

Nålbinding

Mittens based on an Icelandic Viking-Age example

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Introduction

In August 2014 I visited the Royal BC museum in Victoria for a Viking-Age display from the Swedish National Museum. There were a number of members from the local SCA group who had a “Viking Market” in the lobby of the museum, and along with a warp weighted loom, drop spinning, tablet weaving and a few other crafts, one of the participants was doing nålbinding. I was very intrigued, despite having very little experience with knitting, and no experience with crocheting. She taught me a basic stitch, and I made a little wrist band. From there on I spent more time exploring this craft, and today would like to present a pair of mittens made with this technique, based roughly on an example from the National Museum in Iceland.



5W summary

Who: Nålbound mittens were found in graves that have been identified as both male and female. The Iceland example was not a grave find and has no gender assignment.

What: A pair of mittens using nålbinding technique.

When: Viking Age, specifically 10-11th centuries

Where: Inspired by an Icelandic find, with supporting material from Finnish finds.

Why: The purpose of including mittens in grave finds is speculative. The mittens appear to be practical in nature.

How: I used the Oslo stitch to make my mittens and handspun undyed wool yarn.

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Nålbinding technique

This technique has many different names. In the Iceland National Museum they referred to the mitten as having been made with the “needle coiling” technique, while others may refer to this as knotless netting, knotless knitting, single needle knitting, nålebinding, nålbindning, and looping. Nålbinding is frequently spelled naalbinding as well – likely to accommodate North American keyboards. Margrethe Hald uses the term “looped needle netting” in *Ancient Danish Textiles from bogs and burials: a comparative study of costume and Iron Age textiles*.

In Icelandic, this technique is called ‘vattarsaumur’ or ‘nålbragð’ while in Finnish nålbound mittens are called ‘neulakinnastekniikka’ (Source: Sanna-Mari Pihlajapiha, National Museum of Iceland).

There are a number of variants on the technique. Just like knitting has a variety of variants, so too does nålbinding, usually named after extant artefacts and where they were found. (Example: *Oslo stitch, Coppergate Stitch, York Stitch, etc*) Not all of the stitches are from artefacts dated to the Viking Age. The Åsle stitch for instance, is based off a mitten found at Åsle Mose in Gotland, Sweden. Originally the mitten was thought to be

from the 4th century, but later C-14 testing uncovered this mitten was actually created in the 16th century.

Nålbinding is similar to knitting in the sense that it creates a textile with a single piece of yarn (although it's cut into workable lengths instead of one continuous piece) but the result is far less stretchy than modern knitting. Knitting also produces work five times faster than nålbinding, so in many parts of the world knitting replaced nålbinding to produce similar garments. (Source: *Satu Hovi*) The Iceland National Museum notes that knitting wasn't known in Iceland until the 16th century, and even then nålbinding continued to be practised into the 20th century, largely to make milk sieve from cow tail hair.

A brief history of nålbinding

The oldest extant textile thus discovered made using nålbinding is a mesh sieve made

from plant fibre dated to 6500 BCE

found in a cave in Nahal Hemar, Israel.

(Source: *Sanna-Mari Pihlajapiha*)

Another ancient example is a bast fibre net from 4200 BCE in Denmark.

Additionally textiles made of plant fibres

from 3400 BCE have also been found in

Denmark. These early examples are

quite simply constructed, and are similar

to later examples such as a woollen hat

from the Tarim basin in northwest China

dated to 1000 BCE and sandal socks

from Egypt dated between 250-420 CE.

(Source: *Krista Vajanto, V&A*)



Egyptian sandal socks

Between the 10th and 16th centuries CE, extant finds include woollen mittens from Europe, a sock from England, a glove from Latvia, and fragments from Estonia among others. Krista Vajanto notes a “golden nålbound lace fragment” found in Mammen, Denmark dated to the 10th century. Sanna-Mari Pihlajapiha goes on to describe this golden fragment as made from gold and silver threads, and adds that the grave has been dated to the winter of 970-971.

These later finds the stitching “resembles more or less a never-ending spiral” and differences in the looping between styles are distinguishable.

Post-period nålbinding finds include socks, mittens, winter fishing mittens, caps, and milk sieves, and the craft continues today with people making a variety of practical and decorative textiles.

I am most interested in exploring nålbinding from the Viking Age, as that's where my primary persona within the SCA is based. For the purpose of this, I'll be using the

generally accepted 793–1066 CE dates for the “Viking Age”. A great deal of information is available for Finnish finds specifically from the 11th century.

Extant nålbinding finds

There are a number of extant nålbound finds dated to pre 1600s from around the world, however my primary SCA persona is Icelandic, so I wanted to concentrate on Icelandic nålbinding. Unfortunately, there is only one extant example of Viking Age nålbinding in Icelandic, so I also looked to another area of high interest for me – Finland. There have been considerably more extant nålbinding finds from Finland, though they are all fragments to add additional information about nålbinding from the age I’m interested in.

Icelandic find



Top view of the mitten

The extant nålbound mitten that I was able to see in person was an example from Iceland held at the National Museum of Iceland. This is the only example of nålbinding (*Icelandic: Nálbragð*) that I was able to find from Iceland.

Arnheiðarstaðir, Iceland

This mitten is nearly complete and is estimated to be from the 10th-11th century. According to Ulrike Claßen-Büttner, this mitten was made using the Oslo stitch, and was made using “plied course wool

yarn in two different dark colours”. In person, I did not think that the wool was particularly dark – it appeared to be of a similar colour to other textile finds from the Viking Age in Iceland, coloured by the minerals in the soil. This mitten appears to have a rounded top rather than the square top, which is seen in later European nålbound mittens. It has a slightly flared wrist, and appears to be very bulky and oversized, though when I made my own mitten, the result is a similar size, and feels comfortable on my hand. It is worthy of note that I have very large hands for a woman, so this mitten may have either belonged to a large woman like myself, or a man. The mitten is 26.3x12.1cm. (*Source: National Museum of Iceland, Sarpur*) I estimate the measurement from the tip of the thumb to the base on the outside at about 9.5cm.

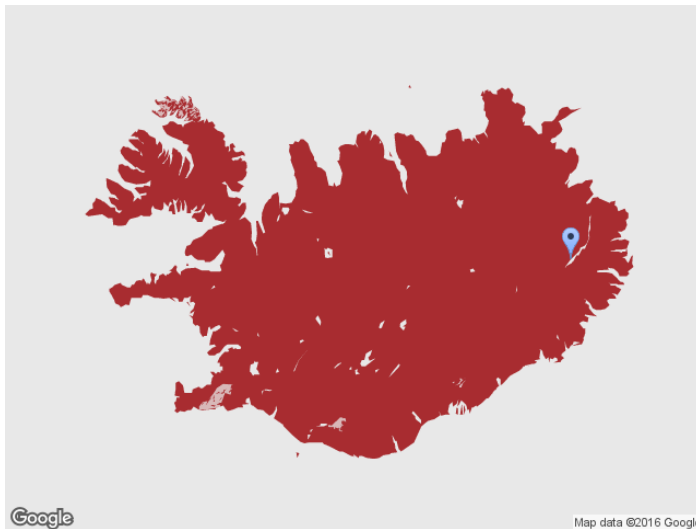
Nålbinding mittens based on an Icelandic Viking-Age example



Close up of the nålbound mitten



Woven fabric mitten also from the museum (dated 930-1200)



Location of the Icelandic mitten find

The site where the mitten was found is in Eastern Iceland, and it does not appear to be a grave find – thus it's not possible to speculate on the gender of the person who might have owned the glove. The mitten was found while excavating for building a new home, and appears to be the site of a previous farm building. (Source: *Sarpur*)

In addition to the one nålbound mitten, the Icelandic National Museum also has mittens and other small extant surviving garments made from woven fabric (vaðmál), which are outside of the scope of this project. For more information about these fabric mittens, please read Rebecca Lucas' *Three Icelandic Mittens*: <http://www.medieval-baltic.us/vikmitten.html>.



Side view of the Icelandic mitten

Finnish finds

Krista Vajanto notes that there have been several Finnish nålbound grave finds from the Late Finnish Iron Age. The majority of these finds were found in the middle part of the

grave, located near bones from the hands, or bronze rings. Despite the location in the grave of the fragments, there is no actual proof that the mittens were in fact mittens. None of them are complete, and could certainly have been a pouch or other textile object - however the regular proximity to the hands strongly suggest that these were mittens. Krista also noted that of these Late Iron Age finds, only one nålbound fragment was found near a foot bone. Like the presumed mittens, this was not complete and can not be proven to be a sock.

Kaarina Kirkkomäki, Finland

Krista Vajanto shares that the tiny fragment of nålbinding found in the Kaarina Kirkkomäki grave #1 is blue, however the colour might be a result of contamination from other blue textiles found in the grave. This fragment is only 1x1cm large, and was found near a bronze knife sheath (presumably worn at the waist). The gravesite has been dated to the 11th century, and was identified as female. The yarn used in this find is 2-ply s-spun yarn.

Grave #31 contained two fragments of nålbinding, one 4.5x4cm which was dark in colour, and yarn used in this find is 2-ply s-spun yarn. The second fragment is light coloured, and 2x1cm. This find is 2 ply, but the author was unsure if the yarn was loosely s-spun or z-spun. These were found near finger bones and a bronze knife sheath, in a female-identified grave dated to the 11th or 12th century. (*Source: Krista Vajanto*)

Graves 21, 23, 24, 27 and 40 also have nålbound fragments but colours are not mentioned. These gravesites are also dated to the 11th century, and include both female-identified graves and a male-identified grave (#24). The yarn construction isn't noted, but the fragments were found near the "middle part of the grave" near unidentified bronze items. (*Source: Krista Vajanto*)

Masku Humikkala, Finland

Grave 30 from Masku Humikkala, dated to the 11th century had a monochromatic and possibly undyed nålbound fragment. The grave has been identified as female, and the yarn used in the 3.5x1.7cm fragment is 2-ply z-spun. The fragment was found in the middle part of the grave, near hand bones. (*Source: Krista Vajanto*) Satu Hovi describes this as thin white or light yarn, though contrasts Krista's report, saying that the yarn was z-spun, and unplied – but that two yarns were used together. She describes these yarns as 0.6mm thin, together approximately 1.5mm in diameter. If this is accurate, this would be very fine yarn.

Halikko Rikala, Finland

Grave 38 from Halikko Rikala, dated to the 11th century has a nålbound fragment made of white wool. This gravesite has been identified as a male grave, and the fragment was found near a bronze finger ring. The fragment is only 2.5x2cm large, and was made of 2-ply s-spun yarn. (*Source: Krista Vajanto*)

Additionally, a stray find of nålbinding has been found at this site, and is 6x4cm large, dated to the 11th century, is reddish-brown, and may be felted. (*Source: Krista Vajanto*)

Eura Luistari, Finland

Pirkko-Liisa Lehtosalo-Hilander shares that there were striped woollen textile fragments



Photograph of the largest sample from the Eura grave.

“made with the sewn mitten technique” made with blue, red, and yellow or white yarn. The fragment included the base of a thumb of the mitten, but did not actually include a thumb. Krista Vajanto notes that the find was from grave 56, which has been identified as a female, and that the grave has been dated to the 11th century. Three fragments have been found, the smallest being 3x2.5cm, and the largest 9x5cm. These were all done in the same stitch, and the fragments were all found near the hands – near hand bones, rings, and a knife sheath.

The largest of the Eura fragments (9x5cm) was found stuck to a bronze knife sheath, which preserved the yarns. Krista Vajanto notes that the side most often photographed as the ‘better’ side “was interpreted to be the reverse side of the textile” because the front side was more degraded. This largest fragment has red, yellowish, and blue yarns, while the remaining

fragments are only yellowish and red. The yellowish and red yarns are 2 ply s-spun yarns and 2mm diameter, while the blue yarns are 1mm diameter, s-spun and “used in pairs”. Vajanto comments that all of the yarns were “spun with a moderate degree of twist”.

Köyliö Köyliönsaari, Finland

Grave 28 from Köyliö Köyliönsaari, dated to the 11th century had two monochromatic and possibly undyed nålbound fragments. These were from a female-identified grave, were found near a bronze bracelet, and were made using 2-ply s-spun yarn. One fragment is only 2.5x1.5cm large, while the second is 2x3cm. (Source: Krista Vajanto)

Piikkiö Huttalanmäki, Finland - sock

Krista Vajanto writes about nålbinding fragments from Piikkiö Huttalanmäki, but notes that no mention of colours of the original textiles were published. This find has been dated to the 11th century, and a female-identified grave. This fragment was found near a foot bone, suggesting that this is the only Finnish sock from this period. This is from grave G2, and unfortunately no information about the yarn or fragment size is available. (Source: Krista Vajanto)

Who made and wore these items

In some cases needlework is considered “women’s work” however there is no evidence one way or another to identify who might have made nålbinding garments.

Gender can not be guaranteed, as there are challenges assigning gender to graves; many graves are assigned gender based on grave goods.

Penelope Rogers notes that the 11th century was a period of “transition from domestic weaving to workshop production” in her analysis of textiles at Coppergate. She notes economic, social, and technological factors which allowed speciality artisans in the area. She notes a weavers guild in York in 1164, and that weaving moved from being a predominantly female occupation to a job performed more actively by men. I don’t believe that industry at Coppergate can be extrapolated to Viking Age Scandinavia or Baltic countries, nor do I believe that the weaving industry can be compared to production of nålbound goods, though it’s notable that the 11th century was a time of change in the production of textiles.

While in large Viking Age settlements individuals were able to specialise in particular skills, there is evidence that in the less urban areas (in particular the Faroe Islands but also Iceland) that there was less specialisation, and more home industry than their more urban counterparts of the same time.

In terms of the production of spinning, Rogers discusses both men and women being wool combers, but focus’ on women working as spinners either full-time or part-time producing yarn for their own use in this time period in Coppergate.



Warp-weighted loom from the Iceland National Museum

There is a theory that the short lengths of yarn needed for nålbinding may have come from leftovers from the weaving process. If this is accurate, then it might be that nålbinding was completed by either weavers with leftover warp yarn from the warping process (not all warp yarns can be woven) or by someone in their household.

While it might not be possible to know who made nålbound items, since many nålbinding finds have been grave finds, there has been gender assigned to the people who might have worn these items.

In the examination of 11th century Finnish nålbinding finds, Kirsta Vajanto identifies fragments found near the hands of the deceased for both male and female-identified graves. These include the Eura Luistari, Halikko Rikala, and Kaarina Kirkkomäki finds which were within female-identified graves. Additionally, the Kaarina Kirkkomäki #24

and Halikko Rikala, #38 have been identified as male. These finds suggest that mittens (or other garments worn on/near the hands) were worn by both men and women – or at least were used to dress both male and female deceased.

Purpose of nålbound mittens



Fabric mitten from Iceland

Mittens have an obvious purpose – to keep the hands warm and to protect them. The Icelandic mitten was not found in a gravesite, but rather from a site likely to have been a farmstead – thus it was likely a practical item and not exclusively a cultural or spiritual one. In the same time-frame that the Icelandic mitten was made, Icelanders also made woven fabric mittens, cut and sewn to shape. As limited extant textiles have been found from Iceland, this neither supports nor denies an impression that nålbound mittens may have had a higher or lower status or impression of quality.

The Finnish fragments are nearly all gravesite finds, and while nålbound mittens likely had a practical purpose (I found out myself that they're warm and keep the hands dry) the inclusion of the mittens in the graves may have had a cultural or spiritual purpose. Finnish men and women in the 11th century were both buried with mantles or cloaks (sometimes worn as mantles, sometimes included like blankets) though obviously the dead do not have a physical need for warmth. The suggestion that the inclusion of mittens in graves in Finland having a spiritual or cultural purpose is also supported by macrofossil finds in the burials at Kaarina Kirkkomäki, which indicate that graves #1 and #23 were done in the summer. (*Source: Krista Vajanto*)

Period methods

Fibre type

Extant finds dated to the Viking Age are wool, however pre-and-post Viking Age nålbinding was used with plant materials, and post-period finds have also included winter fishing mittens made of pig or horse hair and milk sieves made of horse hair in Finland. (*Source: Krista Vajanto*) Margrethe Hald describes a milk strainer made of nålbinding (calling it looped needle-netting) made from thread from cow's hair found in Iceland, though she does not provide a date for this find. She also refers to a milk strainer found in Lapland made of hair, but likewise does not provide a date. The Iceland National Museum indicates that cow-hair strainers were created up until the 20th century.

In an examination of the Eura fragment, the samples were determined to be mainly underwool which “can be obtained by sorting the fleece or collecting the underwool

during the natural shedding time” (*Vajanto*). Along with the underwool, one sample also included minor particles of fur hairs (perhaps hare) and bast fibres. This may have been spun into the yarn or caused by contamination.



Icelandic sheep

Another explanation might be that these fibres came from a fur lining or fur garment worn near the mittens. (*Source: Krista Vajanto*)

Underwool is finer and softer than the fleece found on other parts of the sheep, though the quality of wool varies between different breeds of sheep. “In Finland they had had Åland sheep and Kainuu-sheep” (*Source: Satu Hovi*) while in Iceland the Icelandic sheep has not been interbred with other breeds since coming with the Vikings from Norway, and thus is genetically close to Viking Age sheep.

Colour



Re-creation of the Eura mitten showing the speculative colour and design

Finds from the Viking Age in Scandinavia and the Baltics are undyed and dyed – there does not appear to be a standard. Colours from Finnish finds include blue, red, and yellow. Finds from within my period of interest are either monochromatic or striped, though later examples show evidence of coloured embroidery. (See appendix)

The yellowish yarn in the Eura mitten was tested and purpurin was the main colourant. (*Vajanto*) This chemical is found in madder, which is a plant used for dye during the Viking Age. The red yarn from the same extant fragment also mainly coloured with purpurin (again, likely madder). The blue yarn from this fragment was not tested, but is probably dyed with woad which was “cultivated on a large scale in contemporary Central Europe”. Evidence suggests that the yarns used in the textiles from the Eura grave were all dyed before nålbinding or weaving. (*Vajanto*)

Method

During the Viking Age, a number of different methods for creating nålbound items emerged. There is no evidence of how these different styles developed or migrated

Finnish 10-14th century finds largely are made of one of three stitch types, the “Finnish stitch”, “Finnish turning stitch” and the “Russian stitch”.

from one another, though the styles themselves are not restricted to one geographic area, thus I can presume that either items were transported, or the skill was shared when individuals travelled.

There are different ways of joining new yarns to an existing project. Satu Hovi references the Tuukkala mitten (dated to the 13th or 14th century) indicating that the existing yarn is looped and worked back into the mitten, then the new yarn is looped into the old yarn and the nålbinding continues. She notes that this works well with thick and heavy material, but not well with finer yarn. She explains that an alternative is to join the yarns by ‘opening the ends and mix them together’, but she has not had success with this method. My method is to spit-join the ends, though she does not reference an extant find that supports this method.

Oslo stitch



Oslo Mitten and reconstruction

I opted to use the Oslo stitch for my mittens as it's the stitch used for the Arnheiðarstaðir, Iceland mitten that I was able to view in person. This stitch was used to make a variety of extant finds, including a pre-1400 mitten from Lund, Sweden, and “at least three mittens from Copenhagen” (*Claßen-Büttner*) Denmark. It was also used to create a textile fragment found at Novgorod, Russia that has been dated to between the 10th and 15th century. This Russian example is the “only known Rus piece (of nålbinding) from the Viking Age”. This fragment is believed to be a mitten, though it may also have been from a shoe liner. (*Source: Carolyn Priest-*

Dorman) The name of this stitch comes from an 11th century mitten found in Oslo, Norway.

Yarn type

In an examination of 10th-14th century Finnish finds, mittens were made of s-spun and z-spun yarn, including 2 and 4-ply yarn. There also unplied yarn found used for nålbinding in this period. (*Source: Krista Vajanto*)

Items

Extant finds from Finland during the 11th century include mittens and one sock. The Icelandic nålbound item is a mitten. Other objects were made before and after the 11th century.

Mitten design

Satu Hovi states that in Viking Age Scandinavia “mittens were flat from the top” rather than having rounded fingertips, however I only looked at Icelandic and Finnish nålbinding examples. The Icelandic mitten has a curved top, and the 11th century Finnish nålbinding fragments are only fragments – no complete mittens to illustrate what the top

might look like. In my examination of other mittens from outside this area and time frame, I found rounded tops.



Lund mitten. Note the rounded fingertips and straight wrist.

Additionally, Hovi discusses the shape of the wrist/arm of mittens. While no Finnish nålbound mittens have survived intact, she references mittens from Lund, Sweden – pre 1400s, Riga, Latvia – 13th century, and Åsle, Sweden – 16th century. The earlier mittens she describes have straight wrists, while the later period mitten has a flared armhole. The Icelandic mitten from the 11th century is nearly



Åsle mitten

complete, and has a slightly flared wrist.

Needles

Nålbinding needles are different from sewing needles – they are larger with a large eye to accommodate yarn instead of thread.

In Finland, no extant bone or wood nålbinding needles have been found. A bronze needle has been found at Eura. (*Source: Satu Hovi*) Penelope Rogers indicates that nålbinding needles were often made of bone, were blunt-tipped, and references three bone needles from Coppergate, England dated to the Viking Age. Else Østergård discusses “coarse needles” used for nålbinding for making stockings, gloves, and milk-strainers. Her work is focused on Greenland, where she notes that no nålbinding examples have been found. She also notes that no examples of mittens have been found at all in Greenland. (It is worthy to note that Østergård’s work is focused on medieval Greenland, not specifically Viking Age Greenland.)



Pins and needles from the museum

At the Iceland National Museum, there are several needles on display. The ones pictured to the left include bone and bronze pins on the left, used to hold garments together, and bronze sewing needles along with a bronze needle holder. The needle holder is approximately 7cm tall by my estimate (with the sewing needles slightly smaller), while the needle I use for nålbinding is approximately 9cm tall. Despite the description in the museum, I suspect that the bone ‘pin’ on the left may have been a

nålbinding needle. (*More about needles in the appendix.*)

My mittens

I have made two other pairs of mittens before this pair for display, which helped me learn more about the technique.

I'll briefly discuss them before discussing how I made my mittens for this competition.

First pair



My first pair of mittens were made using a 80% Merino wool & 20% nylon blend commercially-produced yarn. I tried two different techniques to create the thumb shape, learning from the first mitten to make the second. Thus, these two mittens aren't attempting to be identical to one another.

Second pair

For my second pair of mittens, I tried yet a different method of developing the thumb hole that I was less happy with, a different method of building the thumb, and used my very first attempts at hand-spun 100% wool.



While I was happy with the hand-spinning when I made it, I found that the lack of consistency created a less than desirable product. The stage photographed above (one mitten and a partial mitten) represents about 72 meters of hand-spun wool yarn.



The Icelandic mitten close up

These mittens were intended to be a "matched pair" however as I made one and then the next, the results are inconsistent. This was another lesson for me.

How I made this pair

Hand-spinning

For this pair of mittens, I started off using hand-spun wool made from undyed Fine Shetland Top wool. This

was purchased from Shuttleworks Fibre Arts just outside of Calgary. I opted to use undyed wool because of the frequency of undyed wool used for mittens in extant examples from the 11th century that I learned about. Although the Arnheiðarstaðir, Iceland mitten is reportedly made of dark wool, I didn't think this was necessarily the case from seeing the mitten in person.

While it might have been possible to shear sheep, process the wool, and card/comb it myself, this did not seem like a reasonable amount of work for this project. I did however have the opportunity to comb wool while at the Festival of the Snow Eaters 2015 – a very time-consuming task. I did spin up this wool with my drop spindle as well and am quite happy with the (very small) sample of yarn which resulted from this.



The brown yarn was wool-alpaca blend that I carded and spun, while the purple yarn is purchased alpaca-merino top that I spun on my stone whorl drop spindle.



Yarn on my makeshift warping board

I started off with the purchased wool, divided it, spread it out, and used a commercial yarn as a leader on my top-whorl drop spindle. I could have as easily used a handspun yarn as a leader, but that's what's already on my spindle. I used a purchased spindle from Stash Needle Works Lounge in Calgary.

Once I had spun a fair amount of yarn (and my spindle was quite full) I used a makeshift warping board (dowels held between books on my bookshelf) to wind the yarn off my spindle, and bundle it up for washing. I read that the washing and drying helps "set" the spin in the wool.

I washed the wool in hand-washing detergent in my sink, swung/smacked it to get out excess water (a tip I read online) and left it to drip-dry with some weight in my shower. After drying the wool went back on the makeshift warping board (my bookshelf) and then I used a wool winder to make balls. I also wound the wool on dowels at times, to make them portable without getting unwound when I tossed them in a bag to go to A&S practice.

Although I made a drop spindle to get a better feel for spinning with a period-informed stone spindle whorl, I didn't use the stone spindle for the yarn for this project. This was due to timing and weather.

While the yarn I spun is not entirely consistent in diameter throughout its length, it is far better than my earlier attempts at hand spinning. The average diameter of my yarn is approximately 4mm, which is about twice as thick as the yarn used in the Finnish Eura mitten, but I was using the Icelandic mitten as a visual guide, which appears to use much thicker yarn than the Eura mitten.

Then the yarn was ready to use for nålbinding!

Nålbinding

The original extant mitten I saw in the Iceland museum appeared to be quite large, and I presumed that this was so a thinner pair of mittens or gloves could be worn underneath. After wearing my second pair of wool mittens in the rain on a cold day, I realised that while this might be a practical option for dexterity, it definitely wasn't necessary for warmth.

For this pair of mittens I used the hand-spun wool that I created on my drop spindle, and the Oslo stitch. Lengths of yarn were joined by spit-joining, and I used the yarn as-is, without plying it or selecting strands for a consistent diameter. The Oslo stitch is what the Arnheiðarstaðir, Iceland mitten was made from.

The Icelandic mitten had a rounded top where the fingertips go, which I also wanted for my mitten. However, it has a slightly flared wrist which I did not want to imitate, because I find it warmer to wear my mittens inside my coat sleeves rather than over them. The Icelandic mitten is made of 'course' yarn, which made me feel comfortable using my own handspun wool, though it's more 'rough' than it might be if I were a more experienced hand-spinner.

- My initial chain was about 11 inches long.



Measuring the initial length of nålbinding

- From there I circled it around to make the mittens in the round, and worked from the wrist up towards the fingertips.
- I made a tube approximately 5 inches long for the wrist area of the mitten. I wasn't working with any instructions, so tried the mitten on every few rows to check the length.
- This would be the point where I'd start the thumbhole.
 - At this point I also bound back in the original tail from the starting chain - looping it back in to the starting chain and trimming off the excess.
- To develop the thumbhole I stopped working on the main part of the mitten, and worked off a chain approximately 4 inches long.
- Based on my previous mitten attempts, I decided to create a tall loop for the thumb to fit in, and started re-attaching the chain approximately 2.5 inches from it's start, creating a tall hole.



Measuring the placement of the thumbhole

I continued to work the mitten, going up from the new thumbhole towards the fingertips.

- I worked up approximately 1.5 inches and then marked the sides of the mitten on both sides with scrap yarn.
 - This marking would allow me to evenly curve the mitten in from the sides. I replicated this marking on the opposite side of the mitten as well.
 - I did not do this on my earlier mittens, and found that this made a good impact on the shape of my mitten.
- To create the curve, I decreased on the sides, taking two stitches instead of one on either side of the side marking line. I only did this for one



The thumbhole and scrap-yarn marker

round however, since I didn't need a large curve at this point. I would repeat this when I got up to around the area of the pinkie finger, but only on one side.

- Once I had worked up to the fingertips, I was ready to bring in the curve of the top of the mitten. I did this by continuing to reduce by two stitches to bring in the top of the mitten.



Picking up two stitches to decrease the size of the mitten



Decreasing at the top of the mitten.

Next I was ready to add the thumb to my mittens.

- With a strand of contrasting scrap yarn, I marked where the "top" of the thumbhole is.
- I pulled in another strand of yarn, weaving it into the loops. I approached from the left side of the thumbhole, (on a "right" hand mitten) so that the first set of loops for the mitten would develop on the outside of the thumb. (The bottom of the hole.
- When I got to the 'top' of the thumb hole, or what would be the inside of the thumb, I reduced by two stitches for every stitch (decreasing) for the whole length for one round.
- For the 'bottom' of the thumbhole, I returned to doing one-by-one stitches (neither increasing nor reducing).

Two at a time

In order to stay on track, and remember how to make these so they would closely match, I did each step a bit at a time on each mitten.

A note on measurements

I opted to measure length of how much nålbinding I had done rather than counting stitches because of the handspun wool. I didn't trust that the same number of stitches would match if I went by stitches rather than length - and length was more important to me to match between each mitten.

Nålbinding mittens based on an Icelandic Viking-Age example

- Going along the round, I did six stitches reduced (6 stitches reduced to three) on the inside of the thumb. From there on in I did one-by-one stitches (neither increasing nor reducing) for the length of the thumb until it was ready to be reduced for the tip of the thumb.
- I reduced the thumb tip the same way that I did at the fingertips.



The mitten ready for a thumb



Adding new yarn in for the thumb



The top of the thumb hole marked with scrap yarn, adding in decreased stitches to create the top side of the thumb



Thumb in progress



Finished pair of nålbound mittens

My completed mittens are approximately 30cm tall and 12.5cm wide across the widest part of the mitten. This means they are just slightly larger than the Arnheiðarstaðir, Iceland mitten, which measures 26.3x12.1cm. Likewise, I estimate the Icelandic mitten's thumb from the tip to the base on the outside at approximately 9.5cm, while the outside thumb on my mitten is closer to 8.5cm.

Needles

For my project I used a bone needle that I purchased. I have also successfully used needles originally made for plastic canvas, which I found a bit too flexible for my purposes. I have also used metal needles intended for tapestry work, but found that the bone needle “feels” nicer in my hand. It also looks more ‘period’ when doing nålbinding at SCA events.

Areas of note

There are two areas I'd like to point out about these mittens.



1. The blue circle - this is where the thumb joins onto the mitten, and you might notice that the nålbinding in this area is less dense. Other people in the Facebook nålbinding community mentioned that this is a common trait of making mittens. In my other mittens I used scrap yarn to "fill in" this area, but for this project I left this as-is.
2. The pink circle - you'll notice that this is also less dense. This is due to the nature of the handspun wool that I spun - it's not evenly consistent throughout the strand; there are thick bits and thin bits - this less dense area is where the yarn was thinner. With commercially spun wool this isn't a factor. Once I become more proficient at regulating the diameter of the wool, I'll be able to improve upon this.

Areas for improvement

As noted above in the areas of note, I would be able to make a mitten that looks more like the extant version once I am able to gain more skill with hand-spinning to make a more consistent diameter yarn.

I also read frequently of a 1963 publication by Odd Norland entitled *Primitive Scandinavian Textiles in Knotless Netting*, which I was unable to access through the university library. I read previews on Google Books and it only had three instances discussing Icelandic nålbinding, which leads me to believe that it would not have significant additional information – however as a further goal it might be valuable to see if I can obtain it a different way.

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Appendixes

Later Finnish grave finds

Much information about nålbinding in Finland also comes from extant examples dated to after the Viking Age. Although I didn't use these examples to influence my project directly, I think there is much to be learned from these items.

Unfortunately, there are no additional Icelandic finds to add additional references about Icelandic nålbinding.

Kekomäki in Kaukola, Finland

Pirkko-Liisa Lehtosalo-Hilander notes that mittens from the Finnish late Iron Age were “made with a needle like sewn mittens” when discussing a fragment find from a grave find from Kekomäki in Kaukola, Finland. Krista Vajanto also discusses the finds from this gravesite, dating the grave to the 13-14th centuries. She says that the fragment is 6.7x5.8cm large, and that there were multiple colours in loose s-spun wool, and was found near a finger ring.

This mitten is striped, with three colours; white or yellow, red or brown, and blue. The yarn used is between 0.9-1.1mm in diameter, and is s-spun, z-ply, very fine spinning. (*Source: Satu Hovi*) The finest hand spinning I've been able to do thus far with my drop spindle is about 2mm in diameter, and I have yet to try nålbinding with it.

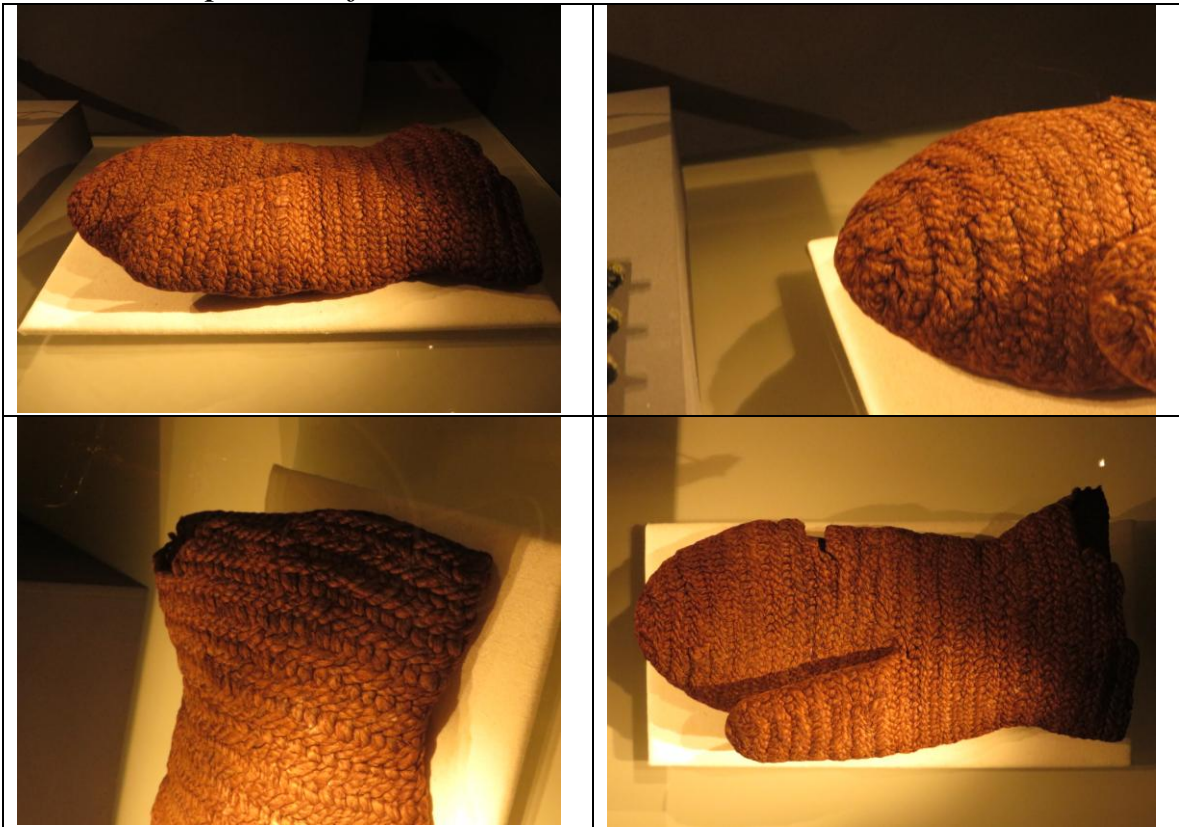
Mikkeli Tuukkala, Finland

Krista Vajanto discusses two graves from this area, dated to the 13-14th century (identified as male) and 13th century (identified as female). The find from the male-identified grave is 18x5.5cm large and made of 2ply z-spun wool, with decoration made of either loose s-spun wool or perhaps not spun. The other grave contained a 10x10.5cm fragment, which is s-spun and not plyed. It has a felted z-spun decoration.

Perniö Yliskylä, Finland

Grave 6 from Perniö Yliskylä, dated to the 12th century had a monochromatic and possibly undyed nålbound fragment. This was from a female-identified grave, was 2-ply z-spun, and is 2.5x1.5cm large. The fragment was stuck to a bronze finger ring. (*Source: Krista Vajanto*) Satu Hovi contradicts Krista's report, and states that the yarn was white z-spun unplied yarn with two yarns used together.

Additional photos of the Icelandic nålbound mitten



The other photographs used in this document are largely from my July 2014 trip to the National Museum in Iceland, while the photographs shared here are from my November 2015 trip.

Icelandic needles

The Sarpur website is a database of cultural finds from Iceland, and has a number of needles from a close time period to what I'm exploring. Below is a table illustrating the details of just some of them. I've included those after the 11th century since

Artefact number	Date	Material	Size
2007-44-143	1186-1554	Iron & bronze (multiple)	N/a
2007-44-718 & 2007-44-753 & 2007-44-316	1186-1554	Wood	N/a
82-75/1982-135-75	1200-1900	Bone	8.6x0.4cm
1987-384-1176	1650-1750	Bone	10.4x0.6cm
11297 / 1932-3	870-1000	unknown	12.4x0.5cm
12724/1939-45-152	900-1100	Bone	3.5x0.6cm
4374-6	1900-2000	Bone	9.8x1.1cm
4374-5	1900-2000	Bone	8.6x1.7cm
240	Unknown	Bone	8.5cm long



Loom weights and needles uncovered after a volcanic eruption.

The needle I used for this project is 9cm long by 0.5cm at the widest point and is made of bone. All but one of the needles listed above (where measurements are available) fall into this general size range. This suggests to me that needles for this kind of craft were being produced and used from as early as 870 to as late as 2000 CE (with an understanding that the dates listed above are ranges, and only represent extant finds). The oldest needles found are made of bone in the Icelandic finds, though as the chart illustrates, other materials were used in Iceland to make needles.

Embroidered later-period fragments

Nålbound fragments from the 11th century Finland do not include embroidery – the embroidered fragments mentioned by Krista Vajanto are later than the period I’m exploring. These fragments are from graves at Mikkeli Tuukkala. One fragment from this gravesite is from a male-identified grave has been dated between the 13th and 14th centuries, and she writes that this fragment was likely a mitten of undyed white wool. The embroidery was done with either blue or green yarn using a chain stitch, herringbone stitch, and stem stitch. She notes that ‘some reddish embroidery is also present’.

The second find from Mikkeli Tuukkala discussed by Krista Vajanto is from a female-identified grave dated to the 13th century. This is made of undyed and probably slightly felted white sheep’s wool. The embroidery is done with blue and reddish yarn using herringbone and stem stitch.

Challenging resources

While looking for information on nålbinding, I found some contradictory information found both online and in published and edited sources. For instance, in *In Search of Vikings: Interdisciplinary Approaches to the Scandinavian Heritage of North-West England* edited by Stephen E. Harding, David Griffiths, and Elizabeth Royles (CRC Press, 2015), the author writes about a nålbound Viking Age find from York, noting that it’s a “form of crocheting developed in Sweden”, and that the technique is “virtually unknown outside Scandinavia”.

The author also notes that “the only other example came from Viking Age Dublin in the Irish Sea region”. This is problematic because of the extensive finds from Finland (not Scandinavia) and the Russian find noted in the body of my research, not to mention that the earliest finds of the technique are not from Sweden either. Although this book is more recent than many of my other sources, I am more inclined to believe the other resources about the origins of the technique and the distribution of finds.

Likewise in *Donna Kooler's Encyclopedia of Knitting*, (Donna Kooler, Leisure Arts, Inc., 2012) the author indicates that “ancient nålbinded items found include small bags, and garments that need to stretch and bend around odd shapes – usually feet and hands”. Unfortunately she does not offer any examples of nålbound pouches or bags, and unfortunately refers to the Åsle mitten as a find dated to the 3rd century, while many other resources have indicated that further testing has proven this mitten was created in the 16th century.

An additional challenge comes from language and translation issues. For instance, Sarpur – a database of cultural artefacts from Iceland was challenging because of the dialect used in their articles. Although I could use Google Translate to get a rough idea of what the article said, I had to confirm the interpretation with my friend Guðmundur Jónsson from Reykjavík who confirmed my interpretation, but understood the challenge, as the article is “written in old Icelandic” (*personal conversation*)