

**"KNOTTY" HEADWEAR: HOW TO NET A MEDIEVAL CAUL OR SNOOD** by Giraude Benet  
(revised September 5, 2005)

**A Brief History of the Hair Net in the 14th Century:**

Based on pictorial and archaeological evidence, the hair net (known in various costume texts as a caul, crespine, crespinette, fret, or the post-period term snood) began to make an appearance on the heads of the fashionable women of England as early as the 11th century, and reached its peak of popularity in early to mid 14th century. As you can see in figures 1 and 2, the hair net was worn with a barbette (a wide linen band, which appears to be folded as it passes under the chin) and filet (a narrower linen head band). It could be worn with or without a couvre-chef, or veil. The net was most likely pinned to the barbette and filet as a way to help keep it securely on the head.



fig. 1



fig. 2

This style of hair dressing must not have been looked upon with favor by the Catholic Church, given its depiction in illuminated psalters of the period. The Oremby Psalter (now in the Bodleian Library) shows an illuminated initial with the figure of a fox, decked out in a hair net, barbette and filet (fig. 3). A psalter in the collections of St. John's College, Cambridge has an illumination of a serpent with the head and arms of a woman coiled around a tree (fig. 4). Like the fox in the previous example, the woman is wearing a hair net, barbette and filet. Given these examples, the hair net worn without a covering veil must have been seen by some as very naughty (and knotty!) headwear indeed!



fig. 3



fig. 4

By the late 14th century and early 15th centuries the hair net had evolved into the elaborate reticulated headdress (fig. 5). Network caps, made with heavier cords and constructed differently than the earlier English examples were popular in 15th-century Italian fashion, as seen in the famous portrait of Beatrice d'Este (fig. 6).



fig. 5



fig. 6

This does not mean that the hair net was not worn in later periods, however. The paintings of Lucas Cranach the Elder from the early 16th century shows many women wearing hair nets, including beaded nets, as part of their hair dressing.



fig. 7  
Detail from  
Hercules and Omphale, 1537



fig. 8  
Detail from  
Judith Victorious, 1530



fig. 9  
Portrait of  
Margarethe von Ponickau. 1526

## Netting Tools and Techniques:

Tools and materials: The basic tools and materials to start netting are few and relatively easy to acquire. To start, you will need:

- A netting shuttle or needle
- A mesh or gauge stick
- Your desired string, yarn, or thread
- A clamp, pole, or some other item or surface upon which to anchor the work

**Netting shuttles** are tools used to produce netting for fishing nets, hammocks, or net bags.

**Netting needles** are much finer, and are used to produce the type of netting necessary for hairnets. Both can be acquired for around \$5.00 from Laxis (<http://www.laxis.com>) or Snowgoose (<http://snowgoose.com>).

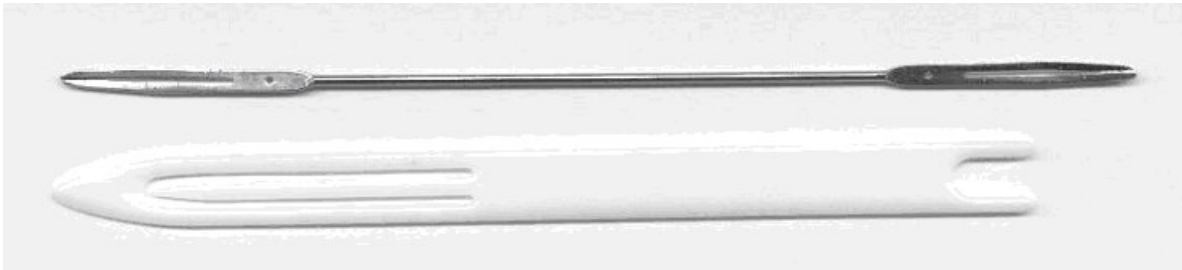


fig. 10: netting needle (top), netting shuttle

Netting needles can be improvised if you have more creativity than money. One very useful improvised netting needle can be made by taping two six-inch upholstery needles together, as seen in figure 7:



fig. 11: netting needle made of two upholstery needles taped together

Not only is this a very workable netting needle, it is also good to use with delicate threads, or threads that have gold or silver filaments wrapped around the outside. A regular netting needle can cut the gold or silver filaments as the thread is wound on or unwound from the needle, and this type of constructed netting needle is very gentle to the thread.

A **mesh stick** is a round or flat stick of consistent width necessary to keep the loops of the netting a uniform size. The width of the mesh stick will determine the size of the openings in the net (the openings in the mesh will be twice the width of the mesh stick). The mesh stick must be wider than the netting shuttle or needle being used, or else net won't be large enough to pass the shuttle or needle through to tie the knots! Mesh sticks can be made of wood, metal or plastic. A double-pointed knitting needle works well as a mesh stick if it's of the correct diameter. Wooden craft sticks (the ones that look

like popsicle sticks) are also an alternative, although they tend to be a little splintery. "Quilters Press Bars" found in the quilting section of most fabric stores make great mesh sticks. They come in a pack of five widths, all good for netting, although you will probably want to cut them in half to make them a more useable length.

**Thread.** The surviving hairnets shown in the book Clothing and Textiles c.1150-c.1450 are all made of a lightly plied, fine silk Z- or S-ply thread. The nets in this book are described as being varying shades of brown, but this could be due to their age and time in the ground before discovery. Other surviving hairnets, especially the embroidered hairnets found at St. Truiden, Belgium, are described as being in various colors, so a color thread would also be period.

It's important to use plied thread with a twist for netting. The twist in the thread is what helps the knot "lock" and remain tight. Netting knots should be firm enough that a piece of netting can be cut to size without the fear of the knots in the piece coming undone in any way. To start out with, I recommend size five or size ten crochet cotton. It's easier to work with for beginners, comes in a variety of colors, and it's very easy on the pocketbook. Avoid rayon threads and yarns! Although they look gorgeous, this is a very slick fiber. Your knots won't stay firm and your loops will slip, resulting in a very uneven net!

If you do decide to use silk, I recommend that you use reeled silk and not spun silk. Not only is this the most period material, reeled silk is strong enough to hold up to the tension that you will subject it to while netting. Spun silk can break with annoying frequency, so if you do use it for your netting, be prepared for the challenge.

**How to anchor your work:** Most small netting projects are suspended on a loop of string or cord called a "foundation loop." In the 13th and 14th centuries, women sometimes anchored their foundation loop to the top of a short staff (fig. 9). This is a very good anchor to use, since you can keep the netting at any level which is comfortable for you to work with, and it's very portable.



fig. 12



fig. 13 detail of netting stand

Some decorative wooden curtain rods with decorative finials are an attractive possibility -- just remove the finial from one end and make a base for it to rest on the floor.

If you don't want to carry a pole with you wherever you want to work on your netting, clamping the foundation loop to the edge of a sturdy table is another viable option. Any type of clamp will work. My favorite is the clamp that comes with my "third hand" sewing tool, since it is specifically designed to be clamped onto furniture, and has a bit of padding. Clamps of other types can be hard on wood, though, so don't set up your netting at your antique dinner table (or anyone else's, for that matter). It's also possible to put the foundation loop through a longer, thicker length of cord or strip of fabric that you loop around your foot, adjusting the length so that the edge you're working on is always in your lap. I don't like looking down at that sort of angle, though, so I don't use this method of anchoring.

### The Basic Netting Knot:

The basic knot used in netting from ancient times to the present is the "sheet bend" knot. The following diagram shows how to make this knot:



Bring thread through top loop from behind



Take thread behind top loop, forming lower loop



Bring thread around to front and run through lower loop



Pull thread until the knot is tight

Now that you can see where the thread needs to go to make the knot, let's talk about what to do with your hands:

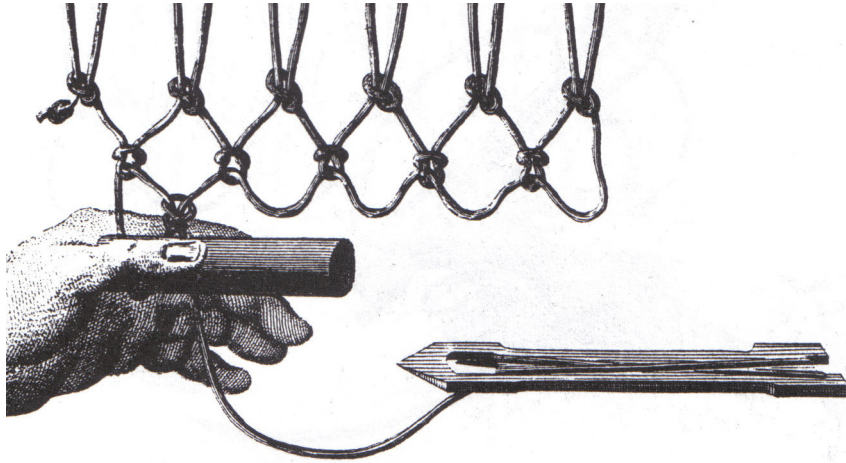


fig. 14

With the mesh stick in your left hand, bring the working thread down over the top of the stick, and hold it in place with your thumb.

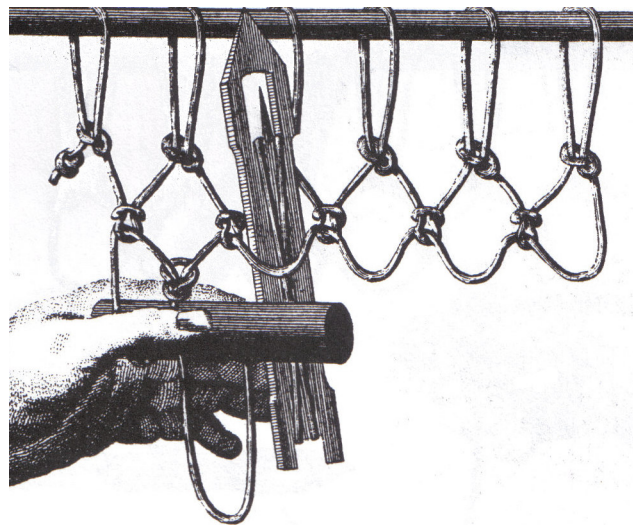


fig. 15

Come back up behind the mesh stick and run the thread through the mesh in the row above that you're going to tie the knot in.

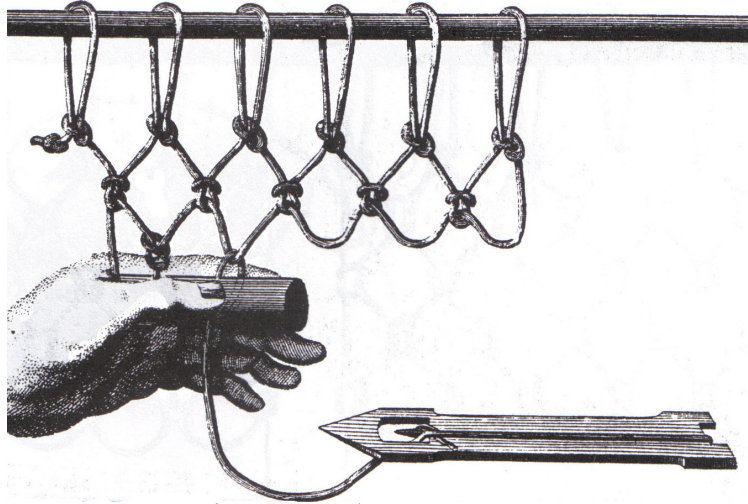


fig. 16

Pull the thread back down over the top of the mesh stick, then pull the thread tight so that the top loop is pulled into a tight "V" and the bottom of that "V" is sitting on top of the mesh stick. (From this point on in the knot tying process, you will want to keep a firm and consistent tension on the net you're working with. This is the secret to getting a good, even mesh. Just don't pull so hard that you break any threads!) Anchor the working thread firmly in place on the mesh stick by pinching it on the stick between the thumb and forefinger of your left hand.

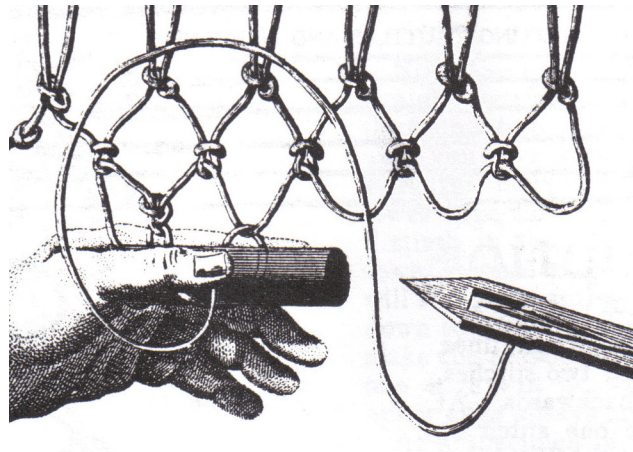


fig. 17

Swing the working thread back behind the joint of your thumb, and up over the mesh you are knotting into. This will help in making the sheet bend knot.

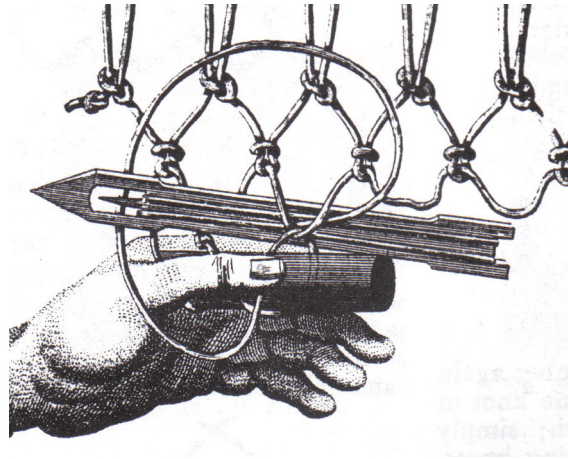


fig. 18

Take the netting needle behind both legs of the top loop, but keep it in front of the working thread. This is important, since this is what will make your knot. Once you've got the shuttle out from behind the top loop, start to pull, taking up the slack of the loop you made over the joint of your thumb. Do not let go of the thread under your thumb!

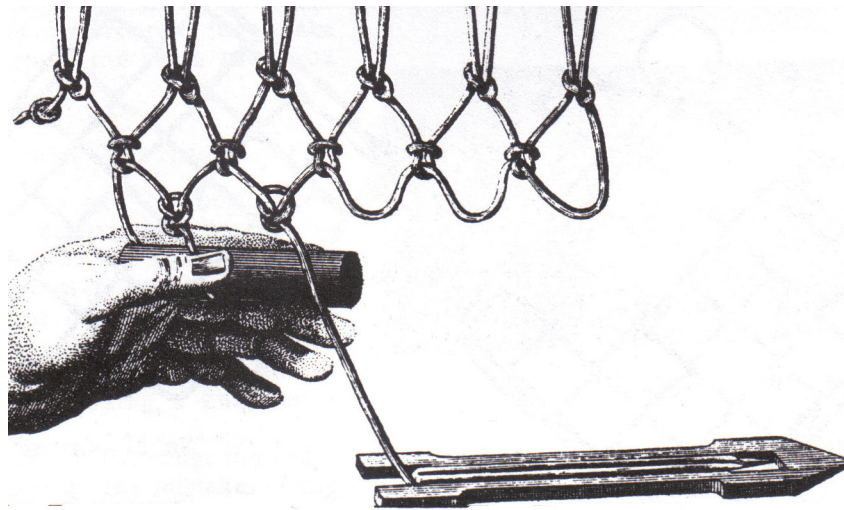


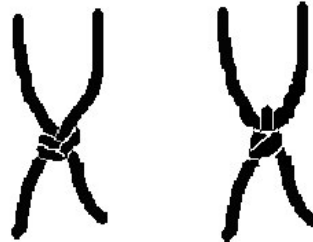
fig. 19

Keep the tension on the working thread tight, and ease the anchored part of the thread out from under your thumb until the knot snaps tight. If you have done everything correctly, the knot should form right on top of the mesh stick.

(If you're left handed, hold the mesh stick in your right hand and the netting needle or shuttle in your left hand. Instead of working your rows from left to right, work them from right to left, taking the working thread behind the top loop from left to right instead of from right to left as shown in the diagrams above.)



Do make sure that when you tighten the knot that the bottom of the top loop becomes part of the knot, or else the knot will be able to slide. This takes a bit of practice, but it helps if you pinch the threads together slightly above the mesh stick, and then pull towards you and slightly up as you finish tightening the knot. If your knots look like the illustration on the right, the knots will slide around and your meshes won't stay even.

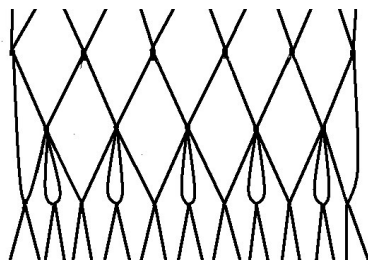


correct knot      incorrect knot

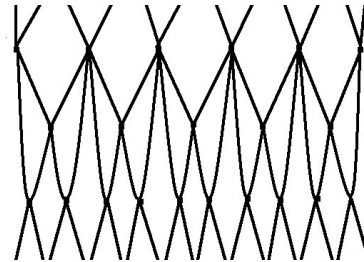
### **Increasing, Decreasing, Adding New Thread, and Other Useful Information:**

#### **How to increase a row:**

As in knitting, sometimes it is necessary to increase the number of loops in a row. This is especially true in medieval hairnets, which frequently start at the crown with a certain number of loops, and then increase to double that number after several rows. The modern way of increasing is to knot two meshes in the same loop. The period way of increasing is to make the extra knot into the row above (see illustration).



modern increase



medieval increase

#### **How to decrease a row:**

To decrease the number of loops in a row, tie one knot through two adjacent loops, tying them together.

### **Adding a new thread:**

When your netting needle is out of thread, the best knot I've found for joining the new thread onto the last of the old is a type of lacemaker's or weaver's knot. I'll describe it as best I can! Fill the netting needle with new thread, then make a loose slip knot at the end of the thread (make the slip knot so that it "slips" when you pull the thread coming from the needle, not the trailing end). Loop the slip knot onto the old thread, and push it as close as possible to the last knot you made. Pull the slip knot tight, and give it a firm tug until you feel the old thread "pop" into the slip knot. Give the joined threads a gentle tug to fully tighten the knot. If made correctly, this knot is very firm and doesn't seem to slip, so you can clip the loose ends very close to the knot, making the join in the threads very difficult to see in your finished net.

Other ways to add the new thread is to tie the first knot with the new thread over the last knot made with the old thread, or

A plastic or metal yarn or tapestry needle, of the sort used in knitting, is handy to have when you are getting close to the end of your working thread. You can remove the last length of thread from the netting needle, thread it through the eye of the yarn needle, and tie a few more knots before having to refill the netting needle. This is a handy technique to use, especially if you are working with silk and want to minimize waste.

### **General netting hints and tips:**

While you're learning the basics of netting, it is easier to work with the knots spread out a bit on the foundation loop so that the loops of the net all appear very distinctly. Once you are comfortable with the technique, however, try to work with the knots as close together as possible on the foundation loop. This will make it easier to get a more consistent tension as you work so you make more evenly-sized loops in your net.

If you find that you have skipped a loop in a previous row, or failed to make a complete knot in a previous row, this can be corrected. You will need to cut away all the loops made after the flaw and the flawed loop itself, join a fresh working thread to the loose end of the last correct loop, then proceed with the net. If the flaw is not noticeable, however, you can finish the net and leave the flaw in place.

Also, there are many variations on the basic technique for making netting. The one I'm teaching is the one that works best for me. If you delve deeper into the bibliography at the end of this handout, you'll see what I mean. Each book gives a slightly different way of using the foundation loop, of tying the basic knot, etc. Experiment, and use whatever technique that works best for you!

## Casting Directly onto the Foundation Loop:

Once you have some practice tying the basic netting knot, you will want to try starting a netting project by casting the first row of loops onto the foundation loop, but not in the same way you did with the practice square. This creates results that are more consistent with the features of surviving medieval hairnets, and the method of starting I recommend if you are aiming for greater authenticity. The illustrations below show a net being cast onto a dowel, which will also work as a foundation if you plan to make a flat piece of netting.

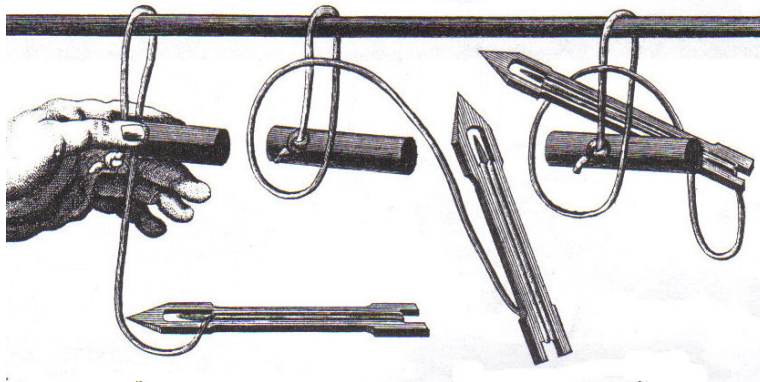


fig. 20

Tie a knot into the end of the working thread, bring the thread around the foundation, and then hold both parts of the thread onto the mesh stick with your thumb to form a loop. Proceed to tie a sheet bend around this loop as if it were a regular mesh. Since you are not tying these knots into a mesh, they do not lock the same way and *can* slip. This why you need to tie a knot in the end of the working thread for the first knot...this will prevent the end of the thread from slipping out of the knot. If you use care, though, and tie them firmly, the knots will remain relatively stable until after you finish the second row of net.

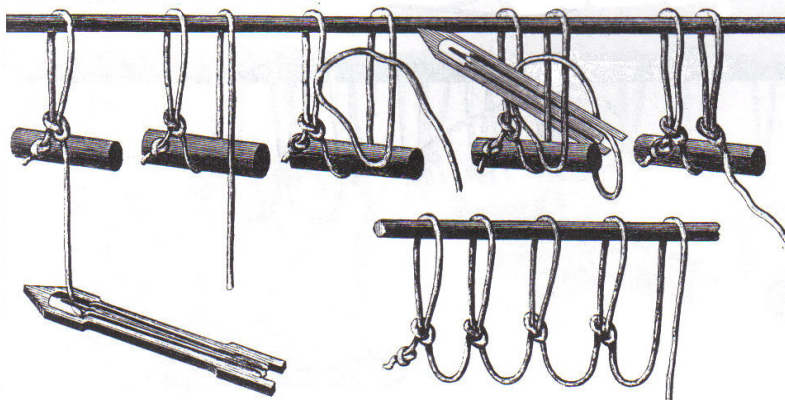


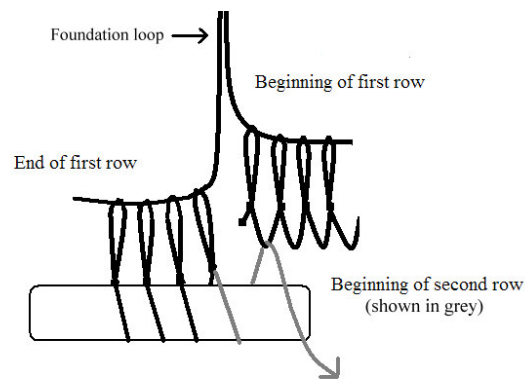
fig. 21

After you have tied the first knot, bring the working thread under the mesh stick, then behind and over the foundation to form the next loop you will use for the second knot. Pinch both sides of this loop onto the mesh stick, and tie a sheet bend around this loop. Repeat until you have cast on the required number of meshes to start your netting project.

## Flat Netting vs. Circular/Spiral Netting:

To make a flat piece of netting, when you reach the end of a row, you remove the mesh stick from the row you just created, flip the work over so that the working thread is again on the left side, and then start the next row. Most hairnets from the medieval period, however, are made from tubes of netting (netted in a spiral) that are gathered at one end and stitched to a length of braid at the open end.

It isn't much more difficult to make circular/spiral netting than it is to make a flat piece of netting. When you reach the end of your first row of netting, simply start the second row by bringing the end of the first row around to meet the start, and make your next knot into the first loop of the first row, as shown in the illustration:



At first, the place where the spiral begins will be slightly more difficult to work with, but after a few rows you won't notice it at all.

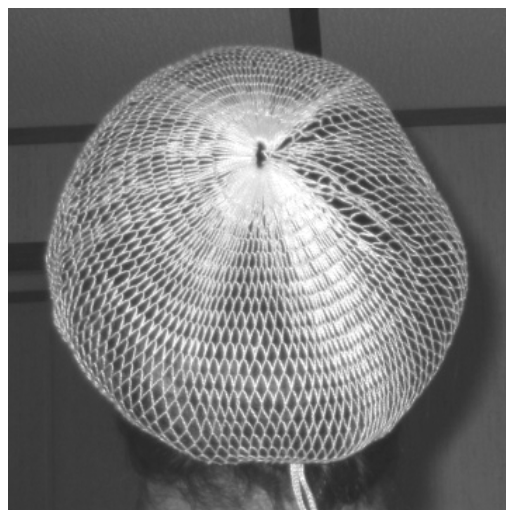


Photo of one of my medieval-style hairnets netted in a spiral

### **Basic Circular Hairnet:**

Tools required:

- Netting needle
- 3/8 inch wide mesh stick, or a size 3 double-point knitting needle

Make 50 meshes onto a foundation loop.

Continue to net in the round using the spiral netting technique for 30-35 rows, or until the tube of net is as long as desired. Finish the net as described further below.

### **Easy "Rectangle" Hairnet:**

You can also make a hairnet out of a flat rectangle of net, kind of like a "lunchroom lady" hairnet. While I can't document any period hairnets made in this fashion, this is an easy project that can be made with very basic netting skills (and I promise you won't look like a lunchroom lady when you wear it with your garb).

Tools required: Same as above

Make 40 meshes onto a foundation loop. Continue to net until you have a rectangle 40 meshes wide and approximately 60 meshes long.

Gather both ends by running strong threads through the loops at the ends and tying them snug, which will make a hammock-like bag. The ungathered sides of your net will now form the edges of the hairnet, which can be finished off using any of the finishing methods described below.

### **A More Period Hairnet:**

Surviving medieval hairnets almost always have loops at the crown that are longer than the rest of the meshes of the net, and they also frequently start out with half the number of meshes, then increase to the full number of meshes after several rows. This project attempts to re-create these common features to create a reasonably authentic hairnet.

Tools required:

- Netting needle
- 3/16 inch or 4 mm wide mesh stick, or size 00 or 000 double-point knitting needle

Make 70 meshes onto a foundation loop, making the first row of loops about 3/4 to one inch long. Using the spiral netting technique, make several rows with the 4 mm mesh stick, then double the number of loops by increasing to 140 meshes for the remaining rows. Continue netting until the net is long enough to fit you, usually about 10 or 11 inches measured from the crown to the edge with the meshes pulled taut down the length.

## How to finish off a hairnet:

For the circular hairnets, finish the crown of the net by running a length of thread through the first row of loops, pulling it tight, and tying it off securely.

The authentic way to finish off the open end of the net is to stitch it to either fingerloop or tablet-woven braid. The way I do it (learned from Emmelyne de Marksbury) is to take a length of braid and measure it to fit your head plus extra to tie. Tie the braid to fit your head comfortably, then stitch the net to the braid starting a few inches to one side of the knot in the braid, and finishing several inches to the other side of the knot. Undo the knot, then thread the unstitched braid through the remaining unstitched loops. This makes the net adjustable, and easier to put on. (If the loops of your net are too small to thread the braid through, you can add a section of larger loops with a single or double thread to form a "casing" for the unstitched ends.)

The quick way to finish off the net is to run a length of braided threads through the last row of loops like a drawstring, and tie the braid to fit your head

The modern expedient for finishing off the net is to take a length of round elastic, run it through the last row of loops, and tie it off so that it fits your head comfortably without sliding off. This isn't authentic, of course, but it's an alternative for those who prefer it.

**Questions? Contact me!** If you have any questions about these projects, or about netting in general, you can reach me via e-mail at [giraude@wedcraft.com](mailto:giraude@wedcraft.com). You can also visit my netting webpage at <http://wedcraft.com/netting.html>.

## SOURCES OF ILLUSTRATIONS:

Figures 1 and 2: Handbook of English Medieval Costume by C. Willet Cunnington and Phyllis Cunnington. Boston: Plays, Inc., 1969.

Figure 3: The Book of Costume, Vol. I by Milla Davenport. New York: Crown Publishers, 1948.

Figure 4: Textiles and Clothing c. 1150-c.1450 by Elisabeth Crowfoot, Frances Pritchard, and Kay Staniland. Woodbridge, England: The Boydell Press, 2001.

Figures 5 and 6: Accessories of Dress by Katherine Morris Lester and Bess Viola Oerke. Peoria, Illinois: Chas. A. Bennet Publications, 1940.

Figures 7, 8, 9 Paintings of Lucas Cranach the Elder, as noted.

Figures 12 & 13: Artes Minores: Dank an Werner Abegg edited by H von M Stettler and M. Lemberg. Bern, Switzerland

Figures 14-21: "Filets de Peche, de Chasse, &c". from Encyclopédie, ou Dictionnaire raisonné des sciences, des métiers et des arts, 1751-1772

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## **ANNOTATED BIBLIOGRAPHY ON NETTING:**

**The Art of Netting. Jules and Kaethe Kliot, eds. Berkeley: Lacis Publications, 1989.**

This book presents a series of different netting instructions and projects reprinted from books and magazines from the late 1700's up to the early 20th century. Of particular interest are the variety of netting knots illustrated at the beginning of the work, and the glossary of darning stitches in the back which can be used to make filet lace

**Brittain, Judy. The Step-by-Step Needlecraft Encyclopedia. New York: Portland House, 1997.**

Some very well-illustrated and clearly presented instructions for netting are found on pages 186-191 of this all-around useful needlecraft book. Basic techniques for mounting a project, how to increase and decrease meshes in a row, how to add a new thread, and how to create square and diamond mesh nets are given as well as how to net in the round. Projects for a string bag and a hammock finish up the chapter on netting.

**Crowfoot, Elisabeth, Frances Pritchard, and Kay Staniland. Textiles and Clothing c.1150-c.1450. Medieval Finds from Excavations in London: 4. Woodbridge, Suffolk, England: Boydell Press, 2001.**

Pages 145-149 of this edition deal with various fragments of hairnets from the 13th and 14th centuries found in the medieval excavations in London. The analysis of these fragments gives information on construction, materials, tools, and techniques used to create the nets. Tantalizing mention is also made of another surviving hairnet in the Germanisches National Museum in Nuremberg, and also of a manuscript illumination of a woman working on a net

**Guild, Vera P. Good Housekeeping New Complete Book of Needlecraft. New York: Good Housekeeping Books, 1971.**

The section on netting from pages 399-403 is unusual in several respects. First, it shows an unusual way of tying the basic netting knot. It also illustrates the use of a "starter chain" of meshes as a way to begin a piece of netting, which I have found to be the easiest for a beginner to work with.

**Reader's Digest Complete Guide to Needlework. Pleasantville, New York: Reader's Digest Association, 1979.**

Instructions for netting are found on pages 420-425 of this book. The chapter is specifically on filet netting, but the basic instructions are the same for any type of netting work. The illustrations of the techniques are very clear and understandable, which is a hallmark of almost all Reader's Digest "how to" books. There is a glossary of darning stitches for filet netting, and a sampler project to make.

**Stof uit de kist. De middeleeuwse textielschat uit de abdij van St.-Truiden. Leuven: Peeters, 1991.**

Although the text is in Dutch, there are descriptions and photos of seven surviving hairnets from excavations at the Abbey of St. Truiden in Belgium. It also has other fascinating textile finds, so this book would be of interest to weavers in the SCA as well. The Peeters Publishers website still has this book listed for sale for 30 Euros. The listing for the book is at:

<http://www.peeters-leuven.be/boekoverz.asp?nr=2493> (I don't have any association with Peeters...I just want more people to be able to get their hands on this book!)

**Vinciolo, Federico. Renaissance Patterns for Lace, Embroidery and Needlepoint: An Unabridged Facsimile of the 'Singuliers et nouveaux pourtraicts' of 1587. New York: Dover Publications, 1971.**

This is a good book for anyone wanting to take their skill with netting one step further to create authentic filet netting (also called filet lace). While the first part of the book is dedicated to other forms of lace designs, the second part offers an interesting selection of patterns that can be darned into square netting. Stitches for darning net can also be found in both The Art of Netting and The Reader's Digest Complete Guide to Needlework, mentioned above.

#### **ANOTATED LIST OF WEBSITES (In no particular order)**

**Silkewerk (by Cindy Myers)**

**<http://www.silkewerk.com>**

This is a "must see" website for making an authentic net. Cindy Myers, known in the SCA as Emmelyne de Marksbury, has done some of the most extensive research into medieval hairnets that I have seen. Her website features a method of starting a net by mounting it onto a dowel, which she concludes is a logical way to start a hairnet and get the long top loops that are such a consistent feature of medieval hairnets. Definitely have a look her extensive bibliography, which includes books featuring archaeological finds and period illustrations of hairnets.

**Anne Liese's Fibers and Stuff: Netting**

**[http://www.geocities.com/anne\\_liese\\_w/Netting/netindex.htm](http://www.geocities.com/anne_liese_w/Netting/netindex.htm)**

I recommend this website as another "must see" for anyone wanting to make an authentic net. Mistress Anne Liese of the East Kingdom has published good instructions for making tubular netting the period way. Check out the "Sources" section! It has a really excellent bibliography to help you with your further research!



### **Cauls, Hairnets and Snoods (by Rita Bartholomew)**

**<http://www.knotsindeed.freeservers.com/patterns/snoods.html>**

Rita Bartholomew has put together an overall excellent website on netting. While this particular page is on making cauls and hairnets, the entire site is a great resource for netting techniques and projects. The hairnet projects listed on the site are very useful and useable, and can be adapted to make a more period hairnet by stitching the netting to a cord instead of using the "drawstring" method of finishing off the net. The pictures of finished hairnets that accompany each project are especially nice!

### **Netting for Hairnets (by Magistra Nicolaa de Bracton)**

**<http://members.tripod.com/nicolaa5/articles/hairnet.htm>**

An excellent set of instructions by Magistra Nicolaa for anyone interested in taking up the craft of netting. This web page gives good, basic documentation for the construction of hairnets with accompanying illustrations. Especially noteworthy are the very clear diagrams for tying the basic netting knot (in this case, a picture really is worth a thousand words). This was my starting point for learning how to net and make a caul! Some of the links to her illustrations no longer work, but all the basic information is still there.

### **Sixteenth Century Cauls, Hairnets and Snoods**

**<http://costume.dm.net/headwear/snood.html>**

This web page gives an overview of how cauls, hairnets and hair bags were worn in later period. More emphasis is given to non-netted headwear.

### **Netting**

**<http://www.northnet.org/ropeworks/reader/net-1.pdf>**

A very clearly illustrated set of instructions by Gerald L. Findley in pdf format. If you're still confused about tying the basic knot, check out these instructions. This document gives diagrams and instructions for how to carve your own wooden netting shuttle and mesh stick, and also shows how to start a net by casting it on to a ring instead of a loop of cord.

### **Knotcraft by Stuart E. Grainger**

**<http://www.troop54.com/knots/Netting.htm>**

This webpage is actually an excerpt from Stuart E. Grainger's book "Knotted Fabrics." It illustrates several different knots that can be used in netting other than the standard sheet bend, but unfortunately does not show the technique for making them, other than for the very interesting "reef knot." The page also briefly discusses alternative netmaking methods