Master thesis

Conservation and Restoration of Cultural Heritage ~ Specialisation: Book & Paper

A WAVE FROM THE PAST

On the formation of wave-patterned deformation of the Lakenhal Sample books

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Photograph on cover page from Lakenhal sample books 1312.16. Photograph taken by Margot Terpstra.

Abstract

This thesis is an investigation into a collection of 31 sample books from Museum the Lakenhal in Leiden. All the books in this collection have a distinct wave-pattern deformation of the bookblock. The aim of this research is to determine how this deformation originated. A survey will be done of the collection, as well as a reconstruction of one of the books and a literary analysis of the deformation and the components that might have had a role in its development.

Samenvatting

In deze thesis wordt een collectie van 31 stalenboeken onderzocht van Museum de Lakenhal in Leiden. Alle boeken in deze collectie hebben een distinctief golf-patroon deformatie in het boekblok. Het doel van dit onderzoek is om te achterhalen hoe deze deformatie is ontstaan. Er zal een survey gedaan worden, samen met een reconstructie van een van de boeken en een literaire analyse van de deformatie en de onderdelen die daar een rol in hebben gespeeld.

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I want to thank Elizabet Nijhoff-Asser for introducing me to the Lakenhal sample books and helping me start up this project. I also want to thank her for sending me the sealing wax for my reconstruction.

My thanks go out to Bas van Velzen, for his help and extensive knowledge on paper, watermarks and ream wrappers, and for his donation of eighteenth century paper for my research. I also want to thank him for his contact with Gangolf Ulrich, to whom I owe the wonderful paper used for my reconstruction. So, many thanks go out to Gangolf Ulbricht, for his generous supply of paper for the reconstruction.

Note from the author

Seeing the circumstances surrounding the writing of this thesis, it was felt an author's note was in order. The majority of this thesis was written during the Covid-19 pandemic. The measures taken to stop the spread of this virus also blocked all access to the objects and some literature that was only available through a library. Some aspects of the thesis had to be changed to accommodate these restrictions. Inevitably, the restrictions will lead to some gaps in this thesis. These include the results of the survey, which had to be performed largely through photographs provided by Museum the Lakenhal on their website, and the choice of materials for the reconstruction. The reconstruction was also largely done at home, instead of the studio in the Ateliergebouw of the University of Amsterdam. This meant that not all the appropriate tools were at hand, and some parts had to be left out.

Table of Contents

Abstract 2
Samenvatting 2
Acknowledgements 2
Note from the author 3
Introduction 6
The objects 6
The problem 7
Research question 8
Methodology 9
Relevance for research 10
Status Quaestionis 11
Chapter 1 The objects: a closer look 12
1.1 Historical background 12
1.2 Objects description and condition 15
1.2.1 The Binding 15
1.2.2 The paper bookblock 18
1.2.3 The samples, adhesive and ink 21
1.3 Storage conditions 24
1.4 A special case: Sample book 1312.31 24
Chapter 2 Survey 26
2.1 Setting up the survey 26
2.2 Performing the survey 27
2.3 Results of the survey 28
2.3.1 Cover 28
2.3.2 Spine 28
2.3.3 Sewing structure and closing chords 29
2.3.4 Bookblock 29
2.3.5 Guards 31
2.4 Conclusion survey 31
Chapter 3 Reconstruction 32
3.1 Preparing for the reconstruction 32
3.1.1 Paper 33
3.1.2 Guards 33

3.1.3 Wax 34
3.1.4 Samples 34
3.1.5 Binding materials 35
3.2 The reconstruction 35
3.2.1 Folding the quires and guards 36
3.2.2 Sewing 37
3.2.3 Folding columns 38
3.2.4 Adhering samples 39
3.3 Results of the reconstruction 39
Chapter 4 Construction, tensions and causes 42
4.1 Book construction and internal factors 42
4.1.1 Movement of the spine 44
4.1.2 Influence of the guards 46
4.2 Empty spaces and tension 48
4.2.1 Sample tension 49
4.2.2 Into the fold 51
4.3 Water damage and external factors 53
4.3.1 The cockling phenomenon 55
4.4 Combining causes 59
Conclusion 60
Discussion 61
Reference 62
Literature 62
Images 66
Summary 68
Appendix I: Condition Reports 69
Appendix II: Results of the survey 100
Appendix III: List of materials used for the reconstruction 106
Appendix IV: Correspondence with Museum the Lakenhal 107
Appendix V: Recommendations for the Lakenhal sample books 109
Storage 110
Conservation treatment 110
Digitisation 111

Introduction

Like many other books, sample books are considered a historical source. But books provide much more information than just the words written on a page. As the name implies, a sample book is a book containing samples.[1] These samples can be anything from paper to textiles, paint or pigments, each providing information on their use, manufacturing and how they were traded. The focus of this master thesis will be a collection of sample books from Museum the Lakenhal in Leiden, the Netherlands. The majority of research done on sample books in general is focussed on their content, and is done from an art historical or art technological perspective. This is not surprising, as their contents often contain a time capsule full of information. The samples are better protected in the book then they would be outside of it. Because the samples have been kept in a closed environment, with little to no contact with light or oxygen, they are often in a better condition than their used counterparts. As such, they can offer a lot of information on the original texture, colour and composition of the sample. Some sample books also contain recipes, which makes it possible to reproduce the samples for further research. The sample books from Museum the Lakenhal that will be researched in this thesis were in use during the eighteenth century in the Lakenhal. Before it was a museum, the Lakenhal functioned as a cloth trade building. The Lakenhal sample books were not used to make a sale, but as a record or administration log for the production and quality control of fabrics. Therefore, they can offer extensive information about the quantity, quality, production and trade of these fabrics. This specific collection of sample books is also interesting for another reason: their damage.

The objects

The Lakenhal has a rich history in textiles, both as a museum and as a historical building that was used for the examination and trade of fabrics. The museum has an extensive collection of sample books. A quick search in their collection produces 123 results, dating between 1690 and 2014.[2] For this thesis, a set of 31 of these sample books will be examined. What these books have in common is that they were all commissioned by the Lakenhal itself, and served the same purpose.

[1] According to the Collins English dictionary, sample books consist of "a number of pieces of fabric, wallpaper, etc fastened together at one edge, for people to examine when trying to choose which example to buy". But it also states that this term was not used until the nineteenth century. Since the Lakenhal sample books date from the eighteenth century, this definition is only mentioned as a side note. Collins Dictionary, *Sample book*
[2] Museum de Lakenhal, *Zoeken in de Collectie: Stalenboek*

Therefore, they will be referred to as the Lakenhal sample books in this thesis.[3] Other than being commissioned by the same institution around the same time period, they are also similar in binding method and content. The books were made to keep track of the quality and production of black fabrics. All volumes list the maker and quality of the fabric that was passed through the Lakenhal, with the samples pasted next to this information (see *Figure 1*). The volumes constitute either a single or multiple calendar years of administrative details, with the year written on the spine of the book and the days on the pages. The 31 books in this collection contain books from 1700 to 1791, but not all years are accounted for.[4] The books are bound in a full parchment laced-case binding and can be closed with alum tawed leather straps. They are sewn on double sewing supports, made from either parchment or alum tawed leather, that are laced through the cardboards. The bookblocks are made up of an antique laid paper. All of the books have guards: a narrow strip of paper that is bound into the book along the spine. The length and material of these guards differ per book.

Figure 1: *Recto page of Lakenhal sample book 1312.28. Photograph taken by Margot Terpstra.*

The problem

The problem with these sample books stares you right in the face as soon as you look at them. The main problem for all sample books in this collection is a heavy deformation of the bookblock. The pages all show a distinct wave-pattern (see *Figure 2* & *3*). The level of deformation varies per book. Even within one book, some pages are more deformed than others. For some books the deformation makes it extremely difficult to consult or open them, in some cases this is even impossible without causing more damage. Some of the pages are locked into one another because the pages follow the same shape of deformation. The added samples make opening the book more difficult because the pages and other samples hook behind one another. This also adds a risk of losing samples when they get stuck behind another page or sample and get torn off when leafing through the book. In various places samples have already been lost or lie detached between the pages.

[3] In Dutch they are referred to as 'Staalmeesterboeken'
[4] Museum de Lakenhal, *Collections, Lakenhal*

Figure 2: *Bottom edge of Lakenhal sample book 1312.4. Relatively mild case of the 'wave'-pattern deformation. Photograph taken by Margot Terpstra.*

Figure 3: *Top edge of Lakenhal sample book 1312.16. Severe case of the 'wave'-pattern deformation. Photograph taken by Margot Terpstra.*

Research question

The main research question for this thesis derives directly from the problem described above, namely: What caused the deformation in the Lakenhal sample books? Since this is a rather broad question, it needs to be divided into sub-questions. These sub-questions will be based on different aspects of the books that might have contributed to the problem. The Lakenhal sample books all have similar bindings, but also have slight variations in the length of the guards, the way the sewing supports are laced through the boards and the amount of adhesive

used for the samples. The sub-question here is: what are these different components in the structure of the book? With the follow-up question of how these different components might have influenced the deformation of the bookblock. It can be expected that there is an overarching factor which caused this deformation. One of the questions that is important to consider is whether the damages occurred because of something that is inherent to the way the books were constructed, such as the binding and the added samples, or by external factors, like climate conditions, storage or water damage.

Methodology

This thesis is diagnostic in nature, meaning it will look for the signs and symptoms in the sample books that might have caused the deformation. To find an answer to the main- and sub-questions, the research will be divided into four parts.

First, a detailed overview of the objects and their condition will be given in *Chapter 1*. This chapter will serve as a base for the research and discusses the history and materials of the Lakenhal sample books. This first part of the research will be supplemented by the results of a survey of all of the Lakenhal sample books. The survey will be discussed in *Chapter 2*. The purpose of the survey is to gain insight into the objects and give a detailed account of their construction, similarities, differences and damages. The results of the survey will create an organized overview of the Lakenhal sample books collection as well as help find comparisons that may point to a possible cause for the deformation. It will help the whole research in gaining understanding about the current condition that the books are in. The survey that will be done is a collection condition survey, in which each object will be looked at separately.

On the basis of the survey, a reconstruction will be made of the Lakenhal sample books, which will be discussed in *Chapter 3.* The main purpose of the reconstruction will be to see what the books might have looked like before the deformation happened, and what the influence is of different components, like the binding and the added samples. Some inherent faults in the construction might become apparent. The reconstruction will illuminate some of these problematic components of the construction.

Lastly, the factors which contributed to the occurrence of the deformation will be discussed in *Chapter 4*, which will focus on literary research. This will be a

combination of empirical research and the current scientific knowledge on different facets of the binding and the problems they might cause, such as the guards, the samples and their adhesive. This chapter will also focus on external influences and includes a discussion on how these aspects may influence the current condition of the sample books. One important external factor to look at is signs of water damage, as it may be a cause for deformation. This part of the chapter includes some empirical research, for which the current condition of the materials will be examined.

Together, these elements of the research will lead to a conclusion and possible answer to the question of what factors played a role in causing the deformation.

Relevance for research

A study of these sample books is relevant and sought after, because the books contain a plethora of information, which at this point is hard to access. The information contained in these sample books needs to be available to the public. The Lakenhal sample books offer information about the fabrics they contain; how they were dyed and what their quality was, as well as information on the maker of these fabrics. They are the starting point of the production and trade of these fabrics. This makes these sample books very valuable, not just as a research object for art historians, but also for historians looking into the manufacturing and trade of fabrics. The Lakenhal sample book collection spans a time period of almost 100 years, and can give a good timeline of changes in production or quality. Therefore, the books are interesting for multiple conservation specialisations: books, textiles and even Art Technological Source Research. For the conservator and curator, a study into the material content, functionality and construction can also be relevant for understanding these kinds of complex books and their multifaceted problems.

Because the books are hard to consult, they lay mostly forgotten in the depot. Museum the Lakenhal is interested in having these sample books digitised so they can be studied. Plans for research into the contents of these books are already in the making. In their present condition, doing research on the books will prove to be very difficult. As they are, handling the books will inevitably lead to damage. Before digitisation can take place, some conservation treatment will be needed to flatten and separate the pages. Before determining what treatment options there are, and to establish whether treating these books at all will benefit them or will result in damage, the loss of historical evidence and character, this research into

the origin of the deformation is needed. Before understanding how one can fix a problem, one must first understand how the problem came to be.

Status Quaestionis

This thesis will build upon the knowledge of bookbinding and construction. Both in the likes of historical treatises, such as the handbooks on bookbinding from Hendrik de Haas (1806) and Dirck de Bray (1658), as well as more contemporary sources. *The movement of the Book Spine,* by Tom Conroy (1987) proved to be very helpful in understanding the movement and construction of the spine and the rest of the book. For the construction of guard books, the thesis *Valse vouwen in kaart gebracht,* written by former Book & Paper student Maartje de Boer, was extremely insightful.

There appears to be very little research done into why and how a whole bookblock would deform in the way that the Lakenhal sample books have. Most articles on deformation in (sample) books focus on possible treatments. Other sample books do show forms of deformation due to the added bulk of samples, since most books are not designed to hold the large amount of additional material that is pasted into them.[5] No other sample books were found with such an extreme form of deformation. Even among sample books, the Lakenhal sample books are therefore a unique case with a unique problem.

There is, however, a lot of research on the contents of sample books. One of the current research projects into the textile samples focusses on Burgundian blacks and pre-modern black colour technologies for dyeing fabrics. This project is a collaboration between the ARTECHNE Project, Museum Hof van Busleyden, Studio Claudy Jongstra, the Department Heritage of the University of Antwerp and the Cultural Heritage Agency Research Laboratory.[6]

[5] Library of Congress, *Preservation Basics: Preservation of Scrapbooks and Albums*
[6] Universiteit Utrecht, *Burgundian Black*

Chapter 1 The objects: a closer look

This chapter will focus on the objects and their current condition. It serves as a general condition assessment for all the Lakenhal sample books. An overview of the condition of the individual books can be found in *Appendix I*. The information in this chapter is partially gathered from the results of the survey of the Lakenhal sample books, which will be discussed in *Chapter 2*. Specific components of the books will be discussed: the parchment binding, the paper of the bookblock, the samples and the adhesive material that is used to adhere the samples to the page. To fully understand the current condition of the sample books, it is necessary to place them in their historical context. Therefore, this chapter will start with providing a historical background on Museum the Lakenhal, the Lakenhal sample books and their function in the eighteenth century.

1.1 Historical background

The Lakenhal sample books owe their name not just to the museum that stores them now, but also to the building where they were in use. Museum the Lakenhal was established in 1874 in the historical building called 'Laecken-Halle'. The 'Laecken-Halle' (translates to Cloth Hall in English) was built in 1640 by the Leiden city council to facilitate the examination of woollen cloth produced in the city. Besides examining fabrics, the building was also used to store and sell these fabrics.[7] For centuries Leiden has been the centre of textile production in Holland.[8] Because of this blooming textile industry, Leiden was the biggest trading-city in South-Holland and one of the most important cities in Europe for textile production in the seventeenth century. The 'Leids Laken' that was produced there, was a very firm woollen cloth, that was felted and shaved to make it warmer than most woven fabrics but stronger than felt. These characteristics made the fabric very desirable, and it was sold all over the world. To guarantee the quality of these fabrics, they were thoroughly examined by the 'staalmeesters' (see *Figure 4*). The 'staalmeesters' or 'Sampling Officials' are part of the Drapers guild and were in charge of comparing the fabric brought in to samples that were known to be of good quality. They also made sure that no shortcuts were taken in the dyeing process and that the colours were durable. After the fabrics were sampled and

[7] Museum de Lakenhal, *Het gebouw*.
[8] Holland being defined as a region in the Netherlands, consisting of North- and South-Holland.

Figure 4: *'Staalmeesters' by Jan de Baen (1675) in Museum the Lakenhal. Oil-paint on canvas, 152 × 315 cm. Men examining pieces of fabric and noting down their findings in a book. The man in the middle is holding a small knife to cut out a piece of fabric to store as a sample. Image from Museum the Lakenhal, Inv. Nr. S12.*

tested they received a 'lakenloodje'.[9] This is a small lead seal added to the fabric with information about the fabric and an insignia stamped into it, indicating its origin and standing as a guarantee for the quality (see *Figure 5*).[10] The size of the 'lakenloodjes' also said something about the quality of the fabric, with larger sizes indicating a better quality.[11] Other information could also be found, like initials of a maker, letters and numbers indicating the type of fabric (fine or coarse) and processes of production.[12] But, as with many things, industrialisation brought an end to this thriving craft textile production in Leiden. Most of the textile production was moved to large factories, with their own forms of quality control. The fabric industry in Leiden already started to diminish at the end of the eighteenth century, losing business to cheaper alternatives. Around 1820 the original function of the Lakenhal building was lost. In the following years it was used for different purposes. While the building was otherwise occupied, the objects that were used and stored there, like the Lakenhal sample books, were moved to the municipal archive of Leiden. In 1868 the city council decided to use the Lakenhal building to store some of their antique art and other cultural heritage artefacts. Between 1869 and the opening of Museum the Lakenhal in 1874, the building was transformed into a museum bit by bit, undergoing multiple restorations and additions. The Lakenhal sample books were moved back to the museum from their storage at the

[9] The literal English translation for this would be 'cloth lead', but since there is no proper translation, the Dutch term was used.
[10] Museum de Lakenhal, *Zeven eeuwen Leids laken.*
[11] Mijderwijk 2009: 141-142
[12] Mijderwijk 2009: 143

municipal archive in 1893.[13] The Lakenhal sample books are not on display, mainly due to their condition, but they are a valuable part of the history of Museum the Lakenhal. They are a historic written source for what happened inside the walls of the 'Laecken-halle'. In addition to the 'Lakenloodjes', information about the production of the cloths passing through the Lakenhal was collected in the sample books that are the focus of this thesis. The Lakenhal sample books contain samples of fabrics that passed through the Lakenhal between 1700 to 1790. The samples consist of different kinds of fabrics, but all are black. Next to the samples there is information written by hand about the samples. In the text, names of textile producers and places are given, along with the amount of samples (stale/staal) that were taken (see *Figure 6*). The month can often be found at the top left corner of each page. Most of the written text are abbreviations. It is not always clear what these abbreviations mean. Therefore, more research is needed in the use of these types of administrative sample books and the textile trade in Leiden. This research does not fall in the scope of this thesis, but it does add another layer of relevance to this thesis; to perform this kind of research, the Lakenhal sample books need to be accessible.

Figure 5: *'Lakenloodje' with the Leiden Keys stamped into it. Seventeenth century. Image from Museum the Lakenhal, Inv. Nr. 5360.*

Figure 6: *Detail of Lakenhal sample book 1312.7, showing information on a place (Tilburg), a name (W. van Noort) and date. Image from Museum the Lakenhal, Inv. Nr. 1312.7.*

[13] Museum de Lakenhal, *Het gebouw.*

1.2 Objects description and condition

Now that the books have been placed in a historical context and there is a better understanding of what the books were used for, it is important to look at their material context and understand how the books were made. The Lakenhal sample book collection is dated to the eighteenth century. The books are not dated to when they were made, instead the date on the spine only indicates when the books were used and the samples pasted into them. Even these dates span over a period of 91 years. Some of the books might have been bound at the same time, but it is unlikely that all of them were. As a result, there are some differences in the exact binding method and materials used. The information given in this chapter can be applied to all Lakenhal sample books, unless stated otherwise. The components discussed in this chapter are: the binding, the paper bookblock, the samples, the adhesive and the ink.

1.2.1 The Binding

All the Lakenhal sample books are bound in a vellum laced-case binding, also known as 'spitselband' in Dutch or 'Dutch vellum binding'.[14] A laced case binding is generally defined as a binding in which the cover is attached to the bookblock by lacing the sewing supports through the joints. A part of the sewing supports will thus be visible on the outside of the book.[15] More information on this type of binding and the problems it may cause can be found in *4.1 Book construction and internal factors*. The parchment covers of the Lakenhal sample books are in a relatively good state compared to the bookblock, and are likely of goat or sheep origin. The parchment ranges in colour from yellow to white to grey. The grey colour appears to be mainly caused by surface dirt, but can also be indicative of the degradation of the parchment.[16] Some of the books show signs of water damage in the form of droplets, tidelines and deformation of the parchment. Parchment bindings were very common in the Netherlands, and were often lined on the inside of the cover with a 'good writing paper'.[17] This lining was done because parchment itself can be rather transparent and the lining made the cover more opaque. Most of the parchment of the Lakenhal sample books are lined this way (see *Figure 10* & *11*). This is especially evident in the sample books with detached covers and curling turn-ins. All of the sample books have grey cardboards.

[14] Pickwoad, 2015.
[15] Ligatus, *Laced-case Bindings.*
[16] Hallebeek 1995: 34
[17] De Haas 1984: 138

The sewing supports are visible on the joints of all the Lakenhal sample books. Two different sewing supports are used: parchment strips and alum tawed leather. The sewing support is made out of double parchment strips, one of which is laced through the cover material (see *Figure 7*). Because of the parchment, these sewing supports are flat. The sewing is looped around the parchment strip. The alum tawed leather is the most common among the Lakenhal sample books and can be found on sample books 1312.1 to 1312.21. Here, the sewing support consists of double twisted strips of alum tawed leather, creating a raised support. The sewing loops over both support as if they are one, as they do on the parchment strip (see *Figure 8*). The sewing does not go through the middle of the two supports, as is often the case with double supports. The supports are laced through the cover in the same way as the first method. But after they come out of the joints to the outside of the cover, the two strips are separated and inserted back into the board with a short distance in between the supports, creating a V-shape (see *Figure 9).* Most of the sewing supports are intact. It is notable that only some of the alum tawed sewing supports have broken, while all the parchment supports are intact.

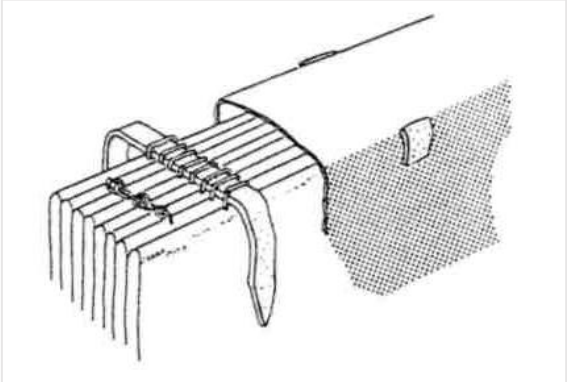


Figure 7: *Laced-case binding. The parchment sewing support laces through the parchment binding. Schematic from Kneep & Binding.*

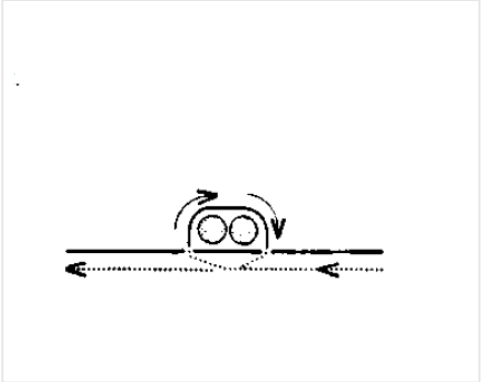


Figure 8: *Sewing loops around both sewing supports at once. Schematic from Kneep & Binding.*

Figure 9: *Alum tawed leather sewing supports, laced in through the joint creating a V-shape. Lakenhal sample books 1312.1. Photograph taken by Margot Terpstra.*

All of the Lakenhal sample books have a hollow spine, which is an inherent feature of the construction of a laced-case binding. There are differences in spine lining and gluing of the spine. Some books have no spine lining and do not show any sign of having been glued at all. An example of this is 1312.1 (see *Figure 10*). Other books have strips of textile spine lining in between the sewing supports and at the head and tail (see *Figure 11*). These books have also been glued on the spine.

All of the books have closing straps made of alum tawed leather.[18] Most of these are broken and missing, remnants can still be seen.

Figure 10: *Lakenhal sample book 1312.1. Double sewing supports made of twisted alum tawed leather. The spine is not glued or lined. Photograph taken by Margot Terpstra.*

Figure 11: *Lakenhal sample book 1312.16. The spine is glued and lined with strips of textiles between the sewing supports and at head and tail of the spine. Photograph taken by Margot Terpstra.*

[18] Except for Lakenhal sample book 1312.31, which has textile ribbons. But these were likely added during the restoration, and are thus not part of the original construction.

1.2.2 The paper bookblock

The bookblock is made from eighteenth century hand-made antique laid paper. The chain lines are parallel to the spine. Paper with the chain lines aligned parallel to the spine generally has a better throw up, so the pages will lie more flat when the book is opened.[19] The paper is made from rags. Because the books were likely not produced at the same time, they contain different watermarks from several places in the Netherlands. One of the watermarks depicts a pro patria lion in a garden. It is very similar to the watermark by C. & J. Honig (see *Figure 12 & 13*).[20] Other watermarks were found with the three crosses of Amsterdam.

Figure 12: *"Papiermonster C. & J. Honig – Pro Patria", Stichting Archief Honig. Image from Zaanse Papiergeschiedenis.*

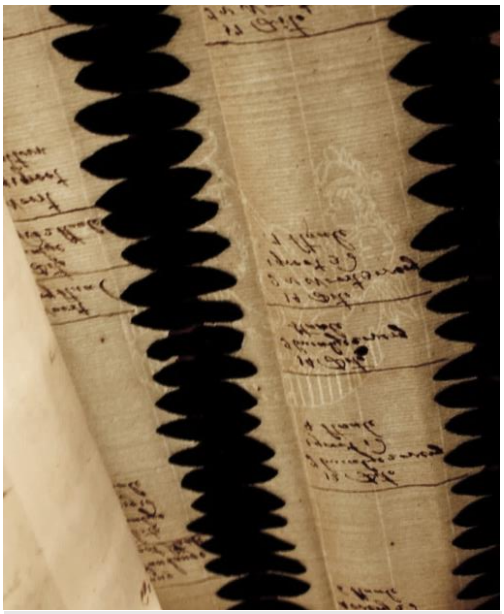


Figure 13: *Watermark on Lakenhal sample book 1312.28. Photograph taken by Margot Terpstra.*

The paper in the bookblock is in a relatively good condition. However, the deformation has caused some of the pages to extend more on the fore-edge than other pages. As a result, the edges of the paper are grey in colour and show a lot of surface dirt. In addition, these edges have a lot of tears and are very brittle (see *Figure 14*). The edges of the bookblock also show signs of surface dirt, especially the top edge, which indicates the books were kept upright at some point.

Although the books could not be weighted, it should be noted that these books feel remarkably light compared to other similar parchment bindings. Especially for their size, the amount of pages and samples they contain. Perhaps the books look

[19] Conroy 1987: 3
[20] Zaanse papiergeschiedenis, *Papiermonster C. & J. Honig*

Figure 14: *Fore-edge of Lakenhal sample book 1312.9 showing surface dirt, brittleness of the paper and edge tears. Note how the pages that lie deeper into the bookblock have less abrasion and surface dirt. Photograph taken by Margot Terpstra.*

bigger than they really are because of the deformation, so you would expect it to be heavier. Half of the volume of these books is not material, but rather the air between the pages. The paper is also relatively thin, and does not add much weight to the bookblock. This means that the paper does not act as a weight upon the paper below, which would keep the paper more flat.

In between the leaves of the bookblock are guards, thee sample books can therefore be defined as guard books: "[a] book containing compensation guards equal to the anticipated thickness of the additional matter to be added at a later time. The guards are sewn with the book and are intended to prevent gaping of the boards or damage to the spine when the book is filled with photographs, clippings, etc. It is also called a stub book."[21] The most common types of guard books are photo-albums and atlases. There are many different types of guards, which serve different functions. Guards can be used to reinforce the sewing holes (sewing guards). This was often done when the paper is thin to stop the sewing thread from tearing holes. In an atlas, guards are used to attach folded maps to make them lie flat when opened (extension guards).[22] The guard pushes the map upwards so it lies flat at a distance from the spine and no information is lost in the fold.[23] These types of guards can be found in sample book 1312.1-1312.3. It is unclear why these types of guards were used for these sample books, since there is no need for the books

[21] Roberts & Etherington: 124
[22] Ligatus, *Guards*
[23] For more information on these types of guards see the master thesis of Maartje de Boer on 'Valse vouwen in kaart gebracht', 2014.

to completely open to 180° in the way an atlas needs to be, and they do not offer much compensation for the thickness of the samples. However, these books are the three oldest in the collection, which might indicate they were ordered together, after which it was decided that these types of guards were not suitable for the use of the books. The guards in the other Lakenhal sample books are loose compensation guards, which are not adhered to the paper using an adhesive. They are wrapped around the outside of each bifolio and bound in. Their main function is to compensate for the thickness of that which is to be pasted to the paper, in this case, textile samples.[24] Although all the Lakenhal sample books have these guards, they are not the same in all books. They are made out of different papers and vary considerably in length. The guards are generally made out of a thicker paper than was used for the bookblock. For a significant amount of the sample books, the guards are made from a grey recycled waste paper with red letters. Some research into the image on the guard showed that these guards are made out of old ream wrappers.

There is another remarkable feature which shows up in twelve of the Lakenhal sample books: a series of pages has been roughly cut out at the end of the bookblock (see *Figure 15*).[25] The paper appears to have been cut out after the book

Figure 15: *Cut out pages at the end of the bookblock in Lakenhal sample book 1312.3 (left) and 1312.9 (right). Sample book 1312.3 still has some pages left before the end of the bookblock, but these appear to be an overview of the different types of fabrics to compare the fabrics to those which still need to be examined. Photographs taken by Margot Terpstra.*

[24] Ligatus, *Guards*
[25] In Lakenhal sample book 1312.3- 1312.5, 1312.8-1312.12, 1312.17 and 1312.22-1312.24

was used, since the cut marks go through the text of the adjacent pages that are still in the book (see *Figure 16*). There are several hypotheses available for why and when these pages were cut out. The pages might have been removed when the books were still in use, either because they were no longer needed or because removing these pages would give the rest of the bookblock more space. Perhaps it was realised early on that the guards did not compensate enough for the added thickness of the samples (see *4.1.2 Influence of the guards*). Another explanation is that the pages were removed at a later stage, either in the municipal archives or in Museum the Lakenhal. The reason might still be the same: to create more room for the bookblock, but with the addition that the deformation was already taking place The extra thickness of otherwise empty pages was perhaps removed to accommodate the remaining deformed pages.

Figure 16: *Cut going through several pages and text. Lakenhal sample book 1312.8. Photograph taken by Margot Terpstra.*

The pages are folded to create four vertical columns, alternating a row of text with a row of samples. These folds are made deliberately and have a function in the books, opposed to folds that were made accidentally by, for instance, mishandling. The deliberate folds which make up the columns are not to be considered as damage, because they are a part of how the books were made and how they were used. The folds should be considered as an intrinsic historical part of these books and their function.

1.2.3 The samples, adhesive and ink

The samples consist of pieces of different black woven woollen textile which are referred to in the sample books as 'Swarte Stale', or 'black samples' (see F*igure 17*). Since the sample books were produced in Leiden, it can be assumed that the fabric is 'Leids laken', as discussed in *1.2 Historical background*. All samples are similar in colour and shape, although there are small

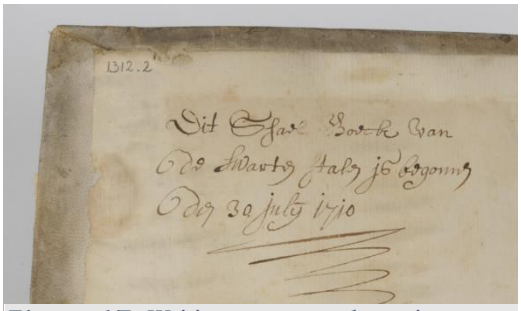


Figure 17: *Writing on paste-down in sample book 1312.2 stating: 'This sample book from the 'Swarte Stale' was started on the 30th of July 1710. Photograph from Museum the Lakenhal, Inv. Nr. 1312.2.*

differences in the size of the samples that were taken. Research done by Museum the Lakenhal found that there are different kinds of fabric: 'saai', 'baai' (bay), 'warp', 'karsaai' (kersey), 'stamet', 'plets' and 'laken'.[26] The fabrics were also categorized into different qualities: 'minder staal', 'enkel staal', 'anderhalf staal', 'dubbel staal' and 'groot staal'.[27] Photographs taken with a microscope lens also show the differences of texture and colour in these samples, which can not easily be seen with the naked eye (see *Figure 18*). Some of the samples appear to be slightly more blue in colour, indicating the use of indigo during the dyeing process. Some samples clearly show the woven nature of the fabric, whilst others are more felted to remove this woven pattern.[28]

Figure 18: *Close up of different textile samples in Lakenhal sample book 1312.3. The samples on the left have a slight blue tinge, while the one in the top right photograph is more 'true black'. In the sample on the bottom right, the woven pattern is still clearly visible. A fingerprint is also visible in the sealing wax. Photographs taken with zoom-lens attachment by Margot Terpstra.*

[26] The Dutch terms were used here since some of the fabrics were only produced in the Netherlands and do not have a proper translation. In some cases the Dutch term was taken from another language and is the same in English. The English term is given when applicable.
[27] Information provided by Jori Zijlmans, curator at Museum the Lakenhal.
[28] Information provided by Jori Zijlmans, curator at Museum the Lakenhal.

The information and the samples are on the recto side of the pages, the verso is generally left blank. Because the samples are always placed in the same column, all the samples are on top of each other; with one row in the middle of the bookblock, and one along the fore-edge. In general, the shape of the deformation appears to follow the location of these samples, grouping them together in bulk. Why this is will be explored further in *4.2.1 Sample tension.* The samples are much thicker than the paper. They also cause the paper to be stiffer in the places where the samples are adhered to. This stiffness is further aggravated by the stiffness of the adhesive material.

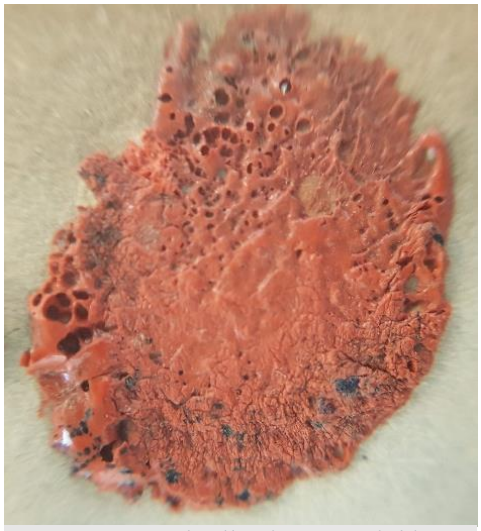


Figure 19: *Red adhesive material in Lakenhal sample book 1312.4. Photographs taken with zoom-lens attachment, taken by Margot Terpstra.*

The samples are adhered to the pages with a red lacquer or wax substance (see *Figure 19*). In appearance it is very similar to a sealing wax used to close letters or a seal adhered to official documents.[29] The chemical composition of the red material is unknown, so no definite statement can be made about them. However, it is very likely a sealing wax of some sorts. Different historical recipes for sealing wax give different ingredients: the *Encyclopaedia Britannica* printed in 1771 states that beeswax and rosin is used, while *Valuable Secrets Concerning Arts and Trades*, printed in 1795, mentions the use of shellac.[30] The wax on the Lakenhal sample books is a hard, shiny, and rigid substance that is brittle in most places: some pieces crumble off when moved. The thickness of the adhesive differs per book. Even within one book the adhesive is applied differently. If the adhesive is a sealing wax it means that it was applied in a warm and liquid state. The use of a sealing wax as an adhesive might also be indicative of the importance of these samples. It might be used as a mark of authenticity to show that these samples were examined and processed in an official fashion. This would explain the use of a sealing wax as a form of adhesive. Sealing wax is not made as an adhesive, and therefore, does not stick very well. A lot of samples have come loose from the red adhesive.

[29] Sealing wax is technically not an adhesive. However, since it is used as such, it will be called an adhesive.
[30] Lapkin et al. 2002: 96

The ink that was used is an iron gall ink. Iron gall ink was the most common form of writing ink in the eighteenth century.[31] Some of the books have ink corrosion, where the ink has completely eroded through the paper, leaving a hole where a letter used to be (see *Figure 20*). This is also a sign of iron gall ink.

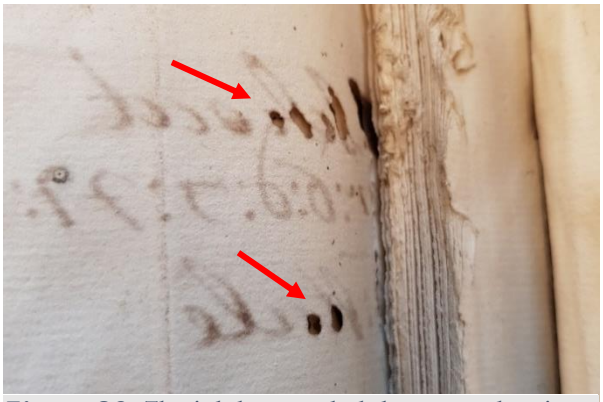


Figure 20: *The ink has eroded the paper, leaving holes. Verso of a page in sample book 1312.8. Photograph taken by Margot Terpstra.*

1.3 Storage conditions

As stated before, the sample books have spent some time in the municipal archives in Leiden, and were returned to the Lakenhal in 1893.[32] It is unknown how they were stored in the archive and in which climate conditions. The depot of Museum the Lakenhal was renovated to facilitate better storage conditions in 1920.[33] In Museum the Lakenhal the books are stored in different ways. Some are stored in a box lined with a silk tissue paper. Most are stored laying down, either wrapped in a blue paper or without any form of protection. Books that are laying down are not stacked. The sample books are now stored in the basement of Museum the Lakenhal. The depot is climate controlled with (de-)humidifiers to 17-18°C and 50-55% relative humidity.[34]

1.4 A special case: Sample book 1312.31

Sample book 1312.31 stands apart from the other sample books, since the bookblock has been treated in the past to reduce the deformation. No official treatment report was found in the digital database of Museum the Lakenhal, so it is unknown what specific treatment was done.[35] This book was sent on loan to the National Ethnographic Museum of Warsaw (Państwowe Muzeum Etnograficzne w Warszawie) in 1987, and it is likely that the restoration of this book was done in

[31] Some carbon inks, based on soot, were also used, but these were generally deemed less suited for writing. Barrow 1948: 292
[32] Museum de Lakenhal, *Het gebouw.*
[33] Information gathered from verbal communication with Jori Zijlmans, curator at Museum the Lakenhal.
[34] Information from correspondence with Museum the Lakenhal, see *Appendix IV.*
[35] Information from correspondence with Museum the Lakenhal, see *Appendix IV.*

preparation of this loan.[36] What can be deduced from the result of the treatment is that all the pages were flattened and lined with an antique laid paper. The paper that was used for lining has a watermark of a lion and a crown with the inscription: 'Pro Patria Eendragt maakt magt'. The contramark are the initials 'VDL' (see *Figure 21*). This paper is a nineteenth century handmade paper made in the Van der Ley papermill.[37] Because of the added paper on the verso of every page, the bookblock is much thicker and does not fit in the parchment binding. The joints on the spine are also broken. The additional paper lining on each page has made the pages very stiff, and they have almost no drape. The watermark on the paper used for lining is similar to a watermark found on the original paper of Lakenhal sample book 1312.16 (see *Figure 22*). It might have been chosen for its similarity.

Figure 21: *Deckle frame with the 'propatria' watermark. Identical to the one found on the paper used for lining 1312.31. Image from Papiergeschiedenis Nederland.*

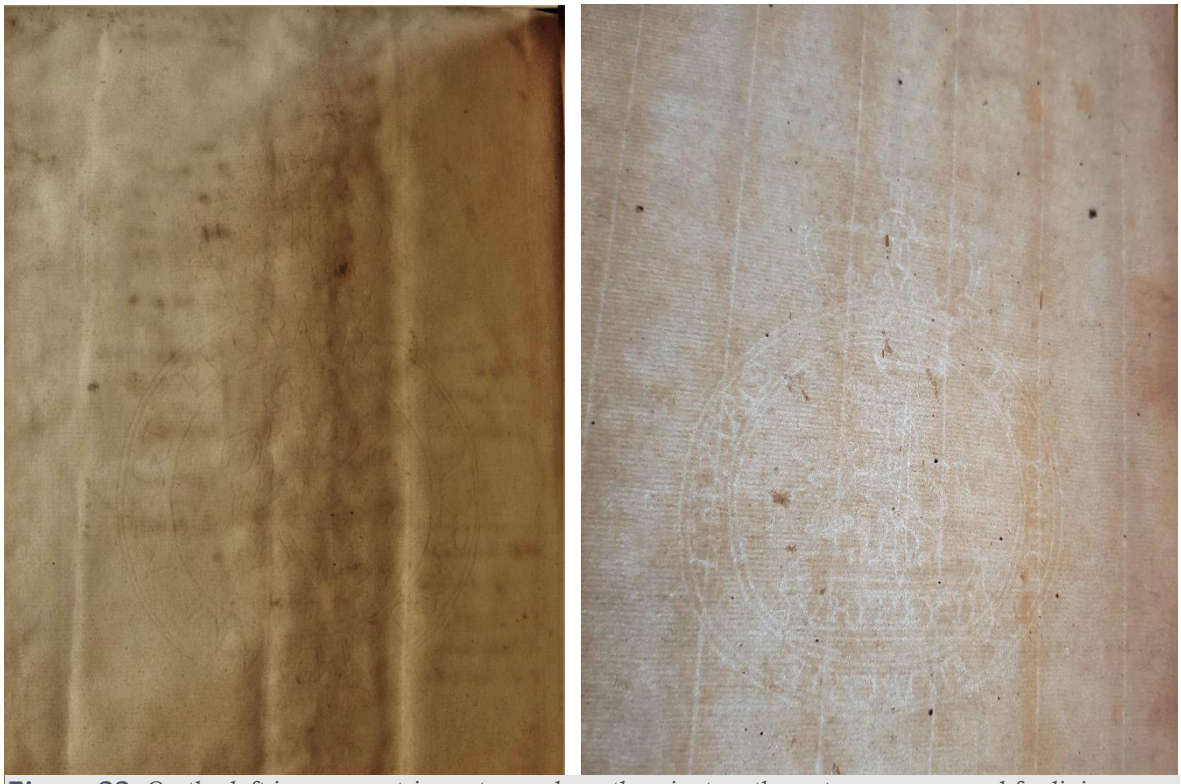


Figure 22: *On the left is a pro-patria watermark on the nineteenth century paper used for lining Lakenhal sample book 1312.31. The two papers pasted together are too thick for light to shine through it. On the right is a pro-patria watermark on the eighteenth century paper found in Lakenhal sample book 1312.16. Photographs taken by Margot Terpstra.*

[36] Information gathered from verbal communication with Jori Zijlmans, curator at Museum de Lakenhal.
[37] Koninklijke Bibliotheek. *De Blauwe Schuit: Het lied van de vergeten ooms*

Chapter 2 Survey

Before starting any type of survey, it is important to establish a goal. To get a better understanding of the specific damages that occur in the Lakenhal sample books, it is important to assess every one of them and compare them with each other. First, detailed information is needed about the objects themselves: What materials do the books consist of? How are the books bound and what is their specific construction? This information will help find common components in the collection that might have contributed to the problem. This information is also needed for the reconstruction. Secondly, the survey will give insight into the type and severity of the damage. Most surveys are done to give an indication of the condition of the objects and possible treatments that might be needed. The primary goal of this survey is not to serve as a tool to give advice about possible preservation or conservation needs, but can of course be used as such.

2.1 Setting up the survey

The Lakenhal sample books are a relatively small collection with only 31 books to survey, so there is no need to take a sample of this collection. The focus in this survey lies on getting more in-depth information for all the individual books. Therefore, a collection condition survey appears to be the most suitable. The Northeast Document Conservation Centre (NEDCC) describes this type of survey as an item-by-item survey carried out by a conservator with detailed knowledge about the type of material or object.[38] This is in contrast to an assessment damage survey, like the UPAA method, which is a sampling method that gives information on the average condition of a collection.[39]

For this survey, the information will be compiled in an excel sheet (see *Appendix II*). Information will be gathered for different topics: metadata, materials, type of binding, condition and specific damages. To establish which topics needed to be assessed, the condition reports and the UPAA damage assessment form, were consulted and incorporated into the excel sheet.[40] Other areas that needed to be included were derived from the damage specific for these books and information that was needed specifically for making the reconstruction. The excel sheet will make it easier to draw comparisons and spot differences between the books. The

[38] Patkus 2003: 2
[39] UPAA stands for 'Universal Procedure for Archival Assessment'
[40] Capiau et al. 2015: 268

survey will be performed by a single person, which will increase the consistency of the results.

In a condition report or survey, objects are often given a status of good, fair or bad, to establish their direct need for conservation or attention. For this survey, the classification of good, fair and bad will not be useful when looking at the condition of the bookblock and the deformation, since all of the bookblocks will fall under the status of bad. The objects will each be given a number, indicating how bad their condition is.[41] To narrow down this classification into four categories or levels of deformation, only the general condition of the bookblock was categorized this way.

1. Bookblock slightly deformed, all pages can be consulted.
2. Bookblock deformed, some pages are inaccessible, small risk of sample loss or damage.
3. Bookblock deformed, a significant number of pages can not be consulted, considerable risk of sample loss or damage.
4. Bookblock deformed, most of the pages can not be consulted, high risk of sample loss or damage.

For the condition of the cover and the binding, the classification of good, fair and bad will be sufficient, since the overall condition of these components is much better. This survey will also look for specific signs of moisture damage like droplets, tidelines, cockling, bleeding of ink and iron gall ink corrosion.

2.2 Performing the survey

Originally, the survey was planned to be performed over the span of a couple of days, in which all sample books would be looked at individually. Unfortunately, this was impossible.[42] Instead, most of the information was gathered from detailed photographs on the museum's website. Some of the information is not visible on these photographs, such as the sewing method or spine linings. These areas are left blank in the excel sheet, so they might be filled in at a later stage. Nine of the

[41] This system was based on the 'consultability' level given for the survey of a large collection, devised to survey large Dutch collections. Havermans 1999: 50
[42] See authors note.

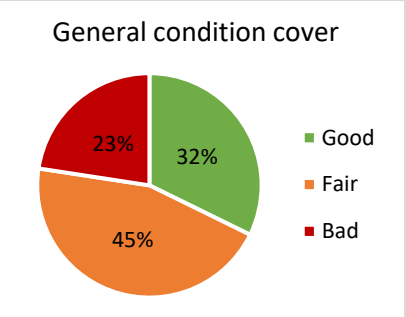
books were viewed in person, and are described in more detail (see *Appendix I* & *II*).[43]

2.3 Results of the survey

The results of the survey were logged in an excel sheet, which can be found in *Appendix II*. Some of the more noticeable results are discussed here.

2.3.1 Cover

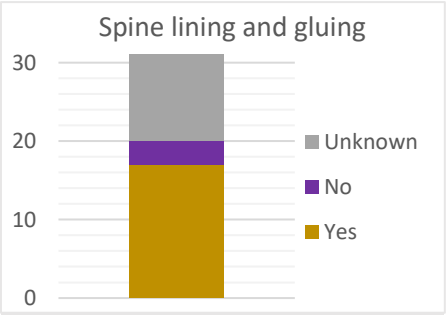
In general , the covers are in a fair condition. Of the 31 sample books, nineteen (61%) show immediate signs of having been in contact with water, such as tidelines and drops on the parchment. The covers that were deemed to be in good condition usually only had a few signs of drops. Larger tidelines were more often accompanied by a darker and greyer colour of parchment. Darker areas on the parchment are more commonly situated on the spine and the fore-edge, which would indicate these were more exposed.



Graph 1: *General condition of the cover of the Lakenhal sample books. 31 books in data. Graph made by Margot Terpstra.*

2.3.2 Spine

For the purpose of this survey, the spine refers to the spine of the bookblock, and not the spine of the parchment cover material. Overall, all the spines of the bookblock were still intact and in a fair condition. Nine of the books (29%) had a concave spine. In seventeen (55%) of the books the spine was glued and lined and three (10%) were not lined or glued at all (see *Graph 2*). For some of the books it was not possible to get a clear view of the spine construction. The books that have a concave spine also have spine lining. The books with a very concave spine also have protruding quires at the fore-edge. The concave shape of the spine pushes the whole bookblock forwards, making them extend beyond the fore-edge of the cover. The fore-edges of



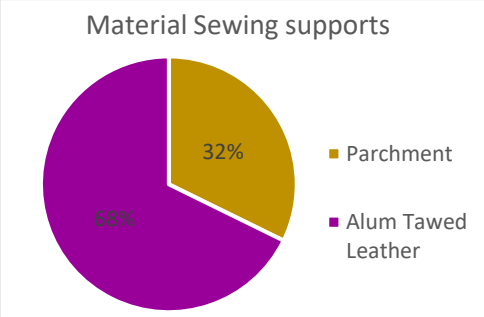
Graph 2: *Spine lining and gluing. 31 books in data. Graph made by Margot Terpstra.*

[43] Sample books 1312.1, 1312.3, 1312.4, 1312.8, 1312.9, 1312.16, 1312.27, 1312.28 and 1312.31.

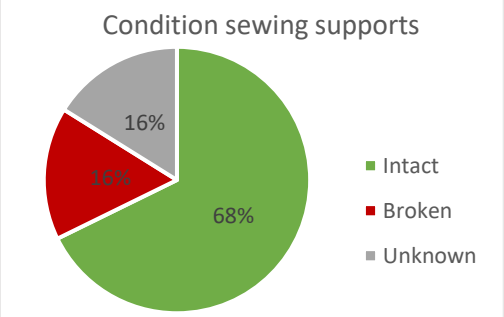
the paper bookblock that extend beyond the cover are covered in edge-tears and surface dirt. The general deformation level of these books is also higher.[44]

2.3.3 Sewing structure and closing chords

Almost all of the sewing threads are intact. However, some of the sewing supports are not. Five (16%) of the Lakenhal sample books have one or more broken sewing supports (see *Graph 4*). All of the broken supports are made out of alum tawed leather. The fastening straps are also made out of alum tawed leather. All of these are broken and have parts missing to varying degrees.



Graph 3: *Material of the sewing supports 31 books in data. Graph made by Margot Terpstra.*



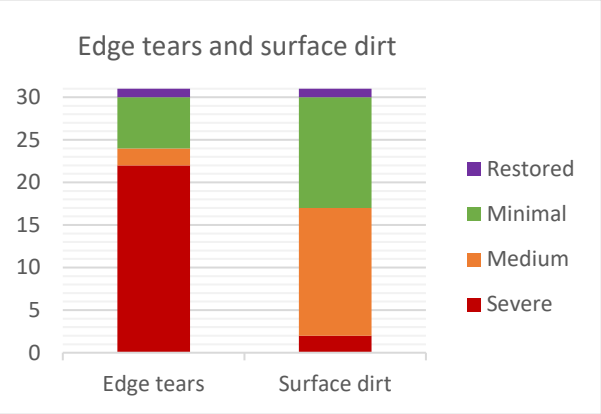
Graph 4: *General condition of the sewing supports. 31 books in data. Graph made by Margot Terpstra.*

2.3.4 Bookblock

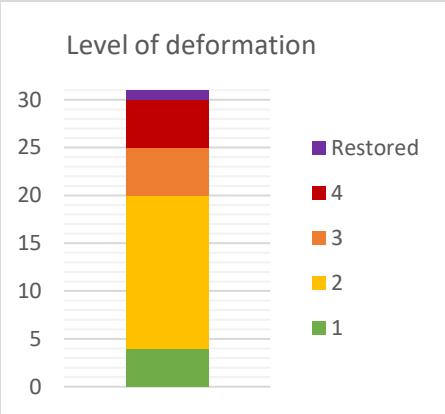
All the edges of the paper have surface dirt in the form of grey/brown edges. The edges of the paper are more brittle, which has resulted in edge tears and loss of material. All the books have some degree of edge tears (see *Graph 5)*. Most of the books are only partially consultable, where some parts of the book can not be handled without causing damage to the book (see *Graph 6*). There does not appear to be a direct link between the level of deformation and edge tears or surface dirt (see *Graph 7* & *8*). Sometimes the deformation has pushed the paper outwards towards the fore-edge, where it is then more exposed to dirt and abrasions, while in other cases, the deformation has pulled the pages into the bookblock, where they are more protected.

Twelve (39%) of the sample books have pages cut out at the end of the bookblock.[45] They are roughly cut where the guards end. The guards themselves are still intact. These books generally have a lower level of deformation: most are a level 2.

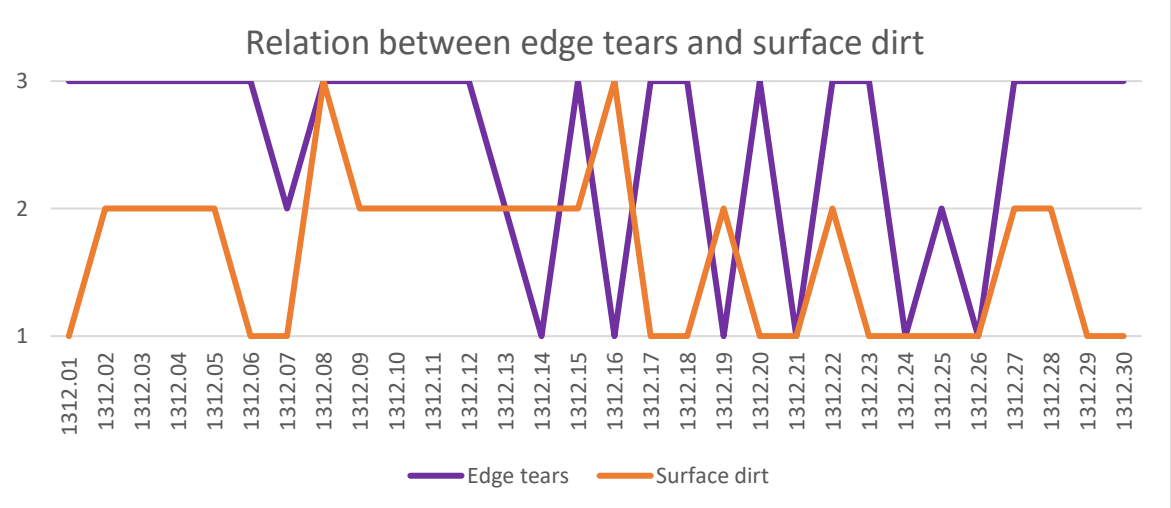
[44] Lakenhal sample books 1312.26-1312.29
[45] Lakenhal sample book 1312.3 – 1312-5, 1312.8 – 1312.12, 1312.16 and 1312.22 – 1312.24



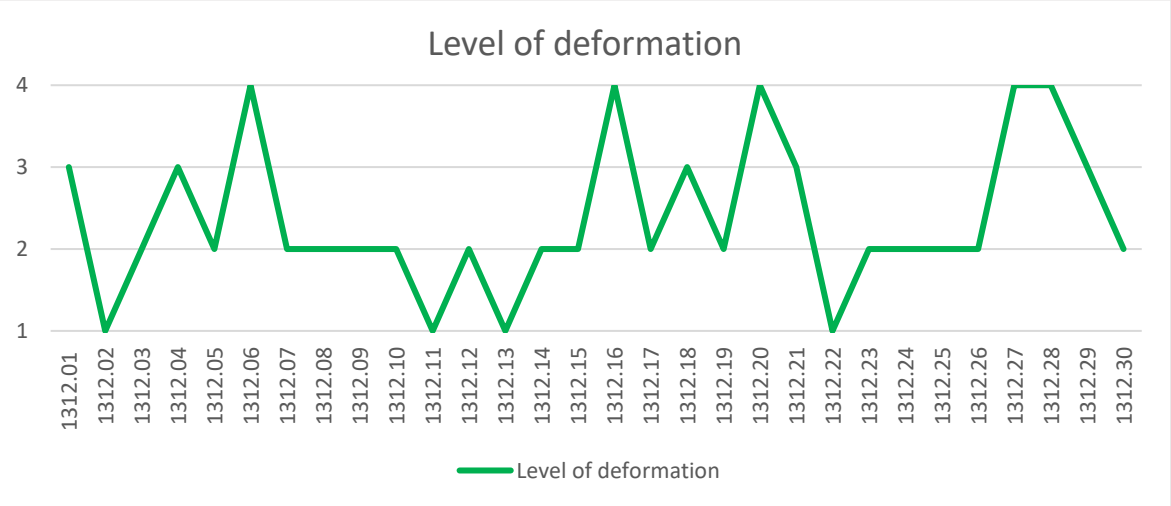
Graph 5: *Edge tears and surface dirt on the paper of the bookblock. 31 books in data. Graph made by Margot Terpstra.*



Graph 6: *Level of deformation of the bookblock. 31 books in data. Graph made by Margot Terpstra.*



Graph 7: *Relation between edge tears and surface dirt on the paper. 1= minimal, 2= medium, 3= severe. 30 books in data. Graph made by Margot Terpstra.*



Graph 8: *Level of deformation. 30 books in data. Graph made by Margot Terpstra.*

2.3.5 Guards

Most of the guards are not attached to the paper other than through sewing. They are wrapped around the outside of each bifolio and sewn with the bookblock. Only three of the guards and their way of attachment is different: on sample book 1312.1 to 1312.3. These guards are much longer than the rest. In these books, the paper of the bookblock is not sewn in, but pasted onto the end of the guards as an extension guard. There appears to be no direct link between the length of the guards and the level of deformation.

2.4 Conclusion survey

The results gathered in this chapter have given a good insight in the current condition of the books and the prevalence of some of the components for the cause of the deformation. Overall, the bindings are in a fair condition, whereas the bookblock are considerably worse. A third of the Lakenhal sample books are partly inaccessible, and can not be safely handled without causing further damage. In particular, the survey has shown that the addition of spine lining, the material for the sewing support and the length of the guards do not have a large influence on the deformation. The sample books with a concave spine also have more surface dirt and edge tears, but this does not relate to the level of deformation in the rest of the bookblock. The level of deformation is also not directly linked to the cut out pages at the end of the bookblock, which some books have. This does however affect the shape of the deformation, which will be discussed in *4.2 Empty spaces and tension*. With these components excluded as having a large influence on the deformation, it will be necessary to focus on the components which all the Lakenhal sample books have in common: the deliberate folds and the addition of samples. These components were all added at a later stage, after the binding, and were likely done in the Lakenhal.

The information gathered in this survey will also be used in the decision process of the reconstruction, which will be discussed in the next chapter.

Chapter 3 Reconstruction

When trying to explain a physical phenomenon, it is not always enough to substantiate the argument with literature alone. So, it was decided to make a reconstruction of the Lakenhal sample books. A reconstruction can have different goals: it can function as a stand-in for performing tests, or help the researcher understand how an object is made and how it functions. The goal of this reconstruction is to see what the books looked like before they were deformed and to better understand their construction. When there is a better understanding of how the construction works, and how the paper moves with addition of the samples, it might indicate the problematic areas in the book that led to the deformation. For instance, do the intentionally created folds that make up the columns cause tension in the paper? And what is the influence of the addition of the samples on the behaviour of the bookblock?

3.1 Preparing for the reconstruction

Before starting the actual reconstruction, some things need to be decided first. The choices for a reconstruction can be based on different sources of information: looking at the object itself, in this case how the book was bound and what materials were used; information left to us by the maker; historical tools that are still available; contemporary treatises describing the process and modern research into the chemical, material and conservation aspects of an object.[46] This reconstruction will mostly rely on contemporary treatises and the objects themselves.

The first decision that was made is that the reconstruction will only encompass the bookblock, and not the parchment binding. This decision was made because most of the problems are centred around the bookblock. Making a full parchment binding would be both costly and time consuming, and would probably not lead to more or better results.

Other decisions had to do with what would actually be reconstructed. There are 31 Lakenhal sample books, with slight variations in binding method, size and materials. Because of these variations, the assumption can be made that not all of them have a decisive influence on the deformation. This has also been confirmed by the survey. So, for the reconstruction, and wherever possible, the most common

[46] Stijnman 2005: 2

features were chosen. The materials that were used for the reconstruction were chosen to resemble those of the original. For a full list of the materials used for the reconstruction, see *Appendix III*.

3.1.1 Paper

The paper that was chosen is similar in weight and thickness to the eighteenth century paper used in the Lakenhal sample books. It is a modern handmade laid paper with a grammage of 80 gsm.[47] The paper is wood-free and Hollander beaten. When folding the quires, the chain lines will be aligned parallel to the spine, as is the case with the Lakenhal sample books. Another important factor is the direction of the folds. There are three folds in every page. These were counted from the spine to the fore-edge and given a symbol to indicate the direction of the fold. Viewed from the recto side, a 'v' fold indicates the paper was folded towards the recto side, and the shape of the fold points down. A '^' indicates that the paper was folded to the verso side and the fold in the paper points upwards. From the results of the survey it is apparent that the most dominant pattern is 'v-v-^'.[48] It appeared that the direction of the folds in one book was always the same. So for the reconstruction, this pattern was used. There is a question about whether the paper was folded before or after the book was bound. It is more likely that the books were bound first. During the testing phase, it became apparent that it is difficult to bind a book with pre-folded pages. This makes it more plausible that the folding of the columns was done after binding. It is also more likely that the pages were folded after binding so it could be done to the specific needs of the user. For the size of the paper, the average of the books was taken. The books have an average size of 323 (height) x 230 (width) x 95 (thickness) mm, and an average of 136 pages, or 68 bifolio's.

3.1.2 Guards

Most of the guards of the Lakenhal sample books are made from ream wrappers, which are not easy to come by. Therefore, it was decided to choose a paper that was similar in thickness and weight. Due to availability and similarity in thickness and weight an antique laid Van Gelder paper was chosen. The chain lines run parallel to the spine, just as the paper of the bookblock.

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[47] This paper was produced by Gangolf Ulrich in Berlin, and contains a watermark of a hand in the bottom right corner showing the initials 'GU'. Nr. 6, Laid, 80 gsm.

[48] "^-^-v", which is the same pattern but upside down was also seen. In a few cases a "v-^-v" was observed. But this seemed to be the exception.

3.1.3 Wax

No chemical analyses could be done to see what type of wax was used for the Lakenhal sample books. However, based on feel, appearance and timeframe, the wax is probably a shellac based sealing wax. The most important characteristic of the wax that was to be imitated for the reconstruction is the stiffness of the wax itself and the rigidity it adds to the paper: the wax should break, rather than bend. The wax that was chosen for the reconstruction is a conservation grade sealing wax used for the consolidation of historic wax seals.

3.1.4 Samples

The exact composition of the fabric is unknown, so it is hard to pick a fabric that is similar. Concerning the effect that the sample has on the book and the deformation, two factors are important: the thickness and the stiffness of the material. A woven black felt fabric was chosen because it matched these factors. A comparison between close-up photos shows the similarities between the fabric in the Lakenhal sample books and the one chosen for the reconstruction (see *Figure 23*). The textile used for the reconstruction is slightly finer, but since there are different qualities of fibre and textile in the Lakenhal sample books as well, this will likely not be an insuperable issue.

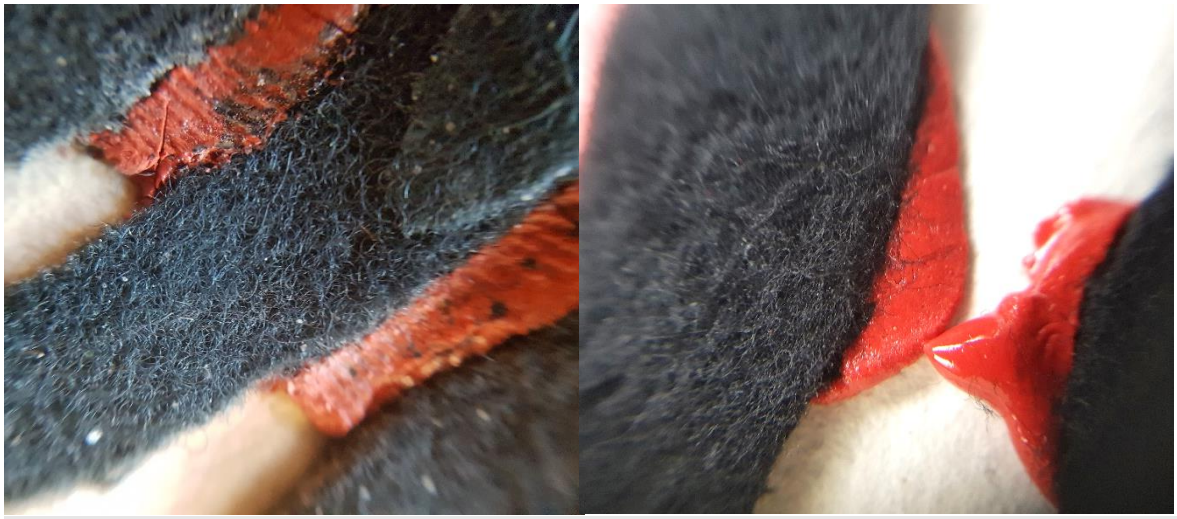

Figure 23: *Comparison of the black woven textiles and sealing wax under magnification. Left: Sample from Lakenhal sample book 1312.3. Right: sample used for reconstruction. Photographs taken by Margot Terpstra.*

3.1.5 Binding materials

A linen sewing thread was chosen that was waxed using bees wax. The sewing thread was often waxed this way to keep it from tangling.[49] For the sewing support, parchment strips were chosen. Although the majority of the Lakenhal sample books are sewn on alum tawed chords, this material is much harder to come by and is preferably used with a sewing frame, which is also not available for this reconstruction. The survey also showed that the material of the sewing support does not have a significant influence on the deformation. The parchment strips are more in line with the type of binding: the 'spitselband'. Often, two strips of parchment, placed on top of one another, were used.[50] Only one of these would be laced through the cover.[51] Since only one of the parchment strips is laced through the cover, the other remains invisible and hidden under de binding. On all the Lakenhal sample books with parchment sewing supports, the binding was still intact. Although it couldn't be confirmed that the sample books used double parchment supports, it appeared to be common practice at the time, and was therefore implemented in the reconstruction.

3.2 The reconstruction

Most of the reconstruction was based on the book *De Boekbinder* (*The Bookbinder*), a treatise published in 1806 by Hendrik de Haas. It is one of the oldest Dutch publications of its kind describing the art of bookbinding in great detail.[52] In the book, De Haas, who had been a bookbinder for 50 years at the time of its publication, describes the steps of bookbinding according to eighteenth century Dutch practices. Another, even earlier description on bookbinding is *Kort onderweijs van het boeckenbinden* (*A short introduction in the Binding of Books)*, written by Dirck de Bray in 1658. It is a short concise illustrated manuscript. Although this book was written before the Lakenhal sample books were produced, the text and illustrations still give a good description of the practices, and as stated in the introduction to De Bray's treatise, the practice of parchment bindings continued well into the eighteenth century, more or less in the same fashion.[53] Therefore, De Bray's treatise was also consulted for some of the steps and compared to those of De Haas. In the following part of the chapter, every step of

[49] De Bray 2012: 68
[50] De Haas 1984: 20
[51] De Bray 2012: 84
[52] De Haas 1984: *"Over de Auteur"*
[53] De Bray 2012: 12

the reconstruction will be described and illustrated with the use of photographs of the process.

3.2.1 Folding the quires and guards

The books are composed of single bifolio's. So the paper sheet should be folded once. Most contemporary sources go into great detail of folding the sheet of paper in such a way that the printed text aligns neatly next to each other, and in the right order, when the quire is folded. The Lakenhal sample books have no printed text, and were probably empty when bound, so there is no need to align any text. When the quire is folded, the fold is pressed using a bonefolder, starting in the middle and going outwards.[54] The guards are folded in the same way.

After folding, the quires would usually be pressed in a book press. According to De Haas, this was done for as long as possible, and at least 2 to 4 hours.[55] The bifolio's were thus pressed overnight. De Haas says nothing about pressing the guards, so the fold was only enhanced using a bonefolder.

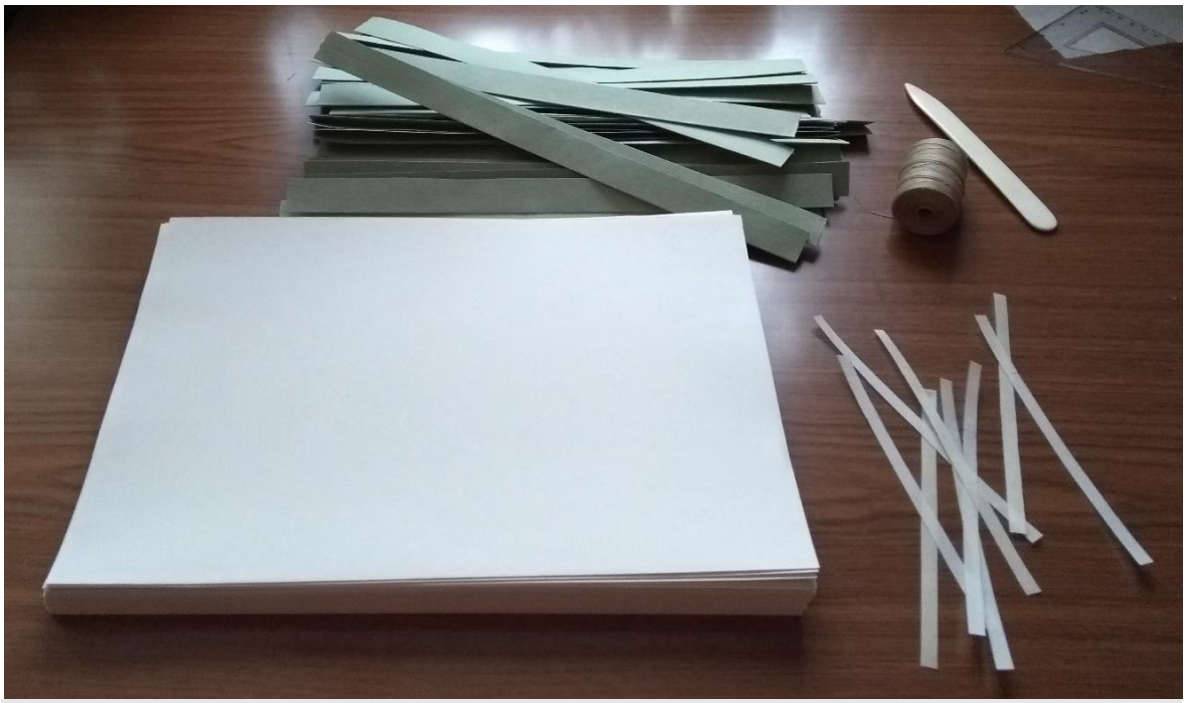

Figure 24: *Materials needed for the reconstruction: Folded quires, folded guards, parchment strips for sewing support, linen sewing thread and a bonefolder. Photograph taken by Margot Terpstra.*

[54] De Bray 2012: 60, De Haas 1984: 1-6
[55] De Haas 1984: 19

3.2.2 Sewing

The folded bifolios and the guards then need to be bound together. The binding method will partially be based on visual analysis of the books. The sewing will be done all-along, from inside to outside. All the books have six sewing stations in total, with four of those being the sewing supports, and two kettle-stitches at the head and tail end. According to De Haas, the parchment strips that make up the sewing support are ¼ thumb wide, and 1½ thumb longer than the book is thick.[56] He uses the 'Amsterdam footsize'.[57] An 'Amsterdam thumb' is 2.57 cm.[58] So, the parchment strips need to be 0.6425 cm wide and 3.855 cm long (excluding the thickness of the book). Each sewing support is spaced four (10,28 cm) thumbs apart, but only two (5,14 cm) between sewing support and chain-stitch. Preferably, the head is kept half a thumb shorter than the tail end.[59] According to De Haas's instructions, this book will then be 52,685 cm long (20,5 thumbs with four sewing supports). If this ratio is maintained, and the spine of the reconstruction is 34,5 cm, a thumb would be 1,68 cm. Using the same ratio, the distance between the sewing supports was calculated. Sewing was done without a frame and using blind-stabbing: pricking the holes as you go, without pre-pricking the quire beforehand.

During sewing, it became clear that the original plan of sewing 50 bifolio's, creating 100 pages, was a little excessive. After 30 bifolio's, it was decided that this would suffice for the purpose of this reconstruction. With 30 bifolio's, the spine is already 4 cm wide (see *Figure 25*).

Figure 25: *Spine of the reconstruction after sewing 30 bifolio's. Photograph taken by Margot Terpstra.*

[56] De Haas 1984: 20
[57] De Haas 1984: XV
[58] Meertens Instituut
[59] De Haas 1984: 20

Most of the spines of the Lakenhal sample books were lined in some way. De Bray instructs to trim the edges using a plough.[60] He also says the spine of the books should be hammered into shape.[61] However, due to a lack of sufficient tools and materials to do so, these steps were omitted, and the spines were left bare.[62] Trimming the edges has no structural function, and the omission of this step has no implication for the movement of the book. Some of the Lakenhal sample books have no spine lining, and most, if not all, are not hammered.[63] In addition, and as stated in *3.1.2 Guards*, guards books were often not pressed or lined after sewing, because the construction of guard books make these steps more difficult.[64]

3.2.3 Folding columns

The columns were folded according to the pattern described in *3.1.1 Paper*: 'v-v-^'. This pattern indicates that the paper was first folded in the middle, before folding it a second time, to create four columns of equal width. For the first middle fold, the fore-edge was lifted and folded towards the spine. The fore-edge of the paper was aligned with the end of the guard. When aligned to the guard, it creates columns of equal width on the outside pages of the bifolio, where the guards are visible. On the inside, however, the column nearest to the spine ends up slightly wider, since there is no visible guard. When the paper would be folded towards the spine, instead of the guard, it left a very narrow column with limited space for writing. The second fold was done in the same direction, giving three folds in the desired pattern that separate four columns (see *Figure 26* & *27*).

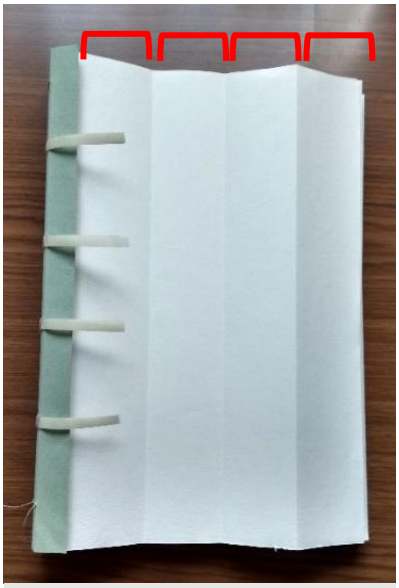

Figure 26: *Folding of the quires to create 4 columns of equal distance for writing and adhering the samples. Photograph taken by Margot Terpstra.*

Figure 27: *Schematic of how the page was folded to create the columns. Schematic made by Margot Terpstra.*

[60] De Bray 2012: 70-72
[61] De Bray 2012: 62
[62] See *Authors note*
[63] Because not all the Lakenhal sample books could be inspected in person, no definite statement can be made regarding the spine of the bookblock and whether none of the spines are hammered.
[64] Vaughan 2013: 41, 138

3.2.4 Adhering samples

The last step of the reconstruction is applying the textile samples with the sealing wax. This step is not described in the treatises of De Haas or De Bray, as it is not common practice in bookbinding. This step would also not have been done by the bookbinder, but at the Lakenhal. To apply the wax, it is heated in a spoon above a flame until it is melted completely. No thermometer was used during this process, as it would not have been used historically. Instead, a process of trial and error was used to determine whether the wax was melted enough to be easily dripped onto the paper. While the wax was still hot, the sample was pressed down into it. In the Lakenhal sample books, fingerprints could be seen in the wax, so the same method of pressing down the sample using a finger, was applied for the reconstruction. Something that was noted during this application process, is that when the wax is pressed down with a finger, the hardening wax and the paper underneath take on the slightly rounded shape of the finger (see *Figure 28*). When the sealing wax is dry and hardened, this shape remains in the paper. The addition of samples to the paper also creates another form of tension, which started at the moment when they were applied. Especially the sealing wax, since it was applied when in a hot and liquid state: the paper is locally subjected to heat and moisture. This heat and moisture can cause the paper to cockle and deform locally. This will be discussed in more detail in *4.3.1 The Cockling phenomenon.*

Figure 28: *The samples and the paper take on a slight curve because they are pressed down using a finger. Photograph taken by Margot Terpstra.*

3.3 Results of the reconstruction

The making of this reconstruction was very educational in understanding the shape that the bookblock takes on and the way the paper changes and behaves once the samples have been applied. When the book is closed, the fore-edge is already much wider than the spine, even when the book is not yet completely filled with samples. This indicates that the guards do not adequately compensate for the thickness of the samples. It can also be observed that the samples in the fore-edge column appear to migrate inwards towards the spine, probably because they are being pulled slightly upwards by the fold. This gives the fore-edge a slight curve.

(see *Figure 29*). What can also be observed is the empty space between the pages. With the addition of samples, the bookblock is no longer a solid block of paper lying flat on top of each other. While the samples lie on top of each other, the rest of the paper is suspended between the samples and the guards.

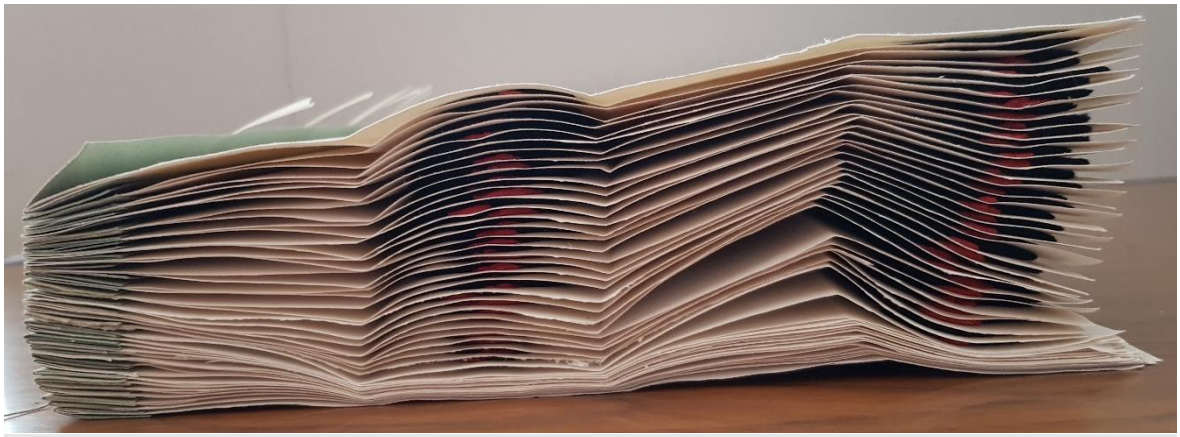

Figure 29: *Closed reconstruction. The column on the fore-edge shows the first signs of deformation and tend to bend inwards towards the spine. Photograph taken by Margot Terpstra.*

When the book is opened, the folds have a more extreme effect than when the book is closed. The beginnings of a wave-shape deformation becomes apparent. Specifically around the fold closest to the fore-edge. This fold points downwards when the book is opened, pulling the samples along the fore-edge downwards with it, and curving the fore-edge inwards into the bookblock (see *Figure 30*). This can also be seen in some of the Lakenhal sample books. The folds set the stage for the deformation to happen. The extra space between the pages is also clearly visible, especially in the column closest to the spine.

Figure 30: *Reconstruction when the book is opened. The folds already create a 'wave'-shape. Photograph taken by Margot Terpstra.*

The most notable of the results from the reconstruction appears to be the deliberate folds for the columns, which pull the paper into the bookblock towards the spine. This is the start of the paper moving and migrating into a part of the

bookblock where it does not originally belong. In addition, the samples create empty spaces between the pages, where the paper can subsequently move to. The paper is less stiff in the areas without samples, and is therefore more prone to deform in this area. The addition of the empty space created between the pages due to the guards and samples adds to the possibility of movement, but also restricts it into specific directions. Another problem, which would be even more aggravated with the addition of a full parchment cover and boards, is that the guards do not give adequate compensation for the thickness of the samples. The guards and the cover trap the paper and the bulk of samples inside the space of the bookblock. It should be noted that all these problems are inherent to the construction of the book, and are there from the very start. Even without the influence of external factors such as (mis)handling of the books, climate conditions, and the natural passing of time and degradation of materials, there are internal problems in the books which lead to deformation. All of these problematic components of the construction will be analysed in the next chapter on the construction, tension and causes of the deformation.

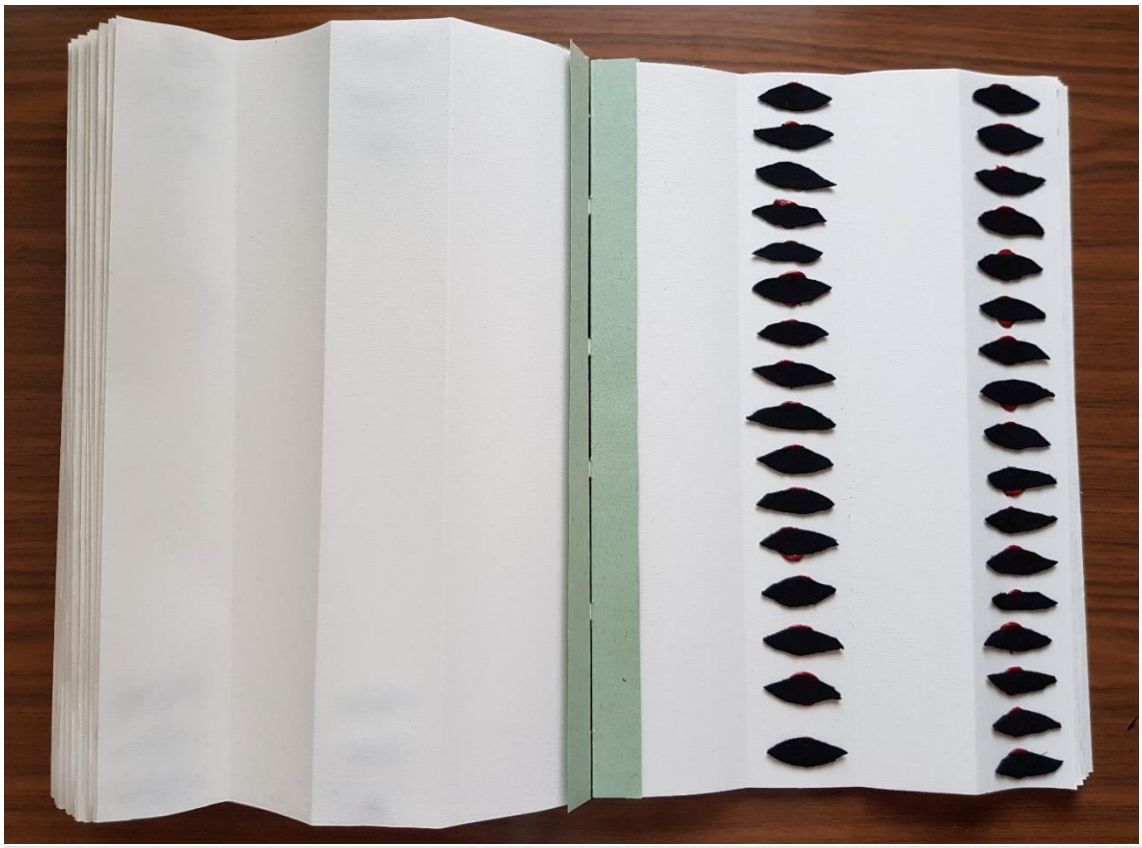

Figure 31: *Reconstruction, opened in the middle. Photograph taken by Margot Terpstra.*

Chapter 4 Construction, tensions and causes

By looking at the Lakenhal sample books and making the reconstruction, some problematic areas of the construction of the books have become apparent, namely: the guards, the deliberate folds made to create columns and the addition of samples to the page. This chapter contains a literary analysis of these different factors, to determine what their influence is on the deformation of the Lakenhal sample books. In the first part of this chapter, the construction and different components of the binding are discussed, especially the addition of guards to the book. How a book is made and how it was bound can already provide some clues to the perceived damage, since some problems are inherent to a specific construction. This has already become apparent in *Chapter 3*. In the second part of this chapter, the focus will be on the paper of the bookblock, and how tension and stresses, created by the construction, might have contributed to the deformation. This will also include a discussion on the extra tension created by the thickness and method of application of the samples and the sealing wax adhesive. Finally, in the last part of this chapter, the focus will be on external causes for the damage, most importantly: water damage.

4.1 Book construction and internal factors

The construction of a book, or how the book was made, has a significant influence on how the book opens and moves when handled. The construction also has an influence on the function, how the book is used, and vice versa. Books that are made for writing in, like the Lakenhal sample books, need a construction that allows the pages to lie flat when the book is open, while a book for reading does not have a need for this type of construction. So, the construction, the function, it's use and how the book moves all influence each other (see *Figure 32*).

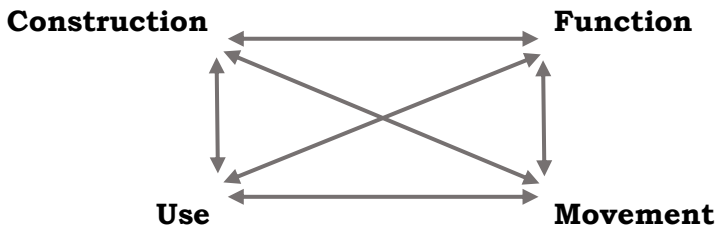

Figure 32: *Schematic showing the influence of construction, function, use and movement on one another. Schematic made by Margot Terpstra.*

As mentioned in *1.1.1. The Binding*, the books are laced-case bindings or 'spitselbanden'. The 'spitselband' was a common binding method in the Netherlands in the seventeenth and eighteenth century. The name derives from the sewing support that is cut into a point, a 'spitsel', and laced through the hinge of the cover material. The sewing supports, and the pastedowns, are the main link between bookblock and cover. Because the sewing supports are the main connection, these components are also the ones undergoing the most stress when the book is being handled. In some of the Lakenhal sample books the sewing supports have already broken and the inner joint has torn, leaving the cover partly detached. Laced-case bindings are characterized by a smooth hollow spine and an open joint.[65] This is important for how the book will open, which will be discussed further in *3.1.1 Movement of the spine.*

The spine is not the only part of a book that moves. All the pages move in relation to each other, both parallel and perpendicular to each other. Every tension and weakness that is created during construction stays in the book. Movement and use of the book accentuate these tensions and weaknesses in the form of folds, tears or deformations. It can be imagined that an administration book used in a fabric trade hall was not treated with the same care that a more valuable manuscript would have been. The Lakenhal sample books were used quite intensively and almost daily over the period of at least a year. They were written in, samples were pasted into them and, being part of an active industry, they were probably moved around and consulted a lot. Part of the damage is likely caused by (improper) handling. When leafing through the book, the samples and paper tend to get stuck behind other samples, and may be torn out when quickly leaving through a book. In addition, when the book is closed with a page stuck behind a sample, the weight of the pages on top of the misplaced sheet will press this page into its wrong position. More about this in *3.1.2 Influence of the Guards*.

These two factors, how the spine moves and the influence of the guards on the movement of the paper, are important when looking at the influence of the construction on the deformation. They will be discussed in more detail below.

[65] De Bray 2012: 27

4.1.1 Movement of the spine

Since the Lakenhal sample books are all laced-case bindings, they all have a hollow spine. This means that when the book is opened the pages will be pushed upwards and the spine will become concave (see *Figure 33*). The amount of throw-up depends on the gluing and lining of the spine, as well as on the stiffness of the paper.[66] None of the backs of the sample books show signs of being rounded or hammered during the bookbinding process. When no hammering or rounding takes place, the spine of the bookblock will remain rather flat and flexible. With this type of construction, the spine of the book has to move less to give the right throw-up for the pages to open flat. The downside of this is that the stress of movement rests on the sewing and sewing supports and joints.

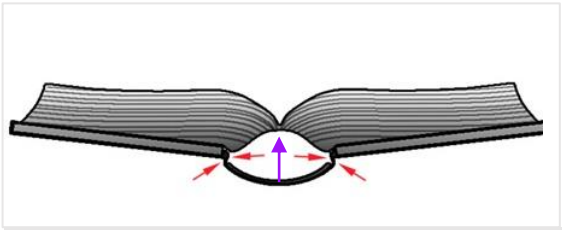

Figure 33: *Hollow spine construction. Red arrows indicating the stress on the joints and the sewing supports. Purple arrow indicates the direction the bookblock is pushed when the book is opened. Schematic made by Femke Prinsen.*

One of the differences among the Lakenhal sample books is how the spines of the bookblock were treated during the binding process. Some books have no spine lining and are not glued. Others only have narrow strips of spine lining in between the sewing supports and at head and tail. A spine lining will make the spine of the bookblock more rigid, but it will also hold the shape of the spine better. Without adequate spine lining the book easily loses its shape and becomes permanently concave.[67] This can be seen in some of the sample books: 1312.19, 1312.21 and 1312.26 to 1312.30. When a spine is concave when unopened, it pushes the middle of the bookblock forwards, and parts of the fore-edge will protrude and be exposed to fraying and pollution (see *Figure 34*).[68] Although not all of the Lakenhal sample books have concave spines, the wave-deformation of the bookblock has caused the same effect of pushing some of the pages towards the fore-edge, while other pages are pushed back into the bookblock. In the Lakenhal sample books, not all the books that have concave spines have these protruding pages, because the

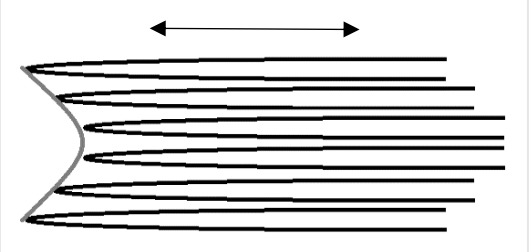

Figure 34: *The quires move horizontally over one another, making some of the quires stick out at the fore-edge. Schematic made by Margot Terpstra.*

[66] Conroy 1987: 3
[67] Conroy 1987: 8
[68] Conroy 1987: 8

deformation moves the pages in a different direction. One of the reasons the pages can move so easily horizontal, or parallel to one another is the flexible construction of the spine.

When looking at the movement and construction of the spine, another factor that needs to be considered is that the Lakenhal sample books are guard books. The addition of guards creates empty spaces between the pages. The bookblock is therefore not a solid block. It is much thicker at the spine, where the guards are, than in the rest of the book. A lot of bookbinding steps for constructing the spine of the bookblock, which include cutting, pressing, gluing, rounding and backing, call for the book to be fixated in a bench. This becomes problematic in guard books because pressing the book would press the shape of the guards into their neighbouring papers and deform the bookblock. Pressure can not be applied evenly, but can only be applied on the area of the spine where the guards are. The rest of the pages are still able to move. For the same reason, hammering to round the spine would deform the bookblock because the paper would be pushed into these empty spaces (see *Figure 35*).[69] These empty spaces, or 'pockets of air' between the pages will cause problems, which will be discussed in more detail in *4.1.2 Influence of the guards.*

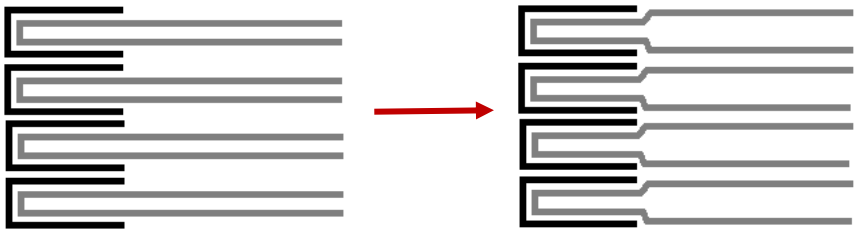

Figure 35: *The guards create empty spaces between the pages where the paper is more free to move to than it would be in 'solid' bookblock. Note that the state on the right is not fixed, and the paper will keep moving. Schematic made by Margot Terpstra.*

One way to work around this problem of pressing the guards is to fill up the empty spaces between pages with a waste paper of the same thickness as the guards. The waste paper would be removed after the rounding and other forwarding steps were complete.[70] Some of the Lakenhal sample books do have spine lining, so the bookbinder must have worked around this problem, either by filling up the empty space, or by another method, for which a press or bench was not needed.

[69] Vaughan 2013: 41, 138
[70] Ten Brink 1982: 181

4.1.2 Influence of the guards

Two types of guard constructions are discernible in the Lakenhal sample books. In the first, seen in sample book 1312.1 to 1312.3, the pages are adhered to the end of the guards, similar to the extension guard. In the other books, they are not glued, but wrapped around the outside of each bifolio and sewn with the bookblock, like a compensation guard. Compensation guards are added into a binding to make sure the bookblock will still fit into the cover when other material is added to it at a later stage.

Despite these compensation guards, most of the bookblocks from the Lakenhal sample books do not fit well in their cover. The boards are much farther apart from each other at the fore-edge than they are at the spine. This can have multiple causes, such as the construction, the wave deformation or because of the way the books were used and stored. *Figure 36* shows a schematic of the (exaggerated) shape the book can take when the guards are not made properly. *Figure 36a* shows the book with 'ideal' guards, which are made to fulfil their function optimally. The guards compensate for the thickness of the bookblock and are not too thick that they overcompensate. *Figure 36b* shows a book where the guards are too thin and do not compensate for the thickness of the bookblock. There is more room between the pages near the fore-edge. *Figure 36c* shows a book where the guards add too much thickness to the spine. There is more room between the pages near the spine. This might not look ideal, but when a book is made with the specific purpose of adding material to it at a later time, like these sample books or a photo-album, this would be the preferred option. Some of the Lakenhal sample books resemble the shape shown in *Figure 36b.* This situation has a few possible explanations: One explanation is that the guards are not thick enough to compensate for the added thickness of the samples and the adhesive after these were added in the eighteenth century. Perhaps the binder was not aware of what would be adhered into the book, and did not account for the thick samples and their adhesive. Another explanation is that the deformation caused an additional thickening of the bookblock, which

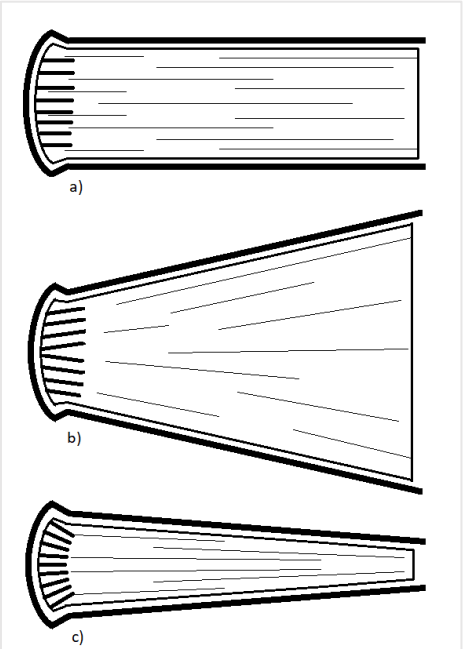

Figure 36: *The effect of guards on the shape of the bookblock. a) Normal guards. b) Guards are too thin. c) Guards are too thick. Schematic made by Margot Terpstra.*

made the boards stand out. In this case, the thickness of the guards may be irrelevant. Of course, it can also be a combination of these: the guards did not add considerable compensation for the thickness of the samples, and the deformation made it worse.[71] It is hard to determine which of these hypotheses is correct, especially when talking about the whole collection. Not all the Lakenhal sample books have these gaping boards that are much wider at the fore-edge. The thickness of the guards is not the same for every book, since different papers were used. In addition, the thickness of the samples and the layer of adhesive is also not always the same: both the thickness of the samples differ because they are taken from different fabrics, and the thickness of the adhesive because it is hard to apply a consistent amount of sealing wax.

The length of the guards typically has an influence on the throw-up and drape of the pages. Shorter guards usually have less throw-up and better drape.[72] But since the length of the guards in the Lakenhal sample books vary so greatly, it probably does not have a significant effect on the wave-deformation. However, what is remarkable is that most of the deformation in the bookblock starts where the guards end (see *Figure 37* & *38*). The guards are made from stiffer paper and are more rigid. Together with the spine they create a barrier that stops the paper from moving in that direction. It fixes the paper in place at one end. The paper will thus move into a space with the least form of resistance. This plays into the previously described problems concerning the empty spaces between the pages. The influence of these empty spaces will be discussed in more detail below.

[71] The thickness that is added to the bookblock by the deformation itself cannot be measured. But it can be checked to some extent by measuring the average thickness of the paper and the samples and multiplying it by the amount of pages in the book. This can be compared to the width of the spine. However, this is very difficult to do with the books in this state.
[72] Conroy 1987: 21

Figure 37: *Bottom edge of Lakenhal sample book 1312.4, showing a plunge of the pages after the guards end. Photograph taken by Margot Terpstra.*

Figure 38: *Top edge of Lakenhal sample book 1312.8, showing a plunge at the bottom of the bookblock. Photograph taken by Margot Terpstra.*

4.2 Empty spaces and tension

Because of the construction of the book, the guards and the addition of thick samples, empty spaces are created in the otherwise solid bookblock (see *Figure 39*). There is no material here, creating pockets of air in between the pages. Ideally, this empty space would be filled up by the samples. However, the samples are located in specific rows, so, only a part of this space is filled up. The paper in these areas is vulnerable for deformation, because it has room to move.

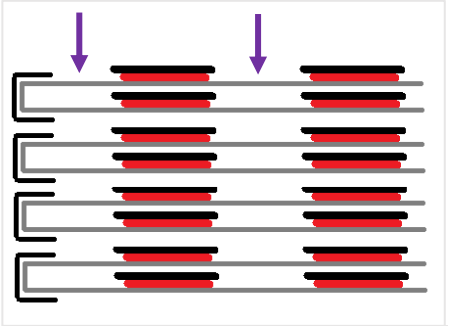

Figure 39: *Image showing where the empty spaces are in the bookblock when viewed from Top or bottom edge. Arrows indicating where these pockets of air are. Schematic made by Margot Terpstra.*

When looking at the top and bottom edge of the books the extra room and empty space that is created by the guards is visible. And most pages appear to plummet down, almost like a waterfall, when the guards end and the paper is no longer held in place (see red arrows in *Figure 37* & *38*). This movement is exacerbated in some of the books by the missing quires at the end of the bookblock (see *Figure 40*). It needs to be mentioned that this 'plunge' deformation also happens in the other books, but in a less dramatic form or in a different direction. As stated in *1.2.2 The paper bookblock*, it is unclear when these pages were removed, or why it was done. Either way, removing these pages gave the remaining bookblock more room to move. And naturally, the paper will move into this empty space, helped along by gravity.

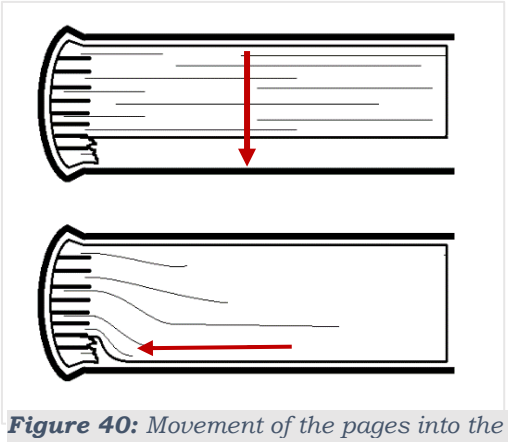

Figure 40: *Movement of the pages into the empty space created by removing the last few quires. Schematic made by Margot Terpstra.*

4.2.1 Sample tension

As mentioned in *1.2.3 The Samples, adhesive and ink*, the samples are made of a woollen cloth that are adhered to the page using red sealing wax. Each sample adds thickness to the paper in certain areas, while other areas are left empty for writing. This gives the paper room to move in these areas, while movement is restricted in others. So when the paper moves, for instance when the book is opened or closed, it will move into these empty spaces between the samples. It appears that in many places where these empty spaces occur, the paper is pushed into these spaces (see *Figure 41*). Furthermore, the samples and the adhesive are more rigid than the paper they are adhered to, so the spots in the paper where the samples are adhered to are restricted in their movement. As a result, the rigid samples are all packed together in a row. They are no longer in a neat stack, but remain on top of one another. The parts of the paper where there are no samples, being the most flexible component, then deforms around the samples,

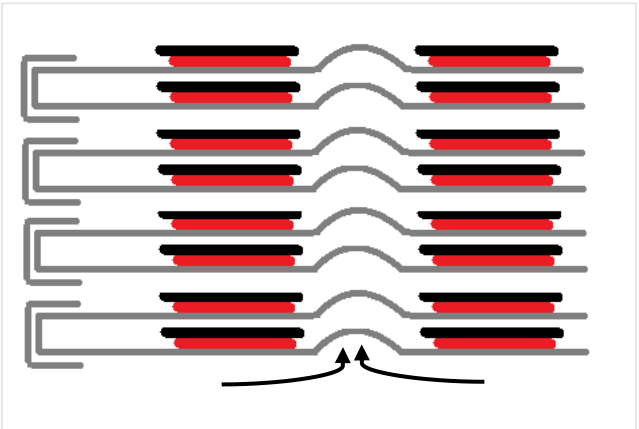

Figure 41: *Schematic showing the empty spaces between the samples and how the paper will move into these spaces when restricted in movement by the rigid samples. Schematic made by Margot Terpstra.*

creating the wave-pattern. *Figure 42* and *Figure 43* show how the paper moves into a certain direction. They also show that the deformation consists of two areas: the areas with samples, that are packed together in bulk, and the areas without samples, that have deformed around these stacks. The addition of samples creates a shortage of room for the paper and samples to move to, so they will want to migrate into this empty space between the rest of the pages. The heavier samples appear to push downwards and towards the spine, while the part of the paper that has no samples attached to it is being pushed upwards and towards the fore-edge. This movement of the samples can perhaps be compared to the way that landmasses, or tectonic plates, move over on another: when one plate moves, it will push another out of its way. The movement and consequential deformation is facilitated even more by the deliberate folds made to create the columns. The more compact waves, where the part of the paper without samples is pushed together, start and end at these folds (see the purple arrows in *Figure 42* & *43*).

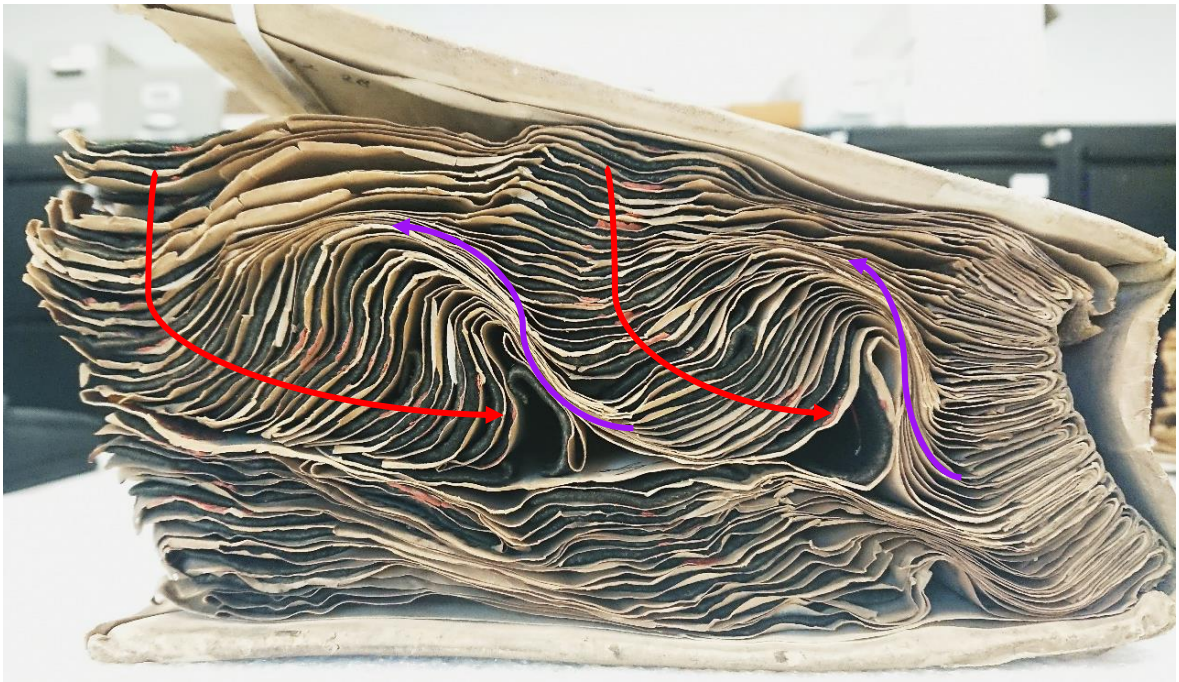

Figure 42: *Bottom-edge of Lakenhal sample book 1312.28 shows how the sample are grouped together and the deformation forms itself around these samples. Photograph taken by Margot Terpstra.*

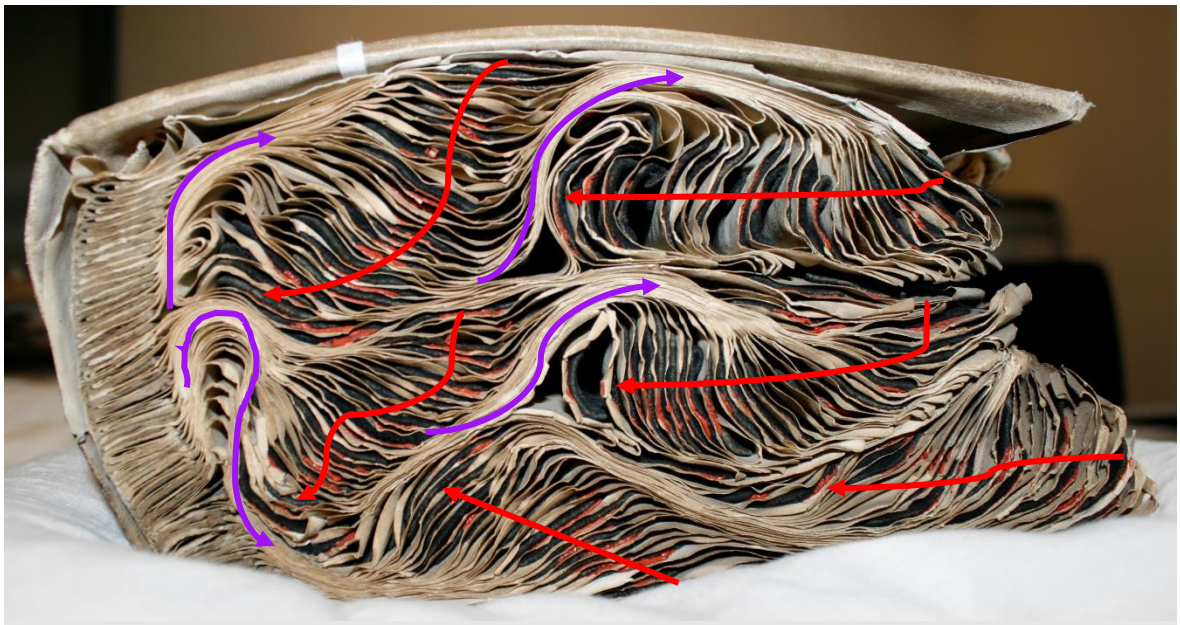

Figure 43: *Top-edge of Lakenhal sample book 1312.16 shows how the sample are grouped together and the deformation forms itself around these samples. Photograph taken by Margot Terpstra.*

4.2.2 Into the fold

As stated in *1.2.2 The paper bookblock,* the deliberate folds which make up the columns are not to be considered as damage. Nevertheless, that does not mean that they did not cause additional damage to the books. Because these folds are already in the paper, they create an almost natural spot for the paper to bend and move in the same direction as the fold. These folds add vulnerable spots in the paper, and because they flank the more rigid area in the paper where the samples are adhered to, all tension is moved to these areas. As a result the paper will move into the fold when the book is handled. In addition, when folds are stacked on top of each other they tend to amplify each other. This is a phenomenon that can be seen in many things, and is nicely illustrated in the artwork 'El Castille' ('The Castle') by Jorge Méndez Blake (2007).[73] The idea being, that a single fold creates a bump in the paper, and every page on top of that one will show the same bump, but larger (see *Figure 44, 45* & *46*). When there is room between the pages, the pages will more easily get stuck in a certain position. Because the pages are not flat, but have folds and samples, the movement of these pages during handling is impaired. A page will get stuck behind a fold or sample when leafing through, and when the book is closed, it won't be able to slide to the right position, pinning the deformation in place.

[73] Mendez Blake 2007, *El-Castillo.*

Figure 45: *A small fold or snag in the paper gets exaggerated by the pages lying on top. Schematic made by Margot Terpstra.*

Figure 44: *Bottom edge of Lakenhal sample book 1312.9. Red arrows indicating how a small fold or bump in the paper will increase in severity. Photograph taken by Margot Terpstra.*

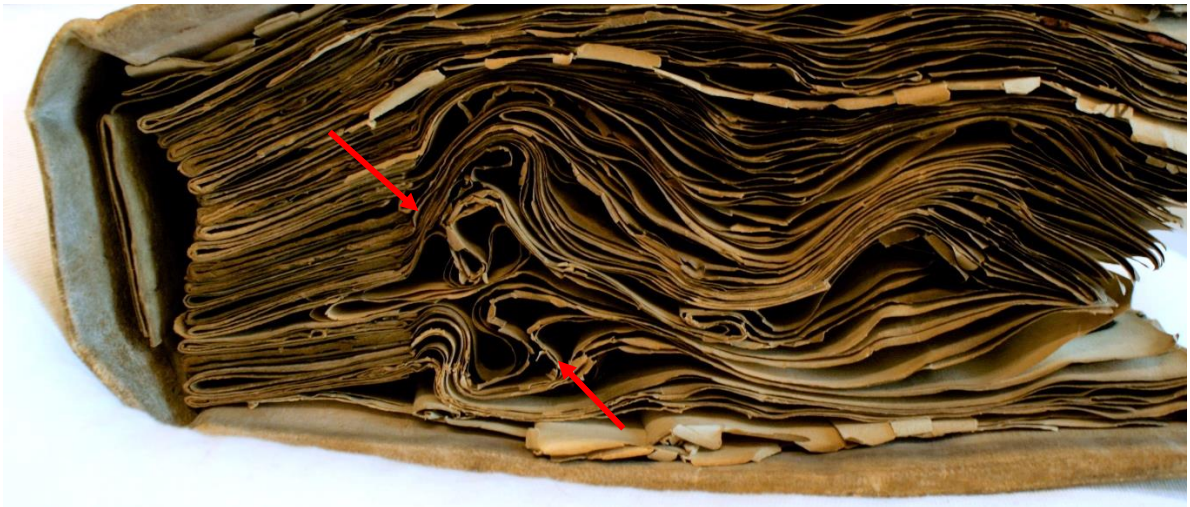

Figure 46: *Example of sample book 1312.1 of folds becoming larger when more pages are stacked. Arrows indicating where this is most visible. Photograph taken by Margot Terpstra.*

4.3 Water damage and external factors

Apart from tensions created by the construction of the book, there can be tension in the paper created by the characteristics and fabrication of the paper itself. If and to what degree a paper deforms is related to these inherent characteristics of the paper. The assumption that the books have become wet or where exposed to excessive moisture at some point in their lifetime, and have consequently deformed, seems an obvious one.[74] Water or an excess of moisture may have caused the paper to cockle and deform. The survey shows that at least nineteen of the 31 sample books have signs of moisture on the cover in the form of droplets, tidelines and deformation of the parchment (see *Figure 47*). The reason signs of moisture were sought on the parchment is because it is more susceptible to moisture and changes in relative humidity than the paper. If there are no signs of moisture on the parchment, it is very unlikely there are any on the paper. Parchment is a hygroscopic material, which means that parchment will expand and shrink with changes in relative humidity, causing mechanical damage and deformation. From a relative humidity of 40% and upwards, parchment is at risk

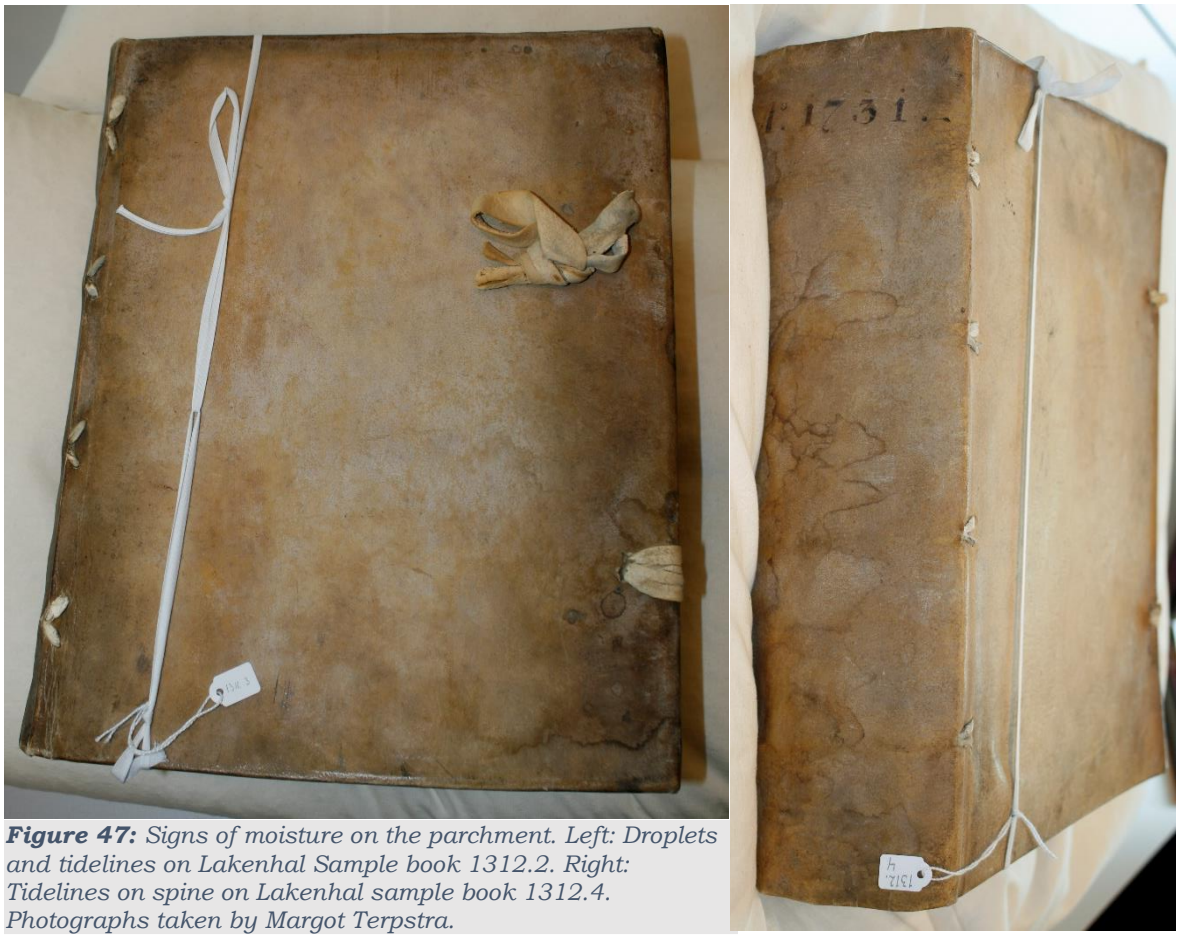

Figure 47: *Signs of moisture on the parchment. Left: Droplets and tidelines on Lakenhal Sample book 1312.2. Right: Tidelines on spine on Lakenhal sample book 1312.4. Photographs taken by Margot Terpstra.*

[74] While doing the research and talking with supervisors and other interested parties, this was often suggested as a cause for the deformation.

from gelatinization, biological growth (mould) and an increased risk of breaking of hydrogen bonds.[75] Parchment that has become wet and subsequently dried in uncontrolled, meaning without any human intervention, conditions can become hard, translucent, and inflexible. It may even shrink, in which case it may no longer fit the binding.[76] Signs of this can be seen in the form of curling turn-ins and undulating parchment. All of these signs of excessive moisture can be seen on the parchment of the Lakenhal sample books, in varying degrees. Most of the Lakenhal sample books only have moisture damage on the spine and the outside of the boards. In some cases the water has also reached the bookblock and seeped between the pages (see *Figure 48*). These tidelines are often restricted to the edges of the bookblock. In at least one of the sample books, there seems to have been an excess of moisture throughout the bookblock, where the paper shows this cockling and there appear to be tidelines around the samples and adhesive (see *Figure 49*). The woollen textile samples would have retained moisture for a longer period of time than the paper would, since it is a much thicker material. It is therefore not strange that the tidelines would appear around the samples.

***Figure 48**: Signs of moisture in the paper of Lakenhal sample books 1312.8. Left: Tidelines on the last page of the sample book. Right: Tidelines on parchment and on past down against the back board, bottom corner. Photographs taken by Margot Terpstra.*

[75] Hansen 1992: 340
[76] Woods 2002: 17

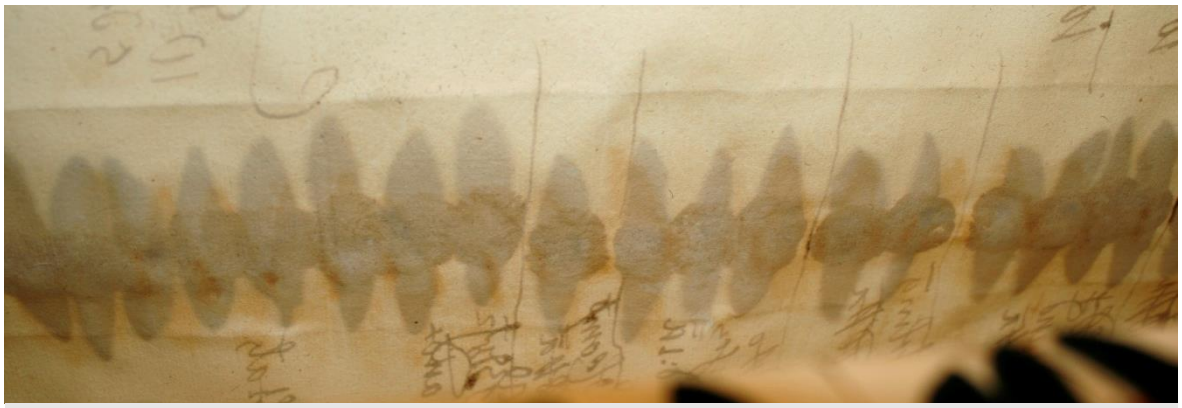

Figure 49: *Verso of a page from Lakenhal sample book 1312.3. In comparison to the verso side of other sample books, these samples shine through the paper. The sealing wax appears to have left a tideline. Photograph taken by Margot Terpstra.*

Another sign of an excess amount of moisture would be bleeding of the ink. This was observed in some of the sample books, but could not be directly linked to the paper being wet at one point.

4.3.1 The cockling phenomenon

The word cockling has been mentioned a couple of times during this thesis, and the phenomena should therefore be explained. According to the American Institute for Conservation (AIC) wiki cockling "is a planar distortion of paper, parchment or textile. It appears as wrinkles, puckers or ripples, often in parallel ridges, without creases".[77] The cockling of paper is an indication that moisture was present in the paper in a significant amount, and that the paper dried slowly. When paper is wet, it expands. This expansion can happen gradually, but often the paper expands more in one direction than it will in another due to the orientation of the fibres. The same applies to the drying process and the rate of shrinkage. Paper does not dry evenly: the outside of the paper dries first. In a book, that means the edges of the book will dry first, then the rest of the bookblock. These discrepancies in the wetting and drying of paper, cause cockling.[78] This can be seen on the edges of Lakenhal sample book 1312.8 (see *Figure 48*), and on whole pages of Lakenhal sample book 1312.3 (see *Figure 49* & *52*).

In practice, two types of cockling can be observed, although they often occur at the same time. The German paper-testing company Emco GmbH, names the types as 'waves' and 'bubbles' (see *Figure 50*). Together, they form the cockling pattern.[79]

[77] AIC wiki, *Cockling*
[78] Kahn 2003: 68
[79] Emco GmbH, *emco IAS Cockling tester*

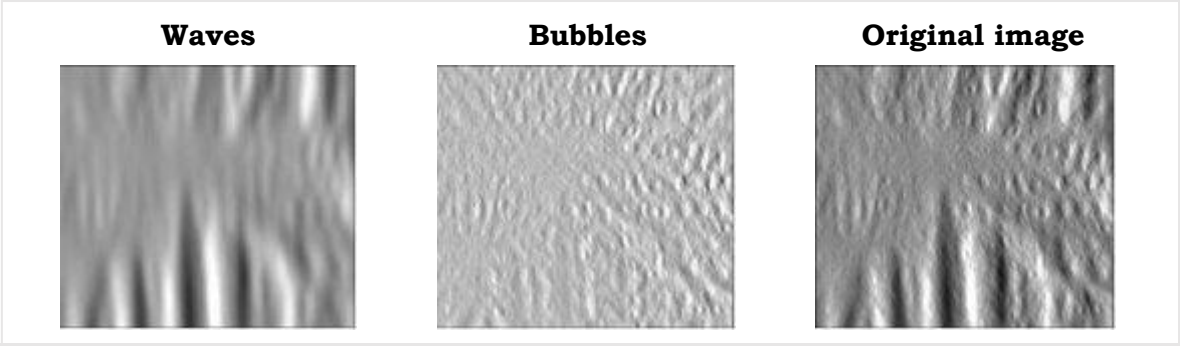

Figure 50: *Left: Wave-pattern, with the waves often going in the same direction in the paper. Middle: Bubble-pattern, in the form of small bumps and dips in the paper. Right: The original image with both 'waving' and 'bubbling' patterns in the paper. Images taken from Emco GmbH.*

In "The Effect of Fiber Orientation on Cockling of Paper", Leppänen makes a distinction between cockling and what Emco calls 'waving'. From the schematic overview from Leppänen, cockling appears to be mostly the 'bubble' pattern (*Figure 51b*). The difference with Leppänen, Emco GmbH and the AIC is that Lëppanen suggests that the "wave' pattern is not part of the cockling phenomenon, but is given a separate name: fluting (*Figure 51c*).[80]

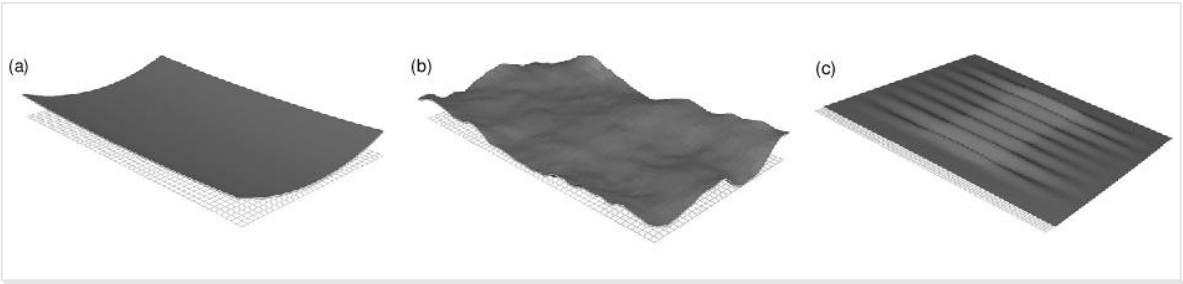

Figure 51: *Schematic figures of (a) curling, (b) cockling and (c) fluting of paper. Image and text from Leppänen 2007.*

However, fluted paper is also the name used for the deliberate pattern made to fabricate corrugated board. So to avoid confusion, the term posed by Emco GmbH, where the 'wave' pattern is seen as a form of cockling, will be used from now on.

As mentioned previously, the cockling phenomenon often occurs when the paper has become wet, either from a liquid coming into direct contact with the paper, or high humidity in the surrounding environment. Cockling occurs when there is a difference in shrinkage in the wet, damp and dry areas of the paper, especially when the paper is dried in the air, with little to no additional weight.[81] In most

[80] Leppänen 2007: 15-16
[81] AIC wiki. *Drying & Flattening*: 3

books, the added weight of the pages and the boards laying on top of each other prevents cockling to a certain extent. But the Lakenhal sample books are all surprisingly light given their size and the number of samples pasted into them. The paper is rather thin and does not provide a lot of weight to press the pages flat. In addition, the extra space between the pages will cause these areas to dry faster, while the areas in contact with the samples will dry slower. The textile samples might hold moisture for a longer period of time and give off this moisture to the paper touching it. This would suggest that the areas on the verso side of the paper which are in contact with the samples would dry slower. Since the samples are all on top of one another, this would also be the area where another sample is adhered to on the recto side. This can be seen in Lakenhal sample book 1312.3: a brown halo surrounds the samples on the verso of the paper. This shining through of the samples to the verso of the paper is not seen so clearly in the other sample books. The paper also has a lot of undulation and feels rougher than other paper in the same book as well as other books, especially where the samples and adhesive are. Cockling also causes a difference in tension throughout the paper sheet and between the paper fibres, making it easier for the paper to deform further.[82] The paper appears to be deformed more around the samples in the row near the edge (see *Figure 52*).

In most of the Lakenhal sample books, even those that do not show any direct signs of moisture on the parchment cover or the paper, another form of cockling can be observed. When the sealing wax is applied, it is in a hot and liquid form. The wax is melted above a candle before being applied. And so, when it comes into contact with the paper, it creates local cockling and deformation of the paper. This was also observed in performing the reconstruction, and looks very similar to the deformation around the samples in the Lakenhal sample books (see *Figure 52* & 53).

All this cockling creates tension in the paper, and has made the paper stiffer in these areas. Consequently, these cockled areas behaves and moves differently than non-cockled parts of the paper.

[82] AIC wiki. *Drying & Flattening*: 4

Figure 52: *Verso of the paper in Lakenhal sample book 1312.3. The samples and adhesive shine through the paper. The paper has a rough texture and shows undulations and wrinkles. Photograph taken by Margot Terpstra*

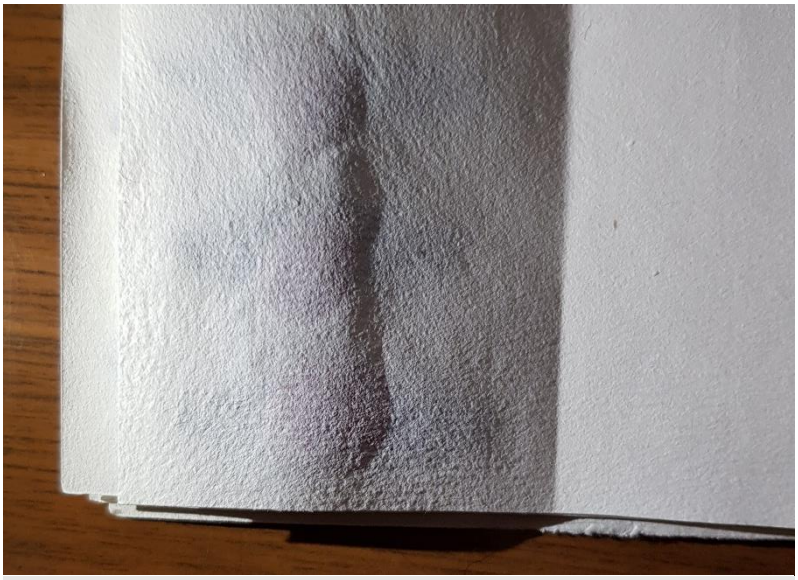

Figure 53: *Deformation around the samples of the reconstruction. Very similar to the deformation in the Lakenhal sample books. Photograph taken by Margot Terpstra.*

4.4 Combining causes

To conclude this chapter on the internal and external factors it is important to note that all of the movements of the paper mentioned above will also have an influence on each other. When one section of the bookblock moves in a certain direction, whether it is pushed aside by the bulk of samples or plummets down to occupy an empty space, it will inevitably create tension in a neighboring section of the bookblock. And thus all these pages will keep pushing each other away to gain more room.

First, the quires in the book are relatively free to move because of the flexible spine construction: the books are not hammered or rounded, and only have very little to no spine lining in the form of a few strips of textile. This allows the quires to move and slide over one another. Guards were added to the construction of the bookblock to give the samples more space. Because of the placement of the sample in rows, only a part of the page is filled. In addition, the samples are much thicker than the guards, so the guards do not adequately compensate for the thickness of the samples. The empty spaces, or pockets of air between the samples and the pages, give the paper even more room to move. When the book is handled, the paper tends to move into the space where it encounters the least form of resistance. Even when the book is not being handled, fluctuations in the climate condition (temperature and relative humidity) may cause the paper to move, even when not directly observable. The pages and samples also get stuck behind one another when leafing through the book. There are two types of deformation of the bookblock that result from these construction issues: the stiffer areas of the paper where the samples are attached to group together in bulk, and the areas without samples form around this bulk of samples. The samples appear to migrate into the bookblock, towards the spine, while the rest of the paper, without samples, is being pushed outwards, toward the fore-edge. The deformation is also aggravated by the folds that were made to create columns. These deliberate folds create a weak spot in the paper.

The deformation is also helped along by other forms of tension in the paper, such as the cockling of the paper. Two types of cockling appear in the paper: one is created by the adherence of the samples with a hot and liquid sealing wax, and the other by excessive moisture coming from outside of the sample book. The moisture and subsequent cockling causes additional tension in the paper. The paper moves and behaves differently, and is more prone to deform.

Conclusion

The goal of this research was to determine the cause of the deformation in the Lakenhal sample books. There is not one single answer to this question, mainly because there appear to be multiple contributing factors.

The survey showed that the level of deformation among the books differs greatly, and much of the construction, like the length of the guards and the sewing supports, did not significantly influence this. The problem appears to be more related to components that were added after the binding of the books, such as the samples, the sealing wax, how the guards compensate the samples, the column folds and the cockling.

In performing the reconstruction, a lot of these precursors for the deformation already show their influence. The folds create a slight wave-pattern by moving the paper into the direction of the fold, either up- or downwards. This, in turn, pulls a part of the fore-edge into the bookblock towards the spine. When the bulk of samples at the fore-edge is being pulled into the bookblock, other areas of the bookblock are forced to move with it. The thickness of the samples create spaces between the pages, and the guards are not adequate compensation for this. As a result, the migrating paper moves to these areas. The overarching theme for the deformation seems to be that the bookblock is not a solid block of paper, as it is in most books. Therefore, the paper is free to move in different directions. But the paper is also restricted because the areas with samples are much more rigid, both because of the samples and the sealing wax, and the tension this created in the paper.

All these components of the Lakenhal sample books are interconnected and influence each other. This is an important point to realise. The formation of the deformation is a complex issue, and congruently, the cause for the deformation is just as multifaceted.

The question for this thesis also stemmed from a willingness of Museum the Lakenhal to digitise these books. Although there was no room in this thesis to deal with this topic, a brief discussion on digitisation is enclosed in *Appendix V*, along with some recommendations for the museum.

Discussion

Because of the limiting circumstances surrounding the writing of this thesis, there is a lot of research that still needs to be done. Starting with an in depth comparison of all the Lakenhal sample books in the survey, as was originally planned. It would be useful to display all the sample books next to one another to compare the shape and direction of the deformation.

For the reconstruction, better, or more accurate, results might be gained by making the full binding, including the spine lining and the full vellum laced-case binding. As the reconstruction stands now, the spine is not fixed in place, because the sewing supports are not laced in. It might also be very interesting to see what would happen to the bookblock when it is exposed to higher levels of relative humidity through artificial aging. Would the same form of deformation occur?

Additional research on possible conservation treatment to flatten the bookblock should be done. A start of this was made in *Appendix V: Recommendations for the Lakenhal sample books.*

Other fields to be researched are the textiles samples and how they were produced. This in itself would be a separate thesis research, which is not in the scope of the Book & Paper specialisation.

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Images

Photographs taken by the author are omitted from this list. Reference to them is in the image description underneath the image. Permission was given by Museum the Lakenhal to use their photo's for the purpose of this thesis.

Figure 4:

'Staalmeesters' by Jan de Baen (1675) in Museum the Lakenhal. Oil-paint on canvas, 152 × 315 cm. Men examining pieces of fabric and noting down their findings in a book. The man in the middle is holding a small knife to cut out a piece of fabric to store as a sample. Image from Museum the Lakenhal, Inv. Nr. S12.

Museum de Lakenhal, *De Staalmeesters* (1675) door Jan de Baen. Olieverf op doek. Inventory number: S12. https://www.lakenhal.nl/nl/collectie/s-12

Figure 5:

'Lakenloodje' with the Leiden Keys stamped into it. seventeenth century. Image from Museum the Lakenhal, Inv. Nr. 5360.

Museum de Lakenhal, *Lakenloodje met de afbeelding van Leidse Sleutels, 17e eeuw.* Inventory number: 5360. https://www.lakenhal.nl/en/collection/5360

Figure 6:

Detail of Lakenhal sample book 1312.7, showing information on a place (Tilburg), a name (W. van Noort) and date. Image from Museum the Lakenhal, Inv. Nr. 1312.7.

Museum de Lakenhal, *Stalenboek van de Lakenhal, 1734.* Inventory number: 1312.7. https://www.lakenhal.nl/nl/collectie/1312-7

Figure 7:

Laced-case binding. The parchment sewing support laces through the parchment binding. Schematic from Kneep & Binding.

Gnirrep, W.K., Gumbert, J.P. and Szirmai J.A.. *Kneep & Binding.* Den Haag: Koninklijke Bibliotheek, 1992, p. 69.

Figure 8:

Sewing loops around both sewing supports at once. Schematic from Kneep & Binding.

Gnirrep, W.K., Gumbert, J.P. and Szirmai J.A.. *Kneep & Binding.* Den Haag: Koninklijke Bibliotheek, 1992, p. 38.

Figure 12:

"Papiermonster C. & J. Honig – Pro Patria", Stichting Archief Honig. Image from Zaanse Papiergeschiedenis.

Zaanse Papiergeschiedenis. *Papiermonster C. & J. Honig – Pro Patria.* https://zaansepapiergeschiedenis.nl/portfolio-item/papiermonster-c-j-honig-pro-patria/

Figure 17:

Writing on paste-down in sample book 1312.2 stating: 'This sample book from the 'Swarte Stale' was started on the 30th of July 1710. Photograph from Museum the Lakenhal, Inv. Nr. 1312.2.

Museum de Lakenhal, *Stalenboek van de Lakenhal, 1710*. Inventory number 1312.2. https://www.lakenhal.nl/nl/collectie/1312-2

Figure 21:

Deckle frame with the 'propatria' watermark. Identical to the one found on the paper used for lining 1312.31. Image from Papiergeschiedenis Nederland.

Image taken from: Papiergeschiedenis Nederland, *Verslag themadag 2012: "Kwaliteitsmerk van Papier"*. Last updated: 2012. Last viewed: 12-03-2020. http://www.papiergeschiedenis.net/pnl_stichting_pnl_activiteiten_themadag_2012_1.html

Figure 50:

Left: Wave-pattern, with the waves often going in the same direction in the paper. Middle: Bubble-pattern, in the form of small bumps and dips in the paper. Right: The original image with both 'waving' and 'bubbling' patterns in the paper. Image taken from Emco GmbH.

Image taken from: Emco GmbH, *emco IAS Cockling tester*. Last updated: unknown. Last viewed: 08-03-2020. https://www.emco-leipzig.com/emco_cockling_tester_paper_topography_en.html

Figure 51:

Schematic figures of (a) curling, (b) cockling and (c) fluting of paper. Image and text from Leppänen 2007.

Leppänen, T.. *Effect of fibre orientation on cockling of paper*. Doctoral Dissertation, Kuopio, Department of Physics, University of Kuopio, 2007, p. 16.

Summary

This master thesis was written for the master Conservation and restoration of Cultural Heritage, in the specialisation of Book and Paper, at the University of Amsterdam. It is an investigation into the Lakenhal sample books. This is a collection of 31 sample books from Museum the Lakenhal in Leiden, the Netherlands. The books each contain samples from a woven woollen black cloth, along with information on the quality and producer of the fabric. The books were used to compare incoming fabrics, and see if they were of the right quality to be sold. All 31 books in this collection have a distinct 'wave'-pattern deformation of the bookblock. The shape of the deformation causes several pages to be locked into one other, making it very difficult to consult the books. As they are, handling the books poses a great risk for further damage. With these books being largely inaccessible, a world of information is lost. The aim of this research is to determine how this deformation originated. The deformation in all the Lakenhal sample books is very similar, and it is therefore likely that the formation of the deformation happened for similar reasons. The first step in this research is a collection condition survey, to determine which similarities and differences there are in the construction and damages of the books. This will be followed up by a literary analysis of the types of construction and the problems that might arise from them. The deformation will also be analysed to determine the components that might have had a role in its development. Both internal construction problems will be discussed, as well as some external factors, such as water damage. In particular, research was done into the construction method of a vellum laced case binding, or 'spitselband' in Dutch, as well as to the construction of guard books. Additional attention will be given to the empty space that is created in the book by the addition of guards and the samples. A bookblock is generally a solid object, where all the pages lie flat on top of one another. Because of the construction of the Lakenhal sample books, there is a lot of air, or empty space, between the pages. The addition of samples creates a shortage of room for the paper and samples to move to, so they will want to migrate into this empty space between the rest of the pages. To see what the books might have looked like before the deformation, a reconstruction was made of the bookblock. Some of the problems in the construction that have led to the deformation already begin to show up in the reconstruction.

Appendix I: Condition Reports

Lakenhal sample book 1312.1

Metadata

Title English/Dutch	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.1
Date	1700
Measurements	338 x 268 x 130 mm (height x width x thickness)
Pages	Circa 160

Condition report

	Materials & method	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Front board detached - Grey discoloration - Parchment deformed - Tidelines
Spine	- No spine lining	- Fair
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Supports are cut between cover and bookblock - Remnants still visible on cover
Fastenings	- Alum tawed leather straps	- Missing on front
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Loose quires, some of which are inserted back in the wrong place - First quire detached - Deliberate folds (for columns) - Non-deliberate folds - Deformation mostly at the top of the bookblock
Guards	- Recycled paper, ream-wrapper - Dutch garden stamp - Paper adhered to the guards	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loos samples
Ink	- Iron Gall ink	-
Particularities	-	-

Lakenhal sample book 1312.2

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.2
Date	1710
Measurements	340 x 300 x 100 mm (height x width x thickness)
Pages	Circa 160

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - A few droplets on the spine - Minimal surface dirt
Spine	- No spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Broken sewing supports
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deformation centred around the bottom of the bookblock
Guards	- Recycled paper, ream-wrapper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Particularities	-	-

Lakenhal sample book 1312.3

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.3
Date	1720
Measurements	340 x 285 x 105 mm (height x width x thickness)
Pages	Circa 160

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Back board detached - Minimal surface dirt - Droplets on the spine - Insect damage
Spine	- No spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape - All-along sewing	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine - Amsterdam watermark	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Cockling and tidelines around samples and on the paper - Cut out pages at the end of the bookblock - Deformation throughout bookblock - Insect damage
Guards	- Recycled paper, ream-wrapper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.4

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.4
Date	1731
Measurements	337 x 243 x 90 mm (height x width x thickness)
Pages	Circa 150

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - Minimal surface dirt - Moisture stains on spine - Tidelines on boards
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape - All-along sewing	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine - Amsterdam watermark	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock - Fore-edge eaten by mice - Metal inclusions in the paper with blue/green tint (perhaps copper)
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.5

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.5
Date	1732
Measurements	330 x 253 x 105 mm (height x width x thickness)
Pages	Circa 180

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair - Minimal amount of surface dirt - Tidelines on front board
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock - Cut out pages at the end of the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.6

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.6
Date	1733
Measurements	335 x 225 x 110 mm (height x width x thickness)
Pages	Circa 120

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / “Spitselband” - Cardboard boards	- Fair
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	-
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio’s - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Loose paper fragments - Deformation throughout the bookblock - Bookblock eaten on by mice
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.7

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.7
Date	1734
Measurements	335 x 240 x 97 mm (height x width x thickness)
Pages	Circa 150

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - Very minimal amount surface dirt
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Medium edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Deformation throughout bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.8

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.8
Date	1735
Measurements	332 x 238 x 85 mm (height x width x thickness)
Pages	Circa 150

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair - Minimal amount of surface dirt - Moisture stains on the boards - Tidelines on top of spine
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape - All-along sewing	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Severe amount of surface dirt - Deliberate folds (for columns) - Tidelines on endleaves - Cut out pages at the end of the bookblock - Deformation throughout the bookblock - Signs of mould - Fly-leaf eaten on by mice
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	- Ink corrosion
Particularities	-	-

Lakenhal sample book 1312.9

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.9
Date	1736
Measurements	337 x 235 x 79 mm (height x width x thickness)
Pages	Circa 130

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair - Black spots on cover - Droplets on cover
Spine	-	-
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape - All-along sewing	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock - Deformation throughout the bookblock - Signs of mould
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.10

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.10
Date	1737
Measurements	333 x 250 x 80 mm (height x width x thickness)
Pages	Circa 150

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Smudges - Black near the spine and the front board
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock - Deformation throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	- Some bleeding of the ink
Particularities	-	-

Lakenhal sample book 1312.11

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.11
Date	1738
Measurements	335 x 240 x 85 mm (height x width x thickness)
Pages	Circa 140

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / “Spitselband” - Cardboard boards	- Good - Minimal amount of surface dirt
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken, partly missing
Bookblock	- Quires consisting of bifolio’s - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock - Deformation throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.12

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.12
Date	1739
Measurements	335 x 249 x 75 mm (height x width x thickness)
Pages	Circa 120

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair - Grey discoloration near the fore-edge - Tidelines on the cover
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Broken on the front joint
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Cut out pages around the samples - Deformation starting away from the guards
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.13

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.13
Date	1741-42
Measurements	335 x 240 x 78 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - Minimal amount of surface dirt - Droplets on board
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	-
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Medium edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.14

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.14
Date	1743
Measurements	335 x 210 x 140 mm (height x width x thickness)
Pages	Circa 180

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / “Spitselband” - Cardboard boards	- Fair - Grey discoloration on board near the spine - Droplets on the spine - Tidelines on the board
Spine	-	- Slightly concave
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio’s - Antique laid paper - Chain lines parallel to spine	- Minimal amount of edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.15

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.15
Date	1744-49
Measurements	335 x 257 x 112 mm (height x width x thickness)
Pages	Circa 108

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / “Spitselband” - Cardboard boards	- Fair - Grey discoloration on front board - Moisture stains on the spine
Spine	- Spine lining	- Slightly concave
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	-
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio’s - Antique laid paper - Chain lines parallel to spine	- Minimal edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.16

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.16
Date	1746
Measurements	330 x 210 x 115 mm (height x width x thickness)
Pages	Circa 180

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Bad - Boards are curved - Front board detached - Grey discoloration on front board and spine - Moisture stains and tidelines
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape - All-along sewing	- Broken at the front
Fastenings	- Alum tawed leather straps	- Broken, partly missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Severe amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock - Some pages in the back are detached
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.17

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.17
Date	1750-51
Measurements	333 x 239 x 100 mm (height x width x thickness)
Pages	Circa 170

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair/bad - Dark circular spots on the front of the board with a yellow halo around it - Moisture stains on the back boar near the spine
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	-
Fastenings	- Alum tawed leather straps	- Broken, partly missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock - Deformation throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.18

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.18
Date	1751
Measurements	330 x 230 x 125 mm (height x width x thickness)
Pages	Circa 200

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / “Spitselband” - Cardboard boards	- Good - Minimal amount of surface dirt
Spine	- Spine lining	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio’s - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.19

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.19
Date	1754
Measurements	335 x 225 x 94 mm (height x width x thickness)
Pages	Circa 170

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair - Grey discoloration near joints and on the spine - Moisture stains on the spine
Spine	-	- Slightly concave
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken, partly missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Minimal edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock - Bottom corner of the bookblock eaten on, probably by mice
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.20

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.20
Date	1755
Measurements	330 x 242 x 140 mm (height x width x thickness)
Pages	Circa 200

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair/bad - Curved board - Grey discoloration near fore-edge and on the spine
Spine	-	- Good
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken, partly missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock - Fore-edge eaten on by mice
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.21

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.21
Date	1761
Measurements	330 x 238 x 72 mm (height x width x thickness)
Pages	Circa 120

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Bad - Grey discoloration near the fore-edge and the spine - Dark smudges on front covers - Droplets on the spine
Spine	- Spine lining	- Slightly concave
Sewing structure and supports	- Alum tawed leather chords - Raised supports - 6 sewing stations: 4 chords, 2 kettle stitch - Chords are laced through cover in a V-shape	- Intact
Fastenings	- Alum tawed leather straps	- Broken, partly missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Minimal edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock - Bottom corner slightly eaten on by mice
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.22

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.22
Date	1764
Measurements	332 x 230 x 90 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - Minimal amount of surface dirt - Small moisture stains on the top of the spine
Spine	- Spine lining	- Good
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock - Deformation very close to guards
Guards	- Cream paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.23

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.23
Date	1766
Measurements	338 x 225 x 85 mm (height x width x thickness)
Pages	Circa 120

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - Minimal amount of surface dirt - Droplets on front board
Spine	-	-
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock - Deformation throughout the bookblock - Front edge eat on, probably by mice
Guards	- Cream paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.24

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.24
Date	1768
Measurements	333 x 225 x 68 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / “Spitselband” - Cardboard boards	- Fair - Grey discoloration near front board and spine - Dark spots on de board - Droplets on the board
Spine	-	-
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio’s - Antique laid paper - Chain lines parallel to spine	- Minimal edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Cut out pages at the end of the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.25

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.25
Date	1770
Measurements	334 x 217 x 60 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - Slightly grey discoloration near bottom edge of the board and spine
Spine	-	-
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	-
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Medium edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.26

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.26
Date	1772
Measurements	328 x 223 x 75 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Good - Minimal amount of surface dirt - Droplets on the spine
Spine	-	- Concave
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Minimal edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Deformation centred at the bottom of the bookblock
Guards	- Cream paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.27

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Inventory number	1312.27
Date	1780
Measurements	335 x 210 x 90 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / “Spitselband” - Cardboard boards	- Bad - Board is curved - Grey discoloration around the spine
Spine		- Concave
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	- Intact
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio’s - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock - Fore-edge of the bookblock eaten on by mice
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Particularities	-	-

Lakenhal sample book 1312.28

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.28
Date	1782
Measurements	332 x 225 x 120 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair - Grey discoloration - Black smudges on boards
Spine	- Spine lining	- Concave
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	-
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Medium amount of surface dirt - Deliberate folds (for columns) - Deformation centred at the top of the bookblock - Mice has eaten a tunnel through the bookblock, from the bottom edge towards the centre of the bookblock
Guards	- Grey paper	-
Adhesive material	- Red sealing wax - Yellow glue (unknown)	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	- Local bleeding
Particularities	-	-

Lakenhal sample book 1312.29

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.29
Date	1787-88
Measurements	336 x 225 x 85 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair - Slightly grey discoloration
Spine	- Spine lining	- Concave
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	-
Fastenings	- Alum tawed leather straps	- Broken/Missing
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Deformation throughout the bookblock - Deliberate folds (for columns) - Mice have eaten a path through the bookblock - Loose paper fragments
Guards	- Grey paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	-
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.30

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.30
Date	1791
Measurements	330 x 241 x 60 mm (height x width x thickness)
Pages	Circa 100

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Bad - Turn-ins are curling - Grey discoloration near bottom edge of the spine and the boards
Spine	-	- Slightly concave
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	-
Fastenings	- Alum tawed leather straps	-
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Severe edge tears - Minimal amount of surface dirt - Deliberate folds (for columns) - Deformation throughout the bookblock
Guards	- Cream paper	-
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	-
Particularities	-	-

Lakenhal sample book 1312.31

Metadata

Title	Lakenhal sample book/Stalenboek van de Lakenhal
Maker	Museum de Lakenhal
Owner	Museum de Lakenhal
Inventory number	1312.31
Date	1730
Measurements	335 x 215 x 115 mm (height x width x thickness)
Pages	104

Condition report

	Materials	Condition
Cover	- Full parchment binding - Vellum laced-case binding / "Spitselband" - Cardboard boards	- Fair/Bad - Joints are broken - Brown on the spine
Spine	- Spine lining (does not appear original)	- Good
Sewing structure and supports	- Double parchment leather strips - One of the two parchment strips is laced through the joints - Flat supports - 6 sewing stations: 4 strips, 2 kettle stitch	- Intact
Fastenings	- Textile ribbon (probably from the restoration	- Intact
Bookblock	- Quires consisting of bifolio's - Antique laid paper - Chain lines parallel to spine	- Deliberate folds (for columns) - All the pages are lined with a 19th century antique laid paper
Guards	- Blue and grey paper	- The blue guards may be from the restoration
Adhesive material	- Red sealing wax	-
Samples	- Black woven woollen textile	- Loose samples
Ink	- Iron gall ink	- Local bleeding
Particularities	- This book has been restored	-

Appendix II: Results of the survey

These are the results of the survey. They were originally mapped in an excel sheet, but were converted to tables to fit in the appendix.

Metadata				Cover			
Inv. Nr.	Year	Pages (circa)	Meassurements in mm (HxWxT)	Material	General Condition	Surface dirt	Water/moisture damage
1312.01	1700	160	338 x 268 x 130	Parchment	Fair. Front board detached	Grey. Discoloured.	Parchement deformed. Tidelines.
1312.02	1710	160	340 x 300 x 100	Parchment	Good	Slight	Droplets on spine.
1312.03	1720	160	340 x 285 x 105	Parchment	Fair. Back board detached Good	Slight	Moisture stains on front board. Grey back board.
1312.04	1731	150	337 x 243 x 90	Parchment	Good	Slight	Moisture stains on spine. Tidelines.
1312.05	1732	180	330 x 253 x 105	Parchment	Fair	Grey	Moisture stains on front board.
1312.06	1733	120	335 x 225 x 110	Parchment	Fair		
1312.07	1734	150	335 x 240 x 97	Parchment	Good	No	No
1312.08	1735	150	332 x 238 x 85	Parchment	Fair	Slight	Moisture stains on boards. Tidelines top spine
1312.09	1736	130	337 x 235 x 79	Parchment	Fair	Spotting	Drops
1312.10	1737	150	333 x 250 x 80	Parchment	Fair	Smudges. Black near spine, front board	No
1312.11	1738	140	335 x 240 x 85	Parchment	Very good	Minimal	No
1312.12	1739	120	335 x 249 x 75	Parchment	Fair	Grey board near front edge	Tidelines
1312.13	1741-42	100	335 x 240 x 78	Parchment	Good	Minimal	Droplets board.
1312.14	1743	180	335 x 210 x 140	Parchment	Fair	Grey board near the spine.	Droplets on the spine. Tidelines.
1312.15	1744-49	108	335 x 257 x 112	Parchment	Fair	Grey front board	Moisture stains on the spine.
1312.16	1746	180	330 x 210 x 115	Parchment	Fair/Bad. Curved	Front board detached. Grey front board and spine.	Moisture stains. Tidelines
1312.17	1750-51	170	333 x 239 x 100	Parchment	Fair/Bad	Dark circular spots on front board with yellow halo.	Moisture stains on back board near spine.
1312.18	1751	200	330 x 230 x 125	Parchment	Good	Minimal	
1312.19	1754	170	335 x 225 x 94	Parchment	Fair	Grey near and on the spine.	Moisture stains on the spine.
1312.20	1755	200	330 x 242 x 140	Parchment	Fair/Bad. Curved	Grey near fore-edge. Grey on spine.	
1312.21	1761	120	330 x 238 x 72	Parchment	Bad	Grey near fore-edge. Grey on spine. Dark smudges on front cover.	Droplets on the spine.
1312.22	1764	100	332 x 230 x 90	Parchment	Good	Minimal	Moisture stains on top of spine.
1312.23	1766	120	338 x 225 x 85	Parchment	Good	Minimal	Droplets on front board.
1312.24	1768	100	333 x 225 x 68	Parchment	Fair	Grey near front edge. Grey on spine. Dark spots on the board.	Droplets on board
1312.25	1770	100	334 x 217 x 60	Parchment	Good	Grey near bottom edge of the spine and board.	Bottom board near spine
1312.26	1772	100	328 x 223 x 75	Parchment	Good	Minimal	Droplets on board
1312.27	1780	100	335 x 210 x 90	Parchment	Fair/Bad. Curved	Grey around the spine.	
1312.28	1782	100	332 x 225 x 120	Parchment	Fair	Grey. Black smudges	
1312.29	1787-88	100	336 x 225 x 85	Parchment	Fair	Grey.	
1312.30	1791	100	330 x 241 x 60	Parchment	Fair/Bad. Turn-ins curling.	Grey near bottom edge of the spine and board.	
1312.31	1730	104	335 x 215 x 115	Parchment	Fair/Bad. Joints broken at front.	Brown on spine.	

	Spine (of the bookblock)			Sewing Structure		Sewing Support		
Inv. Nr.	Glueing	Lining	Condition	Sewing stations (+ chain stitch)	All-along, abbreviated	Style	Material	Condition
1312.01	No	No	Fair	4 (6)		Laced, V	Alum tawed	Broken/Cut
1312.02	No	No	Good	4 (6)		Laced, V	Alum tawed	Broken
1312.03	No	No	Good	4 (6)	all-along	Laced, V	Alum tawed	Intact
1312.04	Yes	Yes	Good	4 (6)	all-along	Laced, V	Alum tawed	Intact
1312.05	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Intact
1312.06	Yes	Yes	Good			Laced, V	Alum tawed	
1312.07	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Intact
1312.08	Yes	Yes	Good	4 (6)	all-along	Laced, V	Alum tawed	Intact
1312.09			Good	4 (6)	all-along	Laced, V	Alum tawed	Intact
1312.10	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Intact
1312.11	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Intact
1312.12	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Broken at the front
1312.13	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Intact (?)
1312.14			Slightly concave	4 (6)		Laced, V	Alum tawed	Intact
1312.15	Yes	Yes	Slightly concave	4 (6)		Laced, V	Alum tawed	Intact (?)
1312.16	Yes	Yes	Good	4 (6)	all-along	Laced, V	Alum tawed	Broken at the front
1312.17	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Intact (?)
1312.18	Yes	Yes	Good	4 (6)		Laced, V	Alum tawed	Intact
1312.19			Slightly concave	4 (6)		Laced, V	Alum tawed	Intact
1312.20			Good	4 (6)		Laced, V	Alum tawed	Intact
1312.21	Yes	Yes	Slightly concave	4 (6)		Laced, V	Alum tawed	Intact (?)
1312.22	Yes	Yes	Good	4 (6)		Laced	Parchment (?)	
1312.23			Good	4 (6)		Laced	Parchment (?)	Intact
1312.24			Good	4 (6)		Laced	Parchment (?)	Intact
1312.25			Good	4 (6)		Laced	Parchment (?)	intact (?)
1312.26			Concave	4 (6)		Laced	Parchment (?)	Intact
1312.27			Concave	4 (6)		Laced	Parchment (?)	Intact
1312.28	Yes	Yes	Concave			Laced	Parchment	
1312.29	Yes	Yes	Concave			Laced	Parchment (?)	
1312.30			Slightly concave	4 (6)		Laced	Parchment (?)	
1312.31		Lining. Probably not original.	Good	4 (6)		Laced	Parchment (?)	

	Bookblock						
Inv. Nr.	Material	Edge tears	Surface dirt (edges)	Water damage	Deformation level	Detached pages	Deformation bulk
1312.01	Antique laid paper	Severe	Minimal		3	First quire detached	Top bookblock.
1312.02	Antique laid paper	Severe	Medium		1		Bottom bookblock.
1312.03	Antique laid paper	Severe	Medium	Cockling, tidelines	2	Cut out pages at the end of the bookblock	Throughout bookblock.
1312.04	Antique laid paper	Severe	Medium		3	Cut out pages at the end of the bookblock	Throughout bookblock.
1312.05	Antique laid paper	Severe	Medium		2	Cut out pages at the end of the bookblock	Throughout bookblock. Close to guards
1312.06	Antique laid paper	Severe	Minimal		4	Loose paper fragments	Throughout bookblock.
1312.07	Antique laid paper	Medium	Minimal		2		Throughout bookblock. Close to guards
1312.08	Antique laid paper	Severe	Severe	Tidelines on endleaves.	2	Cut out pages at the end of the bookblock	Throughout bookblock.
1312.09	Antique laid paper	Severe	Medium		2	Cut out pages at the end of the bookblock	Throughout bookblock.
1312.10	Antique laid paper	Severe	Medium		2	Cut out pages at the end of the bookblock	Throughout bookblock. Close to guards
1312.11	Antique laid paper	Severe	Medium		1	Cut out pages at the end of the bookblock	Throughout bookblock
1312.12	Antique laid paper	Severe	Medium		2	Cut out pages at the end of the bookblock	Around samples. Not close to guards
1312.13	Antique laid paper	Medium	Medium		1		Throughout bookblock.
1312.14	Antique laid paper	Minimal	Medium		2		Throughout bookblock.
1312.15	Antique laid paper	Minimal	Medium		2		Throughout bookblock.
1312.16	Antique laid paper	Severe	Severe		4		Throughout bookblock.
1312.17	Antique laid paper	Severe	Minimal		2	Cut out pages at the end of the bookblock	Throughout bookblock.
1312.18	Antique laid paper	Severe	Minimal		3		Throughout bookblock.
1312.19	Antique laid paper	Minimal	Medium		2		Throughout bookblock.
1312.20	Antique laid paper	Severe	Minimal		4		Throughout bookblock.
1312.21	Antique laid paper	Minimal	Minimal		3		Throughout bookblock
1312.22	Antique laid paper	Severe	Medium		1	Cut out pages at the end of the bookblock	Close to guards.
1312.23	Antique laid paper	Severe	Minimal		2	Cut out pages at the end of the bookblock	Throughout bookblock.
1312.24	Antique laid paper	Minimal	Minimal		2	Cut out pages at the end of the bookblock	Throughout the bookblock.
1312.25	Antique laid paper	Medium	Minimal		2		Throughout the bookblock.
1312.26	Antique laid paper	Minimal	Minimal		2		Bottom of the bookblock.
1312.27	Antique laid paper	Severe	Medium		4		Throughout the bookblock. Not near guards
1312.28	Antique laid paper	Severe	Medium		4		Top of the bookblock.
1312.29	Antique laid paper	Severe	Minimal		3		Throughout bookblock.
1312.30	Antique laid paper	Severe	Minimal		2		Throughout the bookblock.
1312.31	Antique laid paper	Restored	Restored		X		Restored

	Closing chords		Guards			Column folds		
Inv. Nr.	Material	Condition	Material	Adhered to paper	Length	1st	2nd	3rd
1312.01	Alum tawed	Broken/Missing	Recycled Ream Wrapper - Lion Medallion	Yes	long	^	v	v
1312.02	Alum tawed	Broken. Partly missing.	Recycled Ream Wrapper - Amsterdam	Yes	long		v	
1312.03	Alum tawed	Partly missing	Recycled Ream Wrapper - Amsterdam	Yes	long	v	^	^
1312.04	Alum tawed	Broken/Missing	Grey paper	No	short		v	
1312.05	Alum tawed	Broken/Missing	Grey paper	No	short/medium	v	v	^
1312.06			Grey paper	No	short	v	^	^
1312.07	Alum tawed	Broken/Missing	Grey paper	No	short/medium	v	v	^
1312.08	Alum tawed	Broken/Missing	Grey paper	No	short	^	^	v
1312.09	Alum tawed	Broken/Missing	Grey paper	No	short/medium			^
1312.10	Alum tawed	Broken/Missing	Grey paper	No	short/medium			^
1312.11	Alum tawed	Broken. Partly missing.	Grey paper	No	short	v	v	^
1312.12	Alum tawed	Broken/Missing	Grey paper	No	short	v	v	^
1312.13	Alum tawed	Broken. Partly missing.	Grey paper	No	short		v	^
1312.14	Alum tawed	Broken. Partly missing.	Grey paper	No	short	v	^	^
1312.15	Alum tawed	Broken/Missing	Grey paper	No	short	v	v	^
1312.16	Alum tawed	Broken. Partly missing.	Grey paper	No	medium	v	v	^
1312.17	Alum tawed	Broken. Partly missing.	Grey paper	No	short	^	v	^
1312.18	Alum tawed	Broken. Partly missing.	Grey paper	No	short	v	v	^
1312.19	Alum tawed	Broken. Partly missing.	Grey paper	No	short	v	v	^
1312.20	Alum tawed	Broken. Partly missing.	Grey paper	No	short		v	
1312.21	Alum tawed	Broken. Partly missing.	Grey paper	No	short/medium	v	v	^
1312.22	Alum tawed	Broken/Missing	Cream paper	No	short/medium	v	v	^
1312.23	Alum tawed	Intact	Cream paper	No	short	v	v	^
1312.24	Alum tawed	Broken/Missing	Grey paper	No	medium	v	v	^
1312.25	Alum tawed	Broken/Missing	Grey paper	No	short/medium	v	^	^
1312.26	Alum tawed	Broken/Missing	cream paper	No	medium	v	v	^
1312.27	Alum tawed	Broken/Missing	Grey paper	No	medium	v	v	^
1312.28			Grey paper	No	medium	^	v	v
1312.29			Grey paper	No	medium			v
1312.30			Cream paper	No	medium	v	^	^
1312.31	Fabric	Intact. Not original.	Grey/Blue paper	No	short/medium	v	v	^

	Adhesive material	Samples		Biological damage		Ink	Particularities
Inv. Nr.	Type+thickness	Type	Loose samples	Mould	Insect/Rodent		
1312.01	Red. A little.	Laken/Swarte stale	Yes				Different guard attachment (pasted on guards instead of sewn-in)
1312.02	Red. A lot.	Laken/Swarte stale	Yes				Different guard attachment (pasted on guards instead of sewn-in)
1312.03	Red. Medium.	Laken/Swarte stale	Yes		Insect damage on parchment and paper back board.		Different guard attachment. (pasted on guards instead of sewn-in).
1312.04	Red. A little.	Laken/Swarte stale	Yes		Fore-edge eaten by mice		
1312.05	Red. Medium.	Laken/Swarte stale					
1312.06	Red. Medium.	Laken/Swarte stale	Yes		Pages are eaten away by mice. A lot of loose pieces and tears.		
1312.07	Red. Medium.	Laken/Swarte stale					
1312.08	Red. Medium.	Laken/Swarte stale	Yes	Maybe	Back fly leaf eaten away by mice.	Iron Gall Ink corrosion.	
1312.09	Red. Medium.	Laken/Swarte stale	Yes	Maybe			
1312.10	Red. A lot.	Laken/Swarte stale				Bleeding	
1312.11	Red. Medium.	Laken/Swarte stale					
1312.12	Red. A lot.	Laken/Swarte stale					
1312.13	Red. A lot.	Laken/Swarte stale	Yes				
1312.14	Red. Medium.	Laken/Swarte stale					
1312.15	Red. A little.	Laken/Swarte stale					
1312.16	Red. A little.	Laken/Swarte stale					
1312.17	Red. A little.	Laken/Swarte stale					
1312.18	Red. Medium.	Laken/Swarte stale	Yes				
1312.19	Red. Medium.	Laken/Swarte stale			Bottom corner slightly eaten on		
1312.20	Red. A lot.	Laken/Swarte stale	Yes		Fore-edge eaten on by mice.		
1312.21	Red. Medium.	Laken/Swarte stale	Yes		Bottom corner slightly eaten on		
1312.22	Red. Medium.	Laken/Swarte stale					
1312.23	Red. A little.	Laken/Swarte stale			Front edge eaten		
1312.24	Red. Medium.	Laken/Swarte stale					
1312.25	Red. Medium.	Laken/Swarte stale	Yes				
1312.26	Red. A lot.	Laken/Swarte stale					
1312.27	Red. Medium.	Laken/Swarte stale			Front edge eaten		
1312.28	Red. Medium.	Laken/Swarte stale			Bottom edge eaten	Local bleeding	
1312.29	Red. Medium.	Laken/Swarte stale			Path eaten through the bookblock.		A lot of loose paper fragments.
1312.30	Red. A little.	Laken/Swarte stale	Yes				
1312.31	Red. Medium.	Laken/Swarte stale	Yes			Seems to have bled. Probably due to lining.	Restored. All pages are lined with antique lined paper on verso of original

Appendix III: List of materials used for the reconstruction

Paper

Nr. 6. Antique laid, 80 gsm.
Gangolf Ulbricht
Mariannenplatz 2
Kunstquartier Bethanien
10997 Berlin
Tel.: – 49 (0) 30 – 61 58 155
Tax No.: 14/566/63086

Guards

Van Gelder paper, antique laid.

Sealing-wax

Provided by Elizabet Nijhoff-Asser

Herbin Zegellak, rood.
https://www.royalposthumus.nl/nl_nl/herbin-banklak-rood-1-staaf.html

Gutenberg Zegellak, rood.
https://www.royalposthumus.nl/nl_nl/gutenberg-postlak-rood-1-staaf.html

Samples

Woollen felt, woven.
Provided by Femke Prinsen

Sewing thread

100% Linen thread
Peter van Ginkel – Kunstenaarsbenodigdheden

Appendix IV: Correspondence with Museum the Lakenhal

E-mail correspondence with Roos Kliphuis from Museum the Lakenhal
The following questions were posed to Roos Kliphuis, depot manager at the Lakenhal, through email. The questions, and her answers, are listed below in their entirety. The correspondence was done in Dutch.

– – – – – – – – – – – – –

- *Hoe zijn de boeken opgeslagen in het depot? Zitten ze in een doos? Staan ze rechtop of liggen ze verticaal? En als ze verticaal liggen, zijn ze op elkaar gestapeld?*

Dit verschilt, ik heb ze aangetroffen met meerdere gestapeld in een doos en omwikkeld met zijdevloeipapier. Maar ook los op een plank, soms met een omslag van blauw zuurvrij papier/karton. Als ze op een plank liggen dan liggen ze op een van de platten en niet op elkaar gestapeld.

- *Is er iets bekend over de klimaatcondities in het depot? (Temperatuur en relatieve luchtvochtigheid)*

De kelders worden geklimatiseerd door een klimaatinstallatie en het streven is een stabiel klimaat (17/18 graden; 50 – 55 % RH). Tijdens de restauratie uitbreiding van het museum is de klimaatinstallatie vernieuwd, dit was schijnbaar hoogstnodig. Ik ga ervanuit dat de klimaatinstallatie over de jaren heen storingen heeft gehad. Tijdens storingen wordt er geprobeerd het klimaat constant te houden met mobiele be -en ontvochtigers. Deze werken werken vrij effectief in onze kelders omdat het vrij kleine en gesloten ruimtes zijn. Wat mij verder opviel tijdens toen het klimaatsysteem uitstond tijdens de restauratie-uitbreiding is dat de temperatuur in de kelders erg stabiel bleef, rond de 16-17 graden. De RH schommelde wel, maar geleidelijk tussen de 60% - 75%.

Tijdens de herinrichting 2016 – 2019 zijn de boeken opgeslagen in het depot van Hizkia van Kralingen, daar wordt een museaal klimaat aangehouden.

- *Is er een restauratie rapport voor stalenboek 1312.31?*

Volgens TMS is 1312.1 niet gerestaureerd.
Op 27/3/2012 is wel deze conditiebeschrijving gemaakt:
Conditie is slecht. Bevat gebruiksslijtage. Vermoedelijk beschadigd door waterschade: omslag en pagina's zijn gaan omkrullen en bol gaan staan, en ze bevatten vlekken. Papier bevat vlekken, scheuren en vouwen. Enkele stalen zitten (deels) los en enkele stalen ontbreken. De touwtjes waarmee het boek kan worden dichtgebonden zijn beschadigd.

1312.31 is wel gerestaureerd. Hier kan ik helaas alleen geen digitaal verslag van vinden. Wellicht dat er in ons fysieke archief nog wat te vinden is. Momenteel werk ik thuis dus ik kan hier helaas niet bij.
Op 23-4-2012 is wel deze conditiebeschrijving gemaakt:

Conditie is matig. Bevat gebruiksslijtage. Papier bevat vlekken, scheuren en vouwen. Papier is gerestaureerd: pagina's bevatten aanvullingen. Enkele stalen zitten (deels) los en enkele stalen ontbreken. De touwtjes waarmee het boek kan worden dichtgebonden zijn beschadigd.
Deze beschrijvingen zijn niet gemaakt door een restaurator maar behoudsmedewerkers/ collectieregistratoren.

- *Zijn er documenten over de overdracht van de boeken vanuit het stadsarchief naar het Lakenhal in 1893? En is er iets bekend over de conditie waarin de boeken toen verkeerde?*

In TMS wordt vermeld dat er een supplement op de catalogus van 1886 bestaat over het jaar 1893. Het zou goed kunnen dat er hier iets over de verwerving in staat. Vaak is de informatie in de catalogi vrij summier, zeker over de conditie. Ik vind het heel vervelend maar ook voor deze informatie geldt dat ik nu niet bij het fysieke archief kan.
Wellicht dat onze conservator Jori Zijlmans je wel verder kan helpen.

Hartelijke groet | Kind regards

Roos Kliphuis
Depotbeheerder

www.lakenhal.nl

Lammermarkt 31 | Postbus 2044
2312 CL Leiden | 2301 CA Leiden

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Pitch stalenboeken from Jori Zijlmans

Jori Zijlmans is a Curator History (conservator geschiedenis) at Museum the Lakenhal. The following is a pitch she wrote about the Lakenhal sample books, containing some background information on the books. The pitch is in Dutch. Permission was given by Jori Zijlmans to use this pitch as an appendix.

De kunst van het zwarten

Jori Zijlmans

Museum De Lakenhal bewaart sinds 1893 een unieke bron over het zeventiende- en achttiende-eeuwse verfproces in de Leidse lakenindustrie. Het betreft 33 boeken van de Staalmeesters van de Lakenhal die door archivaris en museumcommissielid Charles Dozy van het Gemeentearchief naar het museum zijn overgebracht.

De imposante boeken met elk ruim 100 pagina's en perkamenten band bevatten duizenden stofstalen van honderden lakenproducenten die allen bij naam worden genoemd. Op het eerste gezicht lijken alle stukjes stof op elkaar maar nadere bestudering maakt duidelijk dat het om zeven verschillende stofsoorten (saai, baai, warp, karsaai, stamet, plets en laken) gaat.

Opvallend is dat het alleen zwarte stofstalen betreft waarbinnen vijf kwaliteiten worden onderscheiden: 'minder staal', 'enkel staal', 'anderhalf staal', 'dubbel staal' en 'groot staal'. Andere kleuren zoals rood, groen en geel die naar schatting ongeveer tweederde van alle Leidse stoffen moeten hebben uitgemaakt waren niet aan keuringen onderhevig. Waarschijnlijk omdat deze kleuren minder kostbaar en fraudegevoelig waren.

Het keuren van zwarte en blauwe lakense stoffen deden de Staalmeester op het oog. Op het Staalhof van de Lakenhal werden geverfde lakens bij daglicht naast vijf voorbeeldstalen gehouden. Tenslotte werd de 'azijnproef' gedaan waarbij het een klein uitgesneden stukje laken werd afgekookt of in azijn werd geweekt om de kleurvastheid vast te stellen.

De diverse controles op zwartverven waren nodig omdat er geregeld door de ververs werd gefraudeerd. Zo verplichtte het stadsbestuur dat zwart stoffen eerst met wede of indigo blauw moesten worden geverfd waarna ze door een bad van rode meekrap zwart werden gekleurd. Na 1663 was het 'Castoor zwartverven' op basis van galnoot (nootvormige ingekapselde eitjes op eikenbladeren van de galwesp) en koperrood op een witte of bruine ondergrond toegestaan. Meer dan een eeuw bleven 'Castoorververs' naast 'Blauwververs' in Leiden actief.
Hoewel de stalenboeken oorspronkelijk thuis horen in de Lakenhal en bijdragen aan de historische sensatie die het museum biedt, is door de verhuizing uit het gemeentearchief al meer dan een eeuw een belangrijke bron voor onderzoek naar koopliedennetwerken, ververs, kwaliteitscontrole en verftechnieken in de lakenindustrie aan wetenschappelijk onderzoek onttrokken. Door digitalisering van de boeken komt een ongekende schat aan informatie vrij die in combinatie met andere archiefbronnen tot nieuwe inzichten zal leiden over het vroegmoderne productieproces van de Leidse lakenindustrie.

Appendix V: Recommendations for the Lakenhal sample books

This appendix is included for the benefit of Museum the Lakenhal. Since there was not enough room in the rest of the thesis to incorporate advice or recommendations, but this research started from the question of how these books could be preserved and digitised, it was felt that this research would not be complete without it.

Storage

It is recommended to store the sample books in individual custom-fitted boxes. This will prevent any of the textile samples that are detached from being lost. These boxes should preferably be stored flat, so no additional pressure strain is put on the binding.

Due to the parchment covers, it is recommended to store the books in stable conditions at a temperature of 15-18°C and 45-60% relative humidity.[83]

Conservation treatment

For the choice of conservation treatment, it is important to consider whether any of the damages or deformations have any historical value. As discussed previously in this thesis, the folds were deliberately made to create columns, these are therefore not damage. But it will be almost impossible to remove the rest of the deformation and flatten the pages without removing these folds as well. Flattening in itself might be problematic because of the samples, which create an uneven thickness in the bookblock. Flattening usually entails some form of pressing the pages or putting weight on them.[84] Because of the samples, this weight can not be evenly distributed. Effectively, only the part of the paper where the samples are attached to would be pressed, which bears the risk of cracking the sealing wax when too much pressure is applied. The pages could be flattened by stretching them on a screen, which does not require weight, but does require the whole book to be unbound and the pages treated separately.[85] If all the samples are of the same thickness, some intermediate layer, such as blotting paper or strips of felt, could be placed in between the samples, before applying weight. It will be very challenging however, if not impossible, to remove the deformation from the paper without also removing the deliberate folds that make up the columns. In other words: treating the deformation means it must be accepted that some historical information will be lost. It could be argued that this is a necessary evil, since the folds themselves cause some problems in the bookblock and promote deformation. The most widely used treatment to remove folds and creases from paper is by

[83] Woods 2002: 16
[84] Watkins 2002: 67-69
[85] Watkins 2002: 71

humidification and drying the paper under weights.[86] However, if the deformation is inherent to the construction of the book and the space between the samples, flattening the pages alone might not be a sufficient treatment, and the deformation might come back over time. If the books are digitized in some form after treatment, and can be consulted in a digital form, this might be deemed sufficient.

Lakenhal sample book 1312.31 has already been restored. It appears to have been completely unbound to do so, and all pages are now lined on the verso with another paper. This is a very invasive treatment, and is not reversible. It must be considered whether this type of treatment would be beneficial, or if it takes away too much character of the books.

The consideration should be made what is the most valuable in these books. Is it more important that they should be easily consulted and handled? Or do the books have a more intrinsic value, and should they therefore be conserved in their current state. The deformation in the Lakenhal sample books is quite unique, and daresay beautiful, in itself.

Digitisation

There are two main forms of digitising a collection of books: using a camera to take photographs or using a scanner. The damage on the Lakenhal sample books is quite extensive, and digitisation using a scanner is impossible in their current state. To make use of a scanner, the object needs to be able to lie flat. Most of the Lakenhal sample books however, can not do so in their current state. The thick samples and their adhesive sealing wax may also make this process more problematic. Proper conservation treatment involving the flattening of all pages of all sample books will take considerable time, money and effort. It might therefore be more prudent to take photographs using a camera. This is a more time consuming process. But it also means a conservator can be present to handle the book and turn the pages. It also means that the pages only need to be flat enough to take a photograph, and the book does not have to be opened completely. The samples will not interfere with this process.

It might also be worth it to look into 3D-scanning techniques, such as X-radiography. This technique allows for a 3D-scan to be made from the book. Only

[86] AIC Wiki, *Creases*

one scan needs to be made from the outside of the book, after which the pages could be digitally separated. This technique proved promising for digitally flattening crumbled or rolled up textiles.[87] The technique has also been used to read scrolls without having to unroll them.[88] The downside of this would be that the textile samples would still be largely unavailable for research.

[87] Coopmans 2017: 78
[88] Gregory 2004