

Twisted Textiles

Spin Patterning in Bronze Age and Iron Age Textiles

Hallstatt Salt Mine Edition

The Honorable Glenna Cholmondeley



Introduction

This project probably began for me in the early 2000s when I first learned about spin patterning from members of my weaving guild, shortly after I began weaving. Spin patterning is a method of using differences in twist direction in yarn to create visual patterns in textiles.

This project began in earnest for me as a focus of research in the SCA a couple of years ago when I discovered that spin patterning was used in the bronze age by finding an example in Ancient Danish Textiles of Bogs and Burials by Margaritha Hald. I also discovered many examples of Textiles using spin patterning from the Hallstatt Salt mines from the book Textiles from Hallstatt by Karina Gromer et al. I have reproduced two of the textiles in this book so far, as well as a proof of concept sample, which were included in my Seven Pearls event entry.





Twist Direction

All yarn and thread is twisted to create structural integrity and strength in the fibers. There are two directions that yarn can be twisted. A clockwise twist will create a yarn that slants from bottom left to top right, resembling the letter Z. a counter-clockwise twist will create a yarn that slants from top left to bottom right, resembling the letter S. A yarn that is spun from loose fiber is called a single or singles yarn. These yarns can be twisted together to create plied yarn, which is spun in the opposite direction of the singles yarn in most cases.



Woven Textiles

Modern woven textiles, for the most part, are made from yarns that are consistent, usually plied, in both warp and weft. Warp is composed of the threads that are stretched and aligned first, and Weft is composed of the threads that are woven across the Warp to make the cloth.



Bronze Age and Iron Age textiles are usually made from singles yarn, but can be made from plied yarns or paired singles yarns. Spin patterning can be employed that uses the same fibers, spun in different directions, grouped to give the visual impression of stripes or checks or other visual effects that occur because of the way light reflects differently from yarns spun in different directions. This is what I am studying.



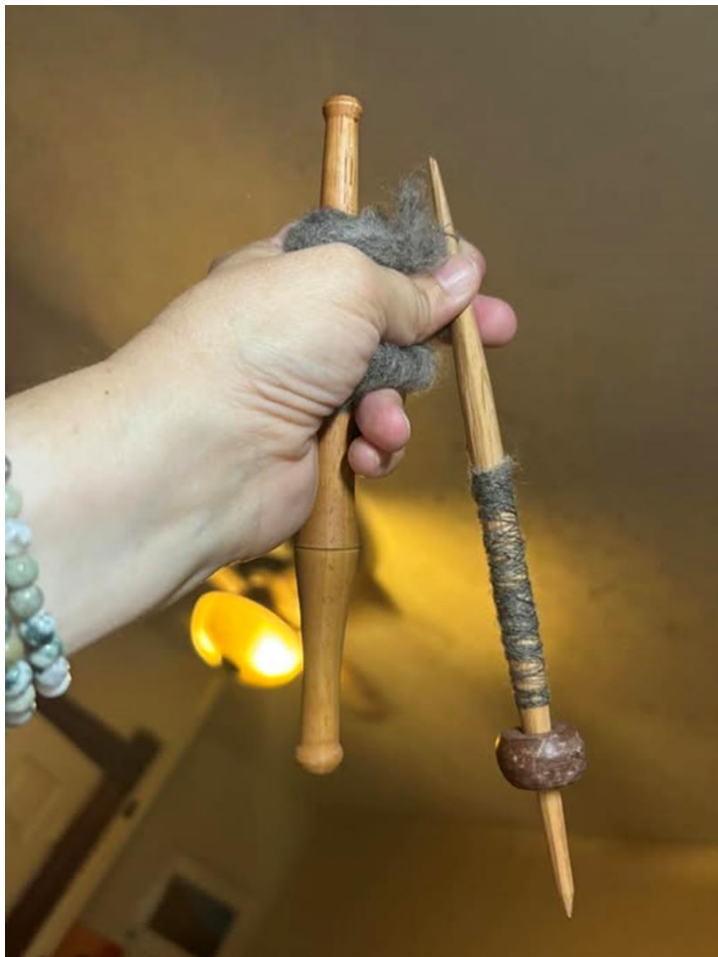


Hallstatt Textiles

The Hallstatt Textiles is a collection of more than 700 individual textile fragments from the Bronze Age and Iron Age that were preserved in a salt mine. They are the remains of clothing, hauling sacks, rags, etc. were left in the mine and preserved and cataloged by the Natural History Museum in Vienna. I have been using this collection of textiles for my research because many of them use spin patterning in the weaving. The catalog also has sufficient detail to reproduce these textiles.

Issues I Have Had and Things I Have Changed in This Project

Admittedly, I am in the early stages of this research. I have had many issues and adjusted many things in the process of creating samples of the textiles on which I am working. I know the techniques I use for the next few samples will continue to evolve. I will try and describe the issues I have found in the following paragraphs.



Spindles

Initially, I spun the yarn for this project using modern top-whorl drop spindles. They work well and I didn't really have issues with these spindles, but it was suggested that I use period spindles for this project. I am now using period style spindle sticks with spindle whorls that date from 900–1100 that were sourced from Ukraine. These spindles actually are more relaxing to use and probably work better for this project.

Looms

As I am replicating the weave structure of textile fragments with handspun yarn, I am making fairly small samples at this stage in the project. My initial samples were woven on small, laser-cut frame looms using a long yarn needle to pick up the pattern. One of the issues I have had with this is the spacing of the slots for the warp on this loom is wider than the ideal spacing of the hand-spun yarn. Another issue I had with this loom was the structure of the loom made it difficult to manipulate the weft threads, because there was a solid bar on the side of the loom.





My next attempt was using a bead loom that had a narrower spacing for warp threads. I also attempted to use heddles with this loom and a shuttle that held more yarn. The heddles did not work well for this set up and I could not easily get the shuttle through the warp. Within a few rows, I was consistently breaking warp threads. The spacing on this loom for the warp threads was also wider than ideal, so this attempt was scrapped.



For the next setup, I use the bead loom again, scrapping the shuttle and using tapestry bobbins as shuttles. I adjusted the spacing of the warp threads by putting multiple threads in the slots to space the warp. This worked much better.

In period, these textiles were probably woven on a warp-weighted loom. Because of portability, space restrictions, and the size of the samples I am making, I will probably not use a warp-weighted loom until much later in the process, but will continue to use modern tools that will produce identical weave structures.





Fibers

The fibers used in the Hallstatt Textiles are almost exclusively wool. I have been using hand-processed fleece. I purchased whole fleeces and have cleaned and combed the fleece to create my spinning fiber. The first fleece I prepared was a brown Shetland lamb's fleece. This created beautiful fiber that spun well, but I feel that the texture and color of this wool did not show the patterning to its best advantage. I then worked with a grey fleece that is a mixed breed adult sheep (Rambouillet, Suffolk, and Texel). This fleece spun up nicely, but was hairy and sticky like Velcro while weaving. Now I am working with a lighter-colored Finnsheep Fleece (Finnsheep is a breed of sheep that has older genetics).

Conclusion

I have been learning a lot by working on this project. I have had to change a lot and I feel that my ability to adapt to problems I encounter has improved. I also feel that my spinning, weaving, and research skills have improved. I am looking forward to exploring twist directions further and finding more sources and techniques.

Bibliography

Birchler, Peter, Karina Gromer, Regina Hofmann-de Keijzer, Anton Kern, Hans, Reschreiter. *Hallstatt Textiles: Technical Analysis, Scientific Investigation and Experiment on Iron Age Textiles*. BAR Publishing, Oxford, 2005.

Gromer, Karina, Anton Kern, Hans Reschreiter and Helga Rosel-MautenDorfer. *Textiles From Hallstatt: Weaving Culture in Bronze Age and Iron Age Salt Mines*. Archaeolingua, 2013.

Hald, Margrethe. *Ancient Danish Textiles from Bogs and Burials: A Comparative Study of Costume and Iron Age Textiles*. The National Museum of Denmark, 1980.

Kern, Anton. *Kingdom of Salt: 7000 years of Hallstatt*. Naturische Museum Wien, 2016.

Into the Wild

On the Trail of SCA Foresters

Master Morien MacBain

Over the course of the last few years, a brilliant new note has arisen in the symphony of hobbies that comprise the Society. SCA Forestry arose first in the Kingdom of the East, and has since spread to kingdoms across the Known World, offering many a vibrant new way of enjoying and deepening their relationships with the natural world and primitive skills relating to it. Æthelmearc now has a full-fledged guild of its own, which has been experiencing high levels of activity and rapid growth!

Foresters engage with the wild spaces of their kingdoms, engaging in a myriad of activities: period camping, hiking, water voyaging, primitive firecraft, foraging, shelter construction, period survival, hunting and fishing aptitude, as well as herbalism, plant/fungi/animal identification and lore, land navigation, craft skills like cordage-making from natural materials, charcoal-making, and countless other abilities that help participants reconnect with the Green! Foresters also devote themselves to teaching their hard-won skills to others, and welcome members of all skill levels.

Some Forester activities may involve multi-day primitive-skills voyaging with period equipment, while others may be practiced in one's own home, garden, or yard. Foresters also form a sort of extended family that crosses kingdom boundaries.

Several subgroups exist within Forestry. Woodwards focus on the Arts and Sciences of outdoor life as well as service to others. Regarders combine their wilderness and weapons skills in tests of endurance. Rangers concern themselves with woodcraft, survival skills, and finding adventures by land and water. There's something for everyone in what we do, and yearly skills challenges give people

encouragement to branch out and try new skills and practice and refine their old ones.

To learn more online: please reach out to online Guild resources, some of which are listed below:

Æthelmearc Royal Guild of Foresters: <https://aethelmearcforesters.weebly.com/>

Æthelmearc Royal Guild of Foresters, Barony of St. Swithin's Bog Foresters, AND Foresters of the BMDL all have Facebook pages as well (to be added to the last one, reach out to Tristyn (Jean Heather on FB) to be sent an invite!

Details on the Forester Challenges (NOT limited to Foresters of Æthelmearc Residents): https://aethelmearcforesters.weebly.com/the-long-trail/2025-2026-aethelmearc-foresters-guild-challenges?fbclid=IwY2xjawNt86VleHRuA2FlbQIxMABicmlkETFubnU4NTc0OE50emVSWmdGAR6ARKSLfiSuh_9hsD6pbCkohf1Xstzjn_3xJv17nH3WaD_sjcBdDZnRBlyr3A_aem_5YXzqKLSQKVF_dIDMKzfNQ

Come join us in good cheer and see who we are and what we do. Happy trails!

Morien MacBain, Warden of the Æthelmearc Royal Guild of Foresters, Ranger

MISSIVE FROM THE MONEYS GUILD

The Moneys' Guild is announcing their second 10,000 Coin Project in preparation for the coming year and will need many citizens volunteering their time to achieve this goal. The Moneys Guild has a Facebook page:

<https://www.facebook.com/groups/577491179299268/>

And you can ask to join here:

<https://docs.google.com/forms/d/e/1FAIpQLScVdRfcj9Vi6ypXeas9-01yY6ogQdRLLeNLIY7j5Pq9z0y9IBw/viewform>

UPCOMING EVENTS:

The College of Silva Vulcani invites you to join them on November 15th for Fall Academy 2025 in California, PA. Come and spend the day with us and our wonderful instructors, marshals, and Majesties. <https://aethelmearc.org/event/fall-aethelmearc-academy-suggested-date-region-2/>

Class List available here: <https://drive.google.com/file/d/1hS-V2w7cCFpw4AkR-AIawIUDBAGEn8BJ/view?usp=drivesdk>

Nithgaard is once again hosting the Known World's finest Fiber Arts Symposium on November 21 through November 23 in Spring Mills, PA:
<https://aethelmearc.org/event/fiber-fabric-fighting-7/>

NOTE FROM THE EDITOR:

If you have an idea for a rabbit hole, please contact the A&S Minister's Office at ans@aethelmearc.org. We would love to include your arts and sciences in a future edition of the Sylvan Signal.