Archaeologia Medii Aevi Finlandiae XV

Janne Harjula

BEFORE THE HEELS

FOOTWEAR AND SHOEMAKING IN TURKU IN THE MIDDLE AGES AND AT THE BEGINNING OF THE EARLY MODERN PERIOD

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Suomen keskiajan arkeologian seura – Sällskapet för medeltidsarkeologi i Finland

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Reconstruction of a medieval shoemaker's workshop. Produced for an exhibition introducing the 15th and 16th centuries. Technical realization: Schweizerisches Waffeninstitut Grandson. Photograph: K. P. Petersen.

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Children's shoes from excavations in Turku. Janne Harjula/Turku Provincial Museum.

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PREFACE

It is nearly ten years since I had the opportunity to work at the archaeological section of the Turku Provincial Museum for the first time. My tasks were diverse. Taking part in planning the forthcoming excavation at the Åbo Akademi Main Building site to be started in the spring 1998 was included. During the fieldwork period, I was responsible for photo documentation at the site. As most archaeologists in Finland know, the excavation turned out to be a real treasure trove for those interested in historical archaeology. Very soon after the fieldwork, a research project, largely based on the excavation results, followed. I was one of the researchers who chose to start post-graduate studies based on the finds from the site and luckily, was given a possibility to work as a researcher on not one but two successive long-term projects of the Academy of Finland carried out in the Department of Archaeology, University of Turku.

In 2001, there started a three year project *From Village into Town - Changing Ways of Life in Southwestern Finland from the 10th to the 16th century*. During this project I started and finished my licentiate thesis on medieval sheaths, scabbards and grip coverings - my first proper dive into the world of archaeological artefacts.

An even deeper dive and into a much larger assemblage of artefacts and more challenging questions happened in 2004–2006 during another three-year project *Medieval Urban Life on Motion - Challenges and Possibilities for Archaeological Understanding of a Town (Turku, Finland)*. During this period I laid the foundations of my doctoral thesis. Going through the mass of finds in a reasonable schedule would not have been possible to cope with as a part-time job. I am deeply grateful for the Academy of Finland for making possible the preparation of these two large studies. Professor Jussi-Pekka Taavitsainen has had confidence in me right from the start. I thank him for giving me the possibility to show that I could do the job. I also want to thank all my colleagues on both projects.

I express my gratitude to TOP-Foundation, Oskar Öflund Foundation and the Finnish Graduate School in Archaeology. Financial support from them has been extremely valuable in different phases of my thesis. Some of the most crucial moments of preparing a large study can happen at the end. I am grateful for the Finnish Cultural Foundation and Alfred Kordelin Foundation for their grants in the final stages of my thesis and understanding the fact that not only starting new projects is important - but that also ongoing projects must be finished properly.

Numerous people have helped me in one or another way with my thesis and thus have become part of its substance. The help of Aki Pihlman and Maarit Hirvilammi of the Turku Provincial Museum has been invaluable. Together with Sanna Jokela I discussed and solved many practical questions concerning archaeological shoes and leather. Visa Immonen has helped by giving me information about current research of my interests. For the analyses of fibres I am indebted to Heini Kirjavainen. For the identification of wood species I am grateful to Tuuli Timonen and Pirkko Harju at the Botanical Museum, University of Helsinki. Antti Suna of the National Board of Antiquities and Historical Monuments has helped in surveying the Turku Castle finds.

The Academy of Finland granted a research exchange to Poland and gave me and my colleague the possibility to witness the blooming of historical archaeology in the field, research and the number and quality of publications. When arriving in Warsaw, the kindness of our guides Klara Sołtan-Kościelecka and Magdalena Bis was something extraordinary to experience. I also want to thank my Polish colleagues Anna Kowalska in Szczecin and Grażyna Nawrolska in Elbląg for their cordiality and willingness to present local archaeological finds, many of them unpublished.

I am thankful to Viktorija Bebre, my colleague in Riga, for giving me an insight into Latvian archaeology and keeping me up to date when it comes to topical research. Contacts with Krista Sarv in Tallinn and Alexandr Kurbatov in Saint Petersburg have been extremely valuable in this respect, too. Marquita Volken of the Gentle Craft in Lausanne has taught me many crucial elements of archaeological shoes and helped in many difficult questions. I am forever grateful to the late Olaf Goubitz for our discussions on archaeological leather finds. Moreover, Olaf Goubitz's medieval contribution in the book, *Stepping through time - Archaeological Footwear from Prehistoric Times until 1800* has been an invaluable guide.

I thank Geoff Egan and Markus Hiekkanen for their time spent reading my text and giving valuable comments. The English language of the thesis was first checked by Geoff Egan and Jaakko Harjula and finally by Colette Gattoni of Åbo Akademi University. I am deeply thankful to all of them for their work. I thank Jouko Pukkila for designing the layout for the book. For the second time, I am honoured to have my book published in the *Archaeologia Medii Aevi Finlandiae* series of the Society for Medieval Archaeology in Finland.

My warmest thanks go to my wife, Mira. Without her support, writing this thesis would have been much harder. Our daughter, Kerttu, has interrupted the working day every now and then and reminded us what elements the real rejoicing of life is composed of.

Since my childhood, I have always enjoyed the support and unconditional trust concerning my choices, whatever they have been, from my parents Leila Harjula and Jaakko Harjula and my sister, Milja Harjula-Karttunen. I dedicate this book to them.

Masku, 27 September 2007

Janne Harjula

INTRODUCTION

According to the title, the subject of this thesis is shoes and their making. More specifically, the focus is on the archaeological material of Turku (Swed. Åbo), Finland, the largest and most important town of the eastern part of Sweden in the Middle Ages and long after (Fig. 1).
Evidently, the long and vivid history of the town has left its marks in the archaeological records and, fortunately, the conditions for the preservation of archaeological finds in soil, especially of the organic materials, have been favourable. The most numerous and best preserved archaeological shoe finds and the best evidence of shoemaking in Finland during its early history come from Turku. Both the subjects, shoes and shoemaking, have until now waited for a comprehensive study although many case studies, which have been of great aid for this thesis, have been carried out.
A shoe assemblage as large and well preserved as the one in Turku offers great possibilities for diverse studies. Different views of the material and details of finds are endless. There are many pitfalls, mostly caused by the sheer quantity of finds, in researching such a vast material with plenty of information to offer. One has to be very careful in designing the study to avoid a lifetime project which, at least in my opinion, should not be the purpose of a single PhD thesis. This outlining means choosing finds

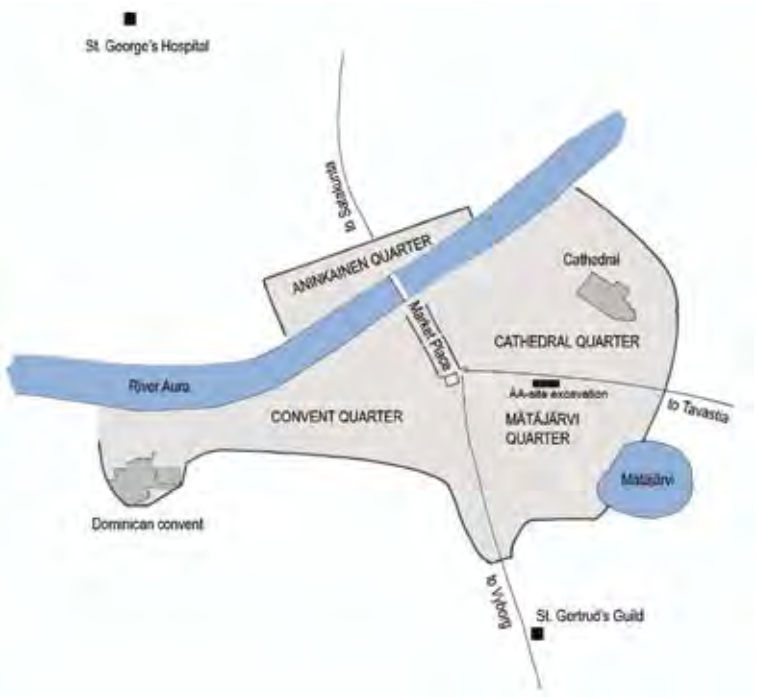


Fig. 1. At the end of the Middle Ages there were four districts in Turku: The Cathedral quarter (Fin. Kirkkokortteli), the Convent quarter (Fin. Luostarinkortteli), the Mätäjärvi quarter and the Aninkainen quarter. The Cathedral quarter reached from the Cathedral to the Great Market Place. It was bounded by the River Aura (Fin. Aurajoki) and the road running from the province of Tavastia (Fin. Häme), which was called Hämeenkatu in the town area. The Convent quarter ran from the Great Market Place to the Dominican convent. The Mätäjärvi quarter was located between Hämeenkatu and the road coming from Vyborg that was called Karjakatu in the town area. The district got its name from the pond of Mätäjärvi, which was shallow and badly polluted already in the Middle Ages. The Aninkainen quarter was situated on the western side of the River Aura. Saint George's Hospital (Fin. Pyhän Yrjänän hospitaali) for lepers and Saint Gertrud's Guildhall (Fin. Pyhän Kerttulin kiltatalo) with its hospice were located outside the town.[1]
The Åbo Akademi main building site (ÅA-site) excavation (1998) can be considered, for the time being, the most important urban excavation in the town of Turku. In the Middle Ages the excavation site belonged to the Mätäjärvi quarter as Hämeenkatu ran on the northern side of the area. Since the beginning of the 18th century the area has been part of the Cathedral quarter as the new course of Hämeenkatu ran on the southern side of the excavation site.

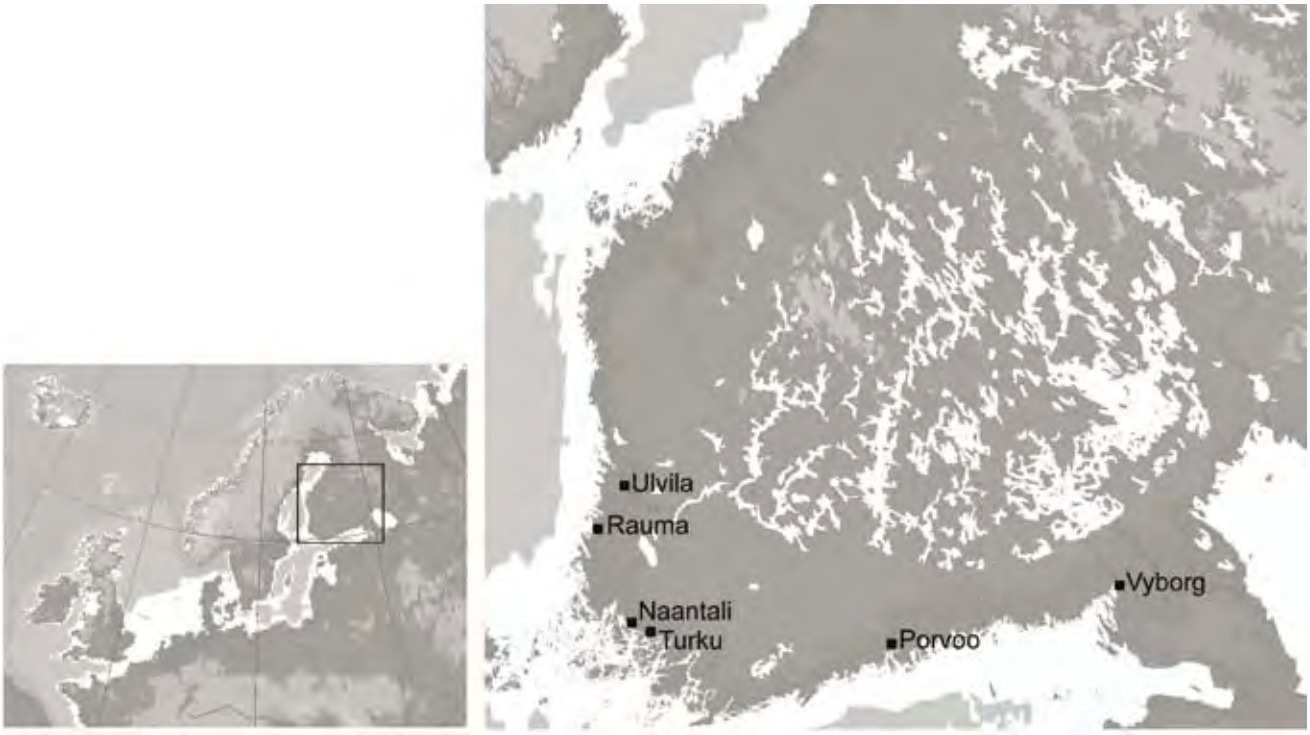


Fig. 2. The six medieval towns of Finland. According to present knowledge, Turku was established in the late 13th century. After its foundation, Turku remained the most important town throughout the medieval period being the centre of the Diocese and foreign trade. Ulvila and Porvoo were founded after the mid-14th century. Although the Castle of Vyborg was founded in 1293 and the town community as well as the town council is mentioned in the written sources in the course of the 14th century, the settlement was not granted town privileges until 1403. Rauma and Naantali followed in 1442 and 1443. The foundation of Rauma and Vyborg was probably motivated by trade and the turbulences of the Scandinavian Union, whereas the foundation of Naantali had the sole purpose of serving and supplying the nearby Brigittine Nunnery and its visitors. Also Rauma had an ecclesiastical community, the Franciscan convent, but the foundation of the town stemmed mainly from economic reasons.[6]

for closer scrutiny and admitting that maybe the whole material cannot be surveyed with the same accuracy in all its details. It means ceasing the flow of new material on the researcher's table at some phase, since after all, new finds are accumulating continually. Finally, one has to admit that these new finds are changing the picture of history all the time and nothing is everlasting except change itself.

Only after these concessions can one start to make more detailed plans for the study. To avoid drifting away from the essential into insignificant details, emphasis has to be put on the research questions considered important and hold to them determinedly. The main source material of this thesis, archaeological leather, can be used as source material in answering a very wide spectrum of different types of questions related to trade, economy, cultural contacts, social structure, demography and the geographical development of the town.[2]

Questions and the definition of the study

This study covers the Middle Ages and the very beginning of the Early Modern Period. The oldest archaeological shoe finds in Turku can be dated by their find contexts to the late 13th century, which, according to present knowledge, has been the period of foundation of the town of Turku.[3] The 14th and 15th century are well represented in the archaeological material, too. Most of the shoe finds come from these centuries. Also covered in this study is the first half of the 16th century. This was an important phase when the newly invented welted shoe and the Modern Period shoe styles occurred side by side with the late medieval turnshoe styles. From the viewpoint of shoes, the end of the Middle Ages and the beginning of the Modern Period overlap in many interesting ways during the first half of the 16th century, which forms a transitional period from the Middle Ages to the Modern Period. The first half of the 16th century is therefore included in this study although archaeological shoe finds of this period are not numerous and the lack of closely-dated contexts decreases the source value of finds even more.

The latter half of the 16th century is mainly not represented by archaeological finds in this study. There are no shoe finds which could be dated by their find contexts or typological grounds to this period. Also, shoe styles of the first and second half of the 16th century are quite different.[4] The latter half of the 16th century is therefore not discussed in this study although the period is touched upon in some chapters.

On the whole, this study treats a period of time when shoe heels were still to come, hence the main title of this work. This next major change in shoe construction, the appearance of proper heels, happens in the late 1500s or beginning of the 17th century.[5] The period, with its historical and shoe

constructional changes, presents completely new problems and has been excluded from this study.
The main geographical outline is quite unambiguous - the town of Turku and Turku Castle. These are the two sites of the archaeological source material. At present, Turku is the only medieval town in Finland where archaeological material is adequate in quantity and quality to answer the questions about shoes and shoemaking presented in this study. Turku Castle with its finds forms an interesting site of comparison to the town of Turku. Furthermore, the castle offers a rare possibility to compare written information and archaeological finds. This applies to the 16th century shoes given as wages and archaeological shoe finds from the castle area.
Finds and research carried out in other medieval towns in Finland have been used as a comparative material in this thesis. It is unfortunate that the other five medieval towns, Vyborg (Fin. *Viipuri*; now situated in the ceded Karelia), Ulvila, Porvoo Rauma and Naantali (Fig. 2) offer rather limited comparative material to the Turku finds.
The reasons for the situation are diverse archaeological formation processes, such as the differences in archaeological activity and the formation and composition of cultural layers. There is much to be expected from excavations to come according to recent excavations in Vyborg, Porvoo and Naantali.[7] This applies especially to organic materials such as leather. There will probably be fewer finds of leather on the basis of the observations of the inorganic nature of the cultural layers in Ulvila and Rauma.[8] Besides towns, organic finds come from excavations in Kastelholm Castle on the Åland Islands. There are shoes, too, among the leather finds.[9]
A great gap in our knowledge about shoes in medieval Finland is due to the total lack of finds from the countryside mainly caused by the typically sparse or non-existent organic cultural layers of these sites, i.e. medieval village places, manors and most of the castles.[10] The only glimpse of the shoes used in the country, may lie in the theoretical possibility that shoes with their origin in the countryside would have, for some reason, been discarded in town and thus become a part of its archaeological record.
In any case, knowledge of medieval shoes in Finland is mainly based on the information gained on the basis of the material from Turku. It is questionable how well this picture can be generalized to cover the whole of Finland or even its medieval towns.
This thesis has been divided into two main parts (Part I and Part II). In **Part I** the shoes have been addressed with the shoe types and styles in focus. In **Part II** the emphasis is on the technical properties and manufacturing technique of archaeological shoes and secondly, on the written and archaeological evidence of shoemaking.
In **chapter one of Part I**, the shoe types occurring in the archaeological material in Turku are presented. The main questions are: *what shoe types occur in Turku and what is the dating and distribution of these types?*
The main question of **chapter two** is, *what kind of life cycle did the shoe types have in Turku?* To solve this, the appearance, period of use and disappearance of shoe styles inside excavated sites with dated contexts have been analysed. Secondly, the percentage distribution of the different shoe types in relation to the total number of determinable shoe types in each phase and from phase to phase is examined.
Chapter three concentrates on the social implications of shoes. The main question is *what kind of shoes did men, women and children use?* The large shoe assemblage of the Åbo Akademi main building site has been used to gain statistical information on the sizes of medieval feet. This information is then used in the analysis of the gender and age of the users of shoes. The size ranges for men, women and children gained can then be compared to sizes of different shoe types and in some cases even information about the users of particular shoe types can be achieved.
In **chapter four** the shoes of Turku have been put in a wider context. The questions are *what is the distribution and dating of the shoe types and style phenomena noted in Turku in the rest of Europe and how does Turku seem in relation to this?* Besides the basic shoe types, a few striking style phenomena, extended tips, suede shoes and different kinds of decorated shoes, have been presented.
In **chapter one of Part II** the shoes are approached from the technical point of view, from the materials and composition of shoes. The question is *what kinds of constructions and materials were used in shoes?*
In **chapter two**, the documentary information concerning leatherworking and shoemaking in the town of Turku, in Turku Castle and in the countryside is discussed. The questions are *what kind of written evidence is there about the leather crafts, especially of shoemaking and what is the source value of this information?*
Sparse documentary information is completed by the actual archaeological remnants of leatherworking and shoemaking. **Chapter three** is devoted to the archaeological evidence of leatherworking and shoemaking. Again, source criticism is used in the evaluation of the archaeological evidence. The question is *what kind of archaeological evidence is there about leatherworking and shoemaking?*
The final chapter is the discussion of Parts I and II. *What was solved in this thesis, what questions are still open but may be answered in the future?*
In appendices 1 and 2, there are listed the sites and the accession numbers of finds discussed in this thesis. Appendix 3 is the report of fibre analyses by Heini Kirjavainen. In appendix 4, the main terms of footwear and shoemaking used in this study are described.

Research history

In this chapter, the research history of the subject of this thesis in Turku and other medieval towns in Finland is discussed. This long research history started with

an article, dealing with structures and artefacts found during the construction work in the late 19th century and at the turn of the next century in Hämeenkatu 17. In his publication, Hjalmar Appelgren includes some leather finds.[11] Leather artefact types found in the survey were knife sheaths, purse fragments and two shoe soles.[12] The shoe soles, however, are not mentioned in the publication. On the basis of the large number of leather finds and especially because there were several examples of the same leather artefact types, Appelgren makes a suggestion that there could have been a workshop of leatherworking/artefact making at the site.[13] Appelgren's article is the first and the only one before the Second World War, which mentions the leather finds of medieval Turku in general, even if he only discusses them in brief. Also the connection of leather finds to their possible manufacture site is the first of its kind in Turku. The actual evidence of a leatherworking workshop in situ is rather weak. The hypothesis can be criticized for its direct connection of discarded, used artefacts and their origin of manufacture. However, one of the two shoe soles seems to be a rough-out of a sole (chapter 3.6 of Part II) so the hypothesis of a workshop can have some basis, although for different reasons than those presented by Appelgren.

In the winter of 1952–1953, a large scale sewer-construction work in Turku was carried out following the eastern riverside of the River Aura from the south side of Aura Bridge to the Old Great Market Place and further to Cathedral Park. To make observations about cultural layers, structures and artefacts, an archaeological survey of the construction work was carried out. It was led by Niilo Valonen, an ethnologist and the head of Turku Provincial Museum at that time. Although a great mass of finds was collected, their context in most cases is known only roughly. This is because there were not enough personnel for a continual survey of such a large construction and supervision of ca. 150 workmen.

Most of the observations were made and artefacts picked up by the workers. Typically, Valonen bought the finds off them afterwards. A part of the finds were lost and it can be assumed that a lot of the finds were not picked up at all.[14] Altogether, there were a lot of problems in documentation. Yet, two important publications by Valonen followed. The first one focused on shoes and the second one presented the survey and the documentation in general.[15]

So, it was Niilo Valonen who for the first time published and discussed archaeological and medieval shoes in Turku. Valonen's work must be considered a great contribution and a great step forward in shoe research, especially regarding the Turku material. Valonen's publications can be characterised as joyful presentations of a selection of the first medieval shoe finds in Finland with illustrations, definitions of types and broad dating by contexts plus a short description of the shoe manufacturing technique.

Such elementary research is still carried out today when new finds emerge from excavations. Although no direct references to archaeological publications, for example, those of Ernfrid Jäfvert's from 1930s in Sweden,[16] were made, it can be assumed that Valonen was well aware of these. Efforts to come to individual conclusions without leaning on other scholars' work can be noted in Valonen's Finnish terms for shoe types, partly ethnological, partly invented by himself (e.g. strap shoe, Valonen: Fin. *päkiäkorvakenkä*). An important contribution by Valonen is the observation that the medieval shoe types in Turku were not noted as surviving in the countryside in later historical times. According to Valonen, the shoes in Turku belonged solely to the medieval urban culture.

When organising an exhibition of finds at Turku Castle, Valonen noted that shoes from the sewer construction were actually not the first ones found in Turku. From the collections of the Turku Provincial Museum, many shoes deriving from the surveys of the first half of the 20th century, both from the town area and the castle were found.[17] According to Valonen, the total number of shoes was now 12 whole shoes, 19 uppers and three soles. It must be noted that even if the number of leather artefacts found was high, Valonen makes no suggestions as to the possible locations of shoemakers' workshops in Turku.

The finds and conclusions of different shoe types and their dating by Valonen must be, because of their pioneering nature, considered a very important part of the history of research of shoes in Turku and therefore presented in more detail in the chapters of the research history of individual shoe types of this thesis.

An important contribution to the knowledge of the dress of the Early Modern Period in Finland, footwear included, is Riitta Pylkkänen's study discussing the dress of the Renaissance and the Earlier Vasa Period, covering the years 1550–1620. Although the main sources were documents and illustrations, archaeological finds made recently in the town of Turku were used to some extent.[18] Pylkkänen's survey of the accounts of Turku Castle to find out the types and numbers of wage shoes distributed in the castle is discussed in section 1.11.2 of Part I.

The next step forward, although a smaller one, was Mona Hallbäck's article of the medieval shoe finds in Turku published in 1970.[19] Excluding some single observations, the article can be considered an update of Valonen's publications with shoe finds from later surveys until 1969/1970 now included. The article starts with a general summary of shoe history and the medieval shoe types. In this, Hallbäck mainly uses Jäfvert's typology.[20] Then, the shoe finds with their find sites are presented. A very good aspect is that Hallbäck has mentioned the access numbers of finds. This makes the later tracing of finds very easy and quick. According to Hallbäck, the number of shoe finds was now 34 whole or almost whole shoes, 123 uppers, 84 soles and a large number of fragments. If we compare the numbers to those mentioned by Valonen (12 whole shoes, 19 uppers) the number of

shoes, uppers and whole shoes counted, was now ca. five times higher than 20 years before. This rise in the amount of material can be considered significant. However, an unfortunate fact is that the finds did not come from archaeological excavations but from surveys. The documentation of find contexts in many cases by the Turku Provincial Museum is very poor or even non existent, probably mostly due to the low resources for archaeological fieldwork during the 1960s.

In dating the finds, Hallbäck largely uses Valonen's results, although the newly found square-toed shoes are dated to the Middle Ages by Hallbäck herself. Contrary to Valonen, Hallbäck uses Scandinavian archaeological publications, for example, those of Jäfvert and Blomqvist, as references.[21] On the basis of the observation that many shoe finds came from Uudenmaankatu, Hallbäck places a possible shoemaker's workshop somewhere in that area. This hypothesis can be criticized for its direct connection of used, discarded artefacts and their origin of manufacture.

Turku decided to become a part of the project *Medeltidsstaden - den tidiga urbaniseringsprocessens konsekvenser för nutida planering* (The medieval town - early urbanization and its consequences for the modern town planning) in 1983.[22] The Finnish part of the project has the title *Keskiajan kaupungit - varhainen kaupungistumiskehitys ja nykyinen suunnittelu* (Medieval towns - early urbanization and town planning today). The purpose of the project, started in Sweden in 1976, was to make an inventory of the situation of urban archaeology in Swedish medieval towns. The project was carried out in each town according to the project scheme. However, material culture was not among the criteria of urbanization in the outline of the project Medeltidsstaden although the project focused on archaeology. The explanation is that the timetable and budget for the inventories did not allow any thorough studies of artefacts.[23]

Still, some authors discussed artefacts, too. In Turku, an analysis of find materials and their distribution from the viewpoint of three artefact groups, ceramics, stave vessels and shoes was carried out by Aki Pihlman. The distribution of medieval artefacts could then be used to make inferences about the extent of the medieval town. In Turku, this was the first time that archaeological material was used for this purpose instead of written documents and maps.[24]

The division of shoes into types was carried out according to the Scandinavian examples of Jäfvert, Schia, Broberg & Hasselmo and Zerpe & Fredriksson.[25] The number of shoes was now 313. Compared to Hallbäck's inventory (1970), we can see that the number of shoes had doubled in slightly over ten years. Except for the finds from the Mätäjärvi excavation carried out in 1975, all shoe finds came from surveys. Fortunately, some of the latest surveys had better information on the find contexts than before. Still, archaeological excavations carried out with modern methods were yet to come.

Even if the analysis of the distribution of shoes was a very important task, there is one aspect which greatly reduces the source value of the maps composed for the publication. The access numbers of finds have not been mentioned. This makes the use of distribution maps in research useless in the sense that one cannot trace back the finds and check the accuracy of observations, although in some cases one can trace back the context of the find spot to a certain survey or excavation. Observations of shoes discussed in the project publication have been discussed in chapters describing the research history of shoe types in Part I of this thesis.

An important task of *Keskiajan kaupungit*, besides discussing the artefacts, was gathering briefly the information on the observations of archaeological structures in Turku. These included those which according to the surveyor were described as tanning vats (Fin. *parkkisammio*). This Register of Town Archaeology, which is continuously updated and kept in the Turku Provincial Museum, has been useful in tracing back observations of structures, possibly connected to leatherworking.

An article about the leather material from the Mätäjärvi excavations (1975 and 1982) differed from earlier research as for the first time, the research questions and methodology chosen by the author, Tapani Tuovinen, defined the study.[26] Modern stratigraphical documentation offered good possibilities for a problem-oriented research to find materials and three questions on shoes were presented.

1) What kind of composition was used in shoe-making?
2) How were the shoes dated stratigraphically and typologically?
3) Was the making of shoes a professional activity?

The chapter devoted to question one is well-researched. The composition of front-laced shoes (the only shoe type in the excavation except one patten strap) has been presented and analysed in detail. In addition, there is a proposal of shoe terms to be used in Finnish.

The dating of front-laced shoes was more problematic. Stratigraphically, it was only possible to conclude that shoe finds came from the lowest cultural layers of the medieval phase. Dating was guided more by artefact datings from other sites in Europe. As a conclusion, the front-laced shoes were broadly dated to the 14th and 15th centuries. The patten strap, the first in Turku, was dated typologically even more broadly from the end of the 13th century to ca. AD 1500.

The possible professionalism of shoemaking was approached from the viewpoint of historical references and archaeological material. From historical sources it was known that there were professional shoemakers in the Mätäjärvi quarter during the 17th century. Leather offcuts of the 17th century could then be used as reference material for offcuts of the medieval phase. The hypothesis was that a trained shoemaker could minimize the use of

leather. Therefore the offcuts of a trained shoemaker are fewer and their form differs from a round form as much as possible, i.e. they were narrow strips or concave-sided polygons. By measuring the form and size of the offcuts it might be possible to make observations about the differences in the degree of experience and professionalism of shoemakers.

As a result, no significant differences between medieval and 17th century offcuts were noted and it could be concluded that medieval shoemakers were professionals. Additional support came from other archaeological and historical information. The front-laced shoes found in the excavation were technically almost identical. This could suggest professional manufacture as specializing and standardizing are usually correlated to professional crafts. Another condition for professional crafts, the monetary economy, was fully developed in medieval Turku, too.

Even if the last two theses sound quite valid, the offcut analysis itself has some weak points. Sanna Jokela has criticized the analysis from a methodological point of view after carrying out a similar analysis on the Aboa Vetus Museum leather material. The selection of offcuts causes particular problems. Only offcuts of a certain shape, those of triangular and strip-shape, are valid for the measurement even though it would be more important to include the indefinite and large polygonal leather pieces in analysis.[27]

Even stronger critique is made of the hypothesis itself. What does the fact that lots of small strips of leather were found tell us? Is it just that it can be assumed that cutting has been frequent and professional, and not, as Tuovinen assumes, that a large number of offcuts indicates unprofessional shoemakers? It should be an equally minor point that some strips are a couple of millimetres wider than the others.[28] From my point of view, the problem of the analysis is the exact measurement of the offcuts. The same result could well have been achieved by the visual observation and survey of the offcuts, without time consuming measurements.

Despite this critique, Tuovinen's article can be considered a significant, pioneering publication of leather and shoe research in Turku. Its greatest benefit is not the results but operating as the first example of a problem-oriented study of leather material in Turku. In the same way, the use of offcuts as source material instead of artefacts only, can be considered significant.

Leather material from another site in Mätäjärvi quarter in Uudenmaankatu 6 (excavations 1986–1987 and 1988) was discussed by Satu Mikkonen-Hirvonen in her MA thesis.[29] All leather artefact groups found, including shoes, were included. Even if the number of whole shoes only numbered three or four, there were a lot of shoe fragments, mostly from front-laced shoes. Besides shoes, a structure, interpreted as a 16th century tanning tub, was found (chapter 3.1.1 of Part II). Mikkonen-Hirvonen's work can be considered mostly as a descriptive case study of find materials from one excavation. The emphasis is on the types of shoes and on their dating by contexts and parallels from other sites.

Leather finds from the Convent quarter were analysed by Sanna Jokela in her MA thesis.[30] This was the first time after Valonen's publications that leather material from this quarter was discussed. The thesis was based on the total leather assemblage from the Aboa Vetus Museum excavation during the years 1992–1995. The thesis was followed by two articles treating the same subject and material.[31] The Aboa Vetus Museum leather finds have also been discussed in a collaborative article on Aboa Vetus Museum and Åbo Akademi main building site finds.[32]

The theoretical framework of Jokela's study was defined by archaeological formation processes. The material studies were also grounded on a culture historical discussion of the use and manufacture of leather. The great contribution to leather research in general was the analysis of animal species in the whole material by means of a visual examination. The domination of bovine leathers became clear and other species were only found in a minority of cases.

This research into shoes begins by analysing the typology and dating of medieval shoes types in Europe. The shoes found are then presented. The dating of the Aboa Vetus Museum finds by contexts is problematic in many cases because a large number of finds come from filling layers.

In addition to the shoe typology, the shoe soles were measured and the results used for social inferences. Unfortunately, the number of measurable soles was very small and the results suffer from this fact. An individual chapter is devoted to health problems concerning feet which resulted from looking at the wear patterns of shoes. The conclusion that may be drawn is that on the basis of the analysed shoes, health problems concerning feet were not very common. More detailed evidence of pathological conditions can be considered only as suggestive.[33]

The main achievements of Jokela's studies are the thorough survey of the find material, the analysis of animal species and new problematics, not presented before in Turku. The occasional poor preservation of organic finds and the lack of context datings decrease the value of the study as a basis for future research to some extent.

The Åbo Akademi main building site excavation in 1998 turned a new page in many ways in the archaeology of Turku. For the first time, the leather material of the ÅA-site[34] was presented briefly in the seminar publication of the Society for Medieval Archaeology in Finland.[35] The purpose of the article was to give examples of the great number and variety of leather finds. The survey was based on that part of the material catalogued so far. Of the shoe types, front-laced shoes, side-laced shoes, tailed-toggle shoes, thong shoes and strap shoes, were noted. These were shoe types which were known from Turku material even before the ÅA-site excavation. On the other hand, the occurrence of buckled shoes was not noted before (they were later found in earlier assemblages, too). The number of patten straps had also now multiplied.

The next step was to present the material to a wider, international audience. This happened in the 3rd International Conference of Medieval and Later Archaeology in Basel in 2002. The presentation was followed by an article.[36] This time, too, a new shoe type was presented. For the first time, the occurrence of one-piece shoes in Turku was noted. The emphasis of the shoe discussion was on the types and their primary dating.

Both the SKAS and Basel publications can be considered as general presentations of the leather material of one site based on the primary survey of the finds.

In 2003, a book presenting the current archaeological research in Turku came out.[37] In a collaborative article, examples of leather research were presented by Harjula & Jokela.[38] The purpose of the article was to present the possibilities of leather studies. The source material was chosen from the assemblages of two sites, the ÅA-site and the Aboa Vetus Museum site. There were examples of different leather artefact groups, shoes, slings[39], bags and knife sheaths. The comparison of two sites and the joining of the results of two individual scholars proved to be quite fruitful. There were many differences but also many unexpected similarities in the find materials. Of the shoe finds, one special aspect was chosen for closer inspection; at both sites, examples of shoes where the upper was made with the flesh side of leather outwards had been found.

The first larger study of the ÅA-site leather material was the licentiate thesis of the author, discussing the knife sheaths, sword scabbards and grip coverings of swords or daggers. Although the ÅA-site material formed the largest part of the assemblage, all the other medieval material of Turku was included.[40] The thesis appeared in a published form a year later.[41]

Besides the studies presented above, examples of the leather finds from the ÅA-site, shoes included, have been part of the two illustrated catalogues published in 2004 by the Turku Provincial Museum.[42]

So far, the publications had only discussed the finds from the town area. Archaeological leather finds from Turku Castle were discussed in an article in 2005 for the first time. The focus was on four special shoes found in the excavation in the outer bailey area, interpreted as medieval fashion shoes with no parallels noted in the town area in Turku.[43]

In 2001, *History of Footwear in Norway, Sweden and Finland* by the shoe historian June Swann appeared.[44] Although the emphasis is on Sweden and Norway and the discussion mostly based on Jäfvert's and Larsen's research,[45] Finland is included. The observations of Finnish medieval shoes were mostly based on Swann's brief survey of the shoes in the collections of the Turku Provincial Museum.[46] In a section discussing the Renaissance Period, Swann uses the publications of Pylkkänen as references.[47] The disadvantage, especially of the medieval section, is that Swann's observations on Turku finds cannot be traced back to actual finds because of the lack of accession numbers.

As we can see, most of the archaeological studies, except Tuovinen's study of offcuts, have mainly discussed the artefacts. Therefore, an important addition is Marita Kykyri's study of wooden buildings and structures. A separate chapter has been devoted to structures possibly connected to professional crafts.[48] Kykyri's interpretation of some large stave vessels as tanning tubs is interesting.

Leatherworking and shoemaking have mostly been discussed by historians as part of crafts in general and have only rarely referring to archaeological finds.[49] Even in the recent studies of crafts, archaeological material has not usually been included.[50] Because of the scarce written information on leather crafts in the Middle Ages, the studies have mostly concentrated on the names of leatherworkers, their nationalities and social status. The information, mostly based on persons' handicraft names does not allow interpretations concerning the actual practising of professions. Another unfortunate lacuna is the missing historical information about the areas of inhabitation of craftsmen in the Middle Ages and the 16th century.

Thus, it has become clear that historical sources alone cannot solve the very basic questions concerning the medieval crafts in Turku. Instead, the historical and archaeological information must be combined. Therefore, the basic information on both history and archaeology on crafts gained so far in Turku, was collected in an article published in 2006.[51] Hopefully, this will partly help in making way for an interdisciplinary research.

Research of leather material in other medieval towns besides Turku has been carried out in Vyborg, Porvoo and Naantali. So far, the largest assemblage is from Vyborg.[52] Although the current leather material is from the very end of the Middle Ages and from the Modern Period, it can be assumed that in the excavations to come, a large amount of well-preserved medieval material will emerge.[53] The same situation of late artefact datings that applies to Vyborg, applies to Porvoo, too. The leather material is from the 16th century at the earliest.[54] What kinds of medieval cultural layers exist in Porvoo town area and how well the older organic material has been preserved in these layers are somewhat ambiguous. In the recent excavations in Naantali, it was proved that at least some organic material, leather included, has been preserved.[55] However, only future excavations will show the true potential of Naantali.

Besides domestic research, Scandinavian and other European research has been of great help for this thesis. Good summaries of the research history in Scandinavia have been gathered by Per Lindqvist.[56] Most of the research carried out in the neighbouring areas and the rest of Europe will reoccur many times in this thesis as references.

Material and methodology

The archaeological material of this study has accumulated during a time period of over a hundred years. The oldest finds come from the 1901 survey

in Hämeenkatu 17. On the other hand, the most recent finds were found in autumn 2005 in the excavation at the Cathedral Square. A complete list and location of sites from where the material of this thesis comes from can be found in Appendix 1.

It is inevitable that the quality of documentation has varied considerably in the course of over a century. Some general observations on documentation can be made. Firstly, documentation of archaeological excavations is usually of better quality than the documentation of surveys. Secondly the quality of documentation in surveys has not progressed chronologically. For example, the survey of 1952–1953 in Itäinen Rantakatu by Niilo Valonen is far better documented than most of the 1960s or 1970s surveys. Mostly the variation in documentation is due to 1) the resources (the most important is time) for the documentation, 2) the general attitude and the changing concern about archaeological remnants and 3) the individuals doing the fieldwork.

Analyses of the 'non-systematic' surveys carried out in Turku and their effects on the value of archaeological materials are by Aki Pihlman.[57] The influence of varying documentation on the source value of the materials of this study becomes clear in most chapters of this thesis, too.

Systematic fieldwork, i.e. archaeological excavations and surveys of modern methods as they are understood today, have been carried out in Turku mainly from the 1980's onwards.[58] In general, the source value of materials from these excavations is good. However, a large part of archaeological material used in this study comes from 'before the 1980's sites'. Without the finds from the ÅA-site (1998), the number of finds from non-systematically researched sites would far exceed the finds from systematically researched sites. In this phase it becomes clear that the ÅA-site is the pivotal position in this study. Much depends on the materials and documentation of this site.

In the 1990's, a new building was planned to be constructed by the Åbo Akademi[59] foundation on the medieval town area of Turku. The plot had been vacant for over 20 years but was archaeologically investigated only after the permission to construct a new building was granted. An area covering 1,350 m^2, with cultural layers of 3.5 m - over 4 m thick preserved on circa 1000 m^2, was excavated by Turku Provincial Museum between April and December, 1998. In its extent, the excavation was unique and epoch-making in Finnish historical archaeology when it comes to the excavation area and the number of finds (Fig. 3).[60]

The youngest archaeologically excavated layers and structures were from the 18th century. The oldest layers and structures were dated to the latter half of the 14th century. Organic material, such as bone, wood, textiles and leather were extremely well preserved in thick and partly waterlogged deposits of the older contexts of the excavation. The largest assemblage of archaeological leather material in Finland up to the present was recovered from the excavation. After the conservation, the leather material was catalogued in the database in Turku Provincial Museum.[61]

The leather material is comprised of over 10,000 accession numbers consisting both of leather waste

Fig. 3. Åbo Akademi main building site excavation with the 15th century layers and structures exposed. Hämeenkatu runs on the left, looking west-southwest.

deriving from leatherworking and leather artefacts. On the basis of the dating of the find contexts, the corpus of the leather assemblage can be dated from the earliest settlement of the area - the latter half of the 14th century - to the 15th century. From the latter half of the 15th century onwards, the number of leather finds decreases.[62] This is mainly because of the thinness of the late medieval layers, the inorganic nature of the Modern Period layers and because of the disturbances of the layers at certain periods, especially during the latter half of the 16th century.

The leather artefact material is comprised mostly of footwear (ca. 88 per cent), which is typical for excavations in medieval towns with suitable preservation conditions.[63] Other artefact types of leather are purses, bags and cases, bands, straps and belts, mittens, sling pouches, miscellaneous items, for example, patches, cut decorations, items of uncertain function and knife sheaths, sword scabbards and grip coverings from swords or daggers.[64]

Unfortunately, the fieldwork was not carried out totally without problems. The problems started during the final and the most important phase of the excavation when documentation suddenly had to be speeded up at the expense of its quality.[65] It was mainly the documentation of contexts, cultural layers and structures of the earliest phase on the site which suffered most because of the mechanical excavation. Still, most artefact finds could be gathered and stored properly for conservation. Thus, the source value of artefactual evidence can be considered good with the exception of accurate contexts.

In part, the lack of proper contexts for finds applies to the whole excavation due to the methods used. The context of the finds was always the excavation unit, i.e. the cultural layer. Therefore, in the case of large units in particular, the insufficient accuracy of the find spot is a problem. When making distribution maps of leather waste and trying to find concentrations of waste, the accuracy of finds only by contexts is inadequate for any certain conclusions. An even bigger problem is the lack of basic information on many important cultural layers. For simple calculations of frequencies of leather/m3 one would need the information on the unit's dimensions (i.e. surface area and thickness).[66] Severe shortages of this kind of information on the most important site of this thesis have guided this study more into the direction of artefactual research instead of the conclusions drawn from the frequency and distribution of leather waste, which was the original starting point. The emphasis of this thesis is in its first part and chapter one of the second part, i.e. the artefacts themselves. It is hard to admit that the huge mass of waste leather collected in Turku, most of it from the ÅA-site, has quite a low source value in studying leather crafts. Fortunately the documentation has greatly developed since the ÅA-site excavation and previous fieldwork. On the other hand, it is a pity that the number of finds from the sites excavated more recently has been much lower than the find masses from the ÅA-site.

This study began at the grassroot level with the laborious but necessary task of cataloguing the ÅA-site leather finds. A benefit of this task is that when a researcher does this job himself, a certain security that every find has certainly passed through his own hands, is gained. Of the material from other sites, some kind of documentation was available but even so, only in some cases. Still, checking every find at least once has been considered important. In fact, most of the finds have been looked at more than once when new questions have arisen. Why all this hardship? I hope that the basic analysis of footwear in this study will form a solid basis to build on in the future. Therefore, extra attention has been put into the careful and comprehensive survey of the finds.

Comprehensiveness in the context of this thesis means that besides cataloguing the ÅA-site material, I have surveyed all the archaeological leather material available, found in Turku and kept in the collections of the Turku Provincial Museum and the National Museum of Finland.[67] From this vast material, it has been possible to select information connected to shoes and shoemaking without missing anything considered essential. Of course, choosing what is important is highly subjective. I have considered essential all the information which helps in answering the questions formulated for this study.

In Appendix 2, there are the accession numbers of the finds listed by artefact types. In the text part, the most representative examples, for instance, of each shoe type have been illustrated, mostly by photographs.

The minimum number of shoes (complete shoes and pieces of shoes certainly representing only one shoe) which could be categorized according to the shoe type is 1163. Even though this is quite a high number, it only represents a small percentage of all the shoe parts from archaeological contexts in Turku. Related to the number of the individual leather finds this minimum number of shoes barely represents some percentages.

It is interesting to look at the effect of the ÅA-site material to the numbers and percentages of shoes from surveys and excavations in Turku. In Table 1, the number and percentages of each shoe type from surveys and from excavations with and without the material from the ÅA-site included are presented.

The number of shoes from the ÅA-site is 845 while the total number of shoes is 1163. It can be seen that the share of shoes from this one ÅA-site is 73 per cent, which is almost ¾ of the total number of shoes in Turku and in this study. Without this excavation, there would be more shoes from surveys than from excavations but with the shoe finds from the ÅA-site included, the percentage of shoes from excavations now far exceeds the number of shoes from surveys. When it comes to the individual shoe types, because of the ÅA-site, the number

Table 1. The number and percentages of each type of shoes from surveys and from excavations with and without the material from the ÅA-site included. Shoe types according to the typology presented in chapter one of Part I.

ÅA-site not included	Excavation	Survey
one-piece s.	2 (67%)	1 (33%)
thong s.	3 (16%)	16 (84%)
strap s.	29 (63%)	17 (37%)
tailed-toggle s.	5 (38.5 %)	8 (61.5 %)
side-laced s.	4 (57%)	3 (43%)
front-laced s.	86 (41%)	122 (59%)
buckled s.	2 (40%)	3 (60%)
boots	-	1 (100%)
combined fast.	-	3 (100%)
pattens	5 (100%)	-
modern p. s.	-	13 (100%)
Σ	136 (42%)	187 (58%)

ÅA-site included	Excavation	Survey
one-piece s.	16 (94%)	1 (6%)
thong s.	6 (27%)	16 (73%)
strap s.	135 (89%)	17 (11%)
tailed-toggle s.	172 (96%)	8 (4.5%)
side-laced s.	26 (90%)	3 (10%)
front-laced s.	537 (81.5%)	122 (18.5%)
buckled s.	50 (94%)	3 (6%)
boots	3 (75%)	1 (25%)
combined fast.	4 (57%)	3 (43%)
pattens	27 (100%)	-
modern p. s.	-	13 (13%)
Σ	976 (84%)	187 (16%)

of tailed-toggle shoes, front-laced shoes, buckled shoes, boots and shoes of combined fastening from excavations now exceeds the number of these shoe types from surveys. However, even if the ÅA-finds are included, there are still more thong shoes and early modern period shoes from surveys than from excavations.

It can be seen that most shoe types come from both surveys and from excavations. Pattens, however, have only been found in excavations while no early modern period shoes come from excavations.

The effect of the ÅA-site finds on the total shoe mass from Turku is very significant. Of course, the effect of the finds from the site has mostly a positive effect on the research with greatly increased information on most shoe types. However, the proportions of finds must be taken into account when making conclusions, for example, about the distribution of finds in Turku to avoid biased results.

Besides shoes, the other archaeological source material used in this study is composed of structures connected to leatherworking, tools of leatherworking and shoemaking and waste leather deriving from leatherworking and artefact making. Of these source groups, all except structures from excavations are still available for closer scrutiny. Of structures, only documents remain and therefore much depends on the quality of documentation in each case.

In addition to archaeological finds and observations, written sources have been taken into account, too. Here, information mainly from published research, i.e. research literature discussing crafts especially in Turku, has been used. As reference material for archaeological finds, publications discussing archaeological leather, shoes and crafts in Europe, especially in the Baltic sphere, have been irreplaceable.

As archaeological objects, shoes form a very special group when it comes to the methodology of studying these artefacts. The special nature is largely due to the puzzle-like challenges caused by separate shoe components drifted apart when threads joining the shoe seams have decomposed. Only with practice and experience one can hope to make something complete out of these parts. On the other hand, even small parts contain a lot of information, if the information hidden in the impressions of other components, stitch holes and seam types are properly interpreted.

Thus, the methodology starts right from the beginning, from documenting the find by drawing and recording the observations. The documentation used in different publications and studies have usually been very inconsistent. Therefore, attempts by different scholars have been made to create a systematic and uniform approach to documentation. This systemacy, a 'common language of shoe studies' is needed to make studies intelligible for other scholars. Perhaps the most comprehensive suggestions for documentation of archaeological shoes have been presented by Olaf Goubitz.[68] These guidelines have been followed in the documentation of shoes of this study. In addition, making outlines of shoe components by drawing them on paper and then using the paper components in constructing the shoe helps in solving the shape and structure of an individual shoe.[69]

Even more varied than the different practices of documentation are the different practices in categorizing the shoes according to type. The variation mainly applies to the terminology and the hierarchy of categorizing shoe types while the same basic forms of shoe styles occur in almost every typology. It is mainly a question of how to name the types and into what order the types, subtypes and variants are put. After all, the basic shoe styles were very similar in all Europe in the Middle Ages even if there were many differences in details. These differences could in archaeological language be called subtypes or variants depending on the categorization used. The method used in categorising the shoes of this study is explained in the next chapter.

PART I: FOOTWEAR

1. SHOE TYPES IN TURKU

In this chapter, the shoe types in Turku are presented. The main questions are, which kind of shoe types occur in Turku in the Middle Ages and at the beginning of the Early Modern Period, how the shoe types are dated and what their distribution in town and Turku Castle is. Datings can be used to draw conclusions of the period of use of a shoe type and possible ups and downs in the intensity of use during the life cycle of the shoe type. The purpose of the examination of the distribution of shoe types is two-fold. Firstly, there are the possible differences in the use of shoes between different quarters in the town and within each during certain periods. Secondly, after the shoe types have been dated, their occurrence in the cultural layers of town can be used to compare the picture formed by shoes to the views presented in earlier research about the extent of the medieval town of Turku.

The discussion of each shoe type begins with a definition, terminology and research history of this particular type. This is followed by a description of shoes in Turku and the possible division into subtypes and variants. Next, there is a look at the distribution and dating of the shoe type. At the end of the presentation of each shoe type, there is a short summary.

In creating the basis for the division of medieval turnshoes into types, two basic variants have frequently been used. They are the shoe height and the method of fastening.[70] In this study, the first distinction of turnshoes is made on the basis of the fastening system. With the fastening used as a criterion, the following basic types of turnshoes have been formed: Thong shoes, strap shoes, tailed-toggle shoes, side-laced shoes, front-laced shoes, buckled shoes, boots and shoes with a combined fastening.

Turnshoes, however, are not the only shoe group in this study. On the basis of the different manufacturing technique, two groups can be distinguished. The first are the one-piece shoes, shoes made without a separately cut sole. The second are the welted shoes of the Early Modern Period. Welted shoes were made without turning the shoe after stitching. This different manufacturing technique had a profound effect on the modern period shoe styles and their shapes. The different manufacturing technique distinguished the modern period shoes from medieval shoe types even though the fastening methods were still the same in some cases, for instance, in front-laced shoes. In addition to one-piece shoes, turnshoes and welted shoes, there is still one further group. The pattens form a distinct category of medieval footwear. Thus, the basic division of shoes in this study is formed by four groups of footwear which are one-piece shoes, turnshoes, pattens and welted shoes. A further division of these groups into types and, in some cases, subtypes and variants is presented in Fig. 4.

The detailed description of the shoe types is given in the following chapters. When possible, in each type, there is a reference to matching shoe types in Olaf Goubitz's shoe typology, for example thong shoes (Goubitz type 10). The Goubitz shoe types suggest the typology used in the book *Stepping through Time. Archaeological Footwear from Prehistoric Times until 1800*, which can be considered the current handbook of European archaeological footwear.[71] Of course, there are differences in details between Goubitz's description and my description of each shoe type. Goubitz's typology, however, is the one which most closely matches the shoe types in Turku. When differences appear, they have been explained in my description of each shoe type. For clarity, references to other typologies have been used when necessary.

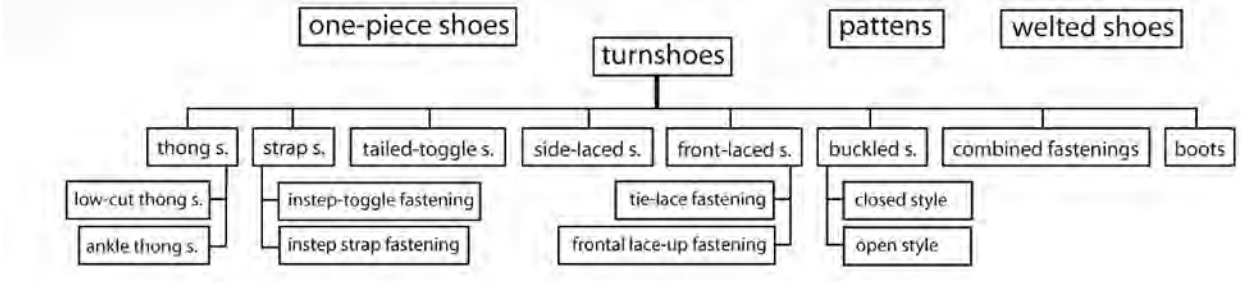


Fig. 4. Division of shoes into groups and types followed in this study.

Fig. 5. One-piece shoes from the ÅA-site preserved as whole. From left to right, TMM 21816:NE50044, NE509160, NE51525. From the contexts of late 14th century - early 16th century. Lengths 22, 28 and 29 cm.

What is the purpose of this kind of type arrangement? For this research, it has mostly been a tool used to categorise the finds. Whether the typology would have had any relevance in the society of the past is a completely different question. Probably the four main groups and the basic shoe types would have been relevant categories if medieval man had had to arrange the shoe data. When it comes to subtypes and variants, it would be more a matter of taste. Unlike the basic shoe types, the subtypes and variants in this thesis are not meant to be fixed groups and only represent one of the many possibilities in dividing the types into more detailed categories.

1.1 One-piece shoes

1.1.1 The type definition and research history of one-piece shoes in Turku

The definition of one-piece shoes is that they are *made from a single piece of leather or hide.* Often, especially in Scandinavian research, the term *hudsko* or its translation (Engl. hide shoe) is used.[72] Literally, it suggests the use of untanned hide. However, one-piece shoes from archaeological contexts were often made, like all the one-piece shoes of this study, of tanned leather. Thus, the term *hudsko* or *hide shoe* is not quite accurate when discussing these archaeological shoes.[73] The terms *primitive shoe*[74] and *moccasin*[75] have sometimes been used in literature, too. These terms are not used here, the former being value-laden and the latter referring loosely to the ethnicity of American and Asian Indians.[76] The term *one-piece shoe*[77] is used throughout this study. The term carries in its name the most important attribute which distinguishes these shoes from multi-piece shoes. It is also without ethnic or ethnographic bonds.

The first one-piece shoes from the archaeological contexts in Turku were noted in the Åbo Akademi main building site assemblage (Fig. 5).

These one-piece shoes were at that time the only finds of this kind in Turku (and the whole of Finland). The shoes were briefly discussed in an article, in which close parallels to the Åbo Akademi site one-piece shoes in the Baltic area and Russia were noted. There also seemed to be both amateur and professionally made one-piece shoes in the assemblage. The dating of these shoes to the latter half of the 14th century and to the 15th century was considered probable.[78] One-piece shoes have also been found in recent Vyborg excavations.[79] In Turku, the shoes from the ÅA-site are no longer only ones either. In a survey for this study, some one-piece shoes in earlier assemblages were also noted.

1.1.2 The number and types of one-piece shoes

The minimum number of one-piece shoes from archaeological contexts is sixteen in the town area and one from Turku Castle. These are shoes preserved as whole or almost whole so that one can be certain that each represents an individual shoe. In addition, there are four fragments from the town area.[80] These, most probably, represent individual shoes because the fragments are from different excavation contexts from the ÅA-excavation although their belonging together cannot be excluded for certain.

All the one-piece shoes in Turku have the same fastening principle. A single piece of leather is bent around the foot and held together with thongs passing through cut slots around the ankle. There are seams formed both on the front and back. On the front, the edges were turned up and around the foot, the edges meet in the middle, above the toes/instep. The seam was put together by seaming the edges with a binding stitch. The edges on the back were simply turned up and stitched together with a binding stitch to form a heel.

The material of shoes is cattle leather in all cases. The thickness of leather in one-piece shoes varies between 1 mm and 3 mm, the average being between 1.5 mm and 2.5 mm.

Differences can be noted in the cutting pattern of shoe leather and in the positioning of thong slots, which result in a slightly different appearance. Chronological differences between different patterns cannot be discerned from the present material.

1.1.2.1 Cutting patterns of one-piece shoes

The cutting patterns of one-piece shoes are presented in Fig. 6.

The most frequent and also the simplest pattern (pattern 1) is a rectangle, in some cases with a slight

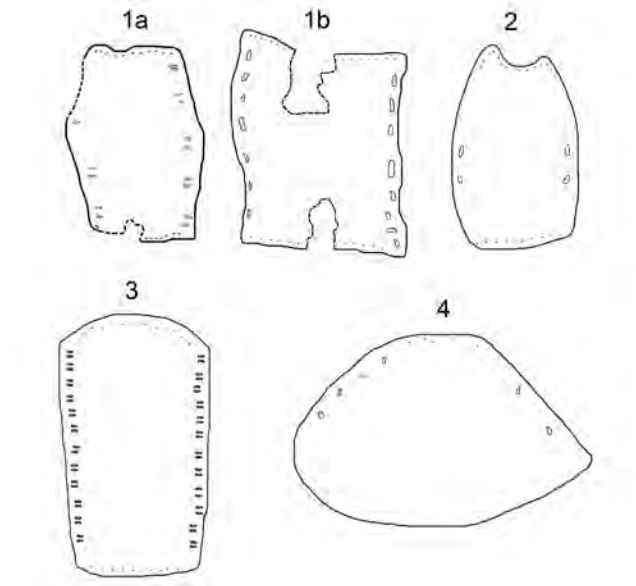


Fig. 6. The four different cutting patterns of one-piece shoes. ***1a, 1b*** *rectangle,* ***2*** *rounded projections on the front,* ***3*** *symmetrically arched front,* ***4*** *irregular patterns.*

tapering towards the toes and/or heel.[81] In this group, at least in the shoes with a preserved heel part, the back part is cut straight without an indent. When cut this way, it will result when seamed in a protruding piece of spare space at the bottom.[82] Even if the indent is a simple way to avoid this, this is not common in Turku shoes. More developed, the so-called Y-back seams or T-back seams[83] have not been noted, either. More effort has been put into the cutting pattern of the front part. Even in the rectangle patterns, an indent in the middle of the front edge which excludes the spare space and gives a neater finish is common.[84]

In the second pattern (pattern 2), the front part is shaped by cutting the indent in a way that two rounded projections are formed (Shoes NE5044 and NE51525 in Fig. 5).[85] One projection is narrower, pointed and extends further than the other. This corresponds to the space under a big toe. Another projection corresponds to the space under the other toes. When this pattern is gathered around the foot and fastened with a thong, the result is a rounded, horizontal arch over the instep.

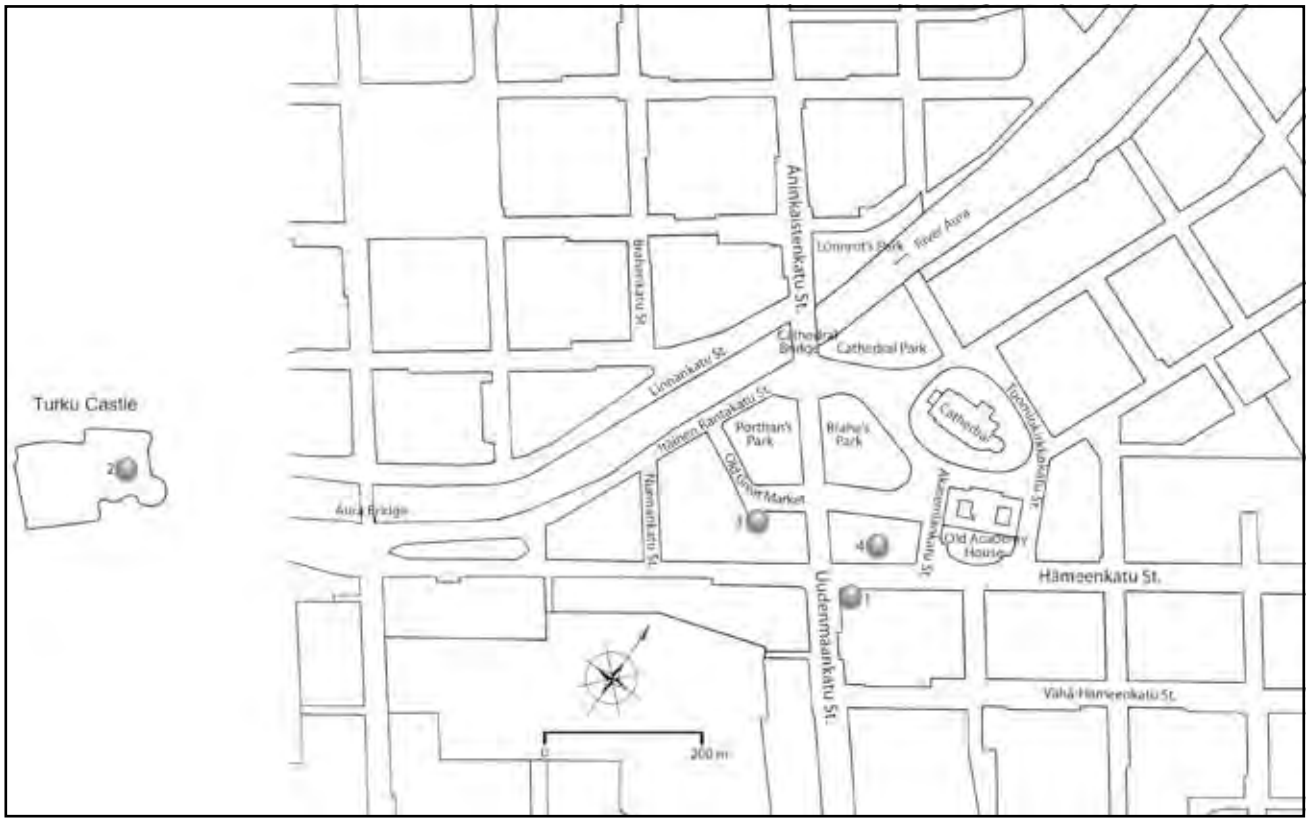


Table 2. The distribution of one-piece shoes. Turku Castle is located at the mouth of the River Aura, roughly three kilometres downstream from the medieval town of Turku.

Site	Number of finds	Symbol on the map
Uudenmaankatu4/Hämeenkatu 16 (survey 1960–1961)	one shoe	1
Turku Castle, eastern outer bailey (survey 1976)	one shoe	2
Old Great Market Place, Hjelt building (excavation 1989)	one shoe	3
ÅÅ-site (excavation 1998)	14 shoes and four fragments	4

Table 3. Dating of one-piece shoes in the Old Great Market Place, Hjelt building.

Phase	Number of finds (main pieces)	Number of finds (fragments)
first quarter of the 14th century	-	2

Table 4. Dating of one-piece shoes at the ÅA-site.

Phase	Number of finds (main pieces)	Number of finds (fragments)
14th century	2	-
latter half of the 14th century - beginning of the 15th century	7	-
latter half of the 14th century - 15th century	2	4
latter half of the 14th century - beginning of the 16th century	1	-
15th century - beginning of the 16th century	1	-
16th century - 17th century (a mixed layer?)	1	-

The sides in this pattern are slightly rounded but the back is cut straight as in the rectangular form.
In the third pattern (pattern 3), the front edge of the leather forms a symmetrical arch (Shoe NE509160 in Fig. 5). The sides widen evenly from the back towards the toe part. The result is a rounded arch over the instep like in pattern 2, but pattern 3 probably needs less puckering by the thong to form the rounded instep shape.[86]
Besides these three basic forms, one-piece shoes have been put together from more irregular leather pieces.[87]

1.1.2.2 Thong slots and thongs

Thong slots in one-piece shoes have been made by cutting slits along the edge of the leather. The slots either run in continuous rows[88] or are placed in pairs with intervals.[89] Shoes with only a few, irregularly placed slots also occur.[90] In one case the decorative row of holes in the upper edge of the leg part of a shoe has been used as thong slots in a shoe made of reused leather.[91] The usual direction of slots is vertical, but horizontal slots (in the direction following the edge) occur, too.[92]
In five shoes, parts of thong were preserved.[93] Unlike in thong shoes, where the thong preserved is always of leather in Turku, in one-piece shoes the preserved thong is of plant fibre. This could indicate two different traditions of making shoes. In addition, according to Heini Kirjavainen's analysis (Appendix 3), three thongs were made of flax and two thongs of hemp. All samples were Z-plied threads (made of two s-twisted threads twined together).

1.1.3 The distribution and dating of one-piece shoes

One-piece shoes have been found in four sites. The total of 17 finds is distributed in the following way (Table 2).

Next, the one-piece shoes are put to their dated contexts (Tables 3 and 4).
The two fragments from the same one-piece shoe from the Hjelt building site in the Old Great Market Place come from a layer dated to phase two in the stratigraphy.[94] The one-piece shoe find from the Old Great Market Place can be dated to the period AD 1300 - 1325 by its find context.
In the Åbo Akademi main building site assemblage, one-piece shoes are represented in the latter half of the 14th century and possibly in the first half of the 15th century. The uncertainty of the 15th century finds is caused by the fact that most of the 15th century layers with finds of one-piece shoes also contain material from the late 14th century. One shoe can be dated to the 15th century or early 16th century by its find context. The shoe from the 16th - 17th century layer is possibly from a mixed context.

One-piece shoes from undated and non-excavation contexts

The one-piece shoe find from the construction work in Uudenmaankatu4/Hämeenkatu 16 can be only broadly dated. Among the finds collected from the site, there were other types of shoes, front-laced shoes and buckled shoes. On the basis of the typological dating of these shoe types, the dating of the one-piece shoe to the latter half of the 14th century or to the 15th century is probable. Support for this dating comes from the general picture of the inhabitation of the Mätäjärvi quarter, which for the most part was a 15th century phenomenon.[95]
On the basis of the associated finds and the general picture of the settlement in the Mätäjärvi quarter, the dating of the Uudenmaankatu4/Hämeenkatu 16 one-piece shoe to the 15th century or to the early 16th century is probable, although earlier or later dating cannot be excluded.
The one-piece shoe from Turku Castle cannot be dated by its context either. Only the associated finds give some support for the dating. Many parts, uppers and soles, of the so-called cowmouth shoes, dated

typologically to the early 16th century and found in the same area and associated layers (although these were technically defined) could indicate an early 16th century dating also for the one-piece shoe.
The one-piece shoe from Turku Castle dates possibly to the early 16th century on the basis of the associated early 16th century cowmouth shoe finds. This dating suggests the possibility that the tradition of making and using one-piece shoes carried on to the Early Modern Period in Turku.

1.1.4 Summary

One-piece shoes were defined as *footwear made from a single piece of leather.* The minimum number of one-piece shoes from the town area is sixteen. One shoe comes from Turku Castle. All shoes have been made from tanned calf/cattle leather. Three different cutting patterns were noted, a simple rectangular pattern being the most common. One-piece shoes with more complex patterns, with rounded projections on the front or symmetrically arched front are fewer. Some of the one-piece shoes have been made from reused leather.
One-piece shoes in the town area come from three sites: Uudenmaankatu 4/Hämeenkatu 16, the Old Great Market Place (Hjelt building site) and the ÅA-site, i.e. from the Cathedral quarter and Mätäjärvi quarter. There are no one-piece shoe finds from the Convent quarter or the Aninkainen quarter. One shoe comes from Turku Castle.
One-piece shoe from the oldest context comes from the Old Great Market Place and can be dated to the first quarter of the 14th century. Most one-piece shoes come from the Åbo Akademi main building site and can be dated to the latter half of the 14th century and possibly to the first half of the 15th century. Another shoe from the Mätäjärvi quarter with its suggested dating to the 15th or early 16th century indicates the possibility that the tradition of making and using one-piece shoes in Turku, at least to some extent, continued through the Middle Ages till the Modern Period. The one-piece shoe from Turku Castle with its suggested early 16th century dating also indicates this possibility.
The quality of one-piece shoes ranges from shoes put hastily together to shoes with a simple pattern but which, however, have been manufactured with care and skill and with knowledge of complex patterns. The first group probably consists of amateur-made shoes and the latter group of both skilfully made amateur shoes and professionally made shoes; the amateur and professionally made shoes in the latter group cannot be distinguished from each other on the basis of the artefacts only. It is probable that different ways of manufacture reflect the different uses of these shoes, i.e. in the group of one-piece shoes there are quickly constructed, technically very simple shoes for more or less temporary use to be worn when normal shoes were not available because of poverty or some other reason. On the other hand, there are carefully manufactured shoes, possibly for different working conditions. This is why one cannot discuss these shoes just as one group but must take into account the possible variants in the manufacture and use of these shoes.

1.2 Thong shoes (Goubitz type 10)

1.2.1 The type definition and research history of thong shoes in Turku

The definition of thong fastened shoes is that they are *closed by thongs running externally around the leg or ankle part of the shoe*. Accordingly, in archaeological literature this shoe type is called thong shoe[96], drawstring shoe[97] or leash shoe[98], all these terms referring to the specific fastening type of these shoes. As the most widely used term, thong shoe is used in this study. The fastening method of the medieval thong shoe comes from prehistoric footwear.[99] Thong fastening can be noted in the oldest one-piece shoe finds from the stone/bronze-age,[100] and it has stayed in use in shoes of ethnographic contexts till the modern day.[101]
The first person discussing the medieval archaeological thong shoes of Turku was the ethnographer and director of the Turku Provincial Museum at that time, Niilo Valonen. On the basis of two find places from the sewer construction of 1952–1953, i.e. the lower end of Rettig's slope and the trench extension in front of Brahe's Park, he noted that thong fastened shoes were very few and regarded them as the earliest shoe type in Turku. Valonen dated most of the shoe finds to the 14th century, but concluded that some thong shoes might even date from the late 13th century (based on the shoe fragments from the trench extension).[102]
After Valonen, there was a long hiatus.[103] In the publication of the project *Keskiajan kaupungit*, in the 1980s, Aki Pihlman estimated the distribution and proportion of different shoe types in Turku, also of thong fastened shoes, but did not discuss their dating. In Pihlman's survey, thong shoes were noted in all the medieval quarters of Turku, the Cathedral quarter, Convent quarter, Mätäjärvi quarter and Aninkainen quarter, with a slight emphasis in the Cathedral quarter and the Mätäjärvi quarter. According to Pihlman, thong shoes were the second rarest footwear type (18 shoes noted), coming only after the side-laced shoes, which were not known at all at the time of Valonen.[104]
Thong shoes from the Aboa Vetus Museum excavations have been presented by Jokela. One of the three shoes has been dated to the beginning of the 14th century by its find context.[105]
When surveying the Åbo Akademi main building site material, I noted that 'thong shoes are clearly giving way to other types of turnshoes. They are represented only in the oldest phase (the latter half

Fig. 7. Later thong shoes from Itäinen Rantakatu, Old Great Market Place and the ÅA-site. Top, from left to right: TMM 14681:731b, 731a, TMM 21816:NE5122. Bottom: TMM 20764:1606, 1535, 1605. The 14th century.

of the 14th century) and are few in numbers even then'.[106]

1.2.2 The number and types of thong shoes

According to this survey, the minimum number of thong shoes found, based on the number of uppers, is eighteen from the town area and four from Turku Castle. The number of fragments which do not certainly come from one shoe is 17 from the town area and three from the castle. All the thong shoes found in the town area are low-cut shoes. There is only one ankle shoe and this is from the outer bailey of Turku Castle. Moreover, a low-cut shoe with an open instep and a high back part comes from the Castle. It is without parallel in the town area.

1.2.2.1 Low-cut thong shoes

Low-cut thong shoes from the town area

In Scandinavia, this style is usually called a 'later thong shoe' or 'open thong shoe' (Swed. yngre remsko/öppen remsko) in distinction from the 'older thong shoe' with a closely spaced thong slots around the opening (Fig. 7).[107]

The cutting pattern of the low-cut thong shoes of Turku is a wrap-around construction, in most cases with insert/inserts on the medial side of the foot.[108] However, two shoes of children's sizes from the Old Great Market Place, from the first quarter of the 14th century context, have a different cutting pattern. The first one is a right foot shoe and has, besides a medial side seam, a seam on the centre of the heel section so that the medial quarter is formed of one insert piece. On the right half of the heel, there is an oblique horizontal cut with a butted edge/flesh seam.[109] The second shoe is a left foot shoe and has a triangular insert on the heel and another larger insert piece on the medial quarters.[110]

Whether these patterns are exceptional or suggest a wider practice is impossible to conclude from the small assemblage of thong shoes. The purpose of the inserts and especially the heel seam could have been to adjust the shoe to the customer's individual foot instead of ready-to-wear footwear. On the other hand, the use of multiple-part patterns has been explained by the economic use of leather, i.e. the use of leather scraps to make up a full pattern.[111] It is also possible that in the early phases of the town, in the late 13th century and at the beginning of the 14th century, the custom of making cutting patterns were not yet unified to a wrap-around construction as seems to be the case in the later phases.

Four shoes, three from the Old Great Market Place and one from the lower end of Rettig's slope have places for longitudinal inserts on the base of the main piece of the upper, on the medial side.[112] This practice of inserts on the base of the upper has parallels in London shoes in the 13th century.[113] A practical reason could be that these parts were easily replaceable. In London shoes the inserts, however, seem to be on the quarters,[114] while in Turku they are on the vamp.

An edge/flesh binding stitch along the top edge of the upper seems to be a standard in the thong shoes of Turku. The stitching could be used for attaching a topband or lining. On one thong shoe, the topband has been preserved.[115]

The use of heel stiffeners in thong shoes can be noted in the shoes of the Old Great Market Place in the first quarter of the 14th century.[116] On the other hand, there are thong shoes without heel stiffeners (an observation based on the lack of stitch holes on the flesh side of the heel) but the ratio of thong shoes with and without heel stiffeners cannot be concluded on the basis of the few finds. It seems, however, that the use of heel stiffeners in thong shoes was not a standard in manufacture.[117]

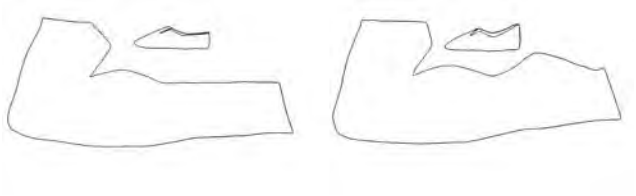


Fig. 8. Two different side profiles of low-cut thong shoes: straight (left) and dip (right).[121]

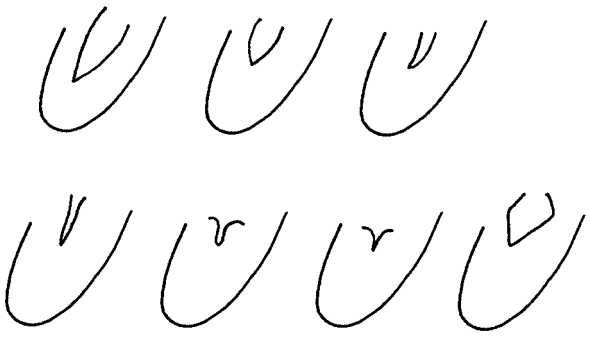


Fig. 9. Shapes of vamp openings in low-cut thong shoes.

The use of rands in lasting margins is present from the first quarter of the 14th century onwards, but the ratio of thong shoes with and without rands (it is not certain whether there were any without) cannot be concluded on the basis of the present material.[118]

In some better preserved uppers it is possible to look at the profiles of uppers more closely. There are two basic types when it comes to the cutting pattern of the top edge, i.e. the side profile of the shoe. In the first type the side has a straight profile, low-cut or ankle height.[119] In the second type there is a rounded or angular dip on the side and the top edge rises towards the heel (Fig. 8).[120]

The profile with a dip seems to be more common than the type with a straight profile. It is possible that different profiles have chronological significance, but the differences cannot be discerned from the present material.[122]

The vamp openings are in most cases U/V-shaped, reaching more or less towards the toes and in some cases curving slightly on one side (towards left in the right foot shoes, towards right in the left foot shoes). In three shoes there is no opening on the instep, only a slight angular indent on the vamp throat (Fig. 9).[123]

In medieval thong fastened shoes, the thongs are usually held in place by keepers, which are of two types. The thong either runs through the incised slots or through loops composed of threaded vertical straps.[124] Only incised slots have been noted in the thong fastened shoes of Turku. The keeper straps are more common in shoes with several tiers of keeper slots than in shoes with only one tier of keepers. This is probably the main reason for the lack of keeper strap type in Turku, where only shoes with one tier of thong slots have been found.

The placing of thong slots in shoes has been systematic. Usually there is a slot on both sides of the instep and the heel and one pair between these, i.e. three slots on one side of the shoe. In some cases the middle slot is lacking. In some cases there is an additional slot in the middle of the instep and/or heel.

A thong or a part of it has been preserved in seven shoes.[125] In all the cases the thong is of leather. Textile thongs have not been noted. Here, there seems to be a clear distinction to one-piece shoes of the assemblage, in which all thongs preserved are of textile even if the fastening method is the same in both thong shoes and in one-piece shoes. A reference to the existence of two traditions of manufacture was already made in chapter 1.1.2.2 and further discussed in chapter 4.1.9 of Part I.

All the thongs preserved are flat leather strips of ca. 3–6 mm width. In some cases the thongs are wider on the heel section and narrow towards the instep. In one case the thong has knots in its ends. In four shoes, thongs have been preserved in their whole length.[126] The length of thongs has been enough to be knotted on the instep but not to be wound once more around the leg. In one shoe,[127] however, both thong ends extend 13 cm outside the instep slots, which in a small shoe is an oversized length or possibly had a decorative function (Shoe TMM 20764:1606 in Fig. 7). In one shoe the thongs remain tied.[128] In one shoe, there remains a piece of a thong, which seems to have its beginning on the instep slot and a direction towards the back.[129] This suggests the possibility that in some shoes thongs could be tied on the side or at the back instead of the instep.

The low-cut thong shoe with an open instep from Turku Castle

The low-cut shoe from Turku Castle differs significantly from the styles of the town area (Fig. 10). The pattern is a wrap-around as in shoes from the town. However, in this shoe, the heel-part extends to the height of the ankle bone but the sides of the shoe are very low and the instep is open to the

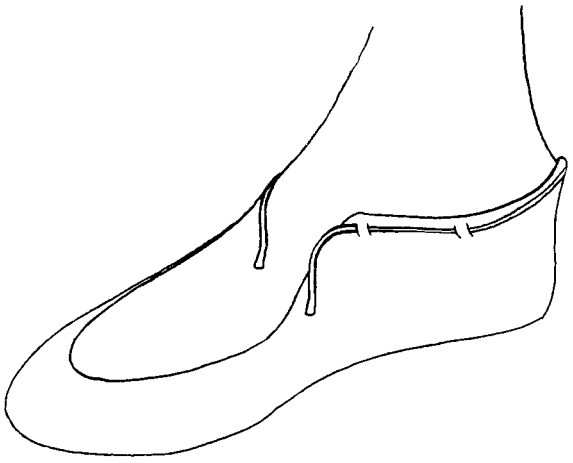


Fig. 10. A low-cut thong shoe with an open instep from Turku Castle (KM 96001:4548). Late 13th century - 14th century.

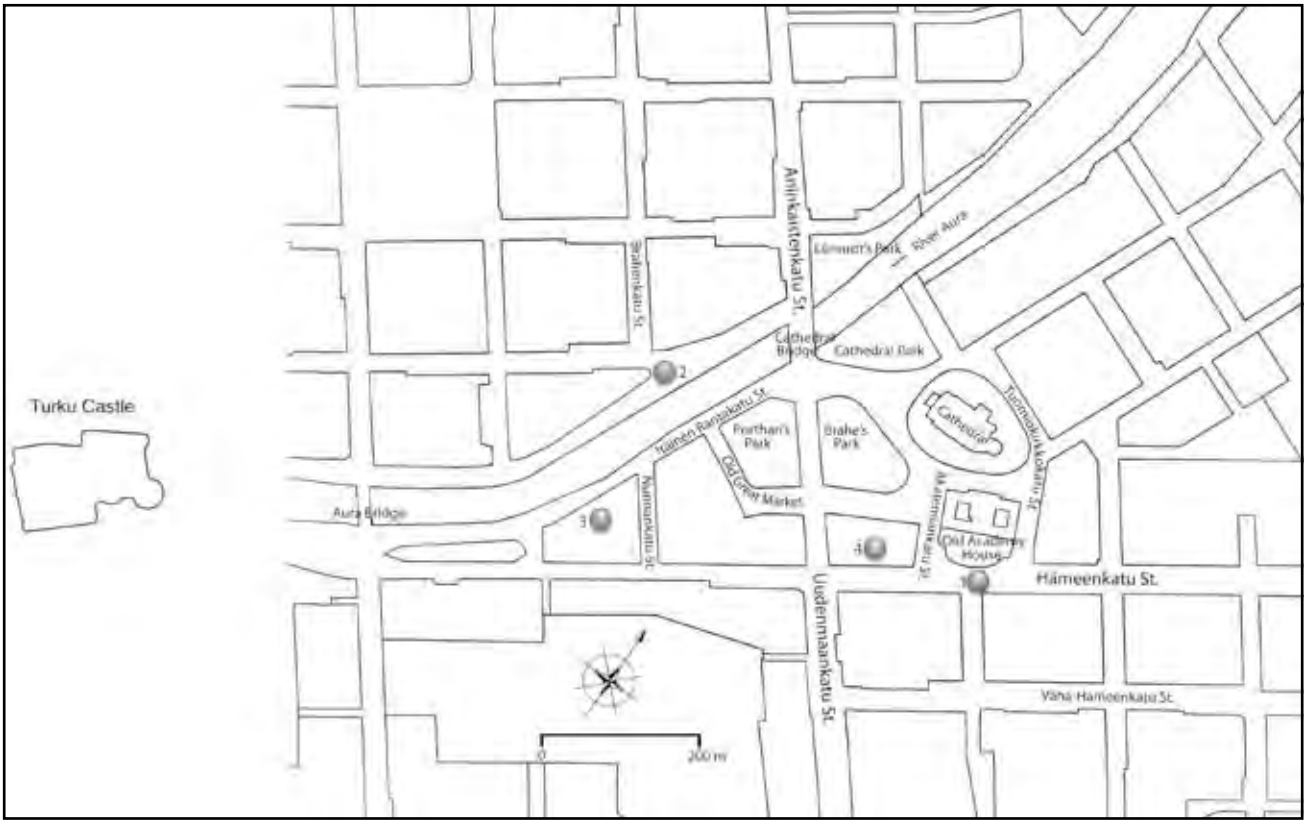


Table 5. Thong shoes with secondary thong slots.

Site	Number of finds	Symbol on the map
Hämeenkatu (survey 1983–1984)	one upper	1
Linnankatu (survey 1984)	one upper	2
Aboa Vetus Museum (excavation 1992–1995)	two uppers	3
ÅÅ-site (excavation 1998)	three uppers one fragment	4

toes.[130] On the basis of the binding stitch on the top edge, the cutting pattern is original. A place for the heel stiffener is visible.

1.2.2.2 Ankle thong shoes

A back part of an upper comes from Turku Castle. It has a leg part reaching above the ankle.[131] Two thong-slots on the heel have been preserved.

1.2.3 The distribution and dating of thong shoes

I have noted a phenomenon which affects the distribution area of thong shoes and partly changes the emphasis of their dating if the phenomenon is not taken into account. Some thong slots in shoes are clearly of a secondary nature, i.e. they are not a part of the original construction of these shoes.[132] The thong shoe distribution with secondary slots is presented in Table 5.

From the Aboa Vetus Museum and the Åbo Akademi main building site come thong shoes with primary slots, too; so the deduction of the secondary thong shoes only affects the number of thong shoes in these sites. However, without removing the Hämeenkatu and Linnankatu shoes the distribution area of thong shoes is much wider than without these shoes.

In most cases slots have been cut in shoes that have originally been *other types than thong shoes*.[133] Slots have been cut in front-laced shoes, tailed-toggle fastened shoes and strap shoes. Thus, it seems possible that thong slots could have been cut in shoes by the owner/wearer even after the professional manufacture of thong shoes had ceased. This is why one must be careful not to include secondary thong shoes in the assemblage when researching the manufacture period of professional thong shoes. Otherwise *both the distribution and the dating can be biased*, that is, there will be thong shoes with too late datings from areas not belonging to the primary discarding area of this shoe type.

Of course, secondary slots could be cut in shoes in the period when there still was professional manufacture of thong shoes. At this time, the style for slots could be taken from original thong shoes, and this type of fastening was still a conventional way of making the repair or additional fastening in shoes.[134]

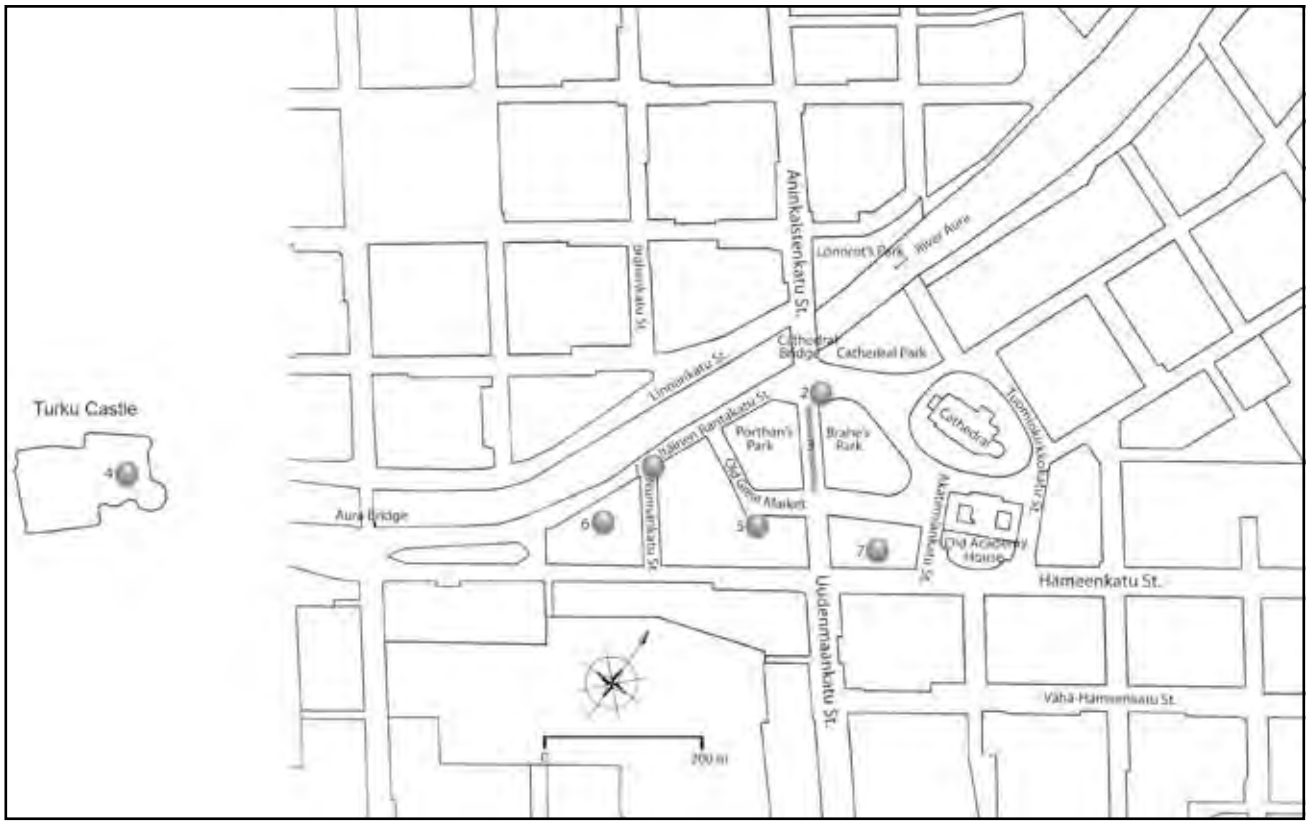


Table 6. The distribution of thong shoes. The find places in the distribution maps have been marked with round symbols in the cases where the exact find spot is known. Places marked with grey mean that there are finds from the area, but the exact location is not known.

Site	Number of finds	Symbol on the map
Itäinen Rantakatu, the lower end of Rettig's slope (survey 1952–1953)	four uppers	1
Trench extension in front of Brahe's Park (survey 1952–1953)	one upper fragment	2
Uudenmaankatu between Brahe's Park and Porthan's Park (survey 1963)	two upper fragments	3
Outer bailey of Turku Castle (excavation 1978–1985)	four uppers and three fragments	4
Old Great Market Place - Uudenmaankatu, area in front of the Hjelt building (survey 1982)	two uppers two fragments	5
Old Great Market Place, Town Hall (excavation 1986–1987)	one fragment	5
Old Great Market Place, Hjelt building (excavation 1989)	eight uppers eight fragments	5
Aboa Vetus Museum (excavation 1992–1995)	two uppers two upper fragments	6
ÅA-site (excavation 1998)	two uppers two upper fragments	7

On the basis of my survey of the finds (the secondary thong shoes not included) the following distribution of shoes with thong fastening in Turku is formed (Table 6).

In some sites, the thong shoes are from contexts, which have been dated either by archaeological or dendrochronological means (Tables 7–12).

There is one thong shoe fragment from a dendrochronologically dated context in front of Brahe's Park. Besides the Old Great Market Place site, the fragment is the only thong shoe find in the Cathedral quarter from a dated context and therefore important. *The thong shoe fragment in front of Brahe's Park relates by its dating to the first quarter of the 14th century to the thong shoe finds of the same age from the Old Great Market Place.*

Thong shoes from the datable contexts in Turku Castle are represented by four main pieces, which

Table 7. Dating of thong shoes from the trench extension in front of Brahe's Park.

Phase	Number of finds (main pieces)	Number of finds (fragments)
first quarter of the 14th century	-	1

Table 8. Dating of thong shoes from the outer bailey of Turku Castle.

Phase	Number of finds (main pieces)	Number of finds (fragments)
14th century	4	-

Table 9. Dating of thong shoes from the Old Great Market Place, Town Hall.

Phase	Number of finds (main pieces)	Number of finds (fragments)
first quarter of the 14th century	-	1

Table 10. Dating of thong shoes from the Old Great Market Place, Hjelt building.

Phase	Number of finds (main pieces)	Number of finds (fragments)
late 13th century	2	-
first quarter of the 14th century	6	7
second quarter of the 14th century	-	1

Table 11. Dating of thong shoes from the Aboa Vetus Museum.

Phase	Number of finds (main pieces)	Number of finds (fragments)
first half of the 14th century	1	-
latter half of the 14th century - first half of the 15th century	1	-

Table 12. Dating of thong shoes from the ÅA-site.

Phase	Number of finds (main pieces)	Number of finds (fragments)
latter half of the 14th century	1	2
secondary contexts	1	-

represent different variants of thong shoes, two low-cut shoes, a shoe with a high heel part, an open instep and low sides and an ankle shoe. *In Turku Castle material, the thong shoes are represented in the late 13th century - 14th century material from the outer bailey area. Unlike in the town area, also ankle shoes and high heel/low side thong shoes with an open instep are also represented.*

Thong shoes are represented as early as in the first phase of the Old Great Market Place site even if there are only two shoes from this period. Phase two is strongly emphasized in the assemblage with 6 main pieces and 8 fragments. From phase three, there is only one heel stiffener from a thong shoe. From later phases, there are no thong shoe finds. *In the Old Great Market Place assemblage, thong shoes are represented in the late 13th century. A clear increase in the number of shoes occurs in the first quarter of the 14th century and an even stronger decrease in the second quarter of the 14th century after which there are no thong shoe finds.*

Datable thong shoes in Aboa Vetus Museum date to the 14th century and possibly to the first half of the 15th century.

In the Åbo Akademi main building site assemblage, thong shoes are represented in the latter half of the 14th century, but the number of thong shoe finds is very small considering the extremely rich leather and shoe finds of the period. There are no thong shoes represented in the 15th century layers.

Thong shoes from undated and non-excavation contexts

Four thong shoes from the lower end of Rettig's slope come from the lowest part of a medieval layer in a sewer section with proto-stoneware ceramics. On the basis of the ceramic datings, Aki Pihlman has suggested that the earliest settlement in this area can be dated to the beginning of the 14th century. It is likely that the thong shoes from this section of the sewer construction also date to the 14th century, possibly to its first half. The 14th century dating of the two thong shoes from the front of the Hjelt building in the Old Great Market Place is probable considering the nearby thong shoe finds from the actual excavation. Similar dating is possible also

for the shoe fragments from Uudenmaankatu, between Brahe's Park and Porthan's park situated between the Old Great Market Place finds and the find from Brahe's Park in the centre of the Cathedral quarter.

1.2.4 Summary

Thong shoes were defined as *shoes closed by thongs running externally around the leg or ankle part of the shoe*. The minimum number of thong shoes from the town area counted by uppers is 18, which must be considered small. All the thong shoes from the town area are low-cut shoes.
The usual cutting pattern of the low-cut thong shoes of Turku is a wrap-around construction, in most cases with insert/inserts on the medial side of the foot. A few children's shoes have an upper composed of a main piece and several smaller inserts. An edge/flesh binding stitch along the top edge of the upper seems to be a standard in the thong shoes of Turku. It could be used to attach a topband or lining. On one thong shoe, a topband has been preserved while there is no evidence of linings. The use of heel stiffeners in thong shoes can be noted in the shoes of the Old Great Market Place from the first of the quarter of the 14th century. It seems, however, that the use of heel stiffeners in thong shoes was not a standard in manufacture. The use of rands in lasting margins is present from the first quarter of the 14th century onwards.
There are two basic types of side profiles of the shoes. In the first type the side has a straight profile. In the second type there is a rounded or angular dip on the side and the top edge rises towards the heel. The profile with a dip seems to be more common. The vamp openings are in most cases U/V-shaped. In some shoes, there is no opening on the instep, only a slight angular indent on the vamp throat. In all cases where a thong has been preserved, it is of leather. Textile thongs have not been noted.
Thong shoes from datable contexts in the town area come from four sites: Brahe's Park trench extension, the Old Great Market Place, the Aboa Vetus Museum and the ÅA-site. The oldest finds from the Old Great Market Place date to the late 13th century. In the first quarter of the 14th century the finds are more numerous and besides the Old Great Market Place, thong shoes come from the front of Brahe's Park and from Aboa Vetus Museum. The finds from the lower end of the nearby Rettig's slope probably date to the 14th century. The latter half of the 14th century is represented by the few thong shoes from the Åbo Akademi main building site and from Aboa Vetus Museum. Thong shoes have not been found from the certain contexts of the 15th century. However, a phenomenon of secondary thong slots in shoes was noted. This phenomenon extends the use of thongs as a fastening method to the 15th century. Shoes with secondary thong slots are not included in the primary group of thong shoes.
On the basis of the present archaeological material, thong shoes in Turku are a late 13th century - 14th century shoe type. It is probable that the use of thong shoes decreases already sometime during the latter half of the 14th century on the basis of such few finds from the representative late 14th century layers from the Åbo Akademi main building site. The emphasis of the distribution of thong shoes is on the Cathedral quarter and the Convent quarter. The only shoes from the Mätäjärvi quarter come from its northern edge, from the Åbo Akademi main building site. There are no thong shoe finds from the western side of the River Aura, i.e. from the Aninkainen quarter.
In Turku Castle material, thong shoes are represented in the late 13th century - 14th century material in the outer bailey area. Only adult sizes are represented. Unlike in the town area, ankle shoes and high heel/low side thong shoes with an open instep also occur.

1.3 Instep-toggle fastened/instep strap fastened shoes (Strap shoes, Goubitz types 35 and 40)

1.3.1 The type definition and research history of strap shoes in Turku

The characteristic feature of Goubitz type 35 footwear is the slit across the instep and a leather toggle on a vamp throat. The two straps of the back part fasten to this toggle over the instep. Goubitz type 40 is also a strap shoe, but in this type there is no toggle on a vamp throat. Instead, fastening is effected by attaching the straps together with a tie-lace, bifurcated strap (latchet) or a buckle.
In archaeological research, the term toggle-fastened shoe is usual when the presence of a toggle is certain.[135] When the details of the fastening are not clear or one has not made a division into toggle-fastened strap shoes and other kinds of strap shoes, the usual term is a strap shoe, sometimes a latchet shoe, the details of fastening usually considered as variants.[136]
In Turku material, there are many shoes which can be classified as strap shoes but further division into types 35 or 40 is not possible. That is why strap shoes are discussed here as one group, and the division into Goubitz types 35 and 40 is made after this.
In Turku, strap shoes were firstly noted by Niilo Valonen. Instead of using, for example, the translation from Swedish (according to Jäfvert's typology) he called them with a semi-ethnographical/semi self-invented descriptive term *nauhaskorvallinen* or *päkiäkorvakenkä* (an English translation would be 'lace-eared' or 'ball of the foot-eared' shoes).[137] On the basis of the finds from the Itäinen Rantakatu sewer construction, strap shoes were, according to Valonen, as popular in the 14th century Turku

Fig. 11. Strap shoes from the Old Great Market Place, ÅA-site and Aboa Vetus Museum. Top, from left to right: TMM 20764:1546, TMM 21816:NE20454, 51248. Middle: TMM 21816:NE204126, NE204127, NE504335. Bottom: TMM 21816:NE509294, NE5137, KM 95032:10506. The 14th century - beginning of the 15th century.

as front-laced shoes.[138] Strap shoes were briefly mentioned by Mona Hallbäck in her article in 1970. In addition to the finds from the Itäinen Rantakatu sewer construction, Hallbäck included the two strap shoes from Uudenmaankatu between Brahe's Park and Porthan's Park, found in 1963.[139]

When Aki Pihlman discussed the Turku shoe finds in the project *Keskiajan kaupungit*, the number of strap shoes had increased to over twenty compared to under ten in the 1950s and 60s. According to Pihlman, strap shoes were now a second common shoe type in Turku after the low and high front-laced shoes. Strap shoes had been found in the Convent quarter, the Cathedral quarter and the northern side of the Mätäjärvi quarter.[140] Later, Sanna Jokela described finds of strap shoes from the Aboa Vetus Museum excavations, but without further discussion of their dating or distribution.[141] So far, the largest assemblage of strap shoes in Turku has been found at the ÅA-site. These have been previously only briefly mentioned.[142]

Fig. 12. An ankle strap shoe with both straps cut to the pattern (TMM 21816:NE0852); the inner (flesh) side. Late 14th century - 15th century.

Fig. 13. A strap shoe with four toggle holes (TMM 16195:135). From a context without close dating.

1.3.2 The number and types of strap shoes

The minimum number of strap shoes in Turku is 153. This number is gained by counting the main pieces of uppers of wrap-around construction and the vamp parts of uppers with a separate vamp. In addition, there are 33 fragments which cannot be counted as representing individual shoes (Fig. 11).
The basic cutting pattern of strap shoes in Turku is a wrap-around construction, usually with an insert or inserts. However, there are two shoes with an upper formed of a separate vamp and back-piece.[143]
Usually one strap belongs to a cutting pattern and the other strap is a separate piece stitched to the upper with a butted seam and edge/flesh binding stitch. In nine cases both straps belong to the cutting pattern (Fig. 12).
There are two basic variants of strap shoes in Turku, the low-cut style and the ankle shoe style. It has been possible to define the height in 89 cases of the total of 153 shoes (58 per cent). Of these 89 shoes, 31 (35 per cent) are low styles and 58 (65 per cent) are ankle shoes or higher.
In the low-cut styles, the profile of the back part of the upper rises towards the higher, rounded heel. The side profile in the ankle shoes and high shoes is usually straight or slightly descending towards the heel.
The use of rands and heel stiffeners is a standard practice in the strap shoes of Turku. There are only a few tongues preserved, but imprints of these on the inside of the upper are common. Tongues would have been triangular, one edge stitched to the inside edge of the upper.[144] Topbands are also rarely preserved, but the typical edge/flesh binding stitch round the opening of the upper probably marks

Fig. 14. A back part of an instep strap fastened shoe (TMM 16195:146b); the inner (flesh) side. From a context without close dating.

the bands now missing.[145] Separate leg-parts which could certainly be connected to main pieces have not been found.
The division of strap shoes into two subtypes (Goubitz types 35 and 40) has been possible in 134 cases of the total of 153 cases (87.5 per cent). Of these 134 strap shoe uppers, 130 shoes (97 per cent) represent instep-toggle fastened strap shoes and 4 shoes (3 per cent) represent strap fastened shoes.

1.3.2.1 Instep-toggle fastened shoes

Even if the actual instep-toggle has been preserved in only nine shoes, there is an element which can be used in identifying an instep-toggle fastened strap shoe. All the shoes of this type in Turku have an impression and stitch holes on the inside (flesh side) of the upper edge where the toggle has been fastened by stitching. Thus, in many cases one can identify an instep-toggle fastened shoe even in cases where the toggle or straps have not been preserved.
The placement of the toggle on the inside of the upper seems to have been a standard in Turku shoes. There is no slit for the toggle in the upper. Instead, the toggle passes under the upper edge. The preserved instep with the impression of the toggle on the flesh side is sufficient for the correct identification of this shoe type, an instep-toggle fastened strap shoe.[146]
There are two basic variants of instep-toggle fastened shoes in Turku, the low-cut style and the ankle shoe/high style. Of the total of 130 instep-toggle fastened shoes, there are 72 shoes (55 per cent) in which the style based on shoe height has been possible to define. Of these shoes 22 shoes (30.5 per cent) have been classified as low styles. 49 shoes (68 per cent) have been defined as ankle shoes styles. Thus, the ankle shoes are more common among the instep-toggle fastened shoes. Only one shoe is 'boot-high' with a 0.9 ratio of height (18 cm) and length (19 cm) (Fig. 13).
In the low-cut styles it is standard that there is one slit in both straps. These slits are toggle holes for the instep-toggle. Most of the ankle shoes

are of this type, too. However, in seven shoes, there are second slits above the toggles holes.[147] That these were used as an additional fastening, to fasten the straps/flaps together with a toggle attached to one strap and put through the toggle hole in the other, is proved by a shoe, where there remains a piece of a toggle in the slit.[148] One shoe has three toggle holes.[149] There are two shoes which have four toggle holes; the bottom one is for the instep-toggle and the rest to fasten the flaps together (Fig. 13).[150]

1.3.2.2 Instep strap fastened shoes

Goubitz type 40 shoes are always low shoes. The strap across the instep is fastened variously with a tie-lace or with a bifurcated strap, a toggle or a small buckle.[151] In Turku, there are two shoes certainly of Goubitz type 40 and two shoes probably of this type (together 4 shoes, ca. 3 per cent of strap shoes). The first one is a back part of the upper with a strap cut to the pattern preserved (Fig. 14).[152]
In the strap-end, there is a round hole for a bifurcated lace. The lace-ends have been put through the hole and knotted together. The base of the bifurcated lace goes through the hole at the end of the second strap now loose from the upper. This strap has edge/flesh binding stitches for a butted seam in its base. It is a short piece, which has probably been stitched to a strap base cut to the pattern of the upper.
From the same context, Uudenmaankatu between Brahe's Park and Porthan's Park, comes a separate vamp-piece of an upper with both straps cut to the pattern.[153] At the strap-end, there is a similar round hole as in the former case.
Of the two other shoes probably representing Goubitz type 40 footwear, the first one is a vamp from the Old Great Market Place.[154] It has no typical impression or stitch holes of the toggle on the inside of the upper. The instep is preserved in its whole width and length. Likewise, no lamination of leather can be noted, which means that the impression should be present if it was originally there. In addition to the instep, a part of a strap cut to the pattern of the upper is present. At the end of this strap base, there are edge/flesh stitch holes for a butted seam. A piece that has been fastened to the seam is missing. It seems likely that the missing piece is the end of the strap with a hole for the lace, similar to the Uudenmaankatu upper. Another possibility is that a bifurcated strap was stitched to the strap base.[155]
A main piece of a strap shoe which has a part of one strap preserved comes from the Aboa Vetus Museum.[156] There are stitch holes at the end of the strap for a piece which has been attached on the strap end, possibly a lace or a bifurcated strap.
A main piece of a strap shoe upper comes from the ÅA-site, in addition to these shoes.[157] The instep has been cut so that the possible place for the instep-toggle is missing. In a preserved strap, there is a leather lace through a hole in the strap. The hole, however, seems to be a normal longitudinal cut of a toggle hole, not a round hole for the lacing. Thus, it seems probable that lacing was used as a repair fastening when the instep with the toggle was torn.
It seems possible that type 40 shoes could have been more common in Turku than has been possible to show from the present archaeological material. Some shoes, defined only as strap shoes (20 shoes, ca. 13 per cent) could be instep strap fastened shoes. This does not change the general picture that the most common fastening method in the strap shoes of Turku was the instep-toggle fastening.

1.3.3 The distribution and dating of strap shoes

Strap shoes in Turku have been found in ten sites. The finds are distributed in the following way (Table 13).
The dating of the finds by their contexts is as follows (Tables 14 - 17).
The two shoes from the Old Great Market Place, Town Hall, can only be given a broad medieval dating.[158]
In the Old Great Market Place, Hjelt building assemblage, strap shoes are represented as early as the late 13th century. An increase in the number of shoes happens in the first quarter of the 14th century and a decrease after this. However, strap shoes have still been used in the second quarter of the 14th century and the latter half of the 14th century / beginning of the 15th century. Adding the fragments does not change the general picture except that it could increase the number of shoes in phase two and thus suggests the possibility that the popularity/number of strap shoes in the Old Great Market Place peaked in the first quarter of the 14th century.
Strap shoes are represented in the 14th century and possibly in the first half of the 15th century in the Aboa Vetus Museum assemblage.
In the Åbo Akademi main building site assemblage, strap shoes are represented in the latter half of the 14th century and in the first half of the 15th century. They are still represented in the latter half of the 15th century and possibly at the beginning of the 16th century. However, from the latter half of the 15th century onwards, the number of strap shoes clearly drops compared to the numbers in the latter half of the 14th century and in the first half of the 15th century.

Strap shoes from undated and non-excavation contexts

The four strap shoes from Itäinen Rantakatu, the lower end of Rettig's slope come from the lowest part of a medieval layer in a sewer section with proto-stoneware ceramics.[159] On the basis of the ceramics, Aki Pihlman has suggested that the earliest settlement in this area can be dated to the beginning of the 14th century. It is likely that the

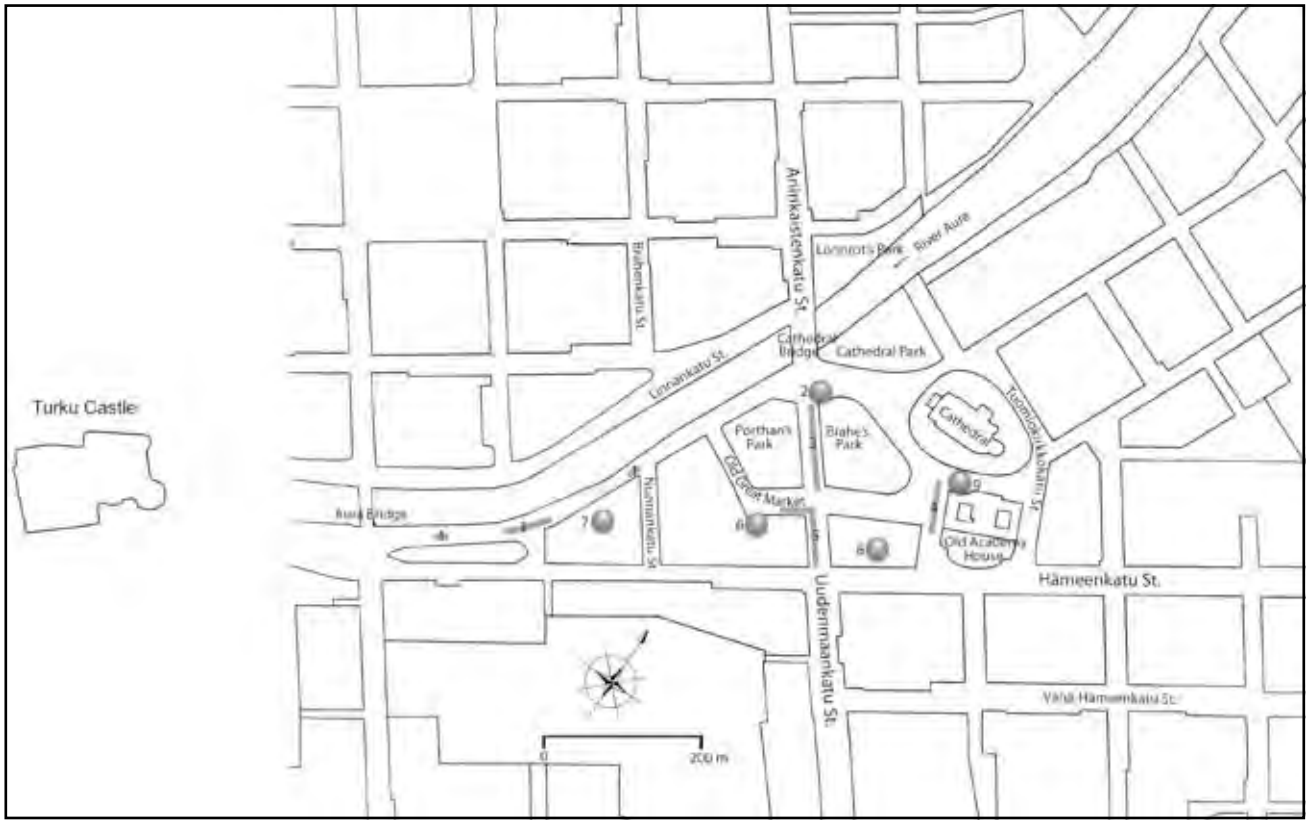


Table 13. The distribution of strap shoes.

Site	Number of finds	Symbol on the map
Itäinen Rantakatu sewer construction (survey 1952–1953)	six uppers	1
Trench extension in front of Brahe's Park (survey 1952–1953)	one fragment	2
Uudenmaankatu between Brahe's Park and Porthan's Park (survey 1963)	four uppers one fragment	3
Akatemiankatu (survey 1980)	one upper	4
Old Great Market Place - Uudenmaankatu (survey 1982)	six uppers	5
Old Great Market Place, Town Hall (excavation 1986–1987)	two uppers	6
Old Great Market Place, Hjelt building (excavation 1989)	10 uppers three fragments	6
Aboa Vetus Museum (excavation 1992–1995)	17 uppers 11 fragments	7
ÅÅ-site (excavation 1998)	106 uppers 13 fragments	8
Cathedral Square (excavation 2006)	see the footnote[1]	9

[1] There seems to be strap shoe/shoes from the Cathedral Square excavation in 2006. The location is added on the distribution map, but as late additions, these finds are not otherwise included or discussed in this thesis.

strap shoes from this section of the sewer also date to the 14th century, possibly to the first half. Two strap shoes outside this area from trench numbers 13 and 57 can be given a broad medieval dating. The strap shoe from a trench extension in front of Brahe's Park is from a mixed layer and can only be given a broader medieval dating.

The rest of the strap shoes from Uudenmaankatu between Brahe's Park and Porthan's Park, in Akatemiankatu and in the Old Great Market Place - Uudenmaankatu cannot be dated more accurately than medieval, because the find contexts, layer or depth of the finds, are not known. However, considering the general picture of the inhabitation of the town, early datings to the 14th century are possible for the finds in Uudenmaankatu between Brahe's Park and Porthan's Park situated in the centre of the Cathedral quarter.

Table 14. Dating of strap shoes from the Old Great Market Place, Town Hall.

Phase	Number of finds (main pieces)	Number of finds (fragments)
Middle Ages	2	-

Table 15. Dating of strap shoes from the Old Great Market Place, Hjelt building.

Phase	Number of finds (main pieces)	Number of finds (fragments)
late 13th century	3	-
first quarter of the 14th century	4	2
second quarter of the 14th century	2	1
middle of the 14th century - beginning of the 15tth century	1	-

Table 16. Dating of strap shoes from the Aboa Vetus Museum.

Phase	Number of finds (main pieces)	Number of finds (fragments)
first half of the 14th century	1	-
latter half of the 14th century	1	-
latter half of the 14th century - first half of the 15th century	7	-

Table 17. Dating of strap shoes from the ÅA-site.

Phase	Number of finds (main pieces)	Number of finds (fragments)
14th century	24	3
latter half of the 14th century - first half of the 15th century	55	9
first half of the 15th century	2	-
latter half of the 14th century - 15th century	7	-
latter half of the 14th century - beginning of the 16th century	9	1
15th century	1	-
latter half of the 15th century - beginning of the 16th century	7	-

1.3.3.1 Chronological and geographical relationship between low strap shoes and ankle strap shoes

Low strap shoes occur at the ÅA-site only in the layers of the late 14th century - early 15th century. In the assemblage of the Old Great Market Place, those strap shoes which it was possible to define more accurately, were all low styles. They occur in the layers of the late 13th century - the first quarter of the 14th century. Strap shoes from Itäinen Rantakatu, from the lower end of Rettig's slope were all low styles. The same applies to the strap shoes of Uudenmaankatu between Brahe's Park and Porthan's Park. Thus, it seems that in Turku, low strap shoes are mainly a late 13th century - 14th century shoe type.

Ankle strap shoes occur at the ÅA-site in the layers of the late 14th century to the late 15th century, possibly even to the early 16th century. It seems that the strap shoe type, surviving to the latter half of the 15th century is the ankle shoe style. On the basis of the present material, the appearance of the ankle strap shoe happens in the latter half of the 14th century. The first recognizable ankle strap shoes come from the ÅA-site. It must be noted that there are strap shoes in the Old Great Market Place assemblage, which have only been categorized as strap shoes, more accurate definition has not been possible. These shoes may also contain strap shoes of ankle height.

The dating of low strap shoes mainly to the late13th century - the 14th century is in good correlation with their distribution. They occur in the Cathedral quarter, Convent quarter and on the northern edge of the Mätäjärvi quarter. Ankle strap shoes were most popular in the late 14th century and the first half of the 15th century. This is clearly shown in the rich strap shoe material of the ÅA-site. Strap shoes are missing from materials of Uudenmaankatu 6 and Mätäjärvi excavations. The reason for this is

Fig. 15. Tailed-toggle fastened shoes from the ÅA-site. Top, from left to right: TMM 21816:NE12812, NE504300, NE11876. Middle: TMM 21816:NE20464, NE12812, NE128207. Bottom: NE209138, NE209139, NE503113. Late 14th century - early 15th century.

probably that when the settlement spread to the rest of Mätäjärvi quarter in the latter half of the 15th century, strap shoes were no longer popular. The shoe find from Akatemiankatu is situated on the edge of the strap shoe distribution area.

1.3.4 Summary

Strap shoes were defined as *shoes with a strap fastening across the instep*. The minimum number of strap shoes in Turku is 153. Thus, the shoe type was very popular.

The basic cutting pattern of strap shoes in Turku is a wrap-around construction, usually with an insert or inserts. Three shoes are composed of an upper formed of separate vamp and back-pieces. The use of heel stiffeners, rands, tongues and topbands is common in Turku strap shoes.

Two subtypes of strap shoes occur in the Turku material, the instep-toggle fastened shoe (Goubitz type 35) and the instep strap fastened shoe (Goubitz type 40). The first type is almost the standard, the latter type occurring only in a few cases. Of the 153 strap shoe uppers, 130 examples (85 per cent) represent instep-toggle fastened shoes and four examples (3 per cent) represent strap fastened shoes. The definition has not been possible in 19 cases (13 per cent). It is possible that there are also strap fastened shoes among these shoes.

The characteristic feature of Goubitz type 35 shoes is the slit across the instep and a leather toggle on a vamp throat. The two straps of the back part both fasten to this toggle over the instep. Goubitz type 40 is also a strap shoe, but in this type there is no toggle on the vamp throat. Instead, fastening is effected by attaching the straps together with a tie-lace, bifurcated strap (latchet) or a buckle.

Among the instep-toggle fastened shoes, the placement of the toggle on the inside of the upper seems to have been the standard in Turku shoes. The toggle passes under the edge of the shoe's upper. The toggle has survived in nine cases and it is always a tailed toggle type. In the low styles it is a standard that there is one slit in both straps. These slits are toggle holes for the instep-toggle. Among ankle shoes, there is a variant in which there are second slits above the toggles holes. These were used as

Fig. 16. A tailed-toggle fastened shoe made with the flesh side of the upper outwards (TMM 21816:NE50372); the inner (grain) side. Late 14th century.

additional fastening. In the instep strap fastened shoes, the fastening is effected by a lace, attached between the two straps. Sometimes, lacing has also been used as a repair fastening in strap shoes, originally fastened with a toggle.
Strap shoes were divided into low shoes (ca. 35 per cent) and ankle shoes and high shoes (ca. 65 per cent). Ankle strap shoes and high shoes have always been fastened with a toggle. In low shoes, the majority are toggle fastened styles but strap fastened styles occur to some extent, too.
In the low styles, there are two different side profiles. The profile of the back part of the upper can either be straight or there can be a dip on the side, the profile rising towards the higher, rounded heel. The side profile in the ankle shoes is usually straight or slightly descending towards the heel.
Strap shoes in Turku have been found in the Old Great Market Place excavations (Hjelt building and Town Hall), ÅA-site excavation, Aboa Vetus museum excavation, and from the following construction works: the survey in Uudenmaankatu, between Brahe's Park and Porthan's Park, Itäinen Rantakatu sewer construction and the trench extension in front of Brahe's Park, the sewer construction between the Old Great Market Place and the crossing of Uudenmaankatu and Hämeenkatu and finally the construction in Akatemiankatu.
The oldest strap shoes have been found in the Old Great Market Place. They date to the late 13th century. In the Old Great Market Place, strap shoes also occur in the first half of the 14th century and to some extent in the latter half of the 14th century - early 15th century. The same dating applies to shoes from the Aboa Vetus Museum. At the ÅA-site strap shoes occur in the latter half of the 14th century - the first half of the 15th century and to some extent in the latter half of the 15th century, possibly into the beginning of the 16th century. Thus, there is a continuation in the occurrence of strap shoes from the late 13th century to the end of the Middle Ages.
It was possible to look more closely at the occurrence of the low strap shoes and ankle strap shoe inside this time frame. Low strap shoes are mainly the late 13th century - the 14th century type, accordingly occurring in the areas inhabited during this period, i.e. the Cathedral quarter, Convent quarter and the northern edge of the Mätäjärvi quarter. The strap shoes of ankle height occur mainly in the latter half of the 14th century and the first half of the 15th century. Their distribution follows the dating, too. Most of the finds are from the ÅA-site. Some ankle shoes can be dated to the latter half of the 15th century at the ÅA-site. Strap shoes are missing totally from the assemblages of the Uudenmaankatu 6 and Mätäjärvi excavations. The reason for this is probably that when the settlement spread to the centre of the Mätäjärvi quarter in the latter half of the 15th century, strap shoes were no longer popular. The single strap shoe find from Akatemiankatu is situated on the edge of the strap shoe distribution area in the Mätäjärvi quarter.

1.4 Tailed-toggle fastened shoes (Goubitz type 75)

1.4.1 The type definition and research history of tailed-toggle fastened shoes in Turku

Tailed-toggle fastened shoes are defined here as *shoes with a vertical V-shaped frontal opening fastened with one or more tailed toggles*. Following the definition of Goubitz, 'a tailed toggle is made by making a simple or complex knot in a strip of leather in such a way that a short end remains for attaching the toggle to the shoe, while the longer end protrudes from the knot like a 'tail'. The knot serves as a toggle. To fasten the shoe, the tail end is pushed through the

toggle hole from the inside, after which it is easily pulled from the outside until the thick knot has passed through the toggle hole.'[160]

Besides tailed-toggle fastening, other terms that have been used of this shoe type are button boots/fastening with knotted laces[161], fastening with knotted leather buttons[162], front toggle-fastening[163] or tailed-knot shoes[164]. All these terms suggest the same fastening system, whether it is called toggles, knotted laces or buttons. Less emphasis has been put on the shape of the frontal opening. In shoes of Goubitz type 75 the frontal opening is V-shaped and vertical as distinct from shoes with a slit across the instep (a strap shoe, variant 35-II in Goubitz's typology). Both of these shoe types can be fastened with tailed toggles, as they are in Turku. Thus, it is not always clear whether only one of these types or both are meant when only the tailed-toggle fastening and possibly the shoe height is mentioned.[165] This makes the comparisons made on the basis of the publications difficult.

The first tailed-toggle fastened shoes in Turku were noted by Niilo Valonen. He mentions the fastening principle, the knotted laces, and counts these shoes as belonging to the group of laced shoes. Valonen uses the shoe find from Hämeenkatu 11 as an example of this shoe type.[166] Hallbäck also mentions the few tailed-toggle shoe finds accumulated during the 1950s and 1960s.[167] In Aki Pihlman's survey for the project *Keskiajan kaupungit*, the number of tailed-toggle fastened shoes was only three, although only shoes of boot height were included. In Sanna Jokela's MA thesis, three leg parts from high shoes with knotted laces are mentioned.[168] The largest number of tailed-toggle shoes comes from the ÅA-site. The usual high shoe height and the high frequency of these shoes as children's shoes have been noted (Fig. 15).[169]

1.4.2 The number and types of tailed-toggle fastened shoes

The minimum number of tailed-toggle shoes in Turku is 184. This is gained by counting main pieces of uppers of wrap-around construction and vamp pieces of shoes with separate vamp and back pieces. In addition, there are 35 shoe parts which cannot be counted as individual shoes.

Two kinds of basic cutting patterns occur; a wrap-around construction and a pattern with a separate vamp piece and back piece. The former is much more common, there are only three finds of separate vamp pieces.[170] Back pieces belonging to these parts have not been found.

The material used is mostly calf/cattle. Two shoes of children's sizes have been made with the flesh side of the upper outwards/grain side inwards (Fig. 16).[171]

Additional parts belonging to upper/sole construction are tongues, heel stiffeners, lace hole reinforcements and rands. Tongues represent a type which has been fastened to the side of the frontal opening. Seven tongues have been found with uppers, but they have been much more common on the basis of the impressions and stitch holes on the inside of uppers. Heel stiffeners represent the typical triangular shape. Even if only 14 heel stiffeners have been found with uppers, they have been more common on the basis of the impressions and stitch holes. Parts of rands have been preserved in ten cases. According to Goubitz, the use of rand makes the turning of a small shoe sewn inside-out particularly difficult.[172] As will later be shown, most of the tailed-toggle shoes in Turku are children's shoes, so this can be the reason for the rarity of rands of tailed-toggle fastened shoes in Turku, too.

The number of tailed-toggles in shoes ranges from one to five. There are three shoes with only one toggle, 33 shoes with two toggles, 37 shoes with three toggles, 12 shoes with four toggles and five shoes with five toggles. Ankle shoes usually have one to three toggles and higher shoes from three to five toggles. The shoe height does not, however, systematically correlate with the number of toggles.

Toggles have usually been fastened on the inside of the upper by their short ends (bases). Toggles are then put through the holes made in the upper. In one case the toggle bases have been stitched to the surface of the upper without the holes.[173] The toggle holes for the toggle-ends can be distinguished from normal lace holes by their typical round form continued with an incision.

In the foot openings of tailed-toggle shoes, there are three different solutions. The top ends of the openings can either be without stitching (only the cut edge), there can be remains of edge/flesh binding stitches (for a butted seam) or there can be an inner binding stitch (for a lapped seam). These three types occur at about the same frequency. The openings of high shoes are either without stitching or they have an edge/flesh binding stitch, probably for the topband. In ankle shoes, both edge/flesh stitching for butted seams and inner binding stitches for lapped seams occur. This makes the conclusions of the possible separate leg parts and of the shoe's original height (the present 'ankle shoes') extremely difficult. It has been observed that both topbands and leg parts of different heights have been fastened to uppers with butted seams and lapped seams. Thus there is no correlation between different seams in the openings of uppers and topbands or separate leg parts.

No separate leg parts have been found together with tailed-toggle shoes. However, there are a large number of separately found leg parts with tailed toggles which either belong to tailed-toggle shoes or strap shoes. Just on the basis of the separately found leg parts it is not possible to determine which shoe type they belong. These separately found leg parts have been further discussed in chapter 4.2.3.2.

Two kinds of sole/toe shapes occur, rounded and pointed. In 12 shoes a short extended tip has been noted (see the shoe NE209139 in Fig. 15).[174] These shoes all date to the latter half of the 14th century - the beginning of the 15th century.

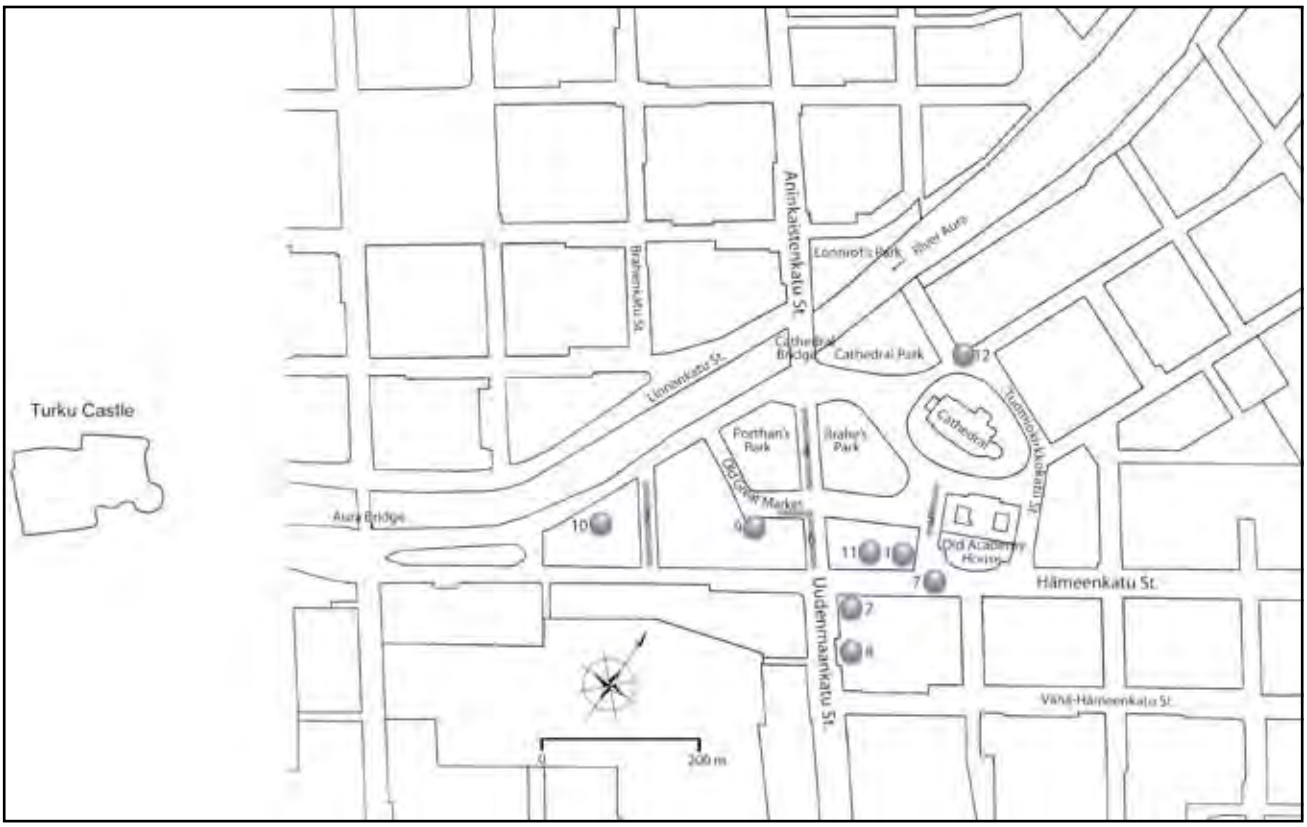


Table 18. The distribution of tailed-toggle fastened shoes.

Site	Number of finds	Symbol on the map
Hämeenkatu 11 (survey 1948–1949)	one upper	1
Uudenmaankatu4/Hämeenkatu 16 (survey 1960–1961)	three uppers three fragments	2
Nunnankatu (survey 1963)	one upper	3
Uudenmaankatu between Brahe's Park and Porthan's Park (survey 1963)	four fragments	4
Akatemiankatu (survey 1980)	one upper	5
Suurtori - Uudenmaankatu (survey 1982)	three uppers	6
Hämeenkatu (survey 1983-1984)	two uppers one fragment	7
Uudenmaankatu 6 (excavation 1988)	three uppers	8
Old Great Market Place, Hjelt building (excavation 1989)	one fragment	9
Nunnankatu (survey 1990)	one fragment	3
Aboa Vetus Museum (excavation 1992–1995)	two uppers	10
ÅÅ-site (excavation 1998)	167 uppers 25 fragments	11
Tryckerihuset (excavation 2006)	see the footnote[1]	12

[1] There seem to be tailed-toggle shoe/shoes from the Tryckerihuset excavation in 2006. The location has been added to the distribution map, but as late additions, these finds are not otherwise included or discussed in this thesis.

The heights of tailed-toggle shoes range from ankle shoes to high shoes. Low shoes do not occur. The ratio of height to length ranges from 0.4 to 1.2. Shoes with a ratio from 0.4 to 0.7 were counted as ankle shoes. 67 per cent of tailed-toggle fastened shoes belong to this group. As high shoes, shoes with a ratio from 0.8 to 1.2 were counted. The rest, 33 per cent of shoes belong to this group.

1.4.3 The distribution and dating of tailed-toggle fastened shoes

Tailed-toggle fastened shoes have been found in 12 sites in Turku. The finds are distributed in the following way (Table 18).
The dating of the finds by their contexts is as follows (Tables 19–21).

Table 19. Dating of tailed-toggle shoes from Uudenmaankatu 6.

Phase	Number of finds (main pieces)	Number of finds (fragments)
1384/1429 - 1440s	3	-

Table 20. Dating of tailed-toggle shoes from the Aboa Vetus Museum.

Phase	Number of finds (main pieces)	Number of finds (fragments)
latter half of the 14th century	2	-

Table 21. Dating of tailed-toggle shoes from the ÅA-site.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
14th century	20	4
latter half of the 14th century - first half of the 15th century	108	17
first half of the 15th century	4	-
latter half of the 14th century - 15th century	12	2
latter half of the 14th century - beginning of the 16th century	10	-
15th century	3	-
latter half of the 15th century - beginning of the 16th century	7	1

Tailed toggle-fastened shoes are represented with three uppers in the lowermost layer in Uudenmaankatu 6 excavation. The phase is dated from the late 14th century/early 15th century to the first half of the 15th century.
The two datable shoes from the Aboa Vetus Museum date to the latter half of the 14th century.
In the Åbo Akademi main building site assemblage, tailed-toggle fastened shoes are represented in the latter half of the 14th century and in the first half of the 15th century. They are still represented in the latter half of the 15th century and possibly at the beginning of the 16th century. However, from the latter half of the 15th century onwards, the number of tailed-toggle fastened shoes clearly drops compared to the numbers in the latter half of the 14th century and in the first half of the 15th century. Adding of fragments does not change the general picture.

Tailed-toggle fastened shoes from undated and non-excavation contexts

Tailed-toggle shoes from other sites than the ÅA-site and Aboa Vetus can be dated only broadly as 'medieval'.[175] It is possible that some shoes, especially in the Cathedral quarter (Nunnankatu survey) and Convent quarter (Uudenmaankatu between Brahe's Park and Porthan's Park) could date to the first half of the 14th century, but this remains a hypothesis until tailed-toggle fastened shoes from better dated contexts emerge.

1.4.4 Summary

Tailed-toggle fastened shoes were defined as *shoes with a vertical V-shaped frontal opening fastened with one or more tailed toggles*. The minimum number of tailed-toggle shoes in Turku is 185. The material used is mostly calf/cattle. However, there are two children's shoes which have been made of supple goat leather. Both have been made with the flesh side out/grain side in.
There occur two kinds of basic cutting patterns, a wrap-around construction and a pattern with separate vamp piece and back piece. Two kinds of sole/toe shapes occur, rounded and pointed. There is a short extended tip in 12 shoes, dated to the latter half of the 14th century - the beginning of the 15th century. The heights of tailed-toggle shoes range from ankle shoes to high shoes. Low shoes do not occur.
Tailed-toggle fastened shoes in Turku have been found in 11 sites, situated in the Cathedral quarter, the Mätäjärvi quarter and the Convent quarter. Tailed-toggle shoes have not been found in Äninkainen quarter.
The tailed-toggle shoes from dated contexts come from the ÅA-site and the Aboa Vetus Museum. At the ÅA-site, the emphasis is on the latter half of the 14th century - the first half of the 15 century. In the Aboa Vetus Museum, datable shoes come from the layers of the latter half of the 14th century. At the ÅA-site, tailed-toggle shoes do occur also in the latter half of the 15th century but to a much lesser extent.

1.5 Side-laced shoes (Goubitz type 50)

1.5.1 The type definition and research history of side-laced shoes in Turku

Side-laced shoes can be defined as *shoes with an opening on the side of the shoe*. On the basis of the placement

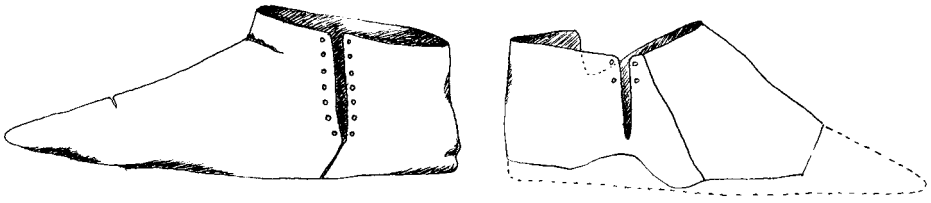


Fig. 17. A lace-up fastened and tie-lace fastened side-laced shoe. Left, TMM 21125:87, without a close dating. Right, TMM 21816: NE51115; late 14th century - early 15th century.

and type of the fastening these shoe are usually called side-laced shoes[176], and are also in this study.

In Niilo Valonen's time in the 1950s, side-laced shoes had not been found from archaeological contexts in Turku. A side-laced shoe is mentioned for the first time in an article in 1970 by Mona Hallbäck discussing Turku shoes. This was a shoe found on a construction site between Brahe's Park and Porthan's Park in 1963.[177] Hallbäck did not mention the other side-laced shoe from the same survey nor a side-laced shoe find from the year 1960-1961 construction site in Uudenmaankatu 4/Hämeenkatu 16.[178]

In Aki Pihlman's survey of shoe finds in the project *Keskiajan kaupungit*, three or four finds of side-laced shoes are mentioned, although without accession numbers.[179] Thus, the number of side-laced shoes had not increased since the 1960s despite many new leather and shoe finds. In fact, this really seems to have been the case. According to my survey, the next finds of side-laced shoes from the town area are not until the Aboa Vetus Museum[180] and Åbo Akademi main building site excavations in the 1990s. Before these excavations the only new finds of side-laced shoes since the 1960s are the two shoes from the excavations in the outer bailey of Turku Castle in 1978-1985, noted in my recent survey of the castle material.

The Åbo Akademi site side-laced shoes have been previously only briefly mentioned. It has been noted that they are few in numbers at this site compared to most other types of shoes and also that they date to the latter half of the 14th century and to the first half of the 15th century.[181] One of the side-laced shoes from the Åbo Akademi site with the flesh side of leather outwards has been depicted and briefly discussed, and another shoe of this kind is mentioned along with the Aboa Vetus Museum find of a same type.[182]

Fig. 18. A side-laced shoe with an uneven number of lace holes (TMM 21816:NE17364). Late 14th century - early 15th century.

Fig. 19. A children's size side-laced shoe (TMM 16195:136). From a context without close dating.

1.5.2 The number and types of side-laced shoes

The minimum number of side-laced shoes found in Turku is 30. Of these, 28 come from the town area and two from Turku Castle.[183]

Side-laced shoes in Turku have been made using two basic cutting patterns. The first one is a wrap-around pattern with possible inserts. The second pattern has a separate vamp and back-piece. The wrap-around pattern occurs in 39 per cent of uppers and the two-piece pattern in 61 per cent of uppers. In both types, the side opening is always on the medial side. Below the opening vent, there is a butted seam. This is the only seam in shoes with

Fig. 20. Side-laced shoes with short extended tips. Left, TMM 21816:NE20957. Right, NE50515; the outer (grain) sides. Late 14th century - early 15th century.

Fig. 21. Lacing in a lace-up fastened side-laced shoe (TMM 21816:NE11256); the inner (grain) side. The 15th century.

a wrap-around pattern. In shoes with a separate vamp and quarters, there is another side seam on the lateral side of the shoe.

On both sides of the opening vent, there are lace holes, the number of which varies from two to eleven (Fig. 17). In some shoes, the number of lace holes is uneven, that is, there can be one lace hole more on the other side of the vent (Fig. 18).

It must be noted that the height of the leg part is not directly related to the number of lace holes, the distance between the lace holes varying. The height of the shoes is difficult to estimate because the vamp parts and quarter parts have usually been found separately. Some general conclusions can still be made. Shoes with two pairs of lace holes are typically low shoes reaching below the ankle while the height of the shoes with three or more pairs of lace holes ranges from 'below the ankle' to 'ankle' and 'above the ankle'. The highest shoe is a children's size shoe where the ratio of height (19.6 cm) and length (17.7 cm) is 1.1 (Fig. 19).[184]

A typical feature in side-laced shoes is a rounded back part. Much less frequent are back parts with a straight side profile.[185] In front-parts, two different toe-forms can be distinguished. The first is a rounded form and the second is pointed, sometimes even with a short extended tip (Fig. 20).[186]

Another typical feature in the side-laced shoes in Turku is the imprint of a reinforcement cord along the top-edge inside the upper. The original purpose of the reinforcement cord is to keep the upper of low shoes made of supple leather from stretching.[187] In the side-laced shoes of Turku, this feature also occurs in higher shoes made of thicker leather. This suggests the strong convention in making shoes of a side-laced type. This convention of the use of a reinforcement cord was probably passed from low shoes of supple leather also to higher shoes of thicker leather, even if the cord had lost its original function. The usual placement for the cord in Turku shoes is on the top-edge of the back and sides of the shoe.[188] No cords have been preserved, but it can be assumed that they were made of vegetable or animal fibre.

There are traces of lace hole reinforcements in shoes, too. Actual reinforcements have been preserved in two cases.[189] Likewise, the use of heel stiffeners seems to have been a typical feature. Remains of lacing have been preserved in five shoes.[190] In all the cases the lace is a flat leather thong. In one case it is possible to see the method of lacing. In a shoe with five pairs of lace holes, a single lace is tied on the lowest hole and goes up in a zigzag fashion (Fig. 21).[191]

The material of side-laced shoes in Turku is calf/cattle leather. In one case the leather is very supple calf leather, in fact, resembling goatskin very much. Another special feature in this shoe upper is that the carefully scraped flesh side of leather has been used on the outside and this way a suede-like effect has been created (for example, the shoe NE51115 in Fig. 17). This is not the only shoe of this type. It occurs in six other side-laced shoes in Turku.[192] The phenomenon has been noted in two tailed-toggle fastened shoes of children's sizes, too.[193] Possible reasons for this peculiarity are discussed in chapter 4.2.2 of Part I.

Side-laced shoes of Turku Castle have been decorated by the openwork decoration, not noted in the side-laced shoes of the town area. Two side-laced shoes from the town area have a decorated foot opening.

1.5.3 The distribution and dating of side-laced shoes

Side-laced shoes have been found in five sites in Turku. The total of 30 finds is distributed in the following way (Table 22).

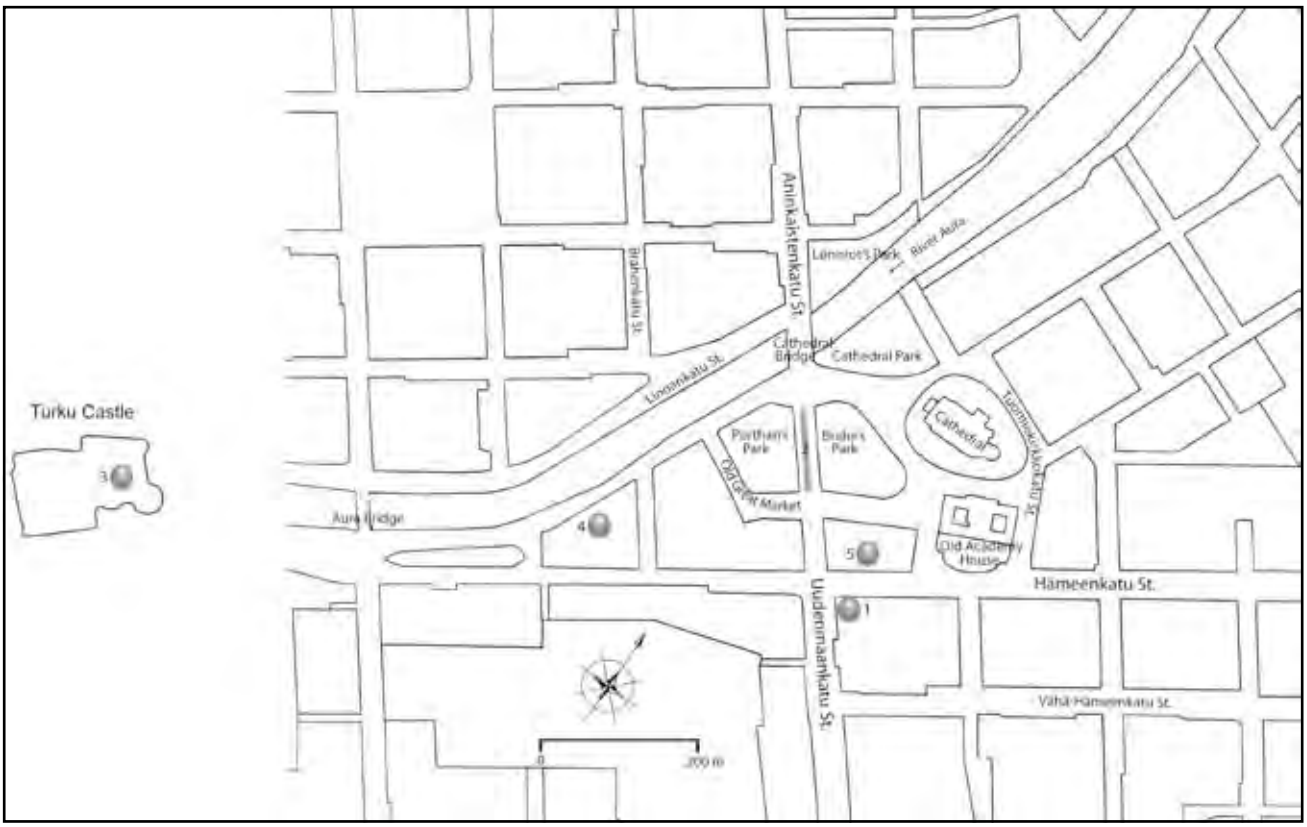


Table 22. The distribution of side-laced shoes.

Site	Number of finds	Symbol on the map
Uudenmaankatu4/Hämeenkatu 16 (survey 1960–1961)	one back part (torn) ➢ one shoe	1
Uudenmaankatu between Brahe's Park and Porthan's Park (survey 1963)	one main piece torn fragment ➢ two shoes	2
Eastern outer bailey of Turku Castle (excavation 1978–1985)	two uppers ➢ two shoes	3
Aboa Vetus Museum (excavation 1992–1995)	two vamps and two back parts ➢ two shoes	4
ÅÅ-site (excavation 1998)	8 wrap-around uppers (4 left shoes, 4 right shoes) 8 quarter parts (5 left shoes, 3 right shoes) 7 vamp parts (3 left shoes, 4 right shoes) ➢ 23 shoes	5

The dating of the finds by their contexts in each site is as follows (Tables 23–25).

There are two uppers from the lowest layers of the excavation at the Turku Castle. These both can be dated broadly to the 14th century, possibly to the middle or the first half of the century. In this case the side-laced shoes of Turku Castle would be older than the shoes in the town area, the oldest of which date to the latter half of the 14th century.

One shoe from the Aboa Vetus Museum can be dated by its context to the latter half of the 14th century - first half of the 15th century.

In the Åbo Akademi main building site assemblage, side-laced shoes are represented as early as the latter half of the 14th century. Most of the 15th century layers with finds of side-laced shoes also contain material from the late 14th century. Shoes from these contexts can date to the 15th century but also to the 14th century. There are, however, side-laced shoes from the 15th century layers, certainly from the first half of the century but two shoes, dated broadly to the 15th century could be from the latter half of the century. The peak of the occurrence of side-laced shoes at the ÅA-site is in any case the late 14th century - early 15th century.

Side-laced shoes from undated or non-archaeological contexts

14th century dating is possible for the shoe from Uudenmaankatu between Brahe's Park and Porthan's Park situated near the Old Great Market Place and

Table 23. Dating of side-laced shoes from the Eastern outer bailey of Turku Castle.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
14th century	2	-

Table 24. Dating of side-laced shoes from the Aboa Vetus Museum.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
latter half of the 14th century - first half of the 15th century	1	-

Table 25. Dating of side-laced shoes from the ÅA-site.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
latter half of the 14th century	6	-
latter half of the 14th century - first half of the 15th century	10	-
latter half of the 14th century - 15th century	2	-
first half of the 15th century	2	-
15th century	2	-
latter half of the 14th century - beginning of the 16th century	1	-

the Cathedral in the centre of the Cathedral quarter. Among the finds collected with the one-piece shoe in Uudenmaankatu4/Hämeenkatu 16, there were also other types of shoes, front-laced shoes and buckled shoes. On the basis of the typological dating of these shoe types, the dating of the side-laced shoe to the latter half of the 14th century or to the 15th century is probable. Support for this dating comes from the general picture of the inhabitation of the Mätäjärvi quarter, which for the most part was a 15th century phenomenon.[194]

1.5.4 Summary

Side-laced shoes were defined as *shoes with an opening on the side of the shoe***.** The minimum number of side-laced shoes from the town area counted by uppers is 28. In addition, two shoes come from Turku Castle.

The material of side-laced shoes in Turku is cattle/calf leather. Seven shoes have been made with the flesh side of the shoe upper outwards to create a suede-like effect. The side-laced shoes of Turku Castle have openwork decoration, not noted in the side-laced shoes of the town area.

Side-laced shoes in Turku have been made from two basic cutting patterns. The first is a wrap-around pattern with possible inserts. The second pattern has a separate vamp and quarters. The number of pairs of lace holes varies from two to eleven. The heights of side-laced shoes range from low shoes to high shoes (boot-height) ankle shoes being most frequent.

Typical features in side-laced shoes are reinforcement cords, lace hole reinforcements and heel stiffeners. Frequent is also a high and rounded back part. Two different toe-forms can be distinguished. The first is rounded and the second pointed.

Side-laced shoes have been found in five sites which are Uudenmaankatu4/Hämeenkatu 16, Uudenmaankatu between Brahe's Park and Porthan's Park, the eastern outer bailey of Turku Castle, Aboa Vetus Museum and the ÅA-site. The oldest finds are from Turku Castle and can be dated to the middle or first half of the 14th century. It must be noted that side-laced shoes are missing from the Old Great Market Place site. This suggests the possibility that in the town area, side-laced shoes appear as late as the latter half of the 14th century.

The earliest side-laced shoes from dated contexts in the town area come from the Åbo Akademi main building site and Aboa Vetus Museum. Here they are represented in the latter half of the 14th century and in the first half of the 15th century with a peak in their occurrence in the late 14th century - early 15th century.

Side-laced shoes from other sites cannot be accurately dated by their contexts. The shoes from Uudenmaankatu between Brahe's Park and Porthan's Park date possibly to the 14th century and the shoes from Uudenmaankatu 4/Hämeenkatu 16 to the 15th century.

On the basis of the present archaeological material, side-laced shoes in Turku are a latter half of the 14th century - 15th century shoe type. It is possible that their greatest popularity was in the late 14th century - early 15th century but more dated finds are needed to support this hypothesis.

The distribution area of side-laced shoes is the Cathedral quarter, the Convent quarter and the

Fig. 22. Front-laced shoes from the ÅA-site. Top, from left to right: TMM 21816:NE17439, NE11092, NE06610. Middle: NE07824, NE06551, NE07814. Bottom: NE05673, NE509183, NE13813. Late 14th century - early 16th century.

northern edge of the Mätäjärvi quarter (the Åbo Akademi main building site) where the majority is found. There are no side-laced shoe finds from other sites in the Mätäjärvi quarter or the western side of the River Aura, i.e. from the Aninkainen quarter. In the Turku Castle material, side-laced shoes are represented in the 14th century material from the outer bailey area. These are the only side-laced shoes in the assemblage with openwork decoration.

1.6 Front-laced shoes (Goubitz types 60, 65 and 70)

1.6.1 The type definition and research history of front-laced shoes in Turku

In archaeological literature, shoes with a frontal opening and lacing are called front-laced shoes or shoes with a front lacing.[195] Usually, further division is made on the basis of the number of lace holes and/or the shoe height. Shoes with a frontal vamp opening and lacing have been divided by Goubitz into three types. Goubitz type 70 shoes are low-cut shoes or ankle shoes with a single two-way tie-lace or bifurcated strap with tapering ends attached to the medial side of the frontal vamp opening. Goubitz type 60 shoes are ankle shoes and shin-high styles with a frontal opening which have more than two pairs of holes for lacing upwards from the instep. Type 65 shoes, 'tie-lace fastening on ankle shoe' are closed with one, two or three tie-laces. These Goubitz types occur in Turku, too. Type 65 occurs only as a one tie-lace variant.

In the Turku material, there are many shoes which can be classified as front-laced shoes but further division is not possible. Front-laced shoes are here discussed as one group, and the division into Goubitz types 60, 65 and 70 is done after this.

Front-laced shoes were firstly noted in Turku by Niilo Valonen. He noted that they were common shoe finds and that there were front-laced shoes of different heights and with a different number of lace holes. Valonen also noted that front-laced shoes had been found in Turku Castle besides the town area.[196] In 1970, Mona Hallbäck added some new finds from the surveys of the 1950s and 1960s to her article.[197] The next larger steps forward were the articles written by Tapani Tuovinen in the project 'Mätäjärvi' and the MA thesis by Satu

Fig. 23. A low-cut front-laced shoe with two pairs of lace holes (TMM 21816:NE51614). Late 14th century - 15th century.

Mikkonen-Hirvonen. For the first time in Turku, it was possible to date footwear finds on the basis of stratigraphically excavated contexts which were dated by dendrochronology and ceramics. Front-laced shoes from these two excavations in the Mätäjärvi quarter were dated by ceramics and dendrochronology to the 15th century and the beginning of the 16th century.[198]

In Aki Pihlman's survey of the medieval Turku shoe material in the project *Keskiajan kaupungit* the percentage of front-laced shoes among the shoe finds was over 60 per cent. Front-laced shoes were distributed in all three quarters on the eastern side of the River Aura, Cathedral quarter, Convent quarter and Mätäjärvi quarter. Some front-laced shoes were noted in the find materials from the western side of the River Aura, in the Aninkainen quarter, too.[199]

Front-laced shoes from the Aboa Vetus Museum excavations have been described by Sanna Jokela. Unfortunately, all finds came from filling layers and thus, they could not be accurately dated then.[200]

Front-laced shoes from the ÅA-site excavation are very numerous. Their popularity among the shoe finds from the latter half of the 14th century to the beginning of the 16th century has been clearly noted (Fig. 22).[201] The most recent finds of front-laced shoes come from the Cathedral Square excavations (Fin. *Tuomiokirkkotori*) carried out in 2005 and 2006.

Fig. 24. A front-laced ankle shoe with two pairs of lace holes and a bifurcated lace (TMM 21816:NE50964). From a context of the late 14th century - early 16th century.

1.6.2 The number and types of front-laced shoes

The minimum number of front-laced shoes has been counted by the main pieces of uppers. The minimum number from the town area is 651 shoes. In addition, there are eight shoes from Turku Castle. I have divided the front-laced shoe material into two subtypes, shoes with two pairs of lace holes and shoes with more than two pairs of lace holes. In Turku, both these subtypes have about the same frequency.

1.6.2.1 Tie-lace fastening (Goubitz types 70 and 65)

This type has two, sometimes three pairs of cut or punched lace holes and a V-shaped, vertical vamp opening. Fastening is done either with a two-way tie-lace or more often, with a bifurcated strap with tapering ends attached to the medial side of the frontal vamp opening. The wrap-around

Fig. 25. A front-laced shoe with two pairs of lace holes and a separate leg-part reaching slightly over the ankle (TMM 21816:NE10479). The 15th century - early 16th century.

Fig. 26. A front-laced shoe with two pairs of lace holes, an integral leg-part reaching slightly over the ankle, a bifurcated lace and a tongue with one-sided attachment (TMM 21816:NE110166). Late 14th century - early 15th century.

pattern, sometimes with insert or inserts, is the typical construction.[202] Heel stiffeners, lace hole reinforcements, rands and tongues with one-sided or two-sided attachment, the latter ones with holes for laces to pass through, are typical features.[203] Two shoes have reinforcements stitched on the inside of the medial side of the upper to prevent wear above the lasting margin.[204]

On the basis of the number of lace holes, shoe height and side profile of the upper, three different variants can be discerned. These three variants fit into Goubitz typology in the following way. Variants 1 and 2 represent Goubitz type 70, 'tie-lace fastening on low shoe'. Variant 3 represents Goubitz type 65, 'tie-lace fastening on ankle shoe'.

The first variant is a *low-cut shoe with a high, rounded heel-part, a dip on the side profile under the ankle bone and two pairs of lace holes* (Fig. 23). The foot opening can be strengthened with a cord. This is typical for low-cut shoes. More common is a binding stitch along the edge of the opening for the topband. There are also shoes with only a cut-edge opening without stitching or a strengthening cord.

The second variant is the most numerous. It is an *ankle shoe with an even side profile or a profile descending slightly towards the heel and two pairs of lace holes* (Fig. 24).

A binding stitch along the edge of the opening is typical even if the actual topband has been preserved in only a few shoes. Besides, there are shoes with

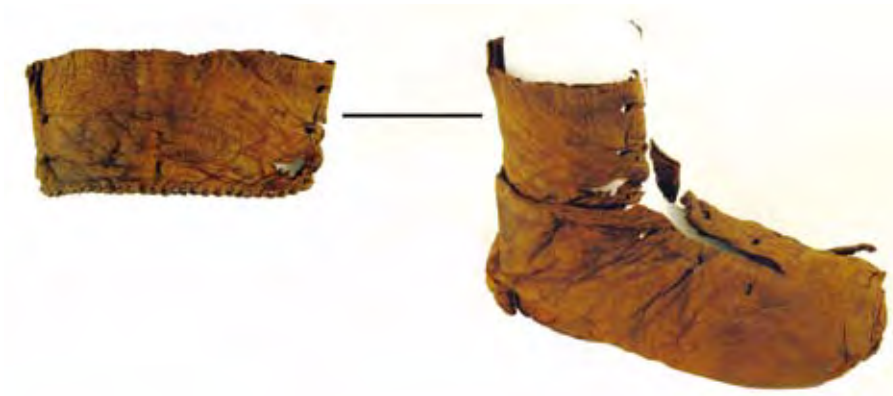


Fig. 27. Shoes with three pairs of lace holes in the main piece and three in a separate leg-part. Top: TMM 21816:NE06524. Bottom: TMM 21816: NE05645. Late 15th century - early 16th century.

only a cut edge. A few shoes of this group have three pairs of lace holes instead of two. As these are more typical as main pieces for shoes with a separate leg-part with lace holes (Goubitz type 60, 'frontal lace-up fastening'), one could assume that these would not be an independent type at all as such. Because, however, some of these shoes do not have any kind of stitching on their opening (for the fastening of the leg part) and the cutting of the opening seems to be original, one must assume that shoes with three pairs of lace holes form a rare 'sub-variant' of an ankle-high front-laced shoe.[205]

The third variant resembles the former type, but has *two pairs of lace holes and an integral or separate, low leg-part without lace holes, which raises the shoe height slightly over the ankle* (Figs. 25 and 26).

The height of the leg part ranges from one cm to ca. four cm. Separate leg parts have been fastened to the main piece either with a whip stitched butted seam or whip stitched lapped seam. It is probable that a part of the shoes of the second variant with a binding stitch along the opening are lacking their separate leg part and thus, would actually belong to this third group. Two shoes of this group have a separate leg part and three pairs of lace holes in the main piece.[206]

1.6.2.2 Frontal lace-up fastening (Goubitz type 60)

This type has a *V-shaped, vertical vamp opening and a minimum of three pairs of holes for lacing upwards from the instep* (Figs. 27 and 79).

Only wrap-around patterns, often with insert or inserts, have been noted. Heel stiffeners, lace hole reinforcements, rands and long and triangular tongues attached from their base are standard features.

The frequencies of the number of pairs of lace holes in the main piece of the upper are the following (on the basis of the ÅA-site material): three pairs (12 uppers), four pairs (53 uppers), five pairs (62 uppers), six pairs (11 uppers), seven pairs (one upper), eight pairs (two uppers), nine pairs (one upper) and ten pairs (one upper). Thus, shoes with four or five pairs of lace holes are the most frequent.

As a standard, shoes of frontal lace-up fastening in Turku have either a binding stitch for a butted seam (less common) or a lapped seam (more common) to attach a separate leg part. There are two shoes without stitching along the opening.[207] The actual leg part has been preserved with the main piece in 13 cases. The leg parts always have lace holes. On the basis of the combinations of main pieces and leg parts found together no clear correlation between the number of lace holes in the main piece and in the leg part can be noted. Neither does the number of lace holes correlate to the height of the shoe. Usually, but not always, do higher leg parts have more lace holes.

The number of pairs of lace holes in leg parts ranges from two to nine. The heights of the leg parts range from ca. four cm to 14 cm. Thus, when the leg parts are connected with the main pieces of ankle height, it can be seen that shoe heights of this type range from the ankle (ankle shoes, ca 12 cm) to under the calf (high shoes, ca. 24 cm).

A large number of separate leg parts, which can no more be connected to main pieces are frequent finds from excavations. The decoration of leg parts by excising indents on the upper edge and punching rows of geometric motifs has been common.

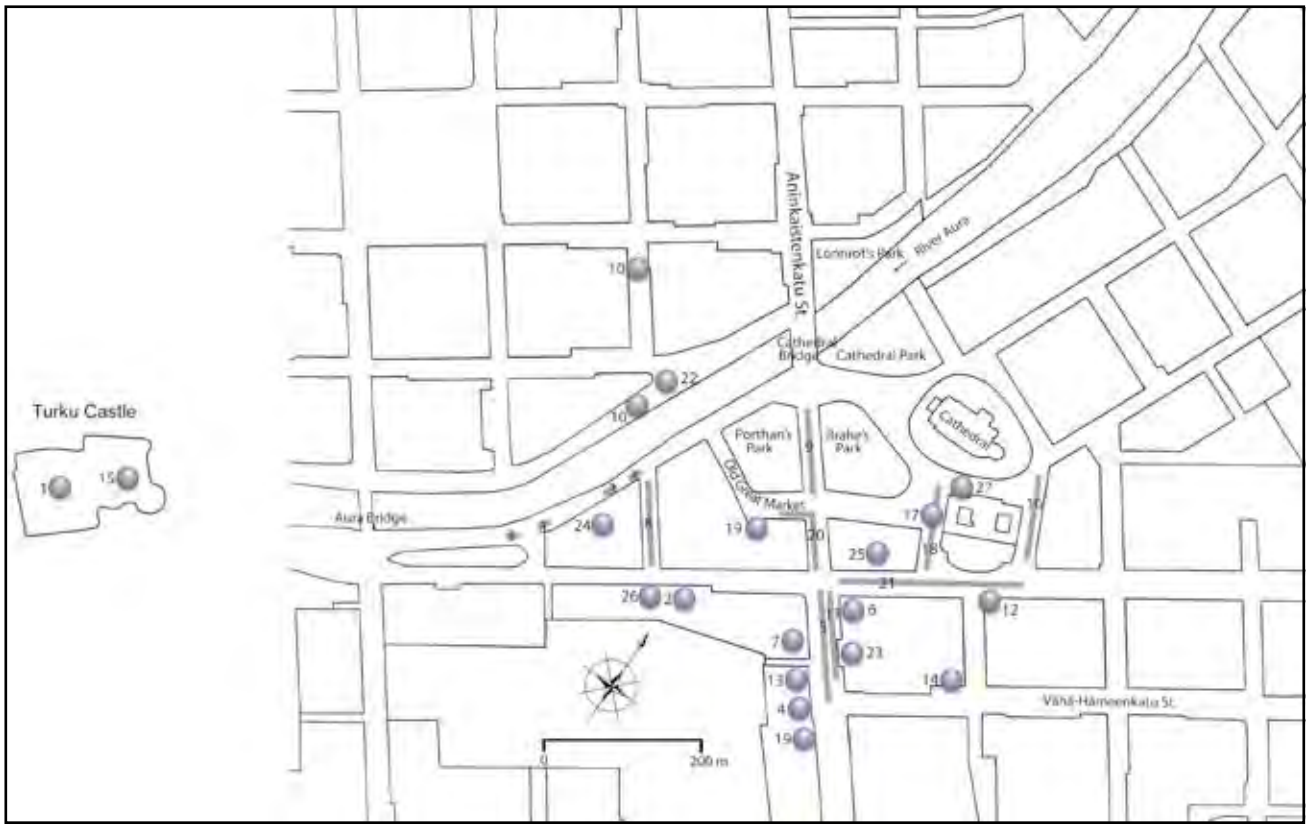


Table 26. The distribution of front-laced shoes.

Site	Number of finds	Symbol on the map
Turku Castle, the main castle (survey 1930–1932)	4 uppers	1
Hämeenkatu 22 (survey 1947)	one upper	2
Itäinen Rantakatu (survey 1952–53)	7 uppers	3
Uudenmaankatu (survey 1954)	two uppers	4
Uudenmaankatu (survey 1954)	17 uppers fragments	5
Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)	11 uppers	6
Uudenmaankatu (survey 1962–1963)	one upper	7
Nunnankatu (survey 1963)	one upper fragments	8
Uudenmaankatu between Brahe's Park and Porthan's Park (survey 1963)	three uppers	9
Brahenkatu (survey 1968–1969)	four uppers	10
Uudenmaankatu (survey 1970)	one upper	11
Hämeenkatu (survey 1971)	two uppers	12
Uudenmaankatu 5 (survey 1971–1972)	seven uppers fragments	13
Vähä-Hämeenkatu 13b (excavation 1975)	15 uppers fragments	14
Turku Castle, eastern outer bailey (survey 1976)	four uppers	15
Tuomiokirkkokatu (survey 1976-1978)	two uppers	16
Old Academy House/Akatemiankatu (survey 1977)	two uppers fragments	17
Akatemiankatu (survey 1980)	nine uppers fragments	18
Uudenmaankatu 7 (survey 1981)	one upper	19
Suurtori - Uudenmaankatu (survey 1982)	six uppers	20
Vähä-Hämeenkatu 13b (excavation 1982)	three uppers	14
Hämeenkatu (survey 1983–1984)	28 uppers fragments	21
Linnankatu (survey 1984)	two uppers	22
Akatemiankatu (survey 1985)	three uppers	18
Old Great Market Place, Town Hall (excavation 1986–1987)	one upper	19
Uudenmaankatu 6 (excavation 1986)	six uppers	23
Uudenmaankatu 6 (excavation 1988)	30 uppers fragments	23
Old Great Market Place, Hjelt building (excavation 1989)	five uppers	19
Nunnankatu (survey 1990)	one upper	8
Aboa Vetus Museum (excavation 1992–1995)	five uppers	24
ÅA-site (excavation 1998)	451 uppers 30 fragments	25
Rettig's slope (excavation 2001)	three uppers	26
Cathedral Square (excavation 2005)	18 uppers	27

1.6.3 The distribution and dating of front-laced shoes

Front-laced shoes have been found in 31 sites in Turku. Two of these are from Turku Castle and the rest from the town area. The sites are presented in a chronological order according to the date of discovery in Table 26.

The dating of the finds by their contexts is as follows (Tables 27–33).

Table 27. Dating of front-laced shoes from Vähä-Hämeenkatu 13b.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
middle of the 15th century - 1520/1530	18	-

Table 28. Dating of front-laced shoes from Uudenmaankatu 6.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
1384/1429 - 1440/1445	12	-
1440/1445 - first half of the 16th century	21	-

Table 29. Dating of front-laced shoes from the Old Great Market Place, Hjelt building.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
second quarter of the 14th century	1	-
latter half of the 14th century - beginning of the 15th century	3	-
mixed layers between medieval and modern layers	3	1

Table 30. Dating of front-laced shoes from the Aboa Vetus Museum.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
latter half of the 14th century - first half of the 15th century	1	-

Table 31. Dating of front-laced shoes from the ÅA-site.

Phase	Number of finds (main pieces/vamp pieces)
14th century	26
latter half of the 14th century - first half of the 15th century	172
first half of the 15th century	42
15th century	19
latter half of the 14th century - 15th century	54
latter half of the 14th century - beginning of the 16th century	30
latter half of the 15th century - beginning of the 16th century	57
15th century - beginning of the 16th century	26
beginning of the 16th century	11
latter half of the 16th century - beginning of the 17th century	5

Table 32. Dating of front-laced shoes from Rettig's slope.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
15th century - beginning of the 16th century	3	3

Table 33. Dating of front-laced shoes from the Cathedral Square.

Phase	Number of finds (main pieces/vamp pieces)
latter half of the 14th century	8
15th century	10

In Vähä-Hämeenkatu 13b, front-laced shoes are represented in the latter half of the 15th century and at the beginning of the 16th century. Besides one patten strap-half, front-laced shoe is the only medieval shoe type represented in the Vähä-Hämeenkatu 13b assemblage.
Front-laced shoes appear in the first settlement phase in the Uudenmaankatu 6 site, dated to 1384/1429 - 1440/1445. In the second phase, dated from the middle of the 15th century to the first half of the 16th century, the number of front-laced-shoes increases considerably. Besides one patten strap-half, front-laced shoe is the only medieval shoe type in Uudenmaankatu 6 assemblage.
In the Old Great Market Place assemblage, front-laced shoes are represented for the first time in the second quarter of the 14th century, although only with one shoe. There is no evidence of front-laced shoes from earlier phases, the end of the 13th century or the first quarter of the 14th century. Front-laced shoes mainly seem to appear from the latter half of the 14th century onwards.
The only front-laced shoe from a dated context at the Aboa Vetus museum comes from a layer dated from the latter half of the 14th century to the first half of the 15th century.
In the Åbo Akademi main building site assemblage, front-laced shoes are represented in the latter half of the 14th century and in the first half of the 15th century. They are still strongly represented in the latter half of the 15th century and to some extent at the beginning of the 16th century. What is interesting, is the observation that there are a few front-laced turnshoes from layers dated from the latter half of the 16th century to the beginning of the 17th century.
Three shoes and three fragments from Rettig's slope excavation come from the filling layers of a well, dated to the 15th century or early 16th century. Accordingly, the shoe finds could have the same dating.
Front-laced shoes are represented by eight shoes in the latter half of the 14th century and by ten shoes in the 15th century in the Cathedral Square assemblage.

1.6.4 Summary

The front-laced shoes were defined as *shoes with a frontal opening and lacing*. The minimum number of front-laced shoes in Turku is 651 from the town area and eight from Turku Castle. Thus, the front-laced shoe is the most frequent shoe type in Turku.
The basic cutting pattern of front-laced shoes in Turku is a wrap-around construction, usually with an insert or inserts. The use of heel stiffeners, rands, tongues and topbands is common.
Front-laced shoes were divided into two subtypes, shoes with a tie-lace fastening (Goubitz types 70 and 65) and shoes with a frontal lace-up fastening (Goubitz type 60). Shoes with a tie-lace fastening were further divided into three variants.
1) low-cut shoe with two pairs of lace holes, a high, rounded heel-part and a dip on the side profile under the ankle bone.
2) ankle shoe with two pairs of lace holes and an even or slightly towards the heel descending side profile.
3) ankle shoe with two pairs of lace holes and an integral or separate, low leg-part without lace holes, which raises the shoe height slightly over the ankle.

Shoes with a frontal lace-up fastening have a minimum of three pairs of holes for lacing upwards from the instep. The frequency of the number of pairs of lace holes in the main piece of the upper ranges from three to ten, four or five pairs being most frequent. As a standard, shoes of frontal lace-up fastening in Turku have a separate, often decorated, leg part with lace holes. When the leg parts are connected with the main pieces of ankle height, it can be seen that shoe heights of this type range from the ankle to 'under the calf'.
Front-laced shoes in Turku have been found in 31 sites. They occur in every medieval quarter, also in the Aninkainen quarter as the only medieval shoe type on the western side of the River Aura.
The oldest front-laced shoe has been found at the Hjelt building site in the Old Great Market Place. It dates to the second quarter of the 14th century. In the Old Great Market Place, front-laced shoes mainly appear in the latter half of the 14th century. Materials from other dated sites, the two Mätäjärvi sites (Uudenmaankatu 6 and Vähä-Hämeenkatu 13b), the ÅA-site, the Aboa Vetus Museum, Rettig's slope and the Cathedral Square also date the front-laced shoes from the latter half of the 14th century to the beginning of the 16th century. The shoe finds from the ÅA-site may suggest the possibility that front-laced shoes of a turnshoe type were still, to some extent, used in the latter half of the 16th century or even at the beginning of the 17th century.

1.7 Buckled shoes (Goubitz type 85)

1.7.1 The type definition and research history of buckled shoes in Turku

Medieval shoes fastened with a buckle or multiple buckles are in archaeological literature simply called buckle shoes, buckled shoes or shoes with a buckle-and-strap fastening.[208] A buckled shoe can mean different types of shoes. Therefore, a more accurate description is usually needed to know which type is in question. The Goubitz type 85, 'shoes fastened with permanently attached buckle', is a broad category of several quite different types and styles belonging to different periods. In Goubitz's categorization, Turku shoes would belong to two sub groups.
All shoes from the town area belong to a group 'closed styles' of Group 1'.[209] These shoes are *ankle shoes and have a V-shaped frontal opening. The fastening is effected by a buckle and a strap. The buckle is fixed to a leather thong which has a base secured*

Fig. 28. A one-buckled shoe of ankle height. A broken buckle, buckle thong and a keeper for a strap tail preserved, but missing the strap (TMM 21816: NE07839). Latter half of the 15th century - early 16th century.

inside the shoe through a slit in the upper. The strap is slipped through another slit in the upper, with the base stitched onto the inside of the shoe. For the tail of the buckle strap, there is always a keeper of leather.
One shoe of Goubitz's variant 'open styles of Group 1' comes from Turku Castle.[210] The difference of this shoe type from the first type is that the shoes are *low-cut styles and have open insteps. The strap and the leather thong for the buckle are usually either cut to the pattern of the upper or sewn integrally with a butted seam to the side of the upper*.
The term buckled shoe is used in this study when referred generally to the two types found in Turku and described above. Terms open and closed styles are used of two Goubitz subtypes found in Turku. More detailed description and clarification is used when necessary to avoid confusion with the types.
Buckled shoes were first noted in Turku in the assemblage of the ÅA-site material in 1998. Attention was paid to the fact that the type was not noted earlier and to the close resemblance of the shoes to those in Helgeandsholmen, Stockholm.[211] In the inventory of the older assemblages for this study, buckled shoes were found among the finds from the town area as well as Turku Castle.[212]

1.7.2 The number and types of buckled shoes

In counting the minimum number of buckled shoes discarded, I have again used parts which occur only once in each shoe. In the rather fragmentary material, the highest number is achieved counting the uppers/parts of uppers where the identifiable buckle/buckle thong/slit for the buckle thong and the keeper/holes for the keeper ends have been preserved. The smallest cut pieces with only one buckle were individually compared to each other to exclude the possibility that the pieces would match together because this would mean that the pieces derived from uppers with multiple buckles, i.e. the same shoes.
Counted this way, the minimum number would be 52 shoes of closed style and one shoe of open style. In addition to these, there are 10 fragments from buckled shoes which do not necessarily represent individual shoes.

1.7.2.1 The closed style

The cutting pattern of these shoes is a wrap-around either of one-piece construction or with insert/inserts on the medial side of the upper. Because of the fragmentary nature of the uppers it is not possible to observe the frequency of shoes with and without inserts. A feature occurring in every shoe of this type is a V-shaped front-opening cut to the instep of the shoe.
In some better preserved uppers it is possible to make some observations on shoe heights. All the shoes of this type in Turku extend to or above the ankle. Low-cut styles do not occur. In shoes extending to the ankle, the profile is usually slightly descending towards the back of the shoe, i.e. the back of the shoe is lower than the rather high front (Fig. 28).
In shoes reaching above the ankle, the height has been gained either by cutting the part above the ankle to the pattern or sewing a separate, ca. 40–50 mm high leg-part to the top-edge of the upper either with a whip-stitched butted seam or with a whip-stitched lapped seam.
The highest buckled shoes of this group extend to the position 'under the calf' and belong to the transition zone between ankle shoes and high shoes. In one shoe with two buckles, there is a pair of lace holes in the main part of the upper and a separate leg-part with three pairs of lace holes. This has been considered as a combined fastening of buckles and lacing (see chapter 1.9 of Part I).[213]
Heel stiffeners, rands and tongues occur but their frequency is unclear. On the basis of the uppers and few soles, a sole shape with a rounded toe seems

Fig. 29. A fragment of a two-buckled shoe (TMM 21816:n1184); the outer (grain) side. Two openings for strap bases and two keepers for the strap tails reveal the shoe type and a two-buckled subtype. 80 x 80 mm.

to be the prevailing shape. No pointed toes were noted.

The number of buckles/shoe varies between one and two. Shoes with one buckle are more frequent. Two buckles occur in eight shoes of the total of 51 (Fig. 29).

The actual buckles are rarely preserved. Usually only the buckle thong or only the slit for the thong in the shoe upper reveals the upper as a buckled shoe. As the reason for such a small number of buckles remaining in shoes, I would suggest the intentional preserving of buckles by cutting or tearing them off before discarding the shoe.

In four shoes, buckles remain, however. There are three buckles of the first type (Fig. 30a, b, c).[214] Their shape is round, oval or U-shaped with a rectangular base. The diameter of these buckles is about 15 mm. The buckle frames are round in section and the thickness of the frame is ca. 4–5 mm. The material is iron. In one buckle (Fig. 30c), a three mm thick pin has been preserved.

There is only one example of the second type (Fig. 30d). It is made of iron but plated with tin.[215] It is possible that plating was more common in other buckles too, but has worn away.[216] The buckle frame is rectangular and the size is 12 x 15 mm. The frame is round in section and its thickness is only two

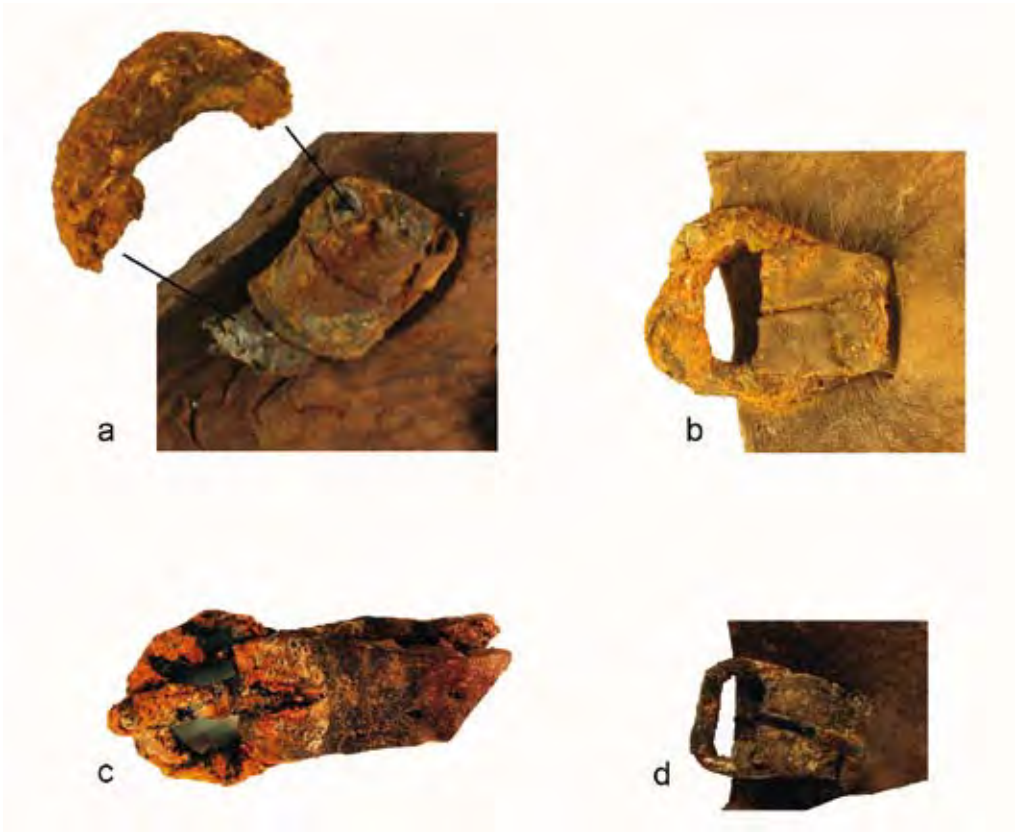


Fig. 30. Buckles from buckled shoes. ***(a)*** *TMM 21816:NE2101,* ***(b)*** *NE07839,* ***(c)*** *NE08519,* ***(d)*** *NE13248. Late 14th century - early 16th century.*

Fig. 31. A cut buckled shoe with a strap preserved as a whole (TMM 21816:NE1142); the outer (grain) side. Late 15th century - early 16th century.

mm. In this buckle a pin and even a roller for the strap have been preserved.
The buckles were fixed to leather thongs. Thongs have been made from ca. 10 mm wide strip of leather slipped through the buckle frame and stitched together at the base. A slit for the buckle pin was cut in the thong. The base of the thong was put through the slit in the upper and stitched on the inside of the shoe.
Straps have been preserved whole or almost whole in eight shoes. In addition, nine shoes have fragments of straps. Straps are made of ca. 10–12 mm wide and 130–150 mm long leather strips tapering to the end. There are usually many parallel holes which make possible the different tightness of fastening. Usually the base of the strap is slipped through the slit in the upper and sewn on the inside of the shoe (Fig. 31). In one case the strap base is bifurcated and both ends are slipped through separate slits and sewn on the inside of the shoe.[217]
In two cases the fastening problem caused by the missing buckle has been solved by replacing the strap by an ordinary shoe lace put through the slit originally for the strap and fastened to the opening left by the buckle.[218]
Keepers for the ends of the straps have been made of ca 5–7 mm wide and 25 mm long leather strips, the wider ends of which have been put through holes in the upper (Figs. 28 and 29). Keepers were secured in place by stitching the ends to the inside of the shoe.

1.7.2.2 The open style

There is only one example of this type of shoe and even this is fragmentary.[219] Preserved from a right foot shoe is the lateral side, part of the instep and the base of the strap to which the buckle was fixed. This strap is cut to the pattern of the upper. The instep of the shoe is open almost reaching the toes. The shape of the opening is a very wide V. The cutting pattern for the upper is a low-cut style. The length of the shoe cannot be measured but is anyway of adult size (Fig. 32).

1.7.3 The distribution and dating of buckled shoes

Buckled shoes have been found in four sites in the town area. The town shoes are all closed styles. The only buckled shoe of an open style is from the eastern outer bailey of Turku Castle. The total of 53 finds is distributed in the following way (Table 34).
The dating of finds by their contexts in each site is presented in the following (Tables 35 and 36).
The shoe from the Outer Bailey of Turku Castle was found with other organic material from the lowest, organic layers. There is a dendrochronological dating to AD 1296 - 1315 from a timber structure to which

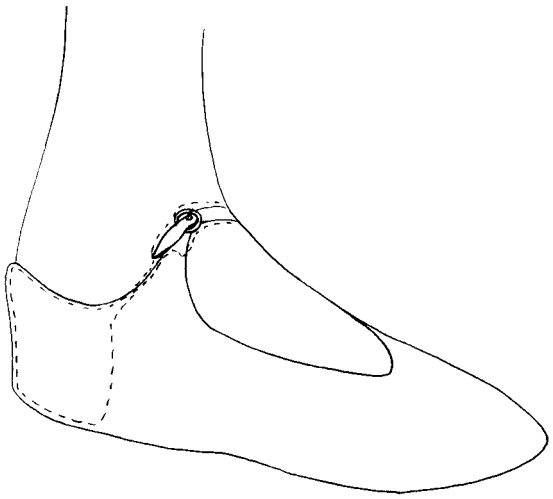


Fig. 32. An open buckled shoe from Turku Castle (KM 96001:4461). The missing parts have been marked with a broken line. Late 13th century - first half of the 14th century.

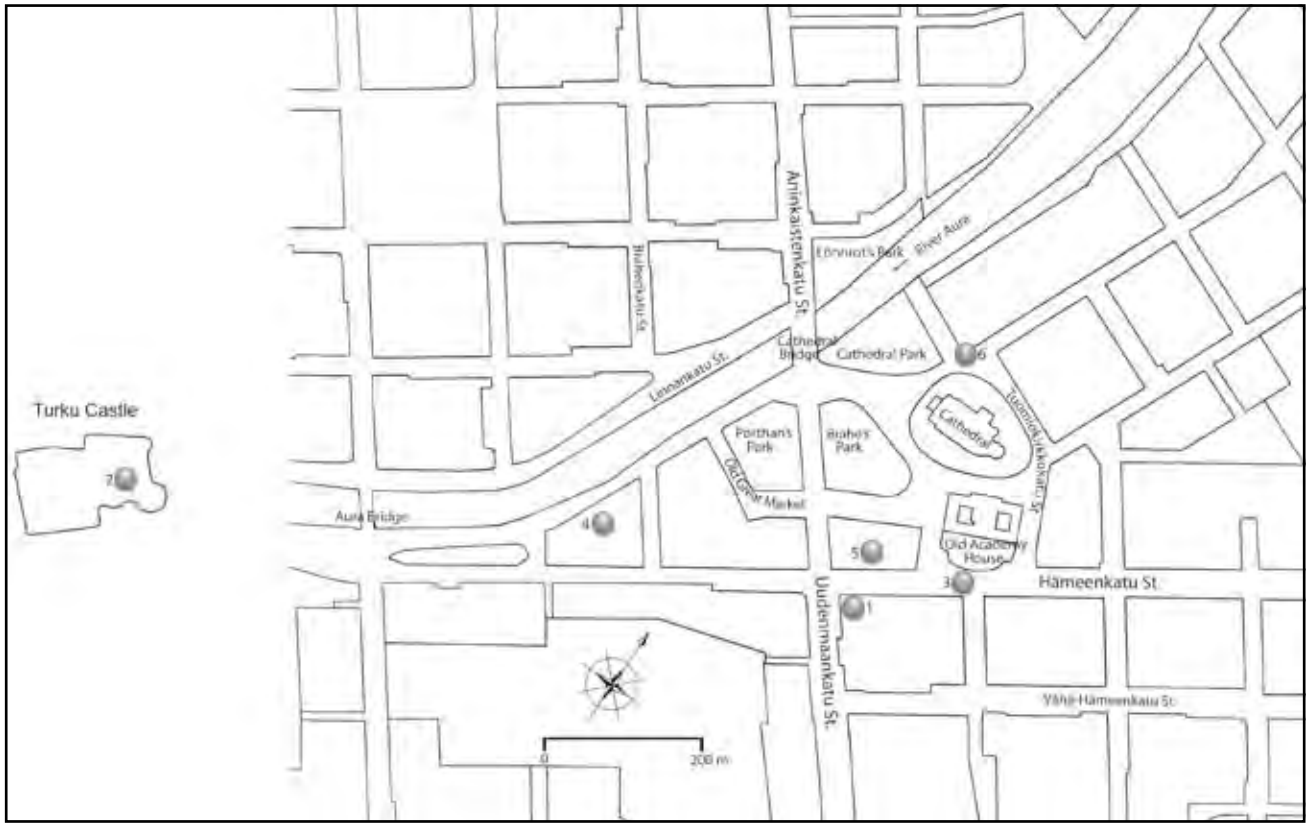


Table 34. The distribution of buckled shoes.

Site	Number of finds	Symbol on the map
Uudenmaankatu4/Hämeenkatu 16 (survey 1960–1961)	two uppers of closed style	1
Eastern outer bailey of Turku Castle (excavation 1978–1985)	one upper of open style	2
Hämeenkatu, on the south side of the Old Academy House (survey 1983)	one upper of closed style	3
Aboa Vetus Museum (excavation 1992–1995)	one upper of closed style	4
ÅÅ-site (excavation 1998)	48 uppers of closed style	5
Tryckerihuset (excavation 2006)	see the footnote[1]	6

[1]There seems to be buckled shoe/shoes from the Tryckerihuset excavation in 2006. The location has been added to the distribution map, but as late additions, these finds are not otherwise included or discussed in this thesis

these layers can be connected.[220] Keeping in mind the possibility of the secondary use of these timbers, the suggested dating for the buckled shoe from Turku Castle is by its find context, relying on the dendrochronological dating, the late 13th century or the first half of the 14th century. Further support for the dating comes from typological datings of the comparative shoe material (see chapter 4.1.6 of Part I).

In the Åbo Akademi main building site assemblage, buckled shoes are represented in the early 15th century at the latest and possibly even in the latter half of the 14th century. The uncertainty is due to the fact that most of the 15th century layers with finds of buckled shoes also contain material from the late 14th century. Buckled shoes from these contexts can date to the 15th century but also to the 14th century. There are many shoes from layers containing only 15th century finds. Buckled shoes occur quite evenly both in the first half and in the latter half of the century. The occurring of such shoes also into the 16th century is uncertain because layers with 16th century material also contain material from the late 15th century; the phases of the late 15th century and early 16th century cannot be discerned from each other at the ÅA-site.

Buckled shoes from undated or non-archaeological contexts

The two finds of buckled shoes from the construction work in Uudenmaankatu 4/Hämeenkatu 16 can be dated only broadly. Among the finds collected with the buckled shoes, there were also front-laced shoes and a one-piece shoe. On the basis of the typological dating of front-laced shoes, the dating of the buckled shoes to the latter half of the 14th

Table 35. Dating of buckled shoes from the Eastern outer bailey of Turku Castle.

Phase	Number of finds (main pieces)
late 13th century - first half of the 14th century	1

Table 36. Dating of buckled shoes from the ÅA-site.

Phase	Number of finds (main pieces/vamp pieces)	Number of finds (fragments)
latter half of the 14th century - first half of the 15th century	22	3
latter half of the 14th century - 15th century	2	1
first half of the 15th century	4	1
15th century	6	3
latter half of the 14th century - beginning of the 16th century	2	-
latter half of the 15th century - beginning of the 16th century	7	2
15th century - beginning of the 16th century	3	-
middle of the 16th century	1	-

century or to the 15th century is probable. Support for this dating comes from the general picture of the inhabitation of the Mätäjärvi quarter, which for the most part was a 15th century phenomenon.[221]
The upper from Hämeenkatu was found from a sewer construction in the southern side of the Old Academy House. The find context was a wood chip layer in ca. 2.5–2.8 meters deep. Only a broad dating to the Middle Ages or to the early 16th century can be given to this buckle shoe find.
The shoe upper from the Aboa Vetus Museum can only broadly dated as medieval on the basis of its find context.

1.7.4 Summary

Buckled shoes were defined as *shoes fastened with a permanently attached buckle or multiple buckles*. The minimum number of buckled shoes from the town area counted by uppers is 52. These all represent the closed style in Goubitz's typology. One buckled shoe of Goubitz's style 'open shoe' comes from Turku Castle.
Buckled shoes of closed type have mainly been found in the Mätäjärvi quarter, most of the finds from the ÅA-site and the rest from nearby sites, Uudenmaankatu 4/Hämeenkatu 16 groundwork and the sewer construction in Hämeenkatu, on the south side of the Old Academy House. One shoe comes from the Convent quarter (the Aboa Vetus Museum site).
The buckled shoes of closed style represent two patterns, pattern A is an ankle shoe with a slightly descending side profile towards the heel. Pattern B is higher with a straight side profile and a separate leg part or leg part cut to the pattern. The number of buckles/shoe varies between one and two. Shoes with one buckle are more common. The material of buckles is iron, sometimes coated with tin. The buckle styles range from round to rectangular.
The buckled shoes of closed type were dated to the 15th century. Some of the shoes date possibly as early as the late 14th century. The continuation of the shoe type to the 16th century cannot be proved from the present material. The popularity of this shoe type was in any case at its height in the 15th century. No increase or decrease in the latter half of the century can be noted, the occurrence is even throughout the 15th century.
The open style from Turku Castle dates to the late 13th century or to the first half of the 14th century. Thus, the buckled shoe occurs earlier in Turku Castle than in the town area. It also represents a different style with a low-cut pattern, open instep and an integral strap.

1.8 Boots (Goubitz type 95)

1.8.1 The type definition and research history of boots in Turku

The boot, sometimes with an attribute 'high' or 'low' to describe the height is the usual term to describe closed footwear in archaeological research.[222] Alternatively, the term boot can be used as a synonym for high footwear, even for open footwear with a fastening system.[223] The definitions of shoe types in this study are based on the type of the fastening system, so the term boot is the best to describe footwear without the means of closure. Following the Goubitz classification, in this study, boots are defined as a closed form of footwear reaching over the ankle or higher, and

Fig. 33. Vamp parts from boots from the ÅA-site. From left to right: TMM 21816:NE5038, NE504124, NE5059; the inner (flesh) sides. Latter half of the 14th century - turn of the 15th century.

lacking a fastening opening, fastening or closure.[224] The description of the height of the footwear is added when necessary.
In the report of *Keskiajan kaupungit*, Aki Pihlman mentions that there are three boot finds from Turku and that the boots were found in the Convent quarter and the Mätäjärvi quarter.[225] These finds cannot be traced back for closer examination because of the lack of access numbers. I have not been able to find these boots in my survey of the Turku material. Thus, besides one find from Uudenmaankatu survey, boots seem to come from the ÅA-site excavation. These have been mentioned but not really described or discussed before.[226]

1.8.2 The number and types of boots

It has been possible to identify four boots from the Turku Material (Fig. 33).
The identification is based on the separate vamp parts, leg parts of boots have not been found. The probable reason for their lack is the reuse of leather. Besides the fact that in the Middle Ages, shoes were much more common than boots, the reuse of leather can be seen as the primary reason for the rareness of recognised boots, especially the leg parts, in most medieval archaeological sites.[227]
The boots of Turku were made using a similar cutting pattern. They represent the pattern where the upper is composed of a separate vamp part and leg part stitched together to form a closed upper. The leg part could have been either of one-piece or composed of a main piece and smaller parts. Because only vamp parts have been preserved there is no information on the heights of the leg parts.
Vamps have been stitched to the leg parts with a butted seam and flesh/edge stitches, which run continuously from the medial side lasting margin to the lateral side lasting margin. There is a slight triangular or rounded insert in the middle of the instep to fit it into the indent in the pattern of the leg part. In one vamp, there is a piece of a bifurcated lace through the upper in the middle of the upper edge of the instep. The purpose of this is not known. It is possible that it is the remnant of the pulling loop of the boot.
In three vamps the toe has been preserved. In all these cases it is pointed and one even has a short, extended tip.

1.8.3 The distribution and dating of boots

Boots in Turku have been found in two sites. The four finds are distributed in the following way (Table 37).
The dating of the finds by their contexts is as follows (Table 38).
All the three vamps at the ÅA-site come from layers, dated from the late 14th century to the turn of the 15th century. *In the Åbo Akademi main building site assemblage, boots are represented in the late 14th century and possibly in the early 15th century.*

Boots from undated or non-archaeological contexts

The vamp find from Uudenmaankatu cannot be certainly dated by its context but the 14th century dating is possible considering the location near the Old Great Market Place and the Cathedral in the centre of the Cathedral quarter.

1.8.4 Summary

Boots were defined as a closed form of footwear reaching over the ankle or higher, and lacking a fastening opening, fastening or closure. The number of boots counted by the preserved vamp parts is four. These all represent the same basic boot style with separately cut vamp and leg. Leg parts have not been found. This is probably because of the reuse of the leather. The reuse of the leg parts causes underrepresentation of this shoe type among archaeological shoes, which has been noted in many archaeological excavations of medieval sites. On the other hand, the small number of even the vamp parts, which should have been preserved better than leg parts, represents the obvious true rarity of this footwear type in Turku, too.
Boots have been found in the Cathedral quarter and the Mätäjärvi quarter where all the finds come from the ÅA-site. Boots were dated by their find contexts

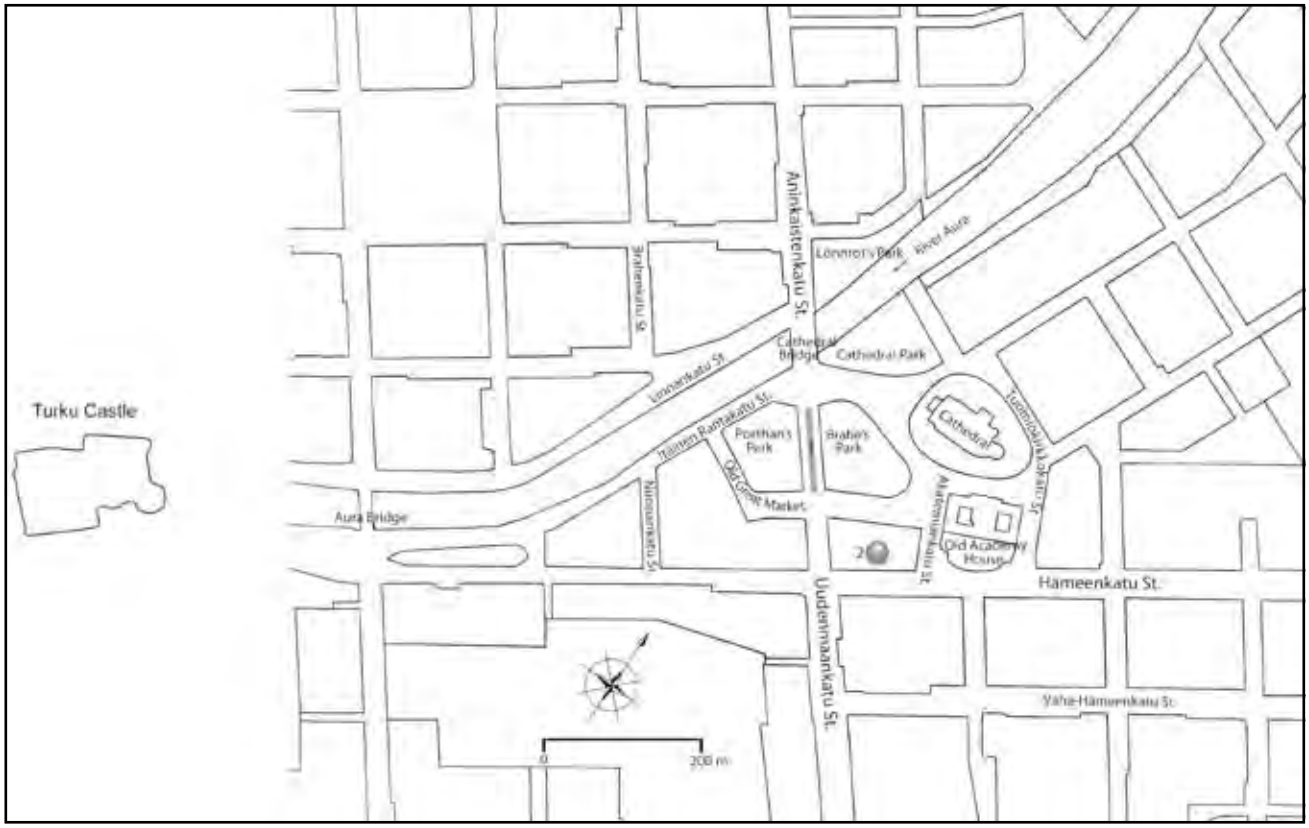


Table 37. The distribution of boots.

Site	Number of finds	Symbol on the map
Uudenmaankatu between Brahe's Park and Porthan's Park (survey 1963)	one vamp	1
ÅÅ-site (excavation 1998)	three vamps	2

Table 38. Dating of boots from the ÅA-site.

Phase	Number of finds (vamp pieces)
latter half of the 14th century - turn of the 15th century	3

to the 14th century and possibly to the early 15th century.

1.9 Combined fastenings in shoes (Goubitz type 100)

Shoes with a combined fastening are here defined as shoes which have *instead of one fastening, at least two different types of fastenings or closure combined on an individual shoe*. Only shoes which seem to be original shoemakers' products are discussed here. Shoes with a repair fastening are excluded.

Shoes with a combined fastening in Turku can be divided into two categories. The first is a combination of *laces and toggles* and the second is a combination of *laces and buckles*.

There are seven shoes with a combined fastening of laces and toggles. These come from three sites (Table

Fig. 34. A shoe with two buckles and a separate leg-part with three lace holes (TMM 21816:NE14721); the outer (grain) side. First half of the 15th century.

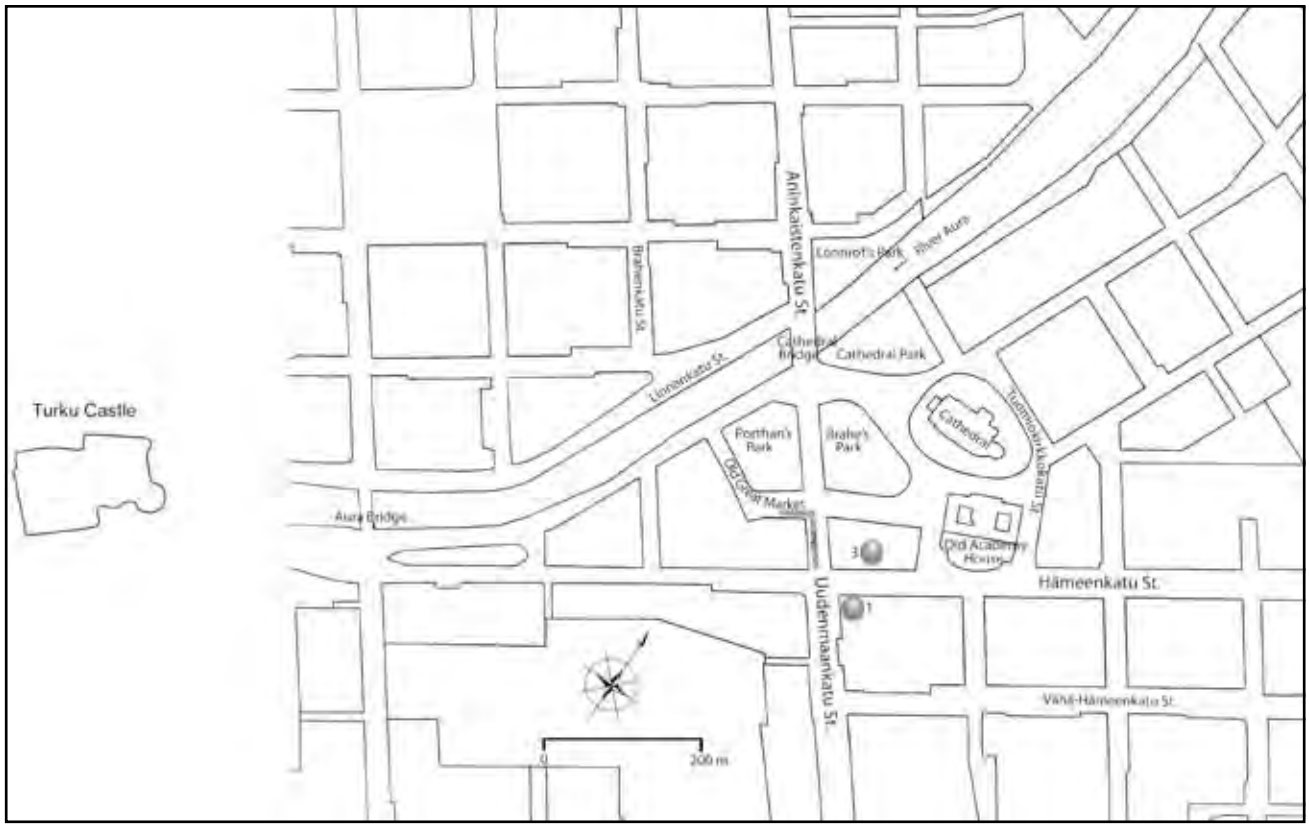


Table 39. The distribution of shoes with a combined fastening.

Site	Number of finds	Symbol on the map
Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)	one shoe	1
Old Great Market Place - Uudenmaankatu (survey 1982)	one shoe	2
ÅÄ-site (excavation 1998)	five shoes	3

39). In this group, there are different combinations of laces and toggles.[228]
One shoe already discussed in the buckle shoes section actually represents a combined fastening type.[229] In addition to two buckles in the main part of the upper, it has a separate leg part with three lace holes (Fig. 34).
Shoes with a combined fastening from the ÅA-site can be dated to the period of the latter half of the 14th century - first half of the 15th century. The shoes from other sites can only be given a broader medieval dating.

1.9.1 Summary

Shoes with a combined fastening were defined as shoes which have at least two different types of original fastenings or closure combined on an individual shoe. The categories noted are *laces and toggles* and *laces and buckles*. Datable examples from the ÅA-site date to the period of the latter half of the 14th century - first half of the 15th century.

1.10 Pattens (Goubitz type 110)

1.10.1 The type definition and research history of pattens in Turku

In the Middle Ages, there were many names for the different types of overshoes which unfortunately are seldom linked to footwear descriptions.[230] In archaeology, medieval overshoes are either called pattens[231], clogs or clog overshoes[232]. In this study, the term patten is used. In archaeological terminology the word patten represents two different kinds of overshoes: the wooden patten and the leather overshoe or sandal.[233] In this study the attribute wooden or leather is added to the term patten when needed for clarity. So far, only wooden pattens and their leather components have been found in Turku.
The basic elements of a wooden patten are a wooden sole, a leather footstrap over the instep either of one-piece or composed of two parts, and sometimes a leather toe cap (Fig. 43b). The leather parts were attached to the wooden sole with nails. Other metal parts sometimes occurring are metal

Fig. 35. A charred patten stilt (TMM 21816:L2118). Late 14th century - early 15th century.

fittings to protect the weaker parts of the sole, to prevent wear and possibly to produce better grip on the slippery surface, ice, for example. In addition there could be reinforcement strips of leather or metal behind the nail heads protecting them from chafing. The wooden soles are either flat or they have stilts which are part of the sole. Separate stilts occur only as replacements. The number of stilts is usually two, one under the front of the foot and the other under the heel. The purpose of the stilts was to raise the foot above the ground and to make it easier to walk on the rigid wooden soles.

The usual way of fastening the two-part strap was by passing a narrow tab extending from the medial half of the strap through a small opening in the lateral half and then securing it with a small nail.[234] This is the only fastening method of two-part straps noted in Turku material. It could be that buckled straps or straps fastened with lacing were more common in overshoes or sandals made of leather.[235]

The first patten footstrap in Turku was found in the 1975 excavations in Vähä-Hämeenkatu 13b (Mätäjärvi).[236] A patten footstrap was also found in the nearby excavation site Uudenmaankatu 6

Fig. 36. A patten sole with two stilts and a broken toe-part (TMM 21816:KP13430). The 15th century.

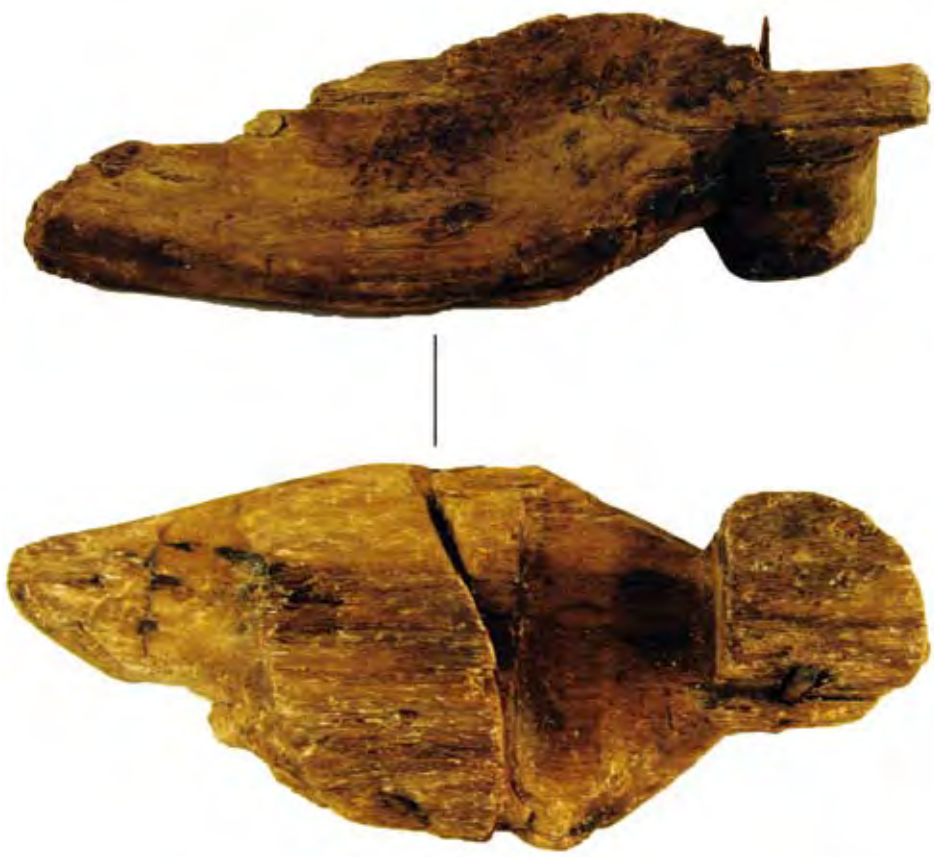


Fig. 37. A patten sole with the original length, but with the foremost heel worn flat (TMM 21816:KP13042). Late 14th century - early 15th century.

Fig. 38. A part of a patten sole with a one-piece strap attached with iron nails (TMM 21816:NE504461); the outer (grain) side. Late 14th century - turn of the 15th century.

(1986–1988) although unrecognized until the recent survey of this material.[237] One patten footstrap described by Sanna Jokela comes from the Aboa Vetus Museum.[238]
The only wooden patten soles so far and the largest number of footstraps were found in the Åbo Akademi main building site excavations. These were earlier only briefly noted and described and the emphasis was on the dating and decoration of these artefacts.[239] The most recent finds of pattens are the two straps and two toe caps from the Cathedral Square excavations in 2005.

1.10.2 The number and types of pattens

There are only four wooden patten soles in Turku. The number is small but on the other hand, there are a large number of footstraps and toe caps. The minimum number of pattens discarded can be estimated by summing up the parts which cannot come from the same patten. These are parts which occur only once in each patten. In the Åbo Akademi main building site material, the highest minimum number is gained when adding the straps of the lateral side of the left foot (14) and the straps of the lateral side of the right foot (11) plus one one-piece strap and one strap formed of two narrow straps.[240] These all represent individual pattens so the minimum number would be 27 pattens. To these one can quite safely add the five footstraps from other excavation sites which were found far from each other and most probably represent individual pattens. Summing up the ÅA-site finds and the finds from other sites, the minimum number of pattens discarded would be 32.

1.10.2.1 Wooden soles

The first of the wooden patten soles to be described is a partly charred and broken stilt (Fig. 35). It seems to have broken from the heel section of the patten. The wood material is *Salix* sp.[241] The 100 mm long part of the sole preserved, slightly narrows towards the heel seat. The height of the stilt is 40–50 mm, which is possibly quite close to the original measurement although there seems to be some abrasion. The shape of the stilt is rectangular with rounded corners. No tapering or widening towards the ground can be noted.
The second patten is a 175 mm long sole with two stilts (Fig. 36).[242] The toe-part has been broken and is missing. The wood material is *Alnus* sp.[243] This patten has a charred surface, too. The width of both the stilts is ca. 45 mm, while the height of the stilt under the front of the foot is 40 mm and the stilt under the heel only 30 mm. The profile under the front of the foot is slightly downward sloping. This has given an improved grip unlike the completely flat sole. The sole is quite narrow (max. 40–50 mm) and follows roughly the outline of the left foot shoe sole with a narrow waist. On the medial side of the patten, there is a 28 mm long nail shaft of a 2 mm diameter through the wood; one of the iron nails which attached the leather strap to the wooden sole.
The third patten was made of *Salix* sp.[244] It is a wooden right foot sole with two stilts, the foremost worn almost flat, and a toe-part (Fig. 37).[245] The length is 225 mm and it has a quite broad and rounded middle part with no waist with a maximum width of ca. 90 mm. The profile is quite heavily downward sloping under the arch of the foot and then rises on

Fig. 39. Patten straps from the ÅA-site. Top, from left to right: TMM 21816:NE509330, NE13498, NE128124. Middle: NE17434, NE50042, NE15925. Bottom: NE06618, NE10439, NE07829. Late 13th century - early 16th century.

the toe-part. The stilt under the heel has a round back part. There is a vertical iron nail through the stilt, its purpose is unclear. In some places on the sole, on top of the front and on the medial side of the sole, there seem to be remnants of iron, possibly remains of fittings or reinforcement strips.

The fourth wooden patten sole is only a small part of a ca. 15 mm thick, flat piece of wood of *Salix* sp,[246] attached by three iron nails to a one-piece patten strap (Fig. 38).[247] The one-piece strap hints at the possibility that the wooden sole was of a different type from the previous ones presented. The flat shape of the patten sole could be original, i.e. the patten was furnished with a thin and completely flat sole or with only very low stilts.

Of the wood species chosen for the patten soles, there were three examples made of *Salix* sp. and one of *Alnus* sp. According to Tuuli Timonen, possible domestic *Salix* species could have been, for example, *Salix pentandra*, *Salix 'Sibirica'* or, perhaps most

Fig. 40. A two-piece patten strap found with medial and lateral strap halves connected together (TMM 18264:4494). Latter half of the 15th century - early 16th century.

Fig. 41. A strap half bifurcated at the base (TMM 21816: NE17269). Late 14th century - early 15th century.

likely, *Salix caprea*. Of the *Alnus* species, both *Alnus incana* and *Alnus glutinosa* are possible.[248] Both *Alnus* sp. and *Salix* sp. have been well suited materials for pattens. These wood species are soft and light materials and easy to work with. In addition, they are very resilient to splitting after getting wet and drying. *Alnus*, in fact, has been the favourite in clog making in England up to the present day.[249]

1.10.2.2 Footstraps

Patten footstraps have been common finds especially in the recent excavations in Turku (Fig. 39). The dominating material of patten straps is calf or cattle leather. It has been noted in all straps where definition has been possible. Thickness of leather varies between two and six mm; the average is 3–4 mm.

The most frequent type is a two-part strap. Except for a single find (Fig. 40), all two-part straps in Turku have been found with medial and lateral halves separated.

It has been possible, however, to try to find parts belonging together from halves found loose, i.e. 'pairs'.[250] As a result, three possible pairs of strap halves were found plus two strap halves from a pair of pattens.[251]

At the ÅA-site material, there is one strap made of a single piece of leather. It has been preserved as a whole with part of the wooden sole attached (Fig. 38).[252]

Of the third strap type, there is only one example. It is a strap half cut from a single piece of leather in a way that it is bifurcated at the base (Fig. 41).[253]

Straps were attached to the sides of wooden soles with nails through the lower edge of the strap. The usual number of nails in pattens in Turku is three (one in the middle and two on the sides), but there are some straps with four or even five nails.[254] The actual nails rarely remain in straps (Fig. 38),[255] but the nail holes are usually present. Exceptions are those straps which have been cut off the sole (Fig. 42). Cutting seems to have been quite frequent and tearing even more frequent. The obvious reason for this must have been the removing of straps before discarding the sole.

It was noted that the number of wooden patten soles is small compared to a large number of straps. This is probably because the soles have ended up as firewood. In fact, two of the three soles are partly charred. It was natural to remove the straps either by cutting or by tearing before discarding the sole as firewood to avoid the stench of burning leather.[256]

Decoration of straps seems to have been frequent. Some kinds of decoration occur in over 60 per cent of straps. Techniques used have been engraving, scratching or scraping, stabbing and excision (see chapter 4.2.3.3 of Part I).

Very common is the occurrence of rows of stitch holes along the edges of the strap. The purpose of these could be decorative or functional. In one case, a two-fold edge-band with a patten strap has been preserved.[257]

When it comes to the fastening method, some straps were adjustable. On the tab-end of the medial strap, there can be several holes for different fittings of the strap. Of the nails, which have secured the fastening, there is only one example.[258]

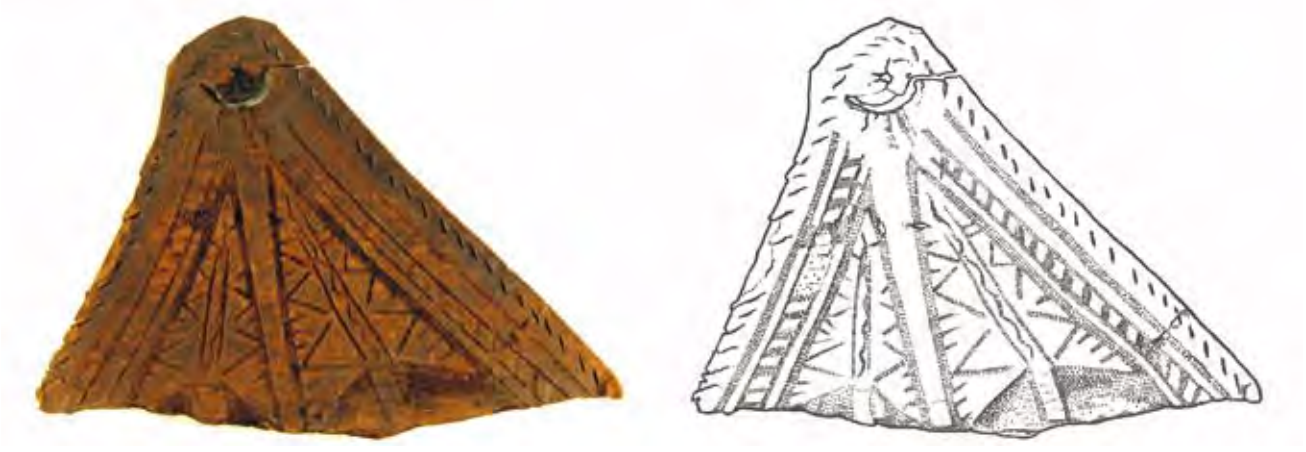


Fig. 42. A lateral strap half of the left foot with the base cut off (TMM 21816:NE12823). Late 14th century - early 15th century.

Fig. 43a. Four patten toe caps which form pairs. Top, pair one: left, TMM 21816:NE1276, right, NE12718. Bottom, pair two: left, TMM 21816:NE20222, right, NE204279. Measures ca. 60 x 40 mm. Late 15th century - early 16th century and late 14th century - early 15th century.

Fig. 43b. A complete 15th century wooden patten from Lübeck with the strap halves, fastening pin and toe cap preserved.[260]

1.10.2.3 Toe caps

The purpose of a toe cap is to give grip on the front part of the foot. There are nine patten toe caps from Turku; they all come from the ÅA-site. Toe caps were made of one piece of leather. They all have the same basic cutting pattern. Toe caps were attached to wooden soles with nails just like the patten straps. It is usual, however, that in toe caps just one nail in both sides of the sole was sufficient. The material of toe caps is calf/cattle leather in all the cases in which definition has been possible. Five of the nine toe caps (55.5 per cent) were decorated either with carving or with excised edged (see chapter 4.2.3.3). In two cases, it has been possible to find toe caps for a probable patten pair from the assemblage (Fig. 43a).[259] Fig. 43b shows an example of a complete patten with a toe cap from Lübeck.

1.10.3 The distribution and dating of pattens

Pattens have been found in four sites in Turku. The material is distributed in the following way (Table 40).
The dating of the finds by their contexts in each site is presented in the following (Tables 41–45).
The patten strap from Vähä-Hämeenkatu 13b excavation can be dated from the latter half of the 15th century to the early 16th century.
The patten strap half from the Uudenmaankatu 6 excavation comes from a layer which can be dated to the very short phase which begins at the turn of the 1430s and 1440s and ends in ca. 1445.[261]
The patten strap half from the Aboa Vetus Museum excavation can be dated to the latter half of the 14th century or the first half of the 15th century by its find context.
In the Åbo Akademi main building site assemblage, pattens are represented as early as the latter half of the 14th century. There are two pattens from layers containing only 14th century material. Most of the 15th century layers with finds of pattens also contain material from the late 14th century. Pattens from these contexts can date to the 15th century but as well to the 14th century. Most of the pattens are from layers containing only 15th century finds. Pattens occur both in layers dated to the first half of the 15th century and layers dated to the latter half of the century. There are several pattens from the layers containing material from the 15th century to the 16th century. However, only one patten strap comes from a layer with only 16th century material.
In the Cathedral Square assemblage, pattens are represented by two strap halves of which the first is dated to the latter half of the 14th century and the other one to the 15th century. In addition there are two toe caps which are dated to the 15th century.

1.10.4 Summary

Wooden pattens were defined as overshoes which are composed of a wooden sole, a leather footstrap over the instep either of one-piece or composed of two parts and sometimes a leather toe cap.
In Turku wooden soles from pattens, straps for fastening pattens to feet and toe caps to give better grip on the toe-part of the foot have been found. The underrepresentation of wooden soles is probably because of the discarding of these as firewood.
Most of the material is composed of patten straps. The straps could be divided to three different types, one-piece straps, two-part straps composed of broad medial and lateral strap-halves (the most common type) and two-part straps in which the halves are bifurcated at the base. The decoration of patten straps with different techniques and with a geometric decoration was common.

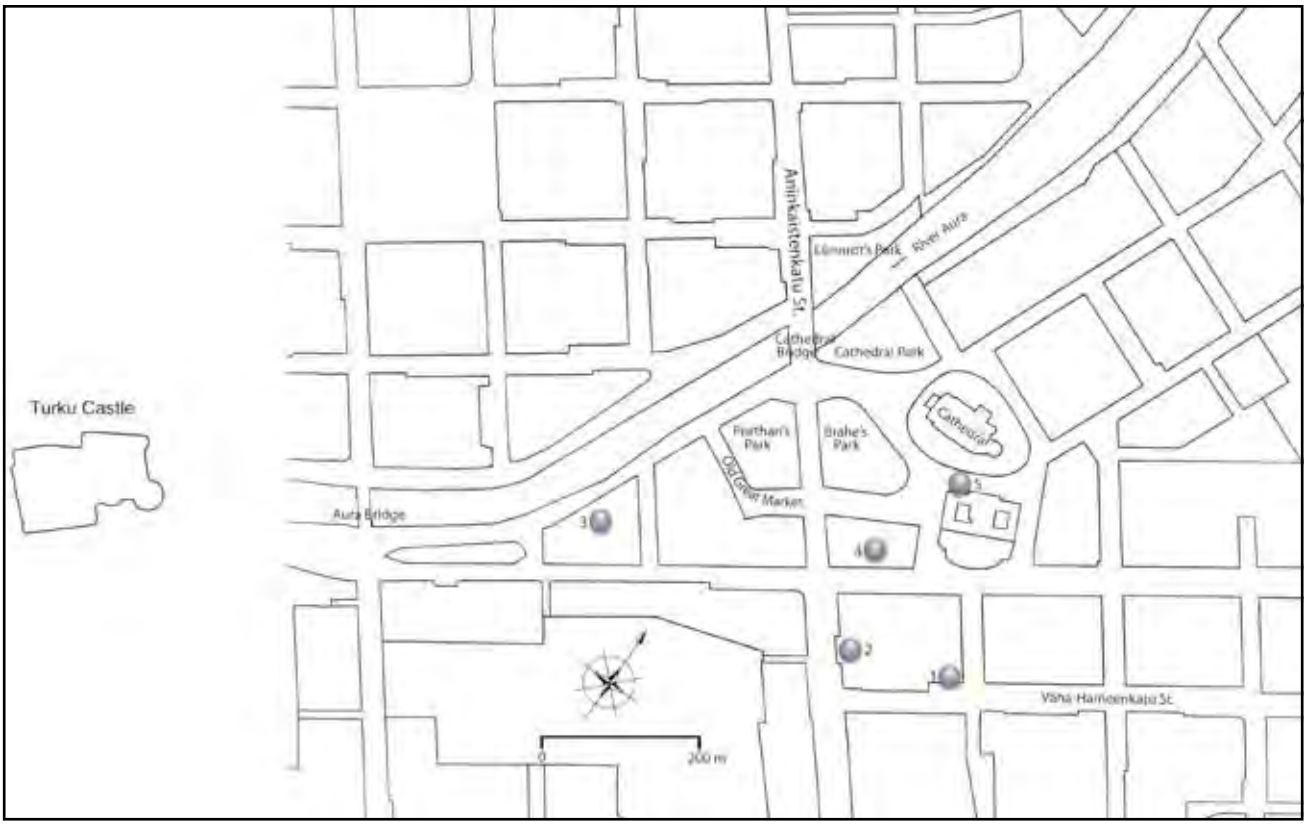


Table 40. The distribution of pattens.

Site	Number of finds	Symbol on the map
Vähä-Hämeenkatu 13b (excavation 1975)	a two-piece patten strap (medial and lateral strap halves connected together with a nail)	1
Uudenmaankatu 6 (excavation 1986)	a half from a two-piece strap	2
Aboa Vetus Museum (excavation 1992–1995)	a half from a two-piece strap	3
ÅÅ-site (excavation 1998)	three wooden soles 52 strap halves and a one-piece strap 9 toe caps	4
Cathedral Square (excavation 2005)	two straps two toe caps	5

All the toe caps represent the same basic triangular cutting pattern. Decoration occurs but it is not as common as in patten straps, and the decoration techniques are more unified and motifs are simpler. Within the small assemblage of wooden soles, different types can be noted. The basic type is the one with two stilts. Of this type there are at least two subtypes, one with a narrow sole and rectangular stilts and the other with a broader sole and the rounded stilt under the heel seat. The second type is a patten with a flat sole or with very low stilts. There can be noted some uniformity in wood materials chosen for patten soles. The soles have been made either of *salix* sp. (three soles) or *alnus* sp. (one sole). Both materials were well suited for patten making being water resilient and easy to work.

All the wooden soles and toe caps come from the ÅA-site as do most of the straps. Besides the ÅA-site, straps have been found in three other sites in the town area, Vähä-Hämeenkatu 13b, Uudenmaankatu 6 and Aboa Vetus Museum.

The minimum number of pattens discarded, counted by the patten straps of which each represents one patten, is 32. The earliest pattens come from the ÅA-site and can be dated to the late 14th century. The patten strap from the Aboa Vetus Museum dates to the latter half of the 14th century or to the first half of the 15th century. Most of the ÅA-site pattens come from the 15th century layers. This is true of pattens from other sites, too. The patten strap from Uudenmaankatu 6 is from the first half of the 15th century context and the strap from Vähä-Hämeenkatu 13b from the latter half of the 15th century or the beginning of the 16th century context. Patten straps from Cathedral Square excavations date to the latter half of the 14th century and to the 15th century.

The emphasis of patten datings to the first half of the 15th century in ÅA-site can be due to the fact

Table 41. Dating of pattens from Vähä-Hämeenkatu 13b.

Phase	Number of finds (patten straps)
middle of the 15th century - ca. 1520/1530	1

Table 42. Dating of pattens from Uudenmaankatu 6.

Phase	Number of finds (patten straps)
ca. 1430/1440 - ca. 1445	1

Table 43. Dating of pattens from the Aboa Vetus Museum.

Phase	Number of finds (patten straps)
latter half of the 14th century - first half of the 15th century	1

Table 44. Dating of pattens from the ÅA-site.

Phase	Number of finds (Straps/Strap halves, each representing one patten)	Number of finds (toe caps, wooden soles and strap halves which may belong to same pattens)
latter half of the 14th century	-	2
latter half of the 14th century - first half of the 15th century	15	27
first half of the 15th century	1	2
latter half of the 14th century - 15th century	4	12
latter half of the 14th century - beginning of the 16th century	-	-
15th century	6	13
latter half of the 15th century - beginning of the 16th century	-	3
15th century - beginning of the 16th century	1	2
16th century	-	1

Table 45. Dating of pattens from the Cathedral Square.

Phase	Number of finds (Straps/Strap halves, each representing one patten)	Number of finds (toe caps)
latter half of the 14th century	1	-
15th century	1	2

that the general emphasis of the organic material from ÅA-site is in this period but on the other hand can hint at the possibility that the peak in the popularity in the use of pattens really was the first half of the 15th century. It seems that pattens were still used in the first half of the 16th century to some extent.

The distribution area of pattens is the Mätäjärvi quarter, especially its northern edge (the Åbo Akademi main building site) the Cathedral quarter and the Convent quarter. There are no patten finds from the western side of the River Aura, i.e. from the Aninkainen quarter or from Turku Castle.

1.11 Shoes of the Early Modern Period

1.11.1 Changing fashion - Changing techniques

Two things connected to each other must be noted when discussing the shoes in the transitional period from the Middle Ages to the Early Modern Period. The first is the changing manufacturing technique of shoes and the second is the changing types and styles of shoes.[262] The new manufacturing technique encouraged new styles and the new styles necessitated a new construction technique. The technique and fashion seem to have gone hand in hand in an

interactive process in which one factor had an instant effect on the other.[263]
Most of the 16th century shoe types would have been impossible to make with medieval turnshoe techniques.[264] Thus, the most important innovation was the welted, double-soled shoe. Welted construction was used in leather pattens already in the 15th century by the wealthy, but in shoes the welted construction was used from the 16th century onwards. Shoes with thick, impact-absorbing and less wear-prone soles became a common necessity when roads started to be surfaced. However, in Northern Europe, the double sole was not commonly adopted until around 1550. Until this, single-soled shoes were used in parallel with double-soled shoes.[265]
Besides the manufacturing technique the fashion and shoe styles changed, too. The pointed toe shape was first replaced by the round shape in the late 15th century, and at the beginning of the 16th century, wide toed shoes appeared. These are called wide shoes or cowmouth shoes (Goubitz type 125) (Fin. lehmänturpakengät; Ger. Kuhmaulschuh; Swed. oxmulesko; Engl. cowmouth shoes; French souliers à pied d'ours).[266]
According to Jäfvert, the first cowmouth shoe in Scandinavia is from Linköping and can be dated to ca. 1500. In general, cowmouth shoes have been dated to the first half of the 16th century. The fashion probably originated in the German/Austrian region.[267] According to some sources, the origin was the court of Emperor Maximilian (1459 - 1519) in the middle of the 1490s, from where the fashion spread fast around Europe.[268]
The uppers of shoes from the beginning of the Early Modern Period can be divided into three basic styles, the low-cut style, the closed style with a high-cut vamp and the mule.[269] The sole shape hints at the upper type but because of the many variants of sole shapes, definite conclusions about uppers made on the basis of the separate soles are not possible.

1.11.2 Lists of wages from castles as a source material

In Finland, shoes of the beginning of the Early Modern Period have been discussed by Riitta Pylkkänen in her monographs treating the dress of the period.[270] Important information concerning shoes made with the new welted technique comes from the written sources, especially the lists of shoes, given as wages in castles. Part of the wages of the personnel of the castle was formed of textiles and shoes. Shoes were usually given three of four times a year.[271]
The information from wage shoes in Turku Castle starts in 1538 when 72 pairs of shoes were given. All were single soled. In 1541, shoes named as 'spisse skoor' were given in Turku Castle. Jäfvert has interpreted these as pointed toe shoes,[272] (Swed. spetssko; spets = point, tip, toe, peak) probably the opposite to the wide toed fashion of the period. In the same year, in Raasepori Castle, 32 pairs of 'spiisz skoo' were made by Simon the shoemaker. That these spiisz skoo were single soled shoes, i.e. both the technique and fashion were 'medieval' is clear from the information on Turku Castle, where in 1542 - 1543, terms 'ensolade skor' (Engl. single soled shoes) and spiisseskor were used as parallel terms.
Dubbelskor (Engl. double shoes), meaning double-soled shoes, are mentioned for the first time in 1541, when at Vyborg Castle, 20 pairs of double-soled shoes and 185 pairs of 'spiisseskor' were made for wages. This does not necessarily mean that double-soled shoes were not given before at Vyborg Castle, only that the first written reference is from this year.
At Turku Castle, double-soled shoes are mentioned for the first time as late as 1551. In this case the year 1551 could really be that of the first appearance of double-soled shoes among servants in the castle. After all, the information on wage shoes goes back to the year of 1538 at Turku Castle.
Pylkkänen has noted that single soled shoes were given to most of the lower staff of servants while double-soled shoes were mostly for the trusted servants.[273] Thus, the distinction of single soled shoes and double-soled shoes would have been a question of status.
Single soled shoes were still made and used in the latter half of the 16th century. Still in 1550s, more single soled than double-soled shoes were made and distributed in both castles.
It is possible to follow the development in Turku Castle even further.[274] In 1558 the ratio of single soled and double-soled shoes changed and in 1560 most of the staff were given double-soled shoes. It is uncertain when the manufacture of single soled shoes ended in Turku Castle. From the year 1573 onwards only the whole number of shoes was given without the division into different types of shoes. This can suggest the possibility that double-soled shoes were now the only type. Support comes from the Stockholm shoemakers' price list of the year 1574, where only double-soled shoes are mentioned.[275]
Recently, Ilana Rimón has analysed information on wage shoes based on the accounts from the Royal Manor of Porvoo during the years 1542 - 1553. The accounts start in 1542 and can be considered representative till 1553. Later information is not comparable to the information on this period chosen for the analysis.[276] The analysis offers an interesting comparison to the information from two castles. Also in Porvoo, a division into single soled and double-soled shoes was made. Double-soled shoes already appear in the first accounts in 1542 when they formed only 20 per cent of the shoe material, the rest were single soled. During the whole period 1542 - 1553 of the shoes given single soled shoes formed the majority. An exception is the year 1544 when the same number of single and double-soled shoes were given.

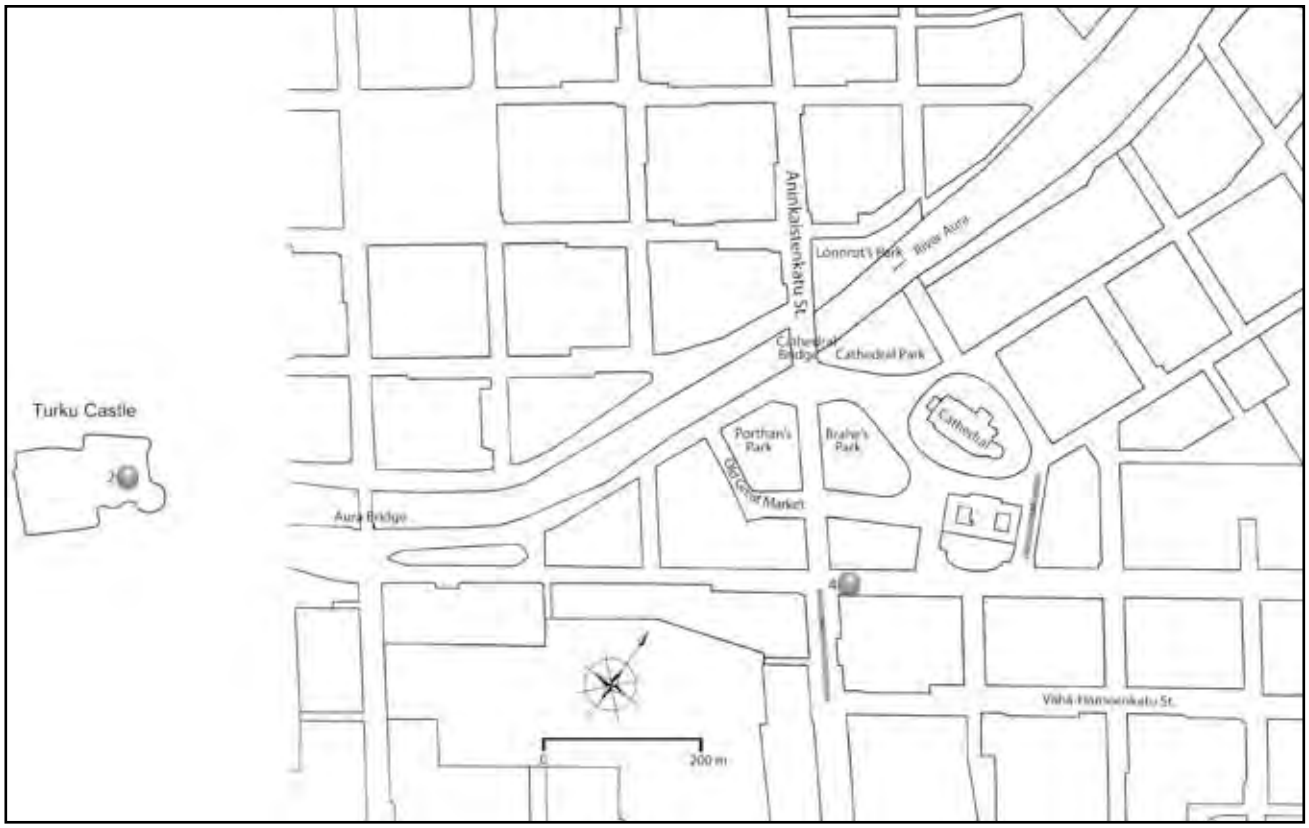


Table 46. The distribution of Early Modern Period shoes.

Site	Number of finds	Symbol on the map
Uudenmaankatu (survey 1954)	four soles, one with a vamp	1
Turku Castle (survey 1976)	four shoes (upper and sole together) four separate insoles	2
Tuomiokirkkokatu (survey 1977)	four soles	3
Hämeenkatu (survey 1983-1984)	toe part of an upper	4

According to Rimón the bases for the distribution of shoes were the demands of the job and the personal needs of a person. Status did not seem to have a direct effect on the quality of the shoes given. For example, double-soled shoes were given to servants of lower status, too. In general, the yearly number and quality of shoes given seems to vary despite the person in question.[277]

As a conclusion, according to the written sources, double-soled shoes are for the first time mentioned as wage shoes in the 1540s (Vyborg and Porvoo). In Turku Castle, they appear as late as 1551. In the first half of the 16th century, the majority of shoes given to the staff were still single soled in Turku Castle, Vyborg Castle and the Royal Manor of Porvoo.

The change to double-soled shoes really only began from the late 1550s onwards. Even if these shoes were the wage shoes of castle servants, the change to double-soled shoes seems quite late. One reason could be that single soled shoes, flexible and watertight, were still very practical in many working conditions. The distinction of medieval type shoes with single soles and modern period type shoes with double soles was also a question of status and wealth. The hierarchy of the castle people was shown in dress which included shoes. A general conclusion is that double-soled shoes appeared among servants later than among the ruling group in the castle. After all, there are archaeological finds of welted, double-soled cowmouth shoes from Turku Castle which can be typologically dated to the first two decades of the 16th century.

Distinctions among the servants are more difficult to make. Even if according to Pylkkänen, there are differences in the quality of shoes given to the personnel according to the status in Turku Castle, Rimón has showed that at least in Porvoo, the variation in the amount and quality of shoes distributed changed from year to year on the basis of individual need, not always connected to status.

1.11.3 Archaeological finds of Early Modern Period shoes in Turku

In archaeology, there have been difficulties in charting the transition from turnshoes to welted shoes. Most often this is caused by the paucity of closely-dated materials responding to fashions changing fast at the turn of the Middle Ages and the Modern Period. This problem has been stressed by Geoff Egan in discussing London shoes, but according to him, the problem is

Fig. 44. A vamp part and a square-toed sole from Uudenmaankatu (TMM 14885:180a-c). Without a dated context.

geographically wider. Besides the lack of closely-dated contexts, there is the problem that different styles were probably worn contemporaneously. Therefore, in London, for example, no close dating for the transition from pointed-toe 'medieval' shoes to the broader-toed 'early Tudor' style has been established so far.[278]

In Turku, in the town area and in the castle, there have been found shoe components which can be typologically defined as deriving from Early Modern Period shoe styles. Unfortunately, Turku is no exception in the sense that close datings for the find contexts are lacking. In fact, no shoe components of the beginning of the Early Modern Period have been found in archaeological excavations. Instead, all come from different surveys.

The research history of Early Modern Period shoes in Turku is very brief. The first finds of possible early 16th century shoes were made from Uudenmaankatu sewer construction running between Hämeenkatu and Vähä-Hämeenkatu (survey 1954). In her monograph, Riitta Pylkkänen mentions some of these finds among the general discussion of shoes of the Early Modern Period. There is an illustration of one of the finds with a dating to the first half of the 16th century,[279] probably given on typological grounds.[280] Later, June Swann mentioned this same shoe, and described it as 'part of a c1520s slip-on shoe, with a square toe and throat and low sides'.[281]

The next Early Modern Period shoes come from the 1977 survey in Tuomiokirkkokatu. The most recent find from the town area is from the well in the 1984 survey in Hämeenkatu. The finds from Turku Castle come from the 1976 survey during the strengthening of the foundation on the castle in the North East tower and north and east wings at the outer bailey. The shoe finds from these last three sites have not been discussed before. The distribution of Early Modern Period shoes has been presented in Table 46.

1.11.3.1 Finds from the town area

The minimum number of Early Modern Period shoes from the town area is nine, counted by the soles. To

Fig. 45. Square-toed soles. Left, TMM 14885:43a-c, right TMM 14885:184; the inner (flesh) sides. Without a dated context.

start with the Uudenmaankatu finds (Survey 1954) the shoe best preserved is the illustrated one in Pylkkänen's monograph, also described by Swann (see above) (Fig. 44).[282] Of the upper, the vamp part has been preserved. The vamp ends just behind the toes, the throat is slightly rounded. The vamp wing is low, only ca. 20 mm. The quarter part of the upper is missing and no kind of fastening system is left. Whether this was a slip-on shoe without fastening, as Swann interprets it, or it has lost its fastening device is uncertain. A front part of the square-toed sole has been preserved. It is an insole with the grain side of leather facing the foot.[283] According to the stitch holes it had originally been stitched to the upper with edge/flesh stitches using the shoemaker's stitching (the present stitching using the original stitch holes was done during the conservation or 'restoration').

Another shoe part from the same survey is a square-toed toe puff of the upper.[284] By its form it could well come from the previous shoe. The puff had the flesh side of leather facing the inside of the upper, which is now missing. Between the puff and the upper, there had been a layer of birch bark, now decayed. According to the find report, it was attached to the puff by some 'light coloured substance'. The use of birch bark as an insulation in modern period shoes has been noted, for example, by Swann. [285]

Of the other shoes from Uudenmaankatu, the parts best preserved are soles. Of the uppers, only small pieces remain. Two soles are square toed and thus relate to the square-toed shoes described above. The first one is a sole with edge/flesh stitches.[286] The small piece of upper with a lasting margin preserved reveals that this shoe was a turnshoe. The second one is a toe part of a square-toed sole with flesh/grain stitches and a small piece of upper preserved. It is uncertain whether this is a turnshoe (Fig. 45).[287]

Fig. 46. A fragment of upper and a slightly rounded sole with a pair of stitch rows for a stitch-down construction (TMM 14885:138b-c). Without a dated context.

The shape of the third sole from Uudenmaankatu is more blunt or slightly rounded than square.[288] A small piece of the upper remains (Fig. 46). The sole/upper construction in this case is not a turnshoe but not a welted construction either. Instead, the bottom edge of the upper was folded outwards and stitched directly to the insole using two rows of stitches, a so-called 'stitch-down' construction, which according to Goubitz, started in the 16th century.[289]

There is a debate over the first appearance of the low-cut square-toed shoe.[290] In general, they seem to get a slightly later dating, ca. 1520 - 1540, than the wide, round-toed 'cowmouth' shoes, dated ca. 1500 - 1520.[291] The sole shapes in the first half of the 16th century, however, show many variations and so far, there is no consistent chronological typology for the

Fig. 47. A square-toed sole from Tuomiokirkkokatu (TMM 18338:57a). Without a dated context.

sole forms. Especially the intermediate forms are hard to fit to the rough square toed - wide, round toed dichotomy.

In the Tuomiokirkkokatu survey, of the possible Early Modern Period shoes, mainly soles have been preserved. One of the soles, an insole, represents the square-toed type, described above in the Uudenmaankatu finds.[292] The difference is that there is no shaping for right/left, and the middle part of the sole has no waist. A part of the upper with a bottom edge preserved tells us that this has been a welted construction (Fig. 47).

Two other soles, with both insoles and treadsoles preserved, have square/blunt toes, but these have a right/left shaping (Fig. 48).[293] It is possible that these were of styles that came into fashion in the 1540s and continued through the latter half of the 16th century after the cowmouth and square-toed shapes had gone out of fashion.[294]

Two soles have such a similar size and shape that they could come from the same pair. Although they were found ca. 30 meters from each other,

Fig. 48. Two soles with square/blunt toes and with a left/right shaping. Top: TMM 18338:273. Bottom: TMM 18338:278a. Without a dated context.

Fig. 49. Two soles of a wide, rounded-toe shape. Left, TMM 18338:265, right, TMM 18338:270a. Without a dated context.

the find layer is possibly the same. These soles represent wide, rounded-toed cowmouth shoes.[295] The soles have no shaping for right/left, and the middle parts have no waist. The diameter in heel, middle and toe sections is 60 mm, 85 mm and 95 mm, i.e. the sole widens evenly towards the toe. Both soles are tread soles, stitched with edge/flesh shoemaker's stitch and with the grain side of leather against the ground (Fig. 49). The find context of these soles gets no dating support from other artefact groups, so only a broad typological dating can be given. Above, it was noted, that the wide toed cowmouth shoes are usually dated to the first half of the 16th century, and especially to the 1500 - 1520s period.

In the 1984 survey in Hämeenkatu, a toe part of an upper to this kind of shoe was found in a well (Fig. 50).[296]

It was made of two layers of leather with flesh sides against each other. One can see from the profile of the vamp, that the lasting margin has not been turned; instead, it is clearly from a welted

Fig. 50. A 14 cm wide toe-part of a vamp from a well in Hämeenkatu (TMM 18884:18). Without a dated context.

construction. Only the toe part of the vamp has been preserved, possible vamp wings are missing. The vamp has barely reached behind the toes. The diameter from the tip of the toe to the vamp throat is only ca. 40 mm. The width of the vamp, however, is considerable, ca. 140–145 mm. As a curiosity, it is interesting to notice that during the reign of Henry VIII, in England, an order was issued limiting the width of shoe toes to six inches (ca. 15 cm).[297] The width of the vamp from Hämeenkatu does not exceed the limit but comes very close. Another interesting point is that at the beginning of the Early Modern Period it was the shoe width that was limited while in the preceding fashion of the late Middle Ages, the toe lengths were limited instead.[298]

As a conclusion, there are both square-toed and wide, rounded-toed soles from the town area. Soles with a blunt toe but with a left/right shaping occur, too. These were defined as possible styles of the latter half of the 16th century. All the uppers preserved represent low-cut styles. The shapes of the uppers range from slender square-toed types to wide cowmouth styles. Possible fastenings of shoes have not been preserved. Early Modern Period shoes occur in the Cathedral quarter and in the Mätäjärvi quarter in its northern edge facing the Cathedral quarter.

Fig. 51. A children's size shoe with a blunt toe (KM 81132:1317). Without a dated context.

1.11.3.2 Finds from Turku Castle

Both soles and uppers of Early Modern Period shoes come from the eastern outer bailey of Turku Castle (survey 1976). The minimum number of shoes counted by insoles is four.

Only in two cases, has it been possible to combine the sole and the upper. The first one represents a wide, rounded-toed cowmouth shoe (Fig. 83a). The insole with its back part missing widens evenly from heel to toe. There is a slight right foot shaping in the sole. The diameter of the toe part is 90 mm. The sole has been stitched to the lasting margin of the upper with edge/flesh stitches. The grain side of the insole was facing the foot. The preserved toe part of the vamp has been made of two layers of leather with flesh sides facing each other. The vamp has been decorated with stamped rings edging the throat and longitudinal, radial slashes through the upper layer of leather. The lasting margin has not been turned, so the shoe is a welted construction.

The other shoe has the upper and insole preserved (Fig. 51).

The sole shape is basically the same as in the previous shoe except for the slightly slimmer shape. The other deviating attribute is its size. The 17 cm length makes it a children's shoe. The construction of the upper and sole is welted as in the previous case. The welt itself is missing. The upper, of which only a vamp part has been preserved, is from a front-laced shoe with two pairs of lace holes. The toe shape is blunt. From these two examples we can see that it would be highly unwise to draw conclusions about the upper type merely on the basis of the sole shape.

There are two parts of Early Modern Period uppers without soles in the castle material. The first is the edge of a toe part (Fig. 83b). It only barely covered the tips of the toes so it is possible that some kind of vamp extension of leather or fabric is missing. The lasting margin has not been turned, so the shoe was a welted construction. The piece is composed of two layers of leather like in the shoe in Fig. 83a described above. The decoration by slashing the upper layer of leather has this time produced a different kind of result.

The last of the uppers preserved has a toe part and the other vamp wing left (KM 81132:532b). In this case too, the lasting margin indicates a welted construction. The vamp is cut horizontally behind the toes; the cut is probably original so the vamp covered the toes and part of the instep. The vamp wing is low.

The extra-broad variant of the cowmouth shoe, the so-called 'bear shoe' (Ger. Bärenschuh) with almost a crescent shaped toe,[299] does not occur in the archaeological material of Turku. These shoes, however, can be seen on the wall paintings in Turku Castle, in the chamber of the gatekeeper of the eastern tower. These paintings were done ca. 1530.[300] Of the fashionable couple on the western wall, he wears bear shoes with low vamp wings,

Fig. 52. Extra-broad cowmouth shoes. A wall painting from Turku Castle, ca. 1530.[301]

high back part and with no evidence of fastening (Fig. 52). The armed knight on the northern wall has the same kind of shoes.

In addition to the shoes described above, there are four separate soles, three insoles and one treadsole, which represent different variations of the same basic shape.[302] All have slight or non existent left/right shaping, all widen evenly towards the toe. The distinction can be made on the slender/wide shape, and rounded/blunt toe shape basis, but the division into exact categories is not possible with an assemblage this small.

The conclusion for the Early Modern Period shoe types in the castle is that both closed styles and open, low-cut styles occur. Decoration of the vamps of the low-cut shoes is frequent. Both square-toed and wide, rounded styles occur. The crescent shaped 'bear shoes' are missing from the archaeological material but can be seen in ca. 1530s wall paintings in the castle. Most of the material is composed of separate soles which are of the same basic type, widening towards the toe, i.e. square-toed and cowmouth styles and also intermediate forms.

It is interesting that double-soled shoes given to the personnel of the castle are mentioned very late in the written sources. This does not mean that double-soled shoes were not used before. From archaeological shoe material of the castle, we can see that double soles

Table 47. The distribution of shoes by types (number of shoes) in relation to the total number of shoes in each phase at the Old Great Market Place. The numbers in brackets include fragments.

	One-piece s.	Thong s.	Strap s.	Front-laced s.	sum
Phase 1	-	2	3	-	**5**
Phase 2	1	6 [13]	4 [6]	-	**11 [20]**
Phase 3	-	[1]	2 [3]	1	**3 [5]**
Phase 4	-	-	1	[3]	**1 [4]**
Phase 4/5	-	-	-	3 [4]	**3 [4]**
sum	**1**	**8 [16]**	**10 [13]**	**4 [8]**	**23 [38]**

were common in shoes, which can typologically be dated to the first half of the 16th century, some of these (the widest cowmouth styles) possibly to the very beginning of the century. It must be noted that in this case the archaeological shoe finds seem to represent fashion shoes, probably of the higher class of the castle people. The servants still mostly wore single soled medieval type shoes well into the latter half of the 16th century as the written sources tell us. Here, written sources and archaeological material nicely complement each other. This time, the luxury side is illuminated by the archaeological finds and the artefacts of the common people by written sources whereas usually it is the other way around.[303]

1.11.4 Summary

No shoe components of the beginning of the Early Modern Period have been found in archaeological excavations in Turku. Instead, all parts come from different surveys. Because of this, only typological dating for these shoes is available. The minimum number of shoes is nine from the town area and four from the castle.
In general, uppers of Early Modern Period shoes can be divided into three basic types, the low-cut style, the closed style with high-cut vamps and the mule. Of these, the low-cut shoes and closed shoes occur in the archaeological material in Turku, mules have not been found so far.
Identification of an Early Modern Period shoe can also be made on the basis of soles. There are both square-toed and wide, rounded-toed soles from the town area. Soles with blunt toe but with a left/right shaping occur, too. These were defined as possible fashion of the latter half of the 16th century. All the uppers preserved represent low-cut styles. The shape of the uppers ranges from slender square-toed types to wide cowmouth types. Possible fastenings of shoes have not been preserved. Early Modern Period shoes occur in the Cathedral quarter and in the Mätäjärvi quarter, on its northern edge facing the Cathedral quarter.
In Turku Castle, both closed styles and low-cut styles occur. Decoration of the vamps of the low-cut shoes is frequent. Both square-toed and wide, rounded style occur. The crescent shaped 'bear shoes' are missing from the archaeological material but can be seen in ca. 1530s wall paintings in the castle. Most of the material is composed of separate soles which are of the same basic type, widening towards the toe, i.e. square-toed and cowmouth styles and also forms between these.
Unlike the case of medieval shoes, information on the Early Modern Period shoes is available from written sources. Important information concerning shoes made with a new welted technique comes from the lists of shoes, given as wages in castles.
Double-soled shoes given to the personnel of Turku Castle are mentioned very late for the first time in the written sources (year 1551). Still in 1557, more single soled than double-soled shoes were made in Turku Castle. From the archaeological shoe material of the castle, however, we can see that double soles were common in shoes, which can typologically be dated to the first half of the 16th century, some of these (the widest cowmouth styles) possibly to the very beginning of the century. In this case the archaeological shoes found seem to represent fashion shoes, probably of the higher class of the castle people. The servants still mostly wore single soled medieval type shoes well into the latter half of the 16th century as the written sources tell us.

2. COMPARISON OF DIFFERENT SHOE TYPES BY SITES

The purpose of this chapter is to gain a picture of the appearance, period of use and disappearance of shoe styles at excavated sites with dated contexts and, where possible (the Old Great Market Place and the ÅA-site), to look at the distribution of the different shoe types in relation to the total number of shoes in each phase and from phase to phase.

2.1 The Old Great Market Place

At the Old Great Market Place, shoes have the excavation unit as their context. There are four dated phases which follow each other.[304] Shoes with known contexts can thus be assigned to dated contexts and phases. The distribution of shoes by types in relation to the total number of shoes in each phase at the Old Great Market Place site is shown in Tables 47 (in number of shoes) and 48 (in percentages).

Table 48. The distribution of different shoe types (in percentages) in relation to the total number of determinable shoe types in each phase at the Old Great Market Place site.

percentages (without fragments)

	One-piece s.	Thong s.	Strap s.	Front-laced s.
Phase 1	-	40	60	-
Phase 2	9	55	36	-
Phase 3	-	-	67	33
Phase 4	-	-	100	-
Phase 4/5	-	-	-	100
Total percentage of the shoe type	**4**	**35**	**44**	**17**

percentages (with fragments)

	One-piece s.	Thong s.	Strap s.	Front-laced s.
Phase 1	-	40	60	-
Phase 2	5	65	30	-
Phase 3	-	20	60	20
Phase 4	-	-	25	75
Phase 4/5	-	-	-	100
Total percentage of the shoe type	**3**	**42**	**34**	**21**

Phase 1: the late 13th century
The shoe types occurring in the oldest phase in the Old Great Market Place are the thong shoe and strap shoe, the former with two examples and the latter with three examples.

Phase 2: the first quarter of the 14th century
In this phase, the frequency of shoe finds grows and the number of finds is doubled compared to the previous period. The shoe types are the same as in the previous period except that the only one-piece shoe occurs in this phase. The percentage of thong shoes seems to be slightly higher than of strap shoes, especially when fragments are included.

Phase 3: the second quarter of the 14th century
After the peak in the frequency of shoes in the second phase, there is a clear drop in this phase in the number and frequency of shoes. Shoe types are thong shoes and strap shoes, plus there is one front-laced shoe in this phase. The frequency of strap shoes is half the frequency of strap shoes of the previous period. The frequency of thong shoes drops even more. They are represented only by one fragment in this phase.

Phase 4: the latter half of the 14th century - beginning of the 15th century
In this phase, the number and frequency of shoes is about the same as in the previous phase. Thong shoes do not occur any more and of the strap shoes, there is only one example. The place of these shoe types is taken by the front-laced shoe.

2.2 The Åbo Akademi main building site

At the ÅA-site the division of finds chronologically is more complicated. As in the Old Great Market Place, the shoe finds have the excavation unit as their context. However, at the ÅA-site there are no strict chronologically divided phases of groups of excavation units. Instead, there are a lot of single contexts with different 'durations' sometimes overlapping. There are, for example, contexts, the dating of which is the latter half of the 14th century. Dating of the others can be the latter half of the 14th century - the first half of the 15th century, 15th century, or in its most extreme, the latter half of the 14th century - the first half of the 16th century. These datings are just examples of different cases. In the cases of contexts with a different life span, the number of finds has been divided technically along the period. As an example, finds with a dating to the 15th century have been divided equally to the first and latter half of the century. Finds with a dating from the latter half of the 14th century to the beginning of the 16th century have been divided between phases latter half of the 14th century - the first half of the 15th century and latter half of the 15th century - the beginning of the 16th century.
The distribution of shoes by types in relation to the total number of shoes in each phase at the ÅA-site is shown in Tables 49 (in number of shoes) and 50 (in percentages). It must be noted that the 14th century phase is only a subgroup of Phase 1. In most cases the late 14th century and early 15th century cannot be distinguished from each other, but instead must be treated as a single phase (Phase 1). Therefore, the finds of the 14th century phase have also been included in the Phase 1 finds.

Phase: the latter half of the 14th century
To this phase, there have been included those finds of Phase 1 which come from contexts with a 14th century dating and not continuing to the 15th century. Shoe types certainly occurring in the 14th century phase are the one-piece shoe, thong shoe,

Table 49. The distribution of shoes by types (number of shoes) in relation to the total number of shoes in each phase at the ÅA-site.

	One-piece	Thong	Strap	Tailed-toggle	Side-laced	Front-laced	Buckled	Boots	Pattens	Σ
14th c.	*2*	*1*	*24*	*20*	*6*	*26*	*0*	*3*	*2*	*84*
Phase 1	10.5	1	89.5	144.5	20.5	304.5	32.5	3	21.5	**627.5**
Phase 2	1.5	-	15.5	19.5	2.5	132.5	13.5	-	5.5	**190.5**
Phase 3	1	-	-	-	-	5	1	-	-	**7**
Sum of phases 1, 2 and 3	**13**	**1**	**105**	**164**	**23**	**442**	**47**	**3**	**27**	**825**

Table 50. The distribution of shoes by types (in percentages) in relation to the total number of shoes in each phase at the ÅA-site.

	One-piece	Thong	Strap	Tailed-toggle	Side-laced	Front-laced	Buckled	Boots	Pattens
14th c.	*2.4*	*1.2*	*29*	*24*	*6*	*31*	*-*	*3*	*2.4*
Phase 1	1.7	0.2	14.3	23	3.3	48.5	5.2	0.5	3.4
Phase 2	0.8	-	8.1	10.2	1.3	69.6	7.1	-	2.9
Phase 3	14.3	-	-	-	-	71.4	14.3	-	-
Total percentage of the shoe type	**1.6**	**0.1**	**12.7**	**20**	**2.8**	**53.6**	**5.7**	**0.4**	**3.3**

side-laced shoe, patten, boot, front-laced shoe, tailed-toggle fastened shoe and strap shoe. The occurring of buckled shoes in the 14th century is a question mark because they have not been found from layers with only 14th century material. Thong shoes and boots occur only in this phase, not later. The three most common shoe types are tailed-toggle shoes (24 per cent), strap shoes (29 per cent) and front-laced shoes (31 per cent). In this phase, front-laced shoes are not yet the dominating shoe type.

Phase: the latter half of the 14th century - the first half of the 15th century

Shoe types occurring at the latter half of the 14th century continue to occur in the first half of the 15th century. Exceptions are the thong shoe and boots which do not occur any more in the first half of the 15th century. A new shoe type is the buckled shoe which, at the latest, appears sometime during the first half of the 15th century. During the phase, front-laced shoes start to grow in popularity and the percentage rises to nearly 50 per cent of all shoes of this period. The percentage of strap shoes drops to ca. 14 per cent, while tailed-toggle fastened shoes preserve their popularity of 23 per cent almost the same as in the previous period through the first half of the 15th century.

Phase: the latter half of the 15th century - the first half of the 16th century

Shoe types of the previous phase which continue to occur in the latter half of the 15th century are one-piece shoes, front-laced shoes, tailed-toggle shoes, strap shoes, buckled shoes and pattens. A shoe type not occurring any more or occurring only sporadically is the side-laced shoe.[305] Pattens and buckled shoes preserve their popularity. The front-laced shoe is the most popular shoe type now with a percentage of ca. 70. The greatest decrease is in the percentage of tailed-toggle shoes and the second largest in strap shoes. The only shoe types certainly occurring at the beginning of the 16th century are the front-laced shoe and the patten. The occurring of tailed-toggle shoes, strap shoes and buckled shoes still in the 16th century is uncertain but possible.[306]

Phase: the latter half of the 16th century - the first half of the 17th century

The only medieval shoe type still certainly occurring to some extent in the latter half of the 16th century is the front-laced shoe. Three shoes can date even to the beginning of the 17th century. In addition, there is one possible fragment of a buckled shoe and also a one-piece shoe although the latter is from a partly mixed layer containing older material, too.

2.3 The dating of the shoe types at the other sites in Turku

In Uudenmaankatu 6 material, front-laced shoes dominate from the late 14th century/early 15th century until the beginning of the 16th century. Other shoe types occurring are the tailed-toggle shoes, which date to the late 14th century/first half of the 15th century and one patten, which dates to the first half of the 15th century.

In Vähä-Hämeenkatu 13b, the prevailing shoe type is the front-laced shoe. They date to the latter half of the 15th century - the beginning of the 16th century. In addition, there is one patten, which dates to the same period.

In the Cathedral Square, front-laced shoes dominate the styles, too. Here, the shoes date from the latter half of the 14th century to the 15th century. The patten finds date to the 15th century.

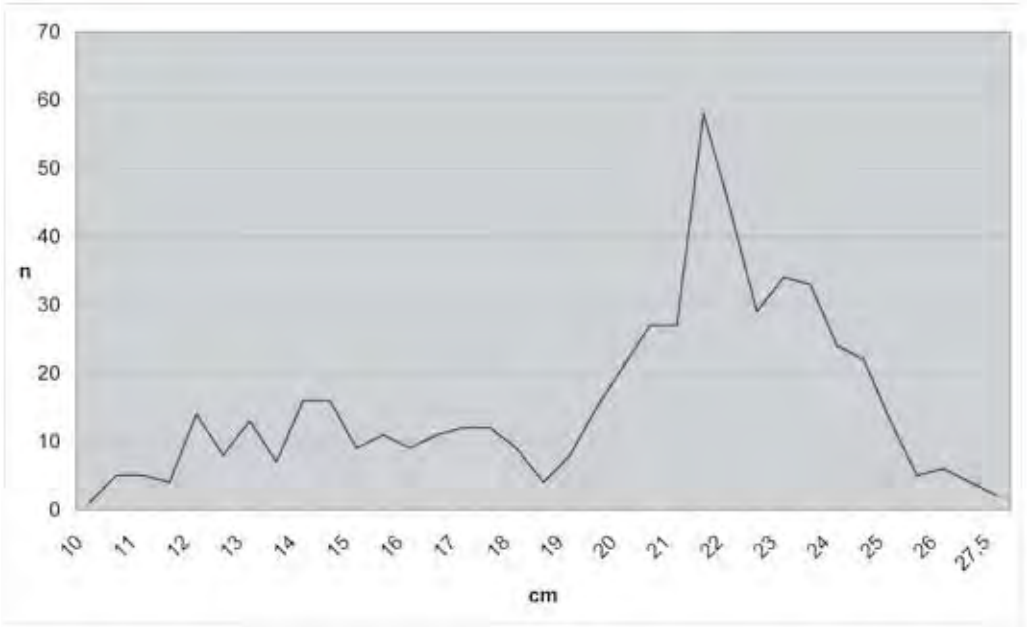


Fig. 53. The measurements of lengths (in centimetres) of shoe soles from the ÅA-site (n = 538).

The shoe types from dated contexts represented in Turku Castle material are the thong shoe, side-laced shoe and the buckled shoe. The shoe types from non-dated contexts are the one-piece shoe, front-laced shoe and the cowmouth shoe. The dated shoes come from the lowermost layers of the eastern outer bailey. According to the dating of the layers, the shoes date to the 14th century, possibly to the first half of the century. This would mean that *buckled shoes and side-laced shoes occur earlier in Turku Castle than in the town area*.

The occurring of one-piece shoe together with cowmouth shoes, the typological dating of which is the beginning of the 16th century suggest the possibility that the use of one-piece shoes has continued to the Modern Period in Turku.

3. SOCIAL INFERENCES ON SHOES

3.1 Shoe sizes

Large footwear assemblages can be used to gain statistical information on the sizes of feet of a certain period. This information can be used to make conclusions of the gender and age of the users of shoes. The shoe size ranges for men, women and children can then be compared to sizes of different shoe types and in some cases even information about the users of particular shoe types can be achieved.[307] When measuring archaeological shoes, certain formation processes affecting the size of shoes, e.g. shrinkage after the recovery of the find, must be taken into account.

3.1.1 Men, women, children - measuring the shoe soles

To gain sufficient statistical information on the foot sizes of the people of medieval Turku, the length of shoe soles has been used as the indicator. To obtain a reliable distribution, the relative sizes of soles matter the most. Absolute lengths are of interest when the intention is to compare the lengths of archaeological soles to the sizes of modern feet.

The material used for the distribution of shoe sizes, is the large sole assemblage from the ÅA-site, altogether 538 measured soles. It can be assumed that the relative sizes of these soles after the recovery from soil have been preserved the same because of the consistent freeze drying conservation method. The distribution of sole lengths is shown in Fig. 53.

The graph has two peaks, the first at 21.5–22 cm and the second at 23–23.5 cm. The peaks correspond to continental shoe sizes 32–33 and 34.5–35.[308] To obtain a better picture of what these sizes represent, it is necessary to compare these sizes to average modern feet sizes. For the analysis of London shoe sizes, Grew & de Neergaard collected historical and archaeological information about the size differences between modern feet and those of different historical populations. The estimation for the medieval sizes was that medieval feet, unaffected by modern dietary developments, were about four English sizes smaller than modern feet.[309] When the lengths of the ÅA-site soles are calibrated by adding them the four sizes to the measures,[310] and the approximate two per cent shrinkage caused by the freeze drying[311] the peaks in lengths would situate in continental shoe sizes 38–39 and 40–41 (English sizes adult 5–5.5 and adult 6.5–7.5). These correspond well to average modern feet sizes of adult women and men. Thus, my interpretation is that the two peaks noted in the lengths of the ÅA-site soles correspond to the most popular sizes of adult women's and men's shoes.

The sole lengths range up to 27.5 cm (continental size 41.5). Calibrated to 'modern' foot size according to the method above, the length would correspond to continental size 47. However, there is a drop in frequencies in lengths after 25 cm, which corresponds to continental size 37.5 (modern foot size 43).

Thus, on the basis of the shoe soles from the ÅA-site, the typical length of men's shoes in Turku would

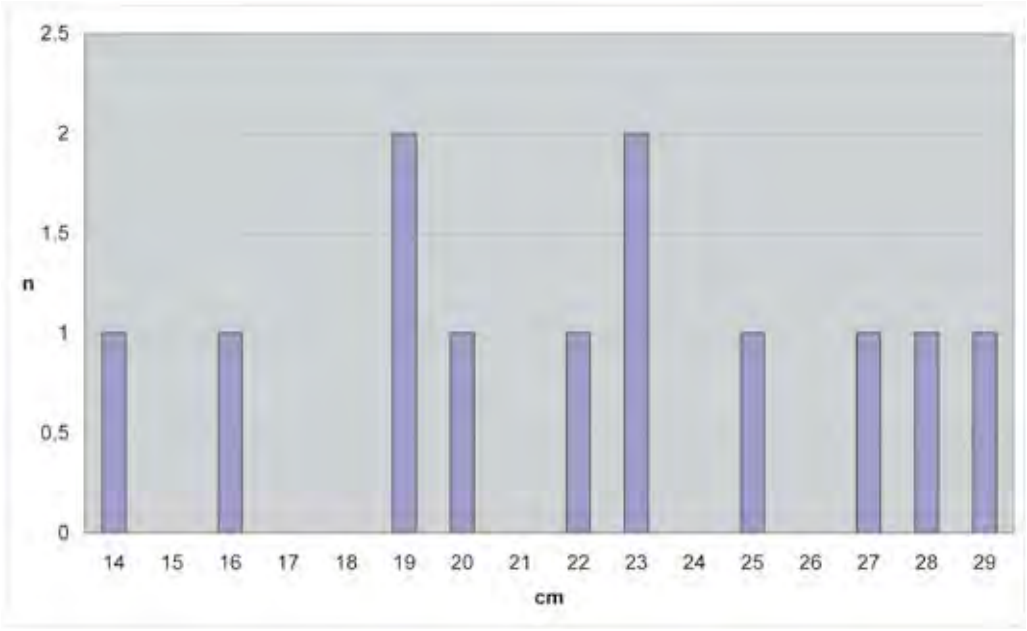


Fig. 54. The lengths of one-piece shoes in centimetres (n=12).

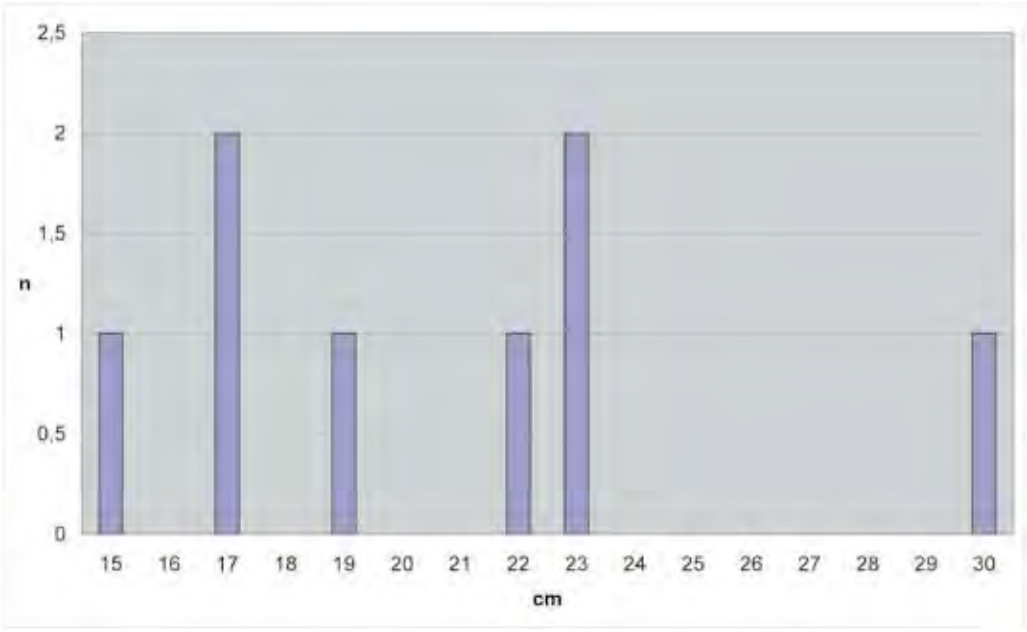


Fig. 55. The lengths of thong shoes in centimetres (n=8).

range from 23 to 25 cm, which corresponds to continental sizes 34.5–35 to 37.5 with some shoes up to size 41.5. Of course, there have been men's shoes smaller than the average and these would overlap with larger women's shoes.[312]

According to the graph, typical female shoes would range to ca. 22.5 cm, continental size 34 (modern size 39.5). It was noted that women's shoes larger than the average overlap with men's shoes. Smaller female sizes, on the other hand, overlap with juvenile shoes. The overlap is seen as a sharp rise in number of soles from 19.5 cm onwards. This is where the smallest women's shoes are probably situated. The borderline between large children's and women's shoes is in any case rather arbitrary because a child is in this respect only a person whose foot is still growing.[313] As a working hypothesis, the size range of women's shoes has here been defined to range from 19.5 cm to 22.5 cm (continental sizes 29 to 34).

The smallest sole sizes are 10–10.5 cm in length (continental size 16) while the first peak in the number of shoes can be seen in length 12 cm, continental size 18. According to Grew & de Neergaard, the size difference of four English sizes between medieval and modern shoe sizes applies to children's sizes, too.[314] Transferred to modern foot size, shoes of sizes 16–18 would correspond to size 20–21.5 shoes. Thus, they would fit a ca. one year old child,[315] which is the age when a child learns to walk. It seems that children in Turku, at least some of them started to wear shoes right from the beginning. All the children's sizes are quite evenly represented until the sharp rise when shoes of children, ca. nine or ten years old, overlap with smaller women's sizes from ca. 19.5 cm upwards.

With defining the size ranges, it is possible to estimate percentages for children's shoes and adult shoes and also for women's shoes and men's shoes. If the border between children's shoes and adult shoes were to be placed in 19 cm (shoes ≤ 19 cm considered as children's shoes) the percentage of children's shoes vs. adult shoes would be 32 per cent for children and 68 per cent for adults. If the size range in adult shoes were defined as 19.5–

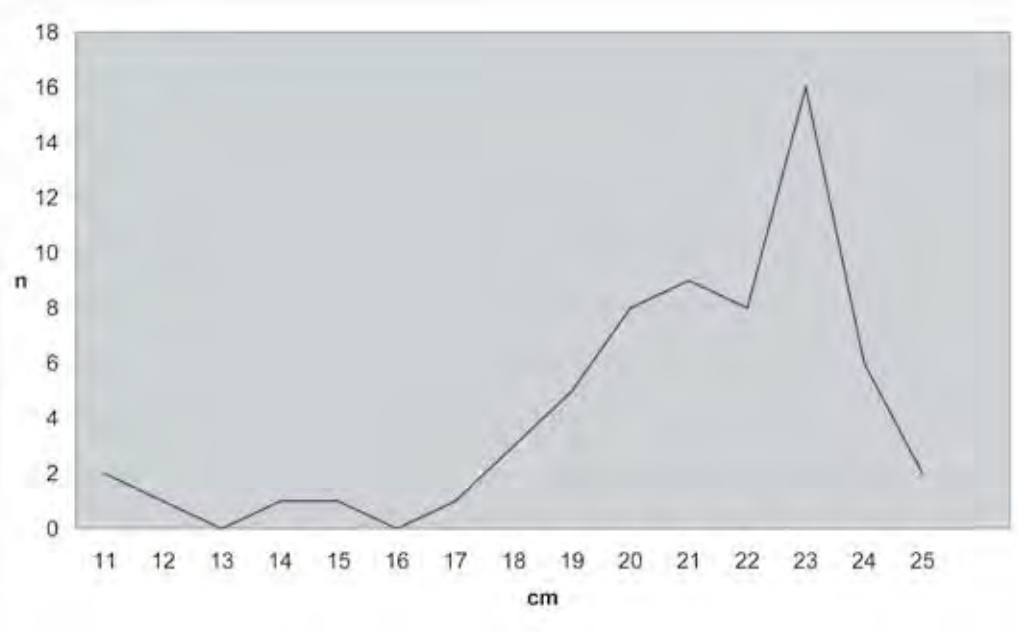


Fig. 56. The lengths of strap shoes in centimetres (n=63).

Fig. 57. The lengths of tailed-toggle shoes in centimetres (n=104).

22.5 cm for women and 23–27.5 cm for men, the percentages for women and men, respectively, would be 41 and 27.

Do the percentages of shoes represent the actual population? In demographical conclusions, one must notice the formation processes which have affected the number of shoes discarded. For example, it is probable that not all children used shoes - at least many children probably did not use shoes during the summer season, shoes could be handed down in family, etc.[316] Thus, the percentage of children would probably be underrepresented if counted by shoes preserved. Because of the probable underrepresentation, the percentage of 32 in children's shoes should be considered as the minimum value in relation to the percentage of children in the population. The percentages of women's and men's shoes are also liable to changes due to the overlapping of men's and women's sizes, which is impossible to define accurately. Also the method of counting the percentages affects the results.[317]

3.1.2 Shoe sizes among different types of shoes

In the following, measurements of samples of different shoe types are compared to the defined general range of sizes for men's, women's and children's shoes. The purpose is to gain information as to whether particular shoe types could be associated with gender or age. Because of the overlapping sizes, results, especially for shoe types with only a few representatives, must be considered as preliminary and tentative but important anyhow, for the finds and data accumulating in the future.

3.1.2.1 One-piece shoes

It has been possible to measure the length of 12 one-piece shoes (Fig. 54).[318]

From the diagram, it can be seen that the sizes of one-piece shoes range quite steadily from children's sizes to women's and men's sizes with no prominent peaks in gender or age. The slight emphasis on

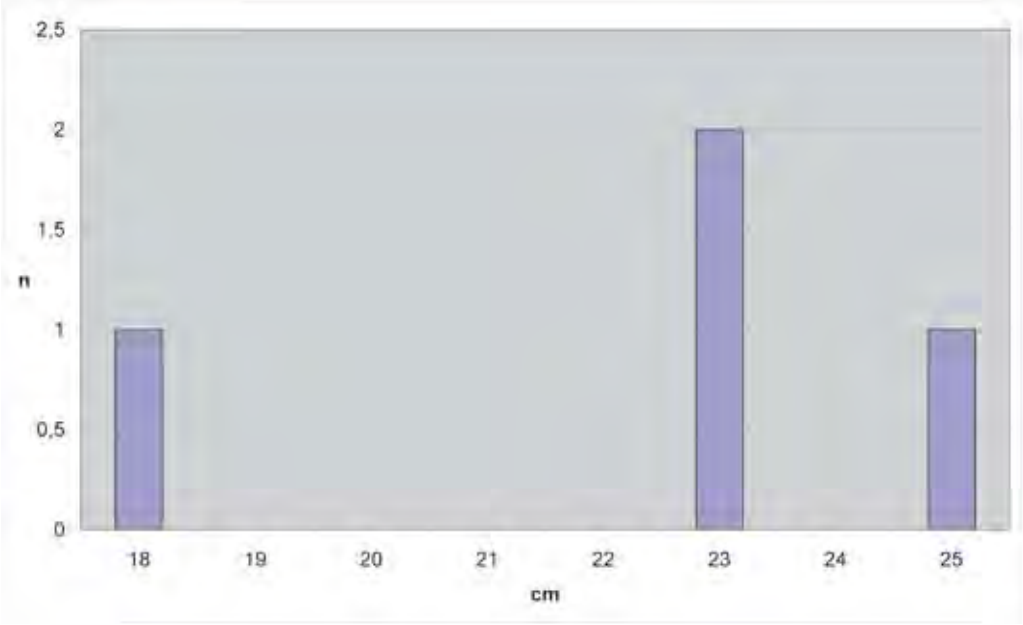


Fig. 58. The lengths of side-laced shoes in centimetres (n=4).

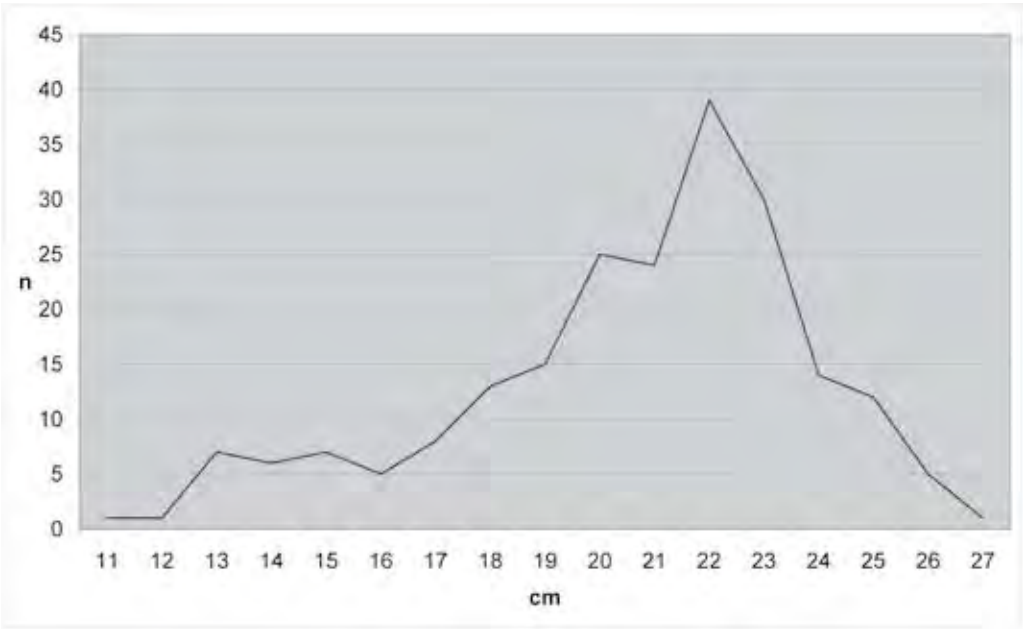


Fig. 59. The lengths of front-laced shoes in centimetres (n=213).

children's sizes and on large men's sizes can be due to the small assemblage. The conclusion is that *one-piece shoes have been used by men and women as well as children.*

3.1.2.2 Thong shoes

The lengths of eight thong shoes have been possible to measure (Fig. 55).
The size range of thong shoes is from children's sizes to juvenile/female and male sizes. One shoe deviates from the rest by its very large size (continental size 45). The conclusion is that *thong shoes have been used by men and women as well as children.*

3.1.2.3 Instep-toggle fastening/instep strap fastening

It has been possible to measure the length of 63 strap shoes (Fig. 56).

The lengths of strap shoes range from 11 cm to 25 cm. Two peaks can be noted. The first is in lengths 20–22 cm and the second in length 23 cm. These correspond to female and male size peaks, noted in the measurements of shoe soles. The percentages for children's, women's and men's sized shoes would be 22 per cent for children, 40 for women and 38 for men, using the size ranges defined in chapter 3.1.1. The rise in the number of children's shoes begins from length 16 cm upwards. Calibration of this length to modern foot size by adding the two per cent shrinkage caused by the freeze drying plus the approximate four English size difference between medieval and modern foot sizes (see chapter 3.1.1) would suggest that of a ca. five-year-old child. This would mean that strap shoes were more popular among juveniles and children from ca. 5 years upwards than among the youngest children.
Strap shoes were worn quite equally by children, women and men. In the group of children's shoes, the emphasis is on juvenile sizes.

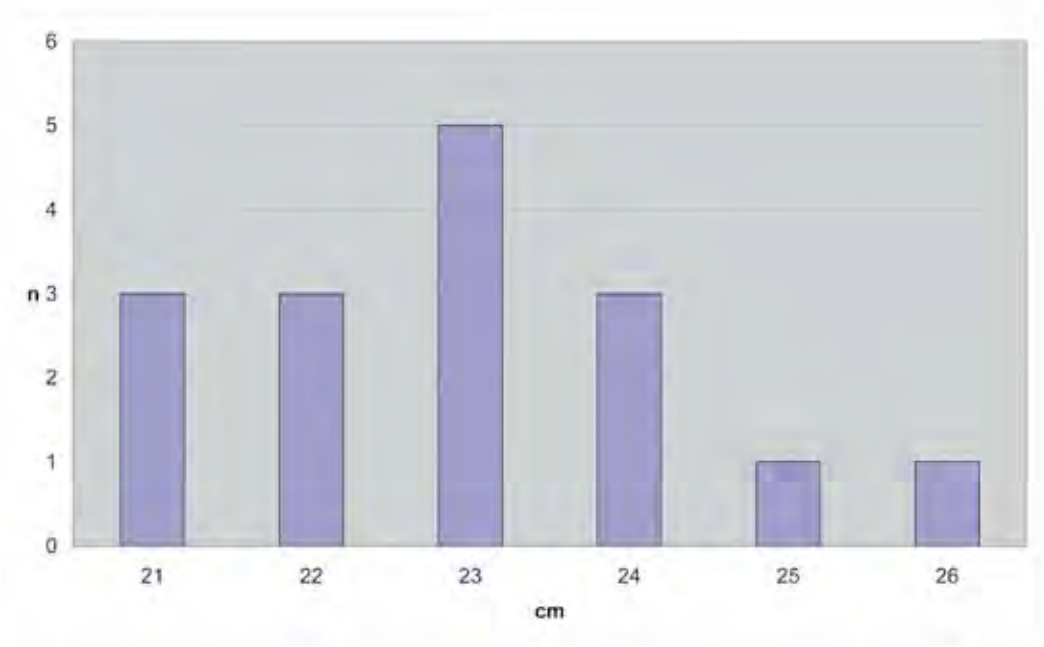


Fig. 60. The lengths of buckled shoes in centimetres (n=16).

3.1.2.4 Tailed-toggle fastening

The lengths of 104 tailed-toggle shoes are presented in Fig. 57.
The lengths of tailed-toggle shoes cover the whole size range from 11 cm to 24 cm. They have been used by children, women and men. However, with the limit of ≥ 19 cm for children's shoes, it can be seen that 67 per cent of tailed-toggle shoes are children's sizes and 33 per cent adult sizes. The peak in children's sizes is in 13–16 cm. Calibration of this range to modern feet size by adding the two per cent shrinkage caused by the freeze drying plus the approximate four English size difference between medieval and modern feet sizes would mean children from up to five years old.
Tailed-toggle fastened shoes have been used by children, women and men. They have been most popular as the footwear of small children.

3.1.2.5 Side-laced shoes

It has been possible to measure the length of only four shoes (Fig. 58).
Three shoes represent male sizes while one shoe represents a juvenile size. Small children's sizes and women's sizes are not represented but that could be due to the small assemblage.
The suggestion is that *side-laced shoes have been used by men and juveniles. Small children's and women's sizes are missing from the present material.*

3.1.2.6 Front-laced shoes

It has been possible to measure the length of 213 front-laced shoes (Fig. 59).[319]
The lengths range from 11 cm to 27 cm with a peak in 22–23 cm, which is the point where men's average sizes meet larger women's/smaller men's sizes. Both women's and men's sizes are well and quite equally represented. All children's sizes from the smallest to juvenile sizes are represented, too. There is a rise from ca. 16 cm upwards, which resembles the curve achieved for the strap shoes. This could mean that, like strap shoes, front-laced shoes were more popular among juveniles and children from ca. 5 years upwards than among the youngest children.
Front-laced shoes were worn quite equally by children, women and men. In the group of children's shoes, the emphasis is on juvenile sizes.

3.1.2.7 Buckled shoes

It has been possible to measure the lengths of 16 buckled shoes (Fig. 60).
The lengths of buckled shoes range from 21 cm to 26 cm, i.e. from female sizes to male sizes. Both groups have an equal representation. Children's sizes or juvenile sizes are lacking, but there is a possibility that this is because of the small assemblage. Another possibility is that buckled shoes were only used by adult men and women. This could be, for example, due to the possibly valuable metal buckles or due to the difficulty young children might find in using buckles.
On the basis of the present material, *buckled shoes can be considered adult female and male shoes. Children's and juveniles' sizes are lacking.*

3.1.2.8 Boots

Because only vamp parts of boots have preserved, it has not been possible to measure the lengths of boots. However, on the basis of the sizes of vamp parts, they all come from adult sized boots. In the present small assemblage of four boots, *only adult sized boots are represented.*

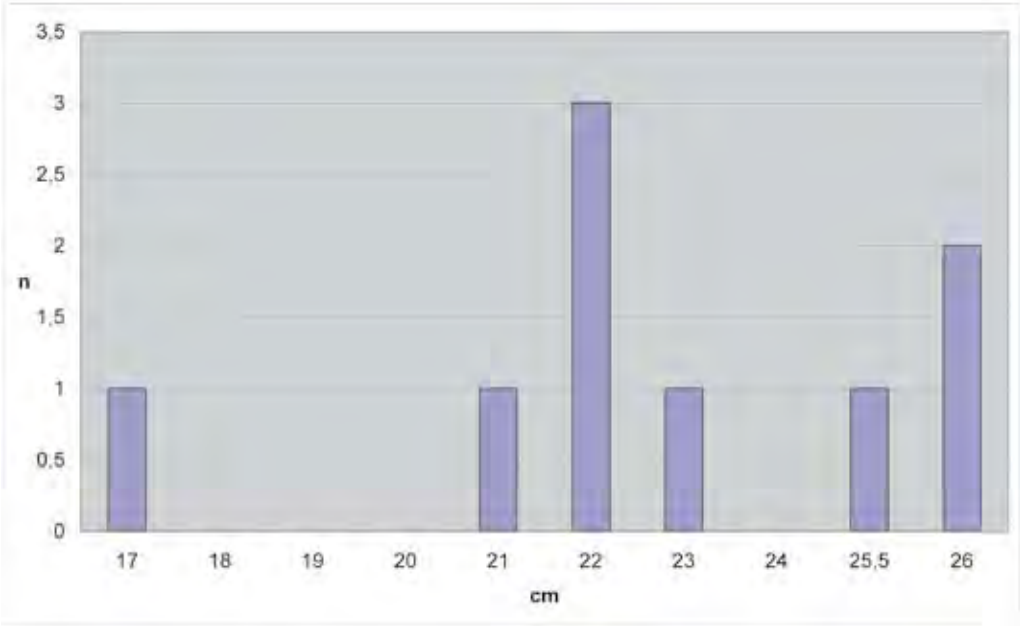


Fig. 61. The lengths of Early Modern Period shoes in centimetres (n=9).

3.1.2.9 Pattens

It has been possible to measure the length of one wooden patten sole and estimate quite reliably the original length of one wooden sole which has a toe part broken. The lengths are 22.5 cm and 23 cm. The first one represents a male size and the second a large woman or a small male size. Children's sizes are not represented in the very small assemblage of wooden pattens preserved. On the other hand, there are a number of patten toe caps and it is possible that these were common especially in children's pattens.[320]
Although only adult sized pattens are represented in the present material, the small assemblage of measurable wooden pattens and the possibility that patten toe caps, present in the assemblage, have belonged to children's pattens, suggest the possibility that pattens were also used by children.

3.1.2.10 Early Modern Period shoes

It has been possible to measure the length of nine shoes (Fig. 61).
Four shoes represent male sizes and one shoe represents a female size. One shoe represents a juvenile size. Small children's sizes are not represented but that could be due to the small assemblage.
The conclusion is that *Early Modern Period shoes have been used by men, women and juveniles. Small children's sizes are lacking from the present material.*

3.2 Children's shoes

The first suggestion to be made on the basis of the ÅA-site material (see Fig. 53) is that children did wear shoes. Depending on the method of counting, the percentage of children's shoes of all shoes is between ca. 15 and 32 per cent. This percentage could, maybe, be regarded as low considering the assumed high percentage of children in the medieval population.[321] Low percentages of children's shoes have been noted in some other medieval sites in Europe, too. Different causes for the discrepancy between the low number of shoes and the assumed high percentage of children in populations have been suggested. It could be, for example, due to the special nature of the site from which the shoe assemblage was collected.[322] It has also been suggested that it was common for children to go barefoot during the summer season,[323] and that the use of footed hose instead of shoes was common among children.[324]
All these factors decrease the number of children's shoes found from archaeological sites. Therefore the low percentages of children's shoes could be regarded as minimum numbers in proportion to the children in the population. The method of defining children's shoes varies, too. When definition is based on size ranges, the definition of children's sizes is the key factor.
On the basis of the smallest shoes in the assemblage, it was found out that they would have fitted ca. one year old children. This corresponds to the age when a child starts to learn to walk. In the assemblage of measured shoe soles forming the general curve of shoe sizes, all the sizes from the smallest toddler's shoes to adolescent sizes are represented quite evenly until the sharp rise when children, ca. nine or ten years old, overlap with smaller women's sizes. However, differences in the frequency of particular shoe types can be found inside the group of children's size shoes.
There are no shoe types in the Turku material, which would be represented only in children's sizes, i.e. are exclusively children's shoe types. The shoe types which occur both in adult and children's sizes are the one-piece shoe, thong shoe, strap shoe, tailed-toggle fastened shoe and front-laced shoe.
In the assemblage of one-piece shoes, the whole range of children's sizes seems to be represented.

Inevitably, no peaks can be noted in an assemblage this small. The closest published parallel for the children's sized one-piece shoes is from Tallinn.[325] The same size range applies to thong shoes. Thong shoes, being once the dominating shoe-type in all Europe, have been found in children's sizes, too.

The larger number of strap shoes, tailed-toggle shoes and front-laced shoes offers better scope to consider the distribution within the children's size range. That the tailed-toggle shoe is common in children's sizes has been noted by many scholars.[326] This is also the case in Turku. Furthermore, on the basis of the present material, they seem to be *most common among young children, from one to ca. six years old*.

Strap shoes and front-laced shoes have been used by children, too.[327] In Turku, they have been used by children of all ages. However, unlike tailed-toggle shoes, these seem to have been most common as the *footwear of older children, from ca. six years upwards*.

The difference in the use of these shoe types occurs around the age, which, in our times, would correspond to the pre-school/school starting age. The age had significance in agrarian Finland, too, where the childhood lasted until the child was seven years old. After this landmark, the child had responsibilities and had to take part in working. Seven years has also been the age of confirmation in the Catholic Church. Only after this age did a child have enough reason to understand the spiritual wisdom.[328] The traditional border between childhood and youth was expressed in dress, too. In the Middle Ages, children gradually assumed full adult costume and boys traded their skirts for breeches at six or seven.[329]

Shoe types not occurring in children's sizes in Turku are the buckled shoe and the boot. It seems probable that the buckled shoe was mainly an adult shoe in Turku.[330] The number of boots in Turku is too low for any definite conclusions, but the evidence from other sites in Europe does not show any evidence for the children's use of boots. Thus, they could probably be considered as adult footwear.

The smallest side-laced shoe in Turku is of a youth's size, smaller children's sizes are lacking. Side-laced shoes of children's sizes were lacking, for example, in Helgeandsholmen, too. In London, where side-laced shoes are much more common in general, they were seldom used by young children.[331] This suggests the probability that side-laced shoes were mainly adult shoes in Turku, too.

The lack of pattens (wooden parts, foot-straps) in children's sizes suggests the rareness of this footwear type as children's shoes. However, there is evidence for older children's use of pattens from London.[332] The possibility that toe caps may have belonged to children's pattens may suggest that some children have used pattens in Turku. The correlation of toe caps and children's pattens needs more evidence to support this, however.

What about the shoe types of the Early Modern Period? It is known that children wore, for example, cowmouth shoes, but even if there are exceptions, these were usually moderately shaped.[333]

Are there any other attributes in children's shoes besides size which distinguishes them from adult shoes? It has been noted by many scholars that high shoes are more common in children's sizes. The usual explanation for high shoes is that they were winter shoes,[334] which fits the idea that children went barefoot in the summer season. Thus, winter shoes would be more common as children's shoes and would be better represented in archaeological materials, too. An alternative explanation for high children's shoes is that they would give better support for a child's developing ankles.[335]

In the Turku material, most of the children's shoes are ankle shoes. So are most of the adult shoes, too, so there is not much difference here. High shoes, reaching to mid-calf are represented in adult sizes by a few examples, but they are most common in small children's sizes. In children's sizes the reasons for the high leg part are probably winter use *and* the support for the ankle. In the Middle Ages, it was common to bind babies in swaddling to ensure that their limbs grew straight.[336] Could it be that this notion was applied also to footwear of the smallest children in the form of high shoes? Low-cut shoes occur in youth's and adult sizes only.

The material used for children's shoes was usually the same as that used for adult shoes, which is calf/cattle leather. Two tailed-toggle fastened shoes from the ÅA-site were made of sheep or goat leather.[337] Even in the shoes of calf leather the material was sometimes treated in a way that the end result was very supple.[338] The same purpose is probable for two tailed-toggle shoes where the material is typically calf, but the uppers have the flesh-side of leather outwards to give a soft-shoe effect.[339]

3.3 Men's and women's shoes

It would be interesting to know whether differences in men's and women's use of shoes can be noted. Are there shoe types which can be considered solely female or male shoes and are there any preferences in shoe types used by both genders? The following conclusions could be made on the basis of the shoe sizes.

One-piece shoes, thong shoes, strap shoes, tailed-toggle shoes, front-laced shoes, buckled shoes and pattens have been used by both genders. In the large assemblage of strap shoes and front-laced shoes, the possible preferences of men and women can be evaluated. There seems to be no preference for either gender. On the basis of size, both the shoe types have been used equally by men and women. The same is true of Early Modern Period shoes. In addition, illustrations of the first half of the 16th century suggest that there was little or no difference between the shoes worn by men and women.[340]

On the basis of the present material, it is not possible to say anything definite about the use of side-laced shoes and boots. Boots can be only defined as adult-sized. In side-laced shoes, women's sizes are lacking but that could be due to the small assemblage of measurable shoes. In comparable analyses in the

British Isles, contradictory results concerning the use of side-laced shoes have been suggested.[341]
In general, there has been little success in trying to distinguish male and female shoes from medieval archaeological materials.[342] Part, but only part of the reason could be that the measurable assemblages of each shoe type have not been large enough for any definite conclusions.[343] The contradictory results concerning the use of particular shoe types and the difficulties in distinguishing male and female shoe fashions suggest the probability that men and women really did wear the same shoe types.[344] This is true especially if shoe types are understood as typological groups discerned by the fastening method and the shoe height as is typical for archaeological studies. However, the attributes of men's and women's shoes could be such that they are not easily discernible from archaeological material, for example, by the colour. As an example, In Biskupa søgur I, it was considered unsuitable luxury for women to wear shoes dyed black.[345]
Moreover, it has been suggested that the differences might have been more typical for the footwear of the higher grade of society than for the lower grade, which is usually better represented in archaeological materials.[346]
In distinguishing male and female fashions, the contemporary pictorial sources could be of use. Unfortunately, women are generally shown either with their gowns covering their feet or with merely the toes protruding.[347] That there have been differences between male and female shoes, comes clearly out of the medieval Scandinavian written sources in which male and female footwear and male footwear are distinguished, i.e. the texts speak about men's shoes and women's shoes. Unfortunately, the criteria for distinguishing male and female fashions are not specified.
In addition, there is one more attribute which distinguishes men's and women's shoes and that is the price of shoes. Among the information concerning the maximum prices for different shoes in Bergen from the year 1282, men's and women's shoes are mentioned. The price for the 'best men's shoes' was ½ *öre*, for the 'best women's shoes' 1 *örtug* and for the best women's boots (stövlar) one öre.[348] In *penningar*, the price of men's shoes would have been 15 penningar and women's 10 penningar. Women's boots would have cost 30 penningar.[349] Thus, women's shoes were somewhat cheaper than men's shoes but women's boots would have been more expensive than men's shoes.
In Sweden, according to the Karl Knutsson's statute in 1450, if a shoemaker worked in a farmer's home, he could ask three penningar for men's shoes and six penningar for women's shoes.[350] Here, women's shoes are clearly more expensive. Thus, the information on the written sources does not show a common trend in price differences between male and female shoes.[351]
One of the few sources which mention details of women's shoes is the fourth section of the craft ordinances of Stockholm's shoemakers'.[352] The ordinances were ratified in 1474 but according to Jäfvert, they were probably written in the first half of the 15th century.[353] To become a master, a shoemaker had to make a pair of women's shoes with 'länkä laska'. Unfortunately, this term is hard to interpret. According to Söderwall's dictionary, länkä could mean chain or loop and laska a tongue (Ger. Lasche). Thus, according to the dictionary, the translation would be 'med kedja försedd lask på skor' (Engl. shoes with a tongue equipped with a chain or loop).[354] However, a more likely interpretation for laska in this context is a 'piece of leather or textile, an insert, stitched to another piece'.[355] The term 'laska' is used clearly in this meaning in another paragraph of the Stockholm's shoemaker's ordinances.[356]
Thinking about the dating of the ordinance (first half of the 15th century) and the archaeological shoe types of the period, the description would best fit a strap shoe, the strap pieces being the 'loop inserts' (länkä laska), seamed to the main piece of the shoe.
It can be concluded that in the archaeological shoe material in Turku, male and female shoes can mainly be discerned by size. On the basis of the present material, men and women seem to have used the same shoe types. No preferences for either gender was noted either. Possible differences distinguishing male and female shoes are ones which cannot be discerned from archaeological material any more (e.g. colour) or are such as are still present in archaeological shoes but difficult or impossible to observe by the present day archaeologist.

3.4 Summary

Large footwear assemblages can be used to gain statistical information on the sizes of feet of a certain period. This information can be used to draw conclusions of the gender and age of the users of shoes. The size ranges for men, women and children can then be compared with sizes of different shoe types and in some cases even information about the users of particular shoe types can be extracted.
The material used for the distribution of shoe sizes was the large sole assemblage from the ÅA-site, altogether 538 measured soles. The two peaks noted in the lengths of the ÅA-site soles correspond to the most popular sizes of adult women's and men's shoes. The typical length of men's shoes in Turku would have ranged from 23 cm to 25 cm with some shoes up to 27.5 cm (continental sizes 34.5–35 to 37.5 with some shoes up to size 41.5). The size range of women's shoes was defined to range from 19.5 cm to 22.5 cm (continental sizes 29 to 34).
Medieval feet, unaffected by modern dietary developments, were approximately four English sizes smaller than modern feet. The lengths of measured soles were calibrated by adding these four sizes to them and the two per cent shrinkage caused by the freeze drying conservation treatment. The peaks in sole lengths were noted to be in the region of the continental shoe sizes 38–39 and 40–41 (English sizes adult 5–5.5 and adult 6.5–7.5). These correspond well to average modern foot sizes of adult women and men.

The smallest sole sizes were only 10–10.5 cm in length (continental size 16). The smallest shoes would have fitted a one-year-old child, which is also the age when a child learns to walk. It seems that children in Turku started to wear shoes right from the beginning.

Using the size ranges, it was estimated that the percentage of children's shoes vs. adult shoes would be 32 per cent for children and 68 per cent for adults. The percentages for women and men, respectively, would be 41 and 27. It was noted, however, that the percentages are liable to change according to the method used. Because of the formation processes of the archaeological record, the percentages do not represent population as such, either. For example, children are probably underrepresented because of their different use of shoes compared to adults.

The following conclusions about the sex and age of the users of different shoe types were made. One-piece shoes, thong shoes, strap shoes and front-laced shoes have been used by men and women as well as children. Tailed-toggle fastened shoes have been used by children, women and men, too, but they have been most popular as footwear of small children, from one to ca. six years old. In children's sizes, strap shoes and front-laced shoes have been most common as the footwear of older children, from ca. six years upwards. The difference in the use of these shoe types is placed around the modern pre-school/school starting age of six or seven years. It is the same age as the traditional border between childhood and youth. This border was expressed in dress which also seems to include footwear. Other attributes in children's shoes besides size which distinguishes them from adult shoes was the shoe height. High shoes, reaching to mid-calf are most common in small children's sizes. In children's sizes the reasons for the high leg part are probably winter use and support for the ankle. Children's shoes were sometimes made from more supple leather, too.

Side-laced shoes, buckled shoes and boots are adult shoes on the basis of the present material. The use of pattens by children is uncertain but possible on the basis of the toe caps found.

On the basis of the present material, men and women seem to have used the same shoe types. No preferences for either gender were noted. Possible differences distinguishing male and female shoes cannot be discerned from archaeological material any more (e.g. colour) or are such as are still present in archaeological shoes but difficult or impossible to discern by the present day archaeologist.

4. SHOES AS OBJECTS OF CHANGING FASHIONS

4.1 Shoe types in Turku vs. European fashion

In this chapter, the datings of shoe types found in Turku are compared to the datings achieved in other European sites for the same shoe types. Firstly, there is the time of appearance of a shoe type. Secondly, there is the disappearance of the shoe type. Between these, there is the period of use of the particular shoe type. In some cases, it is possible to look at the intensity of use during the period of use, too.

A good summary of the problems and source critique in the comparison of shoes types between different sites has been presented by Per Lindqvist.[357] According to him, due to the changing excavation and dating methods, the older dating results are not always comparable to more recent datings. Mostly this is because nowadays, very accurate dating methods, dendrochronology, for example, are available. Another factor that decreases the validity of older dating results, are the changed datings of the materials which have been used to date shoes (coins, ceramics). These changes affect whole chronological systems which have been created during the archaeological research history from different dating elements.

Representation varies between different excavations. The picture of the use of shoes has in many cases been created on the basis of only a few finds. With small assemblages, it is not possible to observe the intensity of the use of shoes.

The location of sites varies. Are the finds from the centre, from a street, inside a yard, from a handicraft area, from a well, etc.? Are the shoes in their primary context, or do they come from another area? This is the general problem of accumulation of material in medieval towns. Do the finds represent the whole town or only one area in it? What were the conditions for the preservation of material?

Certain places and towns have been utilised in different periods and therefore they can lack finds of certain periods. The beginning phase of the town and the thin layers of the late medieval period in many towns are important factors in particular. They mark the beginning and the end of the use of certain shoe types, not the shoes themselves.

Because of all these factors, there cannot be great precision in datings when many different sites, varying in the size of the material and how representative it is, excavated in different times and by different methods, are compared. What one can obtain is usually a half a century precision at best. This is enough for general changes in shoe styles. Those changes which have happened in a decade or two are usually not possible to observe with the present archaeological material.

Despite the problems, comparison is the only way to place the Turku finds in the European context. In fact, the situation of the shoe material is far better than with many other find groups. Shoe finds from many sites have been published and usually at least with some tentative dating. The distribution, the 'shoe map' of the Northern Europe exists, even if there are still blank spots in many places. The Turku finds can now be added to this map with the restrictions mentioned above. The comparison is started with the two shoe types found in the oldest layers in Turku, the thong shoe and the strap shoe.

Fig. 62. Sites with finds of later thong shoes. ***1*** *Turku (FI),* ***2*** *Stockholm (SE),* ***3*** *Uppsala (SE),* ***4*** *Enköping (SE),* ***5*** *Örebro (SE),* ***6*** *Enköping (SE),* ***7*** *Lund (SE),* ***8*** *Aalborg (DK),* ***9*** *Århus (DK),* ***10*** *Ribe (DK),* ***11*** *Nørrevolde (DK),* ***12*** *Schleswig (DE),* ***13*** *Odense (DK),* ***14*** *Svendborg (DK),* ***15*** *Søborg Castle (DK),* ***16*** *Roskilde (DK),* ***17*** *Stegeborg (DK),* ***18*** *Dordrecht (NL),* ***19*** *Lochem (NL),* ***20*** *Groningen (NL),* ***21*** *Einbeck (DE),* ***22*** *Kołobrzeg (PL),* ***23*** *Riga (LV),* ***24*** *Tallinn (EE).*

4.1.1 Thong shoes (Fig. 62)

The thong shoe fashion occurring in the town area of Turku is a low shoe with a vertical vamp opening in which the thong slots are placed in pairs around the opening. In Scandinavia, this style is usually called a 'later thong shoe' or 'open thong shoe' (Swed. yngre remsko/öppen remsko) in distinction to the 'older thong shoe' with a closely spaced thong slots around the opening.[358]

The later thong shoe is a novelty, appearing in most places in the latter half of the 13th century and occurring in the 14th century. The shoe type occurs in Sweden, Denmark, Germany, Poland, Estonia and Latvia (for the location of sites referred to in the text discussing the distribution of shoe types, see Figs. 62–71).[359] On the other hand, it seems to be lacking from the London assemblage and from the finds in Norway.[360]. In the Netherlands, a few later thong shoes have been found in Dordrecht, Lochem and Groningen.[361] The emphasis of the later thong shoe is clearly on the Baltic sphere.

In Sweden, these shoes have been found in Stockholm, Söderköping, Enköping, Uppsala, Örebro and Lund. The appearance is similar in all these towns of central Sweden, the end of the 13th century.[362] In Lund, their appearance has been located more broadly in the latter half of the 13th century.[363]

In Denmark, too, the appearance of later thong shoes is in the latter half of the 13th century.[364] The same applies to Poland (Kołobrzeg), Estonia (Tallinn) and Latvia (Riga).[365]

The period of use of later thong shoes is the 14th century. The longest duration seems to be in the towns of Örebro, Enköping and Uppsala where use continues to the middle of the 15th century.[366] In many towns, the occurrence of later thong shoes in the 15th century if it happens at all, is only sporadic.

It seems that in Turku, the appearance of later thong shoes occurs at the same time, at the end of the

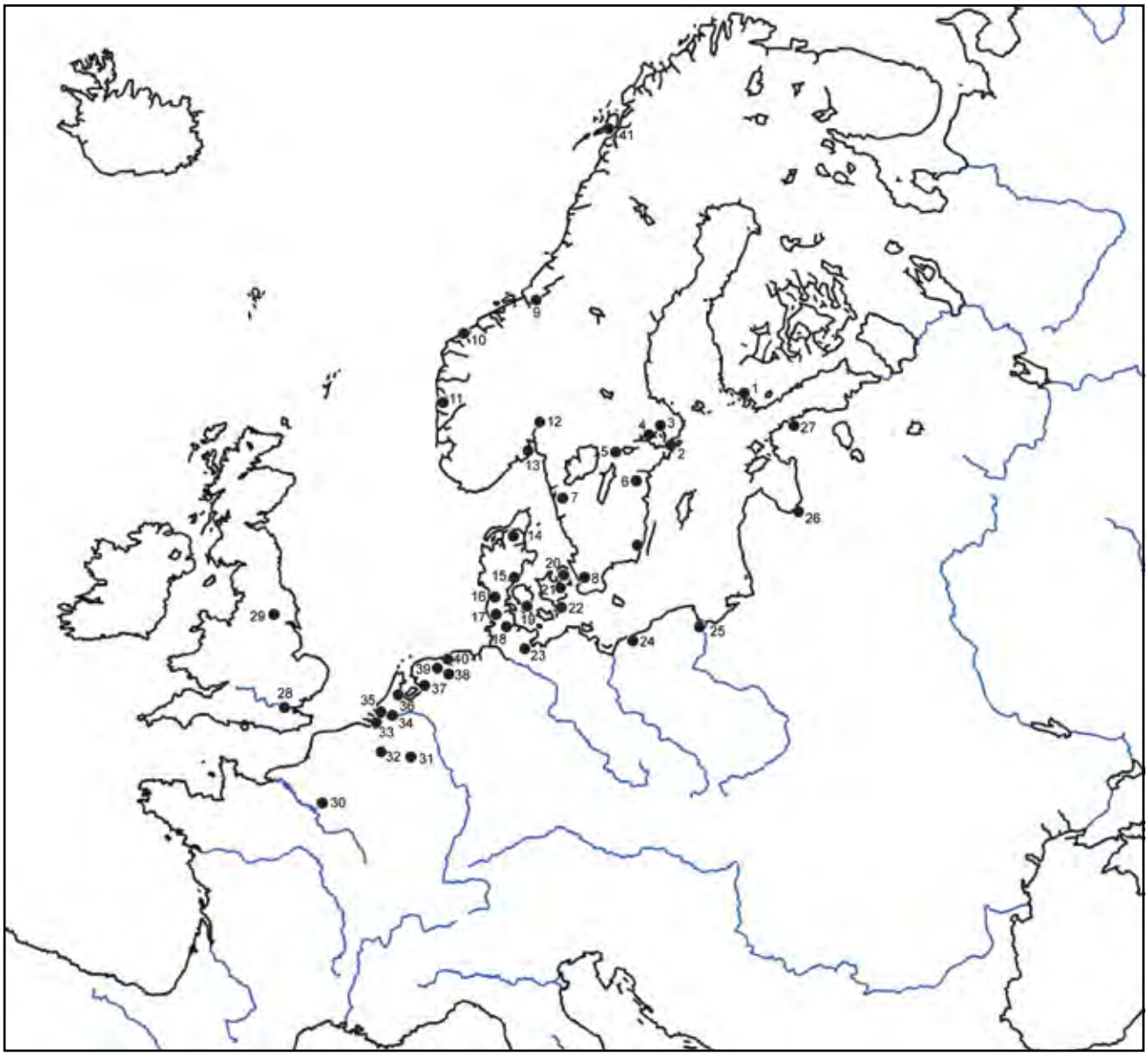


Fig. 63. Sites with finds of strap shoes (instep-toggle fastening, instep strap fastening). ***1*** *Turku (FI),* ***2*** *Stockholm (SE),* ***3*** *Uppsala (SE),* ***4*** *Enköping (SE),* ***5*** *Örebro (SE),* ***6*** *Söderköping (SE),* ***7*** *Lödöse (SE),* ***8*** *Lund (SE),* ***9*** *Trondheim (NO),* ***10*** *Borgund (NO),* ***11*** *Bergen (NO),* ***12*** *Oslo (NO),* ***13*** *Tønsberg (NO),* ***14*** *Aalborg (DK),* ***15*** *Boringholm (DK),* ***16*** *Ribe (DK),* ***17*** *Nørrevolde (DK),* ***18*** *Schleswig (DE),* ***19*** *Svendborg (DK),* ***20*** *Søborg Castle (DK),* ***21*** *Roskilde (DK),* ***22*** *Stegeborg (DK),* ***23*** *Lübeck (DE),* ***24*** *Kołobrzeg (PL),* ***25*** *Gdańsk (PL),* ***26*** *Riga (LV),* ***27*** *Tallinn (EE),* ***28*** *London (GB),* ***29*** *York (GB),* ***30*** *Saint-Denis (FR),* ***31*** *Maastricht (NL),* ***32*** *Brussels (BE),* ***33*** *Reimerswaal (NL),* ***34*** *Dordrecht (NL),* ***35*** *Vlaardingen (NL),*

13th century, with other comparable sites, especially the towns in central Sweden where the appearance is just before the turn of the 13/14th century. The present material, however, shows that unlike in the towns of central Sweden, later thong shoes do not occur anymore in the 15th century in Turku, even sporadically. The dating is the same as in Stockholm, where the low styles of later thong shoes most closely resembling the Turku finds, occur only in the 14th century.[367]

It was noted that the low-cut shoe from Turku Castle differs significantly from the shoes in the town area. In this shoe, the heel-part extends to the height of the ankle bone, but the sides are very low and the instep is open to the toes. By its find context, it was possible to date the shoe from the late 13th century to the 14th century. Typological parallels from Europe, for example, from Schleswig, Einbeck and Svendborg would date the shoe from the latter half of the 13th century to the first half of the 14th century.[368] Thus, the dating would be roughly the same as in the later thong shoes of the town area. It is interesting that this shoe type occurs only in the Castle. It has not been found in the town area of Turku.

Besides, the only higher thong shoe, an ankle thong shoe, is from Turku Castle. This shoe type, occurring commonly in Europe from the 12th century at least to the 14th century,[369] is lacking completely from the Turku town assemblage. It is curious that while the type occurs commonly in the towns of central Sweden, Örebro, Enköping, Söderköping and Uppsala in the 13th and 14th centuries, in Uppsala even in the 15th century, the type is lacking

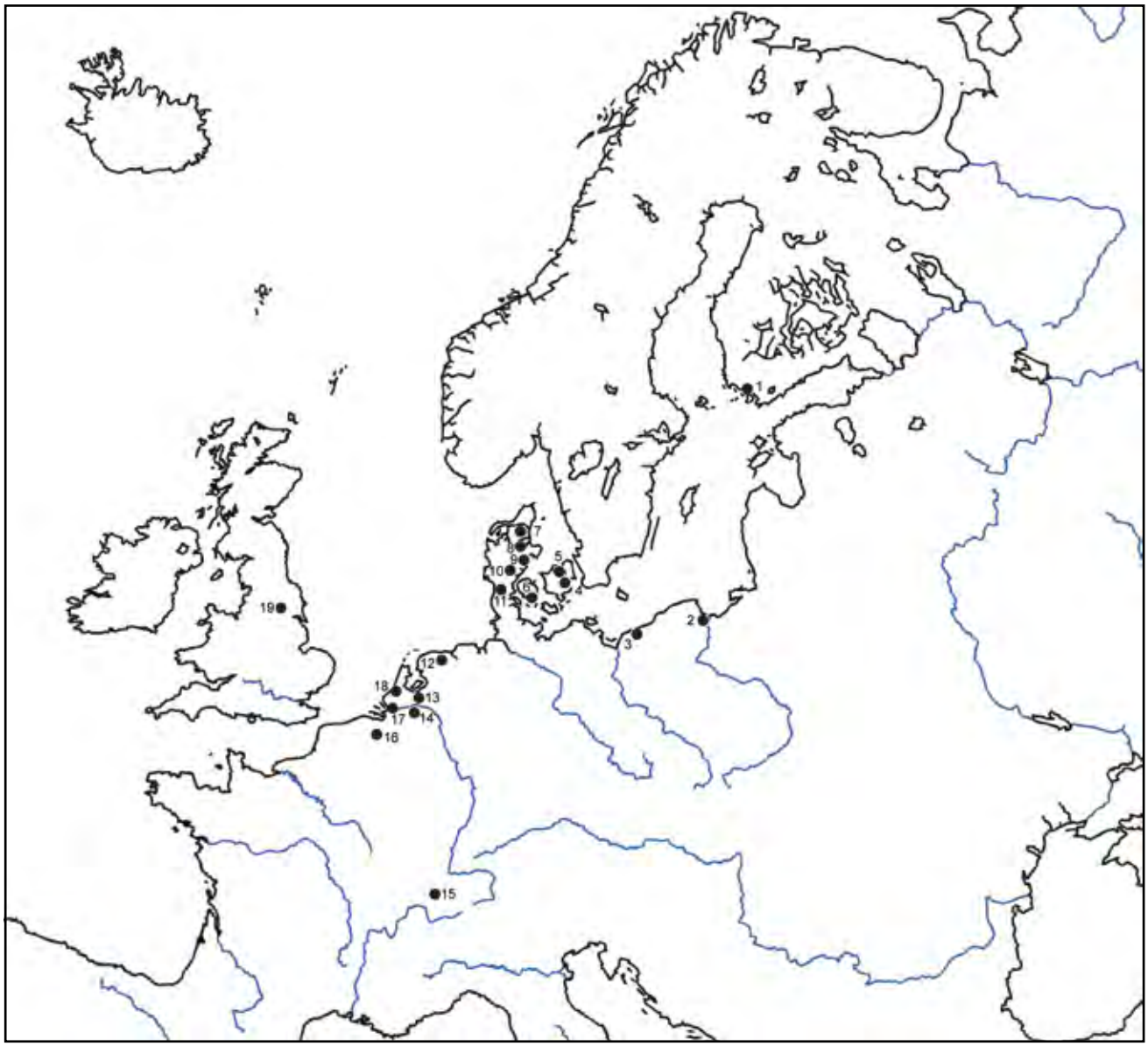


Fig. 64. Sites with finds of tailed-toggle fastened shoes. ***1*** *Turku (FI),* ***2*** *Gdańsk (Pl),* ***3*** *Kołobrzeg (PL),* ***4*** *Køge (DK),* ***5*** *Roskilde (DK),* ***6*** *Svendborg (DK),* ***7*** *Aalborg (DK),* ***8*** *Randers (DK),* ***9*** *Århus (DK),* ***10*** *Boringholm (DK),* ***11*** *Ribe (DK),* ***12*** *Groningen (NL),* ***13*** *Nijkerk (NL),* ***14*** *'s-Hertogenbosch (NL),* ***15*** *Fribourg (CH),* ***16*** *Gent (BE),* ***17*** *Dordrecht (NL),* ***18*** *Haarlem (NL),* ***19*** *York (GB).*

in Stockholm.[370] In this respect, too, Turku closely resembles Stockholm.

4.1.2 Strap shoes (Fig. 63)

Here strap shoes are here discussed mostly as a single group because in most publications, further division has not been made.[371] More detailed comparison is therefore not possible.

In the towns of central Sweden, Örebro, Enköping, Söderköping and Uppsala, the strap shoe appears in the late 13th century and stays in use the whole 14th century and sporadically in the first half of the 15th century. The same applies to Stockholm.[372] In the older towns, Lund and Lödöse, strap shoes appear as early as the first half of the 13th century.[373]

In Denmark, strap shoes occur mainly in the 14th century.[374] In Norway, strap shoes occur from the 13th century to the 14th century.[375] Thus, Danish and Norwegian datings seem to differ from those of Sweden, where strap shoes remain in use at least till the first half of the 15th century.[376] The German finds mostly date to the 13th and 14th centuries.[377]

In London, toggle-fastened strap shoes occur from the end of the 13th century to the middle of the 14th century. In the latter half of the 14th century they occur only sporadically.[378] The York shoes date to the 12th/13th and early 14th century.[379]

In Estonia, strap shoes have been dated to the 14th century.[380] Strap shoes in Gdańsk, Poland, have been dated to the latter half of the 13th century and to the first half of the 14th century,[381] but also to the second half of the 14th century and to the 15th century.[382] The shoes from Kołobrzeg date to the second half of the 14th century.[383] The published finds in the Netherlands, Belgium and France mostly date to the 14th century.[384]

Strap shoes in Turku appear as early as in the foundation period of the town, the end of the 13th century. It seems that the development follows the towns of central Sweden. Strap shoes were used throughout the 14th century in Turku, too. It seems, however, that strap shoes have been used here an exceptionally long time, until the end of the Middle Ages even if their use after the first half of the 15th century is more sporadic. Thus, Turku differs from the towns of the neighbouring areas in Sweden by its longer period of use of strap shoes.

4.1.3 Tailed-toggle fastened shoes (Fig. 64)

The problem with the comparison of datings of tailed-toggle fastened shoes is the typology. In many publications, either no difference between the tailed-toggle fastened shoes (Goubitz type 75) and high variant of toggle-fastened strap shoes (Goubitz type 35-II) have been made or this difference has not been explicitly expressed. This should be important because there is a difference in the datings of these two shoe types. The tailed-toggle fastened shoe with a vertical vamp opening belongs to the period of front-laced shoes and the toggle-fastened strap shoe to the period of strap shoes. To avoid confusion and misinterpretations, only certain tailed-toggle fastened shoes have been discussed in this chapter.

In Denmark, tailed-toggle shoes are rare as adult shoes, but common as children's shoes. They have been found from the same contexts with front-laced shoes, dated to the latter half of the 14th century and the 15th century.[385]

In the Netherlands, the period of the use of tailed-toggle fastened shoes is ca. 1350 - 1450.[386] The same dating has been given for the shoes from York. [387] The shoes from Kołobrzeg have been dated to the latter half of the 14th century and the 15th century,[388] and the ones from Gdańsk more broadly to the 14th century and 15th century.[389] Shoes from Fribourg (Ger. Freiburg), Switzerland, date to the 14th century and the beginning of the 15th century.[390]

Even if the distribution of tailed-toggle fastened shoes is incomplete because of the problems in typology, it can be seen that these shoes have been found from a very wide area in Europe. Also the datings, the latter half of the 14th century and the 15th century are similar at different sites. In Turku, tailed-toggle fastened shoes were used till the end of the Middle Ages. Whether this is the case in some other sites in Europe, too, cannot be determined from the present material. That this shoe type was most common as children's shoe applies to Turku as well as most of the other sites in Europe.

4.1.4 Side-laced shoes (Fig. 65)

As a type, the side-laced shoe has a long period of use; at least from the end of the 11th century/ beginning of the 12th century to the 15th century. The oldest side-laced shoes from the end of the 11th century are from Lödöse.[391] In Oslo, side-laced shoes appear in the first half of the 12th century.[392] Other places with 12th century side-laced shoes are Lund, Söderköping, Svendborg and York.[393]

Examples of 13th and 14th century side-laced shoes come, for example, from Lund, Tallinn, Tartu, Riga, Schleswig, Kołobrzeg, Lübeck, several sites in the Netherlands.[394]

In Stockholm, side-laced shoes appear at the end of the 13th century and occur in the 14th century. They have not been found from the 15th century layers.[395] In Uppsala, Enköping and Örebro, side-laced shoes occur in the 14th century.[396]

Side-laced shoes appear at the beginning of the 14th century in London, too. Here, they have almost a hiatus after the first phase and do not appear again until the beginning of the 15th century.[397] Other sites where side-laced shoes were still used in the 15th century are Svendborg, Oslo, York, Kołobrzeg and Colmar in France.[398]

At first sight, when it comes to the geographical distribution and the period of use, side-laced shoes seem to have been a very common shoe type. This, however, may only be apparent. The occurrence of this shoe type shows great variation in its use in different geographical areas. During its long history, different phases of use can be noted, which sometimes even have a hiatus between. This means, that during these different periods of use in different areas, side-laced shoes could have had, for example, different social contexts.[399] Was it a men's or women's shoe? Was it a fashion shoe or not? Trying to answer these kinds of questions requires that side-laced shoes are not treated as one group. Instead, the local period of use and especially the number of shoes and the intensity of use during the period are important factors.

Koch has noted several interesting matters concerning the side-laced shoes in Denmark. There, side-laced shoes do occur in many sites. However, usually the finds are not very numerous. When goat skin has been used in shoes, it is especially in side-laced shoes that this most often occurs. This is the case also for the extended tips. In addition, a part of the side-laced shoes has been made with a flesh side of leather outwards to achieve a suede-like effect.[400]

These facts have led Koch to assume that the side-laced shoes treated in her studies represent special shoes when it comes to their use and probably to their price. They were either used by the well-to-do, or, on the other hand, by the common people as their 'finer' shoes.[401] This is not necessarily in contradiction with different interpretations of the side-laced shoes in London or Trondheim, where this shoe type is more numerous and has in both places been interpreted as a common shoe type for everyday or work-use. The explanatory factor can be the different period, different social context or geographical area and the combinations of these, i.e. the three basic variables of cultural studies, sometimes forgotten by archaeologists.

Which pattern do the Turku side-laced shoes respect? In the town area, there is firstly the short period

Fig. 65. Sites with finds of side-laced shoes. ***1*** *Turku (FI),* ***2*** *Tallinn (EE),* ***3*** *Tartu (EE),* ***4*** *Riga (LV),* ***5*** *Stockholm (SE),* ***6*** *Uppsala (SE),* ***7*** *Enköping (SE),* ***8*** *Örebro (SE),* ***9*** *Oslo (NO),* ***10*** *Bergen (NO),* ***11*** *Trondheim (NO),* ***12*** *Lödöse (SE),* ***13*** *Söderköping (SE),* ***14*** *Lund (SE),* ***15*** *Kołobrzeg (PL),* ***16*** *Stegeborg (DK),* ***17*** *Roskilde (DK),* ***18*** *Søborg Castle (DK),* ***19*** *Aalborg (DK),* ***20*** *Randers (DK),* ***21*** *Århus (DK),* ***22*** *Odense (DK),* ***23*** *Svendborg (DK),* ***24*** *Lübeck (DE),* ***25*** *Hedegård (DK),* ***26*** *Viborg (DK),* ***27*** *Boringholm (DK),* ***28*** *Ribe (DK),* ***29*** *Nørrevolde (DK),* ***30*** *Schleswig (DE),* ***31*** *Hamburg (DE),* ***32*** *Groningen (NL),* ***33*** *Dokkum (NL),* ***34*** *Kampen (NL),* ***35*** *Lochem (NL),* ***36*** *Utrecht (NL),* ***37*** *Dordrecht (NL),* ***38*** *Reimerswaal (NL),* ***39*** *Oud Turnhout (BE),* ***40*** *Colmar (FR),* ***41*** *London (GB),* ***42*** *York (GB),* ***43*** *Vàgar (NO).*

of use, the end of the 14th century - beginning of the 15th century. Possibly side-laced shoes were still used in the latter half of the 15th century but the peak in their occurrence is in any case at the turn of the 14th/15th century. Secondly, the number of side-laced shoe finds is low. Thirdly, six of the 30 shoes (23 per cent) have been made with the flesh side of leather outwards. These factors suggest the probable fashion phenomenon of side-laced shoes in Turku. There are no archaeological finds of side-laced shoes with extended tips in Turku, but in the illustrations of the so-called Kalmar Manuscript or Codex Aboensis (manuscript B 172 of the National Library of Sweden) from the first half of the 15th century, one can see side-laced shoes with extended tips.[402] The discussion of the origin of the manuscript and its orderer, writer and illustrator continues, both Central Sweden and Finland (Proper)[403] have been suggested.[404]

Fashion is represented in the side-laced shoes of Turku Castle, too, even if by slightly different means. These shoes have been decorated with an openwork decoration, not noted in the side-laced shoes of the town area. Openwork decoration has been seen as a phenomenon of Southern Scandinavia, where it appears in towns like Lund and Schleswig.[405] Perhaps, shoes of Turku castle could be seen as reflecting commercial and/or cultural contacts with these central places. Another distinguishing factor is that Turku Castle shoes may date to the first half of the 14th century, i.e. they might have appeared earlier in the castle than in the town of Turku.

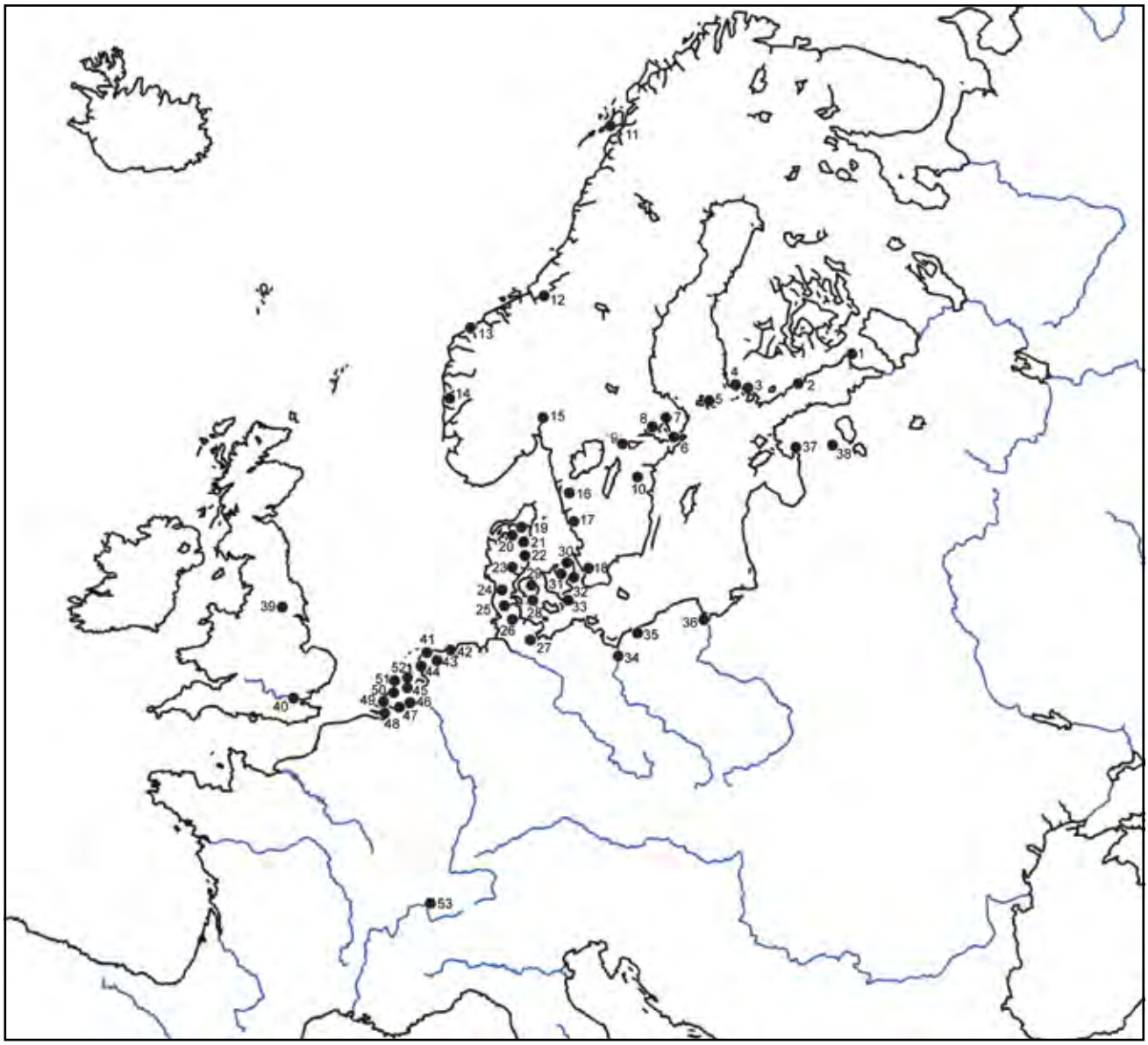


Fig. 66. Sites with finds of front-laced shoes. ***1*** *Vyborg (RU),* ***2*** *Porvoo (FI),* ***3*** *Turku (FI),* ***4*** *Naantali (FI),* ***5*** *Kastelholm Castle (FI),* ***6*** *Stockholm (SE),* ***7*** *Uppsala (SE),* ***8*** *Enköping (SE),* ***9*** *Örebro (SE),* ***10*** *Söderköping (SE),* ***11*** *Vågar (NO),* ***12*** *Trondheim (NO),* ***13*** *Borgund (NO),* ***14*** *Bergen (NO),* ***15*** *Oslo (NO),* ***16*** *Lödöse (SE),* ***17*** *Bocksten (SE),* ***18*** *Lund (SE),* ***19*** *Aalborg (DK),* ***20*** *Hedegård (DK),* ***21*** *Randers (DK),* ***22*** *Århus (DK),* ***23*** *Boringholm (DK),* ***24*** *Ribe (DK),* ***25*** *Nørrevolde (DK),* ***26*** *Schleswig (DE),* ***27*** *Lübeck (DE),* ***28*** *Svendborg (DK),* ***29*** *Odense (DK),* ***30*** *Søborg Castle (DK),* ***31*** *Roskilde (DK),* ***32*** *Køge (DK),* ***33*** *Stegeborg (DK),* ***34*** *Szczecin (PL),* ***35*** *Kołobrzeg (PL),* ***36*** *Gdańsk (PL),* ***37*** *Pärnu (EE),* ***38*** *Tartu (EE),* ***39*** *York (GB),* ***40*** *London (GB),* ***41*** *Dokkum (NL),* ***42*** *Heveskeslooster (NL),* ***43*** *Groningen (NL),* ***44*** *Bolsward (NL),* ***45*** *Amsterdam (NL),* ***46*** *Tiel (NL),* ***47*** *Dordrecht (NL),* ***48*** *Reimerswaal (NL),* ***49*** *Delft (NL),* ***50*** *Leiden (NL),* ***51*** *Haarlem (NL),* ***52*** *Edam (NL),* ***53*** *Vevey (CH).*

4.1.5 Front-laced shoes (Fig. 66)

Besides Turku, front-laced shoes have been found in three other medieval towns of Finland, Naantali, Porvoo and Vyborg. In Naantali, shoe finds are few for the moment because only small scale excavations have been carried out so far. Still, there are shoe fragments, at least one of which is a vamp part of a shoe upper from a front-laced shoe. The probable dating is the 16th century. It is not certain whether the vamp comes from a turnshoe or a welted shoe.[406]

From Porvoo, there are three uppers of front-laced shoes from the excavation at Rihkamatori. The dating of these finds is the 16th century, probably its first half, even if the end of the 15th century cannot be totally excluded.[407] These finds represent shoe types with two pairs of lace holes on both sides of the frontal vamp opening. On the basis of the uppers it is impossible to conclude whether the uppers come from turnshoes or welted shoes or represent some intermediate style between the medieval and Modern Period types.

From the recent excavations in Vyborg, there are front-laced shoes, which according to Alexander Kurbatov are turnshoes. The shoe material can be dated to the very end of the 15th century and to the 16th century.[408]

The dating of shoe finds in these three towns and the fact that front-laced shoes with an earlier dating have not been found, depends on the dating of the sites and layers excavated. Earlier phases of these

towns have not yet been touched by archaeological excavations.
Besides these towns, front-laced shoes have been found in the Kastelholm Castle on the Åland Islands. The find context of these finds has been dated from the end of the 14th century to the beginning of the 15th century.[409]
The appearance of the front-laced shoes in Europe is common in the 14th century. Starting the survey from Sweden, front-laced shoes appear in Lödöse, Enköping, Söderköping and Uppsala in the middle of the 14th century and in Örebro in the latter half of the 14th century.[410] According to Broberg and Hasselmo, in Enköping and Söderköping, front-laced shoe replaces the low thong shoe and the strap shoe while in Uppsala and Örebro these three types occur parallel and the thong shoe and strap shoe are replaced only gradually.[411]
Stockholm differs from the Swedish towns mentioned above in the respect that there, front-laced shoes appear as early as the first half of the 14th century. They are still common in the 15th century.[412]
When it comes to other Scandinavian countries, in Denmark, front-laced shoes occur in the 14th and 15th centuries [413] and in Norway mainly during the 14th and 15th centuries.[414]
The information on front-laced shoes outside Scandinavia is more sporadic. In Estonia, front-laced shoes from the late Middle Ages (14th and 15th centuries) have been found in Pärnu and Tartu.[415] The fact that they are lacking in Tallinn,[416] is probably only because of the dating and placement of archaeological excavations. In Poland, front-laced shoes from Szczecin, Kołobrzeg and Gdańsk have been recorded. They date mainly to the 14th century and the oldest in Gdańsk possibly even to the 13th century but mostly to the 14th and 15th centuries.[417]
In London, front-laced shoes appear at the end of the 14th century. It is interesting that there they were mainly used by children. Adults wore front-laced shoes only occasionally while latchet and buckled shoes were more popular as adult shoes. Front-laced shoes become sparse as early as during the first half of the 15th century and even then they were only used by children.[418]
The front-laced shoe, especially the type 'tie-lace fastening on ankle shoe', continues to the end of the Middle Ages as a turnshoe style and as a welted, double-soled style, to the 16th century,[419] even if late archaeological finds are few depending largely on the poor conditions of preservation in soil. In Finland, 16th century front-laced shoes have been found in Turku, Porvoo, Vyborg and Naantali. In Sweden, the latest front-laced shoes come from Uppsala where there are finds even from the early 17th century.[420] It is uncertain whether these late examples are turnshoes or not.
Front-laced shoes appear in Turku mainly during the latter half of the 14th century. This corresponds well to the datings from the towns of central Sweden. However, the datings to the first half of the 14th century from Stockholm seem to be earlier than in Turku, where only one shoe is from this period. On the basis of the present material, front-laced shoes appear or at least become common earlier in Stockholm than in Turku. Of course, this may be due to the relatively small number of dated early 14th century contexts in Turku.
As in Enköping and Söderköping, front-laced shoes seem to replace the thong shoe in Turku. However, unlike in these Swedish towns, in Turku, strap shoes were still used side by side with the front-laced shoes, although the front-laced shoe is clearly prevailing especially in the 15th century.

4.1.6 Buckled shoes (Fig. 67)

Of the buckled shoes, first the closed style and then the open style will be discussed. In Sweden, closed buckled shoes resembling the type occurring in Turku, have been found in Stockholm. They have been dated to the latter half of the 14th century and to the 15th century.[421] Closed buckled shoes have also been found in Kalmar, but these are without any dating mentioned.[422]
In Denmark, closed buckled shoes date to the end of the 14th century and to the 15th century.[423] In Norway, closed buckled shoes have been found as far north as Vågar on Lofoten Islands, where they date to the end of the 14th century and to the 15th century.[424]
In Germany, Lübeck and Konstanz, closed buckled shoes date to the 15th century.[425] Closed buckled shoes dated to the latter half of the 15th century have been found in Fribourg, Switzerland.[426] Some finds come from Schloss Hallwyl, but these finds have not been dated.[427]
The finds in the Netherlands are many. The datings are consistently the end of the 14th century and the 15th century.[428] In Brugge, Belgium, the dating is the 14th and 15th century. [429]
In London, the closed buckled shoes appear at the beginning of the 15th century. According to Grew & de Neergaard, they replace the front-laced shoes of the 14th century, with which they have a lot in common. Interestingly, in London, closed buckled shoe has been interpreted as a shoe type of men and small children.[430] Closed buckled shoes have been found in York, too. Here they are dated to the 15th century and to the early 16th century.[431]
The dating for closed buckled shoes in Turku, mainly the 15th century but possibly appearing as early as the end of the 14th century and continuing to the beginning of the 16th century, is consistent with datings in other sites in Europe. There is a good pictorial source, which can be compared to the type and datings of archaeological finds. In the St. Barbara altar painting at Kalanti church, SW Finland, the shepherds are depicted wearing three buckle ankle shoes closely resembling the archaeological finds. The altar screen was carved by Master Francke in Hamburg in the 1410s,[432] so the dating, too, matches the archaeological dating of this shoe type.
The open type of buckled shoe has been rightly considered rare in Scandinavia.[433] There is an

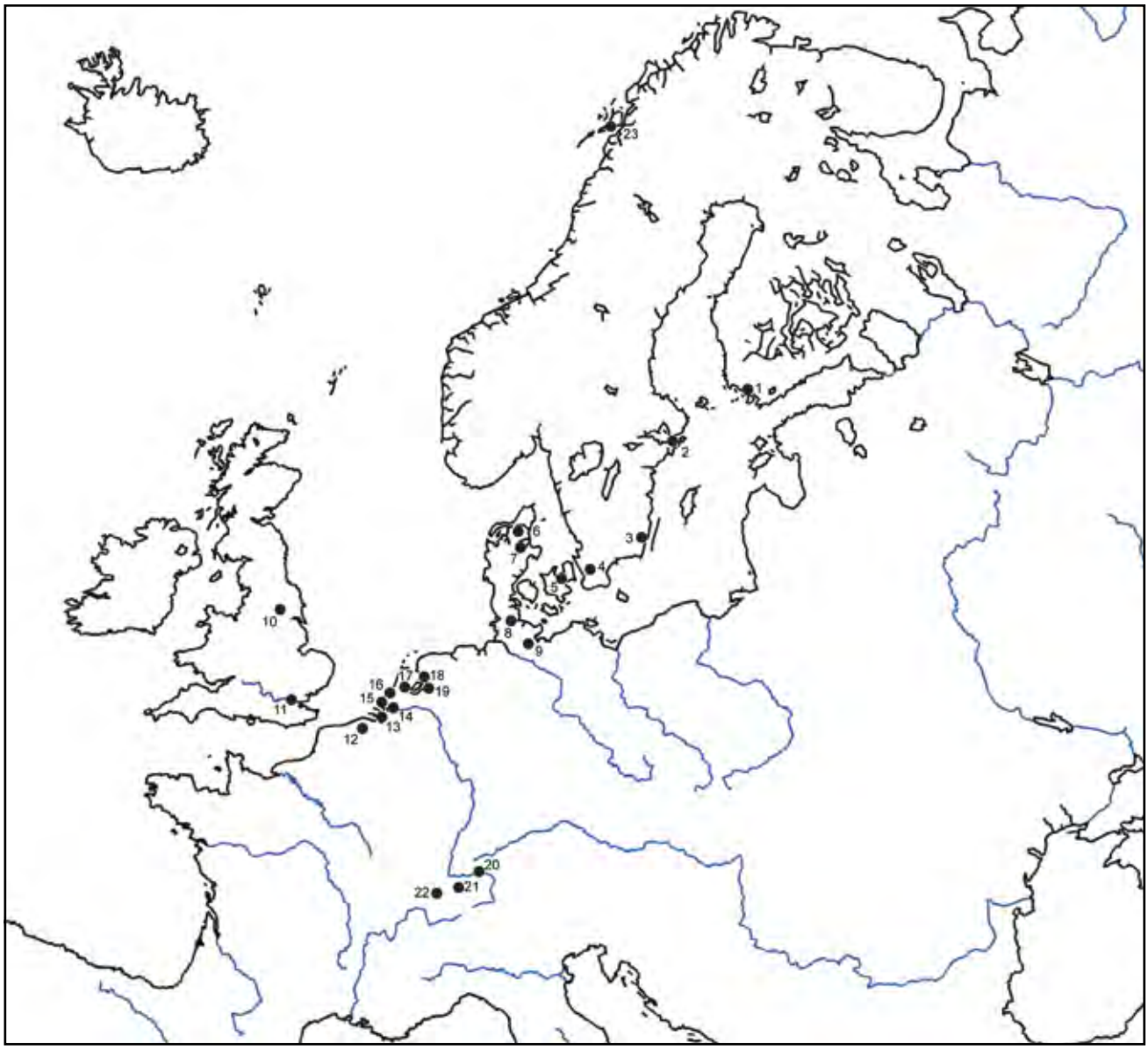


Fig. 67. Sites with finds of buckled shoes. ***1*** *Turku (FI),* ***2*** *Stockholm (SE),* ***3*** *Kalmar (SE),* ***4*** *Lund (SE),* ***5*** *Roskilde (DK),* ***6*** *Aalborg (DK),* ***7*** *Randers (DK),* ***8*** *Schleswig (DE),* ***9*** *Lübeck (DE),* ***10*** *York (GB),* ***11*** *London (GB),* ***12*** *Brugge (BE),* ***13*** *Reimerswaal (NL),* ***14*** *Dordrecht (NL),* ***15*** *s'-Gravenhage (the Hague) (NL),* ***16*** *Leiden (NL),* ***17*** *Amsterdam (NL),* ***18*** *Kampen (NL),* ***19*** *Deventer (NL),* ***20*** *Konstanz (DE),* ***21*** *Schloss Halwyl (CH),* ***22*** *Fribourg (CH),* ***23*** *Vàgar (NO).*

example from Lund, but it is without a dating. [434] Close parallels for the open buckle shoe from Turku Castle come from Schleswig, were they are dated to the 14th century.[435] Open buckled shoes of Northwestern Europe have been given a general dating to the 14th century by Goubitz. According to him, the openness makes these shoes upper class artefacts.[436] In London, too, where these shoes appear at the end of the 14th century, they have been considered shoes of the well-to-do. There, the longest points have been noted in these shoes. [437]
Turku Castle shoe can also be considered a fashion shoe of an upper class person. The typological dating given by Marquita Volken, based on the personal observations of a large number of these kinds of shoes would be the end of the 13th century or the first half of the 14th century,[438] which corresponds well to the suggested dating of the Turku Castle shoe. The late 13th century - first half of the 14th century dating would be much earlier than the dating of the buckled shoes of the town area. Thus, buckled shoes would appear earlier in the castle than in town. As in the case of side-laced shoes with openwork decoration, open buckled shoes, too, suggest the possible contacts to Lund or Schleswig, from where the closest parallels for the finds from Turku Castle come.

4.1.7 Boots (Fig. 68)

In Sweden, archaeological boots have been recorded in Stockholm and Lund. The boots of Stockholm are from Helgeandsholmen and date to the 14th century and to the beginning of the 15th century. [439] In Lund, boots have been found from the 13th century layers and later.[440]
Danish finds are mainly from the 14th and 15th centuries.[441] However, in Svendborg, boots dated as early as ca. AD 1200 have been found.[442]

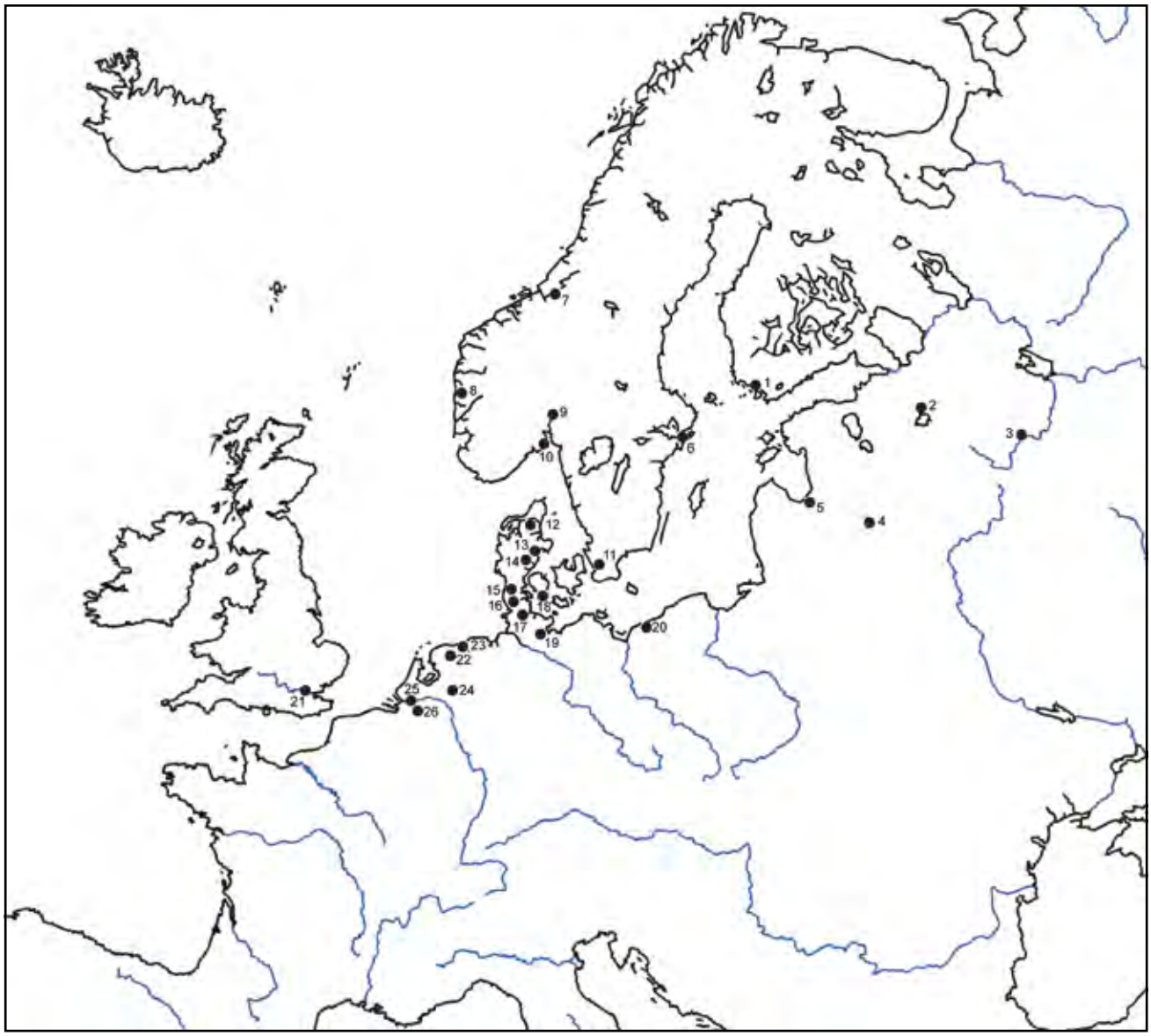


Fig. 68. Sites with finds of boots. ***1*** *Turku (FI),* ***2*** *Novgorod (RU),* ***3*** *Tver (RU),* ***4*** *Polotsk (BY),* ***5*** *Riga (LV),* ***6*** *Stockholm (SE),* ***7*** *Trondheim (NO),* ***8*** *Bergen (NO),* ***9*** *Oslo (NO),* ***10*** *Tønsberg (NO),* ***11*** *Lund (SE),* ***12*** *Aalborg (DK),* ***13*** *Århus (DK),* ***14*** *Boringholm (DK),* ***15*** *Ribe (DK),* ***16*** *Nørrevolde (DK),* ***17*** *Schleswig (DE),* ***18*** *Svendborg (DK),* ***19*** *Lübeck (DE),* ***20*** *Kołobrzeg (PL),* ***21*** *London (GB),* ***22*** *Groningen (NL),* ***23*** *Heveskesklooster (NL),* ***24*** *Huissen (NL),* ***25*** *Dordrecht (NL),* ***26*** *Breda (NL).*

In Norway, the longest period of use of boots has been noted in Bergen, where they are dated from ca. 1200 to the end of the 15th century, although most finds are from the 14th century.[443] The finds from Oslo and Tønsberg have a common dating, ca. 1250 - 1350.[444] In Trondheim, boots have been dated to the 14th and 15th centuries.[445]

In Germany, the boots of Schleswig date to the 13th century and to the beginning of the 14th century.[446] The Lübeck finds are dated from the 13th century to the 15th century.[447] Dutch finds date from the 13th century to the modern period.[448]

In Latvia, boots from the 13th and 14th century have been found in Riga.[449] The Polish finds from Kołobrzeg date from the end of the 13th century to the beginning of the 14th century.[450]

From Russia, the boot finds of Novgorod must be mentioned. They date from the Early Medieval Period to the Late Middle Ages.[451] Medieval boots have been found in Tver, and in Polotsk, Belarus, too.[452]

In London, archaeological boots are few. According to Grew & de Neergaard, on the basis of the pictorial sources, boots were common especially before the 14th century. From the 14th century onwards, they might often have been worn by hunters, travellers and dock workers. In any case, the use of boots does not manifest itself well in archaeological materials.[453]

Good sources where boots have been mentioned are the official price regulations of Norway. 'Forleistar' (front-pieces, vamps), possibly for boots, have been mentioned for the first time in 1282 in the town bylaws of Bergen. 'Forleistar' and 'stöfuelar' are mentioned in the tariffs for German shoemakers in Trondheim in 1377 and in King Olaf Haakonsson's tariff amendments for craftsmen in the towns and workers in the countryside.[454] In Sweden, 'stöwlae'

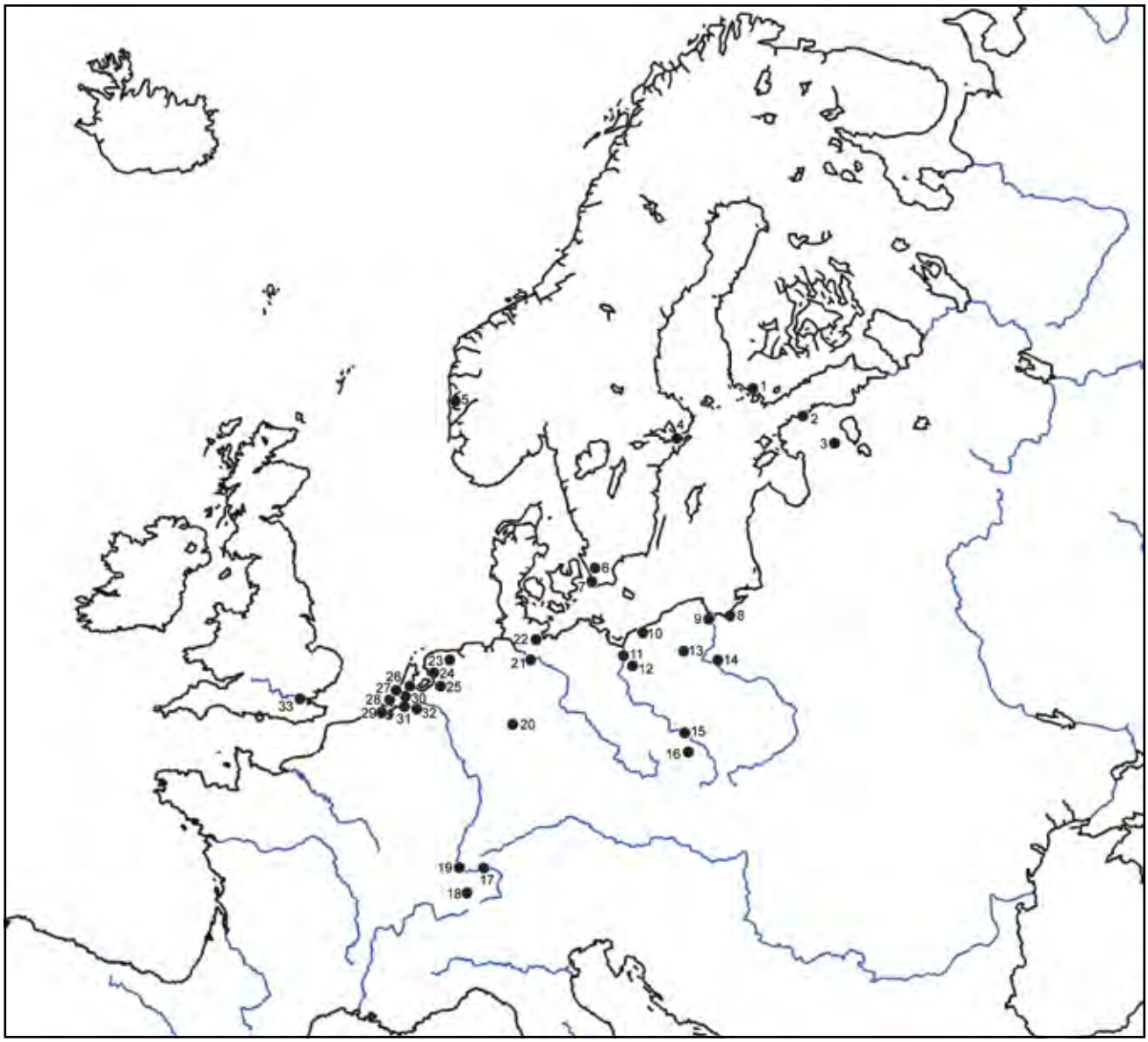


Fig. 69. Sites with finds of pattens. ***1*** *Turku (FI),* ***2*** *Tallinn (EE),* ***3*** *Tartu (EE),* ***4*** *Stockholm (SE),* ***5*** *Bergen (NO),* ***6*** *Lund (SE),* ***7*** *Falsterbohus (SE),* ***8*** *Elbląg (PL),* ***9*** *Gdańsk (PL),* ***10*** *Kołobrzeg (PL),* ***11*** *Szczecin (PL),* ***12*** *Pyrzyce (PL),* ***13*** *Nakło (PL),* ***14*** *Toruń (PL),* ***15*** *Wrocław (PL),* ***16*** *Nysa (PL),* ***17*** *Konstanz (DE),* ***18*** *Schloss Sumiswald (CH),* ***19*** *Basel (CH),* ***20*** *Einbeck (DE),* ***21*** *Lüneburg (DE),* ***22*** *Lübeck (DE),* ***23*** *Groningen (NL),* ***24*** *Kampen (NL),* ***25*** *Deventer (NL),* ***26*** *Amsterdam (NL),* ***27*** *Haarlem (NL),* ***28*** *Delft (NL),* ***29*** *Veere (NL),* ***30*** *Gouda (NL),* ***31*** *Dordrecht (NL),* ***32*** *'s-Hertogenbosch (NL),* ***33*** *London (GB).*

are mentioned in the inventory of Magnus Eriksson in 1340. 15th century boots are depicted, for example, in the wall paintings in Espoo (1430) and Härkeberga (1480) churches and in the altar screen of Strängnäs church (1490).[455] Boots have also been depicted in illustrations of Codex Aboensis of the first half of the 15th century.[456]

On the basis of the archaeological finds and the written and pictorial sources, boots seem to have had a long period or periods of use, from the 13th century to the 15th century. The few boot finds of Turku are situated in the middle of the use period of boots, i.e. the 14th century, possibly to the beginning of the 15th century, too.

Parallels for the extended tip in one of the boot vamps in Turku are the vamps in Boringholm, where six of 12 boot vamps had a short extended tip.[457]

4.1.8 Pattens (Fig. 69)

Patten makers are mentioned in the tax book (Swed. skottebok) of Stockholm in the year 1460.[458] Besides, most of the wooden pattens in Sweden have been found in Stockholm. In Helgeandsholmen excavations, only one wooden patten was found, but patten straps from at least 38 pattens. The dating of the finds was from the end of the 13th century to the beginning of the 15th century. No children's sizes were noted.[459] Besides Helgeandsholmen, wooden pattens in Stockholm have been found in the Gamla Stan (the Old town), Skeppsbron and the Gamla Posthuset. The Skeppsbron patten has been dated to the end of the 14th century and the Posthuset patten to the end of the 15th century. All these three pattens have nail holes in their tip for the toe cap.[460] Besides Stockholm, medieval wooden

pattens have been found in Lund and Falsterbohus in Sweden.[461]

In Norway, wooden pattens from Bergen have been published. In Gullskoen excavations, three wooden patten soles were found.[462] Their dating has been discussed by Buckholm and Swann. According to Buckholm, probably based on the dating of the find layer, one of the pattens would date to the beginning of the 13th century.[463] Swann also believes that these pattens are all early, except one, which would date to the middle of the 15th century.[464] Swann's datings are probably based on typological criteria.

So far, there are no published patten finds from Estonia or Latvia. According to Krista Sarv, a few wooden patten soles but no patten straps have been found in Tallinn. In Estonia, pattens have been found in Tartu, too.[465] According to Sarv, the reason for the low number of finds is probably due to the location of archaeological excavations and the find circumstances and patten finds are to be expected in the excavations to come.[466] According to Viktorija Bebre, the lack of patten finds in Riga is probably because of the poor preservation of organic finds in the late 14th century - 15th century layers.[467]

In Germany, wooden pattens have been reported from Lübeck, where most are dated to the 15th century.[468] Other towns with medieval pattens are Konstanz, Lüneburg and Einbeck.[469] In Switzerland, pattens have been found in Basel and Schloss Sumiswald with broad datings from the 13th to the 15th century.[470] Patten finds, or at least the recorded ones, are more numerous in the Netherlands. There, besides Amsterdam, pattens have been found in many other towns.[471]

In Gdańsk, pattens have been found in the recent excavations (2001–2002) on the Granary Island in such large numbers that even a creation of a basic typology based on these finds has been possible. These finds have been dated from the 14th century to the beginning of the 16th century.[472] In Kołobrzeg, pattens have been dated from the latter half of the 14th century to the 15th century.[473] In Poland, there are also patten finds from Elbląg, Wrocław, Szczecin, Toruń, Pyrzyce, Nakło and Nysa.[474]

The earliest medieval patten from London (there are patten finds even from the Roman Period) is a fragment of a patten strap dated to the early 12th century. The earliest wooden patten, preserved as a whole, is dated to the beginning of the 13th century. The largest group of wooden pattens in London is from the second half of the 14th century.[475] Even the late medieval period, the latter half of the 15th century, is represented in the patten assemblage of London.[476] Thus, the patten material can be considered very representative and conclusions based on this material play a key role when making comparison to other assemblages in Europe. Therefore, a short summary of the observations and conclusions of Grew & de Neergaard is presented here.[477]

Still in the 14th century, wooden pattens with stilts were upper class footwear and accordingly, they were not common. The decoration in the 14th century pattens was frequent. Pattens become more common at the beginning of the 15th century. During this time, other patten types appear. These are the flat soled wooden patten, often hinged, and the leather patten. Stilted wooden pattens are still used along with the new types in the first half of the 15th century. The shape of patten soles follows the shoe shapes of the same age. At the end of the 14th century, there are pattens with long tips. At the beginning of the 15th century, rounded types prevail.

The leather straps of wooden pattens were made of thick cattle leather. Especially in the late 14th century, straps were often of a double thickness, with the flesh sides opposing each other and sometimes with an edge strip. Straps were either of a single broad band (although sometimes composed of several pieces) or made of two pieces of leather joined at the centre. Some straps were adjustable. Also bifurcated straps occur.

Decoration of straps is most common at the end of the 14th century. Techniques used were painting, stamping or stitching. Straps of the 12th, 13th and 15th century are most often not decorated.

The material of wooden pattens of London is beech (*fagus* sp.), alder (*alnus* sp.) and woods of the family Salicaceae (possibly willow, *salix* sp. or poplar, *populus* sp.).

In pictorial sources, pattens are most common in the 15th century.[478] Early archaeological finds move the back line of the use of pattens backwards in time (London, beginning of the 12th century, Stockholm, end of the 13th century, Bergen, beginning of the 13th century). It seems, however, that on the basis of archaeological finds, the pattens were most common during ca. 1350 - early 16th century. The flourishing of the patten fashion was the 15th century. Pattens went out of use after shoes with thicker soles made pattens relatively useless in the latter half of the 16th century.[479]

By whom were the pattens used? Definite conclusions have not been made, mainly because of the lack of large comparable archaeological assemblages with a focus on social contexts. Some ideas have been presented, however, mostly based on the London assemblage. According to Grew & de Neergaard, in London, pattens were not common before the early 15th century. Also the fact that they were decorated in the 14th century, suggests the probability that they were primarily fashion accessories of the well-to-do. During the 15th century, pattens became more common and also new types appeared. They were now worn by the population in general.[480]

Thus, this seems to follow the innovation/fashion pattern where objects are first rare and used only by the wealthy part of the population. After a while they become more common, possibly cheaper and at the same time they lose a part of the glitter they first had. They go out of upper class fashion but stay in use by common people until they go out of use for practical reasons.

How do the pattens of Turku relate to this kind of scheme? First there is the dating. The finds in Turku seem to follow the late 14th century - 15th century dating. This is the use period of pattens in Europe when pattens were most frequent. The possible peak in the use of pattens in Turku is the first half of the 15th century, which matches the period when European patten finds are most common, too. To

solve the possible influence of fashion, the differences in the intensity of use of pattens would be needed. Unfortunately, the very thick layers of the ÅA-site in the latter half of the 14th century and the first half of the 15th century are difficult to compare with much thinner later layers with poor preservation of organic material. How does the number of the finds mirror the use of pattens? The very general conclusion is that there is a peak in the number of pattens in the first half of the 15th century at the ÅA-site. What exactly the decrease in percentages in coming to the second half of the 15th century is cannot be solved.

Besides the number of finds, another matter that seems to change at the latter half of the 15th century is the occurrence of decoration in patten straps. The decoration is more frequent and rich in the straps of the late 14th century - early 15th century at the ÅA-site. Later straps are plain or have much more simple decoration. Whether there are differences between the late 14th century and early 15th century straps cannot be solved from the present material and datings. In any case, the occurrence of decoration seems to follow the same trend that was noted in London patten straps.

Because only wooden pattens have been found in Turku so far, it is not yet possible to make comparison between the occurrence and use of different types of pattens.

The occurrence of pattens in the Mätäjärvi quarter, the Convent quarter and the Cathedral quarter does not reveal anything special about the social context of pattens. Neither does a closer examination of the find contexts help in solving the questions concerning the use of pattens. Still, one thing which has changed because of the recent patten finds, especially the large number from the ÅA-site, is the frequency of pattens compared to other shoe types. This diminishes the validity of the ideas about the pattens as pure haute couture fashion or luxury items. On the contrary, it seems that they were available to a wider population, although it is possible that in Turku, too, they were first shoes of the more élite part of population. More close datings and especially more finds from other sites in Turku are needed to solve the question of the social context of pattens and especially the possible changes in these social contexts in time and place.

4.1.9 One-piece shoes (Fig. 70)

The only shoe type not reflecting Western European medieval shoe fashions is the one-piece shoe. The occurrence of a clearly deviating form of footwear needs explanation. It is first necessary to take a brief look at the history of one-piece shoes in Europe.

Shoes were commonly made of one-piece in Northern Europe until the first shoes with a separate sole and upper appeared in the 8th century.[481] Still in the Viking Period, both shoes made of one-piece and shoes with a separate sole and upper occurred. In Haithabu, for example, both types exist.[482] A good example of the soled shoes of the period are the shoes from the Oseberg ship burial from ca. AD 850.[483] Gradually, one-piece shoes became less common and from the 11th century onwards, shoes with a separate sole and upper were the prevailing shoe type in the archaeological material from towns.[484]

One-piece shoes still occur in the Middle Ages and there seems to be geographical and cultural differences in their distribution and occurrence during that period. In Slavic areas, Russia and the Baltic, one-piece shoes were commonly used in the Middle Ages,[485] and their use continued to the Modern Period,[486] in some parts to the 19th century.[487]

One-piece shoes have also been found at medieval sites in Western Europe. While the researchers in Russia and the Baltic seem to treat one-piece shoes as routine finds, belonging to the cultural tradition of the area, researchers in Western Europe, on the other hand, seem to treat one-piece shoe finds more like primitive curiosities. When four one-piece shoes were found from a 12th - 13th century well in Hoogland (Amersfoort), Netherlands, they were interpreted as footwear made by people lacking knowledge of contemporary professional shoemaking skills. On the other hand, it was noted that the back seams were 'beautifully thonged'.[488]

About the four one-piece shoes found in York, it was asked whether it was 'too fanciful to see these shoes as arriving in York on the feet of foreign traders bringing their goods from the north (Scandinavians)? Less palatably, were the shoes worn by slaves, themselves traded commodities?'[489] One-piece shoes found at Stortorget, Lund and dated to the 13th century were defined as being 'exceptionally late'. A reference was made to the occurrence of one-piece shoes in the 'relict areas', in the Balkans and by the North American Indians. [490]

Thus, it seems that in Western Europe, finds of one-piece shoes have been treated as primitive, proving the lack of professional shoemaking skills of the period and thus, being exceptionally late examples of the ancient shoemaking techniques. The origin for these curious finds has easily been sought from abroad. As a conclusion, it can be said that it is not commonly accepted that one-piece shoes would have been normal footwear of the local people. The preconception of seeing one-piece shoes as primitive or exotic, not belonging to the normal assemblages from excavations can in its worst lead to the situation that fragmentary one-piece shoes especially are not identified. This can be a part of the reason why one-piece shoes are still rare in Western European finds, rarer than they are in reality, when researchers are not used or even 'willing' to find them. In Western Europe, besides the above mentioned Lund, York and Hoogland, one-piece shoes have been found in Norway in Tønsberg[491], Uvdal church[492], Oslo[493] and Trondheim[494].

What about the finds in Russia and the Baltic? In Estonia, finds have been made in Tartu[495] and Tallinn[496]. One-piece shoes have also been found

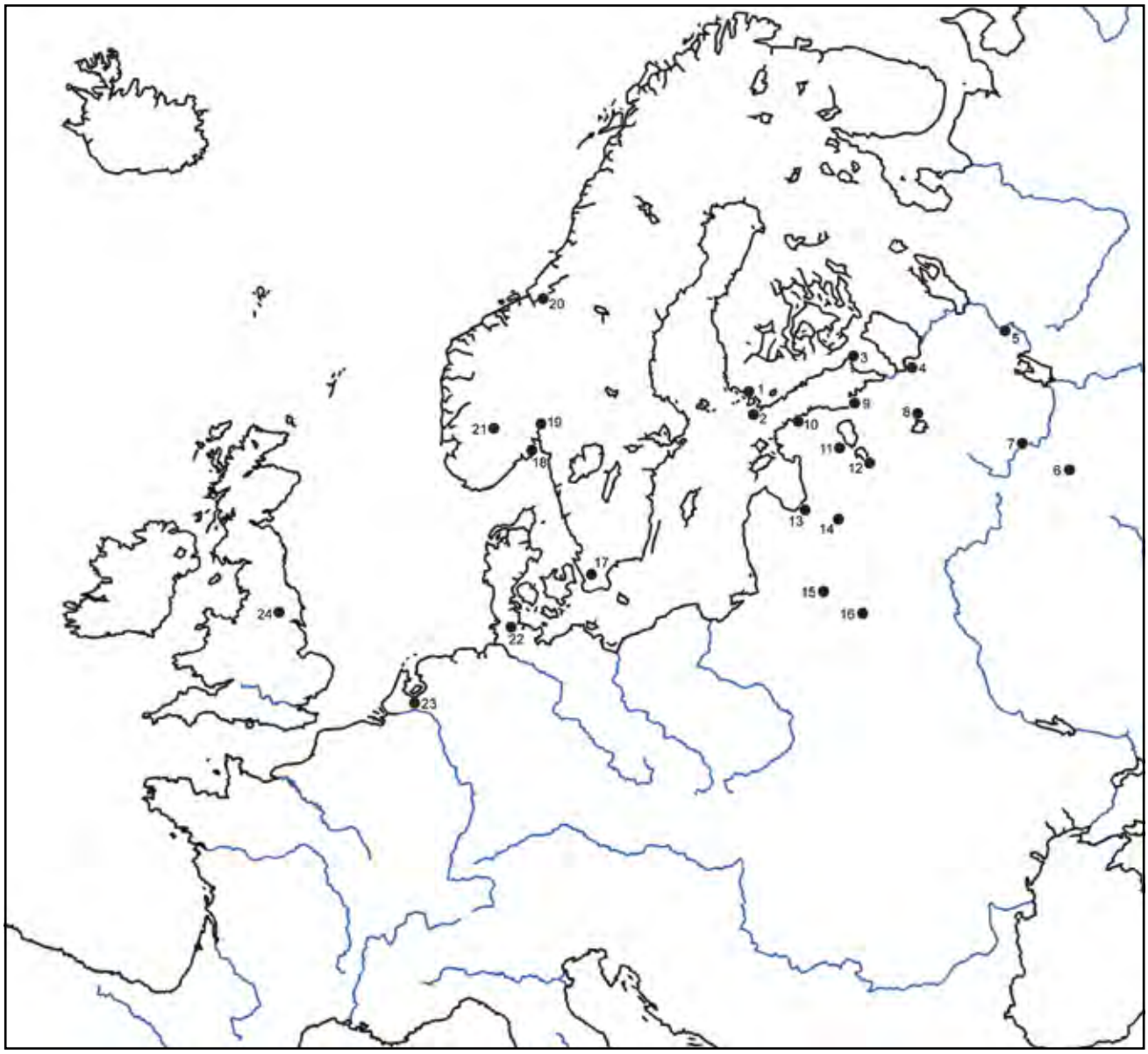


Fig. 70. Sites with finds of one-piece shoes. ***1*** *Turku (FI),* ***2*** *Hankoniemi Cape (shipwreck Mulan) (FI),* ***3*** *Vyborg (RU),* ***4*** *Staraja Ladoga (RU),* ***5*** *Belozersk (RU),* ***6*** *Moscow (RU),* ***7*** *Tver (RU),* ***8*** *Novgorod (RU),* ***9*** *Ivangorod (RU),* ***10*** *Tallinn (EE),* ***11*** *Tartu (EE),* ***12*** *Pskov (RU),* ***13*** *Riga (LV),* ***14*** *Koknese (LV),* ***15*** *Kernavė (LT),* ***16*** *Minsk (BY),* ***17*** *Lund (SE),* ***18*** *Tønsberg (NO),* ***19*** *Oslo (NO),* ***20*** *Trondheim (NO),* ***21*** *Uvdal (NO),* ***22*** *Haithabu (DE),* ***23*** *Hoogland (Amersfoort) (NL),* ***24*** *York (GB).*

in Latvia[497] and Lithuania[498]. In Russia, there have been found one-piece shoes both from medieval and post-medieval contexts.[499]

Thus, on the basis of archaeological finds, it seems that one-piece shoes have been found from different parts of Europe, in east and west. They have been most common in Russia and in the Baltic, where the making and use of one-piece shoes has certainly continued to the post-medieval period. Still, one-piece shoes have also been found in Western Europe where their apparent rarity has partly been caused by the preconceptions of researchers, not prepared to identify one-piece shoes from fragments.

What kind of shoe history do we have in Finland? Even if there is no concrete evidence, it is natural to assume that the tradition of one-piece shoes goes back to the Prehistoric Period in Finland as in other parts of Europe. There have been attempts to reconstruct shoes from the leather remnants from the Late Iron Age inhumation graves but the fragments are too small for any certain conclusions.[500] The question when shoes with separate uppers and soles appear in Finland is still open. The basic information on the shoe remains in graves and the studies on them have been collected by Leena Tomanterä.[501]

The most significant reconstruction attempts are by Sakari Pälsi. On the basis of the few archaeological grave finds and, on the other hand, the rich ethnographical material, Pälsi concluded that the ancient Finnish shoe type was a so-called paulakenkä (an ethnographical thong shoe with a leg part) earlier presented by Theodor Schwindt in the illustrated Kalevala epic.[502] The two most important notions put forward by Pälsi were that the leather used in shoes was tanned and that there were stitches and seams in the leather pieces preserved. The important and probably right conclusion of Pälsi was that the finds did not represent simple one-piece shoes that

would have been without seams and stitches. That Pälsi searched for parallels for the reconstruction of these shoes from ethnographical shoes, not from archaeological finds, was natural, considering that the finds of the same age from Scandinavia, for example, Lund, were for the most part still to be published.[503] It could also be that Pälsi wanted to keep to the Finnish and Fennougrian examples when trying to prove the origin of 'ancient Finnish' footwear. In any case, Pälsi did not consider it probable that the leather parts could be from shoes with separate soles and uppers.[504]

However, it is natural to assume that the development was parallel to other Nordic countries when in the Viking Period, at the latest, the two basic shoe types, a one-piece shoe and a shoe with a separate sole, occurred side by side. As Tomanterä has proposed, it would be reasonable to assume that the shoe remnants from the Late Iron Age graves in Finland would represent shoe types known in Scandinavia at the same time, not shoes known from later ethnographical contexts.[505]

Using the analogy from Scandinavia, a prevailing shoe type of the Crusade Period would be a thong shoe. Possible evidence of the occurrence of this shoe type comes from a Crusade Period Raisio Ihala cemetery. A preserved leg part of a shoe, reported by Itkonen, had leather thongs running around the leg part remaining. Unfortunately, neither the foot part nor seams or stitches were preserved.[506]

As a conclusion about the prehistoric shoe finds in Finland, it can be said that the archaeological evidence suggests stitched and seamed footwear. Using the analogies, the shoe type would be a thong shoe, occurring in the whole of Europe at the period which corresponds to the late Iron Age in Finland. There is no evidence of simple, one-piece shoes without stitched seams in the archaeological finds of Prehistoric Finland. Here it must be noted, however, that the archaeological evidence is from graves where people were put in festive costumes. If the one-piece shoes were everyday footwear, they would not then be represented in the grave finds. The same applies to birch bark footwear, which has not been found in graves, either.[507] Instead, there are at least 14 stray finds of birch bark shoes from Finland. A part of these have been published by Niilo Valonen, but the age of the finds is unknown for the present.[508]

Whether the one-piece shoes were used in the Late Iron Age Finland or not, in any case, the first archaeological one-piece shoes from Finland come from the medieval cultural layers in Turku. A question is now, what role the one-piece shoes had in Turku, where other shoe types with a separate sole and upper prevailed? Different explanations for the occurrence of one-piece shoes have been proposed. Some ideas from Western European scholars have already been presented. It is useful to look at the ideas of the scholars from areas where one-piece shoes have been more common, i.e. the Baltic and Russia.

In these areas, it is usually thought that one-piece shoes and shoes with a separate upper and sole represent two traditions of making shoes. Discussing the shoes of Riga, Latvia, Bebre considers one-piece shoes to be footwear of local people while shoes with a separate upper and sole would be imports from abroad.[509] In addition, according to Bebre, one-piece shoes were used in Riga as everyday footwear by the poorest people or those who came to town from the countryside.[510] Poverty is also mentioned by Schia when discussing the one-piece shoes from Oslo. According to him, one-piece shoes were made by people who could not afford shoes made by a shoemaker. Even small scale domestic industry as a secondary occupation is out of the question according to Schia.[511]

Opposing ideas are presented by Alexander Kurbatov about the one-piece shoes from Vyborg. In recent excavations, one-piece shoes dated to the 15th and 16th centuries have been found. According to Kurbatov, the uniformity in the form of these shoes suggests a local manufacture particularly of this shoe type. The manufacture here would have been professional and standardized, while in Western Europe, one-piece shoes would have been made only for domestic needs. According to Kurbatov, Russia was the only area where the manufacture of one-piece shoes continued throughout the Middle Ages in parallel with the manufacture of multi-piece shoes.[512]

The following ideas about the medieval one-piece shoes have been presented.

1) one-piece shoes were made by amateurs
2) one-piece shoes were professionally made
3) one-piece shoes represent local traditions of making shoes in contrast with multi-piece patterns from abroad
4) one-piece shoes represent the lack of current knowledge of making shoes
5) one-piece shoes represent poverty; they were acquired or made by people who could not afford multi-piece shoes

Is it possible to answer these hypotheses? There are two options to solve the question of unprofessionally/professionally made shoes. The first is the written sources and the second is the estimation of the quality of archaeological shoes. The only possible reference to the manufacture of one-piece shoes is the Ordinance of the Stockholm shoemakers where the first qualification is to make 'bondha sko'.[513] In Söderwall's dictionary this term has been interpreted as men's shoes.[514] 'Men's shoes', however, seems to be too general for the ordinance where every other shoe type is mentioned with a description. Alternative interpretation is to translate bondha in a meaning 'peasant's' (Swed bonde, genitive bonda). But what would these peasant shoes have been like? Jäfvert considered it possible that bondha sko could have been either thong shoes or front-laced shoes.[515] In a later article, however, he mentions that in many areas in Nordic Countries bondsko had a meaning of a one-piece shoe. Jäfvert, however, assumes that bondsko made by full-time shoemakers would have more likely been thong shoes or front-laced shoes.

In Jäfvert's time, hardly any one-piece shoes from medieval archaeological excavations were known. Thus, it was natural that Jäfvert, a shoemaker himself, turned to the multi-piece shoes when thinking about options for the meaning of bondha sko. Now, if one-piece shoes have been found in late medieval contexts, in my opinion, it is quite possible that bondha shoes mentioned in the ordinance meant just one-piece shoes. Moreover, thong shoes or front-laced shoes had nothing to do with peasants; on the contrary, they were urban footwear. My interpretation depends heavily on the translation of bonde. If, in the ordinance, it meant peasant, one-piece shoe is a very likely option. If, however, the translation is a man's shoe, then all shoe types, worn by men are possible. This would lead to more difficulties in interpretation because it was noted that at least in the archaeological material of Turku, there were no shoe types which would have been particularly men's shoes. The 'man's shoe' cannot be connected to any special shoe type. This further strengthens the hypothesis that a man's shoe would not have been an adequate definition in the ordinance of the shoemakers.

When it comes to the estimation of full-time craftsmanship on the basis of the quality of archaeological shoes, it is clear that one-piece shoes in Turku do not form a uniform group. Instead, there are differences in quality. One-piece shoes range from shoes, seemingly roughly prepared from reused leather to shoes with a carefully thought out pattern and technique (thong-slots; front and back seam). In the latter cases, full-time manufacture is not out of question even if the same results could well have been achieved by a skilful amateur.

Thus, in Turku, at least two groups of one-piece shoes can be distinguished using the estimation of the technical quality of shoes as the criterion. The first group, easy to distinguish, comprises definitely amateur-made shoes. The second group is formed by high-quality shoes. But are these of professional manufacture? The problem is that some shoes can be of high quality and still manufactured by a skilled but unprofessional person. These shoes are impossible to discern from professionally made shoes. Thus, the division reflects the distinction between the shoes of the lowest amateurish quality and the blend of shoes of good amateurish/average professional quality and high amateurish/good professional quality.[516] More finds of one-piece shoes are needed to make evaluations within the group of high-quality shoes. Then, a better estimation of the degree of standardization in making these shoes can be made. Also, uniformity in forms can only be seen in a large assemblage of shoes. The present assemblage of one-piece shoes does not show bias in either direction, towards the uniformity or non-uniformity, only that there have been several different patterns for making these shoes. Thus, there has been both low quality and high quality manufacture of one-piece shoes. Amateur manufacture is certain and high quality shoes are either of professional or skilled unprofessional manufacture.

The question of manufacture according to a local (Finnish) tradition is a difficult question, too. It can be assumed, although it cannot be archaeologically proved, that one-piece shoes were made in Late Iron Age Finland. With this hypothesis as a starting point, the medieval one-piece shoes could then be seen as a continuum of this tradition. Recently, Aki Pihlman has discussed the problematics of locally made ceramics, which were used in Turku until the end of the 14th century.[517] According to Pihlman's hypothesis, these ceramics could be used as cheaper vessels in such burgher economies in Turku, which had relations, based on the properties or relationships, to the farms in the surroundings of Turku. In these farms, local ceramics were still made according to the Iron Age and 13th century tradition until the end of the 14th century.[518]

Thus, the Iron Age tradition and even the relationship between Turku citizens and the surrounding farms in the Middle Ages are visible in the archaeological material. It is then possible that shoes, too, have been part of the tradition. It could even be that like ceramics, one-piece shoes would represent the manufacture of the countryside. Here, we would see a rare glimpse of the footwear of the countryside, discarded in town and transformed into a part of its cultural layers.

Besides ceramics, the Iron Age tradition certainly carried on to the Middle Ages in textile manufacture. Despite many innovations, certain tools (warp-weighted looms), textile types (2/2 twill) and the method of collecting wool (picking) still occurred in the Middle Ages parallel with new innovations.[519]

Thus, there is quite strong evidence of continuity from the Iron Age to the Middle Ages in some areas of handicrafts. Still, until shoe finds from the country (Iron Age or medieval) are found, the Iron Age tradition of shoemaking remains a hypothesis. Until new evidence appears, we need to take into account the possibility that instead of the 'Finnish tradition', one-piece shoes could have been a part of the medieval urban culture in Turku, not specifically connected to the countryside, nationality or Iron Age tradition.

What about poverty and lack of knowledge as reasons for making and using one-piece shoes? Although these are possible explanations for some shoes, they do not explain the whole phenomenon. Instead of the lack of knowledge or poverty, I would like to see the simple structure of one-piece shoes as a functional element still important and practical in the Middle Ages in some situations, especially in certain working conditions. These conditions could be where the wear on shoes was heavy or the soil was wet or dirty to a degree that damaged the shoe leather. In all these situations, simple one-piece shoes, at low-cost or easy to make oneself, were better than the multi-piece shoes. Thus, most medieval one-piece shoes would not have been curious relicts of fashions, long gone past, raising mirth or derision among those walking with multi-piece fashion shoes. Instead, they were a normal shoe

Fig. 71. Sites with finds of Early Modern Period shoes. ***1*** *Turku (FI),* ***2*** *Vyborg (RU),* ***3*** *Pärnu (EE),* ***4*** *Stockholm (SE),* ***5*** *Uppsala (SE),* ***6*** *Trondheim (NO),* ***7*** *Nya Lödöse (SE),* ***8*** *Kalmar Castle (SE),* ***9*** *Lund (SE),* ***10*** *Glimmingehus Manor (SE),* ***11*** *Dokkum (NL),* ***12*** *Heveskesklooster (NL),* ***13*** *Groningen (NL),* ***14*** *Zwolle (NL),* ***15*** *Deventer (NL),* ***16*** *Goor (NL),* ***17*** *Bunschote (NL),* ***18*** *Zaltbommel (NL),* ***19*** *Breda (NL),* ***20*** *Mechelen (BE),* ***21*** *Middelburg (NL),* ***22*** *Goes (NL),* ***23*** *Dordrecht (NL),* ***24*** *Haarlem (NL),* ***25*** *Amsterdam (NL),* ***26*** *Vevey (CH),* ***27*** *London (GB).*

type in many outdoor working conditions where it was practical to wear simple, cheap and easily replaceable shoes. In addition, these are attributes which have been suitable for children's shoes, too.
A small part of one-piece shoes, those of the lowest quality, were also more probably, quickly made and occasional replacements for the worn-out shoes than indications of poverty or lack of skill. It was natural that very thorough work was not necessary for making shoes not meant for continual use.

4.1.10 Early Modern Period shoes (Fig. 71)

In the archaeological material of Vyborg, parts of Early Modern Period shoes occur; square-toed soles and also short, wide vamps, typical of cowmouth shoes. These come from the recent excavations. The dating is from the turn of the 15/16th century to the 16th century.[520] Interesting but uncertified information is that according to Pylkkänen, shoe soles for cowmouth shoes were imported to Vyborg.[521] It is certain, however, that the appeal of the shoemakers of the town led to the ban in 1545, according to which the bourgeois of the town were not allowed to sell shoes to the disadvantage of the shoemakers.[522]
In Sweden, 16th century shoe types with various forms of uppers and soles have been found in Lund, Nya Lödöse, Kalmar Castle, Glimmingehus Manor (SE Scania), Uppsala and Stockholm.[523] Of the published examples, the best described are those from Helgeandsholmen, Stockholm, where 29 cowmouth shoes and numerous fragments, dated to the 16th century, were found. Here, in addition to square-toed and wider, round-toed soles, also horned variants of soles occur. The uppers of cowmouth shoes are typical low-cut

Fig. 72. Detail from St. Olav sculpture, with long outcurving toe. Ca. 1250s, Fresvik church, Norway.[537]

forms. The construction of cowmouth shoes is welted. Interesting are the six soles with left/right shaping but with blunt toes and remains of welted construction, dated to the 15th century. They have been interpreted as shoes of the transitional stage between the Middle Ages shoe types and the Modern Period shoe types.[524]

In Norway, Early Modern Period shoes have been found in Trondheim. They are dated from ca. 1500 onwards. All of them are welted shoes with high vamps and low quarters.[525]

In Estonia, cowmouth shoes have been found in Pärnu. They are dated to the beginning of the 16th century. Two of these are low-cut shoes with rounded foreparts. One shoe has a horned shape with only a toe covering vamp. The construction is also welted in Pärnu shoes. An interesting notion is that a part of these shoes are children's ones. From the same contexts as cowmouth shoes, front-laced shoes were found.[526]

An extensive, although not very closely-dated sample of Early Modern Period shoes comes from London. Of the very wide cowmouth shoes, there are only a few examples, mostly composed of soles. Square-toed shoes are more common. They occur both with high-cut vamps and low-cut shoes. Square-toed shoes were in common use in London from at least 1480.[527]

Another extensive sample of Early Modern Period shoes with several variations of sole and upper forms is from the Netherlands. Here too, the problem of the material deriving from different towns is

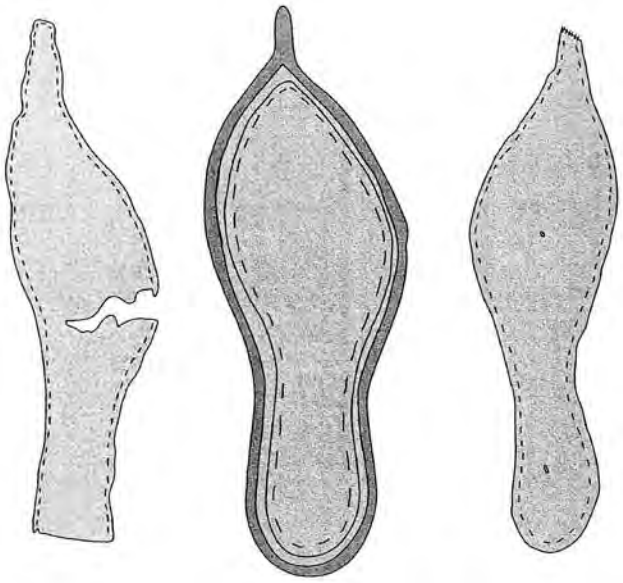


Fig. 73. Three different types of soles for shoes with tip extensions.[547]

the lack of closely-dated contexts. In addition, Goubitz presents some shoes from Belgium.[528] In Switzerland, Early Modern Period shoes have been recorded in Vevey.[529]

4.2 Style phenomena not connected to one shoe type

4.2.1 Extended tips in shoes

Extended tips could be described as the piked toe tips in shoes, extending further than the normal reach of the toes.[530] Different terms have been used either as a general term for medieval pointed shoes or meaning specific types of pointed toes of different lengths or forms or from different periods. The terms 'schnabel' or 'extended tip' of German origin are sometimes used as a general term,[531] or meaning specifically a late medieval pointed type.[532] In this study, the term *extended tip* is used when discussing the Turku finds. The distinction of different forms and lengths of extended tips is made by description, not by using different terms.

According to Goubitz, the phenomenon of pointed toes first appeared in the Carolingian period and subsequently kept reappearing until the first half of the 16th century. During the long period, the pointed shape displays a wide range of variations.[533] In the pointed toes of Scandinavia, at least two different styles and periods can be distinguished. The early 'skewed toe'[534] usually turned outwards to the side (Fig. 72). The longest of these were known as serpents' tails or rams' horns in the late 11th century England and France. These kinds of pointed toes occur from the late 11th century to the 13th century in Scandinavia. The peak seems to have been in the 12th century, especially in the latter half.[535] Early pointed toes are quite frequent in sites where early medieval layers have been excavated.[536]

Fig. 74. A tailed-toggle fastened shoe with a short extended tip, visible on the sole as a sharp point, but more clearly on the upper (TMM 21816: NE504128). Late 14th century - turn of the 15th century.

Of the late medieval type, terms 'Crakow' or 'Poulaine', from a supposedly Polish origin, or 'Pike', have been used.[538] The second phase of pointed toes occurred from the 1350s onwards till the late 15th century, although at least in England, there was a hiatus in pointed toes in the early 15th century.[539] About the possible fluctuations in pointed toe fashion in the rest of Europe during the late Middle Ages, there is no certain information. In England, the sumptuary law of 1368 restricted the length of toes to two inches (5.2 cm). The same was repeated in 1463, but now the restriction only concerned those under the state of lord.[540]

Late medieval pointed toes have been found in fewer sites than the early type. In Sweden, they occur in the 14th - 15th century excavation materials from Stockholm, Uppsala and Lund.[541] In Denmark they have been published from the 14th century Boringholm.[542] A representative sample from the 14th and 15th centuries comes from London.[543]

Problems concerning 'toe extensions' in archaeological shoes have been caused by the slightly confused terminology and definitions. Sometimes a pointed toe has been seen as a 'short extended tip' and sometimes only as a 'sharp toed shoe'.[544] Another problem is that short extended tips in shoes have not necessarily been consciously observed so they can have been left without discussion and thus without a reader's observation especially if there are no figures. This causes underrepresentation of short extended tips, of course.

Detailed descriptions and analyses of toe-extensions, whether called extended tips, pointed toes, pikes, or whatever the term, are few. One detailed analysis of extended tips is from London, where the toe length has been expressed as a ratio between the length of the shoe beyond the position of the toes (estimated by impressions on the sole) and the length of the wearer's foot. Also, the correlation of extended tips with certain shoe types has been analyzed.[545]

Another important analysis of tip extensions is by Koch discussing the material from Borgund. Most essential are the three possible methods of making a tip extension (Fig. 73). In the first case the sole itself has an integral tip extension. The second option is that the sole has a pointed toe but the actual extension has been created by the rand. In the third case the point is a separate extension stitched to the tip of the sole. In the second type toe extensions, if the rand is missing, it is not possible to observe the extension from the sole itself.[546] This, of course,

Fig. 75. Three toe extensions, 'long extended tips' on soles. From left to right: TMM 21816:NE503191, NE50348, NE50429; the inner (flesh) sides. Late 14th century - turn of the 15th century.

can cause underrepresentation of tip extensions observed from soles (which is the typical method!).

4.2.1.1 Extended tips in Turku shoes

Extended tips have been found in four sites in Turku. These are Uudenmaankatu (survey 1954), Uudenmaankatu between Brahe's Park and Porthan's Park (survey 1963), the Aboa Vetus Museum (excavation 1992-1995) and the ÅA-site (excavation 1998). The most representative material from the ÅA-site is discussed first.

Some kind of toe extension has been noted in 42 cases at the ÅA-site. If this number is compared to the number of soles measured (538), there is an extended tip in ca. eight per cent of shoes. Most extensions have been observed in soles, either with or without an upper. There are also a few uppers with extended tips without soles, too. Extended tips made by using the rand have not been noted at the ÅA-site. All the extended tips have been made with an integral toe extension on the sole. It must be noted that the shortest extended tips are visible in soles only as sharp toes, but if the upper is preserved, the extended tip is much more prominent on the toe end, which forms a point extending beyond the normal reach of toes (Fig. 74). These short extended tips are the most common type and have been noted in 36 cases (86 per cent of all extended tips at the ÅA-site).

In six cases (14 per cent) the extended tip is 'long', i.e. it forms a clear extension beyond the toes. The typical length of short extended tips is ca. 2.5 cm. In long extended tips, the lengths of three curtailed ones are now 3.5 cm, 3.5 cm and 2.5 cm. The lengths of the three whole extended tips are 4.5–5 cm, 4.5 cm and 6.5–7 cm (Fig. 75).

All the long extended tips seem to curve slightly outwards. Whether they originally curved upwards, too, cannot be concluded from the finds, mostly composed of soles. Soles with long extended tips have a narrow waist with a distinct curve. The soles with short extended tips vary from the narrow waisted to more broad waisted and from a slight, concaved curve to more sinuous shape. The dating of the ÅA-site extended tips is as follows (Table 51).

It seems that both short and long extended tips appear in the latter half of the 14th century but while long extended tips are concentrated to the latter half of the 14th century - first half of the 15th century period, the shorter extended tips still occur to some extent during the latter half of the 15th century.

At other sites in Turku, only short extended tips occur. In Uudenmaankatu (surveys of 1954 and 1963) altogether four extended tips occur. Of these, three are uppers only, and one is an upper with a sole. The extended tips have been constructed by a pattern and moulding of the toe of the upper. In the case where the sole has been preserved, it has a sharp toe. The Aboa Vetus Museum extended tip differs from the other short extended tips in the sense that in the

Table 51. Dating of extended tips from the ÅA-site.

Phase	Number of finds (short extended tips)	Number of finds (long extended tips)
latter half of the 14th century	5	1
latter half of the 14th century - first half of the 15th century	20	5
latter half of the 14th century - 15th century	3	-
latter half of the 14th century - beginning of the 16th century	5	-
latter half of the 15th century - beginning of the 16th century	1	-
secondary contexts	2	-

tip of the sole there is a small extension and the shape of the rand follows this. In this case the extended tip is composed of the shape of the sole and the rand.[548] The toe of the upper has not been preserved.

In what shoe types do extended tips occur? In Turku, there is no information on the shoe types with long extended tips. Short extended tips occur in strap shoes, tailed-toggle fastened shoes, side-laced shoes, front-laced shoes and boots. The percentages in which an extended tip occurs in these shoe types are: side-laced shoe (7 per cent), front-laced shoe (2 per cent), strap shoe (5 per cent), tailed-toggle shoe (7 per cent) and the boot (25 per cent). The shoe types where extended tips do not occur are thong shoes and buckled shoes.

The lowest percentage of extended tips is in the front-laced shoes. This is interesting because it could be assumed that most extended tips would occur in most popular shoe types.[549] This is not the case with front-laced shoes. However, it must be taken into account that the occurrence of extended tips is probably strongly correlated with the dating of shoe types. This could explain the lack of extended tips in thong shoes, which are too early for extended tips which appear in the latter half of the 14th century. This is the same period when thong shoes disappear in Turku. The lack of extended tips in buckled shoes could be more of a conscious choice. Even if this shoe type was used in the 'period of extended tips' (first half of the 15th century, possibly late 14th century), extended tips do not occur. It seems that pointed toes or short extended tips have not been part of the pattern of buckled shoes in Turku. In buckled shoes, rounded toes are preferred. That a large percentage of front-laced shoes are dated to the latter half of the 15th century could explain the low percentage of extended tips, no longer so popular in that period.

The high percentage of extended tips in boots is due to the small number of finds (only four boots). Anyway, it is interesting that extended tips do occur in boots and in other types of high shoes, too (tailed-toggle fastened shoes). The high percentage of extended tips in boots has been noted, for example, in Boringholm;[550] so Turku is not a curiosity.

The question of the occurrence of extended tips in certain shoe types remains largely an open question in Turku. This applies especially to the occurrence of long extended tips. Short extended tips seem to occur in most shoe types of the late 14th century - 15th century. An exception is the buckled shoe where extended tips do not occur. More closely-dated finds are needed to solve the question of the differences in the frequency of occurrence of extended tips in different shoe types in Turku in different periods.

On the basis of the present material, long extended tips only occur in adult sizes in Turku. On the basis of the few measurable soles, it cannot be judged whether these were men's or women's shoes. Short extended tips occur mainly in adult sizes. Both men's and women's sizes occur but the material is too small for any judgements about the differences of gender in the use of short extended tips. To some extent, short extended tips occur in the juvenile sizes. They are lacking in smaller children's shoes, however.

From written and pictorial sources we know that extended tip shoes had a quite strong relation to fashion and status. Simply, the longest extended tips were most fashionable and they were used by people of high status. The small number of archaeological finds of long extended tips in Turku could be interpreted as reflecting the fashion available only for those with an adequate status, whatever that was.

The occurrence of short extended tips is a more difficult question. These occur in fewer than 10 per cent of shoes but are still much more frequent than long extended tips. They also occur in shoes which do not show any other signs of higher status in type, material, pattern or construction. The low percentage, still higher than that of long extended tips, could be interpreted as short extended tips being the more common extended tip form, available for a wider circle of customers.

4.2.2 'Suede' shoes

In chapters describing the shoe types it was noted that a small number of shoes were made in a different way from the others. Unlike the bulk of the shoe material, the uppers of these shoes were made with the flesh side of the leather outwards. The result is a suede-like[551] appearance and feel.[552] It was noted in seven adult sized side-laced shoes and two tailed-toggle shoes of children's size (Fig. 16). What could be the reasons for the different manufacture of these shoes? Firstly, on the basis of the technical quality these shoes are professionally made. Thus, they are not a result of the lack of acquaintance with the prevailing methods of making shoes. Nine shoes cannot be passed off as sheer curiosities either.

The phenomenon of suede-like shoes is not restricted to Turku. Goubitz writes about medieval shoes in the following way: 'In some cases, the upper of a shoe was made with the flesh side facing outward. In medieval times, this was mostly reserved for luxury footwear, the velvety texture of the carefully scraped flesh side lending the shoe extra distinction'. Goubitz mentions that especially side-laced shoes (variant II of type 50) sometimes have the flesh side of the upper outwards.[553]

Suede-like shoes have seldom been individually described. In the material from Boringholm, two shoes of this kind described by Koch were found. The first one is a tailed-toggle fastened shoe and the other an upper without the fastening preserved. In the latter case the shoe was of goat leather, had an extended tip and openwork decoration. Besides Boringholm, Koch mentions a side-laced shoe from Roskilde with a flesh side of leather outwards.[554] Like Goubitz, Koch considers the fine appearance as the main reason for this kind of shoe. According to her, stitching shoe components, for example, inserts, topbands and tailed-toggles through the

Fig. 76. A children's strap shoe with openwork decoration from the Old Great Market Place (TMM 20764:1782). Length of the sole 11 cm. Late 13th century.

grain side of leather was technically demanding and time consuming because of the hard grain side and its sleek surface. This made shoes of this kind more expensive than normal shoes.[555]

In Turku, suede shoes were probably made to distinguish them from the bulk of ordinary shoes. The phenomenon could be considered fashion, but it is difficult to conclude how widespread it was. The finds are very few, but the reason for this could be the poor archaeological manifestation of high fashion artefacts among usual finds.

The most interesting thing is that the phenomenon is strongly, even if not solely, connected to side-laced shoes. This is true of Turku as well as of many other sites in Europe. Not all side-laced shoes were luxury shoes but when luxurious attributes do occur (extended tips, openwork decoration, suede-like upper), the shoe type in question frequently is a side-laced shoe. A good example of a shoe with these attributes combined (shoe type, extended tip, suede-like upper) is a side-laced shoe from Toledo, Spain, found in the attic of a house.[556]

What explains the occurring of the suede phenomenon in two children's tailed-toggle fastened shoes in Turku then? The reason must be the bootee-like comfort achieved by the supple shoe uppers. Reasons for the rarity of these shoes could be the technical difficulty in manufacture, the poor water and abrasion resistance of the suede shoe and the poor archaeological representation. These factors could partly explain the rarity of adult shoes of this kind. A possibility that suede shoes were an indoor fashion for those who did not have to go out very often must be taken into account, too.

4.2.3 Decoration of shoes

There are several techniques that have been used in decorating shoes in Turku. A short description is needed to understand the different techniques.[557] In *impressed* decoration (Fin. *painettu koristelu*), sometimes also called *creasing* or *veining*, the surface of leather is moistened and worked with hard, smooth tools, *creasers*, to make impressions on the leather. Because of the compression of the leather a dark line or area will appear in these places. In *incised* decoration (Fin. *viiltokoristelu*)[558] the surface

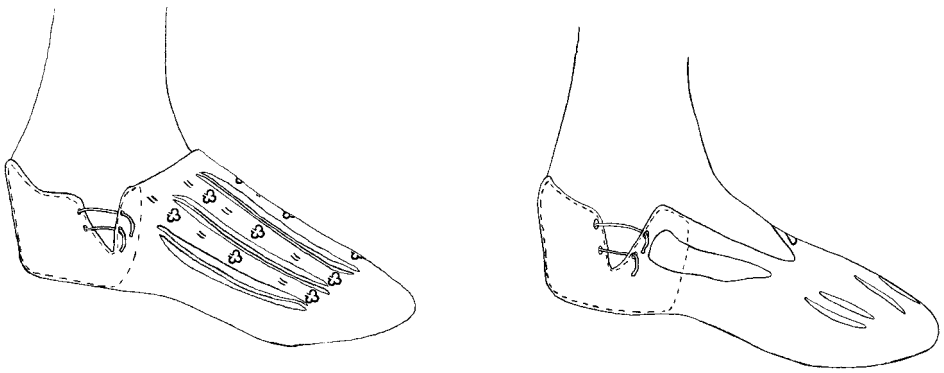


Fig. 77. Two side-laced shoes with openwork decoration from Turku Castle. Left, KM 96001:4403; right, 4556. The missing parts have been marked with a broken line. Late 13th century - 14th century.

Fig. 78. A leg part of a shoe decorated with dentition and perforations (TMM 21816:NE13524); the outer (grain) side. First half of the 15th century.

of leather is cut with a sharp, cutting tool (with a knife, for example). In *engraved* decoration (Fin. *kaiverruskoristelu)*, sometimes also called *gouging (*Fin. *uurtokoristelu)*, the surface of leather is tooled in a way that an amount of leather is removed. The cut is usually wider than in an incised decoration. A knife or special gouge-like tools can be used. In *slashing* (Fin. *läpiviilletty koristelu*) the incisions are cut through the leather. The term slashing is used, when no leather is removed in cutting. If leather is removed by cutting to make, for example, decorative edges or openwork patterns, the technique is called *excision*. In *punching* (Fin. *meistaus*), unlike in stamping, the tool and decoration go through the leather. The punch tools can be used either to make slash-like motifs or openwork decoration. In *scratching* or *scraping*, the surface of the leather is scraped or scratched to make a contrast between the matt parts of the scraped area and the glossy surface. In *stabbing*, the decoration motif is formed of several nearby stitches through the leather. With these decorative techniques a variety of different results have been achieved.

4.2.3.1 Openwork decoration of vamps

Punched openwork decoration occurs in only one shoe from the town area. A small children's strap shoe from the Old Great Market Place (excavation 1989) has the vamp decorated with punched lozenges (Fig. 76).[559] The shoe can be dated to the end of the 13th century by its find context.

Punching and punching combined with slashing occurs in the two side-laced shoes from Turku Castle (excavation 1978–1985) (Fig. 77).

Of the first shoe, only the vamp has been preserved.[560] It has been decorated with three strips, executed by slashing, extending from the toe to the instep. Between the strips, there remain narrow strips, formed by slashing, attached to the vamp from both ends. The broader strips are decorated with *trefoils* (Fin. *kolmilehti* or *apila*). They are made either by punching or cutting. Their base remains fastened to the vamp. The decoration is completed by paired cuts between the trefoils.

The exact context of this shoe is uncertain but because all the other leather material from the eastern outer bailey excavations come from the lowest, organic layers, this find probably does so, too. Close parallels for the shoe come from Schleswig and Århus. The shoes from Århus date to the 14th century and the shoes from Schleswig from the 13th century to the 14th century.[561]

The second shoe from Turku Castle is also a side-laced shoe.[562] It was found next to a timber structure dated dendrochronologically between the years 1296 - 1315. Only a vamp part has been preserved. With the same slashing technique that was used in the previous case a very open instep with decorative cuts was created. The purpose of the slashes was probably to show the coloured lining of the shoe or the hose. Parallels to this shoe, shoes with longitudinal slashes on the vamp, come, for example, from Riga (13th century) and Schleswig (13th and 14th centuries).[563]

Openwork decoration achieved by slashing, excision and punching is mainly a phenomenon of the 13th and 14th centuries. After the early 15th century, the footwear fashion started to be dictated more by the shape of the shoe than the decoration.[564] Carefully executed and time consuming openwork decoration has frequently been connected to upper-class footwear, from wealthy burghers to royalty. More simple openwork decoration sometimes occurs in the footwear of the common people.[565]

Fig. 79. A front-laced shoe with its leg part (TMM 21816: NE110139); the outer (grain) sides. Late 14th century - early 15th century.

In the inventory of Bohus Castle of King Magnus Eriksson in 1340, 30 pairs of openwork shoes (Swed. uthugnæ sco) were mentioned.[566] Geoffrey Chaucer writes in the Canterbury Tales about clerk Absolon who had red hose and shoes with carved windows of St. Paul's Cathedral, 'With Poules window corven on his shoos / in hoses rede he wente fetisly' (The Miller's Tale, I (A) 3317–3318).[567] The closest parallels to the openwork shoes of Turku come from Schleswig. Openwork shoes also come from nearer sites, Lund, Örebro, Tallinn, Tartu and Riga.[568]

4.2.3.2 Decoration of foot openings of shoes

The most common form of shoe decoration in the town area of Turku is the decoration of the foot openings of shoes. This occurs in the upper edges of separate leg parts of shoes, too. With punching, excision and slashing and using combinations of simple motifs, a variety of geometrical patterns have been created (Fig. 78).

The single motifs noted are the following:

- dentition on the upper edge of the leg part; this has been done either with using punch of by excision; punching is more frequent
- fringes on the upper edge of the leg part, executed by slashing
- rows of different geometrical motifs, executed by punching
    - round perforations
    - oval perforations
    - square perforations
    - stellar perforations
    - triangular perforations

By using single motifs or combinations of these, the following patterns have been created. The number of cases is in brackets:

- dentition on the upper edge (4)
- dentition on the upper edge + a row of round perforations below (26)
- dentition on the upper edge + two rows of round perforations below (1)
- dentition on the upper edge + rows of round, square and round perforations below (1)
- dentition on the upper edge + a row of round perforations below and row of cross-motifs (each formed of five round perforations) below (1)
- fringes on the upper edge (2)
- fringes on the upper edge + a row of round perforations below (1)
- a row of round perforations (9)
- two rows of round perforations (8)
- a row of stellar perforations (1)
- a row of oval perforations (1)
- two rows of triangle perforations (1)
- rows of round, stellar and round perforations (1)

At the ÅA-site, this kind of decoration occurs in ca. 14 per cent of separate leg parts. The most common decoration motif is dentition on the upper edge of the leg part with a row of round perforations below. The second common motif is the row or two rows of rounded perforations. The third common motif is only a dentition on the upper edge. Other motifs and combinations occur mostly as single examples. To what shoe types do these leg parts belong? Only one leg part has been found together with an upper

Fig. 80. Patten straps with geometrical decoration. Top, from left to right: TMM 21816:NE5056, NE2017, NE50913. Middle: NE2015, NE509126, NE11084. Bottom: NE2021, NE17396, NE12822. Late 14th century - 15th century.

of a front-laced shoe of Goubitz type 60 (Fig. 79).[569]

In many cases one has to, and fortunately can, conclude the shoe type from the separate leg part. On the basis of the round lace holes, most of the separate leg parts belong to shoes with frontal lace-up fastening (Goubitz type 60). More problematic are those separate leg parts with tailed toggles (or teardrop shaped holes for toggles). In chapter 1.4.2 it was concluded that these come either from tailed-toggle fastened shoes or strap shoes or both. It seems that at least the decorated examples come from tailed-toggle fastened shoes.[570] I base this suggestion on the observation that decorated edges occur in two cases in integral leg parts of tailed-toggle fastened shoes.[571] For strap shoes, there are no such examples.

Almost all separate decorated leg parts represent types with either lace- or toggle holes. There is one leg part with dentition and a row of round perforations which is only two cm high and without lace- or toggle holes.[572] It could almost be called a topband with decoration.

In addition to the two tailed-toggle fastened shoes mentioned above, decorated foot openings of integral leg parts occur in two side-laced shoes. In a shoe from the ÅA-site, there is a dentition on the edge of the foot opening and two rows of round perforations below this. In a high child's shoe from Uudenmaankatu, there is a dentition and a row of round perforations below (Fig. 19).[573]

Close parallels for the decorated foot openings have been found especially in Scandinavia but to some

Fig. 81. Patten straps and toe caps with dentition. Top, from left to right: TMM 21816:NE16426, NE11083, NE20215. Bottom: NE13462, NE509336. Late 14th century - 15th century.

extent also from other parts of Europe. Decoration of foot openings seems to have been frequent in front-laced shoes. From Helgeandsholmen Stockholm come shoes with frontal lace-up fastening (Swed. snörstövel), the most common style of which has a separate leg part with dentition on the edge and a row of round perforations below. Leg parts occur without dentition, too, and some leg parts have complex, geometric openwork patterns. The dating of these shoes with frontal lace-up fastening is the 14th and 15th centuries.[574] Besides Stockholm, separate leg parts of front-laced shoes with dentition and row/rows of perforations have been found in Linköping, Uppsala, Boringholm and Schleswig. In Boringholm, dentition and a row of perforations occur in an integral leg part of a front-laced shoe, too.[575]

Another shoe type with decoration on the foot opening is a tailed-toggle fastened shoe. In Criblet, Fribourg (Switzerland) there are tailed-toggle fastened shoes from the 14th century and beginning of the 15th century, which have a separate leg part decorated with dentition of the edge and a row of round perforations below.[576] From Svendborg come two tailed-toggle fastened shoes, dated to the 15th century, with an integral leg part with dentition on the edge.[577]

The decoration of foot openings seems to occur in side-laced shoes, too. The motifs are the same, dentition and/or rows of perforations. Most of the shoes of this kind have been dated to the 14th century although some could date to the late 13th century. Side-laced shoes with decoration on the foot opening have been found in Skara, Lund, Schleswig, Hamburg and Criblet in Fribourg (Switzerland).[578]

Thus, it seems that decoration in foot openings occur in the same shoe types, front-laced shoes, side-laced shoes and tailed-toggle shoes in Turku as in other sites of Europe with similar finds. An exception is a split-pullstrap fastened shoe from the 14th century Leiden, the Netherlands with dentition and a row of round perforations on the foot opening.[579]

4.2.3.3 Decoration of patten straps and toe caps

Patten straps in Turku have been decorated with punching, excising, engraving, scratching or scraping and stabbing.

In 45 patten straps of the ÅA-site in which a definition is possible, some form of decoration occurs in 29 cases, which is 64 per cent of the patten straps. The decoration of toe caps is of roughly the same percentage. Of the nine toe caps of the ÅA-site, five (56 per cent) are decorated. The patten strap finds from other sites than the ÅA-excavation are not decorated.

Fig. 82. Patten straps with stabbed decoration. Left, TMM 21816:NE509375, from a context of a late 14th century - early 16th century; right, NE12824, late 14th century - early 15th century.

The most popular form of decoration in both straps and toe caps from the ÅA-site is the *linear decoration* (Fin. *viivoitus*) executed by engraving. It occurs in 16 decorated straps and in four toe caps. The motifs range from simple lines to more complex patterns composed of different lines (Fig. 80).
In one case the lines have been impressed with a creaser (see chapter 3.4.3 of Part II of leatherworking tools) instead of an engraving tool. In five cases engraved decoration has been combined with scratching and in two cases with dentition. *Excised or punched dentition* on the front edge of the patten strap occurs in five straps (Fig. 81).
Dentition has twice been combined with engraved linear decoration. Dentition also occurs in three toe caps on their front edges. In two of these cases, dentition has been combined with scraping and engraved, linear decoration.
Stabbing has been used in forming geometric motifs on patten straps (Figs 38 and 82).
This kind of decoration occurs in eight patten straps. On the basis of the imprints of thread, in one case there has been a thread stitched with a running stitch using these stabbed stitch holes. In addition, there were remains of actual threads in the stitch holes in two straps.[580] According to the analysis by Heini Kirjavainen (Appendix 3), the material of both was non-plied, s-twisted hemp yarn. According to Kirjavainen, the non-plied threads fit well to the supposed decorative function of threads in these patten straps. In one case stabbing has been combined with engraved and scraped decoration (strap NE17396 in Fig. 80).
Comparison of patten decoration to finds from other sites in Europe is difficult because there are only a few publications discussing the subject. According to Goubitz, the decoration technique of patten straps of wooden pattens in the Netherlands is almost always stabbing, in some cases with decorative stitching using the stabbed holes. Of the other decoration techniques, only impressing occurs sometimes.[581] Here is a clear distinction to Turku material where engraving is one of the main methods of patten decoration although stabbing and impressing occur, too.
In the patten straps of London, painting, stamping, and the most common of all, stitching, occur. It seems that in London, too, engraved patten straps are lacking.[582] Of the decorated patten straps of Stockholm, only one, with stabbed decorative motif, has been published.[583] Parallels for the engraved pattens straps of Turku have so far been published from Gdańsk, where engraving seems to occur along the stabbed/stitched decoration.[584] Another common decorative form with the Turku finds is the dentition on the edge of the toe cap.[585] This appears in the patten toe caps of Lübeck, too.[586]
The decorative motifs in the patten straps and toe caps in Turku seem to, at least on a general level, be similar to the motifs occurring in the patten straps at other sites of Europe, i.e. geometric patterns. Certain design conventions were probably dictated by the limited space and shape of straps.[587] More reports of decorated patten straps are needed for closer examination of the similarities and differences between the Turku finds and finds from other sites.

4.2.3.4 Decoration of Early Modern Period shoe vamps

Two Early Modern Period shoe uppers from Turku Castle are decorated. In the first case the vamp has been decorated with stamped[588] rings edging the throat and longitudinal, radial slashes through the upper layer of leather. The inner leather layer is intact.[589] The second upper is an edge of a toe part.[590] The piece is composed of two layers of leather as in the previous shoe. Angular slashing or excision of

Fig. 83. Two shoes from Turku Castle decorated with stamped rings and slashes through the leather. ***(a)*** *KM 96001:707,* ***(b)*** *KM96001: 609. Without a dated context.*

the upper layer of leather reveals more of the inner layer than in the previous case (Fig. 83).

Slashed or punched decoration of different forms was typical for the shoes of the 16th century.[591] Styles of decoration of the first half of the 16th century appear to have come from the German military where the trunkhose of footsoldiers were slashed. Slashed decoration in footwear followed the general dress styles of the period and in some cases made shoes elastic and comfortable to wear.[592]

Decorated cowmouth shoes from archaeological contexts are few. Marstein mentions that in Trondheim, the slashed decoration is typical for the early 16th century shoes.[593] A cowmouth shoe from Goes, Netherlands has a toe part slashed in the same way as in shoe in Fig. 83b.[594]

4.3 Summary

In Turku, the appearance of a later thong shoe occurred at the end of the 13th century as in other comparable sites, especially the towns of central Sweden. Unlike in these Swedish towns, later thong shoes do not occur anymore in the 15th century in Turku, not even sporadically. The dating is the same as in Stockholm, where thong shoes most closely resembling the Turku finds, occur only in the 14th century.

The low-cut shoe from Turku Castle differs significantly from the shoes of the town area. The dating by the find context is from the late 13th century to the 14th century. Typological parallels from Schleswig, Einbeck and Svendborg date the shoe from the latter half of the 13th century to the first half of the 14th century.

Besides the open, low-cut thong shoe, the only ankle thong shoe occurs in Turku Castle. This shoe type, occurring commonly in Europe from the 12th century at least to the 14th century, is lacking from the Turku town assemblage. While the type occurs commonly in the towns of central Sweden, Örebro, Enköping, Söderköping and Uppsala in the 13th and 14th centuries, in Uppsala even in the 15th century, the type has not been found in Stockholm. In this respect, Turku resembles Stockholm.

Strap shoes in Turku appear as early as in the foundation period of the town, the end of the 13th century. It seems that the development follows the towns of central Sweden, where strap shoes are used throughout the 14th century. Strap shoes, however, were used longer in Turku, until the end of the Middle Ages, even if their use after the first half of the 15th century is more sporadic.

Tailed-toggle fastened shoes have been found across a wide area in Europe. Datings to the latter half of the 14th century and the 15th century are similar in different sites. In Turku, tailed-toggle fastened shoes were used till the end of the Middle Ages. That this shoe type was most common as children's shoe applies to Turku as well as most of the other sites in Europe.

Side-laced shoes seem to have quite a short period of use, the end of the 14th century - beginning of the 15th century, with a peak at the turn of the 14th/15th century. Secondly, the number of side-laced shoe finds is low. Thirdly, the low number of shoes found, and that six of the 30 shoes (23 per cent) have been made with the flesh side of leather outwards, suggests the probable fashion phenomenon of side-laced shoes in Turku. The side-laced shoes from Turku Castle were decorated with an openwork decoration not noted in the side-laced shoes of the town area. Another distinguishing factor is that Turku Castle shoes may date to the first half of the 14th century, i.e. they might have appeared earlier in the castle than in the town.

Front-laced shoes mainly appear in Turku sometime during the latter half of the 14th century, even if the first example here is from the second quarter of the 14th century. The dating corresponds well to the datings from the towns of central Sweden but datings of several shoes to the first half of the 14th century from Stockholm seem to be earlier than in Turku. Of course, this can be due to the quite small number of dated early 14th century contexts in Turku.

Besides Turku, front-laced shoes have been found in three other medieval towns of Finland, Naantali, Porvoo and Vyborg.

The dating of closed buckled shoes in Turku, the 15th century, possibly the end of the 14th century and continuing to the beginning of the 16th century is consistent with datings in other sites.
Open buckled shoes of Northwestern Europe have been given a general dating to the 14th century. The typological dating of Turku Castle shoe would be the end of the 13th century or the first half of the 14th century. This would be earlier than the dating of the buckled shoes of the town area. Thus, buckled shoes would appear earlier in the castle than in town. The open style of buckled shoe has been rightly considered rare in Scandinavia. Also the Turku Castle shoe may be considered a fashion shoe of an upper class person.
Boots seem to have had a long period, or periods of use, from the 13th century to the 15th century. The few boot finds of Turku are from the middle of this period, to the 14th century, possibly also to the beginning of the 15th century.
The patten finds in Turku seem to follow the late 14th century - 15th century dating with a possible peak in the first half of the 15th century. In Europe, pattens were most common during this period. The occurrence of decoration in patten straps seems to change at the latter half of the 15th century. The decoration is more frequent and rich in the straps of the late 14th century - early 15th century. Later straps are plain or have much simpler decoration. The occurrence of decoration seems to follow the same trend as was noted in the London patten straps.
The occurrence of pattens in the Mätäjärvi quarter, the Convent quarter and the Cathedral quarter does not reveal anything special about the social context of pattens. Neither does a closer examination of the find contexts help in solving the questions concerning the use of pattens. One thing which has changed because of the recent patten finds, especially the large number from the ÅA-site, is the frequency of pattens compared to other shoe types. This narrows down the ideas about the pattens as pure haute couture fashion or luxury items. On the contrary, it seems that they were available to a wider population, although it is possible that in Turku, too, they were at first shoes of the élite.
A one-piece shoe is a type with ancient roots from at least the Bronze Age in Europe but occurring still in the Middle Ages and after, especially in the Baltic countries and Russia. The simple structure of one-piece shoes was a functional element still practical in the Middle Ages in such conditions where the wear of shoes is heavy, the soil is wet or dirty to a degree of harmfulness to the shoe leather. There would be many outdoor working conditions where it was practical to wear simple, cheap and easily replaceable shoes. In addition, these are attributes which have been suitable for children's shoes. Probably representing an Iron Age tradition, it is possible that one-piece shoes were made in the country instead of the town and brought to town, maybe for sale, and finally transformed into a part of the cultural layers of the town.
Early Modern period shoes have been found in various sites around the Baltic, in Sweden, Norway, Estonia, etc. A problem that applies to parallels for Early Modern Period shoes, even those from London and the Netherlands, is the lack of closely-dated contexts.
The question of the occurrence of extended tips in certain shoe types remains largely an open question in Turku. This applies especially to the occurrence of long extended tips. Short extended tips seem to occur in most shoe types of the late 14th century - 15th century. On the basis of the present material, in Turku, long extended tips occur only in adult sizes. Because there are only a few measurable soles with long extended tips, it cannot be judged whether these were men's or women's shoes. Short extended tips occur mainly in adult sizes. Both men's and women's sizes occur but the material is too small for any judgements about the differences of gender in the use of short extended tips. To some extent, short extended tips occur in the juvenile sizes but are lacking in smaller children's shoes. The small number of archaeological finds of long extended tips in Turku (six cases, ca one per cent of soles) could be interpreted as reflecting the fashion available only for those with an adequate status. Short extended tips occur in fewer than 10 per cent of shoes but are still much more frequent than long extended tips. They also occur in shoes which do not show any other signs of higher status in type, material, pattern or construction. It could be interpreted that short extended tips were the more common extended tip form, available for the wider circle of customers.
In Turku, suede shoes were probably made to distinguish them from the bulk of ordinary shoes. The phenomenon could be considered fashion, but it is difficult to conclude how widespread it was. The finds are very few, but the reason could be the poor archaeological manifestation of high fashion artefacts among usual finds.
The phenomenon is strongly, even if not solely, connected to side-laced shoes. This applies to Turku as well as many other sites in Europe. Not all side-laced shoes were luxury shoes but when luxury attributes do occur (extended tips, openwork decoration, suede-like upper), the shoe type in question frequently is a side-laced shoe. The reason for the occurrence of the suede phenomenon in two children's tailed-toggle fastened shoes must be the bootee-like comfort achieved by the supple shoe uppers. Reasons for the rarity of these shoes could be the technical difficulty in manufacture, the poor water and abrasion resistance of the suede shoe and the poor archaeological representation. These factors could partly explain the rarity of adult shoes of this kind. A possibility that suede shoes were an indoor fashion for those who did not need to go out very often must be taken into account, too.
Decoration of the shoes of Turku is divided into four categories, the openwork decoration of vamps, decoration of foot openings of shoes, decoration of patten straps and toe caps and the decoration

of Early Modern Period shoe vamps. Punched openwork decoration in medieval vamps occurs in only one small children's strap shoe from the Old Great Market Place, dated to the end of the 13th century. Otherwise, it occurs in two side-laced shoes from Turku Castle with a broader dating from the end of the 13th century to the 14th century. The closest parallels to the openwork shoes of Turku come from Schleswig. Openwork shoes also come from more nearby sites, Lund, Örebro, Tallinn, Tartu and Riga.

The most common form of shoe decoration in the town area of Turku is the decoration of foot openings of shoes. This occurs in the upper edges of separate leg parts of shoes, too. With punching, excision and slashing and using combinations of simple motifs, a variety of geometrical patterns have been created. The most common decoration motif is dentition on the upper edge of the leg part added with a row of round perforations below. This kind of decoration occurs in shoes with frontal lacing, side-laced shoes and tailed-toggle fastened shoes. Close parallels for the decorated foot openings have been found especially in Scandinavia where this is mainly a 14th and 15th century phenomenon.

Of the patten straps and toe caps from the ÅA-site, over 60 per cent were decorated. Patten straps from other sites in Turku are undecorated. The most popular form of decoration in both straps and toe caps of the ÅA-site is the linear decoration executed by engraving. Another form of decoration is the excised or punched dentition on the front edge of the patten strap. The third decoration method is stabbing which has been used in forming geometric motifs on patten straps. This was sometimes completed with stitching decorative thread using the stabbed stitch holes.

In Turku, engraving is one of the main methods of patten decoration, while in other published assemblages of patten straps stabbing prevails.

In the first case of the Early Modern Period shoe vamps from Turku Castle, the vamp has been decorated with stamped rings edging the throat and longitudinal, radial slashes through the upper layer of leather. The second upper is an edge of a toe part which is decorated with angular slashing or excision of the upper layer of leather. Slashed decoration in footwear followed the general dress styles of the period and in some cases made shoes elastic and comfortable to wear.

PART II: SHOEMAKING

In the second part of this thesis the focus is on the topics that tell us about shoemaking in medieval and Early Modern Period Turku. Firstly, there are the shoes themselves. In Part I the focus was on the types of different shoes and in their dating. In this part shoes are approached from the technical point of view, from the materials and composition of shoes. Secondly, there is the documentary and archaeological evidence of shoemaking. Sparse documentary information is complemented by actual archaeological remains of leatherworking and shoemaking.

1. COMPOSITION OF ARCHAEOLOGICAL SHOES IN TURKU

1.1 Soles

The majority of medieval tread soles in Turku were cut in one piece. However, there were different possibilities to increase the durability of a single-layer sole. This could happen by adding extra layers of leather on top or below the treadsole. The sole could also consist of only one layer of leather but could be composed of several parts, a so-called composite sole.

1.1.1 Double-layered soles

In double-layered soles a part of a tread sole has a layer of leather added on top (flesh side) of the treadsole as a kind of an insole. Both layers were stitched to the upper at the same time in one stitching. This can be seen in identical stitch holes matching each other. The upper layer of leather usually has a more durable grain side outwards facing the foot. The question is, whether the double-soles should be considered as original features or repairs? At least in Turku, they seem to be original features on the basis that not in all cases the lower treadsole has been worn out, i.e. stitching the inner sole as a repair would have been unnecessary.
The extra layer never covers the whole area of sole. Instead, either the toe part, back part or in some cases both parts, have been covered. There are no cases where the middle of the sole would have been covered with a double layer.
Some kind of double-layering occurs in 20 shoes in Turku. Most of these are separate sole finds, but two have been found with an upper. In the first case the shoe is a front-laced shoe and in the second case a buckled shoe. Most of the double-layered soles come from the ÅA-site (16 soles). Other sites with double-layered soles are Uudenmaankatu 6 with three soles (excavations 1986–1987 and 1988) and Aboa Vetus Museum (survey 1992) with one sole.
Most frequent are soles which have an extra layer on the back part of the sole (17 cases). In one case, there is a double-layer on the toe part of the sole. In two cases both the toe part and the back part have been covered by a double-layer but the middle part has only a single layer of leather. The double-layered soles can be dated by their contexts in Uudenmaankatu 6 site and the ÅA-site. The sole from the Aboa Vetus Museum cannot be dated by the find context. The datings for the first two sites are the following (Tables 52 and 53).
In Uudenmaankatu 6 material double-layered soles occur in two phases. The first context is a late medieval - Early Modern Period context. The occurrence of double-layered soles in the later phase suggests the continuation of these kinds of soles to the Post-Medieval period.
At the ÅA-site, double-layered soles occur equally in both the periods: the latter half of the 14th century - first half of the 15th century and latter half of the 15th century - first half of the 16th century. The same frequency in both periods actually tells us about the more frequent use of double-layered soles in the latter period because of thinner cultural layers with less organic finds. The two soles from the beginning of the 17th century contexts suggest the continuation of the use of double-layers soles to the Post-Medieval period in this site, too.
In Scandinavia, a double-layered sole (in a back part of a sole) has been found as early as the late 12th century in Lund.[595] Later medieval examples from Sweden are from Helgeandsholmen, Stockholm. They are here considered as repairs.[596] An analysis of double-layered soles (Ger. Mehrfachsolen) in Schleswig is by Schnack. In Schleswig, double-layers occur in the toe part and/or back part or they cover the whole area of treadsole. The dating is from the end of the 12th century to the 13th century. According to Schnack, in Schleswig, double-soles

Table 52. Dating of double-layered soles from Uudenmaankatu 6.

Phase	Number of finds
1440/1445 - first half of the 16th century	2
latter half of the 16th century - 17th century	1

Table 53. Dating of double-layered soles from the ÅA-site.

Phase	Number of finds
latter half of the 14th century - first half of the 15th century	4
latter half of the 14th century - 15th century	1
latter half of the 14th century - beginning of the 16th century	1
first half of the 15th century	1
15th century - beginning of the 16th century	2
latter half of the 15th century - beginning of the 16th century	5
beginning of the 17th century	2

are original features, not repairs.[597] Double-layered soles have been found in Lübeck, too, where they date to the 13th century.[598]

1.1.2 Composite soles

So-called composite soles (Ger. Teilsohlen) are here defined as soles composed of two parts stitched together with an edge/flesh butted seam. In Turku, there are two types of composite soles. In the first type the sole is composed of a toe part and a middle/back part (5 cases). The second type is composed of a toe/middle part and a back part (7 cases) (Fig. 84).

Composite soles have been found in two sites, the Aboa Vetus Museum (two composite soles from the 1992–1995 excavation) and the ÅA-site (10 composite soles from the 1998 excavation) from where most of the composite soles in Turku come. The datings for the composite soles are the following (Tables 54 and 55).

The two composite soles from Aboa Vetus Museum date to the first half of the 14th century.

At the ÅA-site, composite soles occur from the latter half of the 14th century onwards. They still appear in the first half of the 15th century. Their occurrence after that is uncertain but possible.

In Scandinavia, composite soles have been reported from Lund and Oslo. Their dating is early medieval.[599] In Germany, composite soles come from Schleswig (11th to 14th century) and Lübeck (13th/14th century).[600] Soles composed of two parts are common in medieval London, especially in large shoes, for example, in late 14th century extended tip shoes.[601]

The same question that applies to double-layered soles, whether they are original features

Fig. 84. A composite sole with a separate toe/middle part and a back part (TMM 21816:NE504361); the inner (flesh) side. Late 14th century.

Table 54. Dating of composite soles from the Aboa Vetus Museum.

Phase	Number of finds
first half of the 14th century	2

Table 55. Dating of composite soles from the ÅA-site.

Phase	Number of finds
latter half of the 14th century	3
latter half of the 14th century - first half of the 15th century	4
first half of the 15th century	1
latter half of the 14th century - beginning of the 16th century	3

or secondary repairs, applies to composite soles likewise. Schia considered the composite soles from Oslo as secondary repairs, i.e. the two part sole has replaced the original one-piece sole in repair.[602] According to Schnack, the composite soles in Schleswig are original features and the reason for the construction was the economical use of leather, that even small parts of leather were used for shoes.[603] Goubitz, too, presents the principle of thrift as a possible reason for the composite soles.[604] Grew & de Neergaard and Goubitz have another possible explanation for the composite soles. Two-part soles made the replacement of worn-out sole parts easy.[605] As Goubitz writes, 'The medieval cobbler would then turn the shoe back inside-out, make a cut right across the sole, and detach the worn part from the upper. Using the existing stitch holes in the upper, he would then insert a new partial sole, after which the transverse cut was stitched up.'
Thus, the original two-part construction made the replacement of partial soles possible. When these partial soles are found from archaeological sites, it is usually impossible to say whether the sole part is original or a replacement.[606] The construction itself, however, is original in either case. I consider the composite sole finds in Turku to be original features. When making a shoe, the shoemaker has equipped the shoe with a two-part sole. The reason for the practice could equally well have been the economical use of leather as the easier replacement of a worn out sole part.

1.1.3 Wood-pinned outer soles

Some turnshoes in Turku were equipped with an extra outer sole. The outer sole consists of several layers of leather, attached with wooden pins. The wood-pinned outer sole was fastened to the shoe in the following way: between the inner sole and the upper, there is a rand slightly wider than in normal turnshoes. The outer sole was fastened to the outer edge of the rand either with stitching or with pins (Fig. 85).

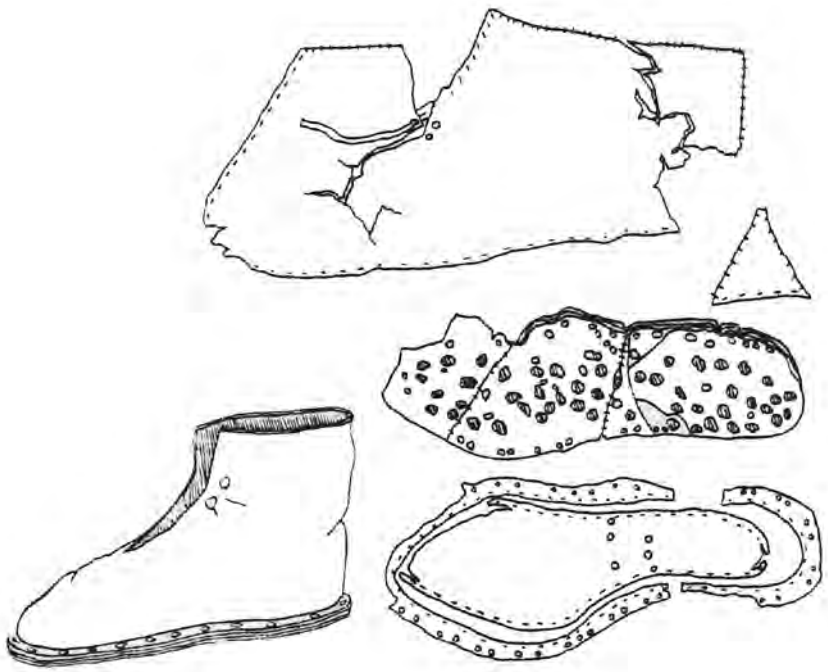


Fig. 85. A front-laced shoe from Helgeandsholmen, Stockholm, with a wood-pinned outer sole preserved as a whole.[607]

Table 56. Dating of wood-pinned soles from the ÅA-site.

Phase	Number of finds
latter half of the 14th century	1
latter half of the 14th century - first half of the 15th century	6
latter half of the 14th century - 15th century	3
first half of the 15th century	1
15th century - beginning of the 16th century	1
latter half of the 14th century - beginning of the 16th century	5
latter half of the 15th century - beginning of the 16th century	3

In Turku, wood-pinned outer soles have been found in three sites, Uudenmaankatu (survey 1954), Uudenmaankatu 6 (excavation 1986–1987) and the ÅA-site (excavation 1998)[608]. The find from the first site cannot be dated by its find context. It is a partial wood-pinned sole composed of four layers of leather.

Three finds of partial wood-pinned soles come from Uudenmaankatu 6 excavation. Because the finds derive from the same find layer it is uncertain whether they are originally from one sole or from different soles. They can be dated to the earliest phase of the area dated between the years 1384/1429 and 1440/1445.

Most of the wood-pinned soles come from the ÅA-site excavation. Because it is not possible to say from how many soles the 20 finds actually come, or count the minimum number, in this case all finds have been treated as representing one shoe. The dating of wood-pinned soles at the ÅA-site is as follows (Table 56).

From the datings we can see that at the ÅA-site, wood-pinned soles have been used from the latter half of the 14th century to the latter half of the 15th century, possibly even to the beginning of the 16th century.

Unfortunately, no wood-pinned soles in Turku have been found with uppers so it is not possible to say in which shoe types wood-pinned soles were used. Wood-pinned soles seem to be partial soles (Fig. 86).

In ten cases the wood-pinned sole has covered the toe and the middle part of the sole and in six cases the heel part. Even if there are no finds of both toe/middle part and the heel part from the same context it is probable that the wood-pinned sole covered both these parts. Otherwise walking with a partial sole would have been very unbalanced at least with

Fig. 86. A partial wood-pinned sole, probably covering the toe/middle part of the sole, composed of four layers of leather and wooden pins (TMM 21816:NE1369). 16 x 12 cm. Late 14th century - first half of the 15th century.

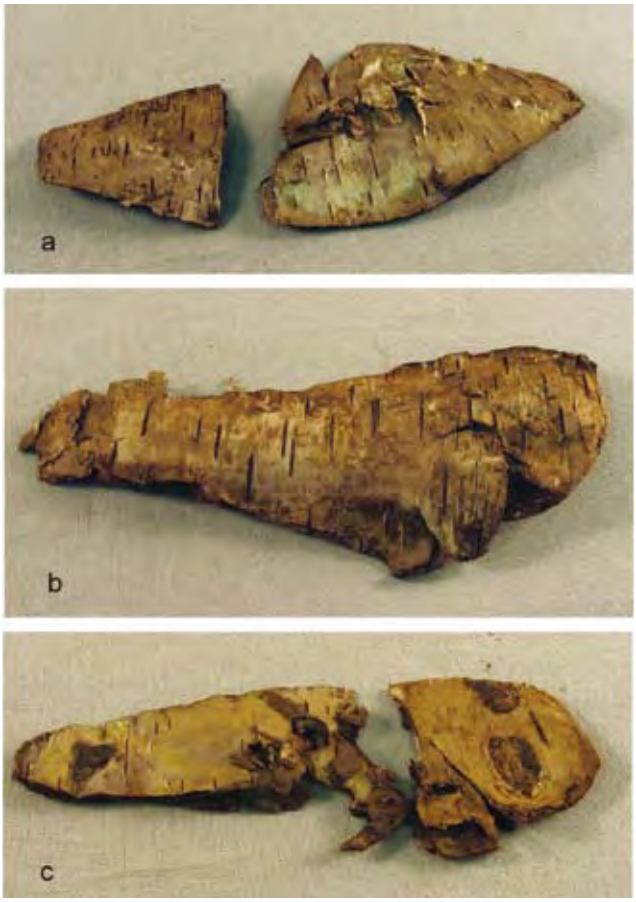


Fig. 87. Sole shaped and sized birch bark pieces from the Cathedral Square excavation. ***(a)*** *TMM 22367: TU1046:001,* ***(b)*** *TMM 22367:TU1039:002,* ***(c)*** *TMM 22367:TU1043:001. The 15th century.*

a partial wood-pinned sole covering the toe and middle part but not the heel. On the other hand, wood-pinned sole on the heel section would have resembled an actual 'heel'. In three wood-pinned soles there are stitch holes along the edge, which proves that the sole was stitched to the rand. There is one example of attaching the wood-pinned sole with pins to the rand. In this case the rand with pin holes along the edge has been preserved.

It has been possible to analyse the material used for pegs in Turku. Seven samples were picked for the analysis. The results show great variation in the choice of woods for pins. Of the seven samples, four were pine (*Pinus sylvestris*), one of lime (*Tilia cordata*), one of birch (*Betula* sp.) and one of aspen (*Populus tremula*).[609]

Additional information on wood-pinned soles comes from a few reported examples from other sites in Europe. In Helgeandsholmen, Stockholm, 47 wood-pinned soles (Swed. Pliggsulan) and 525 fragments were found. The wood-pinned soles were composed of up to five layers of leather which were attached together with wooden pins. The material used for wood-pinned soles was usually re-used leather. The dating of these finds is the 14th and 15th century. Only one wood-pinned sole was found with an upper. It is an ankle shoe with a frontal lacing and two pairs of lace holes (Fig. 85). As the reason for the use of wood-pinned soles, Zerpe & Fredriksson suggest durability and resistance from moisture and dirt.[610]

In Lund, a front part of a wood-pinned sole, composed of three layers of leather, was found in a 15th century well.[611] The tradition of wood-pinned soles has seemingly continued to the Modern Period in Scandinavia. From Trondheim, there are thick forepart soles that have been wood-pinned to the inner sole and which date to the late 16th century.[612] Groenman-van Waateringe mentions that in the 16th century layers in Svendborg, there are 'separate seats tacked to the outer sole with wooden nails' made of *Salix* sp. On the basis of the figure, they seem to be wood-pinned sole constructions similar to those in Turku and Stockholm.[613] Another possible 16th century wood-pinned sole is from Pärnu, where on one sole, 'the wooden pins connecting the different layers of the sole have been preserved in situ'.[614]

According to the publications, wood-pinned sole construction seems mainly to be a Scandinavian phenomenon of the 14th, 15th and 16th centuries. In Turku and in Stockholm, the wood-pinned sole construction goes back to the 14th century. The method of attaching these to shoes, using the broad rand to attach a second, outer sole is an example of a so-called turn-welt construction (see chapter 1.3.2).

1.1.4 Insoles/midsoles of birch bark, felt and plant fibres and the question of winter shoes

There were many different possibilities to increase the warmth and insulation of shoes. This was necessary especially in winter, because of the harsh climate in Northern Europe. A traditional method, known especially from ethnographical contexts, was the use of hair-on boots sometimes with linings of wool or hair facing inside. Another common method has been the use of shoe grass.[615] Even if there are no actual archaeological examples of either of these types in Turku, I suggest that at least the latter type of winter shoes were probably used in Turku in the Middle Ages and later, for the use of shoe grass was both practical and cheap.

There are archaeological examples of the use of birch bark, felt and plant fibres as insulation in shoes in Turku. On the basis of the finds from the Cathedral Square excavation, roughly cut sole shaped pieces of birch bark were used with shoes as early as the 15th century (Fig. 87). How exactly these were placed in medieval single-soled shoes is not clear because no pieces were found inside the shoes, only from the same contexts with these. It could be that pieces of birch bark were simply placed on top of the treadsole without any attachment like the modern day loose insoles. Another possibility is that the birch bark pieces were placed between the sole and the wood-pinned outer sole as midsoles, although there is no evidence of this either.

On the basis of archaeological finds, the use of birch bark as a shoe insulation became more common during the Early Modern Period. There are examples

Fig. 88. Loose insoles of felted wool from Uudenmaankatu 6 excavation (TMM 20671:439). The length of soles 21 and 22 cm. Ca. 1440/1445 - first half of the 16th century.

of the use of birch bark pieces between the inner and outer sole in shoes from Brahenkatu in the Aninkainen quarter and from the Smith's Yard in Turku Castle. The finds from both sites are without a closer dating, but because some of the shoes seem to have proper heels, a 17th century dating is suggested, although a 16th century dating cannot be excluded for some of the finds.[616] As a comparison, there are examples of the use of birch bark between inner and outer soles from Trondheim, dated to the early 16th century.[617] In addition, Goubitz describes and depicts some shoes with an extra filling (cork/wood layer between the insole and treadsole) from the Netherlands (15th century) and also from the arctic contexts (16th century), connected to whaling. According to Goubitz, extra filling between the insole and treadsole was an obvious solution against cold, but, for some reason, not frequently applied.[618]

In addition to birch bark, there is one example of the use of wool for the insulation of shoes in Turku. A pair of loose insoles of felt derive from Uudenmaankatu excavation (Fig. 88). The find can be dated by its find context to the period AD 1440/1445 - first half of the 16th century.[619] It is probable that this solution against cold was much more common than the single find leads us to assume.[620]

In a shoe sole fragment from the ÅA-excavation (a late 14th century - early 16th century context), fibres pressed firmly against the flesh (inner) side of the sole were found.[621] Weave would be a wrong term to describe this kind of 'lining'. It is more like layers of fibres running in two directions but not interlacing with each other as they would in weave.[622] The fibres are pressed against the leather very firmly. Possibly some kind of adhesive was used in attachment of the fibres. Probably, the good quality of hemp in keeping the moisture out was used as an insulation for the shoe. No other archaeological evidence of linings in shoes has been found in Turku so far.

Are there any other indications of winter shoes besides the ones mentioned above? Both shoes with wood-pinned outer soles and pattens kept the moisture (water or snow) out and were probably preferred in bad weather. It could even be that wood-pinned soles were invented as a solution for the moisture problem. Another obvious attribute connected partially to winter conditions is the shoe height - high shoes were preferred in winter. This was already discussed in chapter 3.2 of Part I.

If the archaeological finds of winter shoes are scarce, so are the written sources discussing the subject. It is mentioned, however, that in the Convent and Abbey of Vadstena, Sweden, the brothers wore low shoes with hose in summer. In winter, they wore shoes lined with frieze and hose. In summer, the sisters wore low shoes and stockings (Swed. söckling) reaching to the knees. In winter they wore shoes lined with frieze, both shoes and lining reaching to the knees.[623]

Thus, the most obvious reason for the fact that only a few winter shoes have been found in archaeological contexts was probably that the shoes themselves were mostly the same throughout the year, only the shoe height varying. The warmth and insulation could be increased when necessary by 'loose solutions' such as shoe grass, foot wraps, hose, stockings and insoles which usually were not discarded with shoes.

The warmth and insulation were, however, not the only useful attributes of winter shoes. For the prevention of slipperiness, ice cleats fixed under the shoe could be used. Although there are several examples of these from different sites in Europe,[624] no certain finds have been found or recognized in Turku.

1.1.5 Inner and outer soles of the Early Modern Period shoes

The identification of an inner sole is easiest when either the upper/sole construction has been preserved or when both insole and treadsole have been preserved. In the case of separate sole finds, the

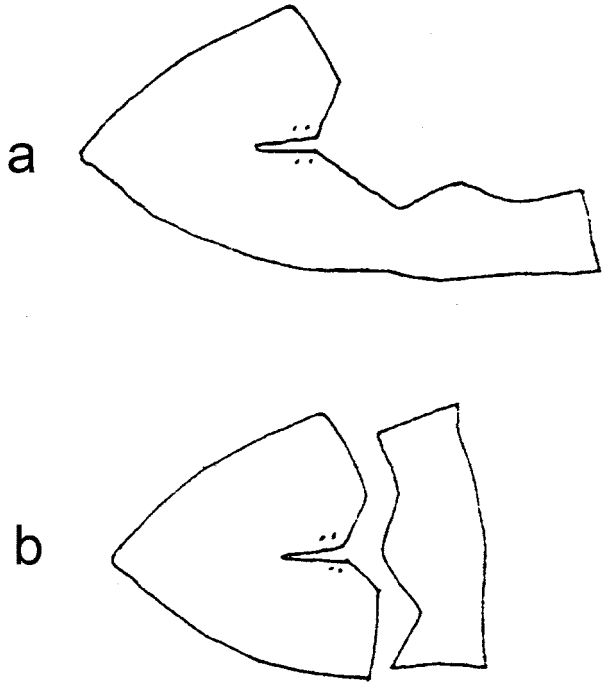


Fig. 89. The two basic cutting patterns of Turku shoes. ***(a)*** *wrap-around pattern,* ***(b)*** *two-piece pattern.*

identification is more difficult. This is because many times, the insole and treadsole have almost identical shape and stitching. In the cases of separate soles, the identification of insoles and treadsoles is based on the patterns of wear.[625]

In Turku, the occurrence of separate inner and outer soles has certainly been noted only in shoes typologically described as Early Modern Period shoes of welted construction (see chapter 1.11.3 of Part I). These have been found both in the town area and in the castle.

However, it was possible to equip shoes with a so-called stitch-down construction with an outer sole, too.[626] Of these, there is only one example in Turku. The sole in shoe TMM 14885:138b–c with a stitch-down construction could be an insole even if this cannot be proved (Fig. 46).

1.2 Uppers

1.2.1 Main pieces and their cutting patterns

In the archaeological shoe material of Turku, two basic cutting patterns of uppers can be discerned. In the first pattern, the upper is composed of one main piece, which is wrapped around and stitched with one vertical or oblique butted seam and shoemaker's stitch on the medial side of the foot. In this thesis this is called a wrap-around pattern. In the second pattern, the shoe upper is composed of a separate vamp piece and back piece. In this pattern, there is a seam on both medial and lateral side of the upper. The second pattern is called a two-piece pattern in this study (Fig. 89).

In these patterns, especially in wrap-around patterns, there are many variations. These include, for example, the exact place of the side seam and the use of inserts. Different approaches to the variants of cutting patterns among scholars can be noted. Eric Schia, for example, partly made the subdivision of shoe types on the grounds of cutting patterns, for which he was also criticized.[627] A different approach is by Schnack. According to her, it is not useful to make typological conclusions on the basis of cutting patterns because different patterns occur even in individual shoes of shoe pairs.[628]

In this study, no special emphasis has been put on the variants of cutting patterns even if I see patterns as a very important part of shoe construction. In theory at least, it might be possible to distinguish the 'handprint' of individual shoemakers from their use of cutting patterns.[629] Also, it would be interesting to know, whether differences in time and place can be noted when it comes to the occurrence of patterns, composed of a large amount of small parts, which are sometimes interpreted as the thriftiness of a shoemaker.[630] However, it is evident that such a detailed study of cutting patterns would need a special study, not suitable for the framework of this thesis.

Even if the variants of cutting patterns were interpreted as not having a clear shoe typological relevance, the *two basic types* of cutting patterns seem to have some correlation to shoe types. First, counting the whole shoe material of Turku, it must be made clear that the wrap-around pattern is the prevailing cutting pattern. It has been used in all medieval shoe types. The occurrence of this pattern is uncertain on the types of the early modern period because of the lack of well enough preserved uppers. Interesting is the occurrence of the two-piece pattern. Shoe types where this pattern occurs are the strap shoe, tailed-toggle shoe, side-laced shoe, front-laced shoe and the boot. The two-piece pattern does not occur in thong shoes or buckled shoes. The two-piece pattern is in a clear minority in strap shoes (3 cases), tailed-toggle shoes (3 cases) and front-laced shoes (one case). Boots and side-laced shoes, however, follow a different scheme. All boots have a two-piece pattern and of the side-laced shoes, 61 per cent have it. The two-piece pattern can be regarded as one of the basic and most common types in medieval boots in Europe so the occurrence in Turku boots is no surprise. The occurrence of two-piece pattern in the majority of side-laced shoes in contrast to every other medieval shoe styles in Turku, however, must be considered as one more special feature in this shoe type.

1.2.2 Other components of uppers

Besides the main piece and possible inserts, several other components may belong to the construction of the upper. In the following, the types and occurrence of heel stiffeners, lace hole reinforcements, topbands, tongues and other parts belonging to uppers are discussed.

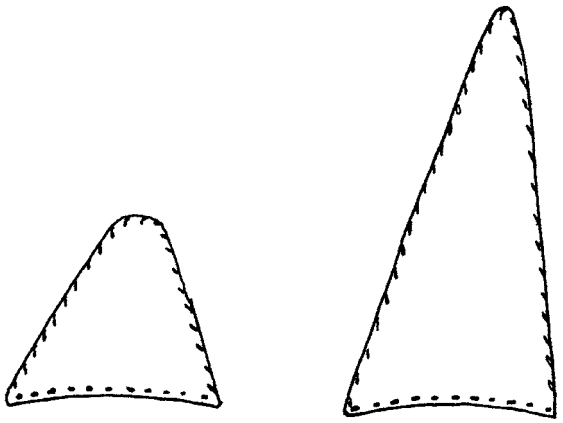


Fig. 90. The basic type of heel stiffeners in Turku.[631]

1.2.2.1 Heel stiffeners

The purpose of the heel stiffener is to make a heel-part of a shoe durable. The use of heel stiffeners seems to be a standard feature in almost every shoe type in Turku. An exception is the thong shoe. In a discussion of this shoe type it was noted that even if heel stiffeners do occur in thong shoes, they are by no means a standard feature. Support for this observation came from Danish thong shoes, which, according to Koch, were sometimes made without a heel stiffener.

All heel stiffeners in Turku are of a same basic type (Fig. 90). The form of a stiffener is triangular with a varying width and height. On the base, there are the typical flesh/grain stitch holes for the attachment to the lasting margin. The edges have imprints of binding stitches with which the stiffener has been stitched on the inside of the upper. Typically, the stiffener has been attached with the more resistant grain side of leather facing the foot.

Heel stiffeners were not made only of leather. From the 15th century layers in the Cathedral Square (excavation 2005), triangular pieces of birch bark, the form of which closely resembles heel stiffeners of leather were found, even if these birch bark pieces are without stitches. It is probable that the pieces were used in shoes with heel stiffeners of leather to give extra stiffness and durability. Parallels come from Helgeandsholmen, Stockholm, where fragments of 16th century Modern Period shoes along heel stiffeners of leather and birch bark stiffeners under them were found.[632] It is not known in which shoe types birch bark stiffeners were used in Turku but it seems that in any case, this innovation goes back at least to the late Middle Ages (15th century) here. Among the Early Modern Period finds from the 17th century, from Brahenkatu, there were birch bark heel stiffeners, which even have stitch holes for the lasting margin (Fig. 91).

Fig. 92. A lace hole reinforcement strip, probably from a shoe with a lace-up fastening (TMM 21816:NE2081). Length of the reinforcement on both sides of the opening vent ca. 20 cm.

Fig. 91. Heel stiffeners of birch bark from Brahenkatu (TMM 17015:48). Ca. 6 x 5 cm. The 17th century.

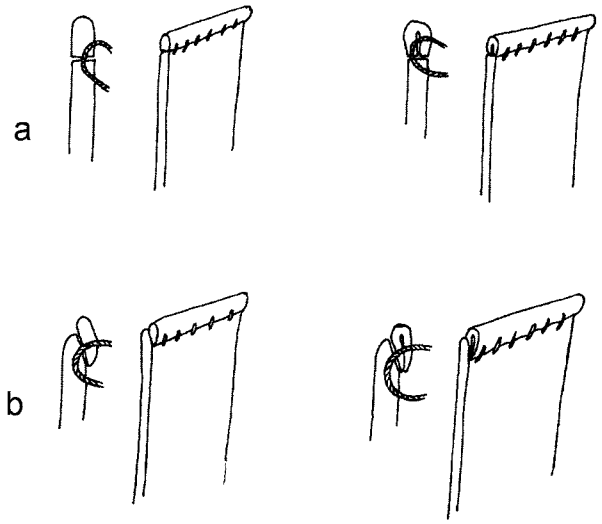


Fig. 93. The two types of topbands in Turku shoes. ***(a)*** *seamed with a butted seam,* ***(b)*** *seamed with a lapped seam.*[633]

Fig. 94. A strap shoe with a tongue preserved (KM 95032:10506). Without a close dating.

1.2.2.2 Lace/toggle hole reinforcements

Sewn on facings, reinforcing lace- or toggle holes occur in three shoe types. They seem to be standard features in front-laced shoes and side-laced shoes. In tailed-toggle fastened shoes they occur only sporadically. Even if uppers have in many cases been found without these reinforcements the occurrence can be inferred from the impressions and stitch holes on the inside of the upper. Lace/toggle hole reinforcements were fastened with a lapped seam and a binding stitch. The grain side of leather usually faces the foot.

The reinforcements are of two basic types. The facing is either of one-piece covering both sides of the opening vent, or composed of two separate pieces (Fig. 92).

In shoes with a frontal lace-up fastening and with a separate leg part, the leg part usually has two separate facings of leather for both sides of the lace holes. In a few cases there are no separate facings. Instead, both edges of the leg part have been folded inside to form a double layer of leather.

1.2.2.3 Topbands and strengthening cords

Topbands are narrow strips of leather, stitched around the opening of the shoe to strengthen the opening. They are usually ca. 5 mm high but some are 10 mm or more and could almost be categorized as low leg parts instead of topbands.

Topbands are of two basic types. The first type has simply a strip of leather stitched on the upper. In the second type, the strip is folded double (Fig. 93). Both the types could have been attached to the upper edge of the shoe in two ways, with a lapped seam or with a butted seam. The stitch type used is always a binding stitch.

Only in a few cases has the topband been found together with an upper. In these cases the shoe types noted are the front-laced shoe, a strap shoe and a buckled shoe. As most of the shoes found in Turku have remains of a binding stitch along the opening, it can be inferred that some kind of topband was a common feature in all shoe types, although the possibility that the binding stitch was for a lining instead of a topband cannot be ruled out.

Strengthening cords are much rarer than edge bindings in Turku's shoes. There are no actual cords preserved, but the existence of these can be inferred from the imprint of the cord and stitch holes of binding stitch along the inside of the shoe opening. The purpose of the reinforcement cord is to keep the shoe upper from stretching. This was useful in low-cut shoes especially if these were made of supple leather. Imprints of strengthening cords have been found in some front-laced shoes and strap shoes - all low-cut. In addition, cords occur in low-cut side-laced shoes in which the use of cord seems to have been a standard. Probably because of the strong convention, strengthening cords were used in side-laced shoes of ankle height, too, in which they would not have been necessary.

1.2.2.4 Tongues

A tongue is a piece of leather sewn into the fastening opening to stop dust or water from entering, or a backwards extension of the vamp, located on the instep of the foot. In Turku, most tongues have been found without uppers. Shoe types which have been found with tongues preserved are strap shoes, tailed-toggle fastened shoes, front-laced shoes and buckled shoes.

In strap shoes, a longitudinal, slightly triangular tongue has been sewn into the transverse slit on the inside of the instep (Fig. 94). This seems to have been a common feature in strap shoes. Even if the

Fig. 95. A tailed-toggle fastened shoe with a tongue (TMM 21816:NE504240). Late 14th century - early 15th century.

actual tongues preserved are few, the imprints and stitch holes are common.
In tailed-toggle shoes, one edge of the tongue has been sewn on one side of the fastening opening to cover it (Fig. 95). How common the tongues in tailed-toggle fastened shoes actually were is uncertain. This is because in this shoe type, tongues were sewn using the same stitches as for the toggle hole reinforcements. Thus, imprints and stitch holes cannot be used for conclusions as to the occurrence of tongues.
The same problem applies to front-laced shoes. Fortunately in this shoe type, there are more examples of uppers preserved with tongues. It seems that in this shoe type, there were three different tongue types. In shoes with a tie-lace fastening and two or three pairs of lace holes, the tongue is either attached on one side or on both sides to the opening vent (Fig. 96). In the latter case, the tongue has lace holes for the laces to pass through. In higher shoes (shoes with a frontal lace-up fastening) the narrow, triangular tongue has been attached on the upper with stitching its base below the opening vent (Fig. 27, below). The tongue follows the opening vent all the way to the top even in high shoes. On the basis of the frequent occurrence of tongues in front-laced shoes, it seems to have been a standard in this shoe type.
In buckled shoes, a tongue has been preserved only in one case. The tongue is a type with a one-sided attachment. The frequency of the occurrence of tongues in buckled shoes is an open question.

1.2.2.5 Laces, toggles, buckle straps and thongs

Shoe laces naturally occur in side-laced shoes and front-laced shoes. In side-laced shoes, all remains preserved are flat strips of leather. There is one example where the remains tell us the method of lacing. This shoe has lace holes for a lace-up fastening. Starting from the bottommost lace hole, one end of the lace has been threaded upwards in a zigzag fashion (Fig. 21).
In front-laced shoes with a tie-lace fastening, the fastening is effected by a tie-lace or by a bifurcated leather strap, the base of which has been stitched inside the upper. Typically, the lace-ends have been drawn through the lace holes on the lateral side and tied together on the outside of the shoe. In those few cases where the laces remain tied, there seems not to

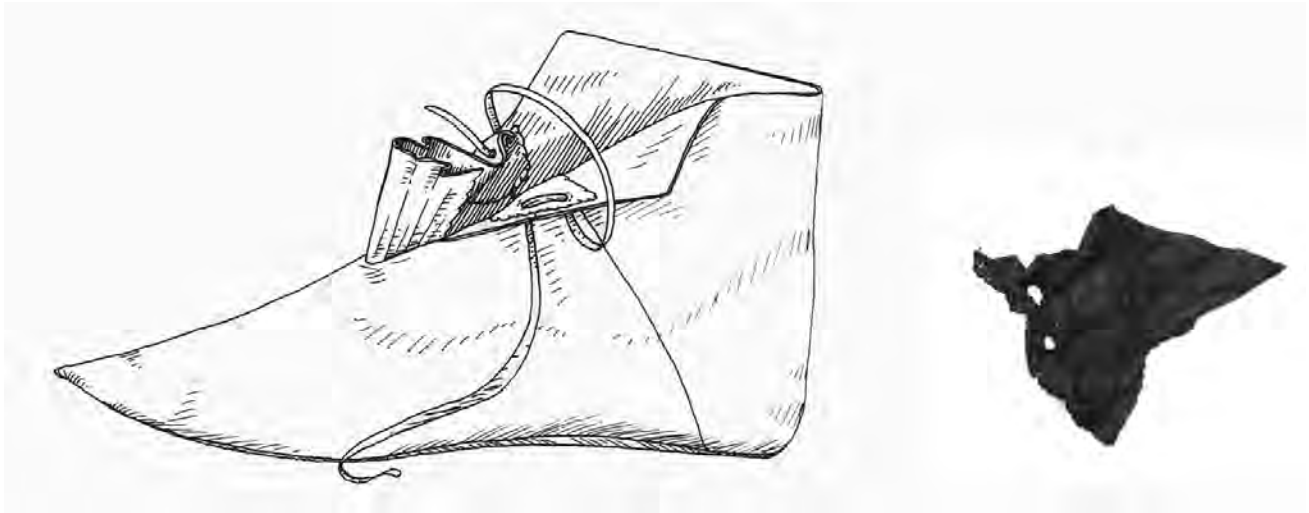


Fig. 96. The principle of a two-sided attachment of a tongue in a front-laced shoe[634] and an example of a two-sided tongue from the ÅA-site (TMM 21816:NE11270).

Fig. 97. A front-laced shoe with two pairs of lace holes and a knotted tie-lace (TMM 21816:NE50358).

have been any regular way of tying the laces. Instead many kinds of ties and knots have been used (Fig. 97). The material of tie-laces and bifurcated straps is a flat strip of leather.

In front-laced shoes with a frontal lace-up fastening, the method of lacing is preserved in one shoe. It is similar to the side-laced shoe with a lace-up fastening (see above) where one lace-end has been threaded upwards.

The material in this case is a flat leather strip. Goubitz has noted that many shoes with a side-laced or frontal lace-up fastening do not have any shoe lace preserved. He has presented the possibility that in these shoes the laces were of twisted or braided vegetable or animal fibres instead of leather, probably because they would have been easier to draw tight and loosen up than leather laces. Also, most of the lace holes in shoes with a lace-up fastening would not have been wide enough for leather laces.[635]

In Turku, too, most of the shoes with a lace-up fastening are missing their laces. The difference is that here the lace holes seem, without a few exceptions, to be of a 'normal size', i.e. suitable for leather laces. Also the example with lacing preserved has a leather lacing. Thus, more evidence for possible animal or vegetable fibres as shoe laces in Turku is needed.

Toggles used for fastening are all of the same type in Turku, so-called tailed-toggles. Also the method of making these toggles has been the same in every case

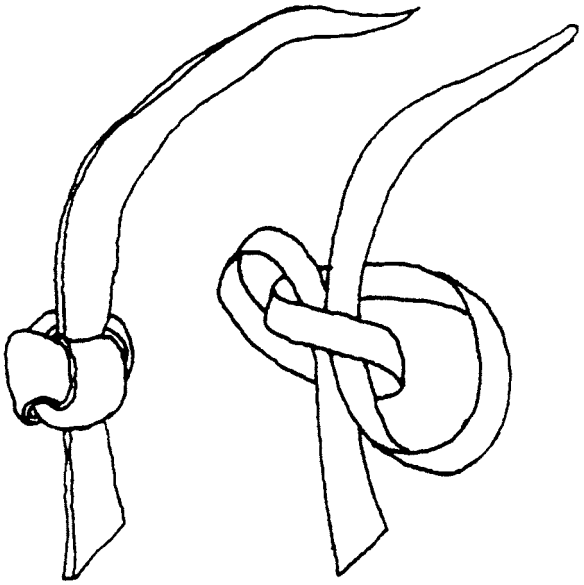


Fig. 98. The type of tailed-toggle used in Turku shoes.[636]

(Fig. 98). Similar tailed-toggles have been used both in tailed-toggle fastened shoes and in strap shoes.

Buckle straps of buckle shoes have been preserved whole or almost whole in eight shoes. In addition, nine shoes have fragments of straps. Straps are made of ca. 10–12 mm wide and 130–150 mm long leather strips tapering to the tail (Fig. 31). There are usually many successive holes, which make different degrees of tightness in the fastening possible. Usually the base of the strap is slipped through the slit in the upper and sewn on the inside of the shoe. In one case the strap base is bifurcated and both ends are slipped through separate slits and sewn on the inside of the shoe.

A thong or part of it was preserved in seven thong shoes. In all cases the thong was of leather. Textile thongs have not been noted.[637] All the thongs preserved were flat leather strips of ca. 3–6 mm wide. In some cases the thongs are wider on the heel section and narrow towards the instep. In one case the thong has knots in its ends (Shoe TMM 20764:1606 in Fig. 7). In four shoes thongs have been preserved in their whole length. The length of thongs has been enough to be knotted on the instep but not to be wound another time around the leg. In one shoe, however, both thong ends extend 13 cm outside the instep slots, which in a small shoe is an oversized length or possibly had a decorative function (Shoe TMM 20764:1606 in Fig. 7). In one shoe the thongs remain tied. In one shoe there remains a piece of a thong, which seems to have its beginning on the instep slot and to be directed towards the back. This could suggest the possibility that some shoes thongs could be tied on the side or back instead of the instep.

In contrast with the use of leather in laces, toggles, buckle straps and thongs in thong shoes, the thongs preserved in one-piece shoes (seven cases) are always of animal/vegetable fibre. In the chapter discussing one-piece shoes, it was suggested that there may have been two different traditions of making shoes.

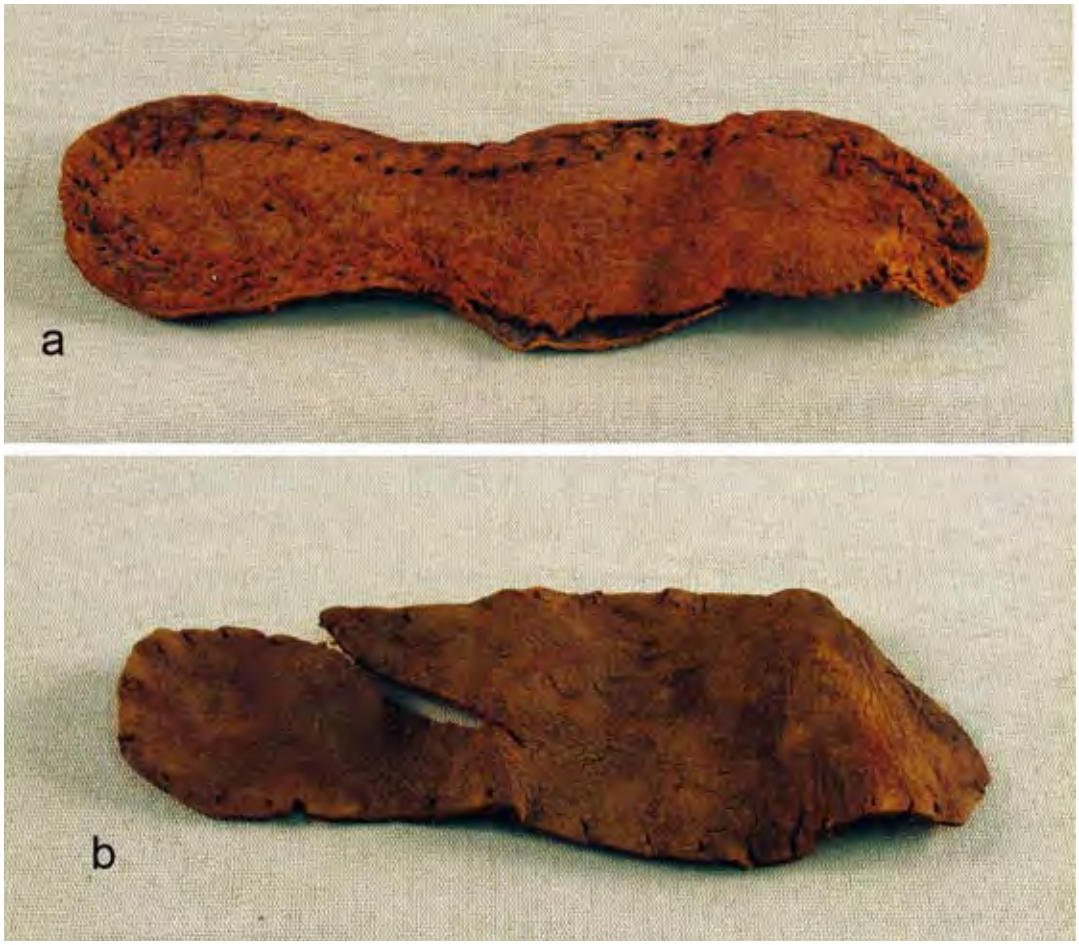


Fig. 99. Children's size soles. ***(a)*** *tunnel stitches on a lasting margin (TMM 21816: n1669),* ***(b)*** *whip stitches on a lasting margin (TMM 21816: NE173100). Late 14th century - early 15th century.*

1.3 Sole/ Upper constructions

1.3.1 Turnshoe construction

The construction principle of a turnshoe is that it is made inside-out. After the sole seam is finished, the shoe is turned right side out whereby the seams are situated inside the shoe. In attaching the sole to the upper, three different types have been noted in Turku.

Type 1 is the prevailing technique of construction. The other two techniques occur only as single examples. In type 1, the lasting margin has been sewn with edge/flesh stitches for the sole and grain/flesh for the upper and possible rand, using shoemaker's stitch. A rand is a narrow strip of leather, triangular in section, sewn into the lasting margin between the sole and upper. The function of the rand is to make the lasting margin watertight and, even more important, to protect the stitches in the vulnerable gap between the sole and upper.[638] The rand could be composed of several short segments or be a continuous length around the lasting margin. The rands seem to have been common in the shoes of Turku, but it is not possible to conclude whether they were standard or not present in every shoe type. In the cases where the shoe is found without a rand it is not possible to infer whether the shoe originally had a rand or not; the stitch holes in the upper and sole are the same in shoes with or without the rand.

Of type 2 construction, there is only one example. It is a child's-size sole which has the lasting margin inset from the sole edge (Fig. 99a).[639] There is a line of flesh/flesh tunnel stitches placed at right angles to the outline of the sole. This stitch type was typical of the 8th to 12th century shoes in Europe and in the 16th - 17th century indoor shoes, which had the flesh side of the sole outwards.[640] The sole from Turku does *not belong to either period. Instead, it is dated to the late 14th - early 15th century and thus represents a very atypical construction of its time.*

Of type 3, there are two examples. The first is a child's-size sole from the ÅA-site dated to the late 14th century or early 15th century by its find context (Fig. 99b).[641] It has been whipstitched over the edge with flesh/grain stitches. A sole from the Aboa Vetus Museum excavation is a two-part sole with a double layer of leather in its seat section. It has whip-stitching in its forepart, round the sole's outer edge. Swann probably mentions this particular sole in her publication though the access number is not mentioned. According to Swann, the sole probably belonged to a soled hose.[642]

Parallels for the finds are few. Jäfvert mentions a sole which was found in excavations under Stockholm Castle. It also had stitch holes for the whip stitch and, according to Jäfvert, it could have belonged to a soled hose.[643] Thus, if whip stitched soles were part of hose, the find from the ÅA-site could be explained this way, too.

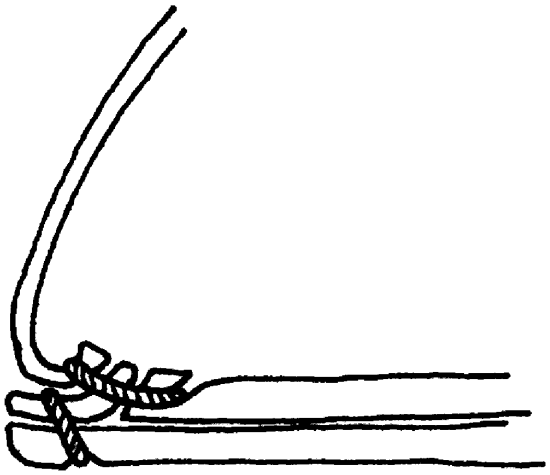


Fig. 100. The principle of a turn-welt construction.

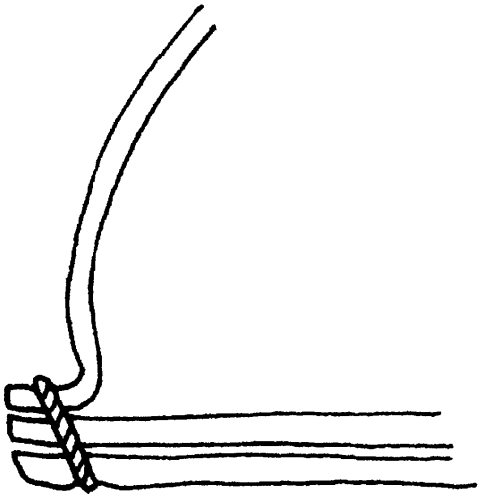


Fig. 101. The principle of a stitch-down construction.[649]

1.3.2 Turn-welt construction

In a turn-welt construction the rand is sewn between the upper and sole of a turnshoe, but is made extra broad so that a second sole can be stitched on (Fig. 100).
The rand will show two rows of stitch holes if used in this way, and is then called a turn-welt.[644] In Turku, turn-welts have been used in attaching so-called clump soles and wood-pinned outer soles. Attachment of these to the rand was by stitching either with a thread or a leather thong or in the case of wood-pinned soles, also by wooden pins. The construction principle is the same in all these types, an outer sole attached to the outer edge of the rand.
In Turku, the turn-welt construction goes back to the late 14th - early 15th century. There are both clump soles and wood-pinned soles from this period. The technique has been in use at least till the Early Modern Period.

1.3.3 Stitch-down construction

In a so-called stitch-down construction, the bottom edge of the upper was folded outward and then stitched directly to the insole and treadsole and in shoes without an insole, directly to the treadsole (Fig. 101). According to Goubitz, this technique was used from the 16th century onwards and mainly in children's shoes.[645] A closely-dated example of this construction is a Russian riding boot in Livrustkammaren, Stockholm's Castle. The boot possibly came to Sweden with the embassy which the Crimean Tatars sent to Stockholm towards the end of the 16th century, with gifts in the form of horses and embroidered leather goods.[646] The construction is turnshoe, changing to stitch-down at the seat.[647] Jäfvert has suggested that stitch-down construction was to some extent used as early as the Middle Ages, although there were no certain examples of shoes of this kind in Sweden before the 16th century.[648]
In Turku, there are two shoes which have a stitch-

Fig. 102. A children's size front-laced shoe with an overlapping bottom edge of the upper, 'stitched-down' with one row of stitches to the sole (TMM 18884:196). Without a close dating.

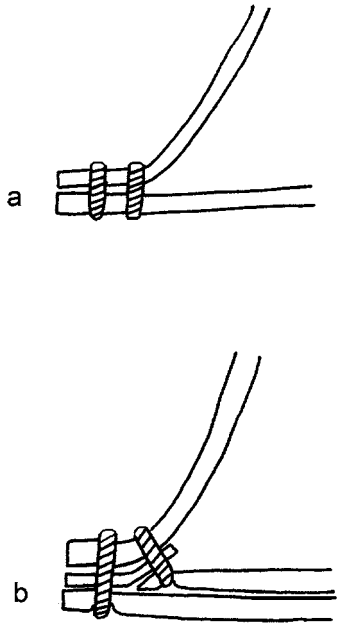


Fig. 103. The two types of stitch-down construction noted in late medieval or early modern period shoes in Riga. ***(a)*** *with a single sole,* ***(b)*** *with an insole, treadsole and rand.*

down construction. The blunt-toed sole of the Early Modern Period type from Uudenmaankatu (survey 1954) has two parallel rows of flesh/grain stitches round the sole edge (Fig. 46). The better preserved example is a children's size front-laced shoe from Hämeenkatu (survey 1983–1984) (Fig. 102). The upper has an overlapping bottom edge, fastened with one row of stitches to the sole. Neither of these examples can be dated by their find context.

Examples of the stitch-down technique have been found in Porvoo, Vyborg and Riga. From the excavations in Porvoo (Rihkamatori 1981), remains of five uppers with a double row of stitches through the outflanged bottom edge, dated to the 16th century were found. The shoe types are unknown because of the fragmentary nature of the material.[650] The rows of stitches suggest the possible use of stitch-down construction in these shoes.[651]

From Vyborg, according to Kurbatov, front-laced shoes with an outflanged bottom edge of the upper stitched to the sole with a double row of stitches have been found.[652] These, too, are examples of a stitch-down construction.

From Riga, there are shoes dated to the end of the Middle Ages or to the early 16th century which have two variations of a stitch-down construction. In the first variant, there is a typical double row of stitches through the edge of the upper to the sole (Fig. 103a). The second variant is a more complicated construction with an insole and a rand (Fig. 103b).[653]

The question, how the welted construction evolved from the turnshoe construction has preoccupied researchers. After all, these are two quite different forms of constructions. One possible answer is that the origin of the welted construction was in the 15th century cork soled pattens with a leather covering. These have a similar construction as fully developed

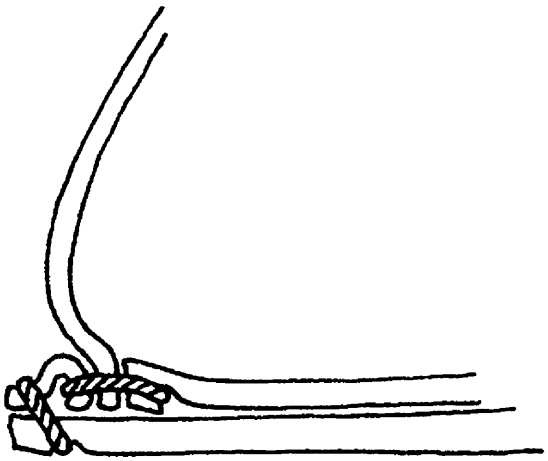


Fig. 104. The principle of a welted shoe construction.[656]

welted shoes. Thus, in leather shoes, the welt might have come from pattens.[654] It is not probable that welted shoes could have developed from a turn-welt construction. From a shoemaker's point of view, there is no logical transition from a turn-welt construction to a welted construction.[655]

However, there is a logical transition from a turn-welt construction to a stitch-down construction. For example, if we look at the second variant of stitched-down shoes of Riga (with an insole and a rand, Fig. 103b), the only difference from a turn-welt shoe with an insole is the overlapping bottom edge of the upper in the Riga shoe. Thus, the development would have been from turn-welt shoes to stitch-down shoes. This, however, was a blind alley because there is no clear technical transition from stitched-down shoes to welted shoes (Fig. 104). It seems that the stitch-down construction was a short lived attempt to create an alternative construction to a turnshoe before the welted shoe appeared and occupied the market. It is unfortunate that the finds are few and that closely-dated examples of this construction are not available for the closer examination of the development from turnshoes to stitched-down shoes.

1.3.4 Welted construction

In shoes with a welted construction, a welt, a strip of leather is sewn along the outside of the upper's bottom edge together with the insole during inseaming, to which the treadsole is stitched later (Fig. 104).

Even if actual welts have not been preserved, this construction can be concluded from the bottom edge of the upper. In welted constructions, the bottom edges have not been turned inside as in turnshoes. Neither have they been overlapping as in a stitched-down construction. Instead, the bottom edge is vertical with flesh/grain stitches. In Turku, welted shoes appear in the materials of Uudenmaankatu (Survey 1954), Tuomiokirkkokatu (survey 1977), Hämeenkatu (survey 1984) and in Turku Castle (survey 1976). Common to all these sites is the fact that no dating for the finds from

the context is available. The definition of these finds as the Early Modern Period shoes is based on the dated and reported parallels of the Early Modern Period shoe styles and especially on the common dating of the beginning of welted construction in ca. AD 1500.

1.4 Types of leather

There are two basic methods of defining the animal species from leather on the basis of visual examination. The first is based on the pattern of hair follicles on leather, different in each animal species. The other method is based on the examination of the relation of the thicknesses of different layers of skin.[657]

The material of this study has been analysed using the first method. For the definition to be possible, the surface of leather must be preserved. Usually the hair follicles are preserved on leather even if the hair is removed before the tanning process. I have used present day leather samples and microscopic photographs[658] as reference material in defining the species. Besides the author's general survey of the leather material of Turku, the results of Sanna Jokela's detailed analysis of the leather material of over 20 000 pieces from the Aboa Vetus Museum excavations play a very important role.[659]

In the shoes from the ÅA-site, calf leather prevails in uppers and soles. Of the 845 shoes, in only two shoes have other leather types been noted. These are two tailed-toggle fastened shoes in which goat or sheep leather was used in uppers. The soles are always of calf leather.[660] Based on the shoe size, all four shoes are children's shoes and the choice of soft goat/sheep leather was probably for comfort.

Calf leather dominates in the Aboa Vetus material, too. There are two thong shoe fragments of pig leather and one heel section of a sole made of seal leather. The heal fragment can be dated to the first half of the 14th century and the thong shoe fragments as medieval.[661]

Thus, the main observation to be made is that the prevailing leather type in the shoes of Turku is calf.[662] It must, however, be noted that the grain pattern may be destroyed because of the wearing or compressing of the surface of leather. In the case of shoes, a part of the upper leathers and especially a part of sole leathers cannot be identified.[663] It is possible that among these unidentified finds a minority are made from leather of different animal species. Leather types in which the surface is easily worn, sheep, for example, are difficult to identify. Among the unidentified cases, there can be pig leather, too, in which hair follicles are sparsely situated.[664] Even if this were the case, the domination of calf leather is obvious.[665]

As a comparison, in London, calf/cattle begins to prevail from the mid 13th century onwards, while earlier goat leather was frequently used.[666] The increase in the use of bovine leather in shoe manufacture was noticed in the shoe finds of York from the 13th century onwards, too. According to Mould, Carlisle & Cameron, the phenomenon seems to have been nationwide.[667]

The material from Svendborg shows that only in the 12th and 13th centuries, other types of leather (goat, deer) than calf/cattle were used. In later medieval phases, calf/cattle totally dominates.[668] A change from the use of goat leather to calf/cattle leather during the 13th century seems to happen in all Scandinavia.[669] In this chronological scheme of change from goat leather to calf/cattle leather, Turku is situated in the late medieval calf/cattle phase, which probably explains the dominance of calf leather in shoes.

Different reasons for the change from goat leather to calf/cattle leather mainly during the 13th century have been proposed. The increased use of calf in London has been explained by a decrease in the amount of imported goatskin, or cordwain, from Spain following the expulsion of the Moors. Another explanation could be the introduction of organised drives of cattle to the London markets.[670] In fact, as the change appears in Scandinavia, too, the phenomenon seems to be European-wide. Lindqvist has explained the phenomenon by the growing importance of cattle. The reasons for this are probably diverse and connected to economy and changes in animal husbandry.[671]

In Lübeck, the relations of leather species seem to be different. There, ca. one third of analysed leather material is goat still in the 14th/15th century.[672] Jokela has discussed the possible reasons for the high percentage of goat leather in Lübeck and the dominance of calf/cattle leather in Turku, on the other hand.[673] According to her, a partial explanation for the differences between Lübeck and Turku could lie in the different size and structure of towns. It has been suggested that there were ca. 1500 inhabitants in late medieval Turku, while the population of medieval Lübeck was over 20 000. There were plenty of pastures for cows around medieval Turku. It could be that in Lübeck, goats were easier to take care of than cattle as goats do not need large pastures and can graze on yards and roofs in town.

The small percentage of other leather types than calf/cattle or goat can be due to the regulations. In several paragraphs of the craft ordinances of Stockholm's shoemakers it was strictly forbidden to use horse, seal or sheep leather in shoes instead of cattle/calf. These leather types were clearly seen as inferior materials.[674]

Besides the animal species, in some cases it is possible to see evidence of the different kinds of treatment of leather. This applies to the different treatments of shoe uppers and soles. Usually, no delaminating can be noted in upper leathers while a large part of soles have been clearly delaminated in soil. There is an explanation for this phenomenon and it is a different kind of tanning process for uppers and for soles. Uppers could be of soft leather. That is why the upper leather was tanned in such a way that the tanning substances penetrated the leather all the way through. The result was flexible and thoroughly

tanned soft upper leather. In the case of soles, the tanning substances were not always allowed to penetrate the whole thickness of leather. Instead, a layer of untanned raw leather was left in the middle. This raw layer made the soles more rigid and water resistant. Thus, this kind of 'raw tanning' could be a conscious choice, not a mistake in the treatment of leather. It must be noted that in general, raw-tanned leather represented poor quality and the treatment gone wrong. In the ordinances of the Stockholm shoemakers, it was forbidden to manufacture raw-tanned leather.[675]
When discarded in the soil, the raw layer of leather starts to decompose and the result is a delaminated artefact.[676] On the basis of the large number of delaminated soles in Turku, raw tanning treatment was frequently used.

1.5 Materials of threads

Thread samples from the lasting margins of shoes at two sites, the Old Great Market Place (13 samples) and the ÅA-site (15 samples) were picked for analysis by Heini Kirjavainen (Appendix 3).
The samples of the Old Great Market Place are looked at first. They date from the late 13th century (one sample) to the first quarter of the 14th century (11 samples) and to the period 1325 - 1350 (one sample), thus representing the late 13th century and especially the first quarter and half of the 14th century. Of the ten identified samples eight were of hemp and two of flax. The suggestion of Heini Kirjavainen is that the three unidentified yarns could possibly be of bast fibre from lime (*Tilia cordata*).
Of the 15 samples of the ÅA-site, 14 could be identified. The dating of these is from the late 14th century to the beginning of the 16th century. The material of the identified samples was hemp in all cases. Thus, there seems to be more uniformity in choosing the thread materials than at the Old Great Market site. According to Kirjavainen, the unidentified sample from the ÅA-site could be of bast fibre from lime (*Tilia cordata*) as the unidentified samples from the Old Great Market Place.

1.6 Summary

The majority of medieval tread soles in Turku were cut in one piece. However, there were different ways to increase the durability of a single-layer sole. This could happen by adding extra layers of leather on top or below the treadsole. In *double-layered soles* a part of a tread sole has a layer of leather added on top (flesh side) of the treadsole as a kind of an insole. At least in Turku, they seem to be original features on the basis that in all cases the lower treadsole has not been worn out, i.e. stitching the inner sole as a repair might have been unnecessary.
Some turnshoes in Turku have been equipped with an extra outer sole. The outer sole consists of several layers of leather, attached together by wooden pins. According to the published examples, wood-pinned sole construction seems mainly to be a Scandinavian phenomenon of the 14th, 15th and 16th centuries. In Turku and in Stockholm, it goes back to the 14th century. Even more important than the occurrence of the actual wood-pinned sole is the method of attaching the wood-pinned sole. Using the broad rand to attach a second, outer sole is a clear example of a so-called turn-welt construction.
In shoes typologically described as Early Modern Period shoes of welted construction, the occurrence of separate inner and outer soles has been noted. These have been found both in the town area and the castle.
The sole could also consist of only one layer of leather but composed of parts, a so-called composite sole. I consider the composite soles in Turku as original features, i.e. that while making a shoe, the shoemaker equipped the shoe with a two-part sole. The reason for the practice could have been the economical use of leather as well as the easier replacement of a worn-out sole part.
In uppers, two basic cutting patterns can be discerned. In the first pattern, the upper is composed of one main piece, a so-called wrap around pattern. In the second pattern, the shoe upper is composed of a separate vamp piece and back piece, a so-called two-piece pattern. The wrap-around pattern is the prevailing cutting pattern. It has been used in all medieval shoe types. The shoe types where the two-part pattern occurs are the strap shoe, tailed-toggle shoe, side-laced shoe, front-laced shoe and the boot. The occurrence of two-piece pattern in the majority of side-laced shoes in contrast to every other medieval shoe type in Turku must be considered as one more special feature in this shoe type.
Besides the main piece and the possible inserts, several other components may belong to the construction of the upper. These are heel stiffeners, lace- and toggle hole reinforcements, topbands, strengthening cords, tongues, laces, toggles, buckle straps and thongs.
In the sole/upper constructions, there were four different techniques which have been used. These are turnshoe, turn-welt, stitch-down and welted construction.
In the turnshoe construction, the prevailing type is the one in which the lasting margin has been sewn with edge/flesh stitches for the sole and grain/flesh for the upper and possible rand, using a shoemaker's stitch.
In a turn-welt construction the rand is sewn between upper and sole of a turnshoe, but is made extra broad so that a second sole can be stitched on. In Turku, turn-welts have been used in attaching so-called clump soles and wood-pinned outer soles. In Turku, the turn-welt construction goes back to the late 14th - early 15th century.
In a so-called stitch-down construction, the bottom edge of the upper was folded outward and then stitched directly to the insole and treadsole and in shoes without any insole, directly to the treadsole. Shoes with this kind of construction cannot be

dated by their find contexts in Turku. According to the parallels in other sites, the technique is a late medieval/Early Modern Period phenomenon before the actual welted construction occupied the market.

In shoes with a welted construction, a welt, a strip of leather is sewn along the outside of the upper's bottom edge together with the insole during inseaming, to which the treadsole is stitched later. This construction only occurs in shoes which can be typologically categorized as Modern Period Shoes.

As a shoe material, the use of calf leather prevails right from the end of the 13th century until at least to the beginning of the Early Modern Period. Other leather types noted are sheep, goat, pig and seal but these form only a very small minority of the material. The small percentage of types other than calf/cattle or goat can be due to the regulations. In several paragraphs of the craft ordinances of Stockholm shoemakers it was strictly forbidden to use horse, seal or sheep leather in shoes instead of cattle/calf. These leather types were clearly seen as inferior materials

Besides the animal species, in some cases it is possible to see evidence of different kinds of treatment of leather. In the case of soles, the tanning substances were not always allowed to penetrate the whole thickness of leather. Instead, a layer of untanned raw leather was left in the middle. This raw layer made soles more rigid and water resistant. This kind of 'raw tanning' could be a conscious choice, not a mistake in the treatment of leather. It was frequently used in tanning the sole leathers in Turku.

The material of threads, used in seaming the lasting margins of turnshoes, was usually flax or hemp, the latter becoming the prevailing material in the latter half of the 14th century. It is possible that bast fibre from lime (*Tilia cordata*) was used especially in the early phases of the town but this hypothesis needs more support.

2. DOCUMENTARY INFORMATION ON SHOEMAKING AND LEATHERWORKING

In the following, shoemakers and other leatherworkers of the Middle Ages and at the beginning of the Early Modern Period, mentioned in documents, are discussed.

The professional contexts of craftsmen in Turku are in most cases not known in the Middle Ages or at the beginning of the Early Modern Period. Instead, the artisans are identified by their names only, and this causes source critical problems. According to Folke Lindberg's study of the artisans in medieval Stockholm, the artisan name could be inherited and changed to a family name, regardless of whether the offspring continued his parent's profession or not. Some merchants, for example, had an artisan name.[677] In Turku, in the middle of the 16th century, there were many burghers with artisan names, who took part in foreign-trade. On the other hand, an artisan could have a patronymic name.[678] Thus, the artisan name does not necessarily mean that the person in question practised the profession his or her name would indicate. On the other hand, many artisans with a patronymic name can be left unrecognised.[679] Proving the artisan status would presuppose that a person was mentioned in a context where he or she is functioning in a profession. Mika Kallioinen has supposed that in medieval Turku, not all artisan names necessarily suggest artisans, practising their profession. On the other hand, he has stated that the question must be left open because, in practice, it is impossible to answer more accurately.[680]

2.1. Craftsmen in town and castle

There are three references to shoemakers in the Middle Ages in Turku. *Thetmarus Sutor*[681] is one of the ratifiers of the transaction in the year 1336, when a burgher from Turku, Gerhard Paris, bought an estate in Hirvensalo.[682] Two shoemakers, *Albrecht* and *Hollinger*, are mentioned among the twelve persons, six of them craftsmen, sealing the letter for Queen Filippa and King Erik (XIII) the Pomeranian, in the year 1425.[683] The letter was associated with the disagreements probably connected to the re-strengthening of the status of the German population in Turku.[684]

Another sort of a craftsman is *Claus Beltare*, who is one of the persons ratifying the sale of an estate of Göbelin Lon, a burgher in Turku, in the year 1347.[685] *Laurens Svärdslipare*, a burgher from Turku, is mentioned in 1488, when he ratified the selling of his property in Turku before of Stockholm's council.[686]

What conclusions can be drawn from this information? Even if the sources do not suggest the practising of professions, keeping in mind the source criticism of names, some indirect inferences on the crafts can be made. The mention of a shoemaker in Turku as early as the year 1336, tells us of the necessity for this craft and of its old traditions. The mention of Albrecht and Hollinger in the same document in 1425 indicates that at that time, there was already more than one shoemaker working in Turku.

Beltmakers (Fin. *vyöntekijä* or *pelttari,* Swed. *bältare/remsnidare*, Ger. *Gürtler*) were craftsmen who manufactured straps, belts and harnesses and associated mountings, buckles and brooches. It seems that in this profession, the making of leather artefacts and casting of related metal objects were combined.[687] The mention of Claus Beltare as early as the first half of the 14th century suggests that even at that early stage of the town, professional division and specialization of some degree between leather artisans may have evolved in Turku.

A sword-polisher (Fin. *miekanhioja*, Swed. *svärdslipare* or *svärdfejare*, Ger. *Schwertfeger*) was a craftsman who assembled the sword, and polished and decorated it.[688] A strict distinction between blade smiths and sword-polishers in the production

chain is difficult to draw. Simple tasks could all be handled by the same person. In more difficult tasks, the balancing and the grinding of the blade were done by the blade smith. The assembling and polishing, the finishing of the sword to the final product, was done by the sword-polisher. Furnishing the sword with the scabbard was their task, too.[689] In addition, sword-polishers renewed used swords, renovating, polishing and furnishing them with new scabbards.[690] Working with scabbards makes sword polishers partial leather artisans. In this profession, too, metal working and leatherworking were combined.

If the name Laurens Svärdslipare is thought to indicate a profession, and the task description of a sword-polisher is thought to be the same as in Sweden and the rest of Scandinavia, there could have been sword-polishers who assembled and renewed the swords with scabbards in Turku in the Middle Ages.

One of the questions which has occupied researchers for a long time, has been the nationality of the medieval burghers. C. J. Gardberg has supposed that both the Latinized name of Thetmarus Sutor and the status of this person could suggest an immigrant German craftsman, who had followed the merchants. Gardberg gives examples from other towns, where the shoemakers were frequently of German origin.[691] According to Kallioinen, the nationality of Thetmarus Sutor, Albrecht and Hollinger could be German, Claus Beltare could be Finnish. The nationality of Laurens Svärdslipare is unknown.[692] The names of foreign origin that were common among the burghers of Turku suggest that in the early stages of the town, in the 14th century, its merchant and craftsman community was predominantly German. During the 15th and particularly the 16th century, the proportion of Finns and Swedes grew.[693]

No tanners are mentioned in the literary sources concerning medieval Turku or other towns of Finland.[694] This is no surprise. In Stockholm, the different crafts of leatherworkers tanned the skins they needed themselves. It is assumed that this was common in Nordic countries in general.[695] An exception is Visby, where the town law of ca. AD 1350 mentions tanners (Swed. barkare) and even white-tawyers[696] (Swed. vitgarvare).[697] It is not known whether these professions really functioned in town.

The first references to tanners in Turku can be found in the documents of the 16th century. Other new leatherworking professions of the 16th century not found in medieval documents are pouch makers, chamois makers, saddle makers and mitten makers.[698] The old professions, shoemaker, sword polisher and belt maker still occur in the 16th century. Kallioinen has proposed that the shoemakers could well have been the largest craft in Turku in the Middle Ages and at the beginning of the Early Modern Period. This is based on the assumed high consumption of shoes by the citizens and of the silver tax list of the year 1571 according to which 14 shoemakers were working in Turku at the same time.[699]

The information on the organisations of artisans during the Middle Ages and at the beginning of the Early Modern Period is rather limited. It is known that in medieval Stockholm the apprentice-journeyman-master system was rare; most workshops had only a master craftsman assisted by his family. Some workshops also had one or two apprentices. There may have been a similar situation in Turku, as no medieval journeymen or apprentices of the town are known. Presumably, most of the households consisted only of a master craftsman and his family.[700]

No craft organizations are known from medieval Turku, either. The first organizations are to be found only in the 1620s.[701] After the issuing of the Corporation Decree in Sweden in 1621, the Corporation of Shoemakers was the first trade guild to be founded in Turku.

Because of the limited information on written sources, archaeology gains importance in investigating medieval and Early Modern Period crafts occupations in Turku. For example, information on the localization of medieval and 16th century craftsmen in the topography of the town is - and will be - solely based on archaeology. Written sources do not permit the placing of craftsmen on a map of the town.[702] This situation differs completely from those European towns and cities where problems related to craftsmen and artisans are elucidated more broadly and in greater detail by written sources and preserved non-archaeological artefact material.

Later historical information about shoemakers in Turku is more informative. In the 17th century, shoemakers particularly inhabited the quarter of Aninkainen and the area adjacent to the pond of Mätäjärvi near Hämeenkatu. On the average, five shoemakers were living in the Mätäjärvi quarter at the beginning of the 17th century and more shoemakers moved to the area at the end of the century. The number of shoemakers in Turku continued to grow in the early 18th century. Between 1750 and 1807, the number of master shoemakers varied between 16 and 30. As a curiosity it can be mentioned that the first shoe shop in Turku was founded as early as in 1749.[703]

It must be remembered that the church and the castle had artisans of their own. For example, Bishop Hemming had four fishermen and a smith working for him in 1364.[704] Even if the information on artisans of the church is very limited, it has been proposed that the church was an important employer of a variety of artisans in Finland.[705] Castles were important employers of artisans, too. In 1562, there were three shoemakers working at Turku Castle at the same time. In 1578 the number of shoemakers had grown to ten.[706]

2.2 Craftsmen in the countryside

There is a lot of evidence of peasants acting as artisans in the countryside in the Middle Ages and at the beginning of the Early Modern Period

in Finland.[707] The Crown could not centralize crafts or trade in towns. In Finland, many peasants practised crafts at least as a side profession.[708] An abundant crafts nomenclature tells us about this. The crafts nomenclature of Finland Proper has not been systematically researched but it seems to be abundant in any case. According to Kallioinen, of the 31 medieval artisan names, 21 belong to smiths and three to tailors. Bakers, rope makers and carpenters are mentioned only once. There are four references to artisans which Kallioinen calls 'nahkuri' (Engl. tanner or leather-dresser).[709] The original term, however, is Swedish 'skinnare'. This term occurs frequently both in personal and place names in the Finnish countryside.[710]

There are different views of the translation and the exact job description of 'skinnare'.[711] An interpretation in the context of medieval Stockholm is by Göran Dahlbäck. According to him, 'skinnare' traded and treated skins. All raw materials of livestock and game that were intended for leathers and furs, except for bovine skins were considered skin. 'Skinnare' could sew cloths of skin/leather or furs, too.[712] Thus, it seems that in the job of 'skinnare' the jobs of skinner and furrier were combined. The reference to bovine skins not belonging to the job of 'skinnare' could suggest the possibility that bark tanning was not allowed or practised by skinnare in towns. Whether this concerned the 'skinnare' of the Finnish countryside in the Middle Ages is not known. At least from the later historical period (18th century onwards), there is a lot of information on bark tanning in the countryside.[713] According to Jäfvert, bark tanning was common in the Swedish countryside in the Middle Ages. A peasant had to have a leather material tanned ready when a commissioned, travelling shoemaker arrived to make shoes that had been pre-ordered.[714] However, it could be that Jäfvert has used an analogy from the later historical period.

The occurrence of shoemakers in the countryside at least from the 15th century onwards is certain.[715] It seems apparent that more shoemakers have worked in the countryside than are noted by the written sources. Himanen has showed that the lack of references to shoemakers is clearly due to the low quality and quantity of written sources.[716] Probably because of this, there seem to be few references to shoemakers working in the countryside of Finland Proper in the Middle Ages or the first half of the 16th century. The only medieval reference to a shoemaker is from the Muurla parish in 1467.[717]

Because of the lack of written information and archaeological finds of shoes from the countryside, possible distribution of shoes between the town of Turku and its surroundings in either direction remains only speculative. In chapter 4.1.9 of Part I, the possibility was presented that the occurrence of one-piece shoes in the town area in Turku could suggest the relations to the nearby countryside around Turku, one-piece shoes reflecting the Iron Age shoemaking tradition.

2.3 Summary

There are three references to shoemakers in the Middle Ages in Turku. Other leatherworkers known are a belt maker and a sword polisher. These artisans are identified by their names. The mention of a shoemaker in Turku as early as 1336, tells us of the necessity of this craft and of its old traditions. The reference to two shoemakers in the same document in 1425 indicates that at that time, there was already more than one shoemaker working in Turku. The reference to a beltmaker as early as in 1347 could indicate that even in that early stage of the town, professional division and specialization of some degree between leather artisans had been evolved in Turku. The sword-polisher, appearing in year 1488 adds one more leather worker to the scanty crew of artisans mentioned in documents.

The first references to tanners in Turku can be found in documents of the 16th century. Other new leatherworking professions of the 16th century not found in medieval documents are pouch makers, chamois makers, saddle makers and mitten makers. The old professions, shoemaker, sword polisher and belt maker still occur in the 16th century.

No medieval journeymen or apprentices are known from the town. Probably most of the households consisted only of a master craftsman and his family. No craft organizations are known from medieval Turku either. The first organizations are to be found only in the 1620s. After the issuing of the Corporation Decree in Sweden in 1621, the Corporation of Shoemakers was the first trade guild to be founded in Turku.

The occurrence of shoemakers in the countryside in Finland at least from the 15th century onwards is certain. However, the only medieval reference to a shoemaker in Finland Proper is from Muurla in 1467. Because of the lack of written information and archaeological finds of shoes from the countryside, possible distribution of shoes between the town of Turku and its surroundings in either direction remains speculative.

3. ARCHAEOLOGICAL EVIDENCE OF SHOEMAKING

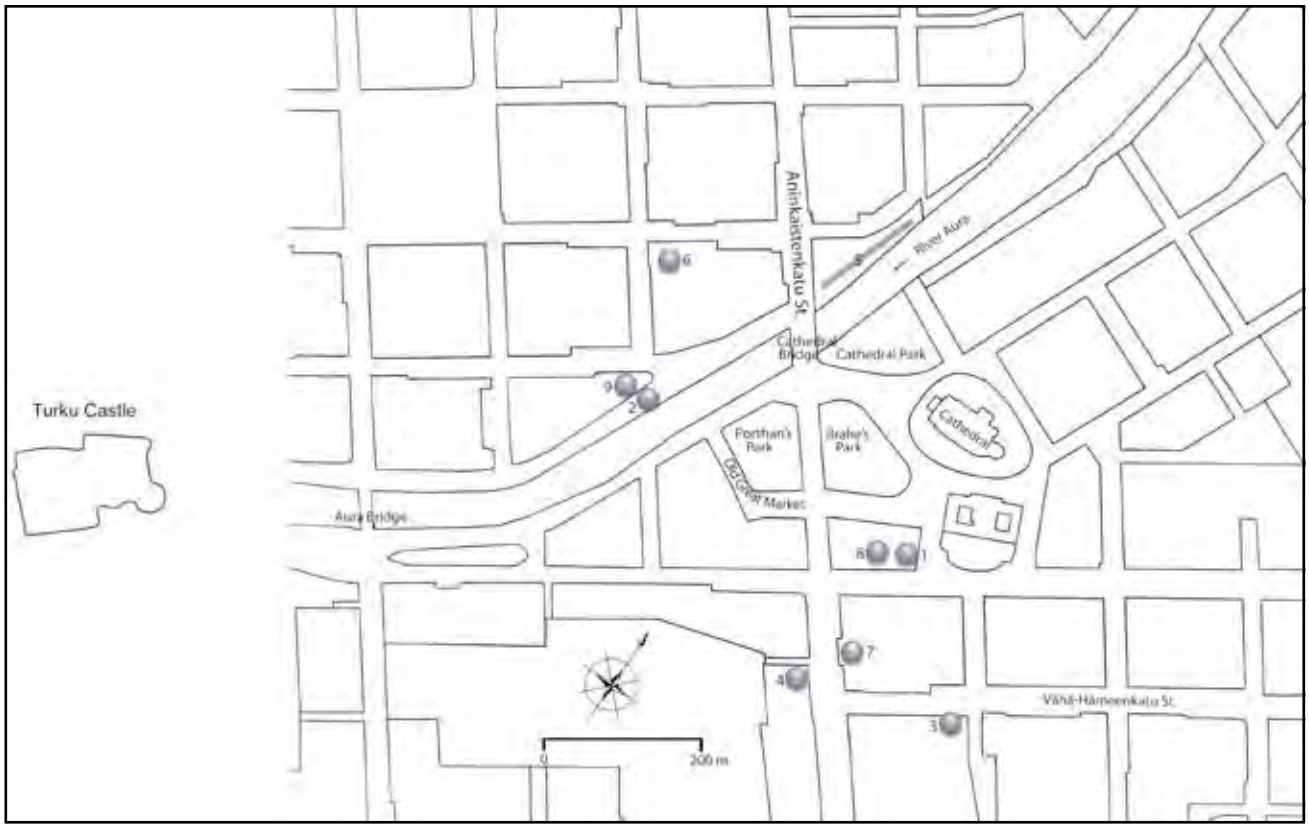
What kind of evidence is there of shoemaking in Turku? First there is the written information which tells us that shoes were made locally in Turku in the Middle Ages and the Early Modern Period. This leads us to an assumption that some part of the archaeological shoe material found in Turku probably constitutes remains of this local manufacture. The probability that some percentage of shoes (how large is not known) was imported, remains. Written sources do not reveal which shoes are of local manufacture and which are imported.

Then there are the archaeological shoes themselves. The shoes found in excavations are for the most part rubbish, cast away by the town dwellers and, as

Table 57. Observations of tanning tubs in Turku.

Site	Observation	Dating	Interpretation	References	Symbol on the map
Hämeenkatu (survey 1948–1949)	two tubs of stave construction; diameter of both 200 cm	Middle Ages or Early Modern Period	two tubs, possibly for tanning	Gardberg 1948	1
Linnankatu (survey 1950)	one tub	unknown	a tub of uncertain function and dating	KL99A[1]	2
Vähä-Hämeenkatu (survey 1970)	one tub	possibly medieval	a tub, possibly for liming/tanning	Pihlman 1989a:64	3
Uudenmaankatu 5 (survey 1971–1972)	one tub of stave construction; diameter ca. 150 cm	probably 14th century	a tub, possibly for liming/tanning	KL354	4
Lönnrot's Park (survey 1983)	one tub	unknown	a tub, possibly for liming/tanning	KL129A	5
Julin's plot (excavation 1983)	two tubs of stave construction; size 90–100 x 135-140 cm; oval shaped	16th–17th century	probable tanning or liming tubs; no leather or lime inside	Kykyri 1989:128, photograph no:19	6
Uudenmaankatu 6 (excavation 1988)	one tub of stave construction; size 85 x 100 cm; not excavated in its entity; lots of leather off-cuts and hair from the same excavation	16th century	probable liming/tanning tub	Kykyri 1989:130, photograph 23	7
ÅA-site (excavation 1998)	a round tub, diameter 200 cm; partly embedded in clay; no lime or hair connected to the structure	14th century; tub filled with early 15th century cultural layer; the tub itself is earlier	a medieval liming/tanning or dyeing tub	Saloranta 1999:24-25; Harjula & Hiekkanen 2006	8
Library plot (excavation 2003)	a pit; diameter ca. 100 cm; the walls edged with planks	dendrochronological dating to AD 1425/1426	a medieval liming/tanning or dyeing tub	Tuovinen & työryhmä 2004; Zetterberg, Kinnunen & Lehtola 2005	9

[1] The Register of Town Archaeology, Turku Provincial Museum.



such, they are mainly evidence of the *use of footwear* in Turku. They only hypothetically act as evidence of the local shoe manufacture because these shoes cannot directly be connected to the local leather artefact manufacture.

The shoe material in Turku seems to have followed the general trends noted in most towns in the Baltic area. Such a detailed comparison between the finds of different towns, by which differences in manufacturing techniques, possible 'local features', could be distinguished, has not been possible in the framework of this study. This is mostly because there are very few studies with such detailed information as could be used in making such comparisons.

It is as difficult to try to distinguish local features as to distinguish 'foreign' features in footwear styles. Artefacts with close parallels abroad, when it comes to manufacturing technique or style, could be imported. However, in the Middle Ages, the ideas, patterns and the craftsmen themselves moved from one area to another. The high proportion of foreign citizens in Turku in the Middle Ages is well known. Therefore, the archaeological find material has a very international character. As a conclusion to the shoe evidence, there are no features in shoes which would distinguish individual shoes or groups of shoes as 'local manufacture' or 'imported'.

There are, however, direct indications of leatherworking and shoemaking in Turku, even if this information cannot directly be connected to the shoes found. The written sources were already discussed in the preceding chapter. In the following section, the archaeological evidence of local shoemaking and leatherworking in Turku is presented. The emphasis is on archaeological evidence which tells us directly and certainly about shoemaking, shoes and shoemaking being the subject of this study. Evidence of other leatherworking connected to shoemaking, for example, tanning, carried out by shoemakers themselves, is presented more summarily.

3.1 Structural evidence

3.1.1 Tanning tubs and the tanning process

The life-cycle of a leather artefact began with an animal skin. The skin had to be treated in such a way that it became resistant to moisture. It has been assumed that in the Nordic Countries in the Middle Ages, it was typical that different leather artisans themselves treated the skins they needed, i.e. there was not a separate profession of a tanner.[718] I assume that this was true of Turku, too. Therefore the archaeological evidence of tanning can be connected to the work of shoemakers or other leather artisans.

Vegetable tanning was the most common type of leather treatment in the Middle Ages. In this procedure, skins and tanning substances were put in layers into the tanning container, filled with water. The time needed for the tanning treatment varied from several months to even years.[719] The actual tanning process was preceded by the process in which flesh and hair was removed from skins. This happened typically by liming the skins in wooden tubs or in pits which could be lined with basketwork, timber, stone, brick or slate.[720]

What kind of archaeological evidence is left behind by the tanning process? Firstly, there are the substances

Fig. 105. Left: a 14th century tanning/dyeing tub at the ÅA-site; right: a tanning/dyeing pit at the Library site with a dendrochronological dating to AD 1425/1426.[724]

used in the process. Secondly, there are the pits or containers, where the skins were put for liming and tanning. It seems that the form, size and number of tanning pits or tubs varied a lot in time and place. Therefore, in archaeology, there is no clear definition for a medieval tanning tub. When only a pit or tub is found in an excavation, it is difficult to say for certainty that it has been used solely or partly for the tanning process. Supporting evidence can be the liming or tanning substances or hair deriving from skins, found together with the pit or tub.[721]

It must be noted that liming and tanning are two different processes. Therefore the lack of lime and hair from a context of a tub/pit does not necessarily mean that the tub/pit was not used for tanning. It could be that this particular tub/pit was used for the actual tanning process but not for the preliminary liming and thus leaving no lime/hair remains, especially if emptied at some stage after its use.[722] Also, to survive in soil, hair as an organic material needs anoxic conditions.

If pits/tubs with lime and hair can quite reliably be connected to the liming-tanning processes, pits/tubs with tanning substances are more problematic. In these cases, other uses of the wooden tubs/pits must be taken into consideration. Instead of tanning, or alongside it, the pits/tubs could have been used, for example, for dyeing textiles. The parallel nature of dyeing and tanning is suggested by the fact that both processes often employed the same materials: the bark of trees and shrubs and the leaves of plants and nutshells.[723]

With the foundation of the information and source criticism presented above, one can look at the archaeological observations made of possible tanning tubs/pits in Turku. There are observations of possible tanning tubs from nine sites. They are here presented in chronological order of the observations (Table 57).

It is unfortunate that even if there are several observations of possible tanning vats in Turku, the information on especially older observations is quite limited. Largely relying on surveyors' observations, the following aspects have been noted. In tanning, mostly tub-like constructions of round or oval shape have been used. The tubs have been made with a stave construction and their typical diameter is ca. 80–150 cm. Partly buried in the ground, the tubs have been of a fixed type. This is appropriate for the long tanning process. The dating of the tubs found is mainly from the 15th century to the 17th century. Tubs from two sites, the ÅA-site and the Library site are certainly medieval (Fig. 105). It is possible that there are later tubs even from the 18th century among the undated examples.

Possible tanning tubs have been found in two quarters in Turku, the Mätäjärvi quarter and the Aninkainen quarter. This fits the general picture of the 17th and 18th century settlement well, when instead of inhabiting the centre of Turku, shoemakers and leatherworkers inhabited the two quarters, Mätäjärvi and Aninkainen, situated on the northern and southern edges of the town (Fig. 1). The picture of the craftsmen settlement in the Middle Ages and Early Modern Period is not known but it seems possible that the later 17th - 18th century settlement had its roots in the Middle Ages. It was natural that especially tanning, being a smelly process, was carried out on the outskirts of the town. [725]

3.1.2 Scraping beams and stretcher frames

Before the actual tanning process could begin, it was necessary that after the liming, once the hair was loosened sufficiently, the hide was spread over a wooden beam and both the sides scraped with a tanner's knife for unhairing and de-fleshing.[726]

At Vähä-Hämeenkatu 13b (excavation 1975), a plank was found which has been interpreted as a hide

scraping beam. The plank was 58 cm wide and 10 cm thick. The length is unknown because the structure continued into the section outside the excavation borders. The context of the plank was a layer dated to the end of the 15th century or the early 16th century. The plank was surrounded by a thick layer of hair. The plank seemed to have formed a solid structure which was supported underneath by a log and stones.[727] Besides the structure itself, the hair suggests the possibility that the plank had been used as a hide scraping beam. Supporting evidence for probable leatherworking in the area is the possible tanning tub, found at a nearby site, some 20 meters from the Mätäjärvi excavation site (Vähä-Hämeenkatu, survey 1970, see chapter 3.1.1 above).

At the ÅA-site, wooden structures which Seppänen has interpreted as racks for stretching hides were found. These were remains of small frames made of planks and posts. The structures are dated by their find context to the first half of the 15th century.[728] Kirjavainen has noted that on the basis of the strong evidence for textile dyeing on the ÅA-site, a possible alternative use of these structures for stretching and drying cloth should also be taken into account.[729] It must be noted here that stretcher frames are not used during the processing of vegetable-tanned leather but are used in the mineral tanning or tawing process of skins.[730] There is no further evidence of these processes at the ÅA-site or other sites in Turku. Therefore, if the structures are interpreted as stretcher frames, I would prefer the suggestion of Kirjavainen.

3.2 Osteological evidence

Archaeo-osteological studies permit conclusions on bone and horn related crafts. According to Auli Tourunen, the practice of certain crafts (e.g. the manufacture of bone artefacts, slaughtering and leatherworking) is generally reflected clearly in the osteological material of the places of activity.[731]

It is known that when skinning slaughtered animals the bones of the lower limbs could be left attached to the hide. These bones then accumulated at those sites where treatment of hides was carried out.[732] On this basis, leatherworking may be indicated by large numbers of bones of the lower extremities of goat from the excavation of Rettig's slope site (excavation 2003).[733]

Horn cores could also be left on the skin. Therefore, besides foot bones, concentrations of horns have frequently been connected to butchering, tanneries or to the leather trade.[734] Horns were a common raw material for various objects and used as drinking-horns, too.[735]

A distinct concentration of bones at the Åbo Akademi site was found in a pit originally situated under the floor of a twin-room house that was in use from the 15th century to the beginning of the 16th century. The pit contained large numbers of large bones and horns of animals.[736] Also the excavation on the Österblad site (excavation 1999) revealed a similar pit of bones and horns.[737] Finally, at the Mätäjärvi excavations (1975 and 1982) a large amount of horn refuse from ca. 1450 to 1520 was found.[738]

How can these assemblages of horns be interpreted? According to Serjeantson, the horns have no meat. Therefore it is not probable that horn finds would be residues from meals. Instead, horn was a valued commodity in its own right.[739] The correlation of horns and leatherworking lies in the hypothesis that tanners would have received skins with horns still attached. It was inevitable that a tanner passed the horns on to the horn worker. Typically, they worked near each other in the part of the town devoted to the smellier craft activities.[740] Based on this hypothesis, the horn assemblages at the ÅA-site, the Österblad site and the Mätäjärvi site can have a connection to the leatherworking activity in these areas although more definite conclusions cannot be drawn. To these observations can be added the foot bones of goat from Rettig's slope excavation.

3.3 Macrofossil evidence

It is known that certain plants, parts of plants or substances manufactured from plants were used in the tanning process as tanning substances. When evidence of these is found in archaeological sites, inferences about their possible use for tanning or for other purposes can be made. There are two plants in particular, which can be hypothetically connected to tanning in Turku. The first is the common hazel (*Corylus avellana*) and the nutshells of this plant. The other is the Bearberry (*Arctostaphylos uva-ursi*) of which the shoots were used.

From the ÅA-site excavation (1998) 13 kilograms of hazel nutshells have been found altogether.[741] It must be taken into account that hazel nutshells are common finds in many medieval sites in Turku. This suggests the probable use of hazelnuts as part of the food economy in the Middle Ages. However, large amounts such as from the ÅA-site can suggest the special use of nutshells besides being remains of food.[742] Nutshells of common hazel were used in tanning of leather and dyeing leather and textiles. The colour achieved was brown or black.[743]

Another plant found at the ÅA-site is the bearberry.[744] Shoots of bearberry have been used in tanning because of the high content of tanning substances. Another use has been in dyeing. The colour achieved is dark grey.[745] From the later historical period, there is a reference by Carl Linnaeus that a large amount of leaves and shoots from bearberries were collected from Northern Finland and sent to the tanners of Stockholm who used bearberry instead of sumach (*Rhus* sp.) in tanning.[746]

The alternative use of tubs and stretcher frames for textile dyeing instead or parallel to tanning of hides has already been noted. The alternative or parallel use applies to plants used in tanning and dyeing

Fig. 106. A half-moon shaped shoemaker's knife from the ÅA-site (TMM 21816: MT5031). Width 175 mm. Late 14th century.

of leather and dyeing of textiles, too. Germans had a saying 'Was Leder färbt, färbt auch Textilien'[747] Both processes, tanning and dyeing employed the same materials: the bark of trees and shrubs and the leaves of plants and nutshells. By archaeological means, it is hard to define exactly which activity the substances were used for in Turku. Both possibilities must be taken into account.

Could it even be that the possibility of exploiting the same substances and structures for two different purposes easily actually encouraged the carrying out of both activities - tanning and dyeing - side by side, maybe for a better income? Another possibility is that tanning and textile working succeeded each other. In Lower Brook Street (in the Middle Ages known as Tannerestret, 'the street of the tanners'), Winchester, for example, timber-lined pits, which were used for tanning at first (11th century), but which by the end of the 13th century were used by cloth-makers and dyers have been found, suggesting a migration of the more unpopular industry away from a site which by that time was well within the built-up area.[748]

3.4 Leatherworking tools

There are certain tools found in Turku, which were used in leatherworking and in leather artefact manufacture. Some tool types were used solely in shoemaking (shoemakers' knives), some types more generally in leatherworking (creasers). There are also tools, which had a wider use but which were used in leatherworking and shoemaking, too (awls, shears, spindles, needles). The tools found in Turku are presented in the following section. First, tools used solely in shoemaking are discussed and then tools which had other functions, too.

3.4.1 Shoemakers' knives

In the Middle Ages there were two basic types of shoemakers' knives. The first type is a half-moon shaped knife (Lat. *scalprum*), used as early as the second millennium BC in Egypt and later in antiquity.[749] The same knife type was used in the Middle Ages and appears frequently in medieval illustrations, seals and emblems.[750] The form of the second knife type is curved and resembles a sickle. There are two variants of this second type. The first one curves evenly and the second has a more angular shape.[751]

Shoemakers' knives occur as archaeological finds, too. Medieval knives of the half-moon type have been found in Lund and Stockholm.[752] Medieval knives of the sickle-form have been found in Stockholm and Einbeck.[753]

The archaeological knife material in Turku has not been systematically surveyed and therefore the shoemakers' knives noted so far probably do not tell the whole story. The only half-moon shaped shoemakers' knife comes from the ÅA-site.[754] Only a metal part of iron has been preserved (Fig. 106). The handle, probably wooden, is missing. The knife was found in a late 14th century cultural layer with no other indications as to shoemakers' activity. Thus, the find context of the knife was probably not its primary context.

There are no finds of the second type, the sickle form shoemakers' knives in Turku. There is, however, a knife sheath, the shape of which would have fitted this kind of knife.[755] The sheath has a downwards curving blade section especially at the tip. The context of the find is dated to the latter half of the 14th century - the turn of the 15th century. The cultural layer has been defined as a cattle yard. There are a large number of leather artefacts and leather offcuts from this layer but no other tools except an awl which could be connected to shoemaking. The sheath is probably not from its primary discarding context.

3.4.2 Lasts

One of the basic tools of a shoemaker is the last. To the shoemaker, the last represents the client's foot. The last was used as a support in shaping and

Fig. 107. Lasts from the ÅA-site and the Old Great Market. Top: TMM 21816:KP50386 (adult size, length 26.5 cm, 15th century), TMM 21816:KP17231 (children size, length 16 cm, late 14th century); bottom: TMM 20764:976 (adult size, length 26.5 cm, ca. 1350 - beginning of the 15th century).

sewing the shoe and it would also serve as an aid in designing new styles.[756] It is assumed that lasts were in common use in the Middle Ages, although it is possible to make a turnshoe without a last, using only a support for sewing the sole seam. The last became indispensable in the Modern Period when footwear was given double soles and shoes became more rigid.[757]

There are seven lasts from archaeological contexts in Turku. It is possible to date three of these by the find context. The dating of the rest of the material is based only on the shape of the last.

From the ÅA-site there are two lasts, one for an adult size foot and one for a child's foot (Fig. 107 top and middle).[758]

The material of the adult size last is Alder (*Alnus* sp.).[759] The last is made of one piece of wood. The find context is a 15th century layer with no other indications of shoemaking. The shape and form of the last follows the shape of a foot. It is narrow-waisted with a pointed toe. The last is for the left foot. On the bottom, there are several pegholes so the last has clearly been used. Pegholes imply of fixing the sole onto the last, either with wooden pins or with iron nails.

The children's size last from the ÅA-site is made of some wood species of the *Salix* family (*Salix* sp.).[760] The last is made of one piece of wood. The find context is a 14th century layer with lots of leather artefacts and offcuts but no other indications of shoemaking. In this last, there are also peg holes on the bottom. The shape and form of the last follows the foot shape of the right foot.

A third certainly medieval shoe last, a one-piece last again, is from the Old Great Market Place (excavation 1989) (Fig. 107, bottom).[761] The material of the last is pine (*Pinus sylvestris*).[762] The find context is dated ca. 1350 - the beginning of the 15th century. The context has no other indications of shoemaking except some offcuts. The form differs from the lasts of the ÅA-site. Although this last follows the outline of the foot, it is flat-shaped instead of a foot shape. In fact, it can be considered more as a sewing support than a last. Close parallels for the find are the flat lasts from Kransen, Uppsala dated to the late 14th century.[763]

From Turku Castle, there are two lasts with no closer dating. On the basis of their shape, the first one, from the 1940 excavation, is probably from the Post-Medieval period (blunt toe, no left/right shaping) and the second one, from the 1930-32 excavation, (pointed toe, narrow waist, left/right shaping) medieval.[764] The two lasts from Hämeenkatu 17 (survey 1901) are probably Post-Medieval on the basis of their symmetric shape (no left/right foot shaping).[765]

The number of lasts found in Turku seems to be small. However, when compared, for example, to the number of lasts found in the Netherlands (about 15 lasts while the number of shoes is ca. 20 000),[766] the Turku finds do not seem so few in relative terms. The reason for the usually small number of lasts found in excavations is obvious. Wooden lasts easily ended up as firewood.

Table 58. Peg/nail holes in soles at the ÅA-site (n = 314).

Placement of holes	Number of examples	Percentage
no holes	20	6.5%
back part	79	25 %
back part + middle part	14	4.5 %
back part + toe	170	54 %
middle part	9	3 %
toe	19	6 %
toe + middle part	2	0.6 %
toe + middle part + back part	1	0.3 %

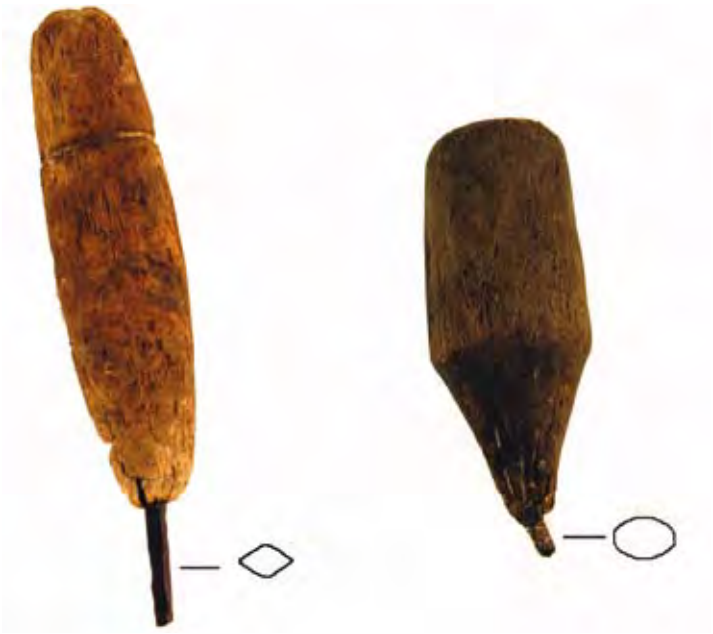


Fig. 108. Awls from the ÅA-site. Left, TMM 21826:KP50717, length 95 mm, 15th century; right, L1845, length 70 mm, first half of the 15th century.

The use of lasts is visible in shoe soles, too. It was already noted that in medieval turnshoes, the treadsole was fixed onto the last with two or three wooden pins or iron nails. Besides the last, this left its marks, peg or nail holes, on soles. Altogether 314 soles from the ÅA-site were preserved in such a good condition that observations on the existence/non existence and placing of the peg/nail holes were possible. The results were the following (Table 58).

It seems that fixing the sole at two points, toe and back has been most common. Another common method has been fixing the sole at the back part only. Typically, one or two pins/nails have been used. There are three holes in the sole only in one case. It must be noted that some soles show no marks of nail holes. How can this be interpreted? These shoes could have been made on the last but without fixing the sole on the last. It is more probable that soles with no holes are from shoes made without any last. The percentages for shoes made with and without the last would be 94 and 6.4, respectively. On this basis the use of the last would have been very common, although not universal in medieval Turku.

It seems that the holes formed in soles due to pegging/nailing were filled even if the filling has been preserved only in a few cases. For stopping up the holes, a small plug, which in seven cases out of eight is wooden at the ÅA-site, was used. In one case, the plug is of leather.[767]

Holes on soles have been noted in the Aboa Vetus material, too. According to Jokela, almost all the soles from this site have a small hole on the toe and back part. Some soles have the hole only in the toe or back. In one sole, the wooden plug in the sole has been preserved.[768]

3.4.3 Awls, creasers, shears, spindles, sewing-needles and thimbles

The awl is one of the basic tools of a shoemaker. The awl is used for piercing the material, especially in making stitch holes. Awl-like tools, however, have been used in woodworking, bone working and other crafts, too and thus awls are not always connected solely to leatherworking.[769] From the ÅA-site, there are four tools which have been defined as awls (Fig. 108).[770] The number of finds can be considered small but this can largely be due to the archaeological formation processes, the corrosion of metal artefacts and the reuse of metals. The dating of the awls by their find context is the latter half of the 14th century and the 15th century. Concrete

Fig. 109. Creasers from the ÅA-site. Left, TMM 21816:P2423, length 95 mm, wood, late 14th century; right, TMM 21816:A1403, length 135 mm, iron, late 14th century - early 15th century.

evidence of the use of awls are the leather pieces with the whole surface full of awl piercings, indicating some kind of practice objects perhaps.[771]
Creasers are used in leatherworking for marking the places for the stitch rows, for strengthening the edges of leather by compressing the leather structure and for decorative purposes. The creaser was pressed on the leather and dragged to form a line. The tool could be heated when a darker and deeper line was wanted.[772] There is at least one wooden and one iron creaser from the latter half of the 14th century or the beginning of the 15th century from the Åbo Akademi site excavation (Fig. 109).[773]
Shears have been used in all kinds of cutting, icluding leather cutting.[774] From the ÅA-site there are eight pairs of shears of which seven are from medieval contexts and one is post-medieval.[775]
There are 33 spindle whorls of bone, stone and wood from the ÅA-site, mostly dating to the 1350 - 1450 period. There are some references from Sigtuna to the use of heavier whorls in twining waxed thread used by shoemakers.[776] According to Kirjavainen, the two heaviest whorls of the ÅA-site, 40–45 grams each, could well have been used for this purpose.[777]
The multipurpose function of the artefact types of this chapter applies to needles and thimbles, too. They are mostly used in textile working but their use in leatherworking or shoemaking cannot be ruled out. In any case, there are only a few of these artefacts from the ÅA-site.[778]
As a conclusion, the problem of the previous chapters, that the archaeological evidence for textile working and leatherworking is the same in many cases, also applies to tools of this chapter. Although these tools, awls, shears, spindles, sewing-needles and thimbles, may well have been used in leatherworking or shoemaking, there are no definite arguments which would support this hypothesis. Creasers, on the other hand, were used mainly in other types of leather artefact making than shoemaking.

3.5 Waste leather

The strongest archaeological evidence of leatherworking must be the waste leather deriving from leatherworking and the making of leather goods. The processing of hides and skins and the making of leather goods produce distinctive waste that, in some cases, allows individual trades to be distinguished.[779]
In the following, I have divided the leather waste into two groups called currying waste and offcuts. These waste types represent leather waste which comes from hide processing and artefact making, respectively.

3.5.1 Currying waste and the currying process

In currying, vegetable tanned hides were worked into leathers with various properties suitable for manufacture into finished goods. Currying in its most evolved form could be a complicated process, which included the following phases in a broad outline.[780]

- dampening the leather in warm water or weak tan liquor
- softening the leather with tools or by trampling
- scouring operations in which both the leather surfaces were scrubbed clean and smoothed out using slickers
- paring the skin down to the required thickness using the currier's shaving knife
- washing of the shaved hides
- flattening the leather with various tools and removing loose tanning materials
- partial drying of the leather
- impregnation with tallow and oils and hanging the leathers in a warm room
- removing of the surplus grease with tools

In this phase the leather for the firm products (shoe soles, for example) was ready. For the softer products, the process continued by

- boarding (softening by folding the leather and rolling the fold up and down)
- staking or perching (rubbing the flesh side over curved, blunt blades)
- swabbing the surfaces with various materials
- polishing the leather with various tools

Of course, there have been variations in time and place in the currying process. Even in its more simple forms, the most essential phases have remained the same. Currying is a necessary process between the tanning and making of the artefacts.[781]
Even if there are examples of a separate currier's craft, for example, in England in the Middle Ages,[782] there is no need to presume that this would have happened in the Nordic Countries where even a tanner was not a separate craft. Thus, it is probable that in Turku, shoemakers and other leather artisans tanned and also curried the leathers themselves for their special purposes. It can be assumed that here, currying was not a separate craft but was instead related to both tanning and artefact making, placed between these two processes and handled by the same person or his/her assistants.
How is currying shown in archaeological record? Firstly, there are special currier's tools. Curriers' knives were specialised tools used for cutting and paring leather. They are distinguished from other knives by having blades which are unusually thin, but relatively wide, and there is usually little or no shoulder between the blade and tang. Blades typically have straight ends and sometimes a projecting spike.[783] These kinds of knives have not been identified from Turku material so far.
Another tool used in currying is the slicker or sleaker. They were used in the currying process to force out dirt retained under the hair roots just below the grain layer and to shave the flesh side

Fig. 110. Currying waste from the ÅA-site (TMM 21816: NJ20784). Late 14th century.

until the surface was smooth and the leather was of even thickness.[784] These kinds of tools have not been identified in Turku, either.

Even without tools, there is evidence of the currying process in medieval Turku. From the ÅA-site excavation, a large amount of 'tattered', tissue-like waste leather was found (Fig. 110).

This was firstly thought to have been produced in the scraping of untanned skins. However, there quickly followed the question: how could the scraping waste have been preserved? After all, untanned skin waste should degrade in a few days in soil. Some of this waste was chemically analysed to discover whether the waste included tanning substances.[785] According to the results, the waste included vegetable tannins.[786] Thus, the scraping of tanned hides represents the currying process in which hides were cleaned and shaved smooth.

The only published reference material on the currying waste seems to be from 16–22 Coppergate, York. The waste there comes from two contexts, the first dated to the mid 10th century and the other to the late 14th/15th century. According to the authors, the waste leather appeared to be 'shavings from the flesh side of tanned hides. Such shavings are produced when a hide is pared down to the required thickness during the currying process. Currying converts the rough, freshly tanned leathers to a material of uniform thickness with properties appropriate for its intended use, so that thick, firm leathers are produced to make shoe soles, and softer, thinner leathers for the uppers'.[787]

How is currying related to tanning and the making of artefacts? As a process, currying is situated *between* tanning and artefact making.[788] If both these processes were carried out in Turku by the same person or his/her assistants, they probably carried out currying, too. Despite this, it is interesting to consider whether currying may have been related more to tanning or artefact making. Connections of currying process to tanning would suggest the possibility that tanning, too, was carried out at the ÅA-site. Maybe then, other evidence relating only hypothetically to tanning at the ÅA-site would strengthen.

First of all, tanning and currying are two different processes. They do not necessarily need to happen in the same place. Evidence of currying does not mean that tanning evidence should be found, too. On the other hand, according to Thomson (in England at least), in the currying process, hides were sometimes soaked in a weak tanning liquid.[789] This suggests the possible use of the same place for both the processes. It is then possible that at the ÅA-site, hides were soaked as part of a currying process. For this purpose, large tubs like those discussed in chapter 3.1.1, could well be used. The same structures could be used in leather (and textile) colouring, too. The tanning could have happened elsewhere. It must be noted that currying might well have been carried out above the ground, without pits or embedded tubs.

There is one quite strong observation which connects currying waste to leather artefact making at the ÅA-site. Without an exception, lots of offcuts come from excavation units with a large amount of currying waste. The close connection of currying waste and waste from artefact making imply the close relation between the two processes.

3.5.2 Offcuts

Unlike currying waste, remains of leather cutting, offcuts, are numerous in Turku. They have been found in almost every excavation and survey extending to layers of organic content. Finds of offcuts as such, without a deeper analysis of the

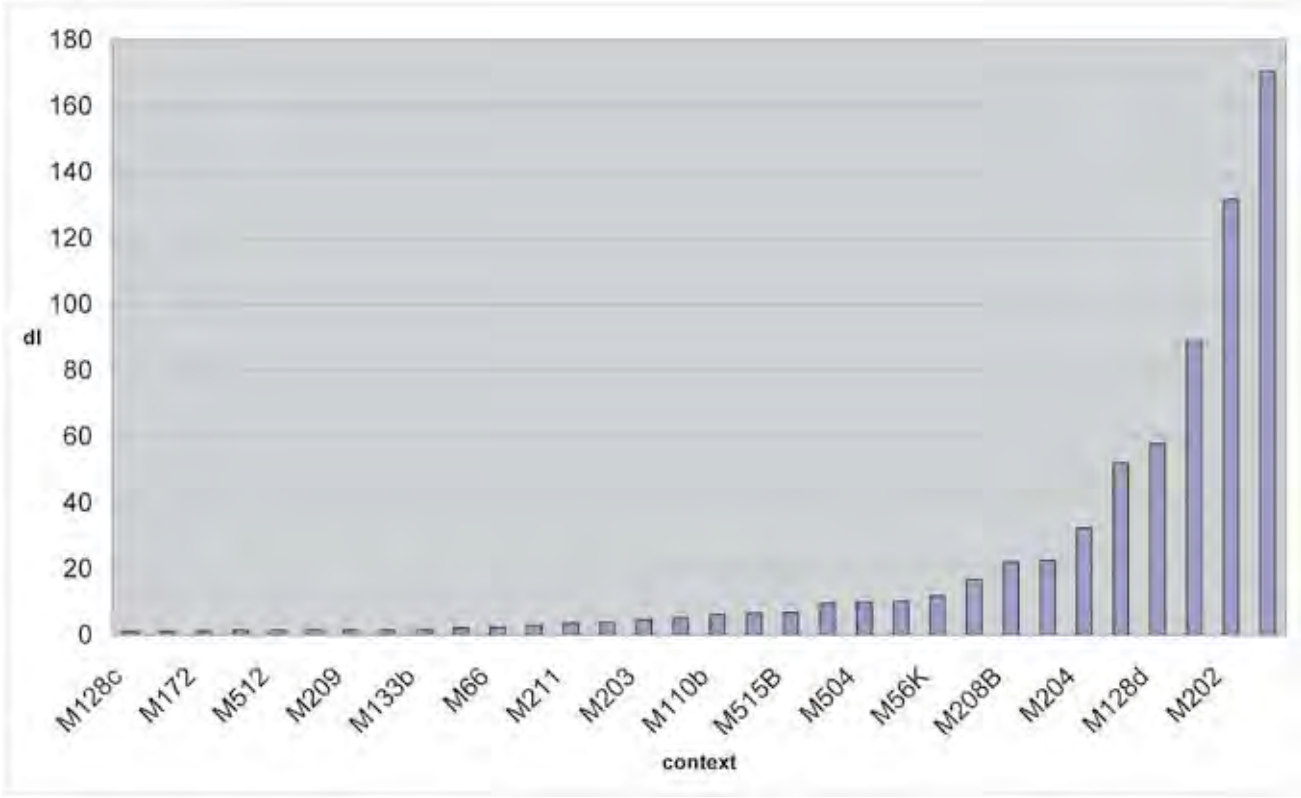


Fig. 111. The distribution of currying waste among the ÅA-site excavation units (with over 0.20 litres of waste).

connection of waste to structures or to other evidence of leatherworking, do not permit any definite conclusions regarding shoemakers' workshops in situ. An obvious risk is that large amounts of waste leather will make the whole town appear to be one large shoemaker's shop.[790] It must be noted that waste leather could have been shifted along with the transfer of soil or that leather waste could deliberately have been used, for example to dry waterlogged soil.

In the analysis of the leather waste in 16–22 Coppergate, York, the offcuts were divided into four groups. According to Mould, Carlisle & Cameron: 'Primary waste comes from initial trimming of hides during and following tanning and currying to remove unusable parts of the skin or hide such as the areas around the head and legs, bellyskin, udders and hide edges. Deposits of these offcuts point to the presence of these leather processing trades. Secondary waste describes the offcuts of leather from cutting out pattern pieces. These offcuts are frequently triangular or elliptical in shape. Certain triangular pieces, known as intersectional cutting pieces, are produced when a series of soles are cut from a hide; these are characteristic of shoe-making. Occasionally secondary waste leather can be seen with hide edges present, indicating that the leatherworker was cutting out pattern pieces from a complete hide rather than from a piece of leather from which the hide edges had been trimmed prior to sale. The final trimmings of the pattern pieces during the assembly into finished goods can be recognized as long, thin, often irregular strips. These have been called tertiary waste. Recovery of secondary and tertiary waste is indicative of the presence of manufacturing trades'.[791] This grouping of leather offcuts was used on the analysis of the ÅA-site material, too.

3.5.3 The distribution of leather waste at the Åbo Akademi main building site and its interpretation

I have chosen the ÅA-site for a closer scrutiny. This site is where the strongest suggestions about shoemaker's workshop/shops in situ, mainly based on the large number of offcuts and their possible connections to structures interpreted as 'workshops' have been made.[792] Besides, the ÅA-site is so far the only place in Turku with finds of currying waste recorded. The amount of currying waste was measured in litres. The total amount from the ÅA-site is 70 litres.[793] Those excavation units which had 0.20 litres or more of currying waste were chosen for further analysis. This division avoids possible misinterpretations; it is easy to misinterpret small amounts of totally worn-out leather debris from artefacts as currying waste. The distribution of currying waste among the excavation units is presented in Fig. 111.

Interesting here is the dating and distribution of this particular leather waste. The currying waste comes only from layers dated between the latter half of the 14th century - the first half of the 15th century. Although currying waste was found in all three excavation areas, the strongest concentration of currying waste is clearly in the 14th century

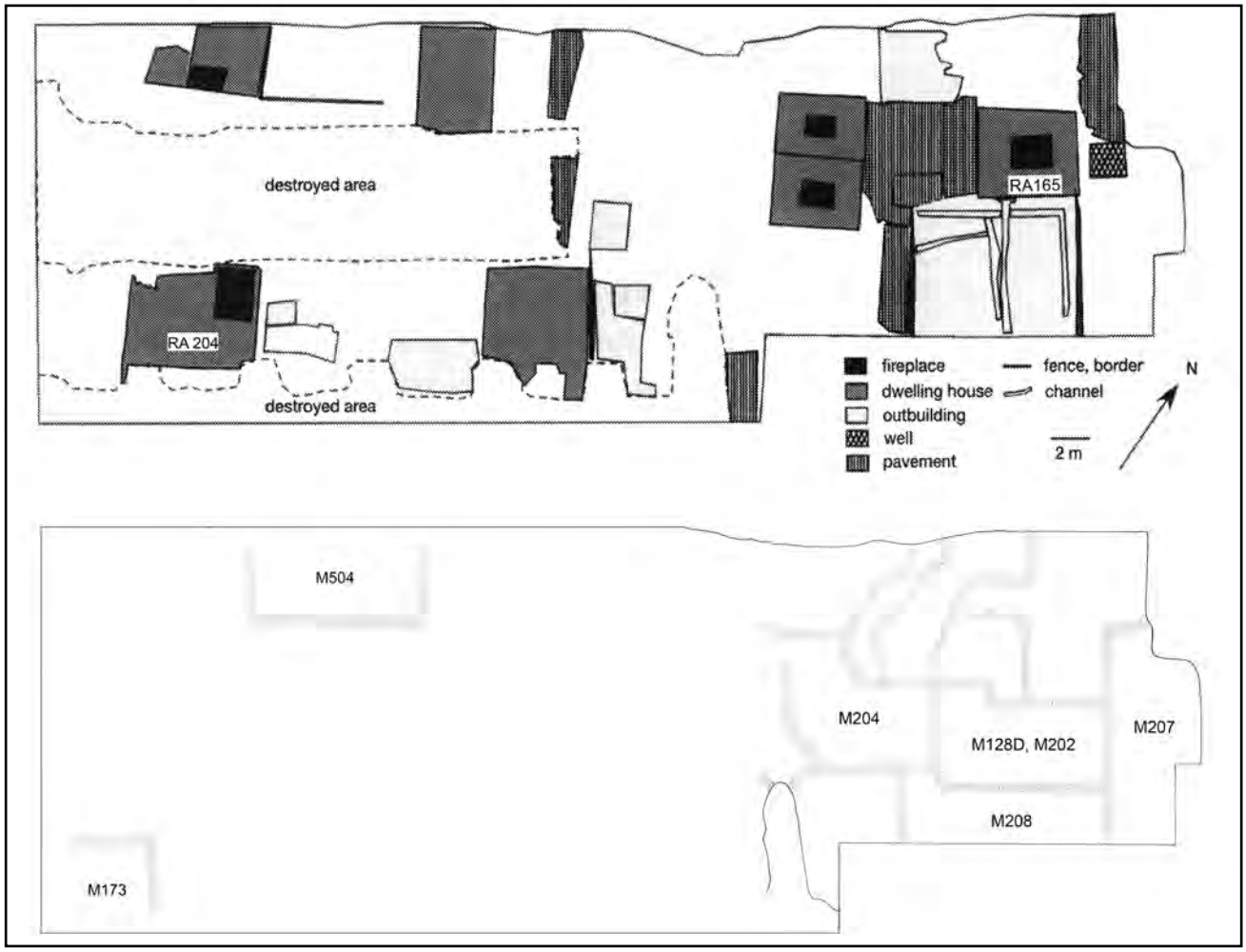


Fig. 112. The structures at the ÅA-site in the early 15th century phase (above) and the cultural layers, stratigraphically and chronologically preceding the structures (below). The currying waste and offcuts were strongly concentrated on the open areas of the eastern excavation area (cultural layers M128D, M202, M204, M207, M208) but also on the western part (cultural layers M173, M504).[794]

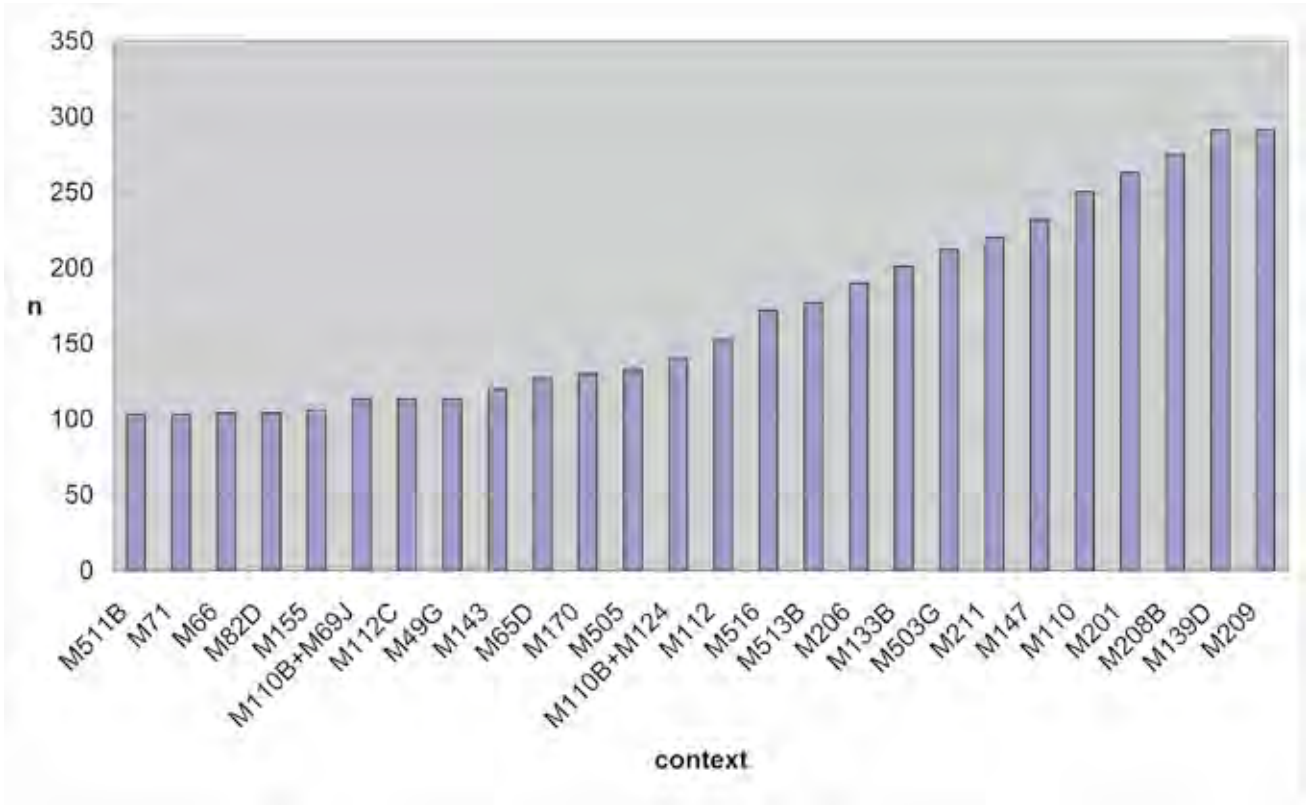


Fig. 113. The distribution of offcuts among the ÅA-site excavation units (with over 100 pieces).

Fig. 114. Different shapes of offcuts from the ÅA-site. Top: primary waste. Middle: secondary waste. Bottom: tertiary waste.

- the early 15th century layers on the eastern part (Compare Figs. 111 and 112).

The amount of leather offcuts at the ÅA-site was counted in numbers. The total number of offcuts is ca. 50,500 pieces.[795] The distribution of offcuts among the excavation units is presented in Fig. 113.

In this material, all three groups of offcuts described above, primary, secondary and tertiary, occur mixed together. One cannot find any clear concentrations of only one offcut type on the site. The occurrence of hide edges (primary waste, Fig. 114, top) together with offcuts from artefact cutting suggests the probability that the artefact maker used complete hides when cutting patterns for artefacts.[796] The preservation of udders and hide edges is also evidence of tanning of whole hides.[797]

It is possible to identify offcuts of shoemaking from the material. There occur pieces, easy to identify deriving from sole cutting, i.e. intersectional cutting pieces (Fig. 114, middle).[798] Tertiary offcuts from trimming are common, too (Fig. 114, below). Other artefact types have not been identified on the basis of the offcut shapes.

A general observation is that leather offcuts are frequent finds in most of those excavation units with favourable conditions for the preservation of the organic material. Unlike the distribution of currying waste, the spatial distribution of leather offcuts can be considered quite even and wide on the site. The cultural layers of open yards between houses and structures mostly had offcuts as part of their content. How can this be interpreted? I do not assume that the wide distribution of offcuts represents the practising of, for example, shoemaking, in most of the buildings on the site. It is more likely that the offcuts have been distributed, perhaps even consciously, from their primary cutting and discarding area to a wider area, for example, in soil drying purposes. Offcuts could have come in with or without purpose with soil when it was moved from one area to another.

Is it then possible at all to connect the leather waste to the leatherworking activity areas except in a very general way, such as 'leatherworking and shoemaking in the area excavated or near it took place'? One can start by looking at the strongest concentrations of leather waste. The first and most important observation is that the frequency of currying waste is highest in the late 14th century - the early 15th century layers in the eastern area of the excavation. Among the excavation units with the highest number of offcuts, there appear the same units as have the highest amount of currying waste (Compare Figs. 111 and 113). It seems that both offcuts and currying waste were discarded in the same contexts. This can be considered as a strong evidence of the connection between the two activities, currying and artefact making.

The origin of the eastern excavation area leather waste concentration is connected to the formation processes of the excavation units in question (the cultural layers with the highest amount of leather waste). The main question is whether the layer and its content were formed *in situ* or the soil shifted from elsewhere? If one has a dating of the cultural layer and it can be confirmed that the cultural layer has accumulated in situ, one can move to the inspection of the nearby structures of the same age/phase in looking for possible workshops.

Unfortunately, hardly any interpretations of the formation processes of the excavation units in question were made during the field documentation. Thus, one can only start from a hypothesis that the layers in question were formed in situ or at least not carried from far away. The dating of the layers M128D, M202, M207 and M208 is the end of the 14th century and possibly the first decade of the 15th century.[799] How did the area and its surroundings look at that time? The southeastern part of the excavation area, especially the excavation contexts M202, M207 and M208,

Fig. 115. Rough-outs of soles from the ÅA-site. Top, left: TMM 21816:NE13917. Top, right: NE14113. Bottom, left: NE2047. Bottom, right: NE04916. Late 14th century - early 16th century.

had no dwelling structures in any period of the Middle Ages. Instead, they were open areas with only structures related to outdoor buildings (wells, water channels etc.).[800] Thus, these spots on the site were well suited for dumping waste, including leather. Also, the origin for the waste from the units M202, M207 and M208, possible workshops, must have been outside the areas of these three contexts themselves.

During the excavation and in the excavation report, the cultural layer M128D, containing lots of leather waste, was stratigraphically connected to the structure RA165, a one-room building with a fireplace, dendrochronologically dated to AD 1405 and destroyed by fire in the end (Fig. 112). The stratigraphical relation of the cultural layer and the structure was defined as 'linked', in stratigraphical terms, representing the same age. This led to preliminary interpretations in which the building was interpreted as a possible shoemaker's workshop.[801] A closer inspection of the relations of these units, however, clearly has showed that the cultural layer M128D precedes the building RA165.[802]

It has been shown that most of the eastern area excavated was actually without dwellings still at the end of the 14th century. The oldest dwellings of the late 14th century are located on the southwestern side of the area nearer the Old Great Market Place and Karjakatu and, on the other hand, on the northwestern side near Old Hämeenkatu. From these locations, the inhabitation spread towards the pond of Mätäjärvi at the turn of the 14th and 15th century (see Fig. 1 for the locations).[803] It is then probable that the origin of the leather waste of the excavation units M128D, M202, M207 and M208 was somewhere in these directions either on the borders of the actual excavated area or in its surroundings. According to Seppänen, during the first decade of the 15th century, the ÅA-site was partly rebuilt and sometimes the older structures were used as foundations for new constructions.[804] Thus, another possibility is that the building RA165, constructed in the year 1405 had a predecessor of the 14th century, which has left no archaeological evidence. It is possible that at least one of the origins of leatherworking and shoemaking waste on the southeastern part of the eastern area would have been this building.

Another cultural layer containing a high frequency of the mixture of offcuts and currying waste is the unit M173 on the southwestern excavation area. Situated below the structures interpreted as a dwelling RA204 (see Fig. 112) and an outhouse, dendrochronologically dated to AD 1401, the cultural layer can be given a 14th century dating. The layer cannot be connected to any specific structure or structures and thus the exact origin of the leather waste cannot be solved. Only, that nearby plots of the 14th century, those outside the excavation area included, are most probable.

It was noted that those excavation units with a high frequency of currying waste without exception have a high frequency of offcuts. This is not the case the other way around. There are excavation units with a high frequency of offcuts totally without or only with a very small frequency of currying waste. Good examples of this phenomenon are units M504, M104 and M78C. These have 2170, 830 and 920 pieces of leather offcuts, respectively, but only M504 has a small amount of currying waste. Layer M504 can be dated to the latter half of the 14th century and M104 and M78C to the 15th century - the early 16th century. Generally, it seems that offcuts have a wider distribution both in time and space at the ÅA-site than currying waste. Offcuts have been found in the latter half of the 15th century - the beginning of the 16th century layers while currying waste is restricted to the latter half of the 14th century - the early 15th century. This suggests the continuing of artefact making - on the basis of the offcut shapes shoes were still included

- until the end of the Middle Ages while currying evidence disappears sometime during the first half of the 15th century.

3.6 Master forms / Rough-outs of shoes

From the ÅA-site, four shoe soles which have no stitch holes on their edges were found (Fig. 115).[805]
These finds can be interpreted in two ways. The soles can be rough-outs, which, for some reason, have not been finished. An alternate explanation is that the soles are cut loose from old shoes and are therefore lacking stitches. The find contexts of these soles cannot be connected to any special leatherworking activity on the site. The finds represent the period from the latter half of the 14th century to the beginning of the 16th century. Another shoe sole without stitches comes from the survey in Hämeenkatu 17.[806]
Parallels to these soles have been found in Oslogate 2–8 in Oslo, dated to the 13th century. Soles with cut edges without stitches were interpreted as half-made soles working as evidence of shoemaking in the area.[807]

3.7 Shoe repairs and the reuse of leather

It was natural that broken shoes were repaired. In the following, the different types of repairs noted in the Turku shoe material are presented. It is also interesting to consider who did the repairs. Besides home-made repairs, professional help could be used.
Damaged shoes could be taken to a shoemaker for repair. However, there were also special trades dealing with shoe repairs. In medieval England, for example, there was a trade called cobblers. Cobblers dealt with old shoes, refurbishing, remaking and repairing them, before selling them on. Thus, besides repairing shoes, cobblers also sold second-hand shoes.[808] In Germany, the job description of the cobbler was divided into two professions. A *Flickschuster* was the one who only repaired shoes while an *Altmacher* bought used shoes, fixed them and sold them on.[809] There is no information on cobblers in medieval Sweden.[810]
The first mention of a possible cobbler in Turku is from as late as the beginning of the 17th century.[811]
It is the archaeological record only which tells us about the shoe repairs in Turku in the Middle Ages and at the beginning of the Early Modern Period.

3.7.1 Replacement of soles

The shoe part most vulnerable to wear was the sole. Therefore, most typical repairs are those of soles. It was possible to change and resole the shoe which meant that the whole lasting margin had to be restitched. According to Grew & de Neergaard, this demanding and time-consuming task was done by a shoemaker, not a cobbler.[812] Although resoling the whole sole cannot be archaeologically identified from the Turku material because the old stitch holes were used in this task, it can be assumed that this was sometimes done here, too.
The two-part composite sole constructions discussed in section 1.1.2 (Fig. 84) were considered as original features in the sense that two-part soles made changing only the front or back part of the sole possible and quick. It is impossible to say whether the sole part of an archaeological shoe is original or a replacement because the old stitch holes were used also in partial resoling. The composite sole construction was noted in 12 cases with a dating from the first half of the 14th century to the end of the Middle Ages. On the basis of the few finds of two-part soles, the partial resoling does not seem to have been very common. It is suggested that resoling was done by shoemakers in Turku.

3.7.2 Clump soles

Much more common are the so-called clump soles. A clump is an additional piece of leather which was used to patch a worn area of a shoe sole. According to Grew & de Neergaard, clump repairs were the task of a cobbler. In this context they suggest shoes in which the clump has been attached with a tunnel stitched thread.[813] Most of the shoes with a clump repair in Turku, however, have been repaired with a very coarse leather thonging. Only in a few cases has the use of thread been documented.[814] The use of coarse thonging could mean that these shoes were repaired by the shoe users themselves.
It has been suggested that a high percentage of heavily worn and repaired soles and clump repairs, may represent rubbish from a cobbler's workshop.[815] It has not been possible to find any such concentrations in Turku material. The even distribution of clump repaired shoes hints at self-made repairs, too.
Clumps are most frequent on the heel section of the sole (Fig. 116, left and right). In some cases, the front part of the sole has been patched, too (Fig. 116, left).[816] It seems that in some cases clumps were stitched to soles before any wear had taken place, probably to prevent the wear of the actual sole, more difficult to change than the clump. Clump repair was used in those cases, too, where the lasting seam had broken. In these cases the clump is usually wider than the sole and thonged to the upper at the sides.
Of the measured shoe soles of the ÅA-site, ca. six per cent showed some kind of signs of clump repairs. This can be considered quite a low percentage. It supports the observation that a large number of shoes found at the ÅA-site were actually in quite good condition when discarded. Their condition would

Fig. 116. Clump soles. Left, TMM 21816:n2928; right, NE2045. Late 14th century - early 15th century.

well have allowed their repair for reuse but for some reason this was not frequently done. Instead, many shoes were discarded after only minor wear and not selected for refurbishment. The material does not support the idea that some kind of shortage of shoes would have prevailed. There was plenty of material for reuse not exploited. Either the reuse was not allowed or there was no need for such activity.

3.7.3 Repairs of uppers

Repairs of uppers are not as frequent as those of soles. Most probably this is because the soles might have worn out long before the uppers.[817] In Turku, the most typical repair of uppers is patching the worn out spot with a patch, sewn on the inside of the shoe with a binding stitch. This repair method has been noted in five cases in Turku.[818] No patches on shoes have been found. The evidence of patching is only the hole on the shoe and the stitch holes on the inside of upper around the hole.
Other types of upper repairs are even rarer. In one case, the replacement of a metal buckle with a leather loop in a case of a buckled shoe was documented.[819] In two cases the tear in the instep of the upper has been repaired using a butted seam and a binding stitch.[820]

3.7.4 Reuse of leather

Salvaging pieces of leather for reuse was a very common phenomenon in Turku in all medieval periods. A large number of artefact pieces cut off, are a clear evidence of this custom. Most cut artefacts which could be recognized are shoes. This is no surprise, when we know that shoes are the largest group of archaeological leather objects in Turku. Other leather artefact types have been cut, too. There are examples of bags, pouches and mittens. Despite the common phenomenon of cutting up leather for reuse, it has not been possible to find any clear concentrations of items cut off, which could be interpreted as deriving from a cobbler's workshop. The distribution of reused leather is too even for any such conclusions.[821]
It seems that all kinds of leather objects were repaired and reused when they had come to the end of their lives. The end results of the reuse found from archaeological contexts are sparse. There are two one-piece shoes made from a leg part of a shoe, a leg part of a shoe made from an unidentified leather object and two open, sandal-like shoes refurbished by cutting shoes (Fig. 117).[822]

3.8 Summary

Based on the archaeological observations from nine sites in Turku, mostly tub-like constructions of round or oval shape were used in tanning. The tubs were made with a stave construction and their typical diameter is ca. 80–150 cm. Partly buried in the ground, the tubs represented a fixed plant. This is appropriate for the long tanning process. The dating of the tubs is from the 15th century to the 17th century. The tubs from two sites, the ÅA-site and the Library site are certainly medieval. The tubs were found in two quarters in Turku, the Mätäjärvi quarter and the Aninkainen quarter. It was appropriate that the smelly process of tanning was carried out on the outskirts of the town. Other structural evidence of tanning are the skin scraping beams and drying racks of hides. It must be noted that large tubs, beams and racks are open for other interpretations of use than tanning.
Osteology and macrofossil evidence can be used as evidence of leather processing. Leatherworking may be indicated by large numbers of bones of the lower extremities of goat from the excavation of Rettig's slope site. Besides, horn cores could be left on the skin. The horn assemblages at the ÅA-site, Österblad site and Mätäjärvi site may have a connection to the leatherworking activity in these areas, although more definite conclusions cannot be drawn.

Fig. 117. Sandals made by cutting pieces off shoes. Left, TMM 21816:NE13253, 15th century; right, TMM 21816: NE2058, late 14th century.

It is known that certain plants, parts of plants or substances manufactured from plants have been used in the tanning process as tanning substances. Altogether, 13 kilograms of hazel nutshells come from the ÅA-site excavation. Large amounts suggest the special use of nutshells besides the use of shells as food. The nutshells of common hazel were used in tanning of leather and dyeing leather and textiles. Another plant used in tanning and found at the ÅA-site is the bearberry.

The alternative or parallel use applies to plants used in tanning and dyeing of leather and dyeing of textiles. Both these processes, tanning and dyeing employed the same materials: the bark of trees and shrubs, the leaves of plants and nutshells. By archaeological means, it is hard to define exactly which activity the substances were used for in Turku. The possibility of easily exploiting the same substances and structures for two different purposes could encourage carrying out two activities, tanning and dyeing side by side. Another possibility is that tanning and textile working have succeeded each other chronologically.

Of the tools found, awls and creasers had a wide use in leatherworking and awls also in woodworking. Shoemakers' knives, on the other hand, were used solely in shoemaking. Of the two basic types of shoemakers' knives, only one example of the half-moon shaped type occurs in the archaeological material in Turku. The knife was found from a late 14th century cultural layer at the ÅA-site. There are no finds of the second type, the sickle formed shoemakers' knives. There is, however, a knife sheath the shape of which would have fitted this kind of knife. The context of the find is dated to the latter half of the 14th century - the turn of the 15th century.

The problem that the archaeological evidence for textile working and leatherworking is the same in many cases, applies to shears, spindles, sewing-needles and thimbles, which may well have been used in leatherworking or shoemaking but also in textile working.

One of the basic tools of a shoemaker is the last. There are seven lasts from archaeological contexts in Turku. The reason for the usually small number of lasts found in excavations is obvious. Wooden lasts easily ended up as firewood. The use of lasts is visible in shoe soles, too. In medieval turnshoes, the treadsole was fixed onto the last with two or three wooden pins or iron nails. These left their marks, peg or nail holes, on soles and lasts. It must be noted that some soles show no marks of nail holes. It is probable that the soles with no holes are from shoes made without a last. The percentages for shoes made with and without a last would be 94 and 6.4, respectively. On this basis the use of a last would have been very common, although not universal in medieval Turku.

The strongest archaeological evidence of leatherworking is the waste leather deriving from leatherworking and the making of leather goods. From the ÅA-site excavation, a large amount of 'tattered', tissue-like waste leather interpreted as currying waste was found. The total amount from the site is 70 litres. The currying waste comes only from layers dated between the latter half of the 14th century - the first half of the 15th century. The strongest concentration of currying waste is clearly on the 14th century - the early 15th century layers on the Kemikum area. The currying waste cannot for certainty be connected to any structures noted in the excavation. It is more probable that the waste was dumped on the open areas of the site from the nearby plots, at least partly outside the excavation area.

Unlike currying waste, remains of leather cutting, offcuts, are numerous in Turku. They have been found in almost every excavation and survey extending to layers of organic content. It is possible to identify offcuts of shoemaking from the ÅA-site material. There occur pieces, easy to identify deriving from sole cutting, i.e. intersectional cutting pieces. Offcuts from trimming are common, too. Other artefact types have not been identified from the offcut shapes from the ÅA-site or other sites in Turku.

The total number of offcuts at the ÅA-site is ca. 50500 pieces. The different types of offcuts occur mixed together. One cannot find any clear concentrations of only some offcut types on the site. The occurrence of hide edges (primary waste) together with offcuts from artefact cutting suggests the probability that the artefact maker used complete hides when cutting patterns for artefacts.

A general observation of the ÅA-site is that leather offcuts are frequent finds in most of those excavation units with favourable conditions for the preservation of the organic material. Unlike the distribution of currying waste, the spatial distribution of leather offcuts can be considered quite even and wide on the site. The cultural layers of open yards between houses and structures mostly had offcuts as part of their content. The offcuts could have been distributed, perhaps even consciously, from their primary cutting and discarding area to a wider area, for example, in soil drying purposes.

Offcuts have been found as late as the latter half of the 15th century - the beginning of the 16th century layers while currying waste is restricted to the latter half of the 14th century - the early 15th century. This could mean that the artefact making - on the basis of the offcut shapes shoes were still included - would have continued until the end of the Middle Ages while currying evidence disappears sometime during the first half of the 15th century.

Besides the ÅA-site, another area with evidence of leatherworking and shoemaking possible to connect to a specific area is the strand area of the pond of Mätäjärvi. It has been suggested that the structural (tanning tubs, scraping planks) and artefact (mainly the leather waste) evidence would represent the carrying out of professional shoemaking with leatherworking included.[823]

Besides tools and leather waste, other evidence of shoemaking are the master forms of leather for shoe soles, mostly found at the ÅA-site.

Shoes in Turku were mostly repaired by clump soles. Most of the shoes with a clump repair in Turku were repaired with a very coarse leather thonging. In only a few cases has the use of thread been documented. This suggests the probability that these shoes were repaired by the shoe users themselves. Another method of sole repairing was resoling. It is suggested that resoling was done by shoemakers in Turku. Repairs of uppers, usually by patching are not as frequent as sole repairs.

On the basis of the large number of cut down leather objects, it seems that all kinds of leather objects were repaired and reused when they had come to the end of their lives. On the other hand, a large number of shoes found at the ÅA-site were actually in quite good condition when discarded. Their condition would well have allowed their repair for reuse but for some reason this was not frequently done. Instead, many shoes were discarded after only minor wear and not selected for refurbishment. The material does not support the idea that some kind of shortage of leather or shoes would have prevailed. There was plenty of material for reuse not exploited.

DISCUSSION OF PARTS I AND II: FOOTWEAR AND SHOEMAKING IN TURKU IN THE MIDDLE AGES AND AT THE BEGINNING OF THE EARLY MODERN PERIOD

Selection of the subject

The purpose of this thesis was to obtain answers related to shoes and their use and manufacture in the town of Turku and Turku Castle in the Middle Ages and at the beginning of the Early Modern Period (late 13th century - the first half of the 16th century). This subject was considered important because of its connections to many aspects of trade, economy, cultural connections, social structure, demography and geographical development of the town. Besides, a very large and well-preserved amount of archaeological shoe material accumulated in Turku during the long archaeological research history was available for research, as yet without comprehensive study.

Research history

The study was begun with the survey of the subject's research history. Of the medieval towns in Finland, most studies of archaeological leather have discussed Turku, although materials from Porvoo, Vyborg (Fin. *Viipuri*; now part of the ceded Karelia) and Naantali have been discussed to some extent. Besides Turku, the potential of the cultural layers for future studies is best in just these three medieval towns. Organic finds from other medieval towns, Rauma or Ulvila may not be expected to have been preserved as well, due to the lack of organic cultural layers.

Part I
Typology, dating and the distribution of shoe types in Turku

As no comprehensive scheme of the development of shoe styles in Turku was available, the main questions of the first two chapters of Part I concentrated on the typology, dating and distribution of archaeological shoe types in Turku.

For the analysis, the mass of shoe finds was first divided into four main groups, one-piece shoes, turnshoes, pattens and welted shoes. Further division into shoe types was then made inside these main groups. By this means, a minimum number of 1163 shoes, possible to define by type, was obtained.

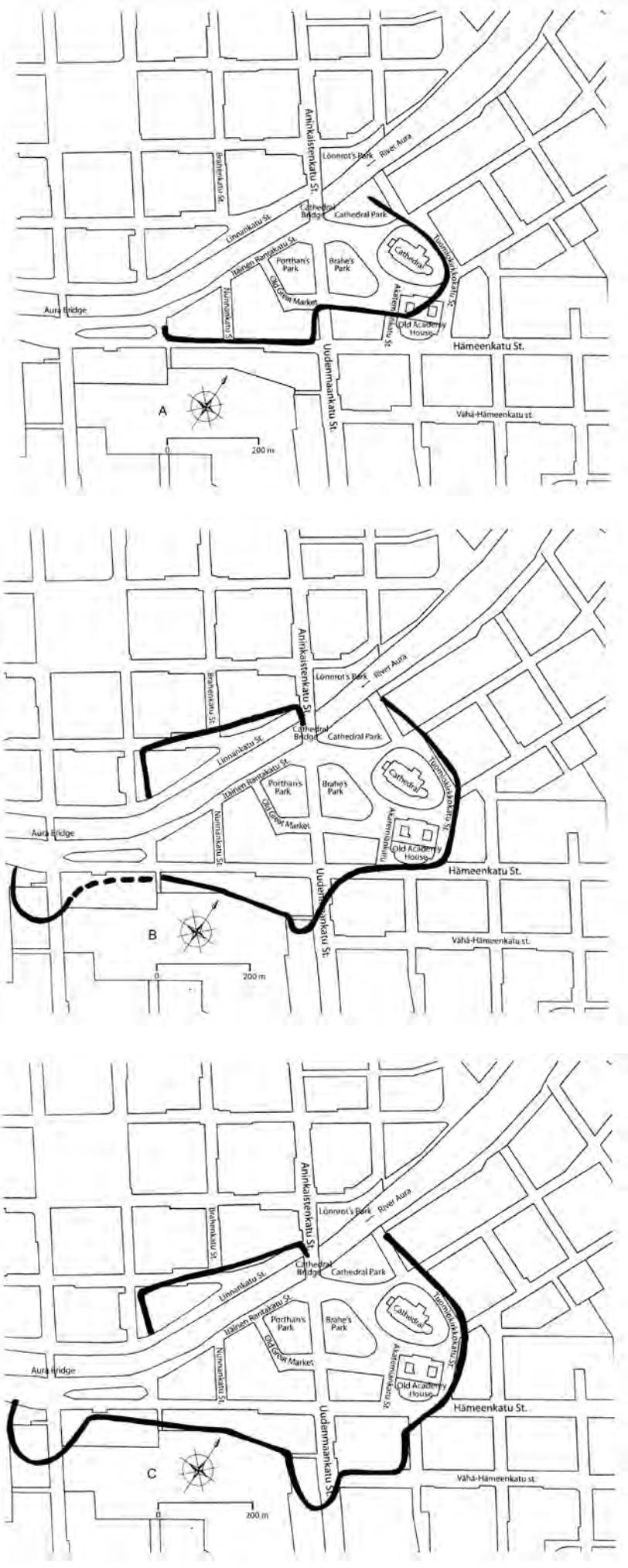
Although the majority of the shoe assemblage is composed of turnshoes with a separate sole and upper, some shoes defined as one-piece shoes were noted. One-piece shoes have been found in the Mätäjärvi quarter and the Cathedral quarter in the town area. In addition, there is one find from Turku Castle. The datings show that one-piece shoes were used in Turku throughout the Middle Ages and possibly still at the beginning of the Early Modern Period.

Thong shoes (together with strap shoes) represent the oldest turnshoe type in Turku, occurring for the first time in the oldest - late 13th century / early 14th century - cultural layers in the Old Great Market Place and then in other 14th century contexts in the town and Turku Castle. On the basis of an almost total lack of thong shoes in the late 14th century Åbo Akademi main building site assemblage, it could be inferred that thong shoes went out of fashion sometime during the latter half of the 14th century. They can be considered a late 13th century - 14th century shoe type in Turku.

The distribution of thong shoes in Turku is the Cathedral quarter, Convent quarter and the northern edge of the Mätäjärvi quarter. In Turku Castle, thong shoes have been found in the eastern outer bailey area. The distribution of thong shoe finds matches the supposed area of the 14th century Turku (Figs. 118a and b) well. The shoe type is concentrated in the nucleus of the town. Finds have not been made in the Aninkainen quarter or the Mätäjärvi quarter except for its northern edge (the Åbo Akademi site).

Strap shoes, too, occur in the oldest phase of the town but unlike thong shoes, they remained in use until the end of the Middle Ages. Some chronological differences could be seen in comparing the variants of strap shoes. Low strap shoes are mainly a late 13th century - 14th century type, accordingly occurring in the areas inhabited during this period, i.e. the Cathedral quarter, the Convent quarter and the northern edge of the Mätäjärvi quarter. On the other hand, strap shoes of ankle height occur mainly in the latter half of the 14th century and the first half of the 15th century. Their distribution follows their dating, too. Most of the finds are from the ÅA-site where some ankle shoes can be dated as late as the latter half of the 15th century. Strap shoes are missing totally from the assemblages of the Uudenmaankatu 6 and Mätäjärvi excavations situated on the strand

Fig. 118. The supposed limits of Turku according to Aki Pihlman ***(a)*** *at the beginning of the 14th century,* ***(b)*** *at the end of the 14th century,* ***(c)*** *at the end of the Middle Ages.*[824]



area of the pond of Mätäjärvi. The reason for this is probably that when the settlement spread to this part of Mätäjärvi quarter in the latter half of the 15th century, strap shoes were no longer popular. Other possible reasons could be connected to some aspect of the social structure of the settlement; that for some reason there was a predominance of front-laced shoes even if other shoe types were available.
Tailed-toggle fastened shoes in Turku have been found at those sites situated in the Cathedral quarter, the Mätäjärvi quarter and the Convent quarter but they have not been found in the Aninkainen quarter. The dating of this shoe type in Turku is from the latter half of the 14th century to the latter half of the 15th century.
On the basis of the present archaeological material, side-laced shoes in Turku are a latter half of the 14th century - 15th century shoe type. It is possible that their greatest popularity was in the late 14th century - early 15th century but more dated finds are needed to support this hypothesis. The distribution area of side-laced shoes is the Cathedral quarter, the Convent quarter and the northern edge of the Mätäjärvi quarter (the Åbo Akademi site). There are no side-laced shoe finds from other sites in the Mätäjärvi quarter or the western side of the River Aura, i.e. from the Aninkainen quarter. In the Turku Castle material, side-laced shoes are represented in the 14th century material at the eastern outer bailey area.
The front-laced shoe is the most numerous shoe type in Turku. It occurs in every medieval quarter, also in the Aninkainen quarter as the only medieval shoe type on the western side of the River Aura. The oldest front-laced shoe has been found at the Hjelt building site at the Old Great Market Place and can be dated by its context to the second quarter of the 14th century. At the Old Great Market Place, front-laced shoes mainly appear in the latter half of the 14th century. Material from other dated sites also date the front-laced shoes from the latter half of the 14th century to the beginning of the 16th century. Some shoe finds from the ÅA-site may suggest the possibility that front-laced shoes of a turnshoe type were to some extent still used in the latter half of the 16th century or even at the beginning of the 17th century.
Buckled shoes of closed style have mainly been found in the Mätäjärvi quarter, most of the finds are from the ÅA-site and the rest from nearby sites. The buckled shoes of closed type were dated to the 15th century even if some shoes could date as early as the late 14th century. The continuation of the shoe type to the 16th century cannot be proved with the present material. The popularity of this shoe type is in any case highest in the 15th century. An example of an open style buckled shoe from Turku Castle dates to the late 13th century or to the first half of the 14th century.
Boots, here defined as a closed form of footwear reaching over the ankle or higher, and lacking a fastening opening, fastening or closure, have been found in the Cathedral quarter and Mätäjärvi quarter where all finds come from the ÅA-site. Boots were dated by their find contexts to the 14th century and possibly to the early 15th century. The probable reuse of the leg parts causes underrepresentation of this shoe type among archaeological shoes, which has been noted in many archaeological excavations at medieval sites. On the other hand, the small number of even the vamp parts, which should have been preserved better than leg parts, could mean the real rarity of this footwear type in Turku.
Shoes with a combined fastening were defined as shoes which have at least two different types of original fastenings or closures combined on an individual shoe. Dated examples from the ÅA-site date to the period latter half of the 14th century - the first half of the 15th century.
Besides turnshoes, there are wooden soles from pattens, straps for fastening pattens to feet and toe caps to give better grip on the toe-part of the foot. Most of the material is composed of patten straps. The distribution area of pattens is the Mätäjärvi quarter, especially its northern edge (the Åbo Akademi main building site) and the Convent quarter. There are no patten finds from the Aninkainen quarter or from Turku Castle. The earliest pattens come from the ÅA-site and can be dated to the late 14th century. Most of the ÅA-site pattens come from the 15th century layers which also applies to pattens from other sites in Turku. The emphasis of patten dating on the first half of the 15th century at the ÅA-site may suggest the possibility that the peak in their popularity was the first half of the 15th century. It seems that pattens were still used in the first half of the 16th century to some extent.

Early Modern Period shoes - archaeological and written sources

No shoe components of the Early Modern Period have been found in archaeological excavations in Turku. Instead, all the material comes from surveys. Because of this, only typological dating for these shoes is available. Of the types of Early Modern Period shoes, the low-cut styles and closed styles occur in the archaeological material in Turku. Mules have not been found so far. On the basis of soles, there are both square-toed and wide, rounded-toed shoes from the town area. Early Modern Period shoes occur in the Cathedral quarter and in the Mätäjärvi quarter, in its northern edge facing the Cathedral quarter. In Turku Castle, both closed style and low-cut style occur. Decoration of the vamps of the low-cut styles is frequent. Both square-toed and wide, rounded styles occur. The crescent shaped 'bear shoes' are missing from the archaeological material but can be seen in the ca. 1530s wall paintings in the castle. Most of the material is composed of separate soles which are of the same basic type, widening towards the toe, i.e. square-toed and cowmouth styles and also intermediate forms. Unlike for medieval shoes, information on the Early Modern Period shoes is available from written

sources. Important information concerning shoes made with the new welted technique comes from the lists of shoes, given as wages in castles. Double-soled shoes given to the personnel of Turku Castle are mentioned very late in the written sources (year 1551). Still in 1557, more single soled than double-soled shoes were made in Turku Castle. In the archaeological shoe material of the castle, however, we can see that double soles were common in shoes, which can typologically be dated to the first half of the 16th century, some of these (the widest cowmouth styles) possibly to the very beginning of the century. In this case the archaeological shoes found seem to represent fashion shoes, probably of the higher class of the castle people. The servants still mostly wore single soled medieval type shoes well into the latter half of the 16th century as the written sources tell us.

The chronological development of shoe styles in Turku in a nutshell

As a conclusion, the chronological development of shoe types in Turku can be summarized in the following way.

In the town area, the late 13th century is represented in the Old Great Market Place and possibly in the Aboa Vetus Museum assemblages. Shoe types occurring are the thong shoe and the strap shoe. These are the only shoe types occurring in the oldest phase of the town of Turku.

In the town area, the first and second quarter of the 14th century are represented in the Old Great Market Place and Aboa Vetus Museum assemblage. The shoe types are the same as in the previous period except that the only one-piece shoe from the Old Great Market Place occurs in this phase. In the second quarter, the shoe types are thong shoes and strap shoes, plus there is one front-laced shoe, the oldest in Turku.

Besides the Old Great Market Place and the Aboa Vetus Museum, the first half of the 14th century and possibly even the late 13th century are represented in Turku Castle. The shoe types occurring in the eastern outer bailey assemblage are the thong shoe, side-laced shoe and the buckled shoe. The lack of side-laced shoes and buckled shoes from the Old Great Market Place assemblage and the occurrence of these shoe types in the first half of the 14th century, possibly even in the late 13th century in the castle means that side-laced shoes and buckled shoes occur earlier in the castle than in the town area.

The latter half of the 14th century - first half of the 15th century is represented in the materials of Vähä-Hämeenkatu 13b, Uudenmaankatu 6, Old Great Market Place, Aboa Vetus Museum, ÅA-site and the Cathedral Square. Shoe types certainly occurring in the latter half of the 14th century are the one-piece shoe, thong shoe, strap shoe, tailed-toggle fastened shoe, side-laced shoe, front-laced shoe, boot and patten. The occurring of buckled shoes as early as the 14th century is a questionable because they have not been found in layers with only 14th century material. At the ÅA-site, thong shoes and boots occur only in this phase, not later. Shoe types occurring in the latter half of the 14th century continue to occur in the first half of the 15th century. Exceptions are thong shoes and boots which do not occur any more in the first half of the 15th century. A new shoe type is the buckled shoe which, at the latest, appears sometime during the first half of the 15th century.

Shoe types which continue to occur in the latter half of the 15th century are the one-piece shoe, front-laced shoe, tailed-toggle shoe, strap shoe, buckled shoe and patten. A shoe type not occurring any more or occurring only sporadically is the side-laced shoe. The only shoe types certainly occurring at the beginning of the 16th century are the front-laced shoe and the patten. The occurrence of tailed-toggle shoes, strap shoes and buckled shoes still in the 16th century is uncertain but possible.

The only medieval shoe type still certainly occurring to some extent in the latter half of the 16th century is the front-laced shoe. Some of these shoes can date even to the beginning of the 17th century.

Social implications of shoes

After the typology, dating and distribution of shoes, the thesis concentrated on the social implications of shoes in chapter three of Part I. The large shoe assemblage of the Åbo Akademi main building site was used to gain statistical information on the sizes of medieval feet. This information was then used in the analysis of the gender and age of the users of shoes. The size ranges for men, women and children could then be compared to the sizes of different shoe types and in some cases even information about the users of particular shoe types could be gained. The starting point was the estimation that medieval feet, unaffected by modern dietary developments, were about four English sizes smaller than modern feet. The two peaks noted in the lengths of the ÅA-site shoe soles correspond to the most popular sizes of adult women's and men's shoes. The typical length of men's shoes in Turku would range from continental sizes 34.5–35 to 37.5 with some shoes up to size 41.5. The size range of women's shoes was defined to range from continental sizes 29 to 34.

The smallest sole sizes are only 10–10.5 cm in length (continental size 16) while the first peak in the number of shoes can be seen in length 12 cm (continental size 18). Transferred to modern foot size, shoes of sizes 16–18 would correspond to size 20–21.5 shoes. Thus, they would fit to ca. one-year-old child, which is also the age when a child learns to walk. It seems that children in Turku started to wear shoes right from the beginning.

The following conclusions about the sex and age of the users of different shoe types were made. One-piece shoes, thong shoes, strap shoes and front-laced shoes have been used by men and women as well as children. Tailed-toggle fastened shoes have been used by children, women and men, but they have been most popular as footwear of small children from one to ca. six years of age. In children's sizes, strap shoes and front-laced shoes have been most common as footwear of older children, from ca. six years upwards. The difference in the use of these shoe types is placed around the modern pre-school/school starting age of six or seven years. It is the same age as the traditional border between

childhood and youth. This border was expressed in dress and evidently in shoes, too.
Side-laced shoes, buckled shoes and boots are adult shoes on the basis of the present material. The use of pattens by children is uncertain but possible on the basis of the toe caps found.
On the basis of the present material, men and women seem to have used the same shoe types. No preference for either gender was noted, either. Possible differences distinguishing men's and women's shoes are such which cannot be discerned from archaeological material any more (e.g. colour), or they are still present in archaeological shoes, but difficult or impossible to discern by the present day archaeologist.

Placing the Turku shoes in the European framework

In chapter four of Part I the shoes of Turku were placed in a wider context. In Turku, the appearance of the later thong shoe happens at the end of the 13th century, just as at other comparable sites, especially the towns of central Sweden. However, unlike these Swedish towns, later thong shoes do not occur anymore in the 15th century in Turku, not even sporadically. The situation seems to be the same in Stockholm, where thong shoes most closely resembling the Turku finds, occur only in the 14th century.
The low-cut thong shoe from Turku Castle differs significantly from the styles of the town area. The dating by the find context is from the late 13th century to the 14th century. Typological parallels from Schleswig, Einbeck and Svendborg conform the date to the latter half of the 13th century or the first half of the 14th century.
Besides the open, low-cut thong shoe, the only ankle thong shoe occurs in Turku Castle. This shoe type, occurring commonly in Europe from the 12th century at least to the 14th century, is lacking from the Turku town assemblage. While the type occurs commonly in the towns of central Sweden, Örebro, Enköping, Söderköping and Uppsala in the 13th and 14th centuries, in Uppsala even in the 15th century, the type has not been found in Stockholm. In this respect, the Turku assemblage resembles the Stockholm finds. The reason for the lack of this shoe type in Turku could be partly chronological - there are few excavated late 13th century/early 14th century contexts - and thus no contexts for ankle thong shoes at the peak of their popularity. The later datings from other sites, Uppsala, for example, suggest the possibility that the reason could be a cultural difference.
Strap shoes in Turku appear as early as in the foundation period of the town, the end of the 13th century. It seems that the development follows the towns of central Sweden, where strap shoes were used throughout the 14th century. Strap shoes, however, have been used longer in Turku, until the end of the Middle Ages, even if their use after the first half of the 15th century is more sporadic.
Tailed-toggle fastened shoes have been found in a wide area in Europe. Dating to the latter half of the 14th century and the 15th century is similar at different sites. In Turku, tailed-toggle fastened shoes were used till the end of the Middle Ages. That this shoe type has been most common as children's shoes applies to Turku as well as most of the other sites in Europe.
Side-laced shoes seem to have quite a short period of use in the town area, the end of the 14th century - the beginning of the 15th century, with a peak at the turn of the 14th/15th century. The short period of use, the low number of shoes found and the fact that 23 per cent of these shoes were made with a flesh side of leather outwards suggest the probable fashion phenomenon of side-laced shoes in the town of Turku.
The side-laced shoes from Turku Castle can also be regarded as fashion shoes. They have been decorated with an openwork decoration not noted in the side-laced shoes of the town area. Another distinguishing factor is that Turku Castle shoes may date to the first half of the 14th century, i.e. they would have appeared earlier in the castle than in the town.
Front-laced shoes mainly appear in Turku sometime during the latter half of the 14th century. The dating corresponds well to that from the towns of central Sweden but dating of several shoes to the first half of the 14th century from Stockholm seem to be earlier than in Turku. Of course this can be due to the quite small number of dated early 14th century contexts in Turku. Besides Turku, front-laced shoes have been found in three other medieval towns of Finland, Naantali, Porvoo and Vyborg.
The dating of closed buckled shoes in Turku, the 15th century, possibly the end of the 14th century and continuing to the beginning of the 16th century is consistent with dating at other sites. Open buckled shoes of Northwestern Europe have been given a general dating to the 14th century. The typological dating of the Turku Castle shoe would be the end of the 13th century or the first half of the 14th century. This would be earlier than the dating of the buckled shoes of the town area. Thus, buckled shoes would appear earlier in the castle than in town. The open style of buckled shoe has been rightly considered rare in Scandinavia. Turku Castle shoe, too, can be regarded as a fashion shoe of an upper class person.
Generally, boots seem to have had a long period or periods of use, from the 13th century to the 15th century. The few boot finds of Turku are in the middle of this period, the 14th century - the beginning of the 15th century.
The patten finds in Turku seem to follow the late 14th century - the 15th century dating with a possible peak in the first half of the 15th century. In Europe, pattens were most common during this period. The occurrence of pattens in the Mätäjärvi quarter, the Convent quarter and the Cathedral quarter does not reveal anything special about the social context of pattens. Neither does a closer examination of the find contexts help in solving the questions concerning the use of pattens. One thing, however,

which has changed because of the recent patten finds, especially the large number from the ÅA-site, is the frequency of pattens compared to other shoe types. This narrows down the ideas about the pattens as pure high fashion or luxury items. On the contrary, it seems that they were available to a wider population, although it is possible that in Turku, too, they were first shoes of the more restricted part of population.

The occurrence of decoration in patten straps seems to change in the latter half of the 15th century. The decoration is more frequent and rich in the straps of the late 14th century - the early 15th century. Later straps are plain or have a much more simple decoration. This strengthens the idea that pattens became more common during the 15th century and were no longer pure luxury/fashion objects.

It has been shown that the Iron Age tradition carried on to the Middle Ages in some areas of handicrafts in Turku, for example, in textile and ceramics manufacture. It is possible that in shoemaking, one-piece shoes represent the Iron Age tradition. The manufacture of one-piece shoes differed from the manufacture of turnshoes of medieval type and thus, there would have coexisted two different traditions of making shoes in medieval Turku. Another possibility is that one-piece shoes were made in the countryside instead of the town and brought to Turku, maybe for sale, and there they were finally transformed into a part of the cultural layers.

Why were one-piece shoes still used in the Middle Ages? The one-piece shoe is a type with ancient roots from at least the Bronze Age in Europe but still occurring in the Middle Ages and even after, especially in Baltic countries and Russia. The simple structure of one-piece shoes was a functional element still practical in the Middle Ages in such conditions where the wear on shoes was heavy or the soil was wet or dirty to the detriment of the shoe leather. There would be many outdoor working conditions where it was practical to wear simple, cheap and easily replaceable shoes. In addition, these are attributes which were suitable for children's shoes.

An important observation is that one-piece shoes seem to connect Turku to the cultural sphere of the Baltic and Russia unlike any other shoe type found in archaeological context in Turku. What exactly the content of this relationship is, is to be solved in the future.

Early Modern period shoe types have been found in various sites around the Baltic, in Sweden, Norway, Estonia etc. A problem that applies to parallels for Early Modern Period shoes, even those from London and the Netherlands, is the lack of closely-dated contexts.

Fashion phenomena

The question of the occurrence of extended tips in certain shoe types remains largely an open question in Turku. This applies especially to the occurrence of long extended tips. On the basis of the present material, in Turku, long extended tips occur only in adult sizes. Because there are only a few measurable soles with long extended tips, it cannot be judged whether these were men's or women's shoes. The small number of archaeological finds of long extended tips in Turku (six cases, ca. one per cent of soles) could be interpreted as reflecting the fashion available only for those with an adequate status.

Short extended tips seem to occur in most shoe types of the late 14th century - the 15th century. They occur mainly in adult sizes. Both men's and women's sizes occur but the material is too small for any judgements about the differences of gender in the use. To some extent, short extended tips occur in the juvenile sizes but they are lacking in smaller children's shoes. Short extended tips occur in less than 10 per cent of shoes but are still much more frequent than long extended tips. They also occur in shoes which do not show any other signs of higher status in type, material, pattern or construction. They could be interpreted in a way that the short extended tips were the more common extended tip form, available for a wider circle of customers.

In Turku, suede shoes were probably made to distinguish them from the bulk of ordinary shoes. The finds are very few, but the reason could be the poor archaeological manifestation of high fashion artefacts among usual finds. The phenomenon is strongly, even if not solely, connected to side-laced shoes. This applies to Turku as well as many other sites in Europe. Not all side-laced shoes were luxury shoes but when luxury attributes do occur (extended tips, openwork decoration, suede-like upper), the shoe type in question frequently is a side-laced shoe. The reason for the occurrence of the suede phenomenon in two children's tailed-toggle fastened shoes must be the bootee-like comfort achieved by the supple shoe uppers. Reasons for the rarity of these shoes could be the technical difficulty in manufacture, the poor water and abrasion resistance of the suede shoe and the poor archaeological representation. These factors could partly explain the rarity of adult shoes of this kind. A possibility that suede shoes were an indoor fashion for those who did not need to go out very often must be taken into account, too.

Decoration of the shoes of Turku was divided into four categories, the openwork decoration of vamps, decoration of foot openings of shoes, decoration of patten straps and toe caps and the decoration of Early Modern Period shoe vamps. Punched openwork decoration in medieval vamps occurs in only one small children's strap shoe from the Old Great Market Place, dated to the end of the 13th century. Besides, it occurs in two side-laced shoes from Turku Castle with a broader dating from the end of the 13th century to the 14th century. The closest parallels to the openwork shoes of Turku come from Schleswig. Openwork shoes also come from more nearer sites, Lund, Örebro, Tallinn, Tartu and Riga.

The most common form of shoe decoration in the town area of Turku is the decoration of foot openings

of shoes. This occurs in the upper edges of separate leg parts of shoes. With punching, excision and slashing and using combinations of simple motifs, a variety of geometrical patterns have been created. The most common decoration motif is dentition on the upper edge of the leg part with a row of round perforations below added. This kind of decoration occurs in shoes with frontal lacing, side-laced shoes and tailed-toggle fastened shoes. Close parallels for the decorated foot openings have been found especially in Scandinavia where this is mainly a 14th and 15th century phenomenon.

Of the patten straps and toe caps from the ÅA-site, over 60 per cent were decorated. Patten straps from other sites in Turku are undecorated. The most popular form of decoration in both straps and toe caps of the ÅA-site is the linear decoration executed by engraving. Another form of decoration is the excised or punched dentition on the front edge of the patten strap. The third decoration method is stabbing which has been used in forming geometric motifs on patten straps. On the basis of the imprints of thread, in one case there was a thread stitched with a running stitch using these stabbed stitch holes. In addition, there were remains of actual threads in the stitch holes in two straps. The non-plied threads are well suited to the supposed decorative function of threads in these patten straps. In one case stabbing has been combined with engraved and scraped decoration.

In the first item of the Early Modern Period shoe vamps of Turku Castle, the vamp has been decorated with stamped rings edging the throat and longitudinal, radial slashes through the upper layer of leather. The second upper is an edge of a toe part which is decorated with angular slashing or excision of the upper layer of leather. Slashed decoration in footwear followed the general dress styles of the period and in some cases made shoes elastic and comfortable to wear.

Part II
Material and composition of shoes

In chapter one of Part II the shoes were approached from the technical point of view, looking at the materials and composition of shoes. The majority of medieval tread soles in Turku were cut in one piece. However, there were different ways of increasing the durability of a single-layer sole. This could be by adding extra layers of leather on top or below the treadsole. In double-layered soles a part of a tread sole has a layer of leather added on top (flesh side) of the treadsole as a kind of an insole. At least in Turku, they seem to be original features because in all cases the lower treadsole has not been worn out, i.e. stitching the inner sole as a repair would have been unnecessary.

Some turnshoes in Turku have been equipped with an extra outer sole. The outer sole consists of several layers of leather, attached together with wooden pins. According to present reports, wood-pinned sole construction seems mainly to be a Scandinavian phenomenon of the 14th, 15th and 16th centuries. In Turku and in Stockholm, the wood-pinned sole construction goes back to the 14th century. The method of attaching the wood-pinned sole using the broad rand to attach a second, outer sole, is a good example of a so-called turn-welt construction.

In shoes typologically described as Early Modern Period shoes of welted construction, the occurrence of separate inner and outer soles has been noted. These have been found both in the town area and the castle.

The sole could also consist of only one layer of leather but composed of two or more parts, a so-called composite sole. I consider the composite soles in Turku to be original features, i.e. that when making a shoe, the shoemaker equipped the shoe with a two-part sole. The reason for the practice could equally well have been the economical use of leather as the easier replacement of a worn out sole part.

In uppers, two basic cutting patterns can be discerned. In the first pattern, the upper is composed of one main piece, a so-called wrap around pattern. In the second pattern, the shoe upper is composed of a separate vamp piece and back piece, a so-called two-piece pattern. The wrap-around pattern is the prevailing cutting pattern. It has been used in all medieval shoe types. Shoe types where the two-part pattern occurs are the strap shoe, tailed-toggle shoe, side-laced shoe, front-laced shoe and the boot. The occurrence of two-piece pattern in the majority of side-laced shoes in contrast to every other medieval shoe type in Turku must be considered as one more special feature of this shoe type.

Besides the main piece and the possible inserts, several other components may belong to the construction of the upper. These are heel stiffeners, lace- and toggle hole reinforcement strips, topbands, strengthening cords, tongues, laces, toggles, buckle straps and thongs.

In the sole/upper constructions, there are four different techniques which have been used. These are turnshoe, turn-welt, stitch-down and welted construction. In the turnshoe construction, the prevailing type is the one in which the lasting margin has been sewn with edge/flesh stitches for the sole and grain/flesh for the upper and possible rand, using a shoemaker's stitch. In a turn-welt construction the rand is sewn between the upper and sole of a turnshoe, but is made extra broad so that a second sole can be stitched on. In Turku, turn-welts have been used in attaching so-called clump soles and wood-pinned outer soles. In Turku, the turn-welt construction goes back to the late 14th - the early 15th century. In a so-called stitch-down construction, the bottom edge of the upper was folded outward and then stitched directly to the insole and treadsole and in shoes without insoles, directly to the treadsoles. Shoes with this kind of construction cannot be dated by their find contexts in Turku. According to the parallels from other sites, the technique is a late medieval/Early Modern

Period phenomenon before the actual welted construction came onto the market.
In shoes with a welted construction, a welt, a strip of leather is sewn along the outside of the upper's bottom edge together with the insole during inseaming, to which later the treadsole is stitched. This construction only occurs in shoes which can be typologically categorized as Modern Period Shoes.
As a shoe material, calf leather prevails right from the end of the 13th century until at least to the beginning of the Early Modern Period. Other leather types noted are sheep, goat, pig and seal, but these form only a very small minority of the material. The small percentage of other leather types than calf/cattle or goat may be due to the regulations. In several paragraphs of the craft ordinances of Stockholm shoemakers it was strictly forbidden to use horse, seal or sheep leather in shoes instead of cattle/calf. These leather types were clearly seen as inferior materials. Goat leather was probably used for books, gloves and other leather artefacts than shoes.
Besides the animal species, in some cases it is possible to see evidence of different kinds of treatment of leather. In the case of soles, the tanning substances were not always allowed to penetrate the whole thickness of leather. Instead, a layer of untanned raw leather was left in the middle. This raw layer made soles more rigid and water resistant. This kind of 'raw tanning' could be a conscious choice, not a mistake in the treatment of leather. It was frequently used in tanning the sole leathers in Turku.
The material of threads, used in seaming the lasting margins of turnshoes, was usually flax or hemp, the latter becoming the prevailing material in the latter half of the 14th century. It is possible that bast fibre from lime (*Tilia cordata*) was used especially in the early phases of the town but this hypothesis needs more support.

Documentary information of shoemaking

In chapter two of Part II, the documentary information concerning leatherworking and shoemaking in the town of Turku, in Turku Castle and in the countryside, was discussed.
There are three references to shoemakers in the Middle Ages in Turku. Other leatherworkers known are a belt maker and a sword polisher. These artisans are identified by their names. The reference to a shoemaker in Turku as early as the year 1336, tells us of the necessity of this craft and of its old traditions. The reference to two shoemakers in the same document in 1425 indicates that at that time, there was already more than one shoemaker working in Turku. The reference to a beltmaker as early as in 1347 could indicate that even at that early stage of the town, professional division and specialization of some degree between leather artisans had evolved in Turku. The sword-polisher, appearing in year 1488 adds one more leather worker to the scanty crew of leather artisans mentioned in documents.
The first references to tanners in Turku can be found in documents of the 16th century. Other new leatherworking professions of the 16th century not found in medieval documents are pouch makers, chamois makers, saddle makers and mitten makers. The old professions, shoemaker, sword polisher and belt maker still occur in the 16th century.
No medieval journeymen or apprentices are known from the town. Presumably, most of the teams consisted only of a master craftsman and his family within the household. No craft organizations are known from medieval Turku either. The first organizations are to be found only in the 1620s. After the issuing of the Corporation Decree in Sweden in 1621, the Corporation of Shoemakers was the first trade guild to be founded in Turku. Castles were important employers of artisans. In 1562, there were three shoemakers working at Turku Castle at the same time. In 1578 the number of shoemakers had grown to ten.
The occurrence of shoemakers in the countryside in Finland at least from the 15th century onwards is certain. However, the only medieval reference to a shoemaker in Finland Proper is from the Muurla parish in 1467. Because the lack of written information and archaeological finds of shoes from the countryside, the possible distribution of shoes between the town of Turku and its surroundings in either direction remains only speculative. It was suggested, however, that the occurrence of one-piece shoes in the town area in Turku could reflect the relations to the nearby countryside outside Turku, one-piece shoes carrying on the Iron-Age shoemaking tradition.

Archaeological information on shoemaking

Sparse documentary information is complemented by the actual archaeological remains of leatherworking and shoemaking. Chapter three of Part II was devoted to the archaeological evidence of leatherworking and shoemaking.
Based on the archaeological observations from nine sites in Turku, mostly tub-like constructions of round or oval shape were used in tanning. The tubs have been made with a stave construction and their typical diameter is ca. 80–150 cm. Partly buried in the ground, the tubs have been of a fixed type. This is appropriate for the long tanning process. The dating of the tubs is from the 15th century to the 17th century. Tubs from two sites, the ÅA-site and the Library site are certainly medieval. Tubs have been found in two quarters in Turku, the Mätäjärvi quarter and the Äninkainen quarter. It was appropriate that the smelly process of tanning was carried out on the outskirts of town. Other structural evidence of tanning are the skin scraping beams and drying racks for hides. It must be noted that large tubs, beams and racks are open for other interpretations of use than tanning.
Also osteology and macrofossil evidence can be used as evidence of leather treatment. Leatherworking may be indicated by large numbers of bones of the

lower extremities of goat from the excavation of Rettig's slope site. Horn cores could be left on the skin, too. The sizeable horn assemblages at the ÅA-site, Österblad site and Mätäjärvi site may have a connection to the leatherworking activity in these areas, although more definite conclusions cannot be drawn.

It is known that certain plants, parts of plants or substances manufactured from plants have been used in the tanning process as tanning substances. Altogether 13 kilograms of hazel nutshells come from the ÅA-site excavation. Large amounts suggest a particular use of nutshells besides the consumption of nuts as food. Nutshells of common hazel were used in tanning of leather and dyeing leather and textiles. Another plant used in tanning and found at the ÅA-site is the bearberry.

The alternative or parallel use applies to plants used in the tanning and dyeing of leather and dyeing of textiles. Both these processes, tanning and dyeing, employed the same materials: the bark of trees and shrubs, the leaves of plants and nutshells. By archaeological means, it is hard to define exactly which activity the substances were used for in Turku. The possibility to easily exploit the same substances and structures for two different purposes could encourage the carrying out of two activities, tanning and dyeing side by side. Another possibility is that tanning and textile working succeeded each other chronologically.

Of the tools found, awls and creasers had a wide use in leatherworking and awls were also used in woodworking. Shoemakers' knives, on the other hand, were used solely in shoemaking. Of the two basic types of shoemakers' knives, only one example of the half-moon shaped type occurs in the archaeological material in Turku. The knife was found from a late 14th century cultural layer at the ÅA-site. There are no finds of the second type, the sickle formed shoemakers' knife. There is, however, a knife sheath the shape of which would have fitted this kind of knife. The context of the find is dated to the latter half of the 14th century - turn of the 15th century.

The problem that the archaeological evidence for textile working and leatherworking is the same in many cases, applies to shears, heavier spindle whorls , sewing-needles and thimbles, which may well have been used in leatherworking or shoemaking but also in textile working.

One of the basic tools of a shoemaker is the last. There are seven lasts from archaeological contexts in Turku. The reason for the usually small number of lasts found in excavations is obvious. Wooden lasts easily ended up as firewood. The use of lasts is visible in shoe soles, too. In medieval turnshoes, the treadsole was fixed onto the last with two or three wooden pins or iron nails. These left their marks, peg or nail holes, on soles and lasts. It must be noted that some soles show no marks of nail holes. It is probable that the soles with no holes are from shoes made without the last. On the basis of the existence or non-existence of nail holes in soles, the percentages for shoes made with and without the last would be 94 and 6.4, respectively. Thus, the use of the last would have been very common, although not universal in medieval Turku.

The strongest archaeological evidence of leatherworking is the waste leather deriving from leatherworking and making of leather goods. From the ÅA-site excavation, a large amount (70 litres) of tissue-like waste leather interpreted as currying waste was found. The currying waste comes only from layers dated between the latter half of the 14th century - the first half of the 15th century. The strongest concentration of currying waste is clearly in the 14th century - the early 15th century layers in the eastern excavation area. The currying waste cannot certainly be connected to any structures noted in the excavation. It is more probable that the waste was dumped onto the open areas of the site from the nearby plots, at least partly outside the excavation area.

Unlike currying waste, remains of leather cutting, offcuts, are numerous in Turku. They have been found in almost every excavation and survey extending to layers of organic content. It is possible to identify offcuts of shoemaking from the ÅA-site material. There occur pieces, easy to identify deriving from sole cutting, i.e. intersectional cutting pieces. Offcuts from trimming are common, too. Other artefact types have not been identified from the offcut shapes from the ÅA-site or other sites in Turku.

The total number of offcuts at the ÅA-site is ca. 50,500 pieces. The different types of offcuts occur mixed together. One cannot find any clear concentrations of only one offcut type at the site. The occurrence of hide edges (primary waste) together with offcuts from artefact cutting suggests the probability that artefact makers used complete hides when cutting patterns for artefacts.

A general observation for the ÅA-site is that leather offcuts are frequent finds in most of those excavation units with favourable conditions for preservation of the organic material. Unlike the distribution of currying waste, the spatial distribution of leather offcuts can be considered quite even and wide on the site. The cultural layers of open yards between houses and other structures mostly had offcuts as part of their content. The offcuts could have been distributed, perhaps even consciously, from their primary cutting and discarding area to wider area, for example, for soil drying purposes.

Offcuts are still found in the latter half of the 15th century - the beginning of the 16th century layers while currying waste is restricted to the latter half of the 14th century - the early 15th century. This probably means that the artefact making - on the basis of the offcut shapes shoes were still included - was continued until the end of the Middle Ages while currying evidence disappears sometime during the first half of the 15th century.

Besides the ÅA-site, another area with evidence of leatherworking and shoemaking, is the strand area of the pond of Mätäjärvi. It has been suggested

that the structural (tanning tubs, scraping planks) and artefact (mainly the leather waste) evidence would represent the carrying out of professional shoemaking with leatherworking included. I certainly agree with these hypotheses.
Besides tools and leather waste, other evidence of shoemaking is the master forms of shoe soles, mostly found at the ÅA-site. Shoes in Turku were mostly repaired by clump soles. Most of the shoes with a clump repair in Turku have been repaired with a very coarse leather thonging. In only a few cases has the use of thread been documented. This suggests the probability that these shoes were repaired by the shoe users themselves. Another method of sole repair was resoling. It is suggested that resoling was done by shoemakers in Turku. Repairs of uppers, usually by patching, are not as frequent as sole repairs.
On the basis of the large number of cut down leather objects, it seems that all kinds of leather objects were repaired and reused when they had come to the end of their lives. On the other hand, a large number of shoes found at the ÅA-site were actually in quite good condition when discarded. Their condition would have well allowed their repair for reuse but for some reason this was not frequently done. Instead, many shoes were discarded after only minor wear and not selected for refurbishment. The material does not support the idea that some kind of shortage of leather or shoes would have prevailed. There was plenty of material for reuse not exploited.

Questions for the future

There were many questions left open for future studies. Most of these crucial questions concern the leathercrafts and their location in Turku. What were the exact locations of leather artisans' workshops in Turku? Instead of a general placement of activity in smaller or larger 'areas' on the basis of leather waste found, we need more well documented structures from excavations which can be certainly connected to leatherworking activity. For the distribution of leather waste, to find possible concentrations marking the activity areas, we need the basic information on the excavation units to calculate the frequency and distribution of waste with adequate accuracy.
Finally, we need methods and documentation that allow the connection of cultural layers with leather waste to these structures. Therefore documentation with an emphasis on the formation process of the layer and field documentation of its stratigraphical relations to structures are necessary and these must be carried out more precisely than in the case of the ÅA-site. In Liisa Seppänen's words about the methods and reality at the ÅA-site: 'Changes in methods and defects in the documentation produce some problems when trying to understand and interpret the stratigraphical relations, contexts and sequences. Whether this level of documentation and, in fact, the source material created, is sufficient for questions regarding social space and activity processes will only be found when the stony path of analysis is completed.'[825] Unfortunately, in the case of the ÅA-site, the analysis is still to be finished and published. So far, only an unpublished draft of stratigraphical relations and datings is available.[826] It is not that the information in this draft should be distrusted. It is rather that the verbal explanation and the analysis behind the stratigraphical frame of boxes would be needed in its final form.
Some questions left open concern the artefacts. There were several phenomena in shoe styles which cannot be connected to actual shoe types. For now, we do not know in which shoe types extended tips occur, for example. This applies to wood-pinned outer soles, too. Dating for several shoe types will probably become more accurate if closely-dated finds are found in the future. Closely-dated contexts can be hoped especially for the Early Modern Period shoes which so far have only came from surveys with undated contexts. Then there are questions which can be solved only if finds emerge by way of happy accident. This applies especially to the preservation of details in finds, for example, dyed or painted shoes.
We had some hint of the differences of finds from Turku Castle and Turku town area in this study. Clearly, the shoe material from the castle differs from that found in town. Different shoe types and fashion phenomena are emphasized even in the small number of shoes found in the castle so far. It seems that some of the castle people as early as the first phases of the castle had good connections to those centres in Europe, mostly of Southern Scandinavia and Northern Germany, where fashion was created, from where the styles spread to the different parts of Europe and where the fashion phenomena for the first time appear in archaeological record. Both Lund and Schleswig were Episcopal sees, which partly explains their position as important towns and even as origins for ideas and fashion.[827] The same applies to Århus. Future finds from Turku Castle will probably bring interesting, new information on these aspects. It also seems that the fashion phenomena do not end at the closing of the Middle Ages. Instead, at the beginning of the Early Modern Period, fashion shoes still occur in the archaeological record of Turku Castle while the shoes mentioned in the wage lists of the castle mention shoes given to servants.[828]
On the other hand, the dating and types of shoes from the town area in Turku mostly resemble those found in the towns of central Sweden. Of these towns, it is especially Stockholm, which has striking similarities in shoe types and their dating with Turku. One explanation must be that both the towns were part of the same kingdom of Sweden with close economic and cultural contacts with each other. However, the short distance and generally vivid cultural/economic contacts do not entirely explain the similarities between Turku and Stockholm. This becomes clear when comparing the shoes of Turku and Tallinn. After all, the

contacts of both burghers and peasants in Turku and its surroundings to Tallinn were very frequent. Still, there are major differences in shoe styles between Turku and Tallinn. These are the lack or scarcity of front-laced shoes and tailed-toggle shoes and the abundance of high thong shoes and high strap shoes in Tallinn but not in Turku. One does not find such close similarities with Lübeck finds, either.

When it comes to shoemaking, could it be that Turku was subject to Stockholm in a way that the same ordinances that defined Stockholm shoemakers' job descriptions, shoe types and even shoe patterns and other details, were valid in Turku, too?[829] There is no certain information on this but as an analogy, I use the frequently occurring hypothesis that the medieval goldsmiths in Turku could have been part of the craft guild of Stockholm's goldsmiths.[830]

In the town area, more information is needed on the social contexts of shoes. At the moment, differences between the shoe materials from different quarters of the town are mostly caused by chronology. The possible differences caused by differences in wealth or social status of inhabitants cannot be discerned. Partly this is due to the mixed nature of find materials even at an intrasite level. It could be that the same plot was inhabited by master and servant with artefacts from both discarded in the same place. Only careful analysis of several find groups together and their relation to the development of inhabitation at one site could give answers to this problem. A total case study of an archaeological site with rich, well preserved find materials, well excavated and documented has not been realised yet.

Extra attention should be given to sites of a special nature, for example, churches, convents, schools etc. Turku or any other town should not miss these unique opportunities to excavate and document properly when the time comes.[831]

As a conclusion, it is clear that Turku was well up-to-date when it comes to shoe styles and their appearance in the Baltic area in the Middle Ages and in the transitional period to the post-medieval times. This study of the archaeological record of shoes in Turku has scratched the surface of a thriving urban material culture, which has left behind an archaeological assemblage of shoes and related finds, rivalling any other assemblage of any single town in Europe both in quality and quantity and with plenty of potential for further studies.

ENDNOTES

1 According to Pihlman 2004a. The addition of the ÅA-site on the map by the author.
2 For the possibilities of archaeological leather and shoe research, see Groenman-van Waateringe 1980a:172; Sarv 2004; Schia 1977a.
3 For the recent interpretations of the foundation and early development of Turku, see Hiekkanen 2002; 2003; 2007:189–191; Pihlman 1995; 1999a; 2006; 2007a; 2007b; 2007d; Pihlman & Majantie 2006.
4 Swann 2001:82.
5 Swann 2001:96–97, 102.
6 According to Immonen 2007.
7 Saksa 2004; Saksa, Belsky, Kurbatov, Polyakova & Suhonen 2002; Saksa, Belsky & Suhonen 2002; Suhonen 2005:181 and the references; 2006:357–358 and the references; 2007 (Vyborg); Hiekkanen 1981; Rimón 2005a; 2005b; 2006 (Porvoo); Uotila, Tulkki & Lempiäinen 2001; Uotila, Lehtonen & Tulkki 2003 (Naantali).
8 Haggrén 2000; Pihlman 1977; 1981; 1982; 1984; 1988; Jäkärä 1999; 2000 (Ulvila); Hiekkanen 1983 (Rauma).
9 Frank 1991:556–557; Kykyri 1997:14, 16.
10 For the representative, but inorganic finds from Finnish manors, see, for example, those from the Laukko Manor (Majantie & Uotila 2000).
11 Appelgren 1902.
12 Shoe soles: KM 4034:57; for the knife sheaths from this site, see Harjula 2004a; 2005a.
13 Appelgren 1902:62.
14 Valonen 1958. For a detailed analysis of Valonen's documentation in the survey, see Pihlman 1995.
15 Valonen 1955; 1958.
16 Jäfvert 1937; 1938.
17 Valonen 1955; 1958.
18 Pylkkänen 1956a; 1956b.
19 Hallbäck 1970.
20 Jäfvert 1937; 1938.
21 Blomqvist 1939; 1946; Jäfvert 1937; 1938.
22 Drake 1986.
23 For the description and discussion of the project Medeltidsstaden, see Andersson 1984; 1990; Dahlbäck 1988a:34–36; Projektprogram 1976:19–22; Suhonen 2005.
24 Pihlman & Kostet 1986:150.
25 Shoe typology by Jäfvert 1938; Schia 1977b; Broberg & Hasselmo 1981; Zerpe & Fredriksson 1982.
26 Tuovinen 1989. For the earlier review of the leather material from the Mätäjärvi excavations, see Pihlman & Tuovinen 1981; 1984.
27 Jokela 2002:81–82.
28 Ibid.
29 Mikkonen-Hirvonen 1991.
30 Jokela 2002.
31 Jokela 2005a; 2005b.
32 Harjula & Jokela 2003.
33 Jokela 2002:71. The surface analysis of shoe components is difficult because shoes can be partially decomposed, delaminated and generally distorted by burial. In some cases it is also difficult to distinquish normal wear marks from those caused by pathological foot conditions (for the method, see Grew & de Neergaard 2001:105–111; Mould 2005:92–94; Swallow 1973; Volken 2005; Volken & Volken 2001).
34 The abbreviations ÅA-site or Åbo Akademi site are from now on used in this study when speaking of the Åbo Akademi main building site.
35 Harjula 1999.
36 Harjula 2002.
37 Seppänen 2003.
38 Harjula & Jokela 2003.
39 Slings from the ÅA-site have been discussed in more detail in a separate article (Harjula 2004b).
40 Harjula 2004a.
41 Harjula 2005a; see also Harjula 2007.
42 Ahola, Hyvönen, Pihlman, Puhakka & Willner-Rönnholm 2004; Kostet, Pihlman & Puhakka 2004.
43 Harjula 2005a.
44 Swann 2001.
45 E.g. Jäfvert 1937; 1938; Larsen 1992.
46 Personal communication, June Swann.
47 E.g. Pylkkänen 1956a; 1956b.
48 Kykyri 1989.
49 Gardberg 1971; Kuujo 1981.
50 E.g. Kallioinen 1997; 2000.
51 Harjula & Hiekkanen 2006.
52 Kurbatov 2001a; Saksa, Belsky, Kurbatov, Polyakova & Suhonen 2002.
53 In Vyborg, artefacts dating earlier than AD 1450 are few for the moment (Suhonen 2006:358 and the references).
54 Rimón 2005a; 2006.
55 Tulkki 2003.
56 Lindqvist 1999:4–5; 2004:51–52.
57 Pihlman 1988; 1995; 1998.
58 Summaries of the archaeological research history in Turku: Drake 1995:82–87; Gardberg 1984; Pihlman 1988; 2007c; Taavitsainen 2003.
59 Åbo Akademi University is the university for the Swedish-speaking Finns.
60 Of the general course, method and find materials of the excavation: Arkeologiset tutkimukset Åbo Akademin tontilla (Turku I/7/4) vuonna 1998; SKAS 4/1999; Pihlman 2003a; Seppänen 2006:381–384.
61 The program used in creating the database was Microsoft Access 1997.
62 Dating of the find contexts, see Seppänen 2003.
63 For the causes for the over-representation of shoes in medieval excavations, see Groenman-van Waateringe 1988a:8–9.
64 For the different leather find groups besides shoes, see Harjula 1999; 2002; 2004a; 2004b; 2005a; Harjula & Jokela 2003.
65 In Finland, according to section 15 of the Antiquities Act, when the constructor is a company, not a private person, the constructor pays the fees or at least participates in the financing of the archaeological investigations. This happens if the costs are not regarded as excessive, considering the circumstances. In practice, this section is open to various interpretations. About the discussion on the proceedings in the Åbo Akademi main building site excavation, see e.g. Haggrén & Lavento 1999; Haggrén, Lavento & Niukkanen 1999a; 1999b; Pihlman 1999; Seppänen 2006:384.

66 For an example of this kind of analysis, see Tuovinen 1989.
67 Except for a few missing finds, almost all leather material catalogued to the museums during the long history of accumulation, is still available for study.
68 Goubitz 1984; 1987; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001.
69 For the description of this method, see the article of Serge and Marquita Volken of the Gentle Craft, Centre for Calceology and Historical Leather, Lausanne, Switzerland (Volken & Volken 2000; 2002a).
70 E.g. Jäfvert 1937; 1938; Koch 2005; Schia 1977b; Schnack 1992a; Zerpe & Fredriksson 1982.
71 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001.
72 Blindheim 1981; Hald 1972:9; Jäfvert 1937:35; Marstrander 1981; Schia 1977b:175, Fig. 98; 1980a:84, Fig. 5; 1987:366, Fig. 33.
73 See also Swann 2001:12–13.
74 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Figs. 6–7 in p. 94.
75 Hatt 1914.
76 Hald 1972:9; Larsen 1974:251.
77 E.g. Groenman-van Waateringe 2001; Swann 2001:12–13.
78 Harjula 2002:129, Fig. 2.
79 Saksa, Belsky, Kurbatov, Polyakova & Suhonen 2002:60–62, Fig. 21.4.
80 Fragments of thong shoes are identified by the preservation of thong slots and/or the binding stitch of the front or back seam.
81 Rectangular cutting pattern: TMM 20764:1575/1723; TMM 16176:19; TMM 21816:NE16464, NE049101, NE10431, NE21145, NE1414, NE201150, NE504172.
82 E.g. Swann 2001:19. The back part cut straight and thus protruding, is clearly observable, for example, in shoe TMM 21816:NE50044 of pattern 2.
83 Examples of Y- and T-back seams in archaeological and ethnographical shoes in Hald 1972:Figs. 26, 76; Pälsi 1937:Figs. 1–3.
84 Indent on the front edge: TMM 20764:1575/1723; TMM 21816:NE104131, NE21145.
85 Pattern of two rounded projections on the front: TMM 21816:NE51525, NE50044; KM 81132:609.
86 Pattern with a symmetrical arch on the front: TMM 21816:NE509160.
87 Irregular cutting pattern: TMM 21816:NE20624.
88 Continuous rows of thong slots: TMM 21816: NE08924, NE1414, NE049101, NE509160; KM 81132:609.
89 Paired thong slots: TMM 20764:1575/1723; TMM 16176:19; TMM 21816:NE128227, NE16464, NE503198, NE21145, NE51525, NE504172.
90 Irregularly placed thong slots: TMM 21816:NE50044, NE20624.
91 Decorative row of holes working as thong slots: TMM 21816:NE20624.
92 Horizontal thong slots: TMM 21816:NE103131, NE128152, NE049101.
93 Thong preserved in KM 81132:609, TMM 21816: NE20624, NE509160, NE50044, NE51525.
94 Phasing of the Hjelt building site by Pihlman 1995:62–63, 310.
95 Kostet 1989:16.
96 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:135; Larsen 1992:17; Swann 2001. Jäfvert (1937:34, 39, Figs. 5, 6, 14; 1938:13–14, 19–20, Plates 3B, 6A; 1981a:546–547) uses the Swedish counterparts 'remsko' and 'remkänga' when speaking of thong shoes.
97 'Drawstring' is used especially in British research (Grew & de Neergaard 2001:123; Mould, Carlisle & Cameron 2003:3319).
98 Groenman-van Waateringe 1988a:15.
99 Blomqvist 1946:155; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:135; Jäfvert 1937:34; 1938:13; Valonen 1955:49.
100 E.g. Groenman-van Waateringe 2001.
101 Because of the same fastening system, in the Finnish language, the term thong shoe, Fin. *paulakenkä*, refers besides to the medieval archaeological shoe also to a shoe type known from the ethnographic contexts of the Finnish and Sami people in the later historical period (e.g. Pälsi 1937; 1938; Valonen 1955:49; Vuorela 1998:588–590). Despite the same name, these thong shoes should not be confused with medieval thong shoes of different pattern.
102 Valonen 1955:47.
103 In Mona Hallbäck's article on Turku shoes (Hallbäck 1970:71), there is a short reference to thong shoes from the Itäinen Rantakatu sewer construction.
104 Pihlman & Kostet 1986:158, map 27b.
105 Jokela 2002:56, Appendix 2; 2005a:8; 2005b:37–38.
106 Harjula 2002:127–128.
107 Broberg & Hasselmo 1981:123, 134–135; Lindqvist 1999:38–39; of the older thong shoe and its distribution and datings in Europe, see, for example, Koch 1998; Lindqvist 2004:Fig. 6.
108 Wrap-around construction in: TMM 14681:731 (1), 731 (2), 731 (1), 731b; TMM 21163:429; TMM 20764:1535; TMM 21816:NE5122; KM 96001:4421.
109 TMM 20764:1606.
110 TMM 20764:1605.
111 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:31.
112 Insert on the base of the vamp: TMM 20764:1587, 1759, 1760; TMM 14681:731 (1).
113 Grew & de Neergaard 2001:13.
114 Grew & de Neergaard 2001:Figs. 9, 13, 19.
115 A topband of a folded type (see chapter 1.2.2.3 of Part II) in TMM 20764:1539.
116 Heel stiffener or the place for one in the early 14th century shoes: TMM 20764:1535, 1538, 1573.
117 The observation that heel stiffeners are not common in thong shoes has been noted also by Koch (1988:68) in her analysis of Danish shoes.
118 Rands in the early 14th century shoes: TMM 20764:1538, 1539.
119 Thong shoes with a straight side profile: TMM 14681:731(2); TMM14740:57; TMM 20764:1605; KM 96001:4421.
120 Thong shoes with a dip on the side profile: TMM 20764:1535, 1539, 1606; TMM 14681:731a, 731b;

TMM 21163:429, 835; TMM 16195:146; TMM 18798:47b (1&2); TMM 21816:NE5122, NE1151.
121 After Koch 2005:Fig. 10.18.
122 In Danish material, Koch (1988:66–67) has dated the straight side profile earlier (ca. AD 1250–1325) than the profile with a dip (ca. AD 1325–1375).
123 U-shaped vamp opening: TMM 14681:731(1), 731(2), 731a, 731b. V-shaped vamp opening: TMM 20764:1760; TMM 21816:NE5122, NE1151; KM 96001:4384. Curved vamp opening: TMM 14681:731b; TMM 20764:1605, 1606. No opening on the instep: TMM 18798:47b (1&2); TMM 20764:1535.
124 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:135; Grew & de Neergaard 2001:14–15, Fig. 15; Larsen 1992:17, Fig. 5.
125 Thong preserved: TMM 14681:731(1), 731a, 731b; TMM 20764:1606; TMM 21816:NE5122; TMM 16195:149; KM 96001:4421.
126 The whole thong preserved: TMM 14681:731a; TMM 20764:1606; TMM 21816:NE5122; KM 96001:4421.
127 Thongs of oversized length: TMM 20764:1606.
128 Thongs tied: TMM 14681:731a.
129 Thong tied possibly on the side or back of the shoe: TMM 14681:731(1).
130 Harjula 2005b:39, Fig. 5.
131 KM 96001:4577.
132 Secondary thong slots: TMM 18884:383; TMM 18982:406; TMM 21816:NE509192; KM95032:10373.
133 Secondary thong slots in other types of shoes: TMM 18982:406; TMM 21816:NE2049; TMM 21816: NE509192; KM95032:10373.
134 Examples of repair thongs are, for example, from Sweden and Norway (Broberg & Hasselmo 1981:93, Fig. 67a nr. 4; Schia 1977b:166, Fig. 82; 1987:Fig. 31). Sometimes a secondary thong fastening was not used as a repair for the broken fastening but as an additional fastening. This can be seen in shoes where the original fastening remains intact in parallel with a secondary fastening (Jäfvert 1937:36; an instep strap fastening and thong fastening combined). Sometimes the extra thong only had a decorative function (Larsen 1992:32, Fig. 42).
135 E.g. Grew & de Neergaard 2001:21–26; Mould, Carlisle & Cameron 2003:3322–3324.
136 Groenman-van Waateringe 1988a:15; Larsen 1970:12; 1992:22–23; Schia 1977b:162; Swann 2001:55. The division of strap shoes into two types, the one in which straps were fastened with a toggle (Swed. knäppslejfsko/känga) and the other one in which straps were fastened with lacing (Swed. snörslejfsko) was done already by Jäfvert (1937:36, Fig. 8; 1938:13–14, Plates 3C, 4A and 5B; 1981a:546).
137 Valonen 1955:44, Fig. 5
138 Valonen 1958, Fig. 23.
139 Hallbäck 1970:71.
140 Pihlman & Kostet 1986:158.
141 Jokela 2002:55, Appendix 2; 2005b:38:Figs. 1–2.
142 Harjula 1999:44; Harjula 2002:128; Harjula & Jokela 2003:258.
143 Strap shoe uppers with a separate vamp and back part: TMM 16195:139 (Goubitz type 40) and TMM 18798:52b (Goubitz type 35).
144 Tongues preserved with TMM 21816:NE51127, NE51336; TMM 21125:195; KM 95032:10506.
145 In TMM 21816:NE51127, there is a topband preserved. It is a non-folded type and stitched originally with a butted seam and a binding stitch to the edge of the upper opening. In TMM 21125:195 and KM 95032:10506 the seam and stitch types are the same but in these the topband is a folded type.
146 Goubitz (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:162) mentions a variant of type 35 in which there is a loop instead of the toggle. Theoretically, the imprints (without the toggle remaining) which I have identified as toggle imprints, could be imprints of a loop for the buckle strap. However, shoes with a loop seem to belong to a buckled strap shoe variant of which there is no evidence in the Turku material. Another possibility could be that toggle imprints could be imprints of the strap keepers of Goubitz type 40 shoes (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:167). There is no evidence of strap keepers of this type in the Turku material either. In all nine cases where the fastening device has survived together with an imprint on the inside of the upper, it is of a tailed-toggle type.
147 Two pairs of toggle holes in: TMM 21816:NE504335, NE51243, NE51130, NE51557, NE51249, n2924; TMM 16195:148.
148 A piece of a toggle in the upper slit remains in TMM 21816:NE504335.
149 Three toggle holes in TMM 21816:NE51126.
150 Four toggle holes in TMM 21816:NE50475; TMM 16195:135.
151 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:167.
152 TMM 16195:146b.
153 TMM 16195:139.
154 TMM 20764:1784.
155 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 1 in p. 168.
156 TMM 21163:518.
157 TMM 21816:NE20931.
158 For the dating problems of area 6 in the Town Hall excavations, see Pihlman 1995:313.
159 Trench numbers 31, 32, 35 and 36; for the field documentation of Valonen, see the register of town archaeology nos. 70a–c.
160 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:201.
161 Groenman-van Waateringe 1988a:16.
162 Swann 2001:74.
163 Mould, Carlisle & Cameron 2003:3325.
164 Volken 2002:379.
165 See, for example, the definition of 'knäppkängor/stövlar' (Eng. button boots) by Jäfvert (1937:40; 1938:14); Lindqvist (1999:45); Zerpe & Fredriksson (1982:227) and 'vristknapfodtøj' (Eng. front-button footwear) by Koch (2005:225).
166 Valonen 1955:43, Fig. 7 (TMM 14165:35).
167 Hallbäck 1970:71.
168 Jokela 2002:121,123.
169 Harjula 2002:129.
170 Separate vamp pieces: TMM 21816:NE20426, NE20481, NE504467.

171 The flesh side is out in: TMM 21816:NE50372, NE204164.
172 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:201.
173 Toggle bases stitched to the surface of the upper TMM 21816:NE50372.
174 Extended tip in TMM 21816:NE13018, NE20434, NE504128, NE17215, NE503113, NE509181, NE20168, NE509189, NE504304, NE209139, NE2097, NE20323.
175 An exception could be an insert of an upper with toggles from the Old Great Market Place excavation (the Hjelt building site). This would date from its find context to the first quarter of the 14th century. However, it is possible that the part does not come from a tailed-toggle shoe but from another type of shoe with toggles, a strap shoe (Goubitz type 35), for example.
176 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:175; Grew & de Neergaard 2001; Groenman-van Waateringe 1988a; Larsen 1992:21; Swann 2001. Jäfvert (1937:34; 1938:Plate 8C; 1981a:546–547, Fig. in p. 551) uses the terms 'sidsnörsko' and 'sidsnörkänga', the Swedish counterparts for side-laced shoes.
177 TMM 16195:146 (Hallbäck 1970:71).
178 TMM 16195:136; TMM 16176:13.
179 Pihlman & Kostet 1986:158, 175.
180 Three side-laced shoes from the Aboa Vetus Museum excavation have been described by Sanna Jokela (2002:56, Appendix 2; 2005b:39). One of these finds with the flesh side of the leather outwards (TMM 21125:87) has been illustrated and discussed in a publication (Harjula & Jokela 2003:259–260, Fig. 2).
181 Harjula 1999:44; 2002:129.
182 TMM 21816:NE51115 and n3146 (later catalogued as NE504481); Harjula & Jokela 2003:259–260, Fig. 2, footnote 22.
183 The count is based on parts which cannot come from the same shoe. Shoe uppers were first divided into left and right shoes. In both groups, each wrap-around upper was counted as representing one shoe. In the case of separate vamp parts and quarter parts, which seem to be common in side-laced shoes, each vamp and quarter part was matched together to see if the parts came from the same shoe. In one case it was noted that the vamp and quarter parts with different accession numbers matched so they have been counted as one shoe (TMM 21163:268 & 284).
184 TMM 16195:136.
185 Straight side profile of the back part: TMM 21816: NE509178, NE11256, NE209217.
186 For the definition of rounded and pointed toe parts, see Larsen 1992:29–30, Fig. 29. Pointed toes in Turku shoes: TMM 21816:NE50515, NE20957.
187 Grew & de Neergaard 2001:51.
188 The imprint of a reinforcement cord has been noted in: TMM 21816:NE11256, NE50714, NE11897, NE51115, NE504481, NE14711, NE1722; TMM 21125:87.
189 Lace hole reinforcement strip preserved in: TMM 21816:NE11256; TMM 21125:87.
190 Lacing preserved in TMM 21816:NE14711, NE11256, NE50515; TMM 16195:146.
191 Method of lacing: TMM 21816:NE11256.
192 Other side-laced shoes with flesh side outwards: TMM 21816:NE201103, NE504481, NE11256, NE209217, NE50444; TMM 21125:87.
193 Tailed-toggle fastened shoes of sheep or goat leather with the flesh side outwards TMM 21816:NE204164, NE50372.
194 Kostet 1989:16.
195 Grew & de Neergaard 2001:Fig.1; Groenman-van Waateringe 1988a:15; Larsen 1992:21; Mould, Carlisle & Cameron 2003:3331. Jäfvert (1937:33, 40, Figs. 3, 15; 1938:13–14, Plate 3A, 5C; 1981a:546) uses the definition 'skor/kängor med snöröppningen rakt över vristen' (shoes with a frontal opening). His further division into subtypes is done on the basis of the number of lace holes and shoe height.
196 Valonen 1955:43–44, Figs. 3, 6, 7; 1958:Figs. 20, 22.
197 Hallbäck 1970:70–71.
198 Shoes from Vähä-Hämeenkatu 13b excavation: Pihlman 1989a; Pihlman & Tuovinen 1981; 1984; Tuovinen 1989. Shoes from Uudenmaankatu 6 excavation: Mikkonen-Hirvonen 1991.
199 Pihlman & Kostet 1989:158, map 27a.
200 Jokela 2002:56, Appendix 2; 2005b:39; later, one of the front-laced shoes could be dated with the help of ceramic dating to the latter half of the 14th century – first half of the 15th century (Ceramic dating by Aki Pihlman, 8.8.2006).
201 Harjula 1999:44, Fig. 1; 2002:128–129; Harjula & Jokela 2003:258.
202 There is one upper with a separate vamp-piece with two lace holes (TMM 21816:NE504288). Because, however, only the vamp-piece has been preserved, it is possible that lacing continued in the quarters. Thus, the vamp-piece does not necessarily represent a front-laced shoe type with two pairs of lace holes.
203 Tongues with lace holes: TMM 21816:NE1478, NE11270, NE1263, NE1696.
204 Reinforcement on the inside of the upper: TMM 21816: NE05672, NE209157.
205 A front-laced shoe with three pairs of lace holes and no stitching in the opening: TMM 21816:NE20820.
206 Shoes with a separate leg part and three pairs of lace holes in the main piece: TMM 21816:NE05672, NE10461.
207 Shoes without stitching along the opening: TMM 21816:NE5004 (six pairs of lace holes), NE5022 (five pairs of lace holes).
208 Grew & de Neergaard 2001:32–33, 68; Swann 2001:74.
209 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:210–211, Fig. 6. In Jäfvert's (1937:37, Figs. on pp. 39 and 47; 1938:13, Plate 5A; 1981a:546) typology these shoes are subtypes of strap shoes and called spännskor and spännkängor (Engl. buckled shoes, buckled ankle shoes).
210 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:210, Fig. 5. In Jäfvert's typology these shoes are subtypes of strapshoes and called 'spännslejfskor' (Engl. buckled strap shoes) (Jäfvert 1937:35–36, Fig. in p. 36; 1938:13; 1981a:548).
211 Harjula 1999:44; 2002:129.

212 Harjula 2005b:40–42.
213 A parallel for this shoe with two buckles and a leg-part with three pairs of lace holes can be seen in Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:239, Fig. 6b (Type 100, Category 3: laces combined with buckles).
214 TMM 21816:NE2101, NE07839, NE08519.
215 TMM 21816:NE13248. Personal communication with conservator Maarit Hirvilammi, Turku Provincial Museum.
216 See Grew & de Neergaard (2001:75, Table 14) about the high frequency of tin-coated buckles in London shoes.
217 A bifurcated strap base in TMM 21816:NE164162.
218 TMM 21816:NE20213 and NE14721.
219 KM 96001:4461.
220 Uotila 1998:68–69, 71.
221 Kostet 1989:16.
222 Groenman-van Waateringe 1988a:16; Larsen 1992:24–25.
223 E.g. Grew & de Neergaard 2001:123; Swann 2001:316.
224 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:229, 317.
225 Pihlman & Kostet 1986:158, 175.
226 Harjula 2002:129.
227 'Boots would be used until the foot part, having undergone various repairs, had finally expired. The barely worn leather of the leg part would then be reclaimed for secondary use, rendering the discarded section unidentifiable as a boot' (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:230). See also Egan (2005:22); Lindqvist (1999:36); Zerpe & Fredriksson (1982:227–228).
228 Five holes with lace holes and toggles in turns (TMM 21816:NE11892; TMM 16176:6); five holes, the two lowest are lace holes, the three uppermost are toggle holes (TMM 18798:152); five holes, the three lowest are lace holes, the two uppermost are toggle holes (TMM 21816:NE1185); four holes with laces and toggles in turns (TMM 21816:NE13443); three holes, the uppermost is a toggle hole (TMM 21816:NE1346).
229 A buckled shoe with two buckles and a separate leg part with three lace holes (TMM 21816:NE14721). The leg part has been fastened to the main part with a butted seam and edge/flesh binding stitch.
230 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:249; Grew & de Neergaard 2001:91.
231 Grew & de Neergaard 2001:91–101; Larsen 1992:32–34. The English term patten (Latin *patinus*, medieval English *paten*, medieval French *patin*) probably comes from the word *pate*, 'paw' (Webster's Encyclopedic Unabridged Dictionary of the English Language: search word Patten). Jäfvert (1937:52, Figs. 20–21; 1938:24, Plate 9A–D; 1981a:548, 551) uses terms *patinus* and *patina*. In Finnish, the Latin term *patinus* could be the most appropriate instead of *patiini* or *patina*, the former meaning a certain type of later historical period half-boot and the latter a film, produced by oxidation on the surface of old copper or bronze (Nykysuomen sanakirja: search words *patiini* and *patina*).
232 E.g. Swann (2001:77–79), who believes that in the Middle Ages leather overshoes were called pattens and wooden overshoes clogs.
233 In the terminology of Goubitz, leather pattens are footwear made of leather, with a cork filling between the insole and the treadsole (type 110, variant II). Footwear composed of a sole made of layers of leather and a strap secured between the layers are called sandals by Goubitz (type 115). Both types are called leather pattens by Egan (2005), Swann (2001:78) and Grew & de Neergaard (2001:101) although Grew & de Neergaard present the possibility that footwear composed of a sole made of layers of leather might have been sandals rather than overshoes, i.e. used mostly with hose or bare foot.
234 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:251.
235 Goubitz type 110, variant II (leather patten) and type 115 (sandal).
236 TMM 18264:4494; Tuovinen 1989:131–132, Fig. 6.3; see also Pihlman 1989a:68, 70–72, Table III.5; Pihlman & Kostet 1986:158, 175; Pihlman & Tuovinen 1981:56–57, Fig. 7; Pihlman & Tuovinen 1984:105–106.
237 TMM 20459:818.
238 Jokela 2002:63–64, Appendix 2; 2005b:40.
239 Harjula 1999:45, Fig. 3; 2002:129; 2004a:footnotes 178 and 181; 2005a:footnotes 177 and 180.
240 In two-part footstraps, the distinction of right and left footstraps and lateral and medial strap-halves is based on the following information. The medial part always bears the tab or the buckle strap. The lateral part bears an opening for the tab or the buckle strap of the medial part. Whether a strap half belongs to a left or right patten can be concluded by the angles formed by the side and the base of the triangular strap. The side towards the instep forms a more acute angle than the side towards the toe (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:251).
241 Timonen 2005.
242 TMM 21816:KP13430.
243 Timonen 2005.
244 Ibid.
245 TMM 21816:KP13042.
246 Timonen 2005.
247 TMM 21816:NE504461.
248 Timonen 2005.
249 Grew & Neergaard 2001:98–99; Malmros & Daly 2005:251.
250 To find possible pairs, straps were first divided to left and right footstraps and then to medial and lateral halves according to the principle presented in endnote 240. In the Åbo Akademi assemblage, there were found 14 medial 'tab' halves; nine of these were from the left patten and five from the right patten. There were twenty five lateral 'opening' halves, 13 of which were from the left patten and 11 of the right patten. One lateral half is either from a left or right foot. There were 11 such straps of which it was impossible to say whether they were inner or outer straps or from the left or right foot.
251 Pair one: straps NE13495 (left, lateral) and NE13498 (left, medial) from the same excavation unit; both undecorated and cut from the sole in the same way. It is possible that NE13462 is from the same patten. It would be intriguing to connect these patten straps to wooden patten KP13430 in the same excavation

unit, but it is impossible to prove the connection. Pair two: straps NE2021 (left, lateral) and NE12822 (left, medial); similar decoration motifs and execution technique; found from excavation units situated on top of each other. Pair three: NE0859 (right, medial) and NE08510 (right, lateral); a certain pair on the basis of the find context (a small excavation unit) and their fitting together. In addition to these three pairs, there were found two straps, NE2015 (right, lateral) and NE2017 (left, lateral) which quite certainly are straps from left and right sole of a patten pair.

252 TMM 21816:NE504461.

253 TMM 21816:NE17269.

254 Four nail holes in TMM 21816:NE1018, NE20215, NE50042, NE509336; five or six nail holes in TMM 21816:NE12824. The secondary nature of some of the nail holes cannot be excluded.

255 Nails or their remnants remain in strap TMM 21816: NE15925 and in a strap/sole NE504461. In the latter the nails are ca. 20–30 mm long.

256 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:250–251; Zerpe & Fredriksson 1982, 228.

257 TMM 21816:06618.

258 In patten strap TMM 18264: 4494, a part of the pin is preserved.

259 TMM 21816:NE1276 and NE12718 are straps from a patten pair on the basis of the decoration. The same applies to straps TMM 21816:NE20222 and NE204279.

260 Falck 1997:Fig. in p. 82.

261 Phases according to Pihlman 1995:80–81, Appendix 3.

262 Jäfvert 1938:33; Egan 2005:21; Goubitz, van Driel-Murray & Groenman van-Waateringe 2001:16.

263 Of the interplay between shoemaking technique and shoestyles, see Volken & Volken 1996:12.

264 Egan 2005:21.

265 Goubitz, van Driel-Murray & Groenman van-Waateringe 2001:78.

266 Egan 2005:24; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:275–279; Pylkkänen 1956a:268; Swann 2001:82.

267 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:275; Swann 2001:82.

268 Pylkkänen 1956a:268 with the references; Swann 2001:82.

269 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:275.

270 Pylkkänen 1956a; 1956b.

271 Lists of shoes in castles in the following from Pylkkänen 1956a:272–275, Appendix 8.

272 Jäfvert 1938:31.

273 Pylkkänen 1956a:273.

274 The problem with the information on Vyborg is that in her tables, Pylkkänen has combined so-called 'enndobelskor' appearing in 1558 in Vyborg Castle with single soled shoes. In my opinion it is more likely that enndobelskor were some kind of double-soled shoes.

275 Jäfvert 1938:Appendix 3.

276 Rimón 2005a:49–50, Table 1; 2006:16–17.

277 Rimón 2005a:50; 2006:16–17.

278 Egan 2005:23.

279 TMM 14885:180a–c.

280 Pylkkänen 1956a:268, Fig. 143. I have left out of my group of Early Modern Period footwear one shoe (TMM 14885:131a–b), which Pylkkänen includes in her list probably on the basis of the shoe shape. It is a front-laced turnshoe with two pairs of lace holes and with a blunt toe. The shoe was put on a last during the conservation and the shape is probably due to that treatment and shaping, not the original form. The drawing on the main catalogue of Turku Provincial Museum, done before the conservation treatment reveals the original round toe form. I have included this shoe in the front-laced shoes of this thesis. I have also included two additional finds from the same Uudenmaankatu survey as possibly belonging to Early Modern Period shoes (parts from two shoe soles: TMM 14885:43, 138b).

281 Swann 2001:86.

282 TMM 14885:180a–c.

283 On the method of distinquishing insoles and treadsoles by the 'pressure wear' and 'friction wear', see Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:80.

284 TMM 14885:187.

285 Swann 2001:82.

286 TMM 14885:43a–c.

287 TMM 14885:186.

288 TMM 14885:138b–c.

289 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:92, Fig. 22a in p. 96. According to Goubitz, this technique was used mainly in children's shoes. In Turku, this technique has been noted in children's front-laced shoe TMM 18884:196. More on this technique can be found in chapter 1.3.2 of Part II.

290 Egan 2005:25.

291 Egan 2005:25; Norris 1938:Figs. 167, 416; Swann 2001:82, Fig. 90.

292 TMM 18338:57a.

293 TMM 18338:273a, 278a.

294 Egan 2005:25; Norris 1938:456–458, 756–762; Swann 2001:88.

295 TMM 18338:265, 270a.

296 TMM 18884:18.

297 Egan 2005:25. Despite the order, according to Swann (2001:82), some of the shoes in Tudor England were up to 16 cm wide.

298 According to the sumptuary law issued 1463–1464 in England, the length of the toe in shoes was limited to two inches (Grew & de Neergaard 2001:117).

299 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:275.

300 Gardberg 2000:Figs. in pp. 36–37.

301 Grönros 1999:Fig. in p. 29.

302 Insoles: KM 81132:469, 509, 700; treadsole (on the basis of the stitch holes for patches) KM 81132:705.

303 For the different picture given by written sources and archaeological finds of the material culture of the castles during the Early Modern Period, see Haggrén 1999.

304 The phases and their datings by Pihlman (1995).

305 There are two side-laced shoes dated by their context broadly to the 15th century. Thus, it is possible that they date to the latter half of the century.

306 The uncertainty is caused by the fact that tailed-toggle shoes, strap shoes and buckled shoes have not been found in layers with only 16th century material.
307 The method has been used by Schia (1977a:311–313), Groenman-van Waateringe (1978; 1988a:73–77), Grew & de Neergaard (2001:105) and most recently by Mould, Carlisle & Cameron (2003:3336–3340). In Turku, the method was first used by Jokela (2002:58–60) but only with a very small sole assemblage from the Aboa Vetus Museum (26 soles).
308 The comparative sole material from Tallinn (141 soles measured) shows that in this assemblage, continental sizes from 33 to 36 prevailed (Sarv 2004:340, 345–346), i.e. the size range is roughly the same as in the Turku material.
309 Grew & de Neergaard 2001:103.
310 One English size is 8.4 mm. Shoe size-scales from Bata comparative size chart. http://www.bata.com/documents/pdf/size_chart_printable.pdf
311 The two per cent shrinkage of ÅA-site shoe soles during freeze drying is based on the measurements before and after the conservation by conservator Maarit Hirvilammi, Turku Provincial Museum. As a comparison, it would be useful to compare the shoe lengths of Turku to a shoe assemblage in which the formation processes causing changes in shoe sizes could be excluded. This could be, for example, the assemblage of concealed shoes in a so-called 'Mühlberg-Ensemble' in Kempten (Allgäu) mainly from the late 15th - 16th century, in which any shrinking of the shoes can be excluded because of the natural dry store conservation. However, it seems that the shoe lengths in this assemblage do not form a normal distribution. Instead, for some reason, children's and women's shoes were preferred when this assemblage was formed (Atzbach 2002:235–236, Graph 2; 2005:105, 108–109, Fig. 4).
312 It is interesting to compare the typical male shoe lengths in Turku (23–25 cm) to the shoe lengths of the *Bocksten man*. This man, 25–35 year old according to the osteological and odontological analyses, was found in full costume, a pair of front-laced shoes included, in a peat bog in Rolfstorp parish, Halland, Sweden in 1936. The probable dating of the find is the the 14th century (Nockert et al. 1985; Sandklef 1943). The present lengths of his shoe soles are 23.3 cm and 25.5 cm (Nockert 1985:106, Fig. 104). The causes for the differences in the lengths between the left and right foot shoe have not been solved. In any case, as such, the lengths correspond well to the average lengths of Turku male shoes. Even if the possible shrinkage during the conservation, estimated to have been 5–10 per cent (Nockert 1985:106), was added to the sole lengths, the difference is not significant. Bocksten man's shoes remain within the size range of Turku male shoes. Bocksten man's stature has been estimated to have been ca. 170–180 cm (Gejvall 1985:30–31). This means that he was at least of the average or beyond the average male stature of his time (See Gejvall 1985: Diagram 1) and the shoe size naturally correlates to his overall stature.
313 Groenman-van Waateringe 1978:184; 1988a:75.
314 Grew & de Neergaard 2001:105.
315 The approximations of age from Bata comparative size chart, http://www.bata.com/documents/pdf/size_chart_printable.pdf
316 Grew & de Neergaard 2001:121.
317 Using the method of Groenman-van Waateringe (1978; 1988a:73–77), the percentages for children's, women's and men's shoes would be 15 for children, 38 for women and 47 for men at the ÅA-site. Thus, the percentage of children would be even lower than counting by the simple size ranges. With this method, there would be fewer women and more men, while counting using the size ranges, there would be fewer men and more women.
318 The precision in measuring the different shoe types is one centimetre. More precise measurement was not possible in most of the cases where the length of the upper, often without the sole, depends on how it is positioned for measuring.
319 The ÅA-site front-laced shoes were considered to be a sample large enough to be used here.
320 See e.g. Barwasser & Goubitz 1990; Falk 1997:83.
321 Groenman-van Waateringe 1978:187, Table 3; 1988a:76.
322 In Helgeandsholmen, Stockholm, only 10.7 per cent of classified shoes were children's shoes. As children's shoes, there were counted shoes ≤ 20 cm (Zerpe & Fredriksson 1982:228, 230–231, Table 7).
323 Grew & de Neergaard 2001:121–122; Groenman-van Waateringe 1978:187; Zerpe & Fredriksson 1982:228.
324 Grew & de Neergaard 2001:121; de Neergaard 1985:15; Koch 1988:74–75.
325 In the Sauna Street excavations in Tallinn, 28 fragments of one-piece shoes from the late 13th century – 14th century, of which only one was of adult size were found (Sarv 1999:79, 83).
326 Groenman-van Waateringe 1988a:117–118; Hylgård 1984:21; Koch 1988:74–75, 2005:226; Zerpe & Fredriksson 1982:228, Table 7.
327 In London, in the late 14th century nearly all children's shoes were front-laced shoes (Grew & de Neergaard 2001:34–35, 105). For the front-laced shoes as children's shoes, see also Zerpe & Fredriksson (1982:228, Table 7). Of the strap shoes as children's shoes, see Grew & de Neergaard (2001:23).
328 Hämäläinen-Forslund 1988:266.
329 de Neergaard 1985:15.
330 According to Grew & de Neergaard (2001:39, 41), in London, buckled shoes with a front-opening were common at the beginning of the 15th century both in child and adult sizes. Buckled shoes possibly acted as replacement for the front-laced ankle shoe of the late 14th century with which it shared many features of design and construction, both overall and in detail. In Helgeandsholmen, Stockholm, buckled shoes in children's sizes are represented only by one shoe (Zerpe & Fredriksson 1982:228). This seems to confirm the low number of buckled shoes in children's sizes in the Nordic Countries where in the place of children's buckled shoes there are front-laced shoes and tailed-toggle shoes.
331 Grew & de Neergaard 2001:43; Zerpe & Fredriksson 1982:Table 7.

332 In London, pattens have been found which would have fitted children from ca. six to eleven years old (Grew & de Neergaard 2001:105).
333 de Neergaard 1985:18, 20, Fig. 3. Children's size cowmouth shoes from Pärnu, Estonia (Kadakas, Haak, Russow, Saluäär & Sarv 2003:192–193.
334 Zerpe & Fredriksson 1982:228.
335 de Neergaard 1985:15.
336 de Neergaard 1985:14; Piponnier & Mane 1997:103–104.
337 TMM 21816:NE204164, NE50372.
338 E.g. in tailed-toggle shoes TMM 21816:NE504300 and NE1692.
339 TMM 21816:NE50372, NE204164.
340 Egan 2005:22.
341 Tentative suggestions concerning the 13th century London material were made that side-laced shoes were worn by men (Grew & de Neergaard 2001:103). In York, opposite conclusions were suggested. There, side-laced shoes occurred in female sizes (Mould, Carlisle & Cameron 2003:3340).
342 E.g. Lindqvist 1999:64; 2004:54.
343 E.g. Grew & de Neergaard 2001:103; Mould, Carlisle & Cameron 2003:3339.
344 Grew & de Neergaard 2001:105; Schia 1977a:312.
345 Falk 1917:60.
346 Grew & de Neergaard 2001:105.
347 On the few illustrations of women's shoes, see Grew & de Neergaard 2001:120–121.
348 Bagge, Smedsdal & Helle 1973:174.
349 The relative values of monetary units in Norway (1 mark = 8 øre = 24 ertog = 240 penningar) according to the information from University of Oslo's Coin Cabinet exhibition http://www.dokpro.uio.no/umk_eng/nominal/penning.html
350 Granlund 1982a:651; Jäfvert 1981a:552.
351 According to the same statute, the price of men's shoes was one öre and women's three öre. According to Jäfvert (1981a:552, referring to Hadorph 1687), there must be an error in numbers either caused by typography or misreading. In penningar, the prices for men's and women's shoes would have been 24 and 72 penningar, respectively. The relative values of monetary units in Sweden were 1 mark = 8 öre = 24 örtug = 192 penningar, according to Swedish coins On-line http://swedishcoins.net/myntfakta/mynt_ordlista.asp
352 Klemming 1856:16, capitulum iiij: 'Mästar sko skulu göras som här six eth bondha sko ok eth par qwinno sko mz länkä laska ok eeth par ynnanbunna sko ok eth par högha stöffla'.
353 Jäfvert 1937:57.
354 Söderwall 1884–1918a:787; 1884–1918b:802.
355 Svenska Akademiens Ordbok, search word *laska* http://g3.spraakdata.gu.se/saob/
356 'Hwilkin som säther klippinx äller siäl skins äller märskins laska j nöthskins sko widher solna som nidhre s. 8. böthe ena thunno öl.' Anyone who puts *inserts* (laska) of sheep, seal or horse leather in cattle leather shoes … must pay a barrel of ale (Klemming 1856:18, capitulum xvij).
357 Lindqvist 1999:49–50; 2004:53; see also Carelli 2001:166–171.
358 Broberg & Hasselmo 1981:123, 134–135; Lindqvist 1999:38–39.
359 Lindqvist 1999:Table in p. 38; Sarv 1999:80, 83, Fig. 1; 2003, Fig. in p. 226; Wywrot 1996:283, Fig. VIII-7: types 2A–B; 1997:206; Wywrot-Wyszkowska 1998:251; 1999:250–251.
360 Grew & de Neergaard 2001; Lindqvist 1999:53.
361 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 15 in p. 141; Goubitz & Ketel 1992:481, Fig. XV-8.
362 Broberg & Hasselmo 1981:123, 129, 134–135, Figs. 87, 96; 1982:98, Figs. 7, 10; Zerpe & Fredriksson 1982:223, Fig. 178.
363 Blomqvist 1939:205, 210, Figs. 28–29, 44–45.
364 Groenman-van Waateringe 1988a:28, 33, 42, 48, Figs. 5.4.3 no. 2, 5.8.13 nos. 9–12, 5.8.17 nos. 1–5; Koch 1988:69; Schnack 1992a.
365 Bebre 1983:Fig. 4; Sarv 1999:80, 83, Fig. 1; 2003, Fig. in p. 226; Wywrot 1996:283, Fig. VIII–7:types 2A–B; 1997:206; Wywrot-Wyszkowska 1998:251; 1999:250–251.
366 Broberg & Hasselmo 1981:Fig. 87; Lindqvist 1999:53.
367 The higher variant of thong shoe, type 4a, still appears in the 15th century in Stockholm, while the lower variant, type 4b, only occurs in the 14th century (Zerpe & Fredriksson 1982:223, Fig. 178).
368 Harjula 2005b and the references.
369 Lindqvist 1999:40–41, Fig. 29.
370 Broberg & Hasselmo 1981:128–129, Fig. 87; Zerpe & Fredriksson 1982.
371 Lindqvist 1999:43.
372 Broberg & Hasselmo 1981:123, 129, Fig. 87; Zerpe & Fredriksson 1982:223.
373 Blomqvist 1939:204, 218, Figs. 25–26; Broberg & Hasselmo 1981:Fig. 90; 1982:98, Figs. 7, 10.
374 Groenman-van Waateringe 1988a:42, 50, 70, Fig. 5.8.12, nos. 7–8, Fig. 5.8.19, no. 1; Koch 1988:71–73; Schnack 1992a:96–97; see also Lindqvist 1999:44 and the tables in pp. 50–52.
375 Larsen 1992:39, 43, Fig. 54.
376 Lindqvist 1999:50–52.
377 Schnack 1992a; 1992b; Volken & Volken 2002b; Vons-Comis 1982.
378 Grew & de Neergaard 2001:21–28.
379 Mould, Carlisle & Cameron 2003:3322–3324.
380 Sarv 1999:82, according to Rommot 1990.
381 Wiklak 1969:488.
382 Wywrot-Wyszkowska 2003:Fig. 2 nos. 1 and 4, Fig. 3 nos. 1 and 3, Fig. 9 no. 4.
383 Wywrot-Wyszkowska 2003:Fig. 7 nos. 1–2.
384 Goubitz & Boersma 2000:614–615, Figs. 3–4; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:161–171; Goubitz & Ketel 1992:483–490, Figs. XV-11–XV-17.
385 Groenman-van Waateringe 1988a:70, Fig. 5.8.5 nos. 2–4; Koch 1988:71, Fig. 11; 2005:225–226, Fig. 10.38.
386 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:201; Goubitz & Ketel 1992:492, Fig. XV-22.
387 Mould, Carlisle & Cameron 2003:3325–3326, Fig. 1595.
388 Wywrot-Wyszkowska 1998:Tables 119.7, 122.4.

389 Wiklak 1995:Table in p. 16; Wywrot-Wyszkowska 2003: Fig. 9 no. 2.
390 Fingerlin 1995:154, Fig. 26, Table 13; Volken 2002:Fig. 4; Volken, Volken & Bourgarel 2001:43–45, Figs. 9–10.
391 Broberg & Hasselmo 1982:134, Fig. 90.
392 Schia 1977b; 1987:360, 362.
393 Lund (Blomqvist 1939:201, Fig. 19); Söderköping (Broberg & Hasselmo 1982:134, Fig. 90); Svendborg (Groenman-van Waateringe 1988a:58, Fig. 5.8.27 no. 2); York (Mould, Carlisle & Cameron 2003:3329); see also Lindqvist 1999:41–42, Tables in p. 42).
394 Lund (Cinthio 1976a:311); Tallinn (Sarv 1999:82, Fig. 7); Tartu (Personal observation at the exhibition *Manu et mente/Kädellä ja mielellä*, Turku Castle, 2.11.2007); Riga (Bebre 1983:131, Figs. 7–8; Caune 2001:Fig. 4); Kołobrzeg (Wywrot 1996:Fig. VIII–7: types 1A–B, 283; 1997:206; Wywrot-Wyszkowska 1998:251; 1999:250–251; Schleswig (Schnack 1992a: Fig. 31); Lübeck (Groenman-van Waateringe & Guiran 1978:171, Figs. 66.35, 67.40); Vons-Comis 1982:246, Figs. 81.96b–c, 83.128a, 85.693a); for the sites in the Netherlands, see Goubitz, van Driel-Murray & Groenman-van Waateringe (2001:178–183).
395 Zerpe & Fredriksson 1982:223, Fig. 177.
396 Broberg & Hasselmo 1981:135, Fig. 90.
397 Grew & de Neergaard 2001:18, 43, Figs. 25–28.
398 Svendborg (Groenman-van Waateringe 1988a:32, 36, Figs. 5.6.3 no. 1, 5.8.4 no. 1); Oslo (Schia 1977b; 1987:360, 362); York (Mould, Carlisle & Cameron 2003:3329); Kołobrzeg (Wywrot 1996:Fig. VIII–7:types 1A–B, 283; 1997:206; Wywrot-Wyszkowska 1998:251; 1999:250–251; earlier ones are from the 13th and 14th century: Wywrot-Wyszkowska 2003:Fig. 6 no. 1); Colmar (Rathgeb 2002:Catalogue no. 585).
399 Koch 2005:220.
400 Koch 1988:73–74; 2005:219–220; the occurrence of extended tips and uppers with the flesh side outwards in side-laced shoes has been noted also by Goubitz (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:175–176).
401 Koch 1988:73–74; 2005:219–220.
402 Vilkuna 1977:126–127.
403 Finland Proper (Fin. Varsinais-Suomi) is a province in south western Finland, centred on the city of Turku and Turku Castle.
404 Edgren 1997; 2002; 2005; Myrdal 2004; 2006; Vilkuna 1977:131–134.
405 Lindqvist 1999:76.
406 Tulkki 2003:70, Fig. 50.
407 Rimón 2005a:32, Appendix 11; 2006:12, Fig. 6.
408 Saksa, Belsky, Kurbatov, Polyakova & Suhonen 2002:63, Fig. 21.3.
409 Frank 1991:556–557; Kykyri 1997:14, 16.
410 Broberg & Hasselmo 1981:Figs. 87, 90; 1982:Fig. 7.
411 Broberg & Hasselmo 1981:123, 130.
412 Zerpe & Fredriksson 1982:221–222, 226–227.
413 Koch 1988:70–71; 2005:223–225.
414 Schia 1977b:158; 1979:51, 53, Fig. 9; 1980a:83; 1989:173, Fig. 4.
415 Pärnu (Kadakas, Haak, Russow, Saluäär & Sarv 2003:192, 195, Fig. 5.2); Tartu (Personal observation at the exhibition *Manu et mente/Kädellä ja mielellä*, Turku Castle, 2.11.2007).
416 See, for example, Sarv 1999; 2003; 2006.
417 Szczecin (Kowalska 2001); Gdańsk (Wiklak 1969:152–153, 157, Figs. 14, 16, 19; Wywrot-Wyszkowska 2003: Fig. 2 nos. 2–3, Fig. 3 no. 3); Kołobrzeg (Wywrot-Wyszkowska 1998; 2003:Fig. 7 nos. 3–4, Fig. 9 nos. 1 and 3).
418 Grew & de Neergaard 2001:34–35, 41, 105, Fig. 41.
419 For the Dutch finds of medieval and post-medieval front-laced shoes, see Goubitz 2002:66–67; Goubitz & Boersma 2000:619, Fig. 6; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:187–200. Good examples of medieval and post-medieval types of front-laced shoes also come from Vevey, Switzerland (Volken & Volken 1996).
420 Broberg & Hasselmo 1982:123.
421 Zerpe & Fredriksson 1982:223–224, Fig. 181.
422 Jäfvert 1937:37, Fig. 10; 1938:13, Plate 5A; 1981a:546.
423 Groenman-van Waateringe 1988a:25, 36, Figs. 5.1.10 no.4 and 5.8.6 nos. 5–7; Koch 1988:71, Fig. 10; 2005:226, Figs. 10.39–10.41.
424 Lind 1991:166, 202, Figs. 8–9.
425 Groenman-van Waateringe & Krauwer 1987; Schnack 1994.
426 Fingerlin 2002:Catalogue no. 588.
427 Lithberg 1932.
428 Amsterdam, 1375–1425 (Groenman-van Waateringe 1972); Leiden, 1375–1400 (van Driel-Murray 1984); Deventer, 15th century (Goubitz 1992); s'-Gravenhage (The Hague), 1375–1425 (Magendans & Waasdorp 1985); Kampen, 15th century (Barwasser & Goubitz 1990); Deventer, Reimerswaal, Dordrecht, Late Middle Ages (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 6 in pp. 214–215).
429 Goubitz 1988.
430 Grew & de Neergaard 2001:39, 41, Figs. 63–66, Tables 10–11.
431 Mould, Carlisle & Cameron 2003:3326–3328, Figs. 1595, 1662.
432 Swann 2001:74, Fig. 78.
433 Lindqvist 1999:43.
434 Jäfvert 1937:35–36, Fig. 7; 1939:13; 1981a:548.
435 Schnack 1992a:'Halbschuhform G2', Tables 46–49, an exact parallel especially in Table 49.1.
436 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:210, Fig. 5 in pp. 213–214.
437 Grew & de Neergaard 2001:28–33; Figs. 42–44, 104, Tables 6–9.
438 Volken 2005.
439 Zerpe & Fredriksson 1982:227–228, Fig. 188.
440 Cinthio 1976a:316, Figs. 1–3.
441 Koch 1988:67–68, Fig. 5, Table 1; 2005:216–217, Figs. 10.3, 10.21, 10.22.
442 Groenman-van Waateringe 1988a:55, Figs. 5.8.22 no. 1, 5.8.23 no.2.
443 Larsen 1992:24, 56, Figs. 25–26, 54; Schia 1980b:193.
444 Tønsberg (Schia 1980b; Ulriksen 1992); Oslo (Schia 1977b:168, Figs. 88–93; 1987:367).
445 Marstein 1987:Fig. 13; 1989:42, Figs. 1c, 18a–b.
446 Schnack 1992a:Tables 81–82, 84–86, 90–91.

447 Groenman-van Waateringe & Guiran 1978:168, Fig. 61 no:7, 66 no:31, 69 no:56, 70 no:56; Vons-Comis 1982: Figs. 82.96e, 86.132d; Volken & Volken 2002b:9, 10, Figs. 8, 17.7.
448 Goubitz & Boersma 2000:619, Fig. 7; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:229–236.
449 Bebre 1983:Fig. 131.
450 Wywrot 1996:267; 1997:194, 206, Fig. VII–4; Wywrot-Wyszkowska 1998:240–241; 1999:250–251.
451 Izjumova 1959, Fig. 8.1, 8.7; 1967:84.
452 Tver (Kurbatov 2004:Fig. 2); Polotsk (Kurbatov 1999: Fig. 9:1.1–1.6).
453 Grew & de Neergaard 2001:5; Egan 2007.
454 Larsen 1992:65.
455 Swann 2001:74–75.
456 Vilkuna 1977:127.
457 Koch 2005:216–217.
458 Dahlbäck 1988b:87, 89.
459 Zerpe & Fredriksson 1982:228, Fig. 189.
460 Jäfvert 1937:Fig. 21; 1938:Plate 9B; Swann 2001:77–78, Fig. 83 (the patten from the Gamla Posthuset).
461 Blomqvist 1980:244, Fig. 20; Jäfvert 1937:41, 52–53, Figs. 20–21; 1938:14, 24, 27, Plate 9.
462 Larsen 1992:32, 34, Figs. 45–46.
463 Buckholm 1998:87.
464 Swann 2001:77.
465 Personal observation at the exhibition *Manu et mente/ Kädellä ja mielellä*, Turku Castle, 2.11.2007.
466 Personal communication, Krista Sarv, 24.8.2006.
467 Personal communication, Viktorija Bebre, 20.11.2001.
468 Falk 1997; 2001; Waateringe & Krauwer 1987:77, 79, Fig. 67.
469 Konstanz (Rathgeb 2002:Catalogue no. 587; Schnack 1992b:Fig. in p. 426; 1994:33, Figs. 37.4669, 3012, 3348, 4146); Lüneburg (Haak 2004); Einbeck (Heege, Volken & Volken 2002:Figs. 633, 637; Volken, Volken, Baeriswyl & Boschetti-Maradi 2004:683, Footnote 40).
470 Basel (Ribbert 2002:Catalogue no. 586); Schloss Sumiswald (Volken, Volken, Baeriswyl & Boschetti-Maradi 2004:683, Fig. 8).
471 Amsterdam, 14th and 15th centuries (Baart, Krook, Lagerweij, Ockers, van Regteren Altena, Stam, Stoepker, Stouthart & van der Zwan 1977:88–92; Groenman-van Waateringe 1975:24, Fig. 4); Dordrecht, Veere, Delft, Deventer, Groningen, 's-Hertogenbosch, Gouda, Haarlem, Kampen, 13th to 16th centuries (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:249–266; Goubitz & Ketel 1992:492–493, Fig. XV-23).
472 Ceynowa 2003; 2005.
473 Wywrot-Wyszkowska 1998:241, Tables 30.4, 93.2, 109.12, 117.3–6, 119.4–5, 120.5–7.
474 Elbląg (personal observations at the Museum of Elbląg, 11.9.2003, with the kind presentation by Mrs. Grażyna Nawrolska); Wrocław (Kaźmierczyk 1970:Fig. 65c); Szczecin (Cnotliwy 1994); Toruń (Drążkowska 1993); Pyrzyce (Gutkowska-Rychlewska 1967); Nakło (Naumowicz 1959); Nysa (Tondera 1966).
475 Grew & de Neergard 2001:91, 93, Fig. 126.
476 Egan 2005:23, Fig. 14.
477 Grew & de Neergaard 2001.
478 Groenman-van Waateringe & Velt 1975:116–117, Figs. 13–14; for detailed patten-shapes occurring in the higly decorated, so-called Falke-group stoneware vessels (ca. 1400-1450), see Stephan & Gaimster 2002:129, Figs. 10a, b, 11.
479 Buckholm 1988: 87; Grew & de Neergard 1988: 119; Groenman-van Waateringe & Velt 1975: 116–117, Fig. 13.
480 Grew & de Neergaard 2001:91.
481 On the early one-piece shoes, see e.g. Grenander-Nyberg 1985:229–233; Groenman-van Waateringe 1975:23–24; 2001; Hald 1972; Marstein 1987; Marstrander 1981; Schia 1986.
482 Groenman-van Waateringe 1975:24.
483 Blindheim 1959; Hald 1972:112–117; Swann 2001:40–43, Figs. 33–35.
484 Swann 2001:51.
485 Bebre 1987:Fig. 2; 1994; 1997:114.
486 17th and 18th century one-piece shoes from excavations in Riga (Bebre 1990:Fig. 9a.1).
487 Bebre 2002:89–90.
488 Snieder 1996; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:11–12, Fig. 3 in p. 17; Groenman-van Waateringe 2001:387.
489 Mould, Carlisle & Cameron 2003:3275, 3277–3280.
490 Blomqvist 1980:241, 245, Fig. 3.
491 Twenty-one examples of one-piece shoes from the period 1200–1350 (Ulriksen 1992).
492 Schia 1980a:84, Fig. 5.
493 Eskildsens Løkke (Grieg 1933:215, Fig. 174; Marstrander 1981:250); Bispegata (Blindheim 1981:554–555; Schia 1977a:148); Mindets tomt, the end of the 13th century – beginning of the 14th century, re-used leather, amateur made according to Schia (1977a:175, Fig. 98); Søndre felt; latter half of the 13th century, re-used leather, amateur made according to Schia (1987:366, Fig. 33).
494 Marstein 1989:58–60, Figs. 1d, 29a–b.
495 One-piece shoes from the 13th and 14th centuries (Aun 1998:127, 143); also an undated example (Personal observation at the exhibition *Manu et mente/Kädellä ja mielellä*, Turku Castle, 2.11.2007).
496 Tallinn, Sauna street; 28 fragments of one-piece shoes from the latter half of the 13th century to the 14th century, only one was adult sized (Sarv 1999:79, 83).
497 Бебре 1987; Bebre 1994; 1997.
498 Shoes from Kernavė, Lithuania, dated to the 13th and 14th centuries (Luchtanas & Gintautas 2002:Fig. 335).
499 Medieval shoes from Novgorod (Антропова 2004:Figs. 11–12; Izjumova 1959; 1967:84); post-medieval shoes from 16th to 17th centuries from Mangazea, Western Siberia (Курбатов & Овсянников 1999). According to Kurbatov and Bebre, one-piece shoes have also been found in Ivangorod, Staraja Ladoga, Pskov, Tver, Moscow, Belozersk (Beloozero) in Russia and Minsk in Belarus (Kurbatov 2004:Figs. 3, 41–42, 115; Saksa, Belsky, Kurbatov, Polyakova & Suhonen 2002:61–62; Bebre 1987:Fig. 2). For the eastern distribution of one-piece shoes, see also Bebre (1997:114) and the references). An interesting find probably connected to Russia is a one-piece shoe from the shipwreck Mulan, lying east of Hankoniemi Cape. The ship was wrecked

in 1611 when bringing booty from Russia to Sweden. It is assumed that the one-piece shoe found belonged to a crew member (Sammallahti 1990:56, Fig. 11).
500 Pälsi 1937; 1938; Itkonen 1960; Tomanterä 1982.
501 Tomanterä 1982.
502 Pälsi 1937; 1938; Kalewala 1887.
503 See Tomanterä 1982:44.
504 Pälsi 1937:66.
505 Tomanterä 1982:44. About the ethnographical shoe types in Finland, see Heikinmäki 1975; Lehtonen 1963; 1968; Pälsi 1937; 1938; Sirelius 1921:412–417, Tables XXI and XXII; Vuorela 1998:588–593.
506 Itkonen 1960.
507 Lehtosalo-Hilander 1984:14.
508 Valonen 1952:196, Fig. 155. It should be possible to obtain radiocarbon datings from these shoes to find out their age. However, it could well be that the datings would not go back to the prehistoric period or even to the Middle Ages. As an analogy, the research and datings of Russian birch-bark shoes can be used. According to A. Kurbatov, 'the idea that the lapot' (birch-bark shoes) had been in use among peasantry since ancient times, was formulated by Russian nobility and intelligentsia, as well as thoroughly educated historians and men of letters of the 18th century. Later that conception was accepted without sufficient criticism by historians of the 19th–20th centuries, including archaeologists and ethnographers.' Thus, the supposed old age of birch-bark shoes in Russia seems to have been a historiographical myth. According to Kurbatov, birch-bark shoes have not been found in medieval cities of the wooden zone of Eastern Europe in deposits of the 10th–14th centuries, even if they occur in the Modern Period contexts from the 16th century onwards (Kurbatov 2001b:233).
509 Bebre 1994.
510 Bebre 1983:125–126; 1997:118; 2002:89–90.
511 Schia 1977c:148.
512 Kurbatov 2001a; Saksa, Belsky, Kurbatov, Polyakova & Suhonen 2002:60–62, Fig. 21.4.
513 Klemming 1856:16, capitulum iiij.
514 Swed. *karlsko* (Söderwall 1884–1918c:135).
515 Jäfvert 1937:57.
516 The same problem in defining good quality artefacts either as professional or amateur-made was encountered in evaluating the technical quality of medieval knife sheaths in Turku. Here too, the quality only was not considered an adequate criterion for professional manufacture (Harjula 2005a:54).
517 Pihlman 1995:209; 2001:342–343; 2003b; 2003c:99–100.
518 Pihlman 2003b:200–201.
519 Kirjavainen 2003:270, 273–275; Kirjavainen & Riikonen 2005:38–39.
520 Kurbatov 2001a; Saksa, Belsky, Kurbatov, Polyakova & Suhonen 2002:62, Fig. 21.1, 21.2.
521 Pylkkänen (1956a:268; 1956b:268) refers to both Ruuth (1906:288–289) and Arwidsson (1846:section no. 165) in this context. Neither source, however, mention imported soles for cowmouth shoes. Neither does Grotenfelt (1887), discussing the trade in Finland at the times of the first Vasa Kings. Thus, this interesting detail concerning shoe import remains uncertified for now.
522 Arwidsson 1846:section no. 165, p. 319.
523 Nya Lödöse, Kalmar Castle, Glimmingehus Manor (SE Scania) (Jäfvert 1938:33); Uppsala (Broberg & Hasselmo 1981:103, 106; Roslund 1984:79, Fig. 89); Stockholm (Zerpe & Fredriksson 1982:226); Lund (Blomqvist 1980:243, Fig. 19; Jäfvert 1938:33).
524 Zerpe & Fredriksson 1982:226.
525 Marstein 1989:52, Fig. 25.
526 Kadakas, Haak, Russow, Saluäär & Sarv 2003:191–193, Fig. 5.1.
527 Egan 2005:21–27.
528 Goubitz 2002; Goubitz & Boersma 2000; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:275–279.
529 Volken & Volken 1996; 2004:89–90, Fig. 3.
530 Schia 1977b:185.
531 Koch 2005; Schia 1977b:185; See footnote 6 in Koch 2005 for the discussion of terminology of pointed toes in medieval shoes.
532 Larsen 1992:30.
533 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:76.
534 Skewed toe is a term used by Larsen (1992:30) of the early pointed toes.
535 Lindqvist 1999:20–21.
536 Archaeological finds of early pointed toes: Lund, 11th century (Blomqvist & Mårtenson 1963:Fig. 200); Söderköping, turn of the 12th/13th century, Enköping, end of the 13th century (Broberg & Hasselmo 1981:129); Lödöse, 12th century (Broberg & Hasselmo 1981:111); Visby, undated 'Soccus' shoe with an outcurved toe (Eldegård 1997:24, Fig. 17); Oslo, first half of the 12th century – middle of the 13th century, with a typology of extended tip forms (Schia 1977b:185–188; 1987:388, 396–397, Figs. 44, 50); Bergen, mainly 12th century (Larsen 1992:41); Trondheim, 12th–13th century (Marstein 1989:26); London, end of the 11th century–ca. 1150 (Grew & de Neergaard 2001:11, 52; Pritchard 1991:232); for the origin and general description of the early pointed type (Schnack 1992a:41; Swann 2001:47–48, 52–53).
537 After Swann 2001:Fig. 46.
538 Grew & de Neergaard 2001:124; Swann 2001:65–66.
539 Grew & de Neergaard 2001:117.
540 About the cultural history of late medieval pointed toes, see Grew & de Neergaard 2001:116; Swann 2001:67–71.
541 Archaeological finds of late medieval shoes with pointed toe tips: Stockholm, latter half of the 14th century (Zerpe & Fredriksson 1982:225); Uppsala, middle of the 14th century (Broberg & Hasselmo 1981:106, 129, Fig. 78d; Roslund 1984:79, Fig. 89); Uppsala, first half of the 15th century (Carlsson 1991); Lund, 14th century (Blomqvist 1939:Fig. 47).
542 Boringholm, the latter half of the 14th century (Koch 2005:213, 215, 231–234).
543 Egan 2005:23, 26, Fig. 8; Grew & de Neergaard 2001:28, 117.
544 Lindqvist 1999:19.
545 Grew & de Neergaard:29, Table 8.

546 Koch 2005:214–215, 231.
547 After Koch 2005:Fig. 10.16.
548 Extended tips made with rands are rare in publications. Besides Koch (2005), see Broberg & Hasselmo (1981: Fig. 78d.10).
549 Lindqvist 1999:19–20.
550 Koch 2005:Fig. 10.54.
551 Nowadays, suede is defined as 'leather finished with a soft, napped surface, on the flesh side or on the outer side after removal of a thin outer layer' (Webster's Encyclopedic Unabridged Dictionary of the English Language: search word Suede. Portland House, New York 1989). When talking about medieval finds, I have preferred the term 'suede-like' when meaning the napped flesh side surface instead of 'suede' to avoid confusion with the modern methods of suede leather manufacture. The main difference between suede, as it is nowadays understood, and the medieval 'suede' is the splitting of leather in two halves (modern suede is made from the inner splits of these halves) which was not done in the Middle Ages. The term suede is taken from the French, 'gants de Suède', Eng. Swedish gloves, deriving from the 17th century (Roberts & Etherington 2006). The medieval period terms for 'medieval suede' are unknown.
552 For the earlier discussion of the suede-like shoes in Turku, when only three examples were known, see Harjula & Jokela 2003.
553 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:29, 45, 175.
554 Koch 2005:229–230, Fig. 10.49.
555 Koch 2005:229–230.
556 Jäfvert 1938:28, Plate 10A.
557 For a detailed description of leather decoration techniques especially in footwear, see Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:41–55.
558 The Finnish terms are author's suggestions for the translations, not established terms of leather working.
559 TMM 20764:1782.
560 KM 96001:4403.
561 Schleswig (Schnack 1992a:'Halbschuhform C', Tables 28–29). Århus (Lorenzen 1971:177, Fig. AZT; Andersen & Madsen 1971).
562 KM 96001:4556.
563 Riga (Caune 2001:Fig. 4); Schleswig (Schnack 1992a: Table 22.2, Table 25.2, Table 27.2).
564 Jäfvert 1938:27; Grew & de Neergaard 2001:78–87; Swann 2001:79–80.
565 Linde 1950:Figs. in pp. 84–85; Schnack 1992a:83. Excised openwork of truly amateurish quality, either of decorative purpose or something else, can be seen in shoe TMM 21816:NE11092 (see Fig. 22) with oval excisions all over the shoe upper.
566 Jäfvert 1937:56.
567 Chaucer 1988.
568 Lund (Cinthio 1976a:Fig. 282); Örebro (Broberg & Hasselmo 1981:Fig. 81.2); Tallinn (Sarv 2003:228, Fig. in p. 229); Tartu (Aun 1998:128, Table III:4; personal observation at the exhibition *Manu et mente/Kädellä ja mielellä*, Turku Castle, 2.11.2007); Riga (Caune 2001: Fig. 4).
569 Front-laced shoe: TMM 21125:NE110139.
570 Decorated leg parts with tailed-toggle holes, probably from tailed-toggle fastened shoes: TMM 21125: NE13540, NE1397, NE14322, NE17363.
571 Tailed-toggle fastened shoes with a decorated, integral leg part: TMM 21125:NE20448, NE209138.
572 A decorated topband: TMM 21125:NE11818.
573 Decorated foot openings in side-laced shoes: TMM 21125:NE11256; TMM 16195:136.
574 Zerpe & Fredriksson 1982:226–227, Fig. 186.
575 Linköping, 14th and 15th centuries (Feldt 1997:108, Fig. 95); Uppsala, first half of the 15th century (Carlsson 1991:Fig. 95); Boringholm, latter half of the 14th century (Koch 2005:Figs. 10.36, 10.37); Schleswig, 14th century (Schnack 1992a:122, Taf. 94.1).
576 Volken, Volken & Bourgarel 2001:Figs. 4, 9.
577 Groenman-van Waateringe 1988a:36, Fig. 5.8.5.2–3.
578 Skara, 13th/14th century (Hjolman & Sigsjö 1975:253, Fig. 61); Lund, latter half of the 13th century–beginning of the 14th century (Blomqvist 1939:204, Fig. 23); Schleswig, 14th century (Schnack 1992a:Taf. 24.1, 26.1); Hamburg, 14th century (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:177); Criblet, 14th and 15th century (Volken, Volken & Bourgarel 2001:Figs. 2, 4, 9–10).
579 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:158.
580 TMM 21816:NE06618, NE20215.
581 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:251.
582 Grew & de Neergaard 2001:99–100.
583 Swann 2001:Fig. 84.
584 Ceynowa 2003:Figs. 1–2, Plate I (strap type 2B), Plate III (toe cap type III).
585 Ceynowa 2003:Plate III (toe cap type I).
586 Falk 1997:Fig. in p. 82.
587 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:251.
588 In stamping leather can be treated with various methods; with a cold or a heated stamp, a flat stamp, a relief stamp or a cutting stamp.
589 KM 81132:707.
590 KM 81132:609.
591 Jäfvert 1938:33–34, 37; Mould 2005:89–90, Figs. 2.69, 2.70; Swann 2001:87, 89–90.
592 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:275; Pylkkänen 1956a:268; Swann 2001:82.
593 Marstein 1989:52.
594 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 2 in p. 276.
595 Cinthio 1976a:315, Fig. 286.2.
596 Zerpe & Fredriksson 1982:229–230, Fig. 194.
597 Schnack 1992a:48–51.
598 Vons-Comis 1982:243, Table in p. 248.
599 Lund (Cinthio 1976a:Fig. 287); Oslo (Schia 1977b:127, 129, Figs. 15–16).
600 Schleswig (Schnack 1992a:51–52); Lübeck (Groenman-van Waateringe & Guiran 1978:166, Figs. 83.40, 83.42).
601 Grew & de Neergaard 2001:49.
602 Schia 1977b:127, 129, Figs. 15–16.
603 Schnack 1992a:51–52.

604 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:76.
605 Grew & de Neergaard 2001:49, 89–90; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:76, Fig. 13 in p. 85.
606 Grew & de Neergaard 2001:89–90.
607 After Zerpe & Fredriksson 1982:Fig. 182.
608 Harjula 1999:45.
609 The analysis by Timonen (2006).
610 Zerpe & Fredriksson 1982:224, Fig. 182.
611 Cinthio 1976a:315, Fig. 286:3
612 Swann 2001:77, Fig. 82.
613 Groenman-van Waateringe 1988a:22, 32, Fig. 5.1.7
614 Kadakas, Haak, Russow, Saluäär & Sarv 2003:192–193, 195.
615 Swann (2001:203, Fig. 252) writes about the use of shoe grass in Sami people's boots: 'Essential for wear in all these boots is the shoe grass from the senna plant. Gathered at the new moon in late August or September when about 60 cm high, it is treated until light and soft. A compact twist is placed first in the snout toe, essential for warmth; then a mass enveloping the hand and lower arm forms the main filling round the bare foot. The boot is then put on, and a flattened 10 cm circle of grass placed behind the foot heel, and more added round the ankle and lower leg as needed. It is removed each night after wear, and shaken out to dry, with the boots also hung up to air. The grass can be reused a number of times, and is obviously healthier than the hose we are now accustomed to, as well as safer, as it generates no perspiration.'
616 Brahenkatu (survey 1968–1969): several finds with the accession number TMM 17015. Turku Castle, Smith's yard (survey at the beginning of the 20th century): finds with the accession numbers 17016:132, 133.
617 Swann 2001:82.
618 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:306.
619 Dating of the context according to Pihlman 1995:81, 327–328. Swann (2001:76–77) mentions insole-shaped pieces of woollen cloth from Stockholm with a 14th century dating, but does not mention the source.
620 For the similar find in Schleswig, see Hirschberg 2003: Fig. in p. 8.
621 Harjula 2005:60, Appendix 2.
622 The fibres run horizontally and vertically with the vertical fibres (which are also longer) under the horizontal ones. The horizontal fibres extend to the edge of the sole between the stitch holes. The fibres have originally been stitched 'over' by the threads, used in seaming the sole. According to the analysis (Appendix 3), the material is hemp. Similar lining of hemp fibres was found on one medieval scabbard from the Åboa Vetus excavation (Harjula 2005:60).
623 Lindström 1845:11–12; Jäfvert 1937:47; 1938:32; Söderwall 1884–1918d.
624 Riga (Celmiņš 1998:23, Fig. 15, cat. no. 4); The Dutch whaling site of Smeerenburg in the Island of Spitsbergen in the Arctic Ocean; Kampten, Regteren and Leiden, The Netherlands (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:305 and the references); Trondheim (Marstein 1989:113, Figs. 61a–c); Kołobrzeg (Wywrot-Wyszkowska 1998:Table 62:6); Szczecin, Elbląg and Gdańsk (Personal information by Anna Kowalska).
625 Treadsoles usually have edge/flesh stitches and the grain side faces the ground. Insoles have edge/flesh stitches, too, but the grain side faces the foot (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:79).
626 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 22a in p. 96.
627 Schia 1977a:252; Critic in Groenman-van Waateringe 1980b:97.
628 Schnack 1992a:52–53.
629 Schia 1977b:252.
630 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:68.
631 Drawing after Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 2 in p. 69.
632 Zerpe & Fredriksson 1982:226.
633 Drawing after Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 2 in p. 69.
634 From Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 7a in p. 193.
635 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:175, 187.
636 After Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 1 in p. 202.
637 Based on the information on published thong shoes, it seems that leather was the prevailing material in thongs of Goubitz type 10-I shoes (thong shoes with cut thong keepers). Goubitz suggests that type 10-II shoes (higher shoes with keeper straps of leather strips threaded vertically through the leg part), rarely having any thongs in situ, could have been fastened with textile cords (Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:136). Certain information on textile cords comes from early thong shoes with closely spaced decorative slits around the ankle. In these, colourful textile thongs were sometimes used (Blomqvist 1939:197–198; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:135; Wiklak 1995:Fig. in p. 18).
638 Grew & de Neergaard 2001:47; Koch 2005:208–209, Fig. 10.7; Mould, Carlisle & Cameron 2003:3257–3258.
639 TMM 21816:n1669.
640 Grew & de Neergaard 2001:47, Fig. 82; Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:91, 306–307.
641 TMM 21816:NE173100.
642 Swann 2001:65.
643 Jäfvert (1937:41–42, Fig. 22; 1938:14, Plate 8A).
644 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:324.
645 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:92, Fig. 22a; for the occurrence of this technique in children's shoes, see also Atzbach 2005:107, Table 4.
646 Wideen 1977; Dahlberg 2006:12, catalogue number I on p. 128; Swann 2006:31.
647 Jäfvert 1938:Plate 16.B; Swann 2001:94–96.
648 Jäfvert (1937:47, 51–52, 58; 1938:115) points to a probable 15th century shoe with a toe extension, noted at the Germanisches Nationalmuseum, Nürnberg.

The shoe was partially constructed with a stitch-down technique at the heel section. He also mentions the Tatar boot at the Livrustkammaren and suggests an eastern origin for both these shoes and also for the stitch-down technique, although not explicitly for the latter.

649 After Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 22a in p. 96.
650 Rimón 2005a:57; 2006:14.
651 Harjula 2005c.
652 Kurbatov 2001a.
653 Personal observation. Latvian Academy of Science, Institute of History, Department of Archaeology, Riga 20.11.2001. The information about the dating of the finds supplied by Dr. Viktorija Bebre.
654 See, for example, Volken & Volken 1996:12.
655 Ibid.
656 According to Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:Fig. 5b in p. 93.
657 Of these methods, see e.g. Groenman-van Waateringe 1984:10–15; Haines 1991; Hansen 1980.
658 Volken 2002.
659 For the Aboa Vetus material, altogether 18155 leather scraps and 2191 artefacts or artefact fragments were analysed (Jokela 2002:26–30; 2005a; 2005b).
660 Tailed-toggle fastened shoes of goat or sheep leather TMM 21816:NE204164, NE50372.
661 Thong shoe fragments of pig leather KM 95032:9890, 9895; sole fragment of seal leather KM 95032:10300.
662 The definition of cattle or calf is made in this study on the basis of the thickness of leather. The skin of a young calf about 1 month is about 1mm thick. The skin of a calf that is almost fully grown, i.e. about 12 months old is about 2.5 mm thick. The skins of mature calves are generally between 4–6 mm thick (Haines 1991:1–2). Of course, it is possible that the thickness of leather is not original. The leather could be pared down to the required thickness by using the tool called the curriers' knife. However, as R.S. Thomson has mentioned, 'This was, however, time consuming, wasteful in terms of the amount of good leather converted into shavings and liable to damage the expensive hide.' The mechanical splitting machine was only patented in 1768 in England (Thomson 1982:147–148, 152–153). On this basis, I presume that the leathers of this study are quite close to their original thickness, that is, thick cattle leathers were not usually pared down to the thickness that could be mistaken as calf leathers.
663 The leather type remains unidentified in ca. 30 per cent of artefacts in the Aboa Vetus material and in ca. 20 per cent of the ÅA-site material.
664 Jokela 2005a:8.
665 Of the leather material in Aboa Vetus Museum, 53 percent of the waste leather and 68 per cent of the leather artefacts were made of calf leather. Sheep (1 per cent), goat (0.5 per cent), seal (0.4 per cent), pig (0.03 per cent) and horse (0.005 per cent) formed the rest of the identified material. Horse leather was only noted in waste leather (offcuts), not in artefacts (Jokela 2005a:7).
666 Grew & de Neergaard 2001:21, 46.
667 Mould, Carlisle & Cameron 2003:3265–3266.
668 Groenman-van Waateringe 1988a:71.
669 Schleswig (Schnack 1992:27); Lund (Westerström 1976:222).
670 Grew & de Neergaard 2001:21, 46.
671 Lindqvist 1999:27.
672 Groenman-van Waateringe & Guiran 1978:170; Vons-Comis 1982:245.
673 Jokela 2002:30.
674 Klemming 1856:19, capitulum xvik, xviij and xix.
675 Klemming 1856:19, capitulum xx.
676 Jokela 2005a; Hansson 1990:88; Jäfvert 1981b:209; Schia 1977b:126.
677 Lindberg 1989:41.
678 Kallioinen 2000:218.
679 On the problems and source criticism in identifying the craftsmen, see e.g. Heino 1985:37–45; 1997:22–25; Himanen 1971:11–26; Kallioinen 1997:87–88; 2000:217–218.
680 Kallioinen 2000:218.
681 Lat. *sutor*, shoemaker or cobbler.
682 REA 86.
683 FMU II 1783.
684 Kuujo 1981:109–110.
685 REA127.
686 FMU V 4187.
687 Biörnstad 1996:372; Forsman 1894:116; Jokipii 1952:141; Kallio 1945:11; Möller 1954:46; Norberg 1981; Talve 1979:92; Vilkuna 1994:318.
688 Granlund 1982b.
689 Blomqvist 1938:168; Bolstad 1991:135; Hildebrand 1983a:584; Stigum 1982; Thålin 1982.
690 Blomqvist 1938:168; Stigum 1982.
691 Gardberg 1971:301.
692 Kallioinen 2000:Appendix 1.
693 Himanen 1971:66–67; Kallioinen 2000:137–140; Ruuth 1916:22–24.
694 Kuujo 1981:162; Himanen 1971:181–182.
695 Dahlbäck 1988b:87; Jäfvert 1981b:211–213.
696 The term white-tawing comes from the end result of treatment, i.e. white coloured leather. In White-tawing or alum tawing, hides were treated with alum, salts and fatty materials. The end result was fine and soft leather. The method belongs to mineral treatments of skin (Larsson 1980:38; Nenno 1998:487; Thomson 1998:7). Leather treated this way is not resistant to repeated wetting and thus is rarely represented in archaeological finds.
697 Visby Stadslag 2:34 (Collin & Schlyter 1853); Granlund 1982a:649.
698 Kallioinen 2000:Appendix 1.
699 Kallioinen 2000:216.
700 Kallioinen 1997:94–95; 2000:220.
701 Kallioinen 2000:220; Kuujo 1981:165.
702 Kostet 1989:32.
703 Ranta 1975:427–438.
704 REA 184.
705 Himanen 1971:179–180; Kuujo 1981:153; as a comparison, see Carelli (2006:547–548) for the significance of the church for the development of craft in Lund.
706 Himanen 1971:160, 175.
707 Talve 1979:88–92.
708 The border between main and side profession in the countryside in the Middle Ages is very vague because of the lack of information (see e.g. Lindberg 1947:17).
709 Kallioinen 2000:227 and the references.

710 E.g. Kerkkonen 1958; Himanen 1971:126–129.
711 Granlund 1981; Kallio 1945:11; Nissilä 1962:126; Talve 1979:90–91; Vilkuna 1935:201; 1981:514–515.
712 Dahlbäck 1988b:86.
713 Kaukonen 1988; Sirelius 1921:40–42; Talve 1979:90.
714 Jäfvert 1981b:211.
715 Himanen 1971:Tables V–VII; Talve 1979:88–89.
716 Himanen 1971:95–96.
717 'Pädher skomakare' (FMU 3328). In Finland Proper, skinners not included, references to other leatherworkers are sparse, too. A beltmaker is mentioned in Lieto in 1464 and 1477 (Himanen 1971:110).
718 Jäfvert 1981b:211–213.
719 Jäfvert 1981b:209; Thomson 1991:13.
720 Thomson 1981:162–164.
721 A good example of a liming pit which leaves no question as to its function was found in Vårfrugatan, Lund and dated to the 12th century. The rectangular pit, lined with basketwork, contained both lime and lots of hair (Mårtensson 1966:11, Fig. 13; Mårtensson & Wahlöö 1970:93, 113). Similar pits were later found in the PK-Banken site (Cinthio 1976b:215). For the unquestionable tanning evidence in Winchester, see Clarke (1984:137–138) and Keene (1990). About the tanning industry and structures in Pest, see Irásné Melis (1996:238). In Linköping, there were found tubs containing a layer of lime and interpreted as lime containers (Swed. kalkbehållare) (Tagesson 1997:46–47, Figs. 28–29). In my opinion the evidence is sufficient to interpret these tubs as liming tubs used in a leatherworking process.
722 Liming and tanning tubs/pits were usually but not always interchangeable. It could be that different tubs/pits were used for these two processes (Thomson 1981:165).
723 Kirjavainen 2004:37; Lempiäinen 2003:329, 332.
724 Photo of the library site pit by Tuovinen & Työryhmä 2004:Fig. 13.
725 There are several examples of the placement of tanning industries on the outskirts of towns in the recent conference proceedings of the Lübecker Kolloquium (Gläser 2006).
726 Thomson 1981:163–164, Fig. 2; 1982:145–146, Fig. 5.
727 Pihlman 1975:35, map 7, photograph 14; Pihlman 1989a:68, 72, Fig. III:1; Pihlman & Tuovinen 1984:103.
728 Seppänen 2002:359–360.
729 Kirjavainen 2004:38–39.
730 Mould, Carlisle & Cameron 2003:3229.
731 Tourunen 2002:99; Tourunen 2003:371–372.
732 Serjeantson 1989:139; Thomson 1981:162; Vretemark 1997:59. For the possible reasons for leaving the bones attached, see Serjeantson 1989:139, 141.
733 Auli Tourunen, personal communication.
734 Serjeantson 1989:136.
735 Tourunen 2003:371.
736 Saloranta 1999:19.
737 Auli Tourunen, personal communication.
738 Vuorisalo & Virtanen 1989:225–226; Koskinen 2004:77.
739 Serjeantson 1989:139.
740 Heege, Volken & Volken 2002b:294; Serjeantson 1989:139.
741 Lempiäinen 2003:332, Fig. 6.
742 Lempiäinen 2003:332.
743 Kirjavainen 2004:37; Lempiäinen 2003:329, 332.
744 Terttu Lempiäinen, personal communication.
745 Lempiäinen 2003:333.
746 Linné 1991:53.
747 Ploss 1962:29.
748 Clarke 1984:137.
749 Nenno 1998:488, Fig. 1.
750 Granlund 1982a:651; Jäfvert 1937:31, Fig. 2b; 1938:114.
751 Granlund 1982a:651; Jäfvert 1937:31, Fig. 2a,b, footnote 6; 1938:114.
752 Lund (Cinthio 1976b:Fig. 159); Stockholm (Zerpe & Fredriksson 1983:Fig. 173).
753 Two evenly curving sickle-form shoemakers' knives from Stockholm (Zerpe & Fredriksson 1983:Fig. 173); an evenly curving and an angular type of the sickle-form from Einbeck (Heege 2006:Fig. 10; Heege, Volken & Volken 2002:Fig. 625.1–2, 626).
754 TMM 21816:MT5031; Pukkila 1999:37, Fig. 1.
755 TMM 21816:NE504429; Harjula 2005a:54, Fig. 39.
756 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:104.
757 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:103.
758 TMM 21816:KP50386 (adult size), KP17231 (children size).
759 Timonen 2005.
760 Timonen 2005.
761 TMM 20764:976.
762 Timonen 2005.
763 Roslund 1984:Fig. 115.
764 TMM 13842:6 (post-medieval); TMM 14681:1761 (medieval). The find number of the latter example indicates the Itäinen Rantakatu sewer construction finds (survey 1952–1953). The find number is a late addition (a wrong one). The find originally comes from the 1930–1932 excavations in Turku Castle, then without a find number. The find is illustrated in Niilo Valonen's article (Valonen 1955:Fig. 8).
765 KM 4034:116, 117.
766 Goubitz, van Driel-Murray & Groenman-van Waateringe 2001:104.
767 TMM 21816:NE1478, NE50422, NE51114, NE07849, NE12826, NE504356, NE20967 (wooden plugs); NE50471 (leather plug).
768 Jokela 2002:60, 127; 2005b:40; wooden pin in sole KM 95032:10462.
769 Ottaway 2003:3237.
770 Awls at the ÅA-site: TMM 21816:P3136, KP50717, L1845, P2864.
771 Awl piercings in TMM 21816:NJ13336, NE128225.
772 Goodall 1990:249; Salaman 1986:6, 200, 247–252, Figs. 1:5, 4:5d, 9:32.
773 Wooden creaser: TMM 21816:P2423; iron creaser: TMM 21816:A1403.
774 Ottaway 2003:3240.
775 Kirjavainen 2003:269; Pukkila 1999:37.
776 Deutgen 1990:112.

777 Kirjavainen 2003:273, 276–277.
778 Pukkila 1999:37.
779 Mould, Carlisle & Cameron 2003:3245.
780 After Thomson 1982:147–149.
781 MacGregor 1998:16; Mould, Carlisle & Cameron 2003:3222; Serjeantson 1989:135; Thomas 1983:4–5; Thomson 1982:147–149; 1998:8.
782 There were curriers in Winchester in the 14th or 15th centuries (MacGregor 1998:16), in London as early as the 13th century (Thomson 1998:8) and in York in the 14th century at the latest (Liddy 2003:3222–3224).
783 Ottaway 2003:3235–3236, Fig. 1572.
784 Goodall 1990:247–249, Fig. 53b:nos. 324–325; Ottaway 2003:3235, Fig. 1572; Salaman 1986:312–313, Fig. 11:31).
785 In the test, ferrochloride, $FeCl_3$, is dropped on the waste. If a dark spot appears on the tested piece, the skin includes vegetable tannins. This test was carried out in 2001 by Conservator Maarit Hirvilammi of the Turku Provincial Museum. The accession number of tested pieces is TMM 21816:NJ17375.
786 Harjula 2002:127, 130; 2005b:69; Harjula & Hiekkanen 2006:530; Harjula & Jokela 2003:257.
787 Mould, Carlisle & Cameron 2003:3230; Mainman 2003: 3254–3255.
788 The position of currying between tanning and artefact making is well reflected in strict rules concerning professions. In England it was typical that a currier was not permitted to be a tanner, nor a shoemaker a currier. Curriers could find themselves sandwiched between and dominated by these two interest groups, tanners and shoemakers (Swanson 1989:57; Thomson 1982:147.
789 Thomson 1982:147.
790 Groenman-van Waateringe 1988b:172; Tuovinen 1989:133.
791 Mould, Carlisle & Cameron 2003:3245–3246.
792 E.g. Saloranta 1999:24–25; Seppänen 1999:30; 2002:359.
793 It was decided that the best way to measure the currying waste would be to use the capacity instead of weight or number of pieces. Weight is due to change depending on the conservation method. Tissue-like waste is also quite impossible to count in numbers.
794 The drawing of structures after Seppänen 2002, Fig. 4. Addition of identifiers RA165 and RA204 by the author.
795 Number is a close approximation gained by counting the pieces in the following way. A heap of similar sized offcuts was collected on the table. A group of, for example, hundred pieces was counted exactly. The rest of the material was counted by making similar sized groups matching to that of one hundred pieces. This was then repeated.
796 Examples of pieces of a hide edge with holes resulting from the stretching of the hide on a drying frame: TMM 21816:NE1245, NE500122, NE128185, NE500156.
797 Besides the ÅA-site, hide edges and udders were common finds in the Aboa Vetus Museum material (Jokela 2002:83).
798 Identifiable offcuts from shoemaking: TMM 21816: NJ128120 (edge of a sole), NJ12823 (back of the sole visible), NJ12824 (sole edges), NJ12888 (two parallel soles).
799 Seppänen 2003; Ceramic datings by Aki Pihlman.
800 Saloranta 1999:23.
801 Harjula 2002:130; Harjula & Hiekkanen 2006:530–531; Seppänen 1999:30; 2002:359.
802 Seppänen 2003; Furthermore, the content of the layer M128D is mostly animal dung, unlikely to have been generated inside the workshop building.
803 Saloranta 1999:23.
804 Seppänen 2002:359.
805 Rough-outs of soles at the ÅA-site: TMM 21816: NE13917, NE14113, NE2047, NE04916.
806 Rough-out of sole from Hämeenkatu 17: KM 4034:57.
807 Smedstad 1991:Fig. 32l, m, n. Publications with rough-outs of other artefact types than shoes seem to be even rarer. Of the Anglo-Scandinavian knife sheath rough-outs found in York, see Cameron 2003:3255.
808 Grew & de Neergaard 2001:89–90; Mould, Carlisle & Cameron 2003:3347.
809 Metzger 2002:144.
810 Granlund 1982a:649.
811 In 1615–1616 a person who is called 'paijkar' (Fin. *paikkari*), which Himanen (1971:26; Table III) has interpreted as a cobbler was referred to. An alternative interpretation of paikkari is a tailor (Forsman 1894:116). In theory, it is possible that Thetmarus Sutor, mentioned in Turku in 1336, was actually a cobbler instead of a shoemaker, the Latin word *Sutor* having both these meanings.
812 Grew & de Neergaard 2001:89–90.
813 Grew & de Neergaard 2001:90; Mould, Carlisle & Cameron 2003:3347.
814 Sole TMM 21816:NE504127 has a row of tunnel stitches across the middle of the sole, probably for attaching a clump.
815 Mould, Carlisle & Cameron 2003:3255.
816 Clump on the heel and forepart of the sole: TMM 21816:n2928.
817 Grew & de Neergaard 2001:90; Mould, Carlisle & Cameron 2003:3348.
818 Patched uppers: TMM 21816:NE50397, NJ17325, NE2094, NE17214, L1330.
819 Buckle replaced with a leather loop: TMM 21816: NE14721.
820 Tear in the upper: TMM 21816:NE10461, NE509192.
821 Compare to Mould, Carlisle & Cameron 2003:3255, 3350–3351.
822 One-piece shoes: TMM 21816:NE201150, NE049101; leg part TMM 21816:NE500138; sandals TMM 21816: NE2058, NE13253.
823 Pihlman 1989b:321; Pihlman & Tuovinen 1984:106.
824 Pihlman 2003b, Fig. 1; 2004b.
825 Seppänen 2006:384.
826 Seppänen 2003.
827 Lindqvist 2004:54.
828 One of the high points of Turku Castle in the Modern Period was the beginning of the 1560's when Duke John (John III, King of Sweden 1568–1592) with his wife, Katarina Jagellonica, held a Renaissance court in the castle. The list of their personal property does not mention leather shoes at all. Instead, all the shoes

mentioned are of velvet and silver and gold fabrics (Hausen 1909:30). This is a good example of the relevance of shoe materials in respect to status. The shoes made of expensive fabrics seem to have been only for those of the highest rank.

829 For a good example of the differences in shoe styles in Stockholm and Bergen caused by differences in craft organizations, see Wubs-Mrozewicz (2005).

830 In the 1501 craft ordinances of Sweden for goldsmiths, probably deriving from the 15th century, it was stated that the trade of Stockholm's goldsmiths "är hoffwedh embetet i Rikit offuer guldhsmedener', i.e. is the main trade of goldsmiths in the state (Karlson, Ljunggren & Kjellberg 1959:130). This has been interpreted as meaning the rules of Stockholm's organisation applied to every goldsmith in the towns of Sweden (Upmark 1925:12), including the goldsmiths in Turku (Borg 1935:23; Saukkonen 1959:268; Immonen 2005).

831 In this context, I point to the excavations of the Dominican convent in Turku. Excavations of this site were carried out at the beginning of the 20th century and during the 1960s. The documentation of the early excavations was not very good and the results are difficult to interpret. There is no report of the 1960s excavations and the material has not been properly organised (Hiekkanen 2007:181 and the references).

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Fig. 16. A tailed-toggle fastened shoe made with the flesh side of the upper outwards (TMM 21816:NE50372); the inner (grain) side. Late 14th century.

Fig. 17. A lace-up fastened and tie-lace fastened side-laced shoe. Left, TMM 21125:87, without a close dating. Right, TMM 21816:NE51115; late 14th century - early 15th century.

Fig. 18. A side-laced shoe with an uneven number of lace holes (TMM 21816:NE17364). Late 14th century - early 15th century.

Fig. 19. A children's size side-laced shoe (TMM 16195:136). From a context without close dating.

Fig. 20. Side-laced shoes with short extended tips. Left, TMM 21816:NE20957. Right, NE50515; the outer (grain) sides. Late 14th century - early 15th century.

Fig. 21. Lacing in a lace-up fastened side-laced shoe (TMM 21816:NE11256); the inner (grain) side. The 15th century.

Fig. 22. Front-laced shoes from the ÅA-site. Top, from left to right: TMM 21816:NE17439, NE11092, NE06610. Middle: NE07824, NE06551, NE07814. Bottom: NE05673, NE509183, NE13813. Late 14th century - early 16th century.

Fig. 23. A low-cut front-laced shoe with two pairs of lace holes (TMM 21816:NE51614). Late 14th century - 15th century.

Fig. 24. A front-laced ankle shoe with two pairs of lace holes and a bifurcated lace (TMM 21816:NE50964). From a context of the late 14th century - early 16th century.

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Fig. 63. Sites with finds of strap shoes (instep-toggle fastening, instep strap fastening). **1** Turku (FI), **2** Stockholm (SE), **3** Uppsala (SE), **4** Enköping (SE), **5** Örebro (SE), **6** Söderköping (SE), **7** Lödöse (SE), **8** Lund (SE), **9** Trondheim (NO), **10** Borgund (NO), **11** Bergen (NO), **12** Oslo (NO), **13** Tønsberg (NO), **14** Aalborg (DK), **15** Boringholm (DK), **16** Ribe (DK), **17** Nørrevolde (DK), **18** Schleswig (DE), **19** Svendborg (DK), **20** Søborg Castle (DK), **21** Roskilde (DK), **22** Stegeborg (DK), **23** Lübeck (DE), **24** Kołobrzeg (PL), **25** Gdańsk (PL), **26** Riga (LV), **27** Tallinn (EE), **28** London (GB), **29** York (GB), **30** Saint-Denis (FR), **31** Maastricht (NL), **32** Brussels (BE), **33** Reimerswaal (NL), **34** Dordrecht (NL), **35** Vlaardingen (NL), **36** Amsterdam (NL), **37** Kampen (NL), **38** Rolde (NL), **39** Groningen (NL), **40** Vågar (NO).

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Fig. 65. Sites with finds of side-laced shoes. **1** Turku (FI), **2** Tallinn (EE), **3** Tartu (EE), **4** Riga (LV), **5** Stockholm (SE), **6** Uppsala (SE), **7** Enköping (SE), **8** Örebro (SE), **9** Oslo (NO), **10** Bergen (NO), **11** Trondheim (NO), **12** Lödöse (SE), **13** Söderköping (SE), **14** Lund (SE), **15** Kołobrzeg (PL), **16** Stegeborg (DK), **17** Roskilde (DK), **18** Søborg Castle (DK), **19** Aalborg (DK), **20** Randers (DK), **21** Århus (DK), **22** Odense (DK), **23** Svendborg (DK), **24** Lübeck (DE), **25** Hedegård (DK), **26** Viborg (DK), **27** Boringholm (DK), **28** Ribe (DK), **29** Nørrevolde (DK), **30** Schleswig (DE), **31** Hamburg (DE), **32** Groningen (NL), **33** Dokkum (NL), **34** Kampen (NL), **35** Lochem (NL), **36** Utrecht (NL), **37** Dordrecht (NL), **38** Reimerswaal (NL), **39** Oud Turnhout (BE), **40** Colmar (FR), **41** London (GB), **42** York (GB), **43** Vågar (NO).

Fig. 66. Sites with finds of front-laced shoes. **1** Vyborg (RU), **2** Porvoo (FI), **3** Turku (FI), **4** Naantali (FI), **5** Kastelholm Castle (FI), **6** Stockholm (SE), **7** Uppsala (SE), **8** Enköping (SE), **9** Örebro (SE), **10** Söderköping (SE), **11** Vågar (NO), **12** Trondheim (NO), **13** Borgund (NO), **14** Bergen (NO), **15** Oslo (NO), **16** Lödöse (SE), **17** Bocksten (SE), **18** Lund (SE), **19** Aalborg (DK), **20** Hedegård (DK), **21** Randers (DK), **22** Århus (DK), **23** Boringholm (DK), **24** Ribe (DK), **25** Nørrevolde (DK), **26** Schleswig (DE), **27** Lübeck (DE), **28** Svendborg (DK), **29** Odense (DK), **30** Søborg Castle (DK), **31** Roskilde (DK), **32** Køge (DK), **33** Stegeborg (DK), **34** Szczecin (PL), **35** Kołobrzeg (PL), **36** Gdańsk (PL), **37** Pärnu (EE), **38** Tartu (EE), **39** York (GB), **40** London (GB), **41** Dokkum (NL), **42** Heveskesklooster (NL), **43** Groningen (NL), **44** Bolsward (NL), **45** Amsterdam (NL), **46** Tiel (NL), **47** Dordrecht (NL), **48** Reimerswaal (NL), **49** Delft (NL), **50** Leiden (NL), **51** Haarlem (NL), **52** Edam (NL), **53** Vevey (CH).

Fig. 67. Sites with finds of buckled shoes. **1** Turku (FI), **2** Stockholm (SE), **3** Kalmar (SE), **4** Lund (SE), **5** Roskilde (DK), **6** Aalborg (DK), **7** Randers (DK), **8** Schleswig (DE), **9** Lübeck (DE), **10** York (GB), **11** London (GB), **12** Brugge (BE), **13** Reimerswaal (NL), **14** Dordrecht (NL), **15** s'-Gravenhage (the Hague) (NL), **16** Leiden (NL), **17** Amsterdam (NL), **18** Kampen (NL), **19** Deventer (NL), **20** Fribourg (CH), **21** Konstanz (DE), **22** Schloss Halwyl (CH), **23** Vågar (NO).

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(DK), **14** Boringholm (DK), **15** Ribe (DK), **16** Nørrevolde (DK), **17** Schleswig (DE), **18** Svendborg (DK), **19** Lübeck (DE), **20** Kołobrzeg (PL), **21** London (GB), **22** Groningen (NL), **23** Heveskesklooster (NL), ***24*** Huissen (NL), **25** Dordrecht (NL), **26** Breda (NL).

Fig. 69. Sites with finds of pattens. **1** Turku (FI), **2** Tallinn (EE), **3** Tartu (EE), **4** Stockholm (SE), **5** Bergen (NO), **6** Lund (SE), **7** Falsterbohus (SE), **8** Elbląg (PL), **9** Gdańsk (PL), **10** Kołobrzeg (PL), **11** Szczecin (PL), **12** Pyrzyce (PL), **13** Nakło (PL), **14** Toruń (PL), **15** Wrocław (PL), **16** Nysa (PL), **17** Konstanz (DE), **18** Schloss Sumiswald (CH), **19** Basel (CH), **20** Einbeck (DE), **21** Lüneburg (DE), **22** Lübeck (DE), **23** Groningen (NL), **24** Kampen (NL), **25** Deventer (NL), **26** Amsterdam (NL), **27** Haarlem (NL), **28** Delft (NL), **29** Veere (NL), **30** Gouda (NL), **31** Dordrecht (NL), **32** 's-Hertogenbosch (NL), **33** London (GB).

Fig. 70. Sites with finds of one-piece shoes. **1** Turku (FI), **2** Hankoniemi Cape (shipwreck Mulan) (FI), **3** Vyborg (RU), **4** Staraja Ladoga (RU), **5** Belozersk (RU), **6** Moscow (RU), **7** Tver (RU), **8** Novgorod (RU), **9** Ivangorod (RU), **10** Tallinn (EE), **11** Tartu (EE), **12** Pskov (RU), **13** Riga (LV), **14** Koknese (LV), **15** Kernavė (LT), **16** Minsk (BY), **17** Lund (SE), **18** Tønsberg (NO), **19** Oslo (NO), **20** Trondheim (NO), **21** Uvdal (NO), **22** Haithabu (DE), **23** Hoogland (Amersfoort) (NL), **24** York (GB).

Fig. 71. Sites with finds of Early Modern Period shoes. **1** Turku (FI), **2** Vyborg (RU), **3** Pärnu (EE), **4** Stockholm (SE), **5** Uppsala (SE), **6** Trondheim (NO), **7** Nya Lödöse (SE), **8** Kalmar Castle (SE), **9** Lund (SE), **10** Glimmingehus Manor (SE), **11** Dokkum (NL), **12** Heveskesklooster (NL), **13** Groningen (NL), **14** Zwolle (NL), **15** Deventer (NL), **16** Goor (NL), **17** Bunschote (NL), **18** Zaltbommel (NL), **19** Breda (NL), **20** Mechelen (BE), **21** Middelburg (NL), **22** Goes (NL), **23** Dordrecht (NL), **24** Haarlem (NL), **25** Amsterdam (NL), **26** Vevey (CH), **27** London (GB).

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LIST OF TABLES

APPENDIX 1. THE SITES

The following list contains, in chronological order, all the sites which are referred to in this study.[1] Excavations are written in **bold**. The rest of the sites are different kind of surveys. Register of Town Archaeology (Fin. *kaupunkiarkeologinen luettelo*) kept and updated in the Turku Provincial Museum.[2] This register can be considered a gateway to all the documents of archaeological observations in the town area of Turku and in Turku Castle. The main sites of archaeological excavations with finds of shoes have been marked on the map (Fig. 119).

Turku Castle, Smith's yard (beginning of the 20th century)[3]
Hämeenkatu 17 (1901); KL 311
Turku Castle, the main castle (1930-32)
Hämeenkatu 22 (1947); KL335A/B
Hämeenkatu 11 (1948–1949); KL275
Linnankatu (1950); KL99A
Itäinen Rantakatu (1952–1953); KL 70A–C
Uudenmaankatu (1953); KL353
Uudenmaankatu (1954); KL231
Uudenmaankatu 4/Hämeenkatu 16 (1960–1961); KL290
Uudenmaankatu (1962–1963); KL337A–B
Nunnankatu (1963); KL133
Uudenmaankatu between Brahe's Park and Porthan's Park (1963); KL234
Brahenkatu (1968–1969); KL29A–C
Vähä-Hämeenkatu (1970); KL297
Uudenmaankatu (1970); KL236
Hämeenkatu (1971); KL59
Uudenmaankatu 5 (1971–1972); KL354
Vähä-Hämeenkatu 13b (1975); KL293
Turku Castle, eastern outer bailey (1976)
Turku Castle, eastern outer bailey (1978–1985)[4]
Tuomiokirkkokatu (1976–1978); KL170A–E
Old Academy House/Akatemiankatu (1977); KL2
Akatemiankatu (1980); KL3
Uudenmaankatu 7 (1981); KL355A
Old Great Market Place - Uudenmaankatu (1982); KL 247
Vähä-Hämeenkatu 13b (1982); KL295
Hämeenkatu (1983–1984); KL60
Lönnrot's Park (1983); KL129A
Linnankatu (1984); KL111
Akatemiankatu (1985); KL447
Julin's plot (1983); KL398
Old Great Market Place, Town Hall (1986–1987)
Uudenmaankatu 6 (1986, 1988); KL451, KL455
Old Great Market Place, Hjelt building (1989)

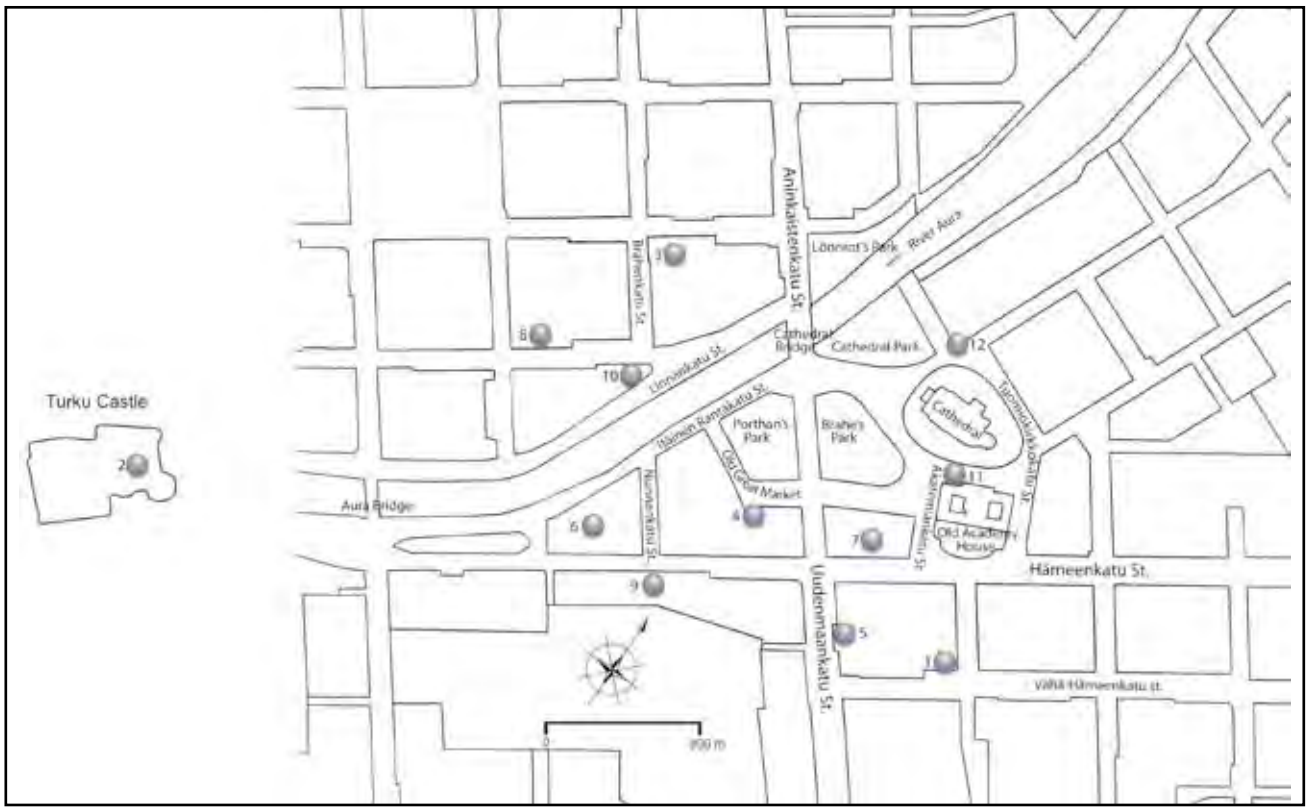

Fig. 119. The main sites of archaeological excavations in Turku with shoe finds (1975–2006). ***1*** *Vähä-Hämeenkatu 13b (1975),* ***2*** *Turku Castle, eastern outer bailey (1978–1985),* ***3*** *Julin's plot (1983),* ***4*** *Old Great Market Place, Town Hall and Hjelt building (1986–1989),* ***5*** *Uudenmaankatu 6 (1986, 1988),* ***6*** *Aboa Vetus Museum (1992–1995),* ***7*** *Åbo Akademi main building site (1998),* ***8*** *Österblad site (1999),* ***9*** *Rettig's slope (2001),* ***10*** *Library site (2003),* ***11*** *Cathedral Square (2005–2006),* ***12*** *Tryckerihuset (2006).*

Nunnankatu (1990)
Aboa Vetus Museum (1992)
Aboa Vetus Museum (1992–1995)
Åbo Akademi main building site (1998)
Österblad site (1999)
Rettig's slope (2001)
Library site (2003)
Cathedral Square (2005–2006)
Tryckerihuset (2006)

Endnotes

1 The 2006 excavations in the Cathedral Square and Tryckerihuset sites have not been included in this study other than adding the shoe types from these sites to the distribution maps (Tables 13, 18 and 34). As late additions, the 2006 finds are not otherwise included or discussed in this thesis.
2 For the register, see Pihlman & Kostet 1986.
3 Pihlman 1995:151, footnote 21.
4 Dating of the excavation phases by Pihlman (1994:76–77; 1995:162, footnote 26, 166–168) and Uotila (1998:60, 71, 78); of the author's interpretation of the phases, see also Harjula 2005b.

APPENDIX 2. THE FINDS

The finds have been categorized according to the typology and order used in the text-part of the thesis. Finds of each artefact type have been listed by sites in their chronological order.

Shoes, counted as fragments in this study have been marked with (f)

ONE-PIECE SHOES

Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)
TMM 16176:19

Turku Castle, eastern outer bailey (survey 1976)
KM 81132:609

Old Great Market Place, Hjelt building (excavation 1989)
TMM 20764:1575/1723

ÅA-site (excavation 1998)
TMM 21816:
n1576 (f)
NE049101
NE08924
NE104131
NE128152 (f)
NE128213 (f)
NE128227
NE1414
NE16464
NE201150
NE20624
NE21145
NE50044
NE503198
NE504172
NE504480 (f)
NE509160
NE51525

THONG SHOES

Low-cut thong shoes

Itäinen Rantakatu (survey 1952–1953)
TMM 14681:
731 (1)
731 (2)
731a
731b
TMM 14740: 57 (f)

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
TMM 16195:
146 (f)
149 (f)

Old Great Market Place - Uudenmaankatu (survey 1978)
TMM 18798:
47b, two vamps
47c (f)

Old Great Market Place, Town Hall (excavation 1986–1987)
TMM 20315:486 (f)

Old Great Market Place, Hjelt building (excavation 1989)
TMM 20764:
1438 (f)
1496 (f)
1535
1538
1539
1572 (f)
1573 (f)
1587
1605
1606
1608 (f)
1612 (f)
1613 (f)
1726 (f)
1759
1760

Aboa Vetus Museum (survey and excavation 1992–1995)
TMM 21163:
429
835
KM 95032:
9890 (f)
9895 (f)

ÅA-site (excavation 1998)
TMM 21816:
NE1151
NE1424 (f)
NE5122
NE51394 (f)

Turku Castle, eastern outer bailey (excavation 1978–1985)
KM 96001:
4384

4421
4544 (f)

Low-cut thong shoes with an open instep

Turku Castle, eastern outer bailey (excavation 1978–1985)
KM96001:4548

Ankle thong shoes

Turku Castle, eastern outer bailey (excavation 1978–1985)
KM96001:4577

Thong shoes with secondary thong slots

Hämeenkatu (survey 1983)
TMM 18884:383

Linnankatu (survey 1984)
TMM 18982:406

Aboa Vetus Museum (excavation 1992–1995)
KM 95032:
10256
10373

ÅA-site (excavation 1998)
TMM 21816:
NE13537
NE13934
NE2049
NE509192

INSTEP-TOGGLE/INSTEP STRAP FASTENING

Instep toggle fastening

Old Great Market Place, Hjelt building (excavation 1989)
TMM 20764:
978
1286
1351 (f)
1540
1545 (f)
1546
1579 (f)
1618
1713/1619
1758/1786
1782
1784
1846

Aboa Vetus Museum (survey and excavation 1992–1995)
TMM 21125:
176
181
184
195
TMM 21163:
74
88
243
247
273
291
292 (f)
360
425 (f)
428 (f)
511 (f)
518
546
816
KM 95032:
9428 (f)
9478 (f)
9484 (f)
9817 (f)
10339 (f)
10373
10469 (f)
10480
10481(f)
10506

Itäinen Rantakatu (survey 1952–1953)
TMM 14681:
260-262
639 (f)
731
820
962
970
1022 (f)
1024 (f)
1815
TMM 14740:12a (f)

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
TMM 16195:
135
138
146A
148

Akatemiankatu (survey 1980)
TMM 18667:114

Old Great Market Place, Town Hall (excavation 1986–1987)
TMM 20315:
1588
1613

Old Great Market Place - Uudenmaankatu (survey 1982)
TMM 18798:

1b
52b
80
116a
126
128

Instep strap fastening

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
TMM 16195:
139
146B (f)

TAILED-TOGGLE FASTENING

ÅA-site (excavation 1998)
TMM 21816:
L1063
n1048
n1841
n2286
n2393
n2733
n3142a
n3142b
n3142c
n3321a
n3321b
n3322
n3368
n2289a
n2289b
NE049103
NE049165
NE04932
NE04970
NE04997
NE07858
NE0788
NE07892 (f)
NE11026
NE11080
NE11841
NE1876
NE12812
NE128158
NE128162 (f)
NE128181 (f)
NE128207
NE128208
NE12833
NE12836
ME12839 (f)
NE12851
NE12885
NE13016
NE13018
NE1335
NE13434
NE13471
NE13854
NE13933
NE14110
NE14315
NE14753
NE14759
NE15924
NE16452
NE16462 (f)
NE16470
NE16490
NE1692
NE17215
NE17235
NE17255
NE17264 (f)
NE17337
NE17377
NE17378
NE17419
NE17420
NE17622
NE1763
NE2003
NE20032
NE20037
NE2006
NE201100 (f)
NE201116
NE20122
NE20150
NE20151
NE20168
NE20211
NE20218
NE2029 (f)
NE20312
NE20323
NE20324
NE204118
NE204119
NE204136
NE204138
NE204162
NE204164
NE204166
NE2042
NE204207
NE204225 (f)
NE204227 (f)
NE20426
NE20429 (f)
NE20434 (f)
NE20448
NE20464
NE20465 (f)
NE20480 (f)
NE20481
NE20612 (f)
NE20619
NE209117
NE20913
NE209138
NE209139
NE20915
NE209150
NE209199
NE20921
NE20926
NE20932
NE2094
NE2096
NE2097
NE20981
NE21023
NE21134
NE21146 (f)
NE50026
NE50050 (f)
NE5007 (f)
NE50077
NE5031
NE503102
NE503113
NE503173
NE503189
NE50344
NE50346
NE5036
NE50371
NE50372
NE50376 (f)
NE504101
NE504121
NE504128
NE50421
NE504240
NE504300
NE504304
NE504320
NE504323
NE504325
NE504334
NE504340
NE504369
NE50437
NE504370
NE504372
NE504373
NE50438
NE504400
NE504416 (f)
NE504437 (f)
NE50446
NE504467
NE50450
NE50464
NE50467 (f)
NE50477
NE50499
NE5052
NE50522
NE50556
NE50558
NE50559
NE50563 (f)
NE50724
NE50729
NE5074
NE50915
NE50916
NE509181
NE509189
NE509190
NE509191
NE509195
NE50930
NE50931
NE50967
NE5116
NE51212 (f)
NE51213
NE5126
NE51324
NE5135
NE51396 (f)
NE51528
NE51536
NE5168

Hämeenkatu 11 (survey 1948)
TMM 14165:35

Nunnankatu (survey 1963)
TMM 16175:12

Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)
TMM 16176:

3
9
12
12 (f)
13 (f)

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
TMM 16195:
144 (f)
146 (f)

Akatemiankatu (survey 1980)
TMM 18667:78

Old Great Market Place - Uudenmaankatu (survey 1982)
TMM 18798:
35
129

Hämeenkatu (survey 1983–1984)
TMM 18884:
212
222
542 (f)

Uudenmaankatu 6 (excavation 1986–1988)
TMM 20671:
1071, two uppers
1116

Old Great Market Place, Hjelt building (excavation 1989)
TMM 20764:1571 (f)

Nunnankatu (survey 1990)
TMM 20844:271 (f)

Aboa Vetus Museum (survey and excavation 1992–1995)
TMM 21125:49
TMM 21163:
537
658

SIDE-LACED SHOES

ÅA-site (excavation 1998)
TMM 21816:
NE06515
NE11256
NE11897
NE14711
NE16449
NE16491
NE1722
NE17364
NE201103
NE201179
NE209217
NE20957
NE503124
NE50322
NE50323
NE50444
NE504481
NE50515
NE5053
NE50586
NE50714
NE509178
NE51115

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
TMM 16195:
136
146

Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)
TMM 16176:13

Turku Castle, eastern outer bailey (excavation 1978–1985)
KM 96001:
4403
4556

Aboa Vetus Museum (survey and excavation 1992–1995)
TMM 21125:87
TMM 21163:268/284

FRONT-LACED SHOES

Turku Castle, the main castle (survey 1930–32)
TMM 21448:
388:1
388:2
388:3
388:4-5

Hämeenkatu 22 (Survey 1947)
TMM 14083:17

Itäinen Rantakatu (survey 1952–1953)
TMM 14681:
626
627
731
1021
1723
1761
1818

Uudenmaankatu (survey 1954)
TMM 14885:
13a, b
44
45
78
84a, b

84e, f
104
106
131a, b
138a
142
153
159
162
165
166a
166b
192

Uudenmaankatu 7 (survey 1953)
TMM 15139:1, two uppers

Nunnankatu (survey 1963)
TMM 16175:
7 (f)
12

Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)
TMM 16176:
1
2
5
7
8
10, two uppers
11, three uppers
12 (f)
13

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
TMM 16195:148, three uppers

Uudenmaankatu 3 (survey 1962–1963)
TMM 16206:1

Brahenkatu (survey 1968–1969)
TMM 17015:
39
54
263
302

Hämeenkatu (survey 1971)
TMM 17152:
4
56

Uudenmaankatu (survey 1970)
TMM 17294:
541

Uudenmankatu 5 (survey 1971–1972)
TMM 17296:
143
144
187
515
509–518, three uppers
609 (f)

Vähä-Hämeenkatu 13b (excavation 1975)
TMM 18264:
4423
4424
4435
4770/4772
4474
4475/4482
4476
4477
4478
4479
4480/4481
4501/4502
4580
4586
4793

Turku Castle, eastern outer bailey (survey 1976)
KM 81132:
622
698
840
1317

Tuomiokirkkokatu (survey 1976–1978)
TMM 18338:
69
264

Old Academy House/Akatemiankatu (survey 1977)
TMM 18557:
13
19

Akatemiankatu (survey 1980), TMM 18667:
9
46
65b
72
83b
129
131b
138
157a-c
163

Uudenmaankatu 7 (survey 1981)
TMM 18703:
10

Old Great Market Place - Uudenmaankatu (survey 1982)
TMM 18798:
130
133
142
150

151
159b

Vähä-Hämeenkatu 13b (excavation 1982)
TMM 18831:
286
292
295

Hämeenkatu (survey 1983–1984)
TMM 18884:
1 (f)
41 (f)
51
53 (f)
58
80
83
84
85
88 (f)
89
91
92
93 (f)
109
134
149
151 (f)
162
192
235
240
345
364
407
426
431
438
440
453
459
470
471
474 (f)
475 (f)
478
479

Linnankatu (survey 1984)
TMM 18982:
405
407

Akatemiankatu (survey 1985)
TMM 19404:
85
118
119

Old Great Market Place, Town Hall (excavation 1986)
TMM 20315: 1621

Uudenmaankatu 6 (excavation 1986)
TMM 20459:
832
833
834
838
841
842

Uudenmaankatu 6 (excavation 1988)
TMM 20671:
301
338 (f)
367
520
531
564 (f)
597
642
713, four uppers
740, two uppers
784, two uppers
846
850, three uppers
911
995
1009
1042, two uppers
1071, two uppers
1094, two uppers
1163

Old Great Market Place, Hjelt building (excavation 1989)
TMM 20764:
443
492
493
527 (f)
696 (f)
1411
746–749 (f)
1818 (f)
1838

Nunnankatu (survey 1990)
TMM 20844:
166

Aboa Vetus Museum (survey 1992)
TMM 21125:
115
153
155
199

Aboa Vetus Museum (excavation 1992–1995)
TMM 21163:
229

ÅA-site (excavation 1998)
TMM 21816:

L1042
L1051
L1148
L1206
L1207
L1268
L178
L211
L2159
L292
L297
L519
L617
L636a
L636b
L69
L74
L975
n1841
n1893
n1986
n1987 (f)
n2035
n2409
n3012
n3103
n3128
n3139
n3142
n3263
n3286
n3325
n3341
n3369
n3407a
n3407b
n3882
n425 (f)
n945
NE0012
NE049107, two vamps
NE049109
NE049112
NE049113
NE049137
NE04915
NE049174
NE04926 (f)
NE04928
NE04933
NE04937
NE04951
NE04956
NE04957
NE04958
NE04960
NE04961
NE04962
NE04967
NE04968 (f)
NE04969
NE04971
NE04988
NE04989
NE04998
NE05633
NE05639
NE05645
NE05646
NE0565 (f)
NE05651
NE05656 (f)
NE05666
NE05672
NE05673
NE05675
NE05678
NE05686
NE05689
NE05693
NE06524
NE06531
NE06536
NE06551
NE06555
NE06610
NE06611
NE06612
NE06619
NE0695 (f)
NE07811
NE078119
NE078121
NE078128
NE07814
NE07815
NE07817
NE07819
NE0782
NE07824
NE07825
NE07830
NE07831
NE07834
NE07840
NE07857
NE07865
NE07866 (f)
NE07869
NE0789
NE07891
NE0813
NE0821
NE08214
NE08216
NE08217
NE08218
NE0851
NE08518
NE0854
NE0862
NE08912
NE08914
NE08915
NE08918
NE08923
NE0897
NE0907
NE10011
NE1011
NE104102
NE104103
NE104121
NE10416
NE10424
NE10430
NE10435
NE10442
NE10443
NE10447
NE10456
NE10458
NE1046
NE10460
NE10461
NE10462
NE10466
NE10479
NE1073
NE11012
NE110125
NE110138
NE110139
NE110148
NE110163
NE110166
NE110171
NE110199
NE11031
NE11077
NE11078
NE11086
NE11092
NE11094
NE11098
NE11099
NE11218
NE11225
NE11234
NE11258 (f)
NE11260
NE11264
NE11270
NE11839
NE11842
NE11849
NE11851
NE11861
NE11863
NE11884
NE1213
NE1231
NE1247
NE1255
NE1263
NE1272
NE12724
NE12733
NE1278
NE12817
NE128198
NE12835
NE12838
NE12852
NE12857
NE12864
NE12884
NE13020
NE13027
NE13029 (f)
NE13055
NE13066
NE13067
NE13079
NE13210
NE13211
NE13218
NE13222
NE13224
NE13229
NE13233
NE13243
NE13244
NE13246
NE13247
NE13252
NE1326
NE13313
NE1338
NE13418
NE13422
NE13423
NE13431
NE13441
NE13452
NE13475
NE13479
NE13516
NE13523
NE1353
NE13617
NE13632
NE13640
NE13813
NE13816
NE13820
NE13827
NE13828
NE13833
NE13834
NE13842 (f)
NE13846
NE13856
NE13865
NE13910
NE14117
NE14124
NE1451
NE14612
NE1471
NE147113
NE147115

NE14717
NE14718
NE14719
NE14722
NE14723
NE14738
NE14743
NE14756
NE14758
NE14761
NE14762
NE14763
NE14764
NE14765
NE1477
NE1478
NE14795
NE1483
NE1491
NE14913
NE1492
NE1497
NE1498
NE1552
NE1576
NE15911
NE15913
NE15914
NE15918
NE15920
NE15923
NE1593
NE15932
NE15934 (f)
NE15936
NE1597 (f)
NE15974
NE15977
NE1605
NE1633
NE164111
NE16412
NE164127
NE164128
NE164141
NE16416
NE164163 (f)
NE164177
NE164178
NE164180 (f)
NE164191
NE1642
NE16427
NE16429
NE16430
NE16431
NE16439
NE1644
NE16448
NE16450
NE16455
NE1647
NE1648
NE16485
NE1696
NE17110
NE1714
NE17213
NE17214
NE17233
NE17240
NE17241
NE17267
NE17336
NE17339 (f)
NE17375
NE1742
NE17439
NE17440
NE1749
NE2001
NE20021
NE20031
NE20033
NE20042
NE20056
NE20062
NE2009
NE201105
NE201115 (f)
NE201145 (f)
NE20115
NE201151
NE2014
NE20140
NE20152
NE20156
NE20157
NE20194
NE20243
NE20247
NE20275
NE20277
NE2028
NE20280
NE2041
NE204133
NE204134
NE204137
NE204160 (f)
NE204190
NE204248
NE204278
NE20447
NE20499
NE2055
NE20820
NE20823
NE209121
NE209142
NE209144 (f)
NE209149
NE209151
NE209154
NE209155
NE209157
NE209198
NE209214
NE20924
NE20925
NE20933
NE20952
NE20974
NE20997
NE20998 (f)
NE21022
NE21024
NE21138
NE50010 (f)
NE50011
NE500131
NE500132
NE500144
NE500145
NE500146
NE500149
NE50015
NE500151
NE500158 (f)
NE50016
NE5002 (f)
NE50022
NE50024
NE50030
NE50031
NE5004
NE50041 (f)
NE50058
NE50065
NE50076
NE5014
NE5016
NE503107
NE503146
NE50317
NE503174 (f)
NE50321
NE50335
NE5034
NE5035
NE50358
NE50391
NE504122
NE504143
NE504216 (f)
NE504284
NE504288
NE504303
NE504332 (f)
NE504418
NE504439
NE504440
NE504470
NE504471
NE504472
NE50451
NE50462
NE50472
NE50476
NE50531
NE50720
NE50721
NE5075
NE509124
NE509131
NE509145
NE509177
NE509183
NE509194
NE509196
NE509197
NE509198
NE5092
NE509213
NE509215
NE509223 (f)
NE50924
NE509244
NE509245
NE50926
NE50928
NE509295
NE5093
NE509311 (f)
NE509312
NE5094 (f)
NE5095
NE50964
NE50984
NE50986
NE51118
NE51313
NE51321
NE51325
NE51326
NE51353
NE51371
NE51517
NE51518
NE51521 (f)
NE51542
NE51546 (f)
NE51558
NE51614
NE51615

Rettig's slope (excavation 2001)
TMM 22196:
NA384:009
NA512:005
NA512:007 (f)
NA522:004 (f)
NA522:005 (f)
NA523:001

Cathedral Square (excavation 2005)
TMM 22367:
NA1036:001
NA1036:011
NA1036:013, three uppers
NA1036:015
NA1036:016
NA1036:020
NA1036:022
NA1036:024
NA1046:005
NA1062:001
NA1064:001
NA1064:004
NA1064:006
NA1068:001
NA1068:003
NA1074:002

BUCKLED SHOES

Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)
TMM 16176:
11
17

Hämeenkatu (survey 1983–1984)
TMM 18884:266

Aboa Vetus Museum (survey 1992)
TMM 21125:23

ÅA-site (excavation 1998)
TMM 21816:
L1246
L1330
n1184
n1527
n1528, two uppers
n2027
n2406
n3141
n3411
n4318
NE05617
NE06556
NE06918
NE07821
NE07839
NE08519
NE0861
NE1008
NE104134
NE10465
NE110176
NE110204
NE11097
NE1110112
NE11227
NE1142 (f)
NE1153
NE1188 (f)
NE1235 (f)
NE12811
NE12819
NE12861 (f)
NE13019
NE13220 (f)
NE13227
NE13235 (f)
NE13248
NE13251 (f)
NE13425
NE13439
NE13449
NE13455
NE1355 (f)
NE1585
NE15949
NE164162 (f)
NE20034
NE20213
NE20821
NE209116 (f)
NE209152
NE2101
NE21139
NE50087
NE50122
NE50474
NE509242

Buckles

ÅA-site (excavation 1998)
TMM 21816:
NE07839
NE08519
NE13248
NE2101

BOOTS

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
TMM 16195:147

ÅA-site (excavation 1998)
TMM 21816:
NE5038
NE504124
NE5059

COMBINED FASTENING

Uudenmaankatu 4/Hämeenkatu 16 (survey 1960–1961)
TMM 16176:6

Old Great Market Place - Uudenmaankatu (survey 1982)
TMM 18798:152

ÅA-site (excavation 1998)
TMM 21816:
NE1185
NE11892
NE13443
NE1346
NE14721

PATTENS

Wooden soles

ÅA-site (excavation 1998)
TMM 21816:
KP13042
KP13430
L2118

Toe caps

ÅA-site (excavation 1998)
TMM 21816:
NE104135
NE1202
NE12718
NE1276
NE13462
NE14794
NE20222
NE204279
NE50069

Cathedral Square (excavation 2005)
TMM 22367:
NA1046:006, two toe caps

Straps

Vähä-Hämeenkatu 13b (excavation 1975)
TMM 18264:4494

Uudenmaankatu 6 (excavation 1986)
TMM 20459:818

Aboa Vetus Museum (excavation 1992–1995)
TMM 21163:280

ÅA-site (excavation 1998)
TMM 21816:
n4200
n4318
NE06618
NE07829
NE07835
NE08510
NE08511
NE0859
NE1018
NE10439
NE10468
NE11083
NE11084
NE11219
NE128124
NE12822
NE128228
NE12823
NE12824
NE13030
NE13495
NE13498
NE147104
NE15925
NE16426
NE17269
NE17271
NE17396
NE17434
NE20035
NE2015
NE2017
NE2021
NE20215
NE20295
NE21018
NE500100
NE50042
NE50061
NE504152
NE504461
NE504462
NE504478
NE504479
NE5056
NE509126
NE509128
NE50913
NE509330
NE509336
NE509375
NE50963
NE50979

Cathedral Square (excavation 2005)
TMM 22367:
NA1046:023
NA1068:006

EARLY MODERN PERIOD SHOES

Uudenmaankatu (survey 1954)
TMM 14885:
43a–c
138b–c
180a–c
186
187

Tuomiokirkkokatu (survey 1976–1978)
TMM 18338:
265
270a
273a
278a
57a

Hämeenkatu (survey 1983–1984)
TMM 18884:18

SOLES MEASURED

ÅA-site (excavation 1998)
TMM 21816:

L1148
L1157
L1195a
L1207
L1287
L170
L181
L74
L901
L96
n1444
n1519
n1520
n1586
n1587
n1588
n1589
n1610
n1611
n1668
n1893a
n1893b
n2237
n2249
n2325a
n2325b
n2392
n2407
n2409
n2812a
n2812b
n2928
n3012
n3104
n3128
n3140
n3145a
n3145b
n3148
n3150
n3269
n3279
n3284
n3344a
n3344b
n3347
n3364
n3366
n3401b
n3401c
n3401d
n3401e
n3401f
n3401g
n3416a
n3416b
n3424
n4251a
n4251b
NE04910
NE049102
NE049109
NE049112
NE049116
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NE049174
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NE201110
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NE50991
NE50992
NE51110
NE51111
NE51116
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NE5127
NE51323
NE51326

EXTENDED TIPS

Short extended tips

Uudenmaankatu (survey 1954)
14885:
104
138a

Uudenmaankatu between Brahe's and Porthan's Parks (survey 1963)
16195:
139
147

Aboa Vetus Museum (survey 1992)
TMM 21125:176

ÅA-site (excavation 1998)
TMM 21816:
n1828
n2865a
NE04928
NE05645
NE12724
NE13018
NE17215
NE20152
NE20168
NE20322
NE20323
NE20434
NE209139
NE20957
NE2097
NE500131
NE503113
NE5038
NE504128
NE504288
NE504304
NE504305
NE504439
NE50515
NE509177
NE509181
NE509189
NE509194
NE509197
NE51210
NE51250
NE51314
NE51615
NE5169

Long extended tips

ÅA-site (excavation 1998)
TMM 21816:
NE204180
NE20488
NE209115
NE503191
NE50348
NE50429
NE51234

SOLES

Double-layered soles

Uudenmaankatu 6 (excavation 1986)
TMM 20459:
763
775

Uudenmaankatu 6 (excavation 1988)
TMM 20671:847

Aboa Vetus Museum (survey 1992)
TMM 21125:181

ÅA-site (excavation 1998)
TMM 21816:
n4274
NE049116
NE06537
NE07811
NE08519
NE08912
NE08915
NE104125
NE10420
NE11085
NE12411
NE13065
NE1573
NE15926
NE500139
NE5011

Composite soles

Aboa Vetus Museum (excavation 1992–1995)
KM95032:
10229
10297

ÅA-site (excavation 1998)
TMM 21816:
n1579
n3401
NE11812
NE204210
NE503180
NE504361

NE50580
NE509255
NE509358
NE513103

Wood-pinned outer soles

Uudenmaankatu (survey 1954)
TMM 14885:109

Uudenmaankatu 6 (excavation 1988)
TMM20671:
1044
1071
1163

ÅA-site (excavation 1998)
TMM 21816:
L1195
L609
n2223
n3409
NE11042
NE11051
NE11058
NE11834
NE13614
NE1369
NE1649
NE50094
NE50121
NE503161
NE504322
NE504438
NE5073
NE509112
NE50997

INSOLES

Birch bark

Cathedral Square (excavation 2005)
TMM 22367:
TU1039:002
TU1043:001
TU1046:001

Felted wool

Uudenmaankatu 6 (excavation 1988)
TMM 20671:439

Hemp fibres

ÅA-site (excavation 1998)
TMM 21816:NE509374

TOOLS

Shoemakers' knives

ÅA-site
TMM21816:MT5031

A leather sheath for a sickle-formed shoemakers' knife

ÅA-site (excavation 1998)
TMM 21816:NE504429

Lasts

Turku Castle (1940 excavation)
TMM 13842:6

Turku Castle (1930–1932 excavation)
TMM 14681:1761

Hämeenkatu 11 (survey 1901)
KM 4034:
116
117

Old Great Market Place, Hjelt building (excavation 1989)
TMM 20764:976

ÅA-site (excavation 1998)
TMM 21816:
KP17231
KP50386

Awls

ÅA-site (excavation 1998)
TMM 21816:
KP50717
L1845
P2864
P3136

Creasers

ÅA-site (excavation 1998)
TMM 21816:
P2423 (wooden)
A1403 (iron)

APPENDIX 3

Heini Kirjavainen

REPORT ON THREAD FIBRES OF SHOES FROM EXCAVATIONS AT TURKU CASTLE, HÄMEENKATU, OLD GREAT MARKET PLACE AND ÅBO AKADEMI MAIN BUILDING SITE IN TURKU, FINLAND

Introduction

Samples of thread fibres of various shoes were analysed. Samples of threads were gathered from seams, stitch holes and thongs (of one-piece shoes) of medieval shoes. Turku Castle (KM 81132: 609) and Hämeenkatu (TMM 18884: 83) yielded one sample each. The Old Great Market Place consisted of fifteen samples with the main accession number TMM 20764. The largest group (21 samples) comes from the Åbo Akademi main building site (the main accession number TMM 21816). It was possible to analyse the total of 36 samples.

Method of examination

The fibres were analysed at various magnifications (x100, x250 and x400) under the microscope with transmitted light and/or polarized light. Fibres were examined only by a longitudinal view on a wet-mount microscope slide. No cross-section was executed because of small sample size ranging between 0,5 and 5 mm. Most often it was necessary to bleach the fibres with sodium hypochlorite (NaClO) to get fibre structure more visible (see Jokelainen 1984: 157).

Identifying characteristics of plant fibres

According to previous study of sewing threads of medieval sheaths and scabbards (Kirjavainen 2005: 98-100), it was already assumed that only bast fibres will be present. A reference group of flax and hemp fibres were prepared by the method of examination mentioned above. Archaeological fibres are more difficult to identify than modern fibres due to fibre deterioration during the burial. Sometimes plant tissue fragments were preserved making the identification a bit easier, particularly that of hemp (e.g. Catling & Grayson 1998: 19). More or less, all the fibres were damaged by *Fungal mycelium* which complicated the identification (e.g. Körber-Grohne 1985: 182).

Flax (*Linum usitatissimum*) fibres are retted from stem to get material for the yarn. A single fibre has thick walls and a small lumen; transverse dislocations can be seen along the fibre. Fibre width varies from 5 to 38 µ (Florian 2002: 49).

Hemp (*Cannabis sativa*) fibres resemble that of flax. A fibre has thick wall, but not as thick as flax fibre; lumen is broad. The macrofibrils in the cell wall have a z-twist whilst flax has them s-twisted. Fibre width is from 10 to 15 µ (Florian 2002: 49).

Identifying charasteristics of threads

Spin direction of threads was recorded. Fibres can be spun into z- or s-direction which produces a structural effect on a thread. Two z-spun threads can be twisted into a S-plied thread and s-spun threads can be twisted into a Z-plied threads (Walton & Eastwood 1988: 5). When spin direction is marked s>Z or z>S, it means that only a separate s- or z-spun thread was preserved but there were still traces of plying left in a thread. A single s means that plying could not be traced at all.

Results

Sample	Fibre	Spin	Function
Turku Castle			
KM 81132: 609	hemp	Z	shoe thong
Hämeenkatu			
TMM 18884: 83	hemp	S	sewing thread
Old Great Market Place			
TMM 20764: 1348	hemp	S	sewing thread
TMM 20764: 1535	unidentified	S	sewing thread
TMM 20764: 1539	hemp	S	sewing thread
TMM 20764: 1542	flax	Z	sewing thread
TMM 20764: 1567	flax z	>S	sewing thread
TMM 20764: 1601	hemp	S	sewing thread
TMM 20764: 1602	hemp	S	sewing thread
TMM 20764: 1604	hemp	z >S	sewing thread
TMM 20764: 1617	hemp	s >Z	sewing thread
TMM 20764: 1709	hemp	S	sewing thread
TMM 20764: 1710	unidentified	S	sewing thread
TMM 20764: 1712	hemp	S	sewing thread
TMM 20764: 1758	unidentified	S	sewing thread
Åbo Akademi main building site			
TMM 21816: NE06618	hemp	s	sewing thread

TMM 21816: NE13912	hemp	S	sewing thread
TMM 21816: NE14713	hemp	S	sewing thread
TMM 21816: NE14714	hemp	S	sewing thread
TMM 21816: NE14749	hemp	S	sewing thread
TMM 21816: NE147106	hemp	S	sewing thread
TMM 21816: NE17364	hemp	s >Z	sewing thread
TMM 21816: NE20215	hemp	s	sewing thread
TMM 21816: NE20488	hemp	Z	sewing thread
TMM 21816: NE204108	unidentified	S	sewing thread
TMM 21816: NE20624	flax	Z	shoe thong
TMM 21816: NE5137	hemp	S	sewing thread
TMM 21816: NE51326	hemp	S	sewing thread
TMM 21816: NE51329	hemp	S	sewing thread
TMM 21816: NE50044	flax	Z	shoe thong
TMM 21816: NE50348	hemp?	Z	sewing thread
TMM 21816: NE50429	hemp	S	sewing thread
TMM 21816: NE509160	flax	Z	shoe thong
TMM 21816: NE51377	hemp	S	sewing thread
TMM 21816: NE51525	hemp	S	sewing thread
TMM 21816: NE51525	hemp	Z	shoe thong

Interpretation

Threads made of hemp form the largest group with 27 samples. Flax threads counted five and unidentified fibres four specimens with vague charasteristics of small-leaved lime (*Tilia cordata*). Distribution of modern flax and hemp is nationwide, but during the Middle Ages hemp was cultivated especially in the eastern parts of Europe, the Baltic Countries and Finland. Flax and linen products were important export items for the Baltic Countries and Central/ Northern Europe (see e.g. Lempiäinen 2003: 329-330; Kaukonen 1981a: 106-107; 1981b: 580-582). Furthermore flax as a fibre and a thread was more expensive than hemp which could be produced locally and was easier to obtain. This could be a reason for overwhelming usage of hemp threads in medieval shoes.

Comparative research on sewing threads of archaeological shoes is very limited and only one study from York can be mentioned. It does not, however, provide much information in this particular case. About the sewing thread material of shoes, the researcher mentions that in medieval York there were growing number of plied flax/hemp threads used in sewing of shoes along with lesser amount of silk and animal fibre (Walton Rogers 2003: 3260). Since, there are no silk and animal fibres found in sewing threads of shoes in Turku material nor there is made any distinction between hemp and flax threads in York material, this research result can be left as such.

Chronology of the study of spinning direction used in sewing threads gives an interesting insight.
It can be calculated that s-spun threads make 15 % and z-spun threads make 85 % out of the Old Great Market Place sewing thread material (n=13). The result is compared with the Åbo Akademi main building site material (n=21) which is 43 % of s-spun and 57 % z-spun threads. What might this change indicate?

As it was concluded in earlier studies of medieval leatherwork, raw material used for spinning did not affect to choice of spinning direction (Kirjavainen 2005: 100). According to some researchers, choice of z-spin is an intuitive construction for human mind. It is easier to rotate a spindle into clockwise direction than opposite (see Barber 1992: 67). It is possible to draw cultural boundaries between the people who spin s- or z-twisted yarns, too (see Geijer 1994: 29-30). It is true that 90 % of people prefer right-handedness i.e. spinning z-twisted thread. So, what caused the increase of s-spun threads in the Åbo Akademi main building site? A sudden rise of left-handed people?

An answer has to do with textile technological change at the beginning of the Middle Ages in Northern Europe. The Old Great Market Place material reflects still the old Iron Age spinning tradition of z-spun threads of local nature whilst the Åbo Akademi site material reflects heterogenous mixed-spinning with z- and s-spun threads. The cloths with mixed-spinning became more popular in northern Europe and spinners learnt in growing numbers to spin s-spun thread for the needs of textile industry (Crowfoot 1990: 476). In the case of the Åbo Akademi site, earlier research has shown that professional textile crafts were executed by the side of leatherworking (Kirjavainen 2002: 346; Harjula 2002: 127). The abundance of new type of weaving implements, not to mention spinning whorls, indicate the change towards more homogenous North-European textile tradition prompted by hanseatic trade.

The Old Great Market Place and the Åbo Akademi main building site form a chronological continuum. The Åbo Akademi site material shows connections towards Europe and its textile technological tradition of spinning and weaving. Without doubt, the same spinners spun threads for the weavers and shoemakers at the Åbo Akademi site.

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APPENDIX 4. GLOSSARY

Ankle shoe	Shoe with an upper that reaches just to or over the ankle. Fin. *nilkkakenkä*.
Awl	Consists of a blade and handle. Used for piercing the material, especially in making stitch holes. One of the basic tools of a shoemaker. Awl-like tools, however, have been used in woodworking, bone working and other crafts, and therefore awls are not always connected solely to leatherworking or shoemaking. Fin. *naskali*.
Back part > of an upper	For the pre-16th-century footwear lacking quarters and a back seam. The term used to describe the rear area of the shoe upper. Fin. *päällisen takaosa*.
Back seam	Seam that joins the rear part of the quarters together, centred at the backmost part of the shoe. Fin. *takasauma*.
Bifurcated strap	*see* Tie-lace
Binding stitch	Also called Whip stitch or Overcast stitch. Angled stitching with a single thread along the edge of a piece of leather. This stitch type can be recognized by the impressions of thread along the edge of leather. Fin. *yliluonti-ommel*.
Boot	Term to describe closed footwear in archaeological research. Alternatively, the term boot can be used as a synonym for high footwear, even for open footwear with a fastening system. Fin. *saapas*.
Buckle strap	Strap that passes through the buckle to fasten a shoe. Fin. *soljen hihna*.
Buckle thong	Strap by which a permanently fixed buckle is attached to the shoe. Fin. *soljen tamppi*.
Buckled shoe	Includes several different types of shoes. In Turku, all the shoes from the town area are ankle shoes and have a V-shaped frontal opening. A shoe of a low-cut style with an open instep comes from Turku Castle. Fin. *solkikenkä*.
Butted seam	Seam made by joining together the edges of two sections of leather. Fin. *vastasauma*.
Closed seam	Join formed when two pieces of leather are stitched together face to face along the edge. Fin. *umpisauma*.
Clump sole	Additional piece of leather used to patch a worn area of a shoe sole. In Turku, clumps were mostly attached with leather thonging. Only in a few cases has the use of thread been documented. Fin. *lisäpohja-antura*.
Cobbler	Dealt with old shoes, refurbishing, remaking and repairing them, before selling them on. Fin. *paikkasuutari*.
Combined fastening	Shoe which has at least two different types of fastenings or closure combined on an individual shoe. Fin. *yhdistelmäkiinnitys*.
Composite sole	Sole composed of two or more parts; usually stitched together with an edge/flesh butted seam. May be an original construction or a repair Fin. *yhdistetty antura*.
Cowmouth shoe	A shoe style (mostly first half of the 16th century) characterised by the toe shape resembling the muzzle of a cow; also variations of eared, horned and bear-paw shapes. Fin. [lehmän-] *turpakenkä*.
Creaser	Used in leatherworking for marking the places for the stitch rows, for strengthening the edges of leather by compressing the leather structure and for decorative purposes.
Curriers' knives	Specialised tools used for cutting and paring leather. They are distinguished from other knives by having blades which are unusually thin, but relatively wide, and there is usually little or no shoulder between the blade and tang. Blades typically have straight ends, sometimes a projecting spike.

Currying	In currying, vegetable tanned hides were worked into leathers with various properties suitable for manufacture into finished goods. Currying is a necessary process between tanning and making of the artefacts.
Currying waste	Tattered, tissue-like waste leather from the currying process.
Cut keepers/slots	Paired slits forming loops in the leg part of a shoe through which the fastening thongs are drawn. Fin. [leikatut] *paulahalkiot*.
Cutting pattern	Main components of the upper or entire shoe laid out flat so that the overall design can be seen; the pieces in their original positions as cut out by the shoemaker. Fin. [leikkuu-] *kaava*.
Double-layered sole	Part of a treadsole has a layer of leather added on top (flesh side) of the treadsole. Both layers were stitched to the upper at the same time with one stitching. The upper layer of leather usually has a more durable grain side outwards facing the foot. Fin. *kaksikerroksinen antura*.
Double-soled footwear	Term referring to post 1500 footwear with an insole and treadsole, normally with a welted construction, but occasionally with other types of sole constructions.
Drawstring shoe	*see* Thong shoe
Edge binding	*see* Topband
Edge/flesh stitch	Stitch hole that goes into the flesh side of leather and comes out of the edge.
Edge/grain stitch	Stitch hole that goes into the grain side of leather and comes out of the edge.
Extended tips	Piked toe tips in shoes, extending further than the normal reach of the toes.
Facing	Pieces of leather sewn to the interior of the shoe which reinforce this area, for example, around the lace holes. Fin. *vahvike*.
Flesh/flesh stitch	Stitch hole goes in the flesh side of leather and comes out of the same side.
Flesh/grain stitch	Stitch hole goes in one side of leather and comes out of the other.
Flesh side	Original inner face of the leather. Fin. [nahan] *lihapuoli*.
Front-laced shoe	Shoe with a frontal opening and lacing. Further division is made on the basis of the number of lace holes and/or the shoe height. Fin. *rintanauhakenkä*.
Grain/grain stitch	Stitch hole that goes into the grain side of leather and comes out of the same side.
Grain side	Outer surface of the leather, originally bearing the wool, fur or hair. Fin. [nahan] *pintapuoli*.
Heel	Backmost part of the foot or shoe, the heel seat; also the component under the heel seat of a shoe. Fin. [kengän] *kanta/korko*.
Heel stiffener	Reinforcement inside the back of the quarters. Fin. *kantavahvike*.
Hide shoe	*see* One-piece shoe
Insert	Added piece of leather which fills out or completes the shape of the upper's cutting pattern. Fin. *liitekappale*.
Insole	Sole upon which the foot rests, found in the interior of the shoe. Fin. *sisäpohja*.
Instep > of a foot or shoe	Area on top of the foot between the rear of the toes and the ankle joint. Fin. [kengän/jalan] *rinta*.
Instep-toggle	Toggle placed on the vamp, on top of the instep. (Fin. *nappi/nappula* [kengän rinnassa].
Instep-toggle fastened shoe	*see* Strap shoe

Keepers (in buckled shoes)	Loops for the ends of the buckle straps.
Lace hole reinforcement	Strip of leather stitched onto the inside of the upper to strengthen the lace holes. Fin. *nauhareikävahvike*.
Lapped seam	Seam where two pieces of leather are overlapped on top of each other. Fin. *limisauma*.
Last	Block of wood roughly resembling a foot shape, upon which the shoe is made. Fin. *lesti*.
Lasting	Technique of pulling the uppers tightly over the last and fixing them in place with tacks or small nails, in order to prepare the uppers for attaching the sole. Fin. *lestitys*.
Lasting margin	Lower edges of the upper that are pulled snug (lasted) in order to be sewn to the insole and rand/welt. Fin. *lestin reuna*.
Lateral	Outer side of each foot or shoe; of the side facing away from the other foot. Fin. [kengän/jalan] *ulkosivu*.
Leg	Part of the upper of high shoe or boot, covering the heel, ankle and calf. Fin. *varsi*.
Medial	Inner side of each foot or shoe; of the side facing the other foot. Fin. [kengän/jalan] *sisäsivu*.
Midsole	Sole layer/layers between the insole and treadsole. Fin. *välipohja*.
Mule/slipper	Footwear without a covering for the heel. Fin. [kannaton] *tohveli*.
Offcuts	Pieces of waste leather left over from the production of leather or cutting out the shoe parts. Fin. *leikkuujäte*.
One-piece shoe	Shoe made from a single piece of leather or hide, including the sole; sometimes called hide shoes or primitive shoes. Fin. *yhdestä kappaleesta tehty jalkine*, '*kurpponen*'.
Openwork decoration	Designs made by cutting or punching shapes and figures out of the leather. Fin. *reikäkoristelu/lävistyskoristelu.*
Overcast stitch	*see* Binding stitch
Partial sole	*see* Composite sole
Patten	Open footwear with a sole and only a footstrap on the top. Soles were made of wood or leather. Fin. *patinus*.
Primitive shoe	*see* One-piece shoe
Quarters	The sides and heel of of a shoe upper, which join the vamp on either side of the foot. In the strictest sense, quarters are seamed at the back of the heel, but in the medieval period most were made as a continuous section.
Rand	Strip of leather included in the sole seam of turnshoes, placed between the sole and upper. The function of the rand is to make the lasting margin watertight and even more important, to protect the stitches in the vulnerable gap between the sole and upper. Fin. *tere*.
Raw tanning	Especially in the case of soles, the tanning substances were not always allowed to penetrate the whole thickness of leather. The raw layer in the middle made the soles more rigid and water resistant. Fin. *raakaparkitus*.
Running stitch	Stitching with a single thread moving in and out. This stitch type can be recognized by the impressions of thread, which repeatedly changes side. Fin. *suoraommel*.
Saddler's stitch	*see* Shoemaker's stitch
Scraping beam	Before the actual tanning process could begin, it was necessary that after the liming (i.e. once the hair was loosened sufficiently), the hide was spread over a wooden beam and both the sides scraped with a tanner's knife for dehairing and defleshing. Fin. *pummi*.

Seam	Line where the two or more leather parts are joined through sewing, *see* butted seam, closed seam, lapped seam. Fin. *sauma*.
Sewing hole/stitch hole	Holes left in the leather after the sewing thread has disintegrated. Fin. *ommelpistot/ ommelreiät*.
Shoemakers' knives	In the Middle Ages there were two basic types of shoemakers' knives. The first type is a half-moon shaped knife. The form of the second knife type is curved and resembles a sickle.
Shoemaker's stitch	Also called Saddler's stitch. Stitching with two threads passing each other through the same stitch holes in the leather. This stitch type can be recognized by the continuous impressions of thread from stitch to stitch and from stretched stitch holes, resembling the form of number eight. Fin. *suutarin ommel*.
Side-laced shoe	Shoe with an opening for ties on the side of the shoe. Fin. *sivunauhakenkä*.
Side seam	Seam at the side of the shoe, between vamp and quarter. Fin. *sivusauma*.
Slicker or sleaker	Used in the currying process to force out dirt retained under the hair roots just below the grain layer and to shave the flesh side until the surface was smooth and the leather was of even thickness. Fin. *räkkirauta*.
Stilt (on wooden patten)	Two or more protruding, wedge-shaped structures on the underside of the sole that serve to raise the sole off the ground.
Stitch-down construction	The bottom edge of the upper was folded outward and then stitched directly to the insole and treadsole and in shoes without an insole, directly to the treadsole.
Strap fastened shoe	*see* Strap shoe
Strap shoe	Shoe with a slit across the instep and a strap or two straps on the back part to fasten over the instep. The straps are attached together with a tie-lace, bifurcated strap (latchet) or a buckle (strap fastened shoes), or they are attached to a toggle on a vamp throat (instep-toggle fastened shoes). Fin. *hihnakenkä*.
Strengthening cord	The purpose is to keep the upper of shoe from stretching. It has been useful in low-cut shoes especially if these were made of supple leather. Fin. *vahvikenauha*.
Stretcher frame	Rack for stretching hides. Fin. [vuodan-] *pingotuskehikko*.
Tailed-toggle	Fastening knob made from leather thong knotted in the middle, with one end fixed to the shoe, the other loose and having a tapering end like a tail.
Tailed-toggle fastened shoe	Shoe with a vertical V-shaped frontal opening fastened with one or more tailed toggles.
Tanning	*see* Vegetable tanning
Thong shoe	Shoe closed by thongs running externally around the leg or ankle part of the shoe; sometimes called leash shoes or drawstring shoes. Fin. *paulakenkä*.
Tie-lace	Leather strap which has been split along most of the length, making two tie-laces joined by the unsplit portion of the strap.
Toe puff	Internal reinforcement at the toe. Fin. *kärkivahvike*.
Toe shape	Form of the shoe's toe, which can be a style and date determinant.
Toggle	Knob, 'button', which must be pushed or pulled through a slit to fasten a shoe's closure. Fin. *nappi/nappula*.
Tongue	Piece of leather sewn into the fastening opening to stop dust or water from entering, or a backwards extension of the vamp, located on the instep of the foot. Fin. *iltti/kieli*.

Topband	Narrow strip of leather, stitched around the opening of the shoe to strengthen and finishing the edge. Fin. *reunusnauha*.
Treadsole	The undermost sole of footwear, facing the ground. Fin. *antura*.
Tunnel stitch	Sewing technique in which the thread is passed for a short distance into the thickness of leather before reappearing on the same side and then passing to the adjoining piece of leather in the same manner, making a stitch that cannot be seen from the outside of the seam. Fin. *piilopisto*.
Turnshoe	Shoe made inside-out. After the sole seam is finished, the shoe is turned right side out so that the seams are situated inside the shoe. Fin. *kääntökenkä*.
Turn-welt construction	Rand is sewn between the upper and sole of a turnshoe, but is made extra broad so that a second sole can be stitched on. The rand will show two rows of stitch holes if used in this way, and is then called a turn-welt. In Turku, turn-welts have been used in attaching so-called clump soles and wood-pinned outer soles. Attachment of these to the rand was by stitching either with a thread or a leather thong or in the case of wood-pinned soles, also by wooden pins. The construction principle is the same in all these types, an outer sole attached to the outer edge of the rand. Fin. *kääntö-reunos -rakenne*.
Upper	Leather above the sole and covering parts or the all of the foot and leg. Fin. *päällinen*.
Vamp	Part of the upper covering for the fore part of the foot up to the instep. Fin. *etupäällinen*.
Vegetable tanning	The most common type of leather treatment in the Middle Ages, where skins and tanning substances were put in layers into the tanning container, filled with water. The time needed for the tanning treatment varied from several months even to years. Fin. *kasviparkitus*.
Waist	Narrow middle part of the shoe or sole, corresponding to the instep and the arch of the foot.
Welt	Strip of leather sewn along the outside of the upper's bottom edge together with the insole during inseaming and to which the treadsole is stitched later. Fin. *reunos*.
Welted construction	*see* Welt
Whip stitch	*see* Binding stitch
Wood-pinned outer sole	Extra outer sole which consists of several layers of leather, attached together by wooden pins. The wood-pinned outer sole has been fastened to the shoe in the following way: between the inner sole and the upper, there is a rand slightly wider than in normal turnshoes. The outer sole has been fastened to the outer edge of the rand either by stitching or by pins. Fin. *nupiantura*.

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What were the shoe styles like and where did the fashions come from? What kind of footwear did children have? How were feet shod in winter or when walking on muddy streets? How did the constructions of medieval shoes differ from post-medieval types? What kind of evidence is there of local shoemaking?

In this study, we are led into the history of shoes and their manufacture. The book is based on the author's thorough survey and analysis of archaeological finds related to footwear and shoemaking in the town of Turku, Finland, and the nearby Turku Castle. It covers the period from the foundation of Turku in the late 13th century to the dawn of the Early Modern Period in the first half of the 16th century. In treating its theme in this extent and depth, the study is the first of its kind in Finland.

The study is a part of the project *Medieval Urban Life in Motion - Challenges and Possibilities for Archaeological Understanding of a Town (Turku, Finland)*, funded by the Academy of Finland in 2004–2006. It was carried out in the School of Cultural Research, Department of Archaeology, University of Turku, Turku Provincial Museum and Aboa Vetus Museum.

This book is the fifteenth volume in the *Archaeologia Medii Aevi Finlandiae* series, publications of the Society for Medieval Archaeology in Finland. It can be recommended for archaeologists, historians, re-enactors and anyone interested in shoes and their cultural history.

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