

Laurels Prize Display on Double Wars XXVII
Reconstruction of an Early Middle Ages turned shoe

- A step by step guide with a lot of pictures -
Version 1.1 May 2014



Disclaimer:

I am not responsible for possible injuries caused by accidental misuse of your awl, steel bristle or hammer !

Needful things to have at hand:

- A patch and skin disinfection if you break through the flesh of the leather and the awl penetrates your skin in a very painful way- that happens from time to time.**
- Hand cream. Depending on your skin and how sensitive it is, the tannins in the leather can affect the skin of your hands. Hand cream helps.**

Still reading?

Good :)

Welcome to the exclusive club of shoemakers !

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Skill needed: intermediate in leatherworking

Materials used: vegetal tanned goat leather about 1.8 to 2.0mm thick for the upper
vegetal tanned cow leather about 3.0 to 3.5 mm thick for the sole
linen thread
optional but recommended: early middle ages glass pearls
Hint: if you do not have access to vegetal tanned leather, you can of course use modern chrome tanned leather. Instead of goat leather you can use cow leather for the upper. Sole leather MUST be cow leather

Tools used:

a) to make the pattern:

- DIN A2 or A3 paper depending on your shoe size
- a pencil
- scissor or knife to cut out the paper pattern
- a ruler
- advisable: a cutting board

b) to make a last:

- beechwood, about 2.5 cm thick - size about the area of your left and right foot
- a jigsaw or a handsaw
- a pencil
- a wood rasp
- sandpaper
- linseed oil
- a clamp

c) to sew the shoe:

- a leather awl to make the stitch tunnels in your leather
- bee wax for the thread and the awl - makes sewing easier
- a little bowl with water
- an old piece of fabric or a sponge to soak it with water and to dampen the leather from time to time
- a wooden board to not harm your table you are working on
- a hammer to compress the seams
- small nails to fix the upper on the sole/last
- a sharp knife to cut leather
- advisable: a shoemaker's iron
- a cooking spoon to the turning process of the shoe

- d) to make your own shoemaker thread (optional):*
- *a roll of simple spun linen thread*
 - *bee wax*
 - *a bee wax / resin composite*
 - *a little piece of leather*

Time to finish the project: depending on your skill in leather sewing minimum time needed about 10 hours.

Your first shoe? Calculate about 20-30 hours.

Primary literature:

Die Lederfunde von Haithabu (leather findings of Haithabu)
Willy Groenman-van Waateringe

Secondary literature:

1) Leather and Leatherworking in Anglo-Scandinavian and Medieval York

Quita Mould, Ian Carlisle and Esther Cameron

The Archeology of York, The Small Finds 17/15

Craft, Industry and Everyday Life

2) Knives and Scabbards. Medieval Finds from Excavations in London

Woodbridge 2008

Cowgill, J., de Neergaard, M., Griffiths, N.

3) Shoes and Patterns. Medieval Finds from Excavations in London

Woodbridge 2006

Grew, Francis; de Neergaard, Margrethe

4) Welche Fußbekleidung trug die ländliche Bevölkerung in der Mark Brandenburg im 13. Jahrhundert? Ein Beitrag zur möglichen Verwendung und Verbreitung verschiedener Schuh- und Überschuhformen im ländlichen Raum; Berlin 2005

Hirschberg, Ruth-Maria

5) Mittelalterliche Lederfunde aus Konstanz (Grabung Fischmarkt); Materialhefte zur Archäologie in Baden-Württemberg, Landesdenkmalamt Baden-Württemberg; Stuttgart 1994

Schnack, Christiane

6) Ausgrabungen in Schleswig. Berichte und Studien 13. Mittelalterliche Lederfunde aus Schleswig - Futterale, Riemen, Taschen andere Objekte. Ausgrabung Schild 1971 - 1975; Neumünster 1998

Schnack, Christiane

7) Ausgrabungen in Schleswig. Berichte und Studien 10. Mittelalterliche Schuhe aus Schleswig.
Ausgrabung Schild 1971 - 1975; Neumünster 1992
Schnack, Christiane

8) Before the heels. Footwear and shoemaking in Turku in the Middle Ages and at the beginning of the early modern period.

Archaeologia Medii Aevi Finlandiae XV, Janne Harjula, 2008

9) Kleidung des Mittelalters selbst anfertigen. Schuhe des Hoch- und Spätmittelalters.
Stefan von der Heide, 2011

10) Stepping through Time. Archaeological Footwear from prehistoric times until 1800.
Olaf Goubitz, 2007

11) Archaeological Footwear. Development of shoe patterns and styles from Prehistory till the 1600's.
Volken, M.

The purpose of this step by step guide

I started back in 2009 with my research to reconstruct medieval turned shoes. Meanwhile I made about 25 pairs of shoes, mainly high medieval turned shoes. My wife Baroness Mechthild Quattermart and me decided at the end of last year in 2013 that we want a viking garb besides our nearly complete high medieval garb. Garb making is the task of my wife, she is much better and faster in that, shoe making is my part. It was our aim to have our viking garb finished at 12th night coronation in January 2014 in Sweden, but it was already before christmas when I started. So I expended my research in early middle ages turned shoes and looked for an easy to make shoe. I found one pattern in the book Leather findings of Haithabu. The shoe type in this guide is good for the 8th to the 10th century, region all countries around the North and East Sea. The time schedule was close but finally I managed to finish a shoe for my wife.



My shoemaker workplace on living history events - period materials and tools



By making the shoe I already published a basic step by step guide on facebook and made it public to everyone. This guide summarizes the facebook guide with a more detailed description and research background.

Sample of materials used in this project

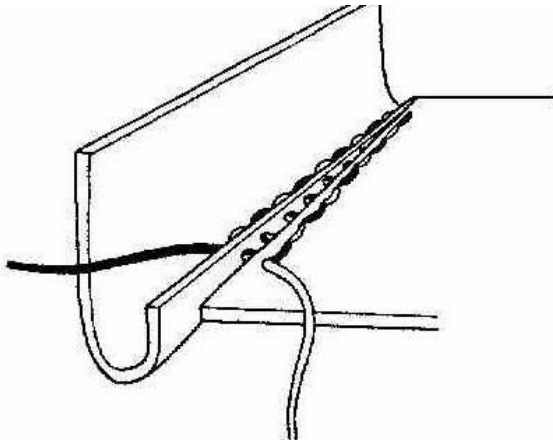
A) vegetal tanned goat leather (upper)

B) vegetal tanned cow leather (sole)

C) Shoemaker thread

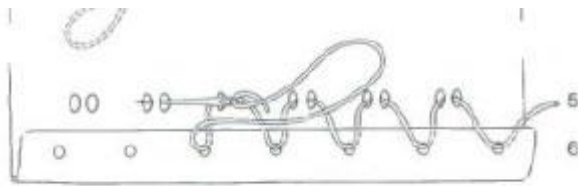
Stitches used in this project

a) Saddle stitch



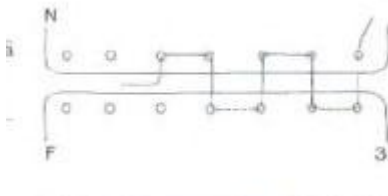
Used for the upper/sole seam

b) A combination of two stitches



Used for the optional rand on the upper.
No. 6 goes completely through the leather.
No. 5 goes through half of the leather.

c) flat seam



N = grain side

F = flesh side

Used for the seam on the front of the upper

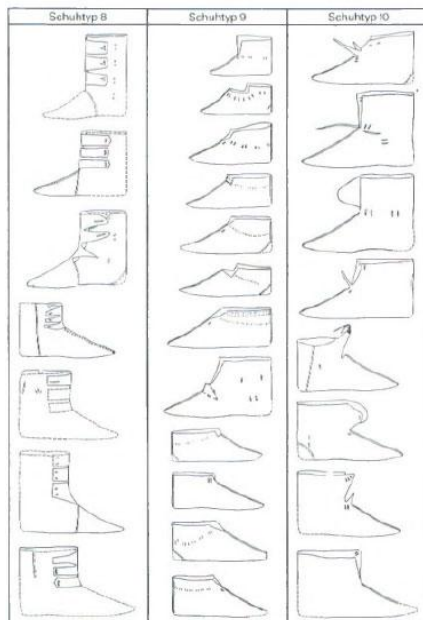
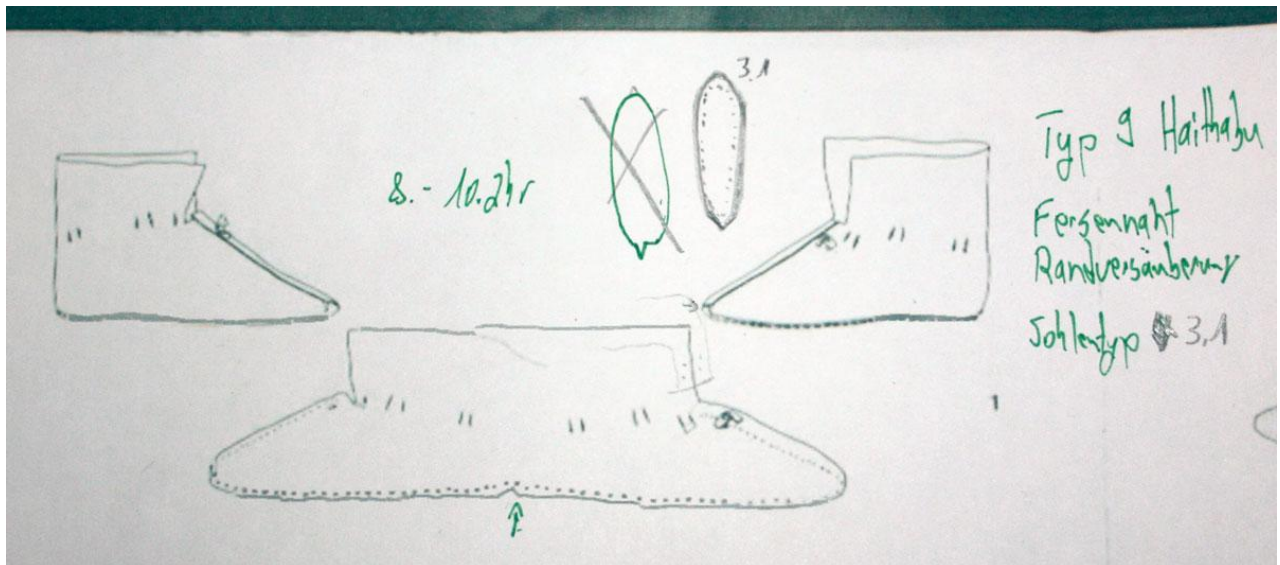
Let's finally start to work !

A) The pattern for the upper

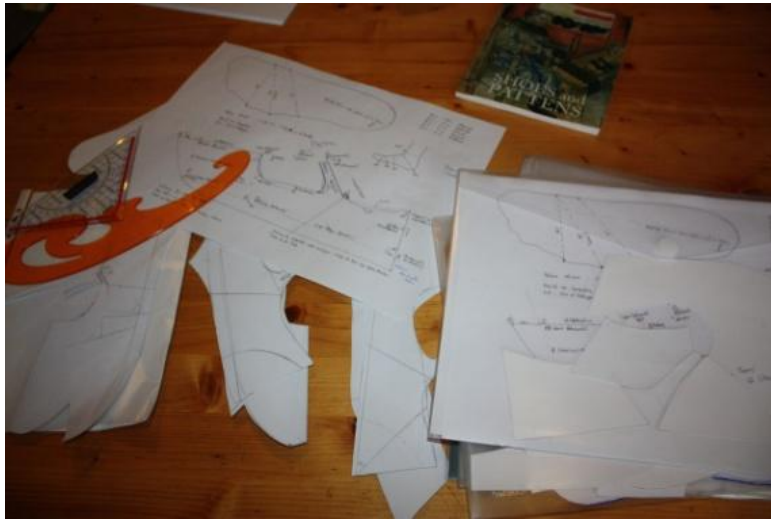
First we need a pattern for our new shoe.

I made a copy of my book Leatherfindings from Haithabu to make some notes on a working sheet.

Here we have a Typ 9 shoe - a quiet common shoe in the early middle Ages. After I have made some research I found out that this type often has heel seams and edge reinforcements, some of the shoes have embroideries on the upper leather (not included in this guide).



After all these years of shoemaking I can tell you that making a pattern is the difficult part of shoemaking - sewing the parts together is just routine in my opinion. Unfortunately I have not made a picture making this specific pattern, but here I have one making a pattern for another shoe:

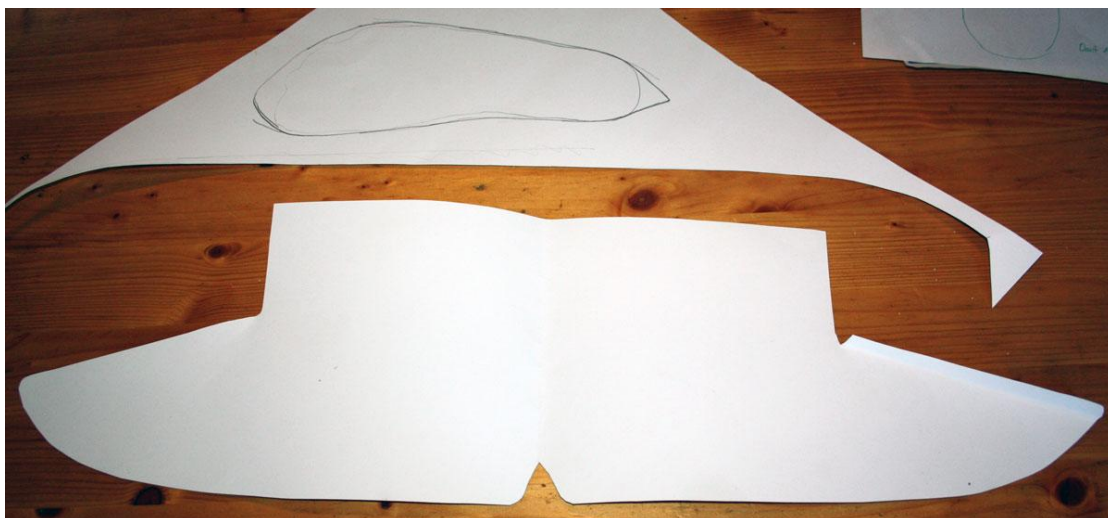


For details how to make a pattern I recommend following books:

9) Kleidung des Mittelalters selbst anfertigen. Schuhe des Hoch- und Spätmittelalters.
Stefan von der Heide, 2011 - in german

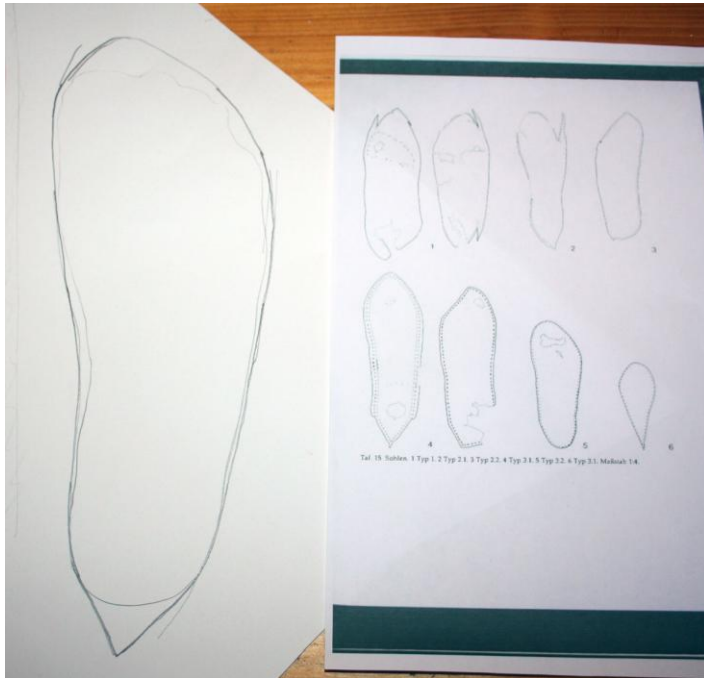
11) not published yet: Archaeological Footwear. Development of shoe patterns and styles from Prehistory till the 1600's. Volken, M.

Your pattern should now look like the one below. If you do not have the skill to make a pattern by taking the measurements and make a pattern out of it, I advise you to take cheap fabric and lay it around your foot and make a pattern on a piece of paper later. The shoe has a seam on the top front.



B) The pattern of the sole

First make a line around your foot with a pencil than define a sole form - here I decided to make the typical 3.1 sole. I decided to take this sole type because of the little triangle at the heel of the upper from the archeological finding. That indicates a Typ 3.1 sole.



C) Cutting out the leather

So, let's cut out a pattern.

On the top we have an about 3.5mm thick cow leather vegetal tanned. The cow leather is for the soles (99% of all soles in the Middle Ages are made of cow leather).

Below you see a hide of vegetal tanned goat leather, about 1.8mm thick. The majority of our shoe type is made out of goat leather - so I choose goat not cow for the upper.



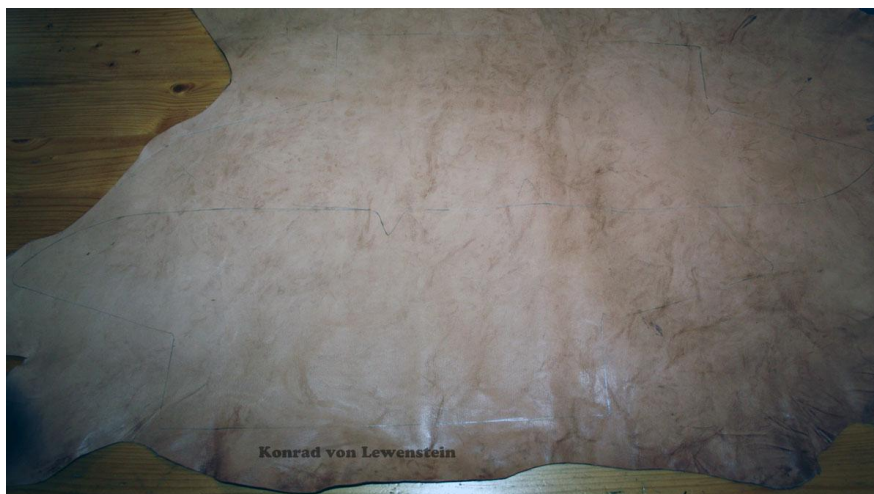
Proof stamps for vegetal tanned sole leather - rather expensive but it is worth it. The tanning process of vegetal tanned sole leather takes up to 18 months. The upper leather tanning process takes only a few weeks/months.



Take the paper pattern, lay it over the leather and surround it with a pencil.



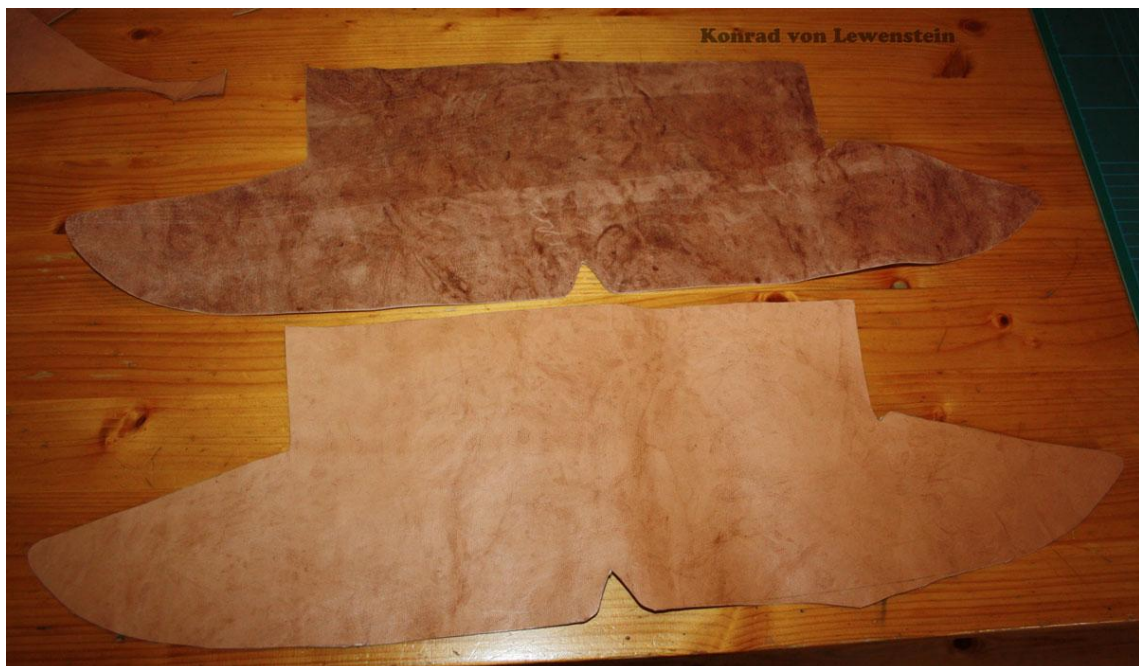
Difficult to see, both patterns are marked on the leather. Do not forget to turn the paper pattern on the other side when you mark the second pattern.



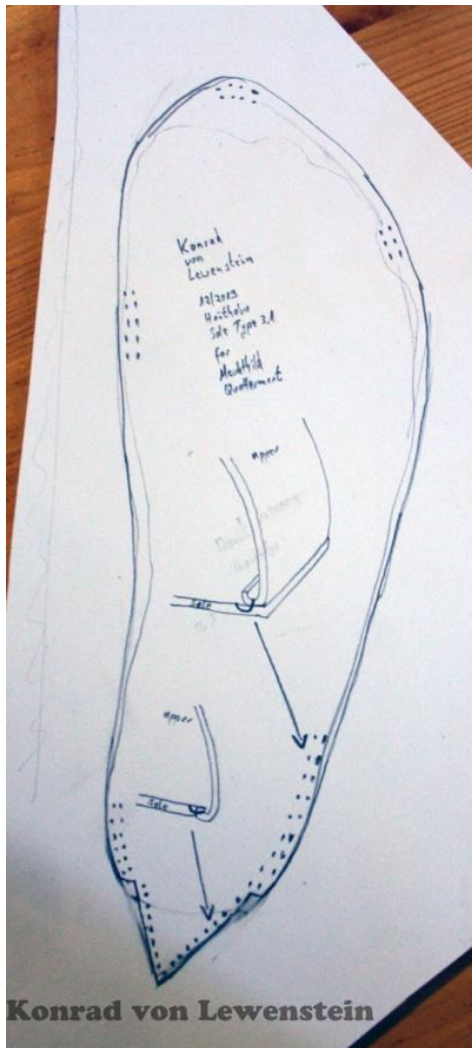
Cut the leather out with a leather scissor or a knife. Do not forget to lay a cutting board under your leather.



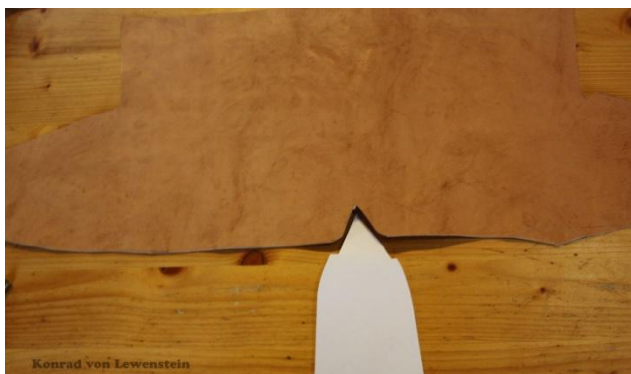
Our two patterns are cut out. Above flesh side on the top, below the grain is on top.)



Thoughts about the sole: I made two sketches how to fix the sole to the upper leather. On the finding of soles we see sometimes the very characteristic stitch holes remains. Only the triangle at the heel is connected with a simple stitch (see lower picture), the rest of the sole gets another connection, see upper picture.



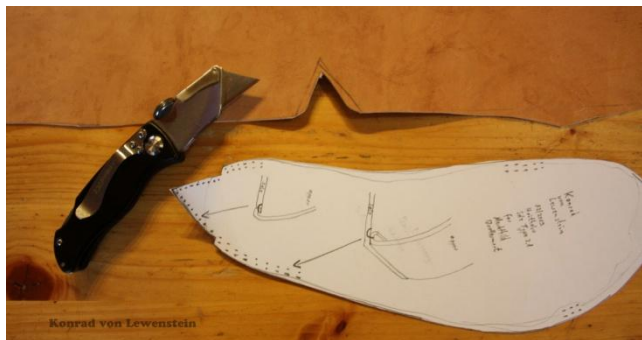
After cutting out the sole pattern I realized that the heel triangle in the upper leather is too small.



Lay the triangle over the leather and mark the edges on the leather



Slightly bigger triangle marked now



After cut out



Make marks on the sole leather, do not forget to turn the pattern for your second sole



Soles cut out



So, now we have all leather parts together, now we must connect the parts.
The long leather strip is for making a rand - this is an option.



D) The shoemakers thread

Concerning the thread you want to use, you can take a synthetic one or a plied thread of linen which you can buy in shops. Depending on the seam and the power forced to the seam you take a thinner or thicker thread. I always make my own shoemaker threads - they are holding incredible long and are period.



For the seam in the upper I take five linen threads. I spin them together in a way that each thread is of equal length and the endings are laid over each other in different positions. Hmm well hard to explain that in English. In the end you should have an ending which is getting finer and finer.



Here is my finished period shoemaker thread, the linen threads are spun and hold together because they are fixed with a combination of wax and resin - but again this is optional - you can just use shoemaker threads bought in shops.



E) Preparing the rand (optional)

After some research and thought about it in general I figured out that my leather straps I wanted to use for the edge thickening were too narrow. The majority of the findings of edge thickenings were 2.5 to 3.0 cm wide. So let's make new ones.



Of course you can use your period tools like a knife and a wood slat to make leather straps. Here I use a "Riemenschneider" a tools to make leather straps. I decided to make them 2.5cm wide - a common size if you look at the findings.



The strap



F) Dying the rand - optional

Dyed strap with indigo - waxed - the very dark blue looks really good, the straps will be a nice contrast to the light goat upper leather.



To explain how to dye leather would expand this guide to a small book. Dying this rand was an experiment. In the early middle ages dying with indigo is rather unlikely, because in that time I have no source of indigo for leather dying. If you want to have your shoe nicer I advice to "dye" the strap with rusted iron and vinegar so it is getting black. You can of course just not dye the strap and use a darker leather so it looks a bit different from the upper.

G) Start of sewing the parts together

Attaching the rand on the upper leather, soak the leather with water - attaching the strap. If you do not want to attach a rand you can skip this process and go further in this guide.

There are two philosophies under the shoemakers. One part sew leather together and let it dry, the other part soak the leather with water from time to time. It is much easier to stitch through wet leather with an awl. I am belonging to the party who soak their leather with water a bit. If you have a smooth goat leather you might sew dry, but concerning cow leather, especially the sole, I highly recommend to dampen the leather.



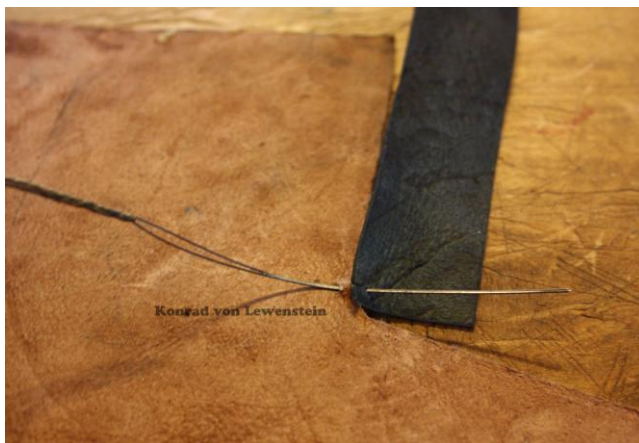
Wax on the awl makes it easier to stitch through the leather



Go through the half of the leather of the upper and the rand
here is the version with a pig bristle connected to the shoemakers thread - this is optional
if you want to sew in a period way.



Same picture as before but with a steel bristle connected to the thread. At home I usually
use a steel bristle because it is more convenient to attach it to the thread and holds
longer



Have a look how I fix the end of the thread. So far I usually made a knot at the ending - well most of the people do so. But a professional shoemaker told me in the recent time, that usually it is unnecessary to make knots, just fix them like in that way.



After you are finished with the seam beat it with a hammer to compress the seam.



View from the other side

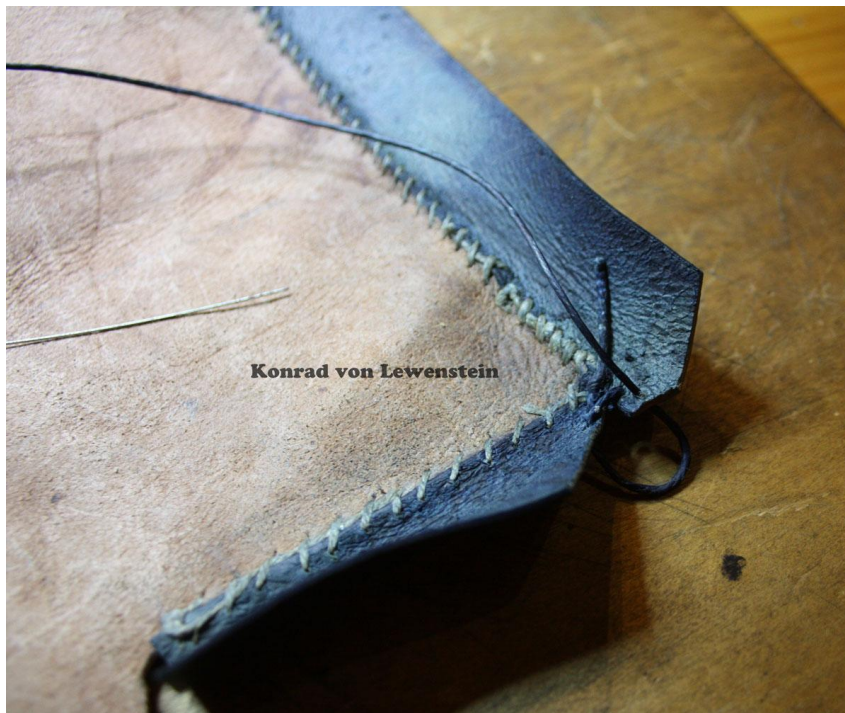
Usually it is not nice to see the thread, but I studied the findings in that case, and well it is like it is. The way I attached the rand is correct.



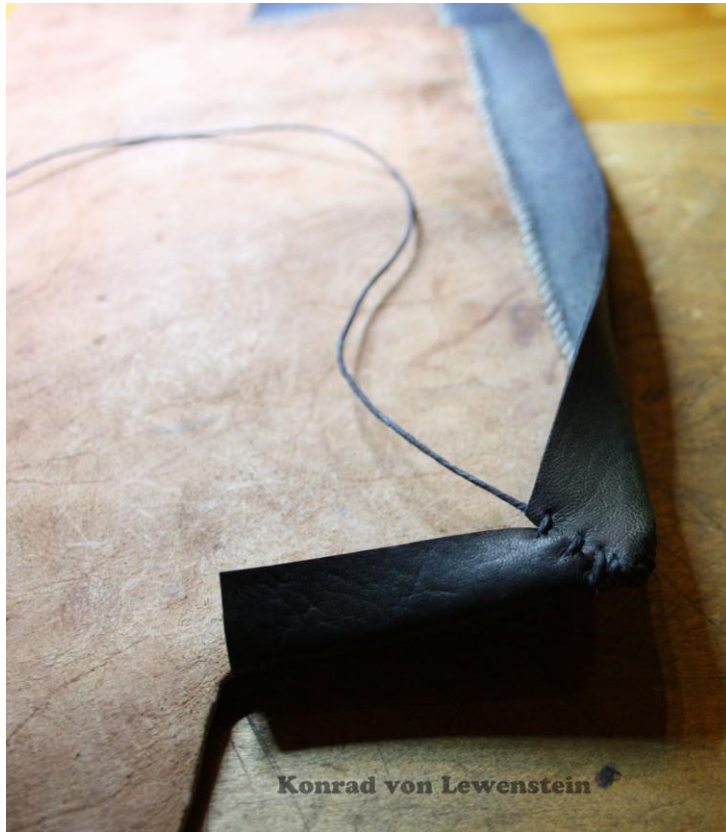
All rands have been attached - this makes the most work (besides to attach the upper to the sole later) - again you do not need to do this but the majority of this shoe type had rands.



Sewing up the edge - experimental - I really have no clue so far to do it better - thread is a experimental blue shoemakers thread, dyed with indigo - of course you can use modern thread if you want to.



View from the other side



Attaching the other part of the rand to the inner side of the leather - the flesh side. Stitch through the rand and then go half through the upper leather - you need practice to do that. Try this stitch on an old useless piece of leather before you do that on your upper.



Sewing up the inner part of the rand edge.



Rand finished - this is the flesh side of the upper
don't forget: the rand is an option. If you have never made a shoe before I advise you to make your first shoe without a rand - you need some skills in leather working for that.



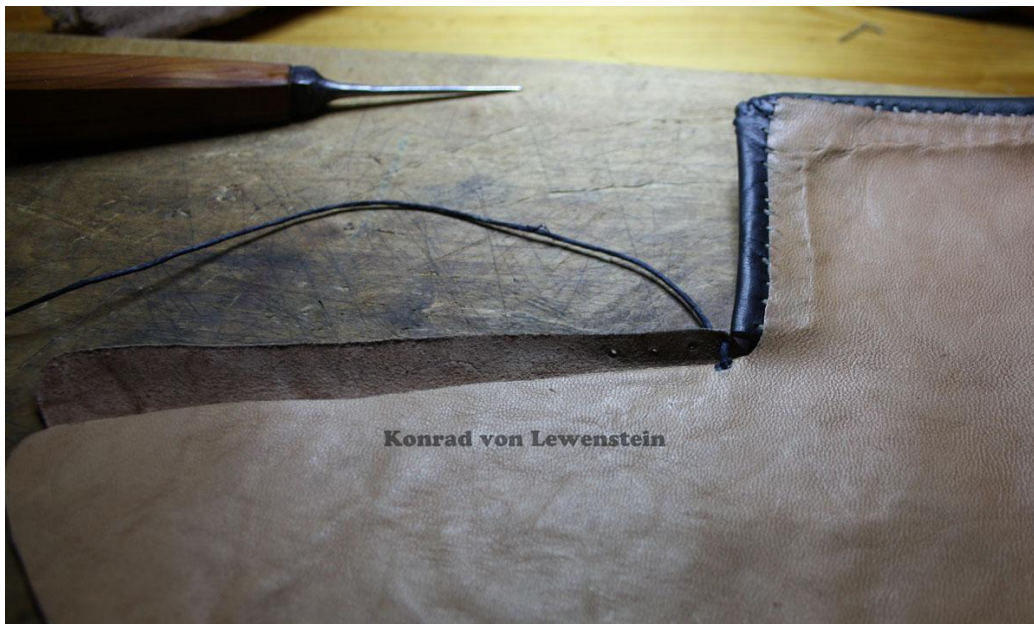
The grain side of the upper.



There shouldn't be any holes in the grain side of the upper after you have attached the rand. Every hole in the grain gives moisture the possibility to soak the flesh of the leather.



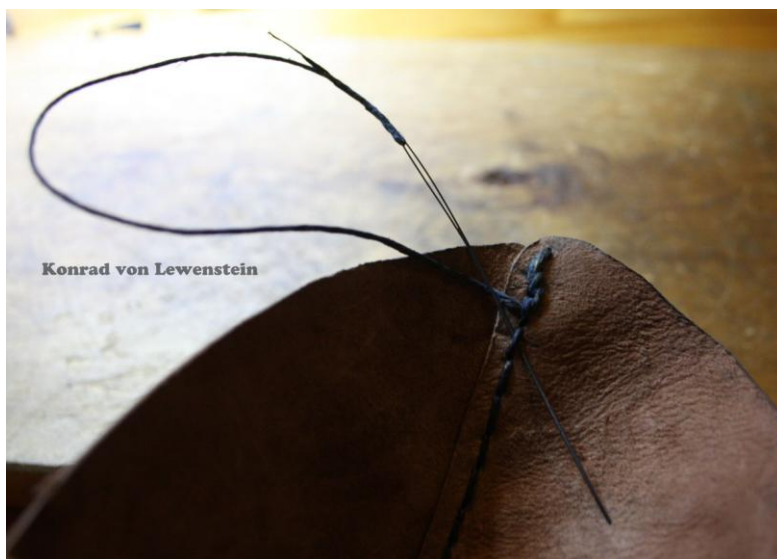
Sewing up the front of the shoe. So far I have seen two versions of such a seam. Here I demonstrate the version which is confirmed by my latest studies. Based on the leather findings and the fact, that the front part must be protected by water/moisture.



Two forward - then one back and so on - see the next two pictures.



Remember not to make too much knots. Just do it like here in the picture - every knot can be uncomfortable.



The grain side - I found it nice to have the seam in that way visible, if you do the stitching from the other side, this seam would be inside and would have another character - try it out on a useless rest of a leather and you will see the difference.



After beating with a hammer on the seam to compress it and so to protect the seam.



Picture from the flesh side.



F) Making a last - optional

Now it is time to make a last - if you want to - I highly recommend it so. Medieval lasts are usually higher and look like a foot (see pictures in the book "Shoes and Patterns"). Our upper is already customized. We only need to attach the sole to the upper.



I always take beech wood around 2.5 cm thick. Take your already cut out leather soles lay them over the wood and mark the sole by using a pencil. Cut the lasts out with a jigsaw or a handsaw. The result will be the same, but the jigsaw is faster.



We need to adjust the front part of the last with a wood rasp.



Sand the last. Every splinter in the wood will destroy the grain of your leather later.



One side of a last is adjusted with the rasp, the other side remains flat, on this side you attach the sole on the last later.



Rub the last with linseed oil - protection from moisture - you will soak the leather with water later.



G) Attaching the upper to the sole by the usage of your lasts

The upper leather flesh outside.



Soak the sole and the upper with water (around room temperature) for about 15 minutes.



Fix the sole on the last with two nails - a lot of findings of leather soles with two holes in that position indicates that it was a common method to fix the sole on a last with nails - iron nails, wood nails ? Grain side lays on the last - you must see the flesh side !!



Fix the upper on the sole/last construction like in the picture with small nails - here I start at the heel because of its special form of the sole. Usually you start with the front.



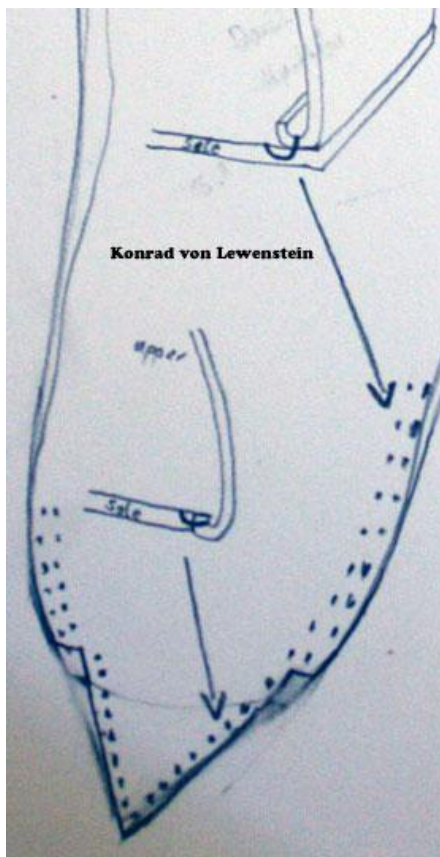
You need some nails to fix the upper.



The first stitch. Go half through the sole and leave the stitching tunnel just before the edge - you need a curved awl to do that - see next picture.



OK?



For the next stitches you make this type of tunnel stitch around the sole -except for the heel. After each



We make the saddle stitch. You need a thread about two arm's length long for a woman shoe. On each ending you attach a steel bristle, pig bristle or a needle - like you wish. Take the two bristles and lead them from every side through the same tunnel.



Two pictures of the saddle stitch from another shoe project.



After you have pulled carefully the bristles through the stitching tunnel your threads should look like beneath.



After each stitch you take the two threads each in one hand and fasten it carefully, but strong, so that you do not tear apart the flesh of the leather. Picture from another shoe project. In other words take the endings of each thread (not the bristle or needle itself!) and tie up the seam.



Picture from this shoe project.



We are reaching the heel.



For the heel we take another stitch, simply go through half of the leather not doing our previous curved tunnel stitch. The awl leaves the stitching tunnel at the edge of the sole.



But use again the saddle stitch.
Yes, the red stain on the wood is my blood...



Be careful here, do not make the stitch tunnels too wide or you risk to destroy the flesh, this will cause some problems for you because you cannot use that particular part of the sole for another stitch tunnel!



Last stitch on the sole. Fasten the knot outside, this looks nicer and makes more sense. The knot outside will not disturb the tread - just make a double knot.



Now be extra careful in this step. We need to get rid of the unnecessary rand with a sharp knife. If you cut the thread, you are in deep trouble ! You can destroy the work of hours and hours of work - be careful.



Ready with the rand.



Soak the shoe in maximum hand warm water - before that you must take out the last of course.



Beat the seam with a hammer to compress the seam and to make a nice surface on the sole - later you walk on exactly this side, means your foot feel every knot or obstacle.



I use a shoemaker's iron for that - you can buy them on internet auction platforms or on the flea market for a few Euros.



Now we must turn the shoe to the other side - start with the heel.



Look from the other side.



Then push the front on the other side.



Nearly finished.



To bring out the front you can use for example a cooking spoon or the wood of a hammer.



Look from above.



The leather is still very unstable. Here is a trick to make the shoe nice looking. Take the other last (left or right last - depending on which shoe you are working at the moment) and put it in the wet shoe - wait until next morning. Do not confront wet leather with a radiator or a fan heater just because you are impatient - that will harm your leather.



The next morning put out the last.



The leather is dry - treat it with wax and or leather oil.



On the finding of the shoe we find a strange construction exactly at this position. Well, it can be a construction to hold up a leather band that is surrounding the shoe, or it helps to enforce this weak point of the shoe. I decided to reinforce this part with a shoemakers thread (experimental wise I dyed my thread with indigo. That was only a text. Yes it works, but I do not have any source for a dyed shoemakers thread, so to be 100% safe do not dye shoemakers threads especially with indigo in early middle ages projects - technically possible but I have no evidence for it).

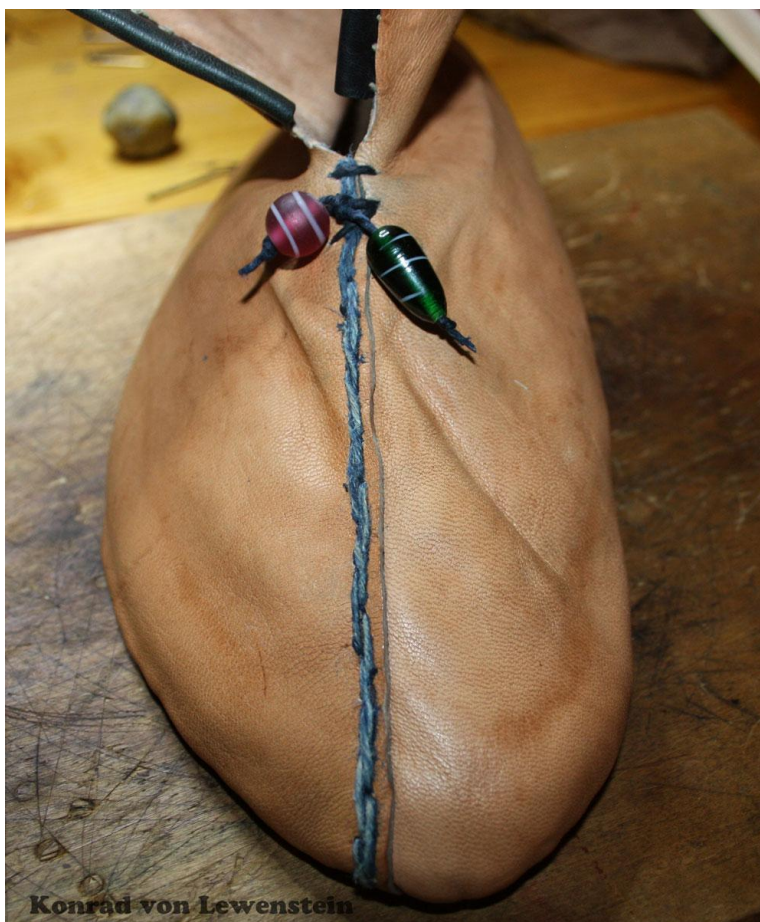


Looks horrible, right? Let's make it nicer ! Take some early middle ages glass pearls.



Et voilà. It looks nice and this sensible part of the shoe is enforced.

Please note: I have no evidence that glass pearls in the middle ages have been attached to shoes in that way I did. The construction on the finding may be a knot that holds a surrounding leather band, like I saw that on other findings. So, this is an interpretation.



View from above.



...to be continued

...to be updated

- END -