produced* and *producing* objects, meaning that they carry information about *how they are made* as well as *what they can make* (Jarefjäll et al., 2017). The produced and producing aspect of hand planes can also be understood in relation to the concept of *affordances* (Gibson, 1979). As mentioned in the theory chapter (1.5.1), tools for woodworking are shaped in accordance with the affordances of different species of *wood, steel,* and *the human body*. The design of hand planes; the angle the iron is set in the body, the geometry of the edge and the wedge, the shape of the throat where the shavings are emitted, and the design of the plane body and handles are all fundamentally determined by the inherent affordances of these elements. This is how the *produced* aspect of hand planes relates to the concept of affordances. Individual and cultural differences in plane design of course vary within the limitations of these affordances.

The affordances offered to the user by the *producing* hand plane are determined by the intentions of the maker of the plane. The most fundamental affordance of a hand plane is perhaps its ability to remove a thin shaving of wood from the material processed with it parallel to the sole of the plane, and in the shape of the edge of the iron. Apart from this basic property, hand planes come in a wide variety of designs and intended uses, with different affordances. To distinguish the different uses, hand planes are divided into different groups based on where and when in the process of manufacture they are used. A common division is done between *bench planes* and *moulding planes*, where planes from the former group are intended for the processing of roughly shaped material into flat, square pieces. Planes from the latter group are intended for the shaping of material into mouldings, i.e. decorative profiles – simple of complex – that run along the length of piece. Moulding planes can, in turn, be divided into sub-groups based on their affordances. A division is usually made between less and more form-specific planes (Bickford, 2012; Boonstra & Bruijs, 2022), where the most form-specific are the *dedicated moulding planes* (Figure 12.), designed to only produce one shape. These come in a variety of more or less complex shapes and usually have a *fence* guiding the plane against the workpiece. Many dedicated moulding planes also have a *depth stop,* specifying a consistent depth for the profile in the material. A less form-specific category of moulding planes are the *hollows and rounds* (Figure 13.), shaped to produce convex or concave curves. These usually do not have either fence or depth stop, allowing for a versatile application in the shaping of mouldings.

Based on Boonstra and Bruijs previous study of the 17 Dutch dedicated moulding planes in the Skokloster tool collection as a link to specific mouldings in historical Dutch late renaissance and early baroque interior woodwork (Boonstra & Bruijs, 2022), this study focuses on the possible link between dedicated moulding planes at Skokloster and the interior woodwork made by the joiner Daniel Knutsson. The possibility of Knutsson as the maker of some of the planes is also investigated. The Dutch planes are, however, not considered in this study, as these planes were the private property of Carl Gustaf Wrangel and most likely not used by the craftsmen building the castle. The

study is instead focused on the other planes in the Skokloster tool collection. The affordances of the dedicated moulding planes – their form-specific nature - are their central feature as source material in this investigation, as it allows for reliable profile-matching between the planes and the woodwork. The fact that dedicated moulding planes usually were built by the joiners themselves, and therefore had a unique profile strengthens the reliability of profile-matches between specific planes and mouldings. Such a reliable match would not be possible with any other types of planes, as they can produce a variety of shapes. A convex hollow and round plane meant to produce a certain radius can for example be applied to a convex moulding with a narrower radius than the plane, creating a slightly faceted, rounded surface, making the profile-matching between plane and moulding uncertain.

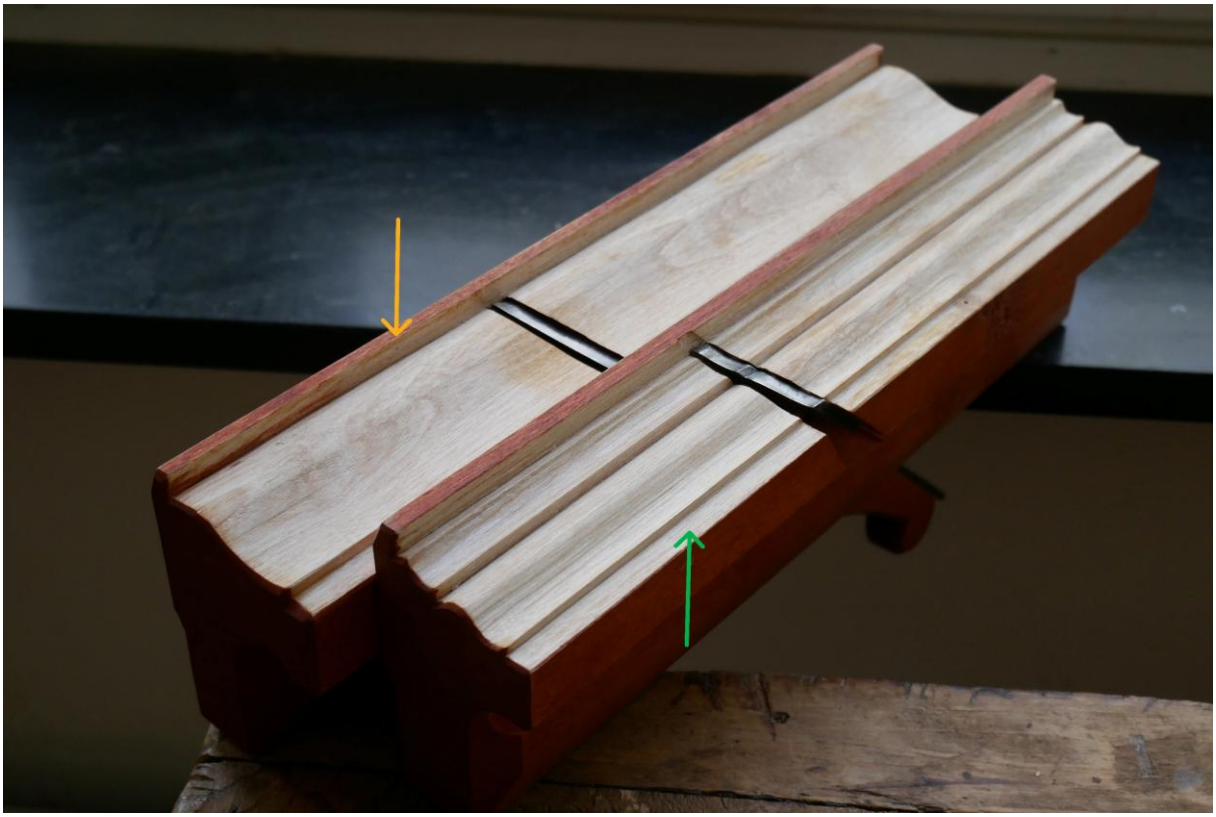


Figure 12. Dedicated moulding planes made by the author. *Fence* marked with yellow arrow and *depth stop* marked with green arrow. See also Figure 22. Photograph by the author.

Figure 13. English hollows and rounds from the Department of conservation's wood workshop at the campus in Mariestad. Three concave and three convex. Photograph by the author.

3.1 The Skokloster tool collection

At Skokloster Castle, there are today around 50 000 museum objects, many of which originate from the original inventory of Carl Gustaf Wrangel (Rangström et al., 1980). During the 18th and 19th centuries, further collections were added to Wrangel´s from the Brahe, Bielke, and Oxenstierna families through marriage and inheritance. The collections consist of a wide range of categories, including paintings, books, weapons and armor, maps, furniture, woven tapestries and other textiles, scientific and mechanical instruments, and tools for woodworking.

The tool collection consists of a few distinguishable parts with different origins and purposes. Many of the tools are wood-turning tools, either from Wrangel´s personal workshop – originally on the fourth floor – or from the later added collections of wood-turning equipment originating from Nils Brahe or Gabriel Oxenstierna (Knutsson & Kylsberg, 2000; Rangström et al., 1980). Wood-turning was, during the 17th and 18th centuries, considered a suitable noble past-time activity and many noble men – including Wrangel – where avid and skilled turners (Andrén, 1948). The lathes, especially the ornamental lathes, have been the subject of previous craft research (Erckrath, 2022; Erckrath et al., 2016). In addition to the wood-turning equipment, a large collection of joinery and carpentry tools are part of the museum collections at Skokloster Castle. Most of the common categories of tools typical for these trades are found within the collection, such as different kinds of saws, drills and boring equipment, measuring and marking tools, axes, chisels and gouges, as well as 123 hand planes of different types. The origin of some of these tools are well documented through letters and bills in the Skokloster archives (Knutsson, 1986; Knutsson & Kylsberg, 2000).

3.2 The Dutch planes

A significant part of the tool collection is of Dutch origin. In 1664, Wrangel ordered a set of woodworking tools from the Dutch tool maker Jan Arendsz Wissing in Amsterdam through the Swedish agent Peter Trotzig. Wrangel appears to have seen a collection of modern Dutch woodworking tools in the possession of his colleague Claes Stiernsköld and decided to purchase a similar kit (Knutsson & Kylsberg, 2000). Included in this shipping of tools there were at least 54 hand planes for different purposes (Figure 14.). Several bench planes are included but most of the planes are moulding planes – both in the form of dedicated moulding planes and hollows and rounds. As the planes from this part of the tool collection are not the subject of the investigation, distinguishing the Dutch planes from the rest of the collection is an important part of the examination.

Figure 14. The majority of the Dutch hand planes at Skokloster. Moulding planes in the middle, and bench planes in the front and back of the picture. A *gerfschaaf* plane in the center front of the picture. Photograph by the author.

The Dutch plane making tradition involves several typical design features, facilitating the distinction between the planes of Dutch origin and the other planes at Skokloster. Apart from obvious distinctive features, such as the maker's stamps of Jan Arendsz Wissing (I:A) and two other Dutch tool makers, possibly contracted by Wissing (H:C and H:H) (Boonstra & Bruijs, 2022) other characteristics can be noted. The Dutch planes are all made from red beech, easily identified through its reddish color and dark, short medullary rays appearing as spots on the surface of the wood. The moulding planes (Figure 15.) have wedges with a characteristic angular shape with a square top corner. The side escapement for the emitting of the shavings is small and rounded. The plane bodies have two different designs at the front: one straight with chamfers, and one with a depression creating a rudimentary handle, and chamfers. In both cases the back of the plane body is rounded with chamfers. The Dutch bench planes, both the smaller smoothing planes called *gerfschaaf* (Figure

14.) (Goodman, 1964) and the longer jointer planes (Figure 16.) have richly decorated throats and handles. The carvings, both on the horns and the throats, usually feature scroll motifs. Sometimes the planes have the year they were made carved at the front of the throat. The wedges are rounder with a flower or sun symbol carved on the front.

Figure 15. One of the 17 Dutch dedicated moulding planes at Skokloster. Featuring the typical Dutch wedge-shape and a depression at the front of the plane body. Adapted from Statens historiska museer, by J. Mohr, 2013, https://samlingar.shm.se/object/ECB930AD-05AF-401C-9485-5C9E2F00FA1C (CC BY 4.0)

Figure 16. One of the Dutch bench planes at Skokloster featuring elaborately decorated horns. Adapted from Statens historiska museer, by J. Mohr, 2013, https://samlingar.shm.se/object/C23122CF-7AE5-4932-9A5B-29DD963E10BD (CC BY 4.0)

3.3 The other planes and possible attribution to Daniel Knutsson

Apart from the Arendsz planes, another 69 hand planes are included in the tool collection. These remaining planes are not a homogenous group like the Dutch planes but consists of planes of different age and origin. Some of the planes from this group have earlier been attributed to the construction of the castle. Professor Johan Knutsson have found profile-matches in the interior woodwork for some of the dedicated moulding planes (Knutsson, 1986). One specific plane (5240) has been found to match mouldings on the doors in the main entrance to the castle as well as on the mantelpiece in the room Leyden (3: P), both of which are made by Daniel Knutsson (Andrén, 1948).

To further explore the potential connection between Daniel Knutsson's activities and the hand planes in the tool collection, the planes from the heterogeneous group of 69 non-Dutch planes were categorized in two stages. First, ten planes with features dating them to after the construction of the castle were sorted out. Four of these planes had dated inscriptions from the 18th century on the plane bodies, the remaining six had characteristic design features belonging to 19th century plane making traditions, such as double iron, steep front of the throat, or asymmetric handle (Figure 17.). According to Hugstmyr, a significant shift in hand plane design happened during the first part of the 19th century (Hugstmyr, 2008), during which the features mentioned above emerged. After having sorted out the ten more recent planes, 59 planes remained.

The remaining group of planes included bench planes, some special-purpose planes with unknown functions, hollows and rounds, and dedicated moulding planes. Within this group of 59 planes, a sub-group of 32 planes with different purposes (all the above except bench planes) but similar design features could be identified. The 32 planes were all built out of some kind of hard fruitwood, possibly pear, and featured a small decoration in the form of a cross with a tilted crossbar, and in some cases a small scallop towards the wedge, on the top of the plane body (Figure 18.). These planes, especially the hollows and rounds and the dedicated moulding planes, had a consistent type of chamfering on the plane body and all of them had irons stamped with a small crown. The hollows and rounds and the dedicated moulding planes were built with the top right side of the plane as a glued-on piece, allowing the bed of the iron and the wedge to be sawed out from the side instead of morticed through from the top before the piece was glued in place, securing the iron and the wedge. Two of the planes (5244 and 5245) in this group had the year 1661 carved into the body of the plane. The earlier mentioned dedicated moulding plane (5240) with identified profile-matches with two of the pieces made by Daniel Knutsson was part of this group, making the group of special interest.

After the identification of the 32 planes with similar features, 27 planes with varying features and functions, but possible connection to the construction of the castle, remained. From both groups, the 32-plane group and the 27-plane group, the dedicated moulding planes – all in all 25 planes - were sorted out. These 25 planes were judged as form-specific enough to be able to make reliable comparisons between planes and woodwork. To be able to compare the shapes of these planes with the interior woodwork made by Daniel Knutsson, templates were made based on the shape of

Figure 17. One of the 19th century planes from the Skokloster tool collection. Dated based on design features. Adapted from Statens historiska museer, by J. Mohr, 2013, https://samlingar.shm.se/object/1FEE6954-8FD9-44FD-A98A-F6DA5B07D395 (CC BY 4.0)

Figure 18. Top side of five of the planes from the identified group of 32 planes with similar features, all featuring a cross with a tilted crossbar and a small scallop towards the wedge. Photograph by the author.

the sole of the plane. Ideally, a template of the shape a dedicated moulding plane makes on a workpiece would be based on the shape of the iron and not the sole, as the iron defines the shape of the moulding while the sole only acts as a guide for the iron. On a worn or unprecise moulding plane, the shape of the sole can be slightly different than that of the iron. The shape of the iron is, however, hard to gauge as it sits in the plane at an angle. Therefore, the templates in this study are made as copies of the soles of the planes, and the risk of impreciseness in this method is taken into consideration when profile-matching the mouldings in the interior woodwork.

The soles were gauged with a profile gauge with 13 points per centimeter and transferred to thin cardboard (Figure 19.). The cardboard was marked with the inventory number of the plane and cut into templates with scissors and scalpel. The finished templates were hung on strings for easy access during the profile-matching of mouldings.

Figure 19. Profile-gauging of the dedicated moulding planes. Photograph by the author.

3.4 Profile-matching the mouldings

In preparation for the field work at Skokloster Castle, a list of pieces likely to be possible to profile-match with templates based on dedicated moulding planes was composed (Table 2.), based on the products made by Daniel Knutssonas described by Andrén (Andrén, 1948). The list included every known interior piece with a clear attribution to Knutsson, as well as the exterior doors in the main entrance, also made by Knutsson.

Table 2. List of pieces made by Knutsson possible for profile-matching

Type of piece	***Room***
Mantlepiece	3: P Leyden
Mantlepiece	3: A Geneve
Mantlepiece	2: V The Grey Room
Mantlepiece	2: A The Kings Hall
Mantlepiece	2: E The Red Room
Mantlepiece	2: M The Yellow Drawing Room
Windowsills	1: P The Silver Chamber
Cellar doors	Arcade on the ground floor
Door	2: C The Countess Bedroom
Main entrance doors	1: A Eastern Entrance Hall
Paneling and workbenches	4: R The Wrangel Wood Workshop

Note: The number : letter codes of the names refer to Andrén's plans of the castle. Number indicates floor and letter name. See figure 11.

Figure 20. The author profile-matching mouldings on the upper part on the mantlepiece in room 3: A Geneve. Photograph by Lotta Lindley.

Figure 21. Match found between the plane 5243 and a moulding in room 2: V The Grey Room. Photograph by the author.

During the fieldwork (Figures 20. & 21.), some of the planned profile-matchings could not be executed for different reasons. The door in room 2: C The Countess Bedroom was blocked from both sides, the windowsills in room 1: P The Silver Chamber turned out to have been shifted at some point and the work benches in 4: R The Wrangel Wood Workshop had been removed, possibly when it was converted into an armory in the 19th century (Andrén, 1948) or earlier.

In addition to the planned profile-matchings, several mouldings on different pieces without attribution to Daniel Knutsson were examined with the profile templates (Table 3.). These impromptu profile-matchings were initiated by the observation of a profile similar to one of the templates during the planned examinations. The results from these profile-matchings raise questions about how tools were shared between the joiners and carpenters during the construction of the castle.

Table 3. Additional products without attribution to Daniel Knutsson examined

Type of piece	***Room***
Mantlepiece	2: X The Counts Bedroom
Door	1: P The Silver Chamber
Door	4: R The Wrangel Wood Workshop
Window frame	4: R The Wrangel Wood Workshop
Door frame	2: V The Grey Room
Door	2: V The Grey Room
Crown moulding on wainscoting	2: V The Grey Room
Picture frame	Staircase

Note: The number : letter codes of the names refer to Andrén's plans of the castle. Number indicates floor and letter name. See figure 11.

3.5 Results

The results from the profile-matches of the different pieces are accounted for in the following two tables of planned (Table 4.) and unplanned (Table 5.) examinations. The matching profiles, as well as any number of additional profiles with no matches found on each piece are noted. Additional profiles were registered if they were plausibly made with dedicated moulding planes. Many of the pieces had larger profiles with faceted surfaces, indicating that they were produced with less form-specific planes such as hollows and rounds, and were therefore not registered.

Table 4. Profile-matches of pieces made by Daniel Knutsson

Room	***Object***	***Year of construction***	***Profiles found***	***Additional profiles***	***Remarks***
3: P Leyden	Mantlepiece	1676	5240, 5247, 5246	1	
3: A Geneve	Mantlepiece	1671	5240, 5246	1	
2: V The Grey Room	Mantlepiece	1662-1663	5240, 5235	-	
2: A The Kings Hall	Mantlepiece	1662-1663	5240, 5245, 5237	-	
2: E The Red Room	Mantlepiece	-	5241	3	
2: M The Yellow Drawing Room	Mantlepiece	-	5240, 5261, 5241	1	
1: P The Silver Chamber	Windowsills	1665	-	-	Shifted at some point
Arcade ground floor	Cellar doors	1666	-	1	One intact, the other shifted
2: C The Countess Bedroom	Door	1665	-	-	No access
1: A Eastern Entrance Hall	Doors	1671	5240	0	
4: R The Wrangel Wood Workshop	Paneling	1673	0	0	No mouldings, just flat boards

Note: The number : letter codes of the names refer to Andrén's plans of the castle. Number indicates floor and letter name. See figure 11. *Additional profiles* refer to profiles found on the pieces without a match among the templates.

Table 5. Unplanned examinations of mouldings

Room	***Object***	***Year of construction***	***Profiles found***	***Additional profiles***	***Remarks***
2: X The Counts Bedroom	Mantlepiece	1671	5240, 5237	-	
1: P The Silver Chamber	Door	-	5246	-	This door and the door to 4: R are the same type
4: R The Wrangel Wood Workshop	Door	-	5246	-	See above
4: R The Wrangel Wood Workshop	Window frame	-	5240, 5243, 5268	-	
2: V The Grey Room	Door frames	-	5235, 5241	-	

2: V The Grey Room	Door	-	5243	-	
2: V The Grey Room	Crown moulding on wainscoting	-	5235	-	
Staircase	Picture frame	-	5241	-	

Note: The number : letter codes of the names refer to Andrén's plans of the castle. Number indicates floor and letter name. See figure 11. *Additional profiles* refer to profiles found on the pieces without a match among the templates.

The profile-matching of mouldings on the different pieces resulted in matches for 10 of the 25 dedicated moulding planes (Table 6. & Figure 22.). Of these 10 profiles, eight were found on pieces made by Daniel Knutsson. The other two profiles (5243 and 5268) were found during the impromptu examinations of other pieces. Eight of the dedicated moulding planes to which matching mouldings were found belong to the group of 32 planes with similar features described earlier. The table below shows the spread of the different profiles among the planes and pieces.

Table 6. Profile-matches between dedicated moulding planes and mouldings

Inv. Nr.	***Number of finds***	***Part of the group of 32 planes***	***Found on object made by DK***
5235	3	√	√
5237	2	√	√
5240	8	√	√
5241	4	√	√
5243	2	√	No
5245	1	√	√
5246	4	√	√
5247	1	√	√
5261	1	No	√
5268	1	No	No

As evident by the results of the investigation, Daniel Knutsson used at least eight of the 25 dedicated moulding planes preserved in the Skokloster tool collection, dating them to the construction of the castle. Seven of these dedicated moulding planes are part of the collection of 32 planes with similar features. The eighth one (5261) bears some similar features to the other seven, like the construction with a glued-on piece on the top right side, but it is made of oak instead of fruitwood and does not have the cross-decoration or the crown-stamp on the iron. The plane numbered 5241 stood out in the results, with eight matches, double the amount of any of the other planes. It was apparently an appreciated and useful profile.

The results raise questions about how the joiners' workshop at Skokloster was equipped and what the professional customs for tool-sharing among the joiners looked like. Through the profile-matching of the planes and the woodwork, a few patterns emerged, offering insights into what some of the dedicated moulding planes—originally part of the set of 32 but now lost—might have looked like. The examinations revealed three possible series of planes, two of whom now show clear signs of being incomplete. These series consist of planes producing highly similar shapes but in different

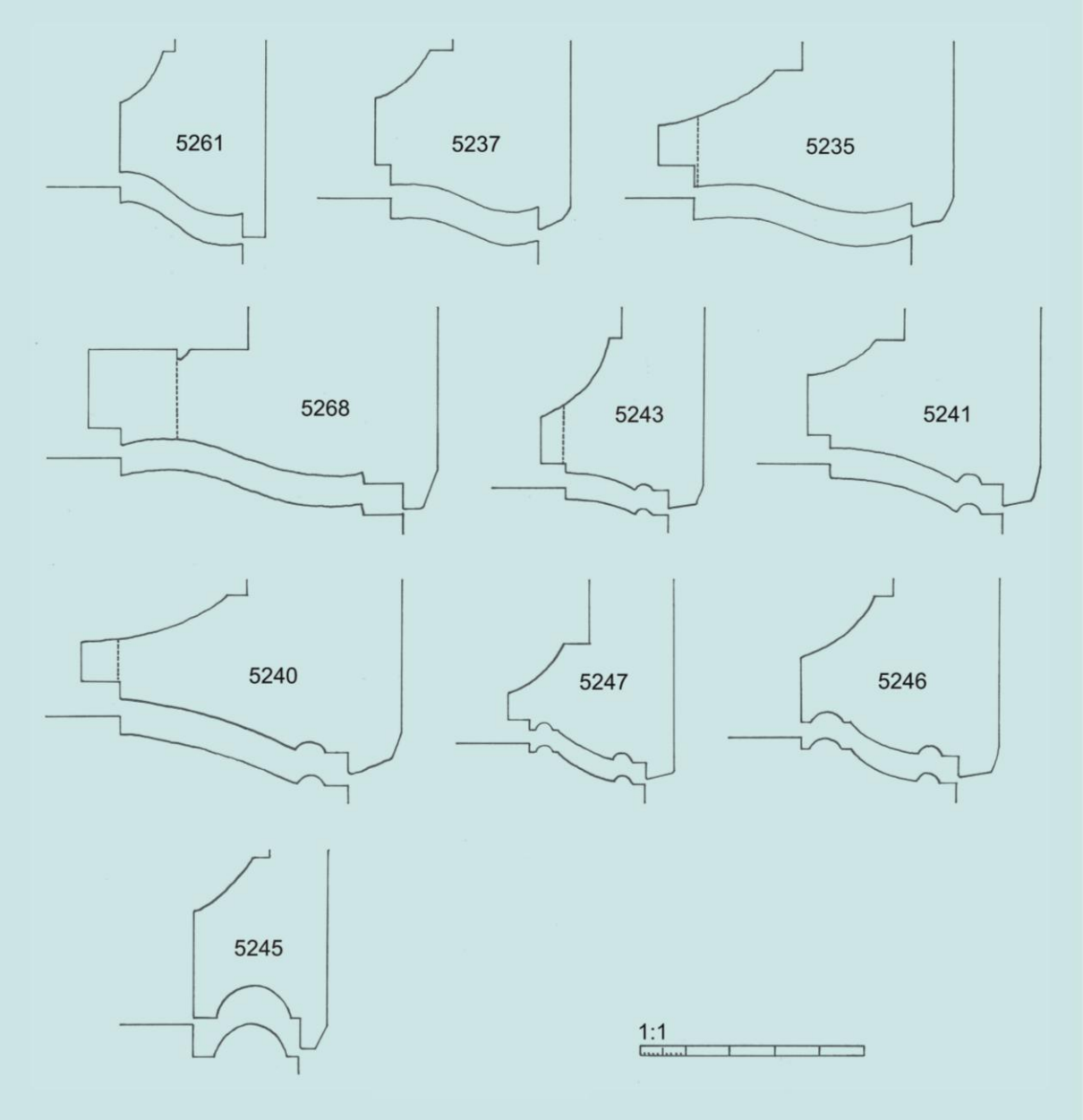


Figure 22. The ten profile-matches between dedicated moulding planes and mouldings on the pieces examined in the investigation. Illustration by the author.

sizes. The first series consists of the planes 5246 and 5247, both with an astragal and cove with astragal-profile but in two different sizes. Additional planes with the same profile, but larger or smaller than these two, may have been part of the original set, although it is also possible that these were the only ones. The second series consist of the planes 5240, 5241, 5242, 5257, and 5243. These are all in the shape of an ovolo with astragal but in falling sizes from 51 millimeters to 22,5 millimeters in width. Matches for three of these planes (5240, 5241 and 5243) were found, while no matches were found for the other two (5242 and 5257). What did emerge during the examinations, however, was a moulding with the same profile as these five, but with a width that did not match any of them; instead, it was found to fall between the widths of 5240 and 5241. This suggests that the series of five ovolo with astragal-planes originally consisted of six or possibly even more planes. The last plane that likely has been part of a series is the plane 5236, an ogee with astragal. During the

profile-matching on the mantlepiece in room 2: A The Kings Hall, a moulding matching in shape but not in size to 5236 was found (Figure 23.), indicating that there have been at least two planes with this profile in different sizes.

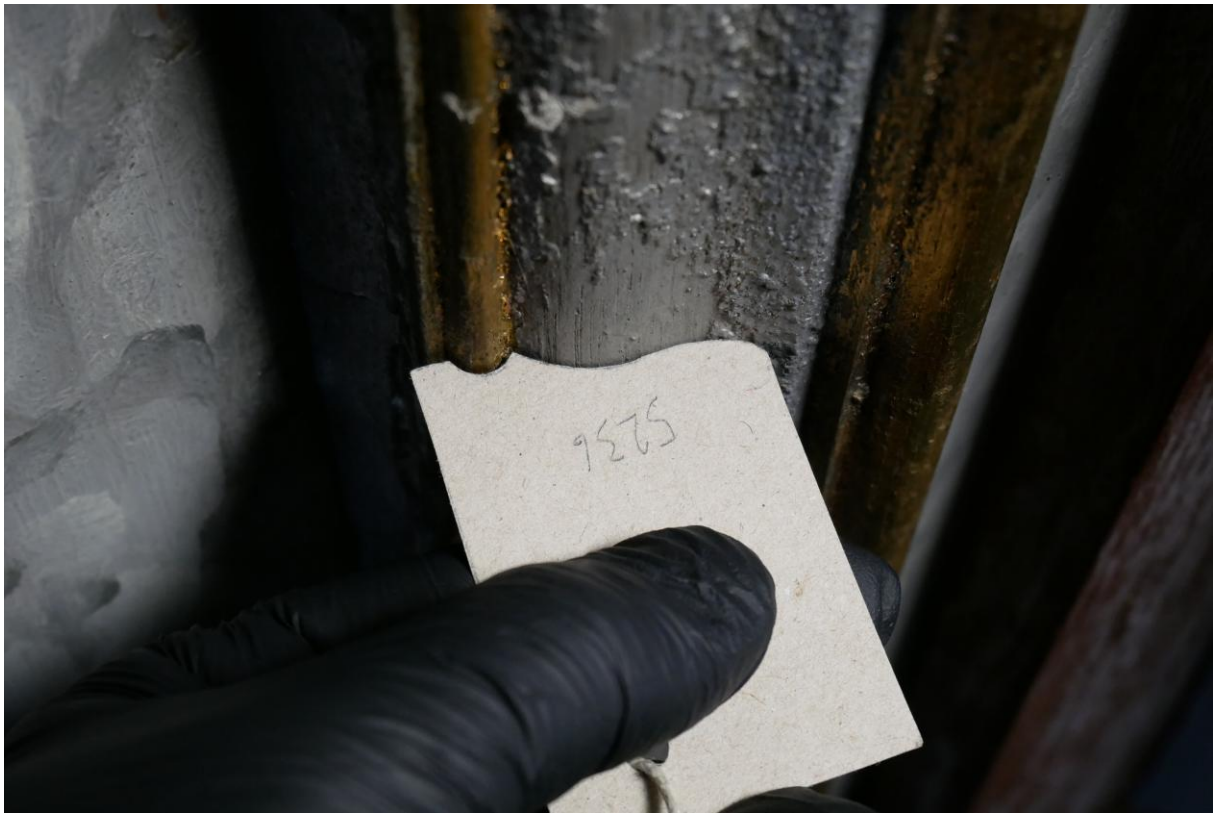


Figure 23. Examination of a moulding on the mantlepiece in room 2: A The Kings Hall. The plane 5236 matches in shape but not in size, suggesting the existence of a series of at least two planes with this ogee and astragal-profile in different sizes. Photograph by the author.

3.5 Summary

This investigation set out to explore possible links between some of the dedicated moulding planes in the Skokloster tool collection and the interior woodwork made by Daniel Knutsson. Through profile-matching with templates gauged from the soles of 25 dedicated moulding planes, matches were found for ten of them—eight on pieces made by Knutsson, and two on other parts of the interior. Seven of the matched planes belong to a group of 32 planes with shared features, suggesting a strong connection between this group and Knutssons practice. The results provide insights into how the joiners' workshop at Skokloster may have been equipped and points to the existence of now missing dedicated moulding planes, as several matched profiles appear to have been part of plane series with similar profiles in different sizes. The results from this investigation are discussed further in chapter 5. *Discussion and conclusions*.

4. Part three – Knutsson and the Leyden mantlepiece

The third part of the thesis is a craft research deep dive into one of the parts of the interior of Skokloster Castle made by Daniel Knutsson (Andrén, 1948); the mantlepiece in the room called Leyden on the third floor (Figure 25.). This piece, as well as the 20 other mantlepieces, along with the rest of the interior and exterior of the castle has numerous times been studied from traditional art-historical and architecture-historical perspectives (Andrén, 1948; Bergström & Turander, 2004; Hidemark & Stavenow-Hidemark, 1995; Rangström et al., 1980). In these studies, the focus has been on the stylistic influences behind the designs of different parts of the castle, the architects Jean de la Vallée and Nicodemus Tessin the Elder and their design choices, as well as the decorative motifs found on carvings, plasterwork and tapestries.

The creation of the 21 mantlepieces in the castle have been the subject of analysis by Andrén (Andrén, 1948), who concludes that 12 are made by the master wood carver Marcus Hebel, 6 by the wood carver Berendt Gnau, and three by Daniel Knutsson. The three mantlepieces that Andrén attributes to Knutsson lack the carved ornaments made by Hebel and Gnau, these are instead decorated with applied mouldings. Andrén goes on to mention that the joiners of course built the wooden frameworks for all the mantlepieces, this was not the work of the wood carvers. Despite this, he still describes the ornamented mantlepieces as made by the wood carvers and not the joiners, even though the work effort involved in carving the ornaments likely would have been less than that for the construction of the frameworks. According to bills, Hebel was paid 80 d.k.m. for more complex sets of ornaments for mantlepieces and 44 d.k.m. for less complex, while Knutsson was paid 100 d.k.m. for each mantlepiece (Andrén, 1948).

It is evident that Andréns focus on the mantlepieces concerns the ornaments and the influences of the design, while the construction of the framework of them – the actual mantlepiece, one could argue – is of little interest. In his analysis of them, he portrays the drawings that acted as models for the mantlepieces and proceeds to describe the likenesses and differences between the original drawings and the Skokloster mantlepieces. The drawings come from the book *Livre d'Architecture d'Autels et de Cheminées* by the French architect Jean Barbet, published in 1633 (Barbet, 1633). The mantlepiece in Leyden is according to Andrén (1948) based on Barbets plate 17 (Figure 24.), but slightly simplified and with taller proportions. This adaptation of Barbets design raises questions about who was responsible for the design of the mantlepieces and how the artisanal collaboration between the different tradespeople involved looked.

Andrén describes how the engineer Hendrich Anundhsson led the building activities and design choices on site, often through a rich correspondence with Wrangel. In 1657, Anundhsson sends two of the plates from Barbets book to Wrangel, as design suggestions for the mantlepieces. The year after, Marcus Hebel delivers ornaments for 12 mantlepieces based on Barbets designs. In 1662, the first mantlepieces are constructed with Hebel's ornaments by Knutsson (Andrén, 1948). Some kind of adaptions between Barbets drawings and the actual designs of the mantlepieces were likely made between 1657 – when Anundhsson design suggestions are accepted by Wrangel and Hebel contracted for the ornaments – and 1665 when Anundhsson dies. These adaptations could have

been made by Anundhsson himself, or in collaboration with Hebel and/or Knutsson. There are of course still unanswered questions concerning this. Were there drawings made for, or by, Hebel and Knutsson or were they granted some artistic freedom in their interpretation of Barbet? What knowledge did Anundhsson possess concerning joinery and wood carving, did he understand the inherent limitations of materials and technology in these trades or were the trade specific knowledge of Knutsson and Hebel necessary for the design process?

Regarding Knutssons role in the design and construction process of the mantlepiece in Leyden, several questions could be raised. Did he have a copy of Barbets plate 17 at hand? If he had a drawing made by Anundhsson or himself, what measurement and level of detail did it have? The only other mantlepiece closely resembling the one in Leyden is the one Knutsson built in the room Geneve in 1671 (Andrén, 1948), six years after Anundhsson dies. Did Anundhsson and Knutsson have time to discuss the design of these mantlepieces before Anundhsson died? How much of the design and construction evident on the Leyden mantlepiece today are the results of Knutssons decision making? Did he choose which moulding plane to use where?

These questions are of course hard, or impossible, to answer through the accessible source material today. What could be stated, however, is that somewhere along the way between Barbets drawings and the finished mantlepiece, design is interpreted and translated into craft procedures, 2D motives are adopted to a 3D reality, and the affordances and limitations of pen and paper are adapted to the affordances and limitations of pine, oak, glue, nails, and woodworking technology. In the situation where Knutsson constructed the mantlepiece, he became the artist who, through his skill and craftsmanship , had to find practical solutions that took both *mind* and *matter* into consideration.

Andréns traditional art-historical analysis of the mantlepieces, with a focus on influences, motifs, and ideas, had no intention of investigating the interplay between design and craftsmanship . The following analysis of the mantlepiece in Leyden sets out to complement Andréns focus on *mind* with a focus on *matter*, with no intention of dichotomizing the two. Rather, it should be seen as a humble attempt to live up to Lehman's idea of an ideal analysis of art where all elements in its becoming are considered equally (Lehman, 2015).

The mantlepiece in Leyden is chosen as the object of analysis as it – unlike the other mantlepieces in the castle – never was painted, and to this day displays the surfaces left by Knutssons tools and hands. Another factor making this piece suitable for analysis is the open, or incomplete, right side of it, allowing for inspection of the inside and backsides of the construction. These factors combined open for the possibilities of an extensive craft research analysis of the mantlepiece, as they invite the researcher to conduct a close investigation of traces and clues. Through a forensic examination (Almevik, 2012) of the object, where seemingly insignificant traces and clues are documented and interpreted, the mantlepiece can be deconstructed, and the craft procedures behind the different parts can be interpreted. These interpretations of Knutssons work processes shed light on the choices he made along the way, and how he responded to the affordances and limitations of material and technology. In other words, his skill and craftsmanship .

Figure 24. Plate 17 from Jean Barbet's book *Livre d'Architecture d'Autels et de Cheminées* published in 1633. This illustration was likely the reference drawing for the design of the mantlepiece in Leyden. From *Livre d'Architecture d'Autels et de Cheminées* (Barbet, 1633), Public domain.

Figure 25. The mantlepiece in Leyden. Built by Daniel Knutsson in 1676 and never painted. Photograph by the author.

4.1 Deconstructing the material

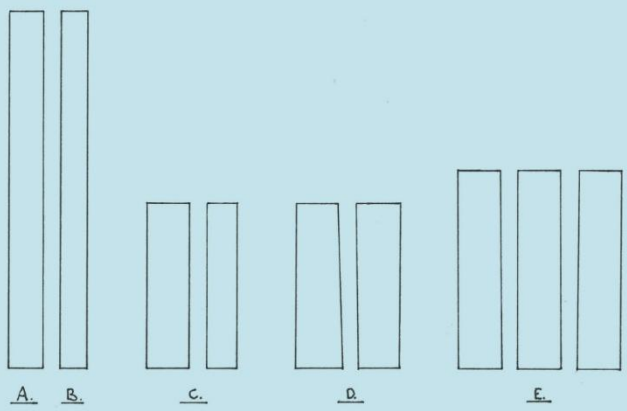
The mantlepiece consists of two types of constructively distinguishable wooden parts: the panels and the cornices. These elements act together as a decorative covering of the actual fireplace built from bricks and plaster. The decorative, wooden mantlepiece is divided into a lower and upper part. Each of these two parts would in theory consist of two side panels and a front panel. The mantlepiece in Leyden is, however, missing most of its right side, possibly due to the never-executed installation of a tiled stove right next to it, like in many other rooms. This incomplete side leaves the mantlepiece with the following elements: the lower part has a left and a front panel with a cornice on top, the upper part has a left panel, a front panel, and an incomplete right panel, as well as a top cornice. The lower part of the mantlepiece rests on the wooden floor, while the upper part stands on the cornice of the lower part. Both parts are fastened to both the wall and the inner construction of bricks through metal and wooden braces concealed on the inside of the panels and cornices.

The panels are made from frames constructed of approximately 30 mm thick boards, with the rails joined to the stiles using mortise and tenon joints, secured with wooden pins and possibly glue. The panels appear to have been built with the outside as a reference side, as the insides of the panels are left with rough surfaces and differing thicknesses. The infill panels do not appear to sit in a groove in the frames as an ordinary wainscoting-construction. The incomplete upper right panel displays no such grooves, and the upper front and left infill panels display a distinct warping that a tongue and groove construction would not allow for. The infill panels instead appear to be fastened with nails to the frames on these panels. The lower left infill panel has probably been shifted at some point (the wood has a somewhat different color than the rest of the mantlepiece and the wood quality is slightly poorer) and gives no visual clue as to how it is fastened in the frame. It is not unlikely that it is just glued in place. Onto the frames and infill panels, decorative moldings, carved ornaments, and other pieces are fastened with glue, nails and/or wooden pins.

All parts of the mantlepiece are made from pine, except for the visual parts of the lower cornice, which is made from oak. The wood, both the pine and the oak are of relatively good or very good quality. In this case, it means that the pine is slow-grown and has relatively straight grain and few knots, while the oak has very straight grain and almost no knots at all. Pine boards where either bought from the Hälsingland region in Sweden or imported from Wrangel's estate Björnö gård in Finland. These boards were sawn on water powered, sash-type sawmills, and were bought to Skokloster in three different qualities: single boards [enkla bräder], double boards [dubbla bräder], and planks [bottenbräder]. According to Andrén (1948), single boards would have been one inch thick with a narrower width, while double boards were thicker than an inch and wider in width. The planks would have been two inches or thicker. Most likely, all three qualities would have been delivered with the wanes intact, as this was the common practice of sawing at the time. High-quality oak was a common, standardized trade good, often referred to as *wagenschot* or in Swedish; *vagenskot*. It was brought to Skokloster from Mönsterås, Pomerania, and Riga and used for interior as well as exterior details (Andrén, 1948).

The following pages account for the forensic analysis of the different parts of the mantlepiece.

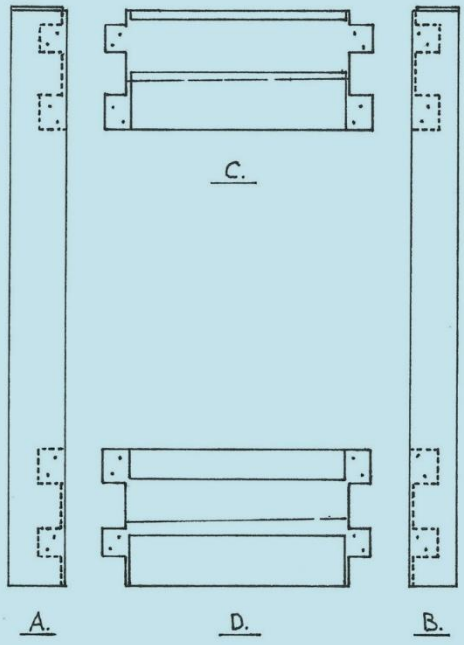
Lower left panel

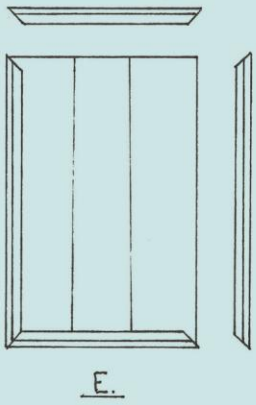


The frame of the lower left panel consists of stiles made from single boards (A. and B.) joined with wide rails made from two glue-together boards (C. and D.) The infill panel consists of three boards (E.).

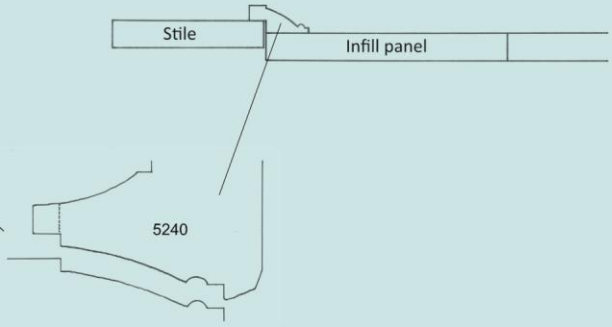
The rails have both tenons and tongues and the stiles have corresponding mortices and groves. The tongue and groove construction complements the mortice and tenon joints by preventing the full width of the rails from warping.

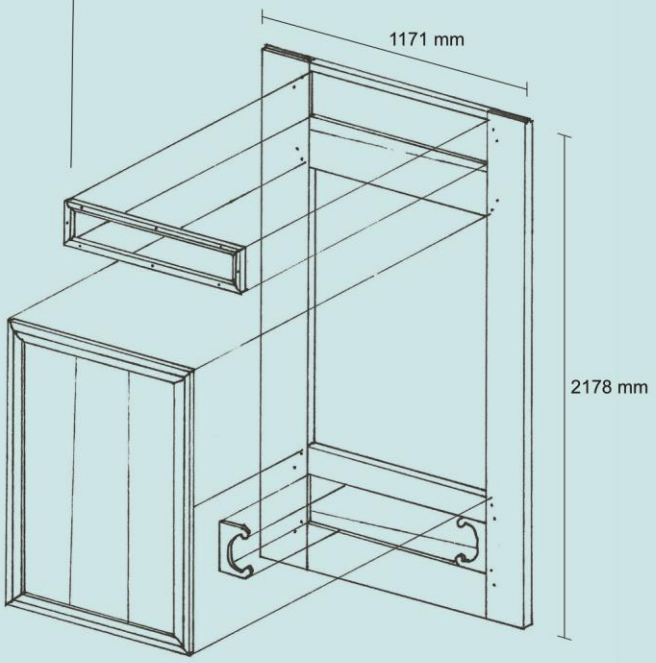
The top of the stiles has a tongue that fits in a groove in the underside of the cornice. This supplies the cornice with steering, making sure that it rests on the stiles of the lower panels, through which the weight of the cornice and the upper part of the mantlepiece is distributed towards the floor.





The infill panel consists of three boards glued together with an ovolo with astragal-moulding glued on along the edges. The moulding has a rabbet along the edges, allowing the infill panel to be lowered into the opening in the frame.

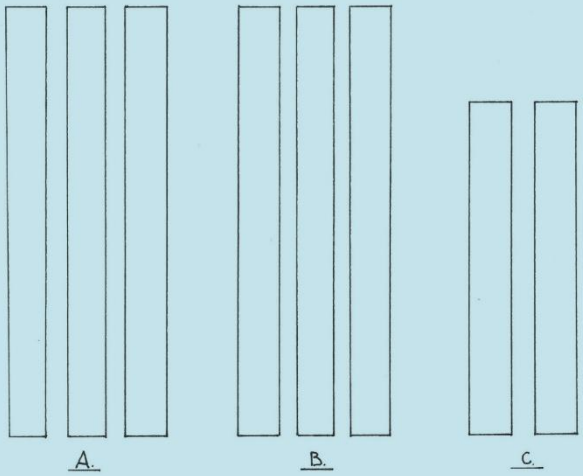


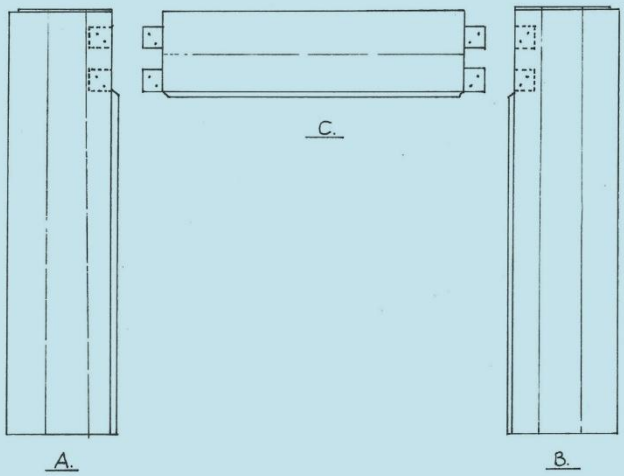


Both rails have a lower middle part, decorated to give the impression of an infill panel. The lower rail has two arches glued to the lower part, while the top has a frame of astragal and cove with astragal (5247) mouldings pinned and possibly glued to it.
These lower parts of the rails are most likely planed down after the two boards making up the stile were glued together.

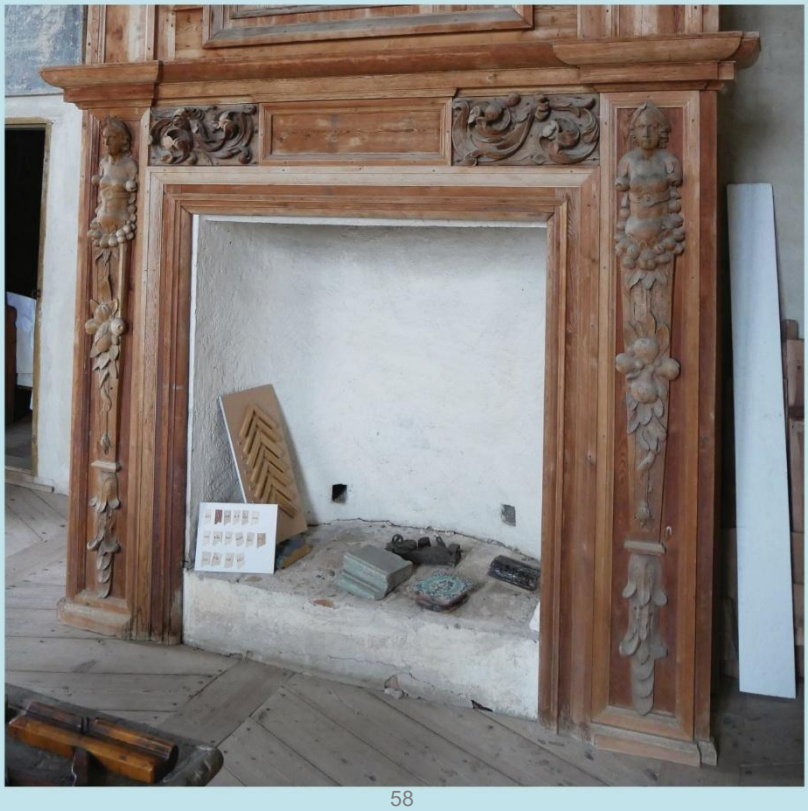
Lower front panel

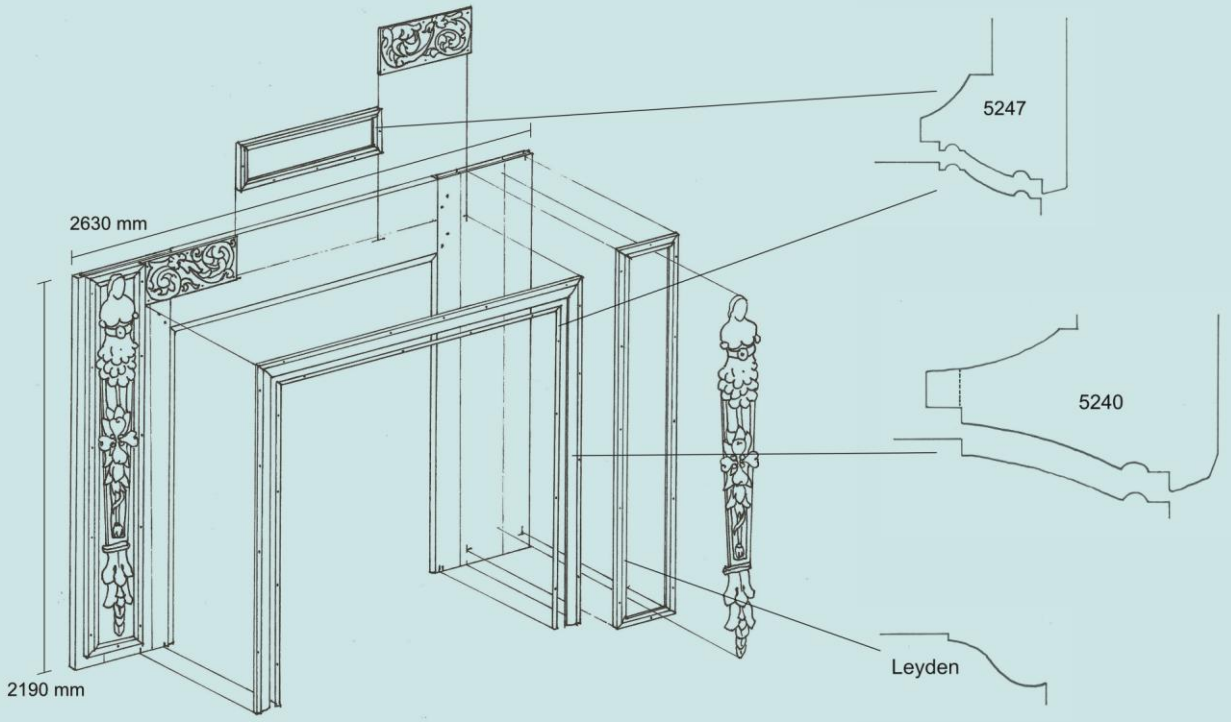
This panel frames the fireplace and consists of two wide stiles, each made up of three boards, joined with a top rail made from two boards.



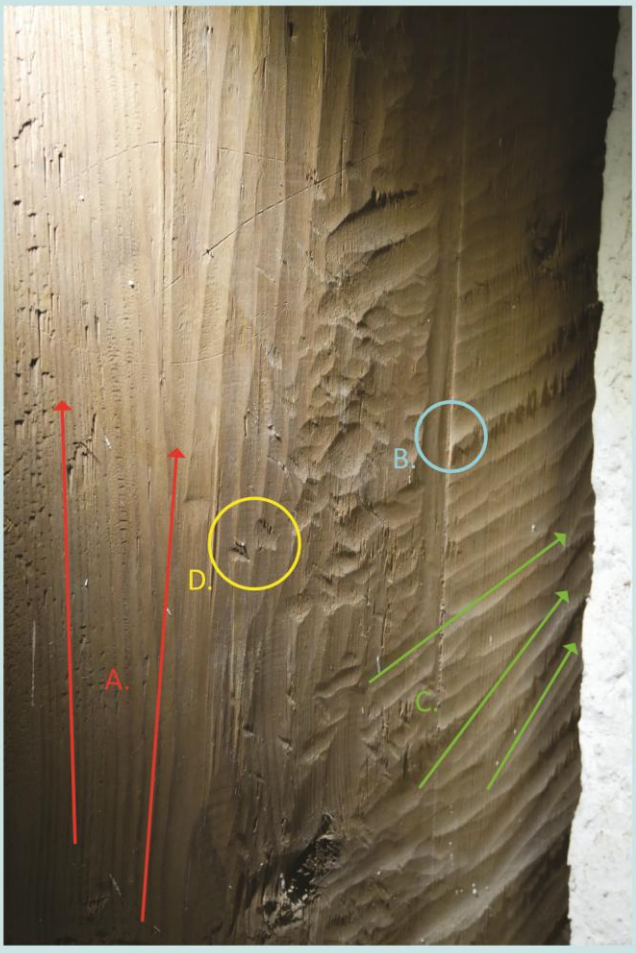


The stiles and rails are joined by double mortices and tenons but lack the complementing tongue and groove found on the left side of the mantlepiece. The top of the stiles does however have the tongue fitting into the groove on the cornice. The rail and the stiles are finished towards the fireplace with an ovolo-molding mitered in the corners.





Much of the front is covered with decorative moldings and carved ornaments. The stiles are decorated with herms carved in oak, framed by mouldings with an ogee profile. No matching moulding plane has been found for this ogee. These mouldings are fastened with nails concealed by wooden pins, this could be observed on the backside of the right stile, visible on the right side of the mantlepiece. The herms are fastened with nails from both the front and the back. Apart from the ogee-profile on the stiles and rail, two additional mouldings frame the fireplace. These are an astragal and cove with astragal (5247), and a wide ovolo with astragal (5240). The mouldings are fastened with glue and wooden pins. The rail is adorned with two acanthus ornaments in oak nailed to the rail, separated by a frame with the same astragal and cove with astragal moulding (5247) as around the fireplace, fastened with wooden pins.



Tool traces on the back of the right stile

The backside of the right stile, visible on the right side of the Mantlepiece, displays tool traces from Daniel Knutsson's production of the stile. The tool traces can be interpreted as part of the production process in the following way:

A. The three boards are planed flat and to the desired dimensions on three sides. The backsides are not planed down to a specific dimension, but left with scrub plane marks running along the grain. The direction of the tear out of the grain indicates that it was planed from the bottom of the stile.

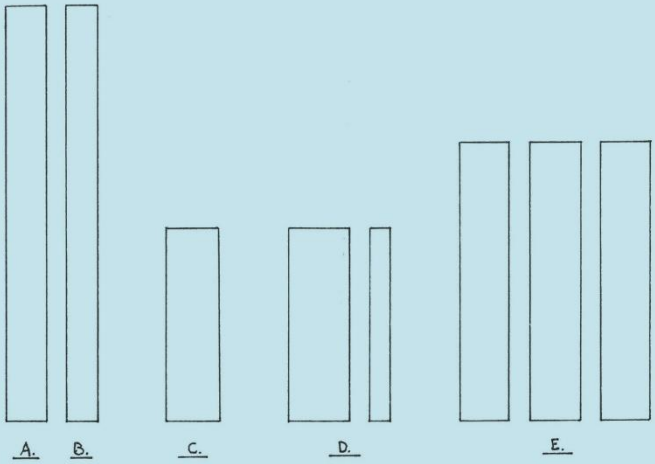
B. The boards are glued together, one of them is considerably thicker than the others.

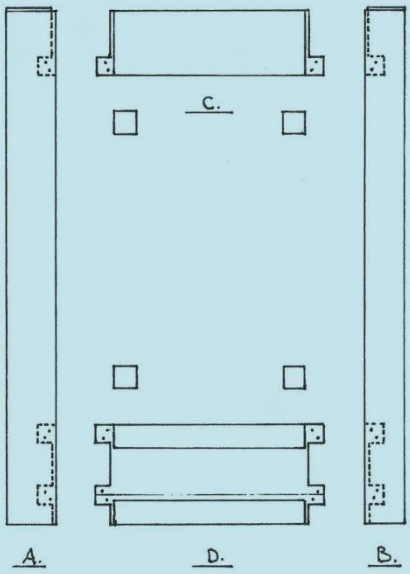
C. This board is roughly planed down, going diagonally across the grain with a scrub plane.

D. Marks left from the scrub plane catching and letting go of the wood, as it rides over the bumpy surface at the start of the strokes, indicates the direction of planing.

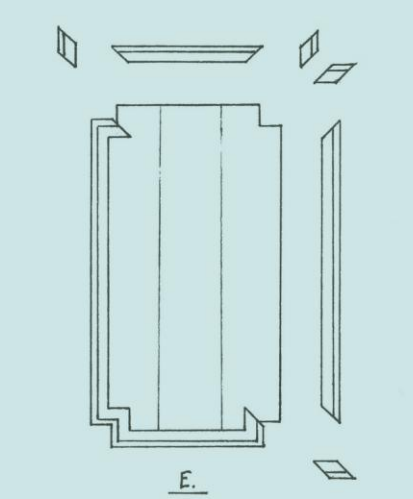
Upper left panel

The construction of the upper left panel closely resembles the lower left panel, but with some distinct differences. The lower rail (D.) is of the same type as on the lower panel while the upper rail (C.) consists of one flat board with only one tenon, most likely supported with a tongue, this is however not investigated due to difficulties reaching it during the examination. The stiles (A. And B.) are made from single boards and finished with a tongue on top corresponding with a groove in the top cornice. In the opening for the infill panel in the frame, small squares are glued in place to correspond to the notched corners of the infill panel.



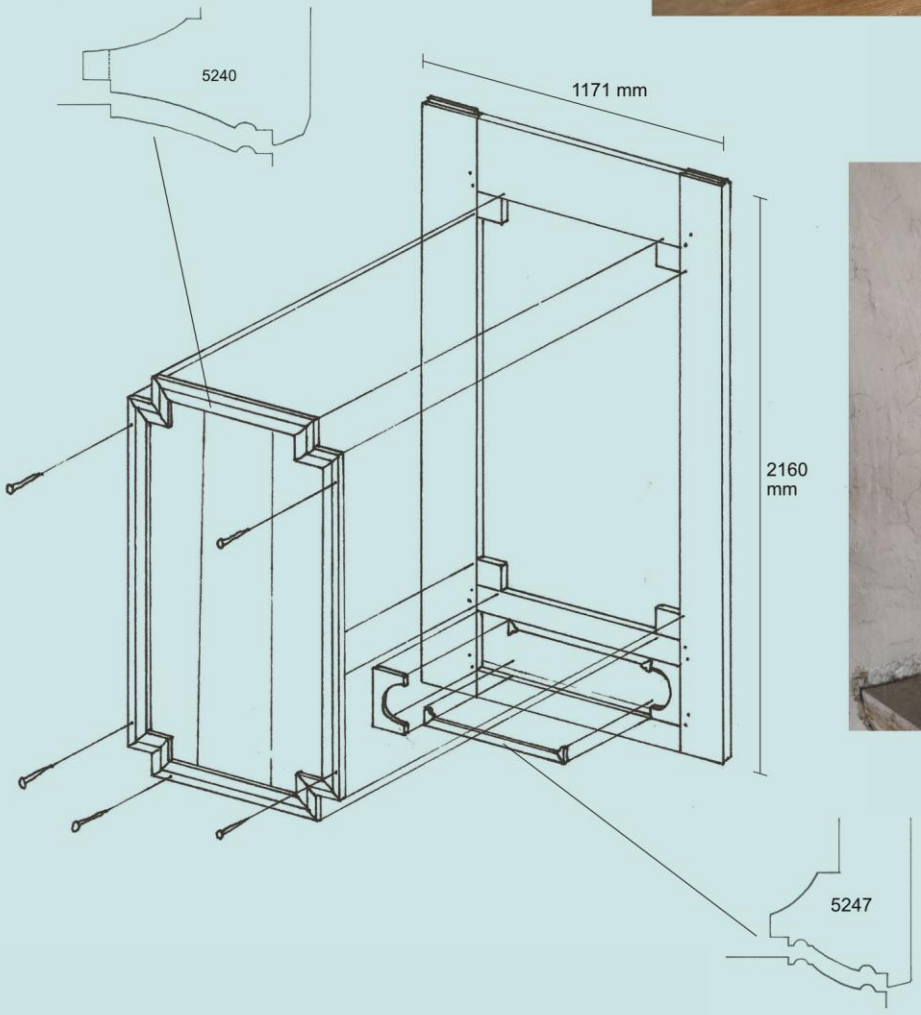


An incomplete panel of the same construction as the upper left panel is found on the upper right side of the mantlepiece. Here, the frame without the infill panel can be studied as it was never added on this side. This frame acts as a reference for the construction of the panels, and details such as the absence of a groove in the frame for the panel, the glued on square pieces in the corners, and the rough worked surfaces and differences in thickness between the different pieces of the frame can be studied.



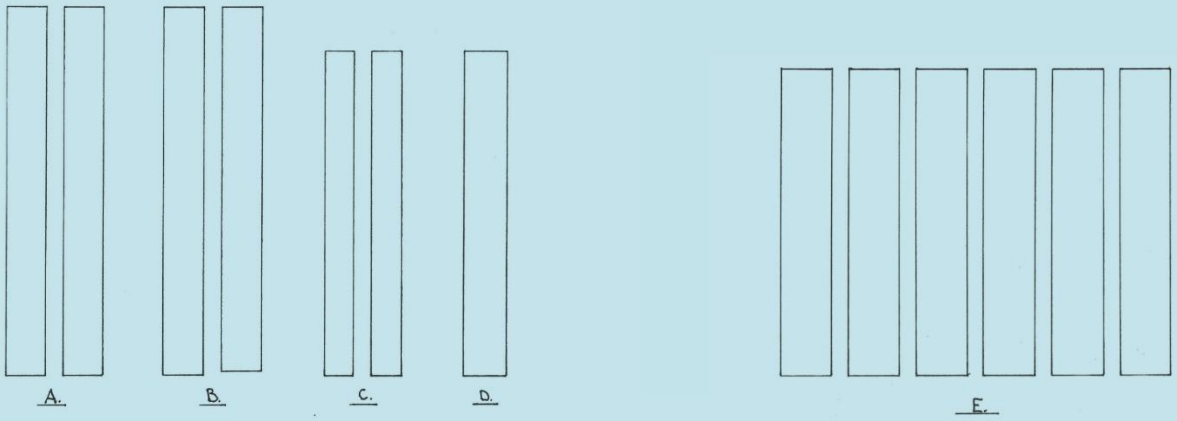
The infill (E.) panel is similar to the lower left but has notched corners where the ovolo with astragal moulding (5240) is mitered three times. Unlike the lower left infill panel, this one is likely not shifted, giving insight into the original construction, as it was built by Daniel Knutsson. The mouldings appear to be fastened to the panel with glue, as no wooden pins or nails were found. The infill panel itself is fastened to the frame with five nails through the outer edges of the mouldings.

Considerable warping of the infill panel has caused it to detach from the frame in the lower left corner. One of the five nails are placed here and might have been added later as an attempt to compensate for the warping.

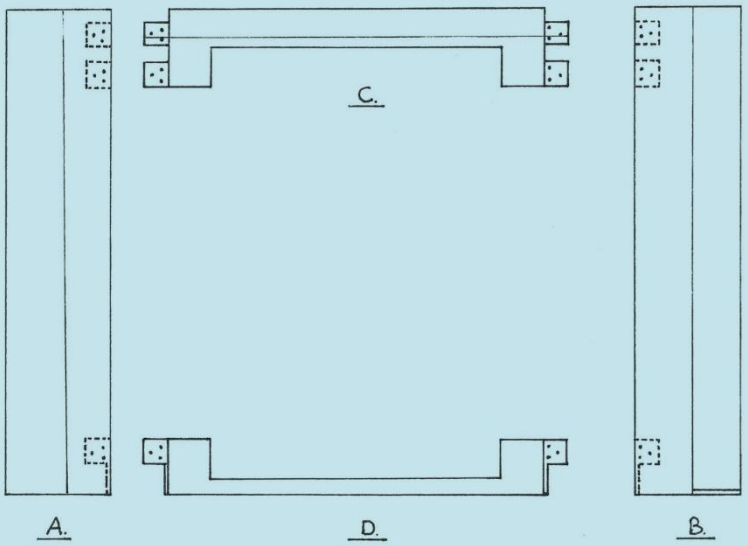


The lower rail is decorated with arches and the same astragal and cove with astragal moulding (5247) as on the lower left and front panels.

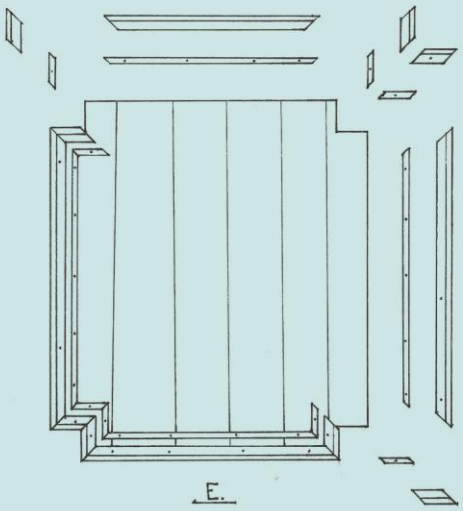
Upper front panel



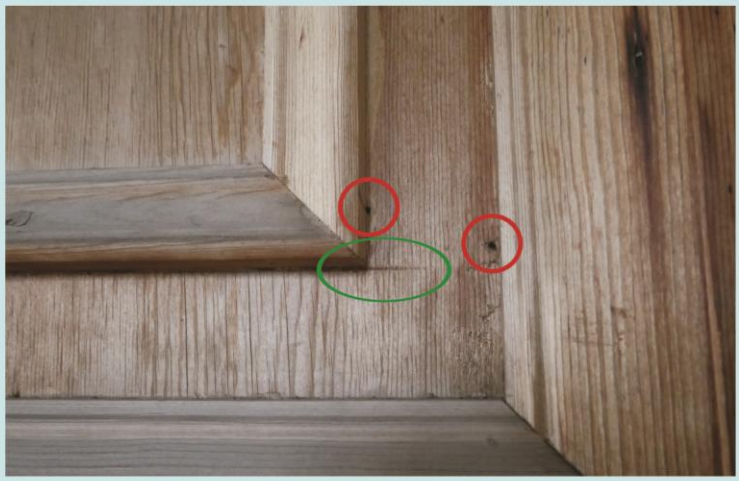
The upper front panel has wide stiles made from two glued-together boards (A. and B.). The upper rail (C.) also consists of two boards and likely has two tenons, this could however not be examined since this area is mostly covered by added carved ornamentations. The lower rail (D.) is made from one board and has single tenons and tongues. Instead of the construction with glued on square pieces in the corners – as on the left and right upper frames – the rails in this frame have cut-outs to match the notched corners of the infill panel.



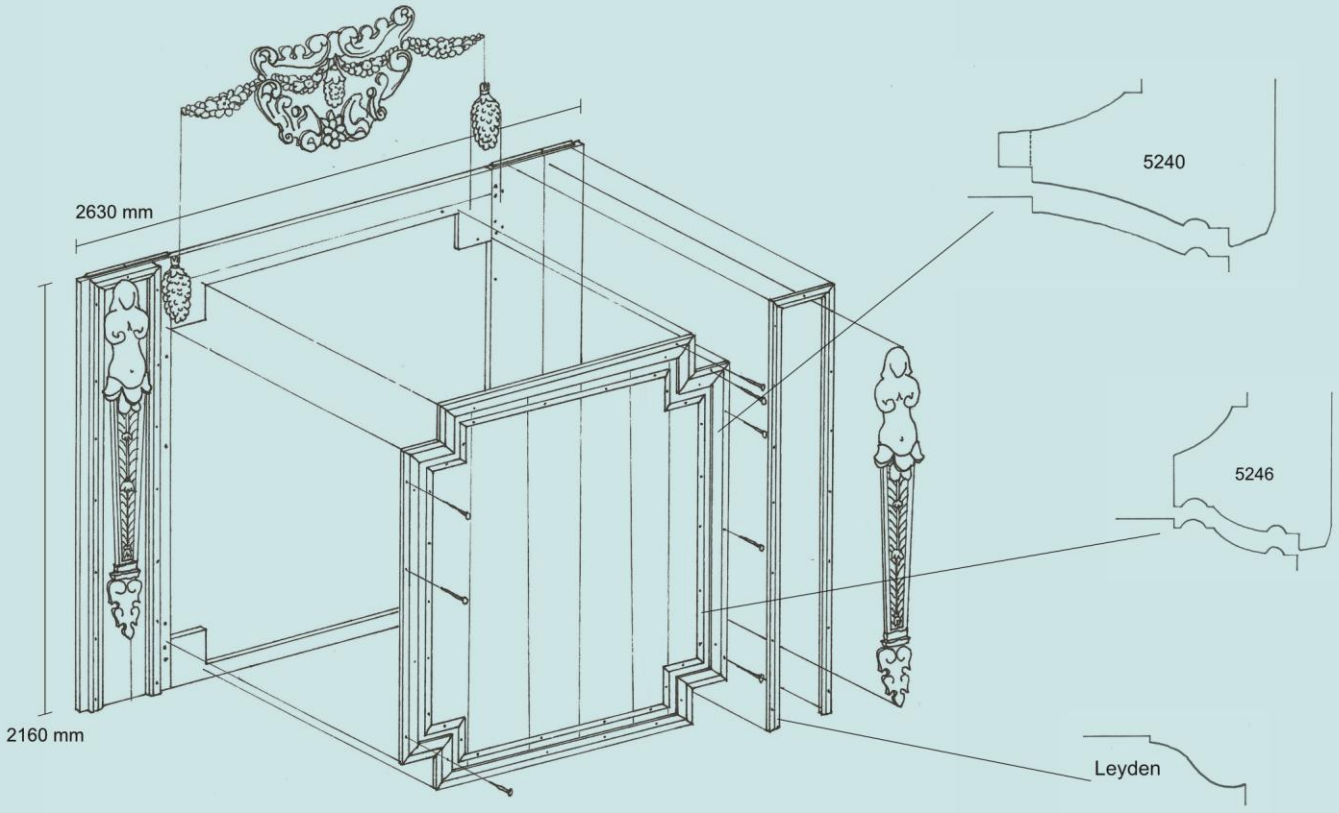
Daniel Knutsson cut the bottom end of the right board on the right stile approximately two centimeters too short, and added a small piece of wood to fill the gap.



The infill panel (E.) is of the same construction as on the upper left panel but much wider and taller. It is built up from six boards of exceptionally knot free pine wood (E.). In addition to the wide ovolo with astragal-moulding (5240) around the edges, a narrower astragal and cove with astragal-moulding (5246) is added on the infill panel. This astragal and cove with astragal-moulding is not the same as the one found on the other panels, but a slightly wider one. The outer mouldings (5240) are fastened with glue and tiny finishing nails, while the narrower mouldings (5246) are fastened with glue and wooden pins. In several places along the mouldings, small holes, possibly from a nail, were found (red circle). These holes could maybe say something about the process of applying the moldings to the infill panel. Perhaps small nails were driven into the panelboards to act as a guide for the mouldings as they were nailed/pinned and glued in place.
A scratched line right at the end of the mitered corner of the inner moulding (green ellipse) suggest that it was aligned with the nail and the line when fastened. Daniel Knutsson would have known that the mantlepiece would be painted, therefore, the small holes left by the nails, and the scratched lines would pose no problem as they could be filled with putty or paint.

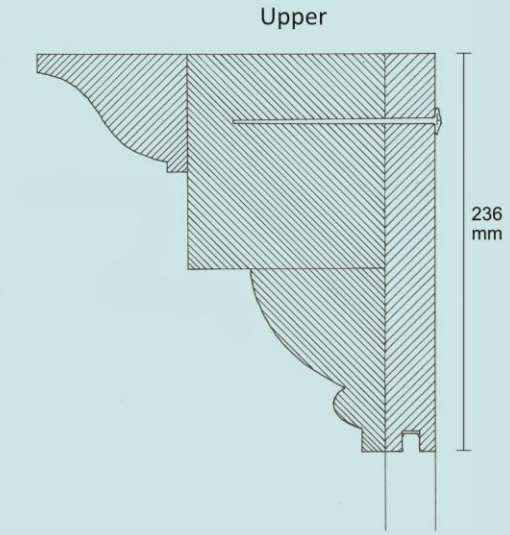


Similarly to the lower front panel, herms framed by ogee-profiled mouldings are added to the stiles. Furthermore, the top of the panel is decorated with grape clusters with festoons reaching towards a large cartouche fastened on the panel and top cornice. Just as on the upper left panel, the infill panel on the front has been subjected to considerable warping. It is fastened to the frame with eight nails unevenly spread out along the edges of the outer moulding.

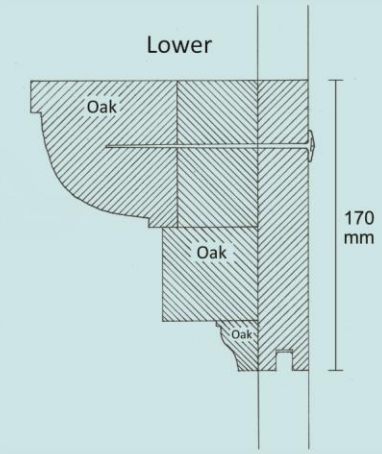


Upper and lower cornices

The upper cornice was unfortunately to high up to reach for close inspection during the examination of the mantlepiece. The measurments and shapes of the profiles might not have a completley true correspondance with the actual cornice and the construction of it is based on the construction of the lower cornice. What can be said about the upper cornice with certanity is, however, that it sits on the stiles of the panels with the same tongue and groove construction as the lower cornice does and that it has three complete sides, unlike the lower cornice which only has a short piece reaching around the corner on the right side of the mantlepiece.



The construction of the lower cornice could be thoroughly studied at the end of that short part of it on the right side, where it was also possible to see the inside of the cornice. Here, it was evident that the cornice is built up of four separate pieces fastened on an aproximatley 30 milimiter thick baseboard fitted with a groove to recive the tongue of the stiles underneath. The visible pieces of the cornice, the large ovolo on top, the fillet in the middle, and the ogee at the bottom are all made from wagenschot-oak, while the baseboard and filler piece behind the ovolo are made from pine. The pieces are glued together and the top pieces are secured with a nail through the baseboard.



Except for the small ogee at the base of the lower cornice, the mouldings on the cornices are most likely not made with dedicated moulding planes but with a combination of flat and concave and convex planes – so called hollows and rounds. During the probing of mouldings on other mantlepieces, tool traces on similar larger mouldings indicated this. The top cornice of the mantlepiece attributed to Daniel Knutsson in 2: M The Yellow Drawing Room has a profile similar to the bottom moulding on the upper cornice on the Leyden Mantlepiece and displays a faceted surface. This type of surface would be the result of using a flat or less convex plane than the curve of the moulding when making it.

4.2 Summary

In this chapter, an analysis of the mantlepiece in the room called Leyden was conducted, with the aim of achieving a higher understanding of the skill and craftsmanship of Daniel Knutsson. The study set out to complement Andrén's art-historical analysis with a focus on the craft behind the visual appearance of the mantlepiece. Through a forensic analysis of the construction, the piece could be deconstructed and the traces and clues inherent in the material could be analyzed. The results from the investigation are discussed in the following chapter.

5. Discussion and conclusions

5.1 Discussion

5.1.1 The conditions of a försvarskarl

Daniel Knutsson is an example of a professional joiner from pre-industrial times traceable through unusually rich source material. Through the investigation in chapter 2. *Part one – Knutsson and his context,* a picture emerged of the professional as well as private aspects of Knutssons life during his 24 years at Skokloster Castle. Along with the details of Knutsson's context, questions arise on some of his social and working conditions. What was his relationship with the guild craftsmen like? Sources on the history of the joiners guild in Stockholm tell of conflicts between the guilds and the craftsmen working as *försvarskarlar*, with harassment and accusations of *bönhaseri* i.e. illegal practice of crafts (Andrén, 1973). The construction site at Skokloster employed a large number of craftsmen, both guild-affiliated and independent. Were these tensions between guild- and non-guild craftsmen evident in the social interactions amongst the work force? Among the other known joiners involved in the construction of the castle, Knutssons closest colleagues in his trade seem to have been the two journeymen Hans Sivers and Mattias Slange and perhaps the master joiner Berendt Sifwersson, all of whom he worked together and alongside with during the interior furnishing of the castle. What were the hierarchies between them? Did they perceive Knutsson as an equal or as an inferior craftsman? Did they judge each other as professionals based primarily on guild titles or skill and experience? According to the payrolls accounted for by Andrén, the daily rate of 1:16 d.k.m. applied to the joiners generally (Andrén, 1948). Was this seen as fair among the joiners? These type of social interactions among colleagues are not accounted for in the original documents, at least not in Andrén's excerpts of them, but the source material brings the research close enough to the specific craftspeople and the workplace at Skokloster for these questions to be raised and contemplated.

There is however one event that suggests some kind of tension in the workplace. In 1668, Knutsson is dismissed from his position due to misconduct or bad behavior. After writing a letter to the estate's treasurer, he regained his position and continued working at Skokloster until 1676. The letter was not accessible in full in this study, only Andrén's short account of it, and the details or context of Knutsson's misconduct remain unknown. Knutsson's behavior could have been related to tensions between himself and guild craftsmen, but there is no evidence to support this and there could be numerous other explanations to the case. What Knutsson, regaining his position however suggests, is that his competence was seen as valuable enough for the proceeding of the construction to make up for his misconduct.

Granlund describes how the nobility exploited craftsmen employed under the noble privilege of hiring *försvarskarlar* during the 17th century (Granlund, 1944). Since this type of employment provided legal protection against conscription into the frequent wars of the time, conditions and wages for these workers could be reduced to unfairly low levels—as long as they remained under that legal protection. Consequently, it could be explored if this is reflected in any way in the conditions of Knutssons employment. Without reference material concerning the conditions of

workers who were exploited by the nobility in other settings, the accuracy of an estimation of Knutsson's conditions is hard to verify. However, judging from the accounts of what type of foodstuffs Knutsson received as payment, such as large amounts of meat, and malt and barley for brewing (Andrén, 1939), it seems as if he and his family lived under decent conditions. Taking into consideration that Knutsson received the same daily wage as the guild joiners (Andrén, 1948), even though he did not have a certificate of proficiency, suggests that his wages were not unfairly low. If, as the sources indicate, Knutsson was in fact not exploited as a *försvarskarl*, it could have had several explanations. The two most obvious being that Wrangel could have been a decent employer who did not seek to exploit his workers, or that Knutsson was regarded as a respected and important tradesman who deserved fair conditions of employment. Either of these explanations, or both, or some other explanation could be true.

5.1.2 The anonymous plane-maker

The results from the investigations of mouldings, involving profile-matching between dedicated moulding planes and pieces made by Daniel Knutsson, highlighted the importance of the set of 32 planes with similar features as a link to the practices of the joiners at Skokloster. The examinations showed that planes from this set were frequently used by Knutsson as he built different parts of the castle. Furthermore, the results drew attention to the series of dedicated moulding planes within the set of 32, with similar profiles but different widths, as well as suggested the existence of additional, now lost dedicated moulding planes within these series.

These discoveries raise questions about the origin and use of the planes from the set of 32. Was the set – like the set of Dutch planes – made by a specialized tool maker and brought to the construction site to facilitate for the joiner's needs of planes? If so, who ordered these planes, and who made them? If the planes were not ordered from outside the workplace, but produced in-house, were they produced all at once, as a set, or were they made over time as the need for them arose during the building process? And if they were made in-house, could it have been Daniel Knutsson who built them? These possible scenarios shall be discussed separately.

Within the pre-industrial joinery trade in the German-speaking regions of Europe and Scandinavia during the 17th and 18th centuries, plane making was an integrated part of the profession (Whelan, 1993). The joiners produced the tools they needed, planes included, with hardware ordered from blacksmiths. In Holland and England, however, specialized plane making trades started to emerge during the 17th century (Goodman, 1964; Whelan, 1993). Jan Arendsz Wissing, and the other Dutch plane makers behind the planes ordered by Wrangel in 1664 were part of this, at the time, relatively new group of craftsmen who produced standardized shapes of planes with great precision and growing reputation. It can nonetheless be ruled out that the set of 32 planes are of Dutch or English origins, as these plane making traditions have clear distinctive features with little resemblance to the planes in the set. The characteristics of the Dutch planes are accounted for in the investigation, and the English planes are also clearly distinguishable from the ones in the set. Consequently, if the planes were made as a finished set by a craftsman outside of Skokloster, and brought to the joiners at the construction site, that craftsman would not have been one of the specialized Dutch or English plane makers. Furthermore, if the planes were not built by a specialized plane builder, but by a joiner

in Scandinavia or the German-Speaking areas of Europe, this would have been an uncommon practice at the time. That does, however, not rule out this possibility. Wrangel was, according to Andrén, unusually engaged in the details of the building process and the specifics of the castle under construction. Despite seldom being there in person, he engaged craftsmen he met in other parts of the country and sent them to Skokloster, as well as arranged for wagenschot-oak and other material to be shipped to the construction site (Andrén, 1948). It is not inconceivable that Wrangel may have engaged a joiner in Germany or Sweden to make the planes in accordance with the latest designs of baroque profiles and sent them to Skokloster. Another possible commissioner of the planes is engineer Anundhsson who led the construction work on site and oversaw many of the design choices.

If the set of planes was not built outside of Skokloster but made by the joiners in-house to supply their need for planes for the construction work, an attempt can be made to narrow down on who could have made them. As mentioned in the investigation, two of the planes in the set (5244 and 5245), have the year 1661 inscribed in the plane body. This coincides with the year when the construction of mantlepieces appears to have begun in the castle. Olof Nilsson, a joiner from Uppsala, seems to have come to Skokloster during the second half of 1661 upon Anundhsson's initiative and started building mantlepieces. During the spring of 1662, Anundhsson and Nilsson could not agree on the price for the mantlepieces. Nilsson initially wanted 150 d.k.m. per piece, lowered it to 140 in april, but Anundhsson still though it was too expensive, and Nilsson returned home after having completed three pieces and received only 125 d.k.m. in total. Knutsson seems to have started to build mantlepieces for the cheaper price of 100 d.k.m. per piece parallel to Nilsson, either in 1661 or in early 1662. According to Andrén's accounts of the building process, these mantlepieces built by Nilsson and Knutsson seem to have been the first more decorated pieces of interior woodwork built in the castle. Consequently, it is not unlikely that the planes were built for the initial purpose of being used for the construction of the mantelpieces. Apart from Knutsson and Nilsson, there are no accounts of any other joiners working at Skokloster 1661-1662. This could indicate that one of them built the planes. If Nilsson was the one who built them, it would be somewhat puzzling that he did not bring them back to Uppsala upon his departure, unless he was contracted beforehand to build them for the construction site. However, Andrén states that there are no accounts in the payrolls of Nilsson ever receiving more than the 125 d.k.m. mentioned above.

If the planes were built at Skokloster but not by Nilsson, the craftsman most likely to have made them would be Knutsson, as he seems to have been the only other joiner working there in 1661. Another circumstance supporting the theory of Knutsson as the maker of the planes is the fact that they remained at Skokloster, if they were the private tools of any of the other joiners who left the castle when they were finished, they would most likely have brought them with them when they left. Knutsson was however employed by the estate and lived and worked there until his death in 1678, and the tools he made for the construction of the castle could have been seen as the inventory of the estate wood workshop.

As evident by this discussion, the investigation provided some answers but raised more questions. Through continued research, for example by expanding the profile-matching examinations to other parts of the interior of the castle, some of the theories might be debunked and others answered.

5.1.3 Understanding Knutsson's practice

In *Material Culture Studies*, a main theoretical concept is the understanding of objects as sources of information about more than the objects themselves (Nyström et al., 2021). With that in mind, what information can be interpreted through the analysis of the Leyden mantlepiece? And how can additional, complementing sources develop the analysis? The investigation's close attention to detail in the different parts of the mantlepiece is an attempt to read, or listen to, the inherent communicative aspects of the material (Palmsköld, 2007). With Medbo's phrasing, it is an attempt to understand the *wood-based linguality* (Medbo, 2022) of Daniel Knutsson, with my own experience in similar craft traditions amplifying the potential for interpretation (Botwid, 2022; Karlsson, 2013a; Knutsson, 2019; Medbo, 2022; Nyström et al., 2021).

Perhaps, the best one-word description of Daniel Knutssons craftsmanship would be pragmatic, in the sense that the range of precision and execution within the mantlepiece is wide, nuanced, and – in most cases – well considered. Examples of this can be found throughout the piece. A sort of hierarchy in precision can be observed, where the appearance of the visible parts is achieved with care and attention to detail, while the finishing of non-visible parts is strictly functional. The visible parts of joints and miters, the wood quality (straight grain, few knots), and the overall surfaces of the visible outside show what Knutsson could accomplish through his trade specific knowledge in joinery. This is what strikes the viewer upon seeing the Leyden mantlepiece, and even more so, the other, painted ones. When finished with paint, the different parts of the panels – stiles, rails, infill panels, mouldings, and other added pieces – come together to a perceived whole. The illusion of joinery does its job.

5.1.4 Infill panels – ignorance or shortcuts

On the Leyden mantlepiece, there is, however, one part which breaks that illusion on two (earlier possibly three, as the lower left most likely is shifted) places, namely the warped infill panels. As described earlier, the panels do not appear to be constructed as ordinary frame- and panel-constructions with the infill panel fitted in a groove in the stiles and rails. The incomplete upper right panel, missing the infill panel, accounts for a construction without grooves, where the infill panel is attached to the frame with nails fastened through the glued-on mouldings along the edges of the infill panels. This construction has proved to be insufficient for holding the infill panels in place, causing them to warp. Knutssons choice of construction raises questions: was he not aware of the risk of warping? This is unlikely. The very similar mantlepiece in the room Geneve, built by Knutsson in 1671 – five years before he built the Leyden mantlepiece – displays the same warping. The warping could have occurred after 1676 when Knutsson left the castle, but wood warps as it adapts to the humidity and temperature of the environment, and the Geneve mantlepiece had been finished for five years when the Leyden mantlepiece was built. Hence, some signs of warping would most likely have been evident on the Geneve mantlepiece when Knutsson started the Leyden one.

There is of course the chance that some dramatic change in the humidity of the castle has happened during the last 350 years, but no major changes in the heating or control of humidity have taken place in the castle, the rooms are still unheated as they were in the 17th century. The only difference is that since the castle was made into a museum in the 1960s, the fireplaces are no longer occasionally used. This could have had some effect on the woodwork, but it is hard to conclude anything.

Even if the warping did not occur until after Knutssons time at the castle, he would have been familiar with frame constructions with panels set in grooves as he built doors of this type both in 1668 and 1673 (Andrén, 1948). In 1673, he built the large double doors for the main entrance to the castle in a similar style to the mantlepieces in Geneve and Leyden. The doors also feature flat infill panels and the same moulding (5240) along the edges, but in this case, the infill panels are set in grooves. In 1668 he built frame doors together with the other joiners.

The reasons behind Knutssons decision to not set the infill panels in grooves remains unclear. It is no doubt a time-saving solution, fitting the panel in a groove would have taken considerably longer time than gluing the mouldings to it and nailing it in place in the frame. Perhaps he was aware of the probability of warping but took the risk. After Anundhsson death in 1665, the supervision of the work place and perhaps the inspection of finished work were more sporadic, as the site manager position was not filled by anyone else (Andrén, 1948). Wrangel himself spent little time at Skokloster during the 1670s. His last recorded stay at the castle was during the spring of 1674, after which he – with increasingly poor health –was called out to war (Bergström & Turander, 2004). When he died in June 1676, the Leyden mantlepiece might not have been finished, or even started yet. Perhaps Knutsson, in the absence of supervising inspection, took some constructional shortcuts with the infill panels, well aware of the risks.

5.1.5 The (in)significance of the invisible

The non-visible sides of the mantlepiece – the insides and backsides of the construction – are as important, or perhaps even more important when attempting to read the language of Knutssons craft practice. As mentioned before, they are left rough, with toolmarks from scrub planes and saws. The modern viewer could perhaps be astonished by the stark contrast in finish between the visible and non-visible surfaces, where the craftsmanship might be perceived as sloppy and unskillful. This would, however, be an uninformed judgement of skill. One of the hazards of relying on one's own experience in crafts as a source of information and an enhancer of interpretation (Botwid, 2022; Karlsson, 2013a; Knutsson, 2019; Medbo, 2022; Nyström et al., 2021) is the risk of bias and incorrect analysis. In order to treat one's own experiential knowledge as a source, one must scrutinize it with the same level of source criticism as any other source. The craft researchers craft knowledge must be deconstructed (Karl-Magnus, 2022; Seiler, 2022) while still maintained, a somewhat paradoxical but necessary approach that has proved useful in reconstruction projects.

As Knutsson (2019), Klein (2018, 2020, 2022), and Tarule (2007) have shown, a widespread norm in joinery and cabinetmaking before the industrialization was the hierarchy in finish between *primary* and *secondary* surfaces. Knutsson develops this observation to encompass other crafts too, such as

embroidery, tailoring, and clay sculpture. The opposite of this, the idea of precision in the execution of every part of an object – disconnected from function – is according to Knutsson associated to 19th century ideals of diligence and cleanliness, both physical and moral. The ethics of a job well done for its own sake. These ideals persist today and can shape our expectations and muddle our perception of what quality in earlier craftsmanship looked like (Knutsson, 2019). During the 17th and 18th centuries, good craftsmanship seems to have been judged according to other standards than in more recent times. The secondary surfaces were not intended to be seen, they were only meant to be functional, any visual aspects of them were the mere results of production practices. The primary surfaces were, on the other hand, meant to be both functional and beautiful. The 17th and 18th century craft traditions of professional joinery, expressed through craft procedures aimed at particular results evident in the products, was according to Knutsson (2019), Klein (2018, 2020, 2022), and Tarule (2007) shaped by these norms.

The rough secondary surfaces of the Leyden mantlepiece bear witness to the norms of joinery that Daniel Knutsson adhered to in the professional context he was part of. According to Karlsson (Karlsson, 2013a), norms of craftsmanship are rooted in professional practice and are thus inherently social. As social constructs, the shifting norms of finish of joinery products can be framed and contextualized in relation to a wider societal background and history of ideas. Historian Peter Englund describes life in the 17th century as characterized by stark contrasts and what, from a modern point of view, might be perceived as contradictions. These contradictions were rooted in the inevitable and eternal opposites of life and death, joy and sorrow, light and darkness, poverty and abundance. During the 17th century, the negative sides of these contrasts were unavoidable and to some extent accepted as the God-given natural order of things, just as they had been for centuries. This did not necessarily mean that the hardships of life were met with indifference or a calm stoic composure, but strictly hierarchical societal structures, deep injustice, diseases, and sudden death were not seen as something essentially unnatural, since they were almost impossible to avoid (Englund, 2000). And alongside them stood wealth, pleasure, joy, and all the other opposites of suffering, acting as counterweights. The opposites could even rely on each other to form a complete whole. The material splendor of the aristocracy was to some extent meant to be admired by the common people, who, through their poverty and awe, acted a necessary contrasting backdrop (Englund, 1997). In this society, shaped by feudal ideals and agrarian worldviews, time was seen as cyclical rather than linear, and the focus set on maintaining balance rather than pursuing progress. With emerging capitalistic, scientific and philosophical ideas growing during the 18th and dominating by the 19th century, this old worldview gave room to new ideals. Through the rising capitalistic ideas and the industrial revolution, order, objectiveness, consistency, and progress became valued principles, while the thinkers of the enlightenment and the emerging natural sciences started to question the natural orders and advocate for reason, empiricism, and justice. Englund describes this as a movement from the old ideals of aristocracy to the new ideals of the bourgeoisie, from contemplation to calculation, and from esthetics to ethics (Englund, 1997). Knutsson identifies how these moral values start to make their way into the norms of professional joinery during the 19th century, shaping professional practice and the appearance of craft products (Knutsson, 2019). Perhaps this movement from rough secondary surfaces to an all-encompassing attention to detail can be described as a moral paradigm shift within the professional craft practices. The workmanship

of Daniel Knutsson, manifested through the contrasting primary and secondary surfaces of the Leyden mantlepiece might seem as an expression of a contradictory and inconsistent professional practice – perhaps as an unprofessional practice – to the modern viewer. However, it could instead be understood as a reflection of pre-modern ideals, expressed through a professional practice of workmanship.

5.1.6 Money, time and assessments

The information on wages for the joiners (see chapter one), when paid by the day, allows for a thought experiment involving Knutssons daily wage – 1 d.k.m and 16 öre, or 1,5 d.k.m. – and the fixed sum he received for the construction of the Leyden mantlepiece – 100 d.k.m. With the help of these two sums, a hypothesis about the number of days it could have taken Knutsson to build the mantlepiece can be formulated, built on the assumption that the fixed price he received was based on a realistic calculation of the time required to build it. Knutsson consistently received a sum of 100 d.k.m. for the mantlepieces he built, it happened three times between 1671 and 1676 (Andrén, 1948). It is not known whether this price was proposed as an offer by Knutsson and accepted by the project management or the other way round. It is, however, known that the joiner Olof Nilsson from Uppsala wanted 140 d.k.m. each for the three mantlepieces he built 1661-62 but that it was considered too expensive by Anundhsson. Nilsson was sent home again with only 125 d.k.m. total in payment. Parallel to Nilsson, Knutsson starts building the first of his mantlepieces, for an unknown sum.

If the fixed sum of 100 d.k.m. is converted into daily wages, based on the assumption above, it would mean that it took Knutsson approximately 66,7 days to complete the Leyden mantlepiece. If he worked a six-day work week, which was common at the time, 66,7 days would be around 11 weeks. And if his workdays were 13-14 hours including breaks, which was normal at Skokloster (Andrén, 1948), 66,7 days sums up to somewhere between 867 and 934 hours, including brakes. It is tempting to reflect on whether this hypothetical work effort could have been feasible or not. This has not been done within the investigation, but the deconstruction of the mantlepiece into separate pieces and craft procedures allows for – and could be seen as – the first stages of a reconstruction of Daniel Knutssons work process. By breaking down the already identified parts into a hypothetical chain of operations, the time needed for the different steps of the process could be assessed and summed up for comparison with the calculation above. Almevik describes a dialectic between the interpretations of historical craft procedures from the physical results on one hand, and reconstruction of the procedures as a testing of the hypothesis on the other hand (Almevik, 2017). Adhering to that methodology, a testing of the hypothesis through reconstruction would be a logical continuation of the investigation.

5.2 Conclusions

The investigations in this thesis aim to understand the skill, craftsmanship, and context of the joiner Daniel Knutsson. The study has approached these inquiries through an MCS-theoretical viewpoint and an interdisciplinary methodology informed by micro-history, forensic investigation, and source-pluralism. The results paint a picture of a craftsman during the 17th century, active in one of the

greatest private buildings projects in its time. The details of Knutsson's private and professional life during the construction of Skokloster Castle help to inform the understanding of these types of extensive building projects in pre-modern times.

A discovery that emerged as central to understanding the professional joiner Daniel Knutsson and his context was the conclusion that he was most likely a *försvarskarl*. This insight shaped several subsequent lines of inquiry and contributed to situating Knutsson within the broader context of craft guilds, his employer, his colleagues, and his professional skills within his trade. The emerging image of Knutsson and his workplace is dynamic and perhaps more complex than previously assumed, with guild-affiliated master craftsmen working alongside the *försvarskarl* Daniel Knutsson under seemingly equal conditions. The fact that Knutsson was literate and entrusted with the construction of some of the castle's most visually dominant interior elements—such as the mantlepieces—despite lacking a formal certificate of proficiency, challenges the established notion of master craftsmen from Swedish guilds or even renowned continental masters as the creators of places like Skokloster. The investigations have showed that Knutsson's skills and craftsmanship was in line with the professional norms and standards of the time. They are characterized by a pragmatic and workmanlike approach, with a clear hierarchy in finish between visible and non-visible parts of the joinery.

The investigations of the preserved tools and their link to the documented joinery work made by Knutsson resulted in both direct matches between moulding planes and woodwork – all in all eight matches – as well as the discovery of a set of planes with a strong connection to Knutsson's practice. The profile matching analysis indicated that the identified set of 32 planes, where seven of the eight matching moulding planes were included, likely have been more extensive in its original form. The identification of incomplete series of moulding profiles within the set, confirmed by cross-referencing the planes with the woodwork, revealed that several moulding planes could have been lost since Knutsson's time. It could also be concluded that Knutsson is one of the most likely makers of the planes. The results of the investigation furthermore raised questions around how the workplace and the joinery workshop during the construction were organized and presented what type of workbench Knutsson could have used.

Finally, it can be concluded that approaching Skokloster Castle—a well-known historical site previously examined through other scholarly perspectives—using a craft research methodology informed by MCS theory yielded new insights. This strengthens the argumentations for these methods and approaches and proves that their application can provide deeper insights into the material itself, the individuals involved in its creation, and the broader societal patterns of the time.

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