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The lifecycle of casks: the production, use, and repurposing of casks in the Netherlands (1300–1800)

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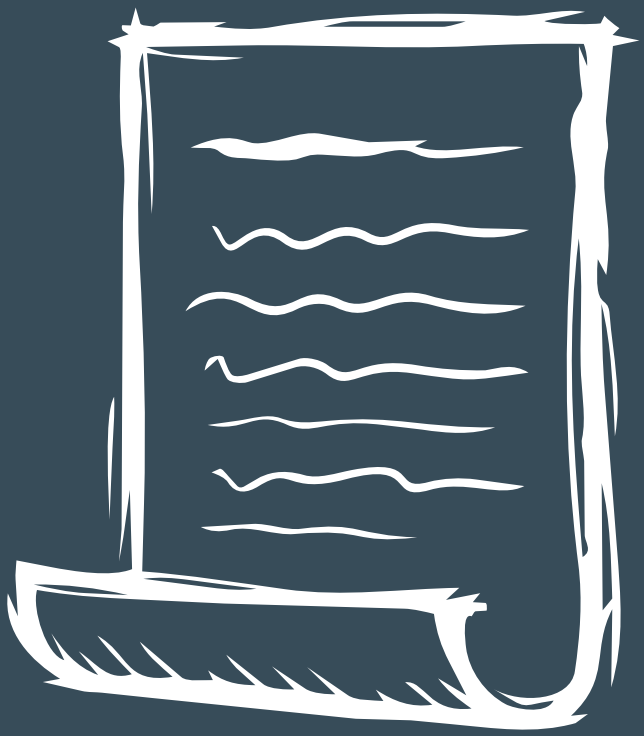
Summary



Summary

This study focuses on casks from Dutch archaeological contexts dating from the Late Middle Ages to the Early Modern period (1300–1800). During this time, the Netherlands emerged as one of the most urbanized regions in Europe, with trade serving as the primary driver of this transformation, in which casks were employed as transport containers. It is therefore not surprising that these casks are a common find within Dutch archaeological contexts, particularly in urban settings, where they were often repurposed as linings for cesspits or water wells, as well as in the excavation of shipwrecks. Yet despite their frequent occurrence, casks have attracted surprisingly little scholarly attention. This lack of focused study can largely be attributed to an underestimation of their interpretive potential, stemming from a general lack of background knowledge about these artefacts.

The research presented in this dissertation aims to address this gap through a series of studies focused on casks. Each sub-study is guided by a specific research question and draws on its own dataset, consisting primarily of archaeological data. In addition to archaeological data, written sources have been extensively used to contextualize and supplement the research results. Furthermore, iconographic material and artefacts from museum collections have been employed, alongside dendrochronological data applied on a broad scale to gain further insights into the provenance and dating of the casks.

Chapter 1, the introduction, formulates the central research question: What do casks from Dutch archaeological contexts from 1300 to 1800, examined through an interdisciplinary analysis, reveal about their lifecycle (production, use, and repurposing)? The research question, in conjunction with the research design presented in Chapter 1, highlights the lifecycle of the cask as the guiding framework that structures this dissertation. Within this lifecycle, three main phases were identified: the production of casks, their use as transport containers, and their repurposing. Each of these themes has been analyzed as a separate research topic in this dissertation, along with a fourth theme: cask marks. Since cask marks cannot be exclusively linked to a specific phase in a casks' lifecycle, they are addressed separately following the chronological analysis of the other research themes. Below is a concise summary of each research theme, based on the sub-studies, each of which are presented in detail in a separate chapter.

Overarching studies

In Chapter 1, in addition to presenting the theoretical framework, research questions, and research design, the key functions of casks are also outlined. Here, the large-scale adoption of casks from the Late Middle Ages is compared to the introduction of shipping containers in modern global trade, in order to illustrate how they significantly influenced the development of trade networks, both in the

past sixty years and during the Late Middle Ages and Early Modern period. Both shifts were part of broader transformations in international trade that led to substantial reductions in transport costs and an increased specialization within trading markets. These changes affected not only trade practices but also port and maritime infrastructure: ships became larger, harbors were deepened and expanded, and cranes were installed to optimize loading and unloading.

However, a key difference between casks and shipping containers lies in the preser*vat*ive function of casks. Their ability to protect contents from sunlight and air substantially extended the shelf life of a wide range of products. This was particularly vital in the context of Late Middle Ages and Early Modern trade, as casks' storage facility enabled longer periods of transport. As a result, goods could be traded over greater distances, which in turn stimulated further regional specialization in food production.

Chapter 2 focuses on the lifecycle of casks, with particular attention to its average lifespan. This lifespan is divided into several successive phases: the production of coopers' timber, its drying and transport, the processing of this timber into casks, the use of casks as transport containers, and finally their repurposing. For this sub-study, a comprehensive dataset was compiled consisting of 464 casks that were analyzed using dendrochronology. The data originates from maritime archaeological contexts, where casks have mostly been recovered in their original function as transport containers. Additional data were collected from urban archaeological exca*vat*ions, where casks were more commonly found in their repurposing phase, typically as linings for cesspits and water wells.

The analysis of the dataset reveals that the timber production phase, the time from the formation of the oldest tree ring to the felling of the tree, had a median duration of 150 years. Following felling, the timber underwent drying and was then transported to cooperages. This phase lasted approximately three years. Once at a cooperage, the timber was processed into casks over a period of roughly seven weeks, a phase that included both additional drying and the actual production. The primary use of the 464 casks in the dataset, as transport containers, had a median duration of six years. This was followed by the repurposing phase, in which the casks from the dataset were used for a median duration of 75 years. On average, the full lifespans of the casks in the dataset amounted to approximately 234 years.

Production phase

The production phase of casks was analyzed in two separate studies. The first, presented in Chapter 3, focuses on the provenance of the timber found in Dutch archaeological contexts and its diachronic development. The aim of this sub-study was to gain insight into the import of coopers' timber and to determine what proportion of the casks were produced in the Netherlands. For this research, a dataset was compiled consisting of 357 casks, of which one or more components

were successfully analyzed dendrochronologically.

The analysis revealed seven provenance areas of coopers' timber: the Rhineland, the Meuse Valley, the North German Plain, the Baltic region, Poland, France, and Burgundy/Loire Valley. These areas are represented in varying proportions in the casks studied, showing a clear diachronic development. Until around 1500, timber from the Rhineland and the Meuse Valley dominated, indicating transport via the major rivers. From the Early Modern period (1500–1700) onwards, sea transport increased, with timber from the Baltic region and the North German Plain playing a greater role in Dutch coopering.

To determine whether casks were actually produced in the Netherlands, timber from multiple provenance areas within a single cask was examined. Notably, combinations of Polish and Baltic timber were often found in casks, indicating timber import and assembly in the Netherlands. Additional archival research, including records from 38 Dutch coopers' guilds, confirms that there was indeed significant cask production within the Netherlands during this period.

The second sub-study of the production of casks, presented in Chapter 4, focuses on the subsequent steps in the production of casks in the Netherlands. It explores the multifaceted history of the coopers' craft in relation to broad urban, economic, and technological developments in the Late Middle Ages and Early Modern period. Special attention is given to the role of coopers' guilds, which played a central role in organizing cask production. The structure of these guilds, the number of members per guild, and the various roles within them are discussed in detail.

In addition, the step-by-step production process of a cask is discussed, using 3D scans of casks from archaeological contexts to visualize technical aspects. Finally, research was conducted into the price of a cask and the composition of that price, in order to gain a better understanding of the economic value of casks during the research period.

Use as transport container

The sub-study of the use of casks as transport containers, presented in Chapter 5, focused on the characteristics of the two most common cask types produced in the Netherlands: beer casks and herring casks. Central to the analysis were the distinguishing features of these casks, including capacity, dimensions, number of staves and headboards, stave thickness, number of hoops, timber used, and the types of holes. The research was primarily based on written sources, gauging instruments from museum collections, and iconographic material, with archaeological data used for verification.

The sub-study revealed clear distinctions between beer casks and herring casks, both in their physical characteristics and in the degree of regulation regarding these characteristics. Herring casks from Holland had a standardized volume of 120 liters, which was strictly enforced, likely due to the international reputation of quality herring from Holland, which was protected by interested parties. Beer casks, by contrast, showed much more variation: their capacity differed by city and time period, which was related to the local nature of the beer trade and the absence of centrally prescribed specifications for beer-cask capacity.

Repurposing

The sub-study of the repurposing phase was designed as a case study and focuses on three large-scale excavations in Vlissingen: the Groote Markt, Spuistraat, and Dokkershaven. The results are presented in Chapter 6 and are based on a dataset of 226 casks that were repurposed as linings for cesspits or water wells. The case study examined the influence of three factors on the choice between cask or brick lining: soil conditions, economic considerations, and the availability of casks. Each of these factors could play a role in decisions whether to repurpose casks as a practical and cost-effective solution or to use bricks for the construction of cesspits and water wells.

The analysis showed that variation in soil conditions in Vlissingen had no clear impact on the use of casks as shaft linings. The hypothesis that unstable ground would more often lead to the choice of a cask-lining due to their quick and safe handling, was not supported by the data. However, the financial means of the property owner did play a role: cask shafts were significantly more common on plots owned by individuals with below-average financial means, suggesting a preference for this more affordable construction option.

Additionally, the availability of casks was likely an important factor. An exceptionally high number of cask-lined cesspits and water wells were found in Vlissingen: 86% of the cesspits and 55% of the water wells were constructed with casks. Only the Dutch city of Dordrecht shows comparable percentages. Since both cities served as trans-shipment ports, there was probably a larger supply of used casks that could be repurposed as building material.

Cask marks

An important sub-study within this dissertation is dedicated to cask marks. This sub-study aimed to achieve a comprehensive understanding of these marks by exploring several key aspects: first, to determine the intended purpose behind the application of the marks; second, to identify the specific phase within a casks' lifecycle when a mark was applied; and third, to clarify the role or function of the individual or group responsible for marking the casks. Based on these objectives,

a typology was developed, based on the cask marks' intended functions. This typology, along with the supporting analysis and reasoning, is presented in detail in Chapter 7. During this research, the analysis of cask marks from the shipwreck *Burgzand Noord 4* (BZN4) unexpectedly led to the highly probable identification of the wreck as the ship *'t Hart*. This discovery resulted in an additional, initially unplanned case study—research on BZN4 and *'t Hart*—presented in Chapter 8.

The sub-study that led to the development of a typology for cask marks began with the creation of a dataset containing 1,021 cask marks from archaeological contexts. These were supplemented with an additional 880 cask marks from written sources that were combined in the publicly accessible Database WOODAN Cask Marks (www.woodancaskmarks.org). Initially, the most distinctive characteristics of the cask marks were identified. These consist of the design, the method of application, and the marks' location on the cask.

Based on the characteristics of cask marks, previous research, and information from written sources about the reasons for applying cask marks, a typology was developed. This typology includes a total of six main types and nine subtypes.

1. Production mark
   A. Construction mark
   B. Coopers' mark

2. Cask gauge mark
   A. Cask gauge approval mark
   B. Cask gauge rejection mark

3. Content gauge mark
   A. Content gauge approval mark
   B. Content gauge rejection mark

4. Identification mark
   A. Product identification mark
   B. Personal identification mark
   C. Corporate identification mark

5. Count mark

6. Content quantity mark

In the sub-study, the individual types were initially described based on information from written sources, supplemented by data from architectural-historical research and, in some cases, interviews with present-day coopers. The typology was then applied to the cask marks from archaeological contexts within the dataset. This process provided

additional insights into the characteristics and use of the cask mark types and subtypes.

The second sub-study using cask marks as its starting point, focused on the analysis of marks recovered from the shipwreck *Burgzand Noord 4* (BZN4). One particular cask mark, consisting of the letters MSP, was found a total of four times on the wreck. This mark was successfully attributed to Matheus Sigismundus Pallak (1709–1767). Through this connection, targeted research into his trade relations was carried out using written sources, which revealed the frigate *'t Hart*, known to have sunk near Texel in 1751. The strong correspondence in both location and time period between the wreck of BZN4 and *'t Hart* led to the formulation of the hypothesis that BZN4 may, in fact, be the remains of the frigate *'t Hart*.

To test this hypothesis, a number of details were identified for further assessment. These included, for both BZN4 and *'t Hart*, the construction date, the ship's dimensions, its use as a merchantman, its equipment and cargo during the final journey, the geographical location of the shipwreck, and the date of its sinking.

Each of these details was then examined by comparing written source material on *'t Hart* with the maritime archaeological data from BZN4. This ultimately led to the conclusion that *'t Hart* was a very strong candidate for the identification of BZN4, marking the first time a merchantman has been identified in Dutch waters. Moreover, this study highlights the importance of research into cask marks, which can serve as a crucial link between written sources and archaeological data.

Chapter 9 presents the conclusion and focuses on answering the central research question of the dissertation. By combining the results of the various sub-studies and placing them within the context of previous research, an integrated understanding emerges of the lifecycle of casks in Dutch archaeological contexts. In addition, Chapter 9 briefly discusses the added value of an multidisciplinary research approach and outlines possible directions for future research, positioning this study as a foundation for further exploration.