BLEND, SPIN & KNIT FLAX: A Handspun Shawl to Cast On

Spin Off

WINTER 2024

the art & craft of spinning yarn

DEEP ROOTS natural fibers

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& More

SPIN OFF WINTER 2024

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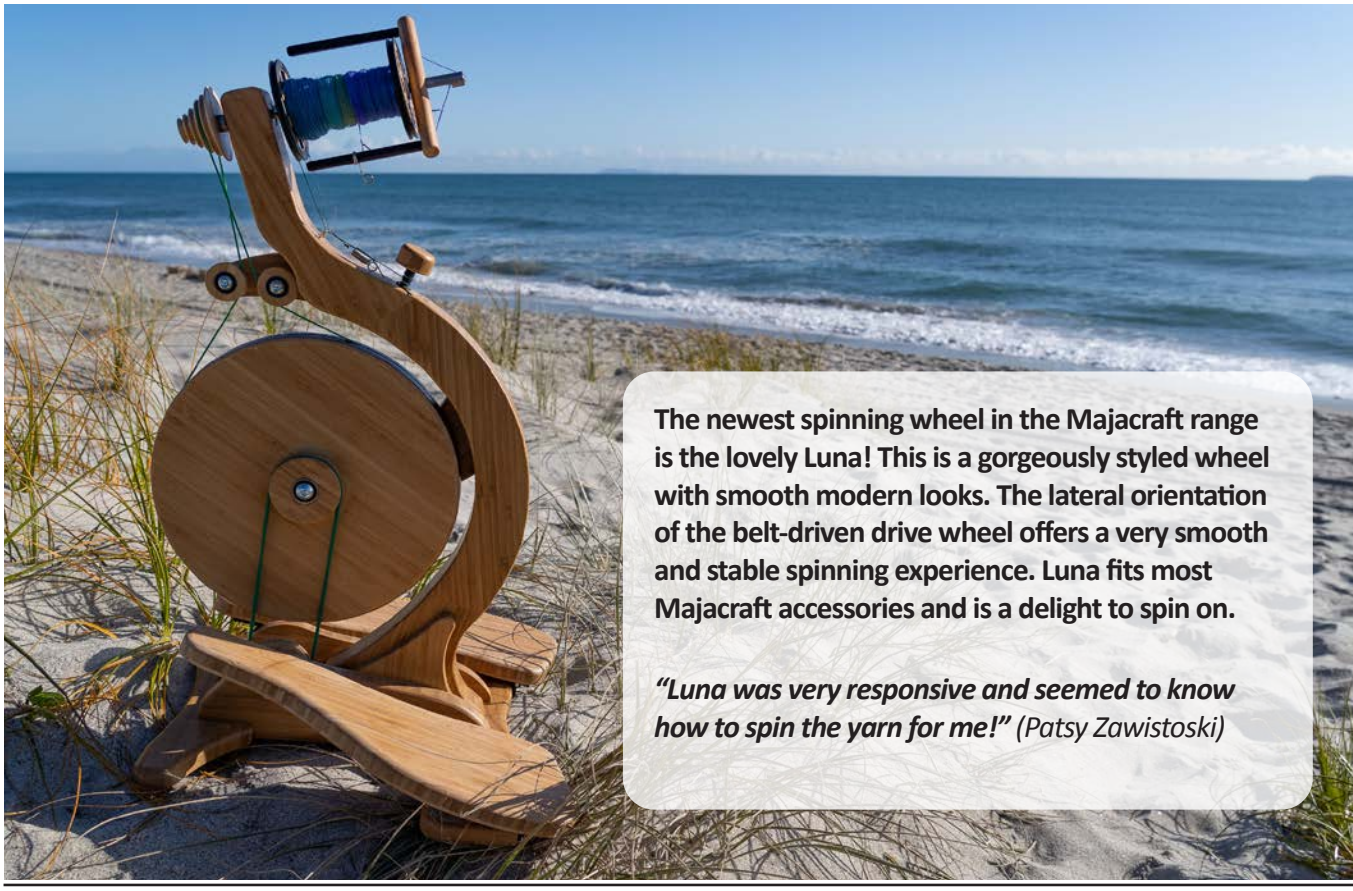

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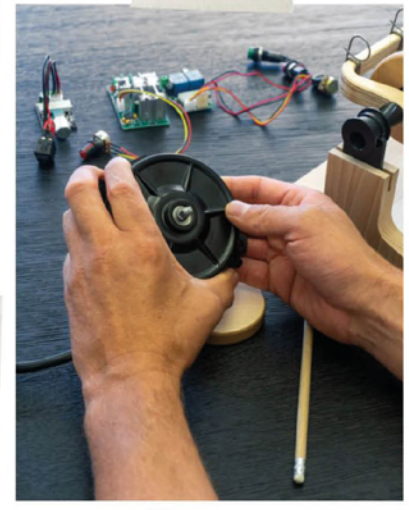

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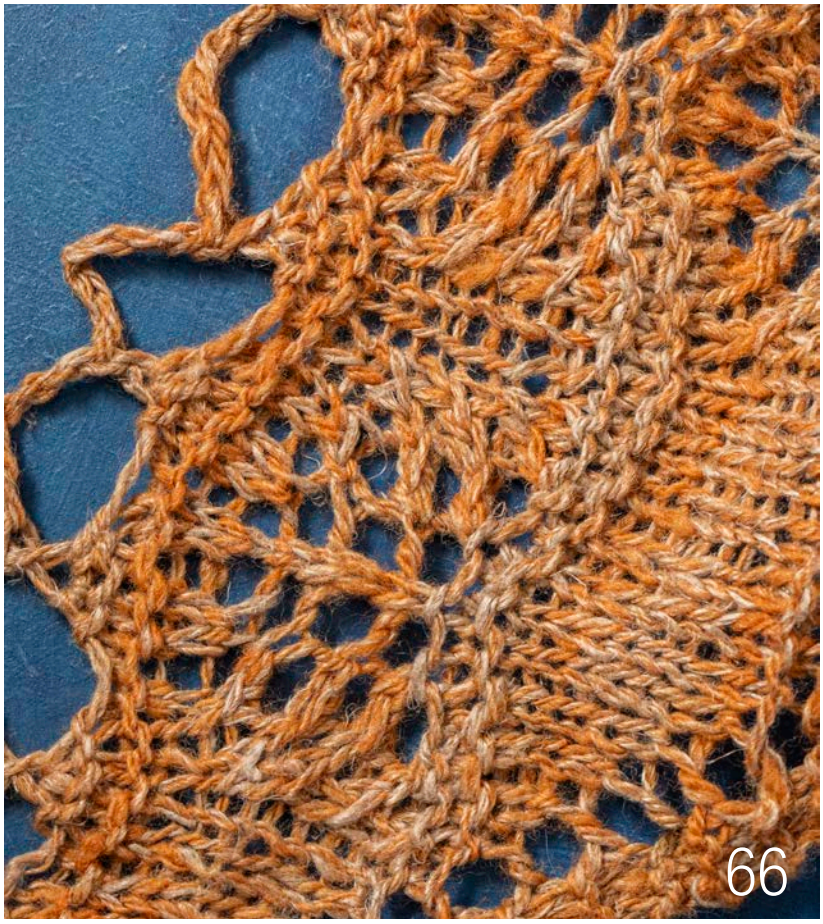

Photos by Matt Graves unless otherwise noted

DEPARTMENTS

On the cover: Navajo ewe and lamb on the Navajo Nation
Photo by Diné shepherd Nikyle Begay

spinoffmagazine.com

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The natural fibers we work with—cotton, wool, flax, hemp, and silk, for example—have traveled along with us throughout human history and carry complex stories. Each has, at times, been raised sustainably and processed by makers respected in their communities. Each also has ties to periods of breathtaking extraction and harm.

However, we can also find people today using these plants and animals as a tool to improve the world around them. In this Deep Roots issue, many of the authors are intensely dedicated to not only helping others understand histories, cultures, and landscapes, but also to helping people like you and me connect with them through our spinning fingers. We can participate in making these hopeful visions for the future a reality.

The world is teaming with natural fibers; this issue alone will take you to a dozen countries. **A. Sabine Schröder-Gravendyck** introduces us to the Skudde, a rare Prussian sheep that has found a revival in landscape restoration efforts. **Jeanne Carver**, a force in the American wool industry, shares her work in creating climate-beneficial Shaniko wool; we hope you'll give it a spin! **Chitra Balasubramaniam** explores sheep breeds in India, which has the world's second largest population of sheep (Surprised? I was.)

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Dr. Annamarie Hatcher takes us back tens of thousands of years to explore the roots of plant fibers, while **Barbara Kelly-Landry** walks us through blending flax with wool or silk for a drapey yet cozy wrap. **Emily Robison** shares how her work with Micronesian communities has inspired her to process plants found near her home in Puerto Rico, and **Jacqueline Harp** is here to help you successfully process suri alpaca.

And on the cover, we have **Nikyle Begay**'s Navajo-Churro ewe and lamb looking fiercely into the future. Natural fibers can endure with our support, so let's get spinning.

Spin Off®
Vol. XLVII No. 4 Winter 2024

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Photo by Debbie Blair

From Judy's collection: fuller's teasel *(left)* and wild teasel

Teasels through Time

I REALLY ENJOYED THE ARTICLE on teasels in the Fall 2023 issue of *SpinOff* ["Testing Teasel: A Stone Age Approach to Flax Processing" by Steph Horak]. When I was a kid, we had wild teasels growing along the side of our driveway. We also lived near Skaneateles/Marcellus, New York, which was the teasel capital of the world during the time when the domestic teasels were used extensively in the production of wool fabrics.

As an adult, I became interested in those fuller teasels due to my interest in spinning and weaving. I managed to grow some fuller teasels, although too many times the seeds that I bought as fuller turned out to be the wild ones, wasting two years each time only to discover that! I also grew and processed flax, both at home and at the Harlow House, a living museum in Plymouth, Massachusetts. I wish I had known then about using teasels in that process! Anyhow, I loved the article . . . one of my favorites of all time.

—Judy Gilchrist

Colcha Connections

I READ WITH GREAT INTEREST the article by Julia Gomez on colcha embroidery and *sabanilla* [*Spin Off* Spring 2023]. I am a dyer, spinner, and weaver who volunteers in the living history program at Old Town San Diego State Historic Park. Our period of interpretation is 1821–1872, and we have direct evidence of colcha embroidery by the women of the pueblo.

About 10 years ago, park curators and interpretive staff asked me to make colcha embroidery yarn and sabanilla fabric from Churro fleece. After some research and experimentation, I produced embroidery yarn and handwoven cloth, both made from locally sourced Churro fleece. I made many skeins of naturally dyed embroidery yarn and many yards of sabanilla for the museums in the park. Much of the Churro yarn was spun in the park in front of park visitors. Some of this work will be used to create an altar cloth at Casa de Estudillo, a National Historic Landmark. Some will be placed elsewhere in the adobe museums at the park. It has been my pleasure to participate in this program.

Handspun sabanilla

Photo courtesy of Susan Hector

—Susan Hector

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Healing Fibers

IN FEBRUARY 2022, I HAD a stroke. Once I was home from the hospital, my daughter Rebecca and I found some yarn in my stash. Years ago, I taught her to knit; this time she had to cast on for me. I started knitting—a step forward! Doing this with Becca was comforting, and with a little practice, it all came back.

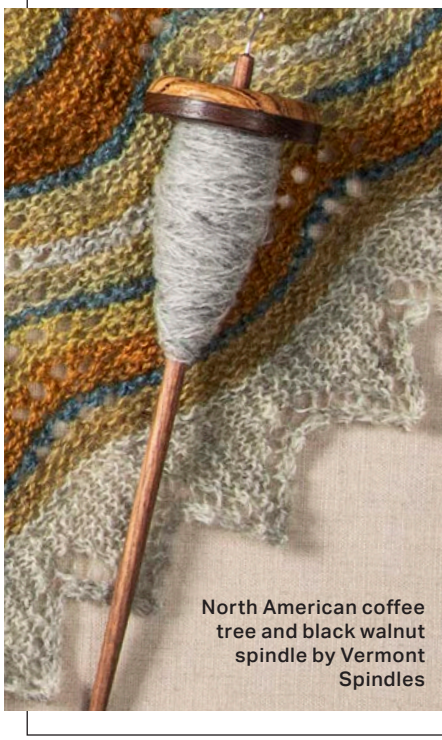
Combing a gray Nistock Farm fleece from a Cotswold named Poppy was next. After the progression from simple, meditative combing to carding, I felt the need to spin! I began to spin outside during our moderate summer and fall weather. (Thank you, Gord Lendrum, for designing a versatile, portable wheel!) Poppy had a generous 7-pound fleece, so I keep returning to her when I need a soothing, repetitive exercise. Winding off on a niddy-noddy, my manual dexterity and coordination improved.

Inspired by Shetland Wool Week, I started a Fair Isle tunic with my own design. While math has always been a strong suit, I found some deficit here. Memorizing sequences, visually translating individual stitches to seeing patterns was good abstract thinking.

In a *Long Thread Podcast* episode, Melanie Falick said, "creative expression is essential to our wellbeing." Humble Pie is seldom very tasty, but working with fibers has provided connectedness, inspiration, and challenges as I heal. I am hopeful that this provides encouragement to others who experience setbacks. It's a journey!

—Linda Voss Plummer

Photo by Michael Plummer



North American coffee tree and black walnut spindle by Vermont Spindles

I Spy Spindles

You may notice the beautiful spindles we've used in photo styling this issue—we're so excited to be featuring Vermont Spindles. Bill Mutschler posts freshly made spindles throughout the week, working his way through his expansive wood collection of over 150 species. He enjoys learning about and sharing native woods, so we were delighted to include his work in this "Deep Roots" issue. See his work at VermontSpindles.etsy.com.

Oops!

Spin Off Fall 2023, "Get This: Dizzes": The diz listed from CF Merchantile was improperly credited. This beautiful diz is made by Celestial Farms and can be purchased on Etsy at CF Merchantile. cfmerchantile.etsy.com

Spin Off Fall 2023, "Handcard & Diz: An Unexpected Pairing for Smooth Prep and Color Effects," by Kim McKenna: The article incorrectly states that Kim used a handcard with teeth roughly 1½ inches in height. Those would be very long teeth, indeed! Kim uses a standard handcard with teeth that are roughly 1.5 centimeters in height.

Have you been inspired by *Spin Off*, your fiber fellows, or makers of the past? We would love to hear from you! Share your work with us at **spinoff@longthreadmedia.com**.

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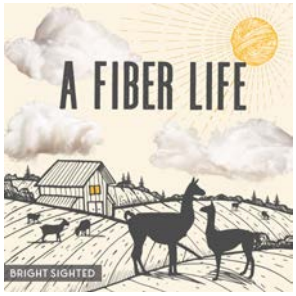

A Fiber Life hosted by Lisa Mitchell

Lisa Mitchell raises guanacos on Whidbey Island, Washington. In her podcast, she explores connections between handcrafting and raising fiber animals and how it all ties into our lives. Through these stories, Lisa encourages listeners to examine their own relationships with fiber and fiber animals.

afiberlife.com/podcast

The Sheepspot hosted by Sasha Torres

The Sheepspot invites handspinners to learn about making yarns they love, with quick and doable spinning lessons. With lots of helpful resources, this is one podcast that's great for listeners learning to spin for the first time, those learning art-yarn techniques, and anyone exploring wools from different breeds of sheep.

sheepspot.com/podcast

The Long Thread hosted by Anne Merrow

The Long Thread podcast features textile-centric conversations with fiber artists, authors, spinners, weavers, and needleworkers from around the world. Listeners can hear about the world of wool with Clara Parkes, learn about Navajo weaving with Lynda Teller Pete, peek into the world of publishing with Melanie Falick, and more. All types of makers will find connections with these rich narratives from around our fiber community.

longthreadmedia.com/podcast

Modern Wool hosted by Lydia Christiansen

The *Modern Wool* podcast discusses the many facets of sustainable, small-batch wool and yarn production. Educator and mill owner Lydia Christiansen dives into topics ranging from sheep breeds to dyes to the value of wool. Pay a visit to the Abundant Earth Fiber website to see sweet photos of their lambs.

abundantearthfiber.com/pages/modern-wool

The Fiber Artist hosted by Cindy Hwang Bokser

The Fiber Artist podcast presents interviews with fiber artists and other modern creatives. Macramé artist Cindy Hwang Bokser and her guests discuss how they tap into their creative souls, build community, find contemplation through expressive fiber work, and more. This podcast is great for artistic individuals who are seeking ways of finding inspiration and purpose for their work.

niromastudio.com/pages/the-fiber-artist-podcast


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Undyed shawl and indigo-dyed scarf by Hannele Köngäs

Photos by Matt Graves unless otherwise noted

Finnish Woven Waves

Hannele Köngäs Explores High-Twist Yarns

"Light as feathers and beautifully drapey" was how Linda Ligon described the beautiful woven textiles that Marilyn Murphy had purchased at Santa Fe's International Folk Art Market last summer. The weaver of these fascinating woolen gauzes is Hannele Köngäs, and wrapping one of Hannele's shawls around my shoulders was a divine experience.

We asked Hannele if she would tell us about how she combines Finnish wool, traditional textile inspiration, and the power of twist to create three-dimensional cloth that dances and moves. I hope you enjoy meeting her as much as I did!

—Kate Larson, editor

Kate Larson: ***Can you tell us about the antique textiles that inspired you to explore these wonderful woven surfaces?***

Hannele Köngäs: I was young and eager, a first-year textile student. One evening, I found an interesting piece of wool fabric at school. I was perplexed by the fabric, turning it in my hands—was it twill or was it plain weave? I could not understand; it looked like twill, but the warp and weft crossed simply as in plain weave. The next morning, I asked the master, and she said, "Oh, it is woven with high-twist yarn; it's only plain weave." I decided then that someday I would weave with extra twist in my yarn.

In the early 1990s, I was working at a museum that housed a reconstruction of a dress from the Iron Age woven with spindle-spun yarns. I noticed that a warp-weighted loom needs warp yarn with extra twist to prevent the yarn from breaking under tension. I also became familiar with Scandinavian Iron Age textiles where the pattern is created by using S- and Z-spun yarns in warp and weft. I had yarn twist direction in mind for over 20 years until, when I turned 50, I decided, "It's now or never; if I don't now start to test weaving with high-twisted yarn, I shall be an old bitter woman." I've now had a weaving studio of my own, Waveweaver's Wool, since early 2000.

KL: ***Once you knew you wanted to explore twist direction and twist count, what was your next step? Did you find a spinning mill to work with?***

HK: I received a small grant for product development, allowing me to have a Finnish spinning mill, Pirtin Kehräämö, spin the weaving yarns I needed with extra twist. I quickly worked out how much twist is needed and what density is best for this pattern and for that pattern. But it's not only the twist that influences the fabric effect but also the wool.

KL: ***Can you tell us a bit about the sheep and wool you are using?***

HK: We have three main native sheep breeds in Finland, and of those, I use wool from the Kainuu Grey (Kainuunharmas in Finnish). There are only about 1,200 ewes left of this breed. They are born

Courtesy of Herrakunnan Lammas

Kainuu Grey and Finnsheep in the south of Finland where Hannele sources her wool. Shepherd Sari Jaakola says the flock mostly grazes natural grasslands, which support endangered flora and fauna species.

Waves and twill-like textures can be created using combinations of S- and Z-twist yarns in plain-weave fabrics.

Kainuu Grey fleece

Courtesy of Herrakunnan Lammas

black and change color after the first shearing, to a beautiful light or dark gray. Their wool is soft and shiny. Wool from the same sheep can be different from one year to the next, and I think grazing in Finland influences the wool, too.

I had a small flock of my own in early 2000 that lived on a neighbor's farm. It was an interesting experience, and I learned a lot from them, but it was a little bit difficult to have them without my own fields.

KL: ***Do you size these high-twist yarns for weaving using starch or something similar? How does the fabric change from the loom to finished object?***

HK: The yarn I work with is a singles with extra twist. There is no need to starch the warp, and the high-twist yarn does not break. Of course, if you have too much twist so that the yarn is not at all elastic, it can break. Earlier in the twentieth century, people used to have warp yarn and weft yarn, two differently spun wool yarns, for their fabrics. Wool was carefully selected and spun for different uses.

My yarn still contains oils, and on the loom, the woven fabric is a loose gauze. After washing, the twist builds waves and bubbles, depending on whether you have used only Z-twist or a combination of Z- and S-twist. Density is very important; if the fabric is too tight or too loose, the twist does not form any pattern. You can also get different patterns with different densities, like false twill or waves or bubbles. If someone is interested in "twist-built patterns," they must start by sampling. It's interesting and astonishing—there are so many factors playing the game with you.

To see more of Hannele's inspiring work and connect to her web shop, visit waveweaverswool.fi. Find her on Instagram @kongashannele.

Thank you to Sari Jaakola and Jaakko Jussila for sharing pictures of their flock. Learn more at herrakunnan.fi and on Instagram @herrakunnanlammas.

On the loom, Hannele's fabric is a smooth gauze.

Once washed, waves and bubbles develop.

Photos this page courtesy of Hannele Köngäs

Bowl of Linen

KIRSI MANNI

Fiber Old flax stricks from my village, some of it grown as far back as the 1920s; gifted linen thread from handweavers who have passed away; and flax that I have grown myself.
Wheel Hjulbäck antique wheels from my neighboring village.
Spinning method Wet-spun long-line flax from distaff.
Finished size Diameter about 12" (30 cm) square.

Photos by Kirsi Manni

My fascination with fiber lies in its dimensional properties as I transform fiber into yarn, weave it to become two-dimensional, and then give it shape as a three-dimensional garment. This piece is my first attempt to make a freestanding three-dimensional weaving.

I chose linen for this project because of its stiffness and rigidity. Linen has a lot of variation depending on soil, retting process, preparation, and spinning. I have so much antique and vintage Swedish linen thread, and I was curious to see if I could use it in combination with my own homegrown flax. This is the result of trying to weave different qualities and gauges of linen on a narrow warp of linen singles.

I grew and prepared my own flax as part of a project called "1 KVM LIN," or 1 Square Meter of Flax. This Swedish Heritage Association initiative started with 700 growers in south Sweden and expanded to over 6,000 growers around Sweden in 2021. The growing and preparation of my own flax from seeds to thread was done with antique tools that I collect and repair. Retting, breaking, scutching, and hackling must be done to extract the flax fibers from the plant and prepare them for spinning. I wet-spun my singles using water or flax goo (boiled flax-seed extract). Give it a try: Boil 1 tablespoon of seeds with about 8 ounces of water and let it simmer for a few minutes. The consistency should resemble runny snot. Keeping a bit of this on my fingers as I allow twist into the fibers smooths the yarn's surface.

I mostly make garments, so I'm already thinking in three dimensions, but a garment follows a body shape, and in this project, there is no support for the shape. After spinning the yarn, I tried several approaches before finally getting

the effect I wanted. In the end, I wove an open sett to give the fabric a transparent quality and allow the individual threads to be shifted to shape the bowl. The threads are held in place with starch. While I love every part of making, seeing my bowl actually standing and holding its own weight was exhilarating. The challenge is to work *with* the material and not *against* it, while still exploring its boundaries.

Last summer, my bowls were accepted to a juried show about contemporary linen weaving in the region, arranged by the Dalarna Heritage Association. It was so special to see my work displayed in a glass casing!

My interest in fiber arts is driven by curiosity and the potential for transformation: from individual fibers to yarn to cloth to garment. The fourth dimension in creating is time; we are all familiar with the question, "How long did it take you to make this?"

And the answer is, "My lifetime."

Kirsi with an armload of homegrown flax

Kirsi Manni was born into fiber, literally growing up under her mother's and grandmother's looms and sewing machine tables. At university, she studied math, textiles, and handweaving and graduated with a bachelor's degree in education for secondary school. Today, after 20 years in the education system, Kirsi has her own studio and workshop. She does restoration work for churches, museums, and private customers and gives lectures and teaches weaving classes.

Have a finished object to share? Tell us about it! Contact **spinoff@longthreadmedia.com** to submit your project.

Courtesy of Centre for Pastoralism, Photo by Aishwarya Maheshwari

A woman spinning Patanwadi wool on a Doshi charkha

Desi Oon

Spinning India's Indigenous Wool

CHITRA BALASUBRAMANIAM

While India is most known for cotton and silk production, Indian shepherds raise dozens of native sheep breeds. On a sunny day in May, I headed to an exhibition in Delhi to learn more about an initiative to help market indigenous wool from India. Desi Oon acts as a platform for over 16 partner organizations working with shepherds, herders, breeders, spinners, weavers, and local craftspeople. The word *desi* in Hindi (a language spoken by a large portion of the population in India) means native or indigenous, and *oon* means wool. The exhibition in Delhi was an eye-opener to the wealth of indigenous wool in the country. From shorn fleeces and spun yarn to garments and other finished goods made from sheep's wool and blends with goat, yak, and camel hair, the textiles on display were a true delight.

Armed with a basic understanding of the initiative's work, I met Vasant Saberwal and Riya Sequeira Shetty at a café near their office. Vasant K. Saberwal is the director for the Centre for Pastoralism (CfP), and Riya Sequeira Shetty is the CfP's coordinator for the Desi Oon initiative. What resulted was a fascinating journey into India's indigenous breeds of animals and their fibers. According to Saberwal, "In India, pastoralism has been viewed as an outdated mode of life treated with suspicion. There have been efforts over many decades to convert the nomadic lifestyle of the

pastoralists into a steady, more stable life. There have also been restrictions on foraging by the nomads and their stock in forestland and other places. The pastorals have over centuries carefully crossbred their animal wealth to create a very hardy pool of livestock. With pressures to give up the nomadic lifestyle, the herding and its associated livelihood option is at stake, and with it, the livestock wealth of the country."

CHALLENGES FACING INDIA'S SHEEP

CfP deals with pastoralists to help them gain recognition for the breeds of livestock they have developed, and Desi Oon works with indigenous breeds of sheep, goat, camel, and yak. We limit ourselves to indigenous sheep in India. In 2022, the International Wool Textile Organisation listed India as having the second-largest population of sheep in the world. The herders still practice the nomadic system of migrating long distances with their flocks. The study of their nomadic journey is a story in itself. What is shocking is that despite producing 40 million metric tons of wool, India imports most of its wool. The ease of availability of imported finer wool has resulted in the indigenous wool losing its edge. Sushma Iyengar, the force behind the wool initiative and one who has done groundbreaking work in Kutch, Gujarat, says, "Over the years, governmental policies have favored and facilitated the import of wool on the one hand and the export of sheep and goat meat on the other. As a consequence, the demand for indigenous wool has gone down. And shepherds have adapted by shifting their herd composition to maintaining sheep breeds that are fattier or then crossbreeding their indigenous breeds with fatty sheep breeds, purely for meat." Saberwal adds, "The ground reality is that nearly 80 percent of the wool that is sheared from indigenous sheep is thrown away. The breeds of sheep are such that they need to be sheared twice a year, but given the lack of market and economic gain from the wool, the shepherds simply throw it away." It just gets thrown in fields or landfills.

The indigenous wool fibers are short staple and difficult to weave or process. The wool is also coarser, and processing it into apparel as is makes it difficult to sell. The imported wool is softer and easier to work with.

Gaddi sheep near Kangra

Courtesy of Centre for Pastoralism, Photo by Hasmat Singh

Women spinning wool on charkhas

Courtesy of Centre for Pastoralism, Photo by Varsha Solanki

There are also inexpensive acrylic/wool blends that are easily available at attractive prices. Jen Hoover of Aana Jaana from California, a hobby spinner with a master's degree in textiles, echoes this, saying, "Over the years, the world has moved toward finer, softer, luxurious wool, with the result that the indigenous coarser varieties are not in demand."

Iyengar speaks of how the Dhebaria Rabari (see Resources) make a journey of over 1,800 miles (3,000 kilometers) over nine months, covering nine states—the longest migration by a nomadic pastoralist community in India. It has become clear over the decades that when the shepherds reach the borders of Madhya Pradesh (a state in the central part of India), they have adopted sheep breeds they find on the border that are known more for their meat than their wool. As an example, Saberwal says, "When I was doing my PhD work in 1995, wool sold at 60 rupees [72 cents] per kilo. Today, after nearly 30 years, it still sells for 60 rupees per kilo. So, there is no economic incentive for the community to seriously work to sell wool."

Wool is relegated to the background, becoming a waste to be discarded. Hoover has studied the indigenous practices and says, "Earlier cultural practices demanded the use of indigenous wool but that market has dropped significantly. During my conversation with the spinners and weavers, I realized they wanted a market to sell their products, and so I began Aana Jaana, a small online shop." Hoover shared the indigenous wool from five breeds with her fellow spinners to generate interest. Apart from the traditional cultural aspect of the use of wool by the community, other major users were the carpet industries, the railways, and the army. These consumers have disappeared over time.

With tons of sheared wool being discarded, the CfP and Desi Oon were set up to find a use for the wool so that it would become lucrative for the shepherds to retain their flocks and be able to view wool with pride. Hoover has informally associated with Kullvi Whims in Himachal Pradesh (a state in the hills of India). This organization works with herders of the local heritage breed of sheep called the Gaddi and produces beautiful products. She recalls how, for her first production for her brand, she carried 110 pounds (50 kilograms) of wool to be processed. The organization was dismayed about what to do with it. Today, the organization sends 1,700 to 2,200 pounds (800 to 1,000 kilograms) at a time. With the demand rising, the price of wool has

doubled in the last couple of years, which will hopefully make it worthwhile for the shepherds to focus on the indigenous breed for both wool and meat.

Shetty talks of several measures being undertaken, such as the use of small carding machines and research into developing softer wools. The small carding machines allow the wool to be carded at home or at the village level—the shepherds need not look to a mill. Shetty says, "Many of our partner organizations are combining indigenous wool with silk, cotton, and more. We are exploring the use of wool in building insulation and the packaging industry where the insulating properties of wool will help."

HERITAGE BREEDS OF INDIA

The National Bureau of Animal Genetic Resources of India recognizes 44 indigenous breeds of sheep. Several other varieties of sheep have not yet been registered or recognized by the bureau. These include sheep from the Gangetic Plains, the central part of India, and other such regions. The wool of each of these heritage breeds has its own typical characteristics. This diversity of wool is like icing on the cake, with a range of characteristics that make the wool amazing for spinners, weavers, and knitters to experiment with. The wool from the colder regions such as the Himalayan belt is longer and softer. Other regions produce coarser wool.

One of the breeds most spoken about is the Deccani sheep. Found in the states of Karnataka, Telangana, and Maharashtra, the natural-colored wool varies from black to dark brown to light brown. The wool is a coarse 30 microns. The black wool from the Deccani sheep is used to weave the *Gongadi*, a handspun, handwoven black blanket with colored stripes at the end. This blanket is given in marriages and is worn on special occasions, but the shepherds carry it with them at all times. It can also be called an all-weather jacket that wards off the cold, absorbs rain, keeps the wearer dry, and is excellent protection against the sun.

Patanwadi sheep

Courtesy of Centre for Pastoralism, Photo by Khamir

Courtesy of Centre for Pastoralism

A beautiful shawl woven on the handloom

The Gaddi is a breed from the Himalaya hills in Himachal Pradesh, the northernmost state of India. This breed can be seen in the Himalayan belt, and it produces one of the softest wools from India. The Gaddi is a crossbred sheep that has a double coat—a fine undercoat and a long overcoat. I'm told that the mix of long and short fibers makes it ideal for spinning. The sheep, its wool, and handspinning are woven into the cultural fabric of the area. The wool's natural coloration ranges from creamy white to light brown to chocolate to bluish gray.

From the desert regions of Rajasthan, particularly Bikaner, comes the Bikaner Chokla sheep. The wool is the finest from the area and is known for its warmth. Patanwadi from Kutch comes in a naturally colored brown and is handspun on the Bageshwari charkha, the Peti charkha, and the Ambar charkha. (*Charkha* means spinning wheel in Hindi and does not specifically refer to box- or book-style charkhas.) Felting is carried out in almost all areas where sheep are found.

Given the quantity of wool produced and currently going to waste, the wool advocates I spoke with are focused on industry use, and at the moment, apparel is produced in a very minuscule quantity. Efforts are underway to make it lucrative for the herders to continue breeding these heritage breeds and use the wool to their advantage. Desi Oon and others continue to work on smaller scales, helping to connect makers with markets for the wool products that form an important part of the heritage of India.

Resources

Aana Jaana, aanajaanahimalayan.etsy.com.

Balasubramaniam, Chitra. "Banned Embroidery: The Story of a Dhebaria Rabari *Bhujka*." *PieceWork*, Spring 2021, 10–13.

Centre for Pastoralism, centreforpastoralism.org.

Desi Oon, desioonhub.org.

International Wool Textile Organisation. "World Sheep Numbers & Wool Production." In *IWTO Market Information, Edition 17*. Brussels: IWTO, 2022. iwto.org/wp-content/uploads/2022/04/IWTO-Market-Information-Sample-Edition-17.pdf.

Kullvi Whims, kullviwhims.com.

Chitra Balasubramaniam writes about, collects, and experiments with textiles, following her passion for writing about food, travel, and heritage. She dabbles with stock investment analysis and research. She also runs a small travelogue, visitors2delhi.com, and can be found on Instagram @visitors2delhi, and on Twitter @chitrabalasub.

Skudden fleece contains a soft undercoat that ranges from 7–40 microns and also contains coarse, shiny hair fibers.

Photos by A. Sabine Schröder-Gravendyck

East Prussian Skudden

The World of Wool

A. SABINE SCHRÖDER-GRAVENDYCK

Short-tailed sheep seem to have been spread by Norse Vikings between the late eighth century and the middle of the eleventh century. The ability of these sheep to thrive under harsh conditions led to the development of many breeds across northern Europe, well adapted to their respective environments. Skudde sheep are one of the breeds still in existence that trace back to Viking sheep.[1] A long history with many unknowns is typical for landrace breeds.

East Prussia and the Baltic region had many heath landscapes, forests, and moors where the frugal Skudden thrived. Still today, if grass is available, they eat good grass; otherwise, they feed on heath, nettles, rushes, birch seedlings, and other nutrient-poor plants. Moreover, they tolerate the humid or wet conditions found on peatland. These sheep have long existed in this landscape, finding food where the cultivation of crops is impossible, turning plants inedible for humans into meat, milk, wool, manure, bones, pelts, and lambs—they are the perfect self-sufficient sheep.

Short-tailed sheep have double-coated fleeces, meaning their fleeces contain hairy fibers and woolly fibers. It doesn't mean that there are only two types of fibers, so you might also describe some fleeces as multicoated. If you look closely at a Skudde fleece, you'll find short hairs called *kemp* (fiber diameter 15–250 µm [microns], mean 68 µm) and fine wool fibers (fiber diameter 7–40 µm, mean 24 µm). There are also wavy long hairs (15–90 µm, average 44 µm) forming the outer fleece to protect against rain and snow. The wool fibers reach 60 to 100 percent of the total staple length, giving the locks a V-shape.[2]

The mixed-wool fleece of the Skudden can be white, black, gray, or brown. Markings may occur. The triangular-shaped tail ends clearly above the ankle joint (the "short tail" that is a hallmark of this ovine group), and at least the last third of the tail is covered with kemp.

These fiber types are also present in wild sheep but in different proportions and manifestations. Some sheep in Skudden flocks still shed partly or even completely, which connects them to wild sheep. If we knew nothing about the history of Skudden and looked at their fleeces, we would know their deep roots go back into the past.

How to pronounce Skudde?

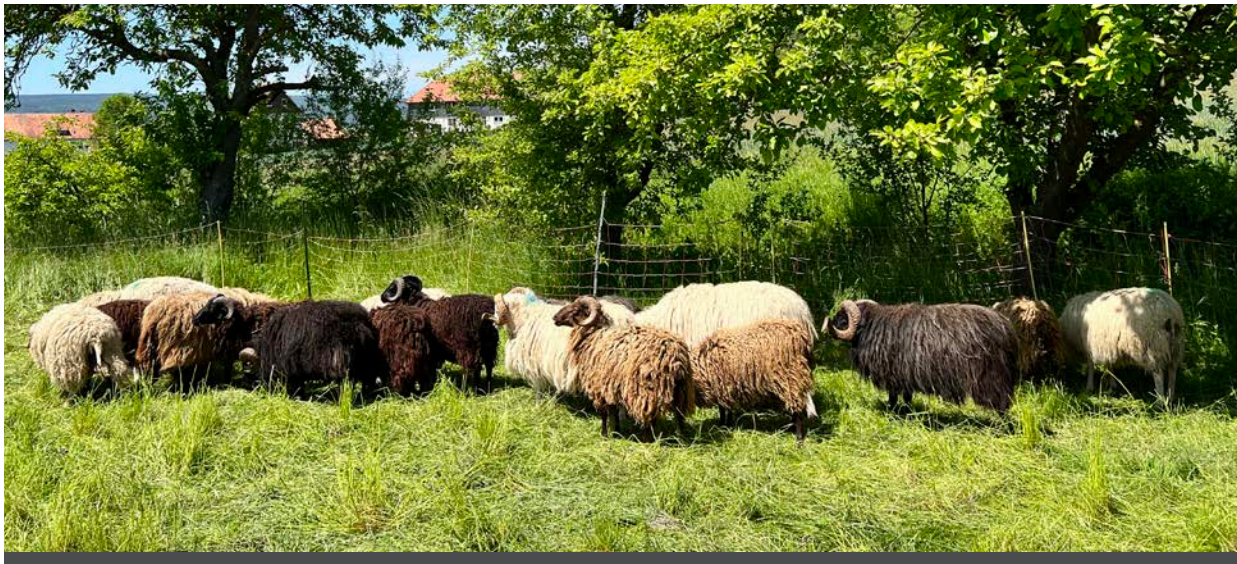
In German, we would say *skoo-dah (skʊdə)*, and the plural form is skudden (*skoo-den*) (*skʊdŋ*). These sheep were found in East Prussia and the Baltic region, so there are several possibilities for where the name may have originated. It could be a remnant from the long-gone Prussian language. In the German-Lithuanian border region, the word *skudde* was used for breeds as well as ewes or sheep in general. The Polish-Lithuanian interjection *skudi* or *skudy* comes into question as a potential root. And the town and region of Skuodas in northern Lithuania was known for a primitive sheep breed until the 1940s. Or does it come from the Kashubian call "kut, kut, kut!" that's used to lure sheep? As the breed is deeply rooted in times long passed, no one really knows.

SKUDDEN THEN AND NOW

Beginning in the eighteenth century, Merino sheep from Spain and meat breeds from England were imported into Prussia and elsewhere. This strategy for developing finer wool and more meat was pursued mostly by prosperous farmers and aristocrats, and they raised purebred flocks of the newly acquired sheep in addition to crossing them with local landrace sheep.

These crosses rendered the improved offspring they were seeking, but only when new demands for better food and shelter were met. Crossbreeds kept in the same circumstances as their landrace ancestors often died. Eventually, the infusion of new genetics produced an essential change: the crossbred sheep led to new breeds of bigger, more productive animals. Only small-scale farmers, farmhands, and a few other people continued to keep Skudden. Soon, they were considered poor people's sheep.

In the first half of the twentieth century, the Skudden population decreased dramatically. During World War I, livestock in general decreased. Depression and political crisis followed. Again,



East Prussian Skudden are the smallest German sheep. This group of males at Sollingschaf is shown in full fleece on shearing day.

during World War II, a lot of livestock were lost. Forced displacement and chaos after the war finally led to the loss of the remaining Skudden in their native areas.

The fact that we still have Skudden today is due to the few remaining in the zoos of Munich, Leipzig, and Berlin during the war and the very few sheep that accompanied displaced Germans. Passionate and knowledgeable people succeeded in preserving the breed and increasing the number of East Prussian Skudden. The herdbook contained almost three thousand sheep in 2021.[3]

The breeding goal for today's Skudde shepherds is a small and robust sheep, especially suitable for landscape management and foraging nutrient-poor pastures. Purebred rams weigh 77 to 110 pounds (35 to 50 kilograms), with a shoulder height of 19¾ to 25½ inches (50 to 65 centimeters). They carry a mane, throat fringe, and snail-shaped horns.

Ewes weigh 55 to 88 pounds (25 to 40 kilograms), have a shoulder height of 15¾ to 23½ inches (40 to 60 centimeters), and can be polled (hornless) or carry small horns or vestigial horns called scurs. They are aseasonal, which means that three lambings are possible in two years. Skudden are very good mothers and have one or two lambs, sometimes even three, which mature within two to three years.

An older ram with a fantastic set of horns from the Moordiek Skudden

Norbert surrounded by friendly Skudden

WHY DO PEOPLE KEEP SKUDDEN TODAY?

Modern flocks are kept for different reasons and in different landscapes. These adaptable sheep have much to offer, and I connected with several flocks to learn more about them.

Moor

Not far from Hamburg, Heide and Norbert live on a small farm in the moor. They raise endangered breeds and are engaged in the Society for the Conservation of Old and Endangered Livestock Breeds (GEH). I visited their Moordiek Skudden flock, which grazes peatland meadows. Contrary to a reputation for being shy, the sheep come right up to Norbert. They surround him and enjoy being cuddled. "If you spend time with them every day and behave friendly and respectful, they become trusting," he says.

Because Skudden can tolerate wet ground that would cause hoof diseases in other sheep breeds, they are a suitable breed for new ways of farming. Most of the bogs and peatlands in Europe have been drained for building or agricultural use, but today, we understand that these naturally wet areas are important habitats, carbon stores, and water regulators. Some farmers are using paludiculture (agriculture and forestry on wet land) techniques to restore these landscapes, and Skudden can play a part in this work.

Mountain

When I entered the barn, everyone was calmly busy. Sitting on the floor, Sabine the shepherdess and her daughter had Skudden ewes on their laps and were handshearing. A friend from Berlin who recently learned to handshear was working in a corner, and another helper kept notes, managed ear tags, and more. The ewes and their lambs were penned in the back of the barn, and each time an animal was sheared, it was immediately reintegrated into the flock. Later, Karo, a professional shearer, completed the team.

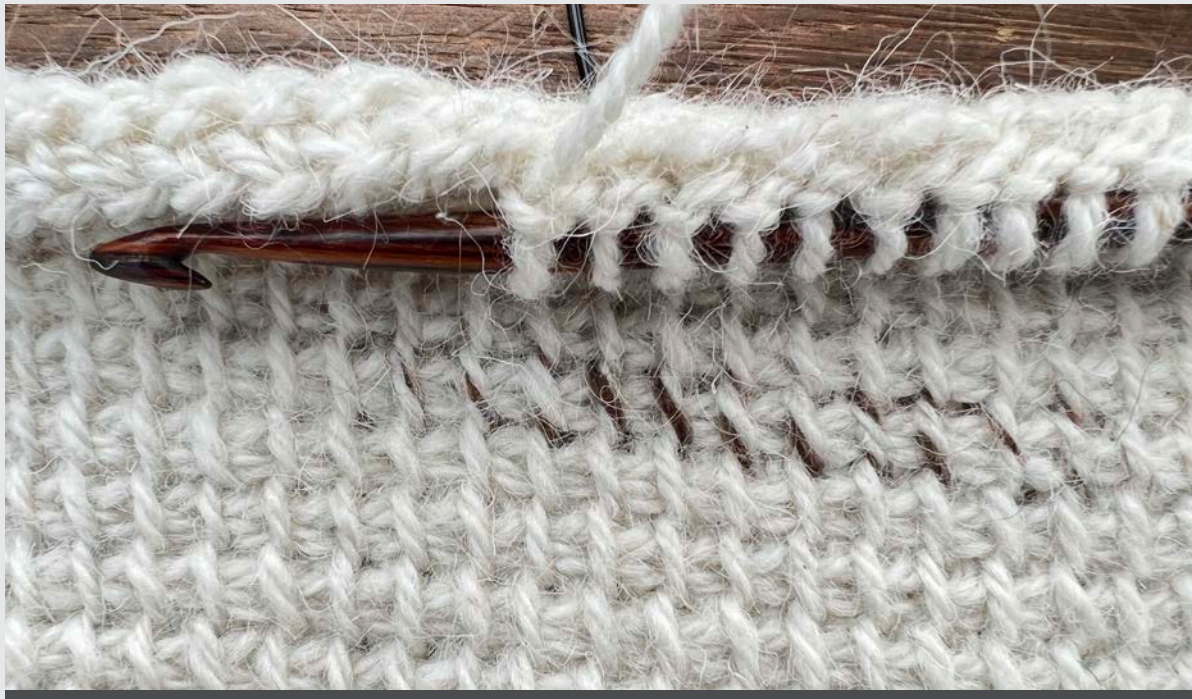
Sollingschaf, Sabine's small company, provides landscape maintenance using sheep. The low mountain range where she lives has many areas that are small, difficult to access, or not economical to work with machines. She can bring the Skudden to those areas to graze, ensuring that the areas remain biodiverse and free of trees.

City

Skudden can also do their important work in urban spaces. Frank works as a professional shepherd in a very modern way. He manages two former airport grounds, Tempelhof and Tegel, and other urban areas in Berlin with Skudden. Several hundred hectares are developed into public open space with nature reserves, and recreation areas are part of the sustainable urban development provided by Grün (Green) Berlin, a state-owned company.

"Skudden are the most efficient sheep I've ever encountered," Frank told me. They can graze low-nutrient forage and biodiverse habitats much better than mechanical mowing can do, and they don't bother ground-breeding birds. They are long-lasting sheep: the rotation period for ewes at Green Berlin is 8 to 10 years.

Find Sabine's Endlessly Adaptable Woolly Case project on page 36, and learn more about processing Skudden fleeces on our website at LT.Media/Skudden.



When creating her Tunisian-crochet project, Sabine used a white Skudde fleece with small amounts of brown Skudde.

Locks will change in character throughout a fleece.

FLEECE IN THE HAND

As expected, there's a broad range of fleece quality within the breed. In former times, Skudden wool was sought-after as it makes high-quality felt that was used for clothing, saddle blankets, and padding for harnesses. The wool was also used for weaving, nålbinding, and knitting.

The Skudden fleeces I worked with contained a surprisingly high amount of lanolin compared to many landrace fleeces. The locks had different lengths, depending on where on the sheep's body they grew, ranging roughly between 2 and 7½ inches (5 to 20 centimeters). After washing and drying, the real colors came to light. Most Skudden are white, from creamy to bright white. The fleece I worked with for my crochet project (see page 36) was beautifully shiny, as the silky hair reflects light. In brown, gray, and black fleeces, hairy parts may be black, variations of brown, or blond—just imagine the colors of the final yarns, garments, and cloth. The fleeces contained short, brittle kemp fibers that fell out of the fleece and yarn as I worked. Depending on the processing method, more or less kemp will make it into your finished textile.

The wide range of fiber diameters and lengths in the fleece and in one lock give you many prepping options. You can blend all the fiber types together on a drumcarder or with handcards. Because of the length, rolling sideways or diagonally from the handcard can be a better method than making a usual rolag. Shorter locks are easily rolled into rolags. You can also separate the hair and wool of every lock by hand and use them separately. The hair can be spun into sturdy, inelastic yarn for bandweaving or warp. Combing is another option to separate the fibers.

I drumcarded the locks to blend short and long fibers thoroughly, and I then dizzed them into a lofty sliver. To create a halo in my finished yarn, I did a middle forward draw without smoothing (semiwoolen). Long draw, short draw—many spinning methods work. In the end, my sturdy three-ply yarn was perfect for a woolly case that will keep my tablet secure.

Notes

1. "Skudde," Arche Warder Center for Old Domestic and Farm Animal Breeds, arche-warder.de/tiere/skudde.
2. Gunhild Kurt and Horst R. Brandt. "Development and Characterization of Lambs' Coats of East Prussian Skudden and Rough-Coated Pomeranian Landrace Sheep," *Archiv für Tierzucht* 51, no. 5 (October 2008): 468.
3. "Sheep: Skudde," Federal Office for Agriculture and Food (Germany), tgrdeu.genres.de/en/livestock-animals.

Resources

Crew, F. A. E., and J. S. S. Blyth. "On Fibres of Intermediate Character Found in the Fleece of Ovis Vignei." *Annals of Applied Biology Cambridge* 10 (1923): 295–300.

Dýrmundsson, Ó. R., and R. Niżnikowski. "North European Short-Tailed Breeds of Sheep: A Review." *Animal* 4, no. 8 (August 2010): 1275–1282. doi.org/10.1017/S175173110999156X.

Kun, G. "Contributions to the Characterization and Use of the Mixed Wool of East Prussian Skudden and Rauhwolligen Pomeranian Sheep." Diss., Giessen, Liebig Univ., 1995.

Ryder, Michael L. "Fleece Evolution in Domestic Sheep." *Nature* 204 (1964): 555–559.

———. *Sheep and Man*. London: Duckworth, 1983.

Skuddenhof Moordiek, skudden-moordiek.de.

Skudden & Pommern (breed association), schafzuchtverband.de.

Society for the Conservation of Old and Endangered Livestock Breeds (GEH), g-e-h.de.

The Solling Sheep, sollingschaf.wordpress.com.

A. Sabine Schröder-Gravendyck, DVM, makes her home on Germany's North Sea coast, where she works as a naturalist and educator in sustainability and ecology. She is always looking for new ways to help people merge their personal spaces with nature. Learn more at florafauna.pro.

Bespoke bags for laptops, iPads, notebooks, and more! *Clockwise from top left:* Kate's zippered notebook bag, Angela's iPad slipcase, and Samantha's embroidered iPad bag

Photos by Matt Graves

The Endlessly Adaptable Woolly Case

A. SABINE SCHRÖDER-GRAVENDYCK

Most patterns ask for a specific yarn to create a specific fabric, and we as spinners can make a yarn that meets those requirements, depending on our skills and habits. However, this project offers you a framework for making a useful bag with the yarn *you* find most suitable. The first step is to become familiar with your fiber and then use spinning techniques to refine your yarn for this specific use. I hope using this kind of recipe helps you feel empowered as a maker.

A cushiony bag for a laptop, tablet, phone, or camera keeps the device safe. Whether you are protecting sensitive electronics or other precious items, you need a bag with the right balance of firmness, elasticity, and thickness to cushion contents and sustain the shape of the bag.

A good fiber choice for this project is rare-breed wool. Keeping our rare breeds is important and can ensure that there's a sheep for every landscape and a wool for every purpose. This is the place to showcase the unique properties of rare wool. Which rare breeds are close to you?

SEARCHING FOR STRENGTH

You can use any fiber for this project, provided it passes the strength test. If you're working with a fleece, take a few locks from different areas of the fleece, then check each one. If you're working with combed top, take a lock-size section to test. A piece of a carded preparation may or may not work, but it's worth trying.

Pinch the tip and cut ends of a lock (or a staple-length section of prepared fibers about the size of your pinkie finger) between index fingers and thumbs (A). Pinch firmly enough that the fibers are not drafting and pull quickly in opposite directions with a snapping action (B). What do you hear? Repeat this twice more.

The pinging sound may stay the same or change from a lower pitch to a higher pitch with each pull. If the sound stays the same, it tells you that your fiber is strong. If the pitch changes only slightly, the fiber is still good and usable. If you hear the sound continuing to change by the third pull, the fiber is weak. In some cases, you will hear fibers breaking or the fiber will pull apart. If that happens, I don't recommend it for this project.

PREPARATION NOTES

You need a firm and durable yarn for this project, so choose a method that doesn't put a lot of air between the fibers. Combing, flick carding, or drumcarding dense

batts are all good options. If you prefer prepared fiber, combed top or rather dense roving will also work fine.

This project is the perfect opportunity to work with rare breeds. I am especially keen to work with rare double-coated and multicoated breeds such as Icelandic, Spelsau, Drents Heideschaap, Heidschnucke, Hebridean, and more. I used Skudden here, an endangered breed in Germany with a multicoated fleece. (Read more about Skudden on page 30.)

A key to success is managing the properties of these locks, which have more than one quality of fiber within each lock. We often call these double-coated fleeces because typically two fleece qualities dominate: long hairy fibers and shorter, softer woolly fibers. A drumcarder works well to thoroughly mix the different qualities together, making spinning easier. Opening the locks first makes drumcarding quicker and more efficient. Prepping double-coated locks takes a bit more time, but it's worth the effort: you get very strong and durable yarns.

Keeping our rare breeds is important and can ensure that there's a sheep for every landscape and a wool for every purpose.

SPINNING NOTES

For a firm and durable yarn, use a spinning technique that is more on the worsted side. No twist between hands, short draw, and fingers smoothing yarn will lead to a firm yarn. Depending on your way of spinning over the fold, that may also work.

Every part of the process adds up to the final yarn. A strong fiber, a suitable preparation, and a worsted spinning method will make a good strong yarn. Don't go for maximum twist and wiry yarn but add enough twist energy so that your yarn has the strength to protect the important contents of the bag. There's no specific gauge needed for this project, so just try exploring with the fiber; acquaint yourself with the wool.

From left: Kate's Lincoln yarn and roving, Angela's chain-plied Cotswold, and Samantha's two-ply Navajo-Churro yarn.Zebrawood Mini-Rosa top whorl by Vermont Spindle

Tunisian Simple Stitch

Tss (Tunisian Simple Stitch)—Work Forward Pass (FwP) followed by Return Pass (RetP).

Forward Pass (FwP): Loop on hook counts as 1st stitch. Skip first bar at edge of work. *Insert hook from right to left behind front vertical bar (Figure 1), yarn over and pull up loop (Figure 2), leave loop on hook; repeat from * to last vertical bar at edge, pick up front and back loops of last bar to create firm edge.

Return Pass (RetP)—Yarn over and draw through first loop on hook, *yarn over and draw through 2 loops on hook (Figure 3); repeat from * to end, ending with 1 loop on hook.

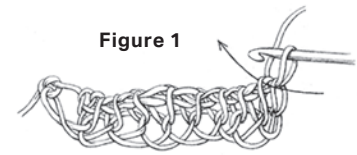


Figure 1

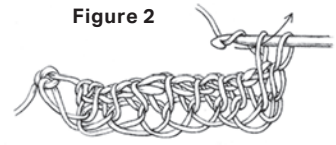


Figure 2

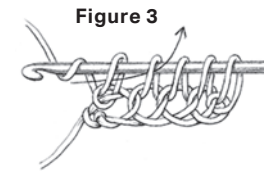
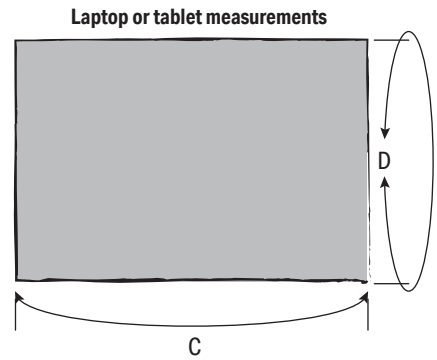


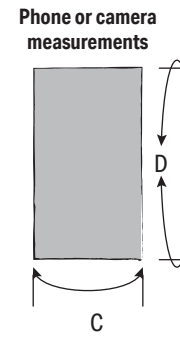
Figure 3

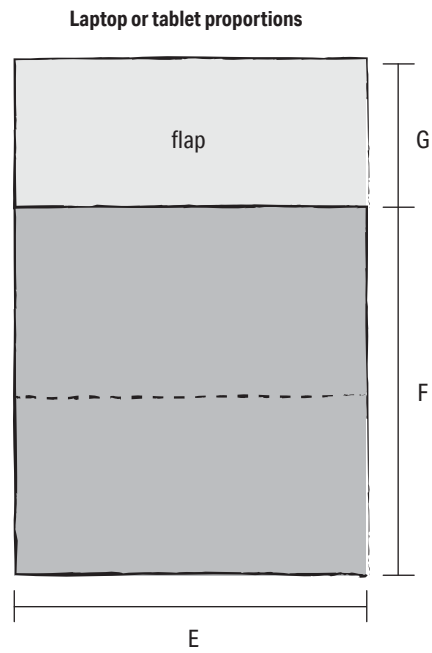
This easy bag pattern is created from a simple rectangle that is folded and sewn at the end.

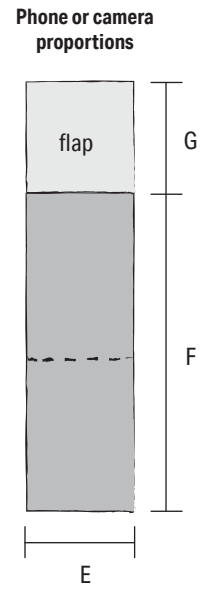
See Steps 3–5 to determine the measurements below:

- C: Device width (half of the circumference)
- D: Device height (total circumference)
- E: Width
- F: Height (will be folded to create bag body)
- G: Optional flap









INSTRUCTIONS

Step 1: Spin.

Choose a special wool and get spinning. While you can spin any gauge, something between DK and chunky weight is a good place to start for this project. Choose any number of plies and a yarn design you like. Spin at least 10 yards of handspun, wash, and allow to dry.

Step 2: Make a swatch.

Crochet a swatch using Tunisian Simple Stitch (Tss) that is 10 stitches wide (see sidebar). Use your best guess for hook size and just start over with a different hook if you want to adjust the fabric density. Aim for some density as the fabric should have some structure and not be too loose. There is no right or wrong answer and no specific gauge. Once you are happy with the fabric, crochet 10 yards of handspun yarn total. Wash the swatch and let it dry.

Step 3: Measure your swatch.

Count the stitches per inch (or centimeter) to determine your stitch gauge and write the number down. Measure the rows per inch (or centimeter) to determine your row gauge and write it down. Measure over a larger distance if your swatch allows (i.e., over 2 or 4 inches) and divide by the number of inches or centimeters for a more accurate result.

A: Stitch gauge

B: Row gauge

Step 4: Measure your device.

Measure all the way around the device on the edge you want to slip into the bag (width), divide by 2, and write it down. Finally, wrap a tape measure all the way around your device in the other direction to determine device height (bag depth) and write it down.

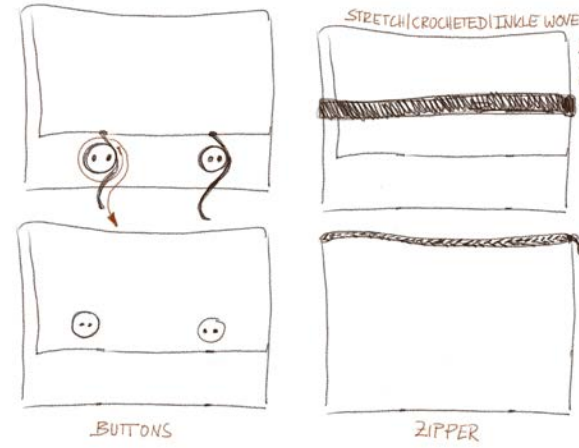
C: Device width (half of the circumference)

D: Device height (total circumference)

Step 5: Make your plan.

A × C = E (how many stitches wide your bag needs to be)

B × D = F (how many rows are needed for the bag to enclose your device)



Create your own closure: buttons, bands, ties, and zippers. Illustration by A. Sabine Schröder-Gravendyck

Want a flap? Decide how many inches of flap you prefer:

Flap depth × B = G

> How much fiber do you need? Visit our website to learn how to estimate the yardage needed for your project based on your swatch. Go to LT.Media/SwatchYardage.

Step 6: Get started.

After spinning the yarn for your project and giving it a wash, begin working Tss using the number of stitches and rows you calculated. From time to time, compare your work to your device to make sure you are still on track.

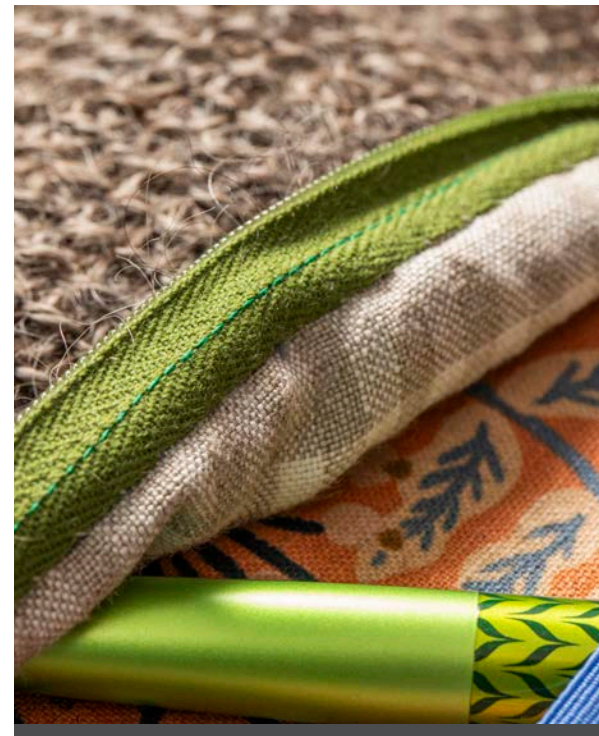
Step 7: Finishing up.

When you are done, fold the fabric to the length of your device and use a crocheted slipped stitch or sewn whipstitch to connect the sides of the bag. Add extra rows of single or double crochet to edges if desired. If you have a flap, lining the bag or adding a crochet or sewn edge will help reduce curling. Add buttons and button loops, ties, or any closure you like!

SAMANTHA'S NAVAJO-CHURRO IPAD BAG

Rare Breed Fiber Navajo-Churro (Rainbow Fiber Co-Op), light gray carded roving.
Yarn 2-ply Z-twist heavy worsted weight; 776 ypp; 11 wpi; 208 yd.
Hook Tunisian size H/8 (5.0 mm).
Gauge 20 sts and 18 rows = 4" in Tss.
Finished Size 8" × 10½".

Samantha used buttons and crocheted cords to secure her bag's flap.



Kate added a zipper and lining to her bag to secure pens and paintbrushes.

Although long, silky fibers and shorter, crimpy fibers were mixed in this beautifully prepared roving, it remains remarkably soft to the touch.

I enjoyed spinning this fiber and found it easy to spin. Because I like woolen spinning, I spun over the fold using a long draw. Spinning over the fold gave me the most consistent singles yarn. I slightly fulled the yarn, so it was sturdier to make the bag.

I made two 10-yard, three-ply samples: one with S-ply twist and one with Z-ply twist. I wanted to compare the two to see if the Z-ply twist would improve the fabric because some crocheters find they untwist S-ply yarns as they crochet. I like the Z-ply sample fabric better, so I spun up 217 yards of Z-plied yarn.

I decreased on each side of the bag to shape the flap using a forward-pass decrease: I inserted my hook under the first two bars and pulled up a loop (first decrease made), then I worked across to the last three bars, inserted the hook under two bars (second decrease made), then picked up the last bar of the row. The flap is secured with crochet chains attached to the flap edge, which wrap around two buttons.

I also added a cross-stitch diamond on the flap using two-ply Black Welsh Mountain yarn. Finally, I worked a row of reverse crochet stitches on the flap edge of the bag and the interior edge. This helped some with the fabric's tendency to curl and is decorative.

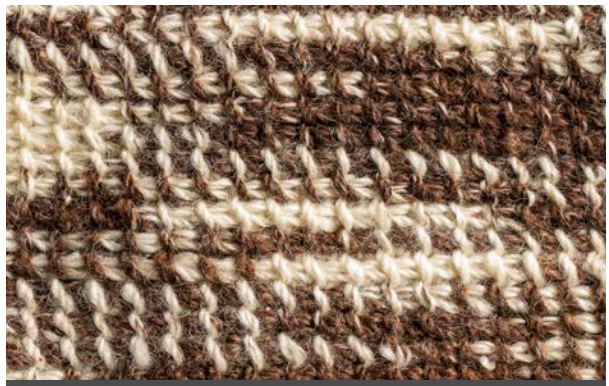
KATE'S LINCOLN SKETCHBOOK BAG

Rare Breed Fiber Lincoln Longwool (Cross Wind Farm), natural gray.
Yarn 2-ply S-twist fingering weight; 1,280 ypp; 22 wpi; 202 yd.
Hook Tunisian size G/7 (4.5 mm).
Gauge 17 sts and 17 rows = 4" in Tss.
Finished Size 13¾" × 10".

Mill processing can sometimes leave strong fleeces such as longwools feeling dry and dull. After predrafting, this roving was loose, open, lustrous, and easy to spin.

When I started mulling over this project, my first thought was to reach for some Lincoln roving that had been sitting in my stash awaiting the perfect project. It isn't a multicoated wool as Sabine used, but I wanted to see how a luster longwool would work up in the same kind of project. I adore the drape, structure, and silky shine of Lincoln, and this bag project doesn't require a wool that is next-to-skin soft.

Lincoln is so strong on its own that it does not need high spinning twist to create density and durability. In fact, even a low-twist yarn can be fairly dense because longwools do not have the tight crimp pattern that creates loft in other wools.



Angela used chain plying to create color pooling.

I first took two lengths of roving and predrafted them together. Predrafting longwool rovings helps pull the fiber into a nearly combed orientation, making spinning easier and the results smoother and more consistent. I created several samples to see how different amounts of singles and ply twist would work in Tunisian Simple Stitch. I found that a two-ply yarn with medium-to-low twist was my favorite balance of structure, loft, and hand. I settled on a hook size that created a somewhat open fabric that remained supple, and I planned to add a lining to the bag for further stability and density.

ANGELA'S COTSWOLD IPAD SLEEVE

Rare Breed Fiber Cotswold from mid-south flocks, white and dark brown.
Yarn Chain-ply Z-twist heavy worsted weight; 376 ypp; 10 wpi; 112 yd.
Hook Tunisian size K/10½ (6.5 mm).
Gauge 13 sts and 12 rows = 4" in Tss.
Finished Size 8" × 10".

Madison's dark brown fleece from Bolivar, Tennessee, was the first full fleece I bought as a new spinner many years ago, and I still have some left. Sheba's white Cotswold fleece was a more recent purchase from a friend's farm in Coldwater, Mississippi.

I enjoy Cotswold wool because it has the luster of longwools but a softer hand than most. The two distinct colors of fleece I had in my stash inspired my project. I planned a yarn with clear blocks of color that could mix in the crochet stitch in random ways to create a surface pattern.

I made several samples testing size, yarn structure, tightness of twist, and twist direction. I found that the plied yarn gave a crisper stitch definition than a softly spun singles that obscured it and that the final Z-twist in the ply worked up more neatly in the finished crochet piece than S-twist. I drumcarded the fleece, doffing it through a diz as a long strip of roving. I spun the S-twist singles with a short-backward draw to make a smooth worsted singles. I spun lengths of one color, then joined the other color to create solid blocks, switching back and forth between white (Sheba) and dark brown (Madison) every 1½ to 2 yards. I then chain-plied Z, positioning the chain loops at the color changes to keep them as distinct as possible. I scoured the yarn by soaking it in hot water to remove any remaining dirt and grease from the older fleece.

I worked Tunisian Simple Stitch over 32 stitches for 45 rows, until the fabric was long enough to wrap around my tablet. The sleeve is a simple rectangle folded in half and joined with a slip stitch along two sides. The color changes in the yarn mixed at random, occasionally making solid white or dark brown patches, and sometimes working onto the hook in one color and off in the other color. Where the colors mix, the Tunisian crochet stitches create shapes of zeros and ones—perfect for a digital device case!

Resources

Cross Wind Farm, crosswindfarm.com.
Rainbow Fiber Co-Op, rainbowfibercoop.org.

A. Sabine Schröder-Gravendyck, DVM, makes her home on Germany's North Sea coast, where she works as a naturalist and educator in sustainability and ecology. She is always looking for new ways to help people merge their personal spaces with nature. You can find more about Sabine on her website, florafauna.pro.

Samantha Stopple is an avid spinner, knitter, weaver, and indie crochet designer. When she's not playing with fiber, she takes long walks in the wetlands or is bird-watching on her front porch. Find her @sammimag on Instagram and at sammimag.com.

Kate Larson is the editor of *Spin Off,* teaches handspinning and knitting around the country, and spends as many hours as life allows in the barn with her beloved flock of Border Leicesters.

Angela K. Schneider spins, knits, weaves, and practices a multitude of other fiber arts, including making some of her own tools like the crochet hook used in this project. She is the project editor at Long Thread Media.

One of Nikyle's beautiful ewes finds a morning snack.

Photos by Nikyle Begay

T'aa dibé (The First Sheep)

A Diné Shepherd's History of the Navajo-Churro

NIKYLE BEGAY

Navajo folklore says that **t'aa dibé** (the first sheep) were a gift from the Holy People. But because of our pride, those first sheep were taken away and promised to be returned when our humility was regained. History says that the Spanish Churra sheep were driven up from Mexico in the mid-1500s. This expansion led to the acquisition of the sheep by my ancestors, a reacquaintance with an animal that they've remembered in their creation stories, sacred chants, and prayers.

Since then, there has been a timeline of fruitful years as well as involuntary reductions of what was once recorded as the "old-type" Navajo sheep. Today's Navajo-Churro sheep are the result of historical selective breeding by both Indigenous and Hispanic shepherds. The sheep are smaller than your average commercial and finewool breeds, having a "deer-like" frame and instincts that drive them to be good range foragers. These traits allowed them to become well adapted to the arid American Southwest and its variable terrain and climate.

The silky, lustrous wool produced by the old-type Navajo sheep had become prized for its durability, best characterized in the textiles that have remained intact for centuries. By industry standards, Navajo-Churro is considered a "carpet wool," because of its staple length and coarseness. Navajo-Churro were bred to retain the genetic capability to produce wool in an array of natural colors and a primitive fleece structure. Each sheep's skin has primary follicles that produce a longer "guard-hair" outercoat and secondary follicles that produce a shorter, fine-wool inner coat that lacks defined crimp. Navajo-Churro wool also contains small amounts of short, opaque fibers known as kemp that shed into the wool as it grows. Longer medullated fibers that do not shed are sometimes found in the britch area of Navajo-Churro.

Navajo-Churro ewes are quite prolific, lambing unassisted once and sometimes twice in one year, where twins and triplets are not uncommon. Their lambs are known to bounce right up and get to nursing after being born. These newborn lambs will remain at their mother's side while she grazes, keeping themselves within range of hearing her soft mutters. The fierce maternal instinct of Navajo-Churro ewes and their vivacious lambs make this breed of sheep well matched for lambing out on the range.

A relaxed ewe being skillfully blade-shorn by Jay Begay.

Both rams and ewes may be polled (hornless), have scurs (vestigial horns), or grow two or more horns. Ideally, Navajo-Churro sheep will have horns that do not obscure their vision, their ability to graze, nor cause injury or infection to themselves. Navajo-Churro sheep are one in a handful of breeds around the world that can carry a genetic mutation that causes them to have multiple pairs of horns. This mutation can also cause split upper eyelid deformity in genetically multihorned animals. Cases of severe splits in the upper eyelids can cause injury to the eyes of an affected animal, so breeders are encouraged to pay attention to their breeding practices of multihorned sheep.

HISTORY

Editor's note: In this section, Nikyle touches upon important and painful stories about their community's relationship with the Navajo-Churro and the threads of historical trauma that run through the Diné connection with sheep, wool, and textiles. Additional resources are available at the end of the article for readers who wish to learn more.

In the years leading up to the Long Walk—an event in American history when the Navajo people were marched from their ancestral homelands to an internment camp in eastern New Mexico—Navajo sheep and shepherds flourished in the Four Corners region. They saw no borders, grazing in the lands between the Grand Canyon, Mogollon Rim, Monument Valley, Canyon de Chelly, and even up onto the Rocky Mountains.

Due to fear of Navajo obstruction of westward expansion, the U.S. Army was ordered to destroy the Navajos, subsistence through a scorched-earth policy. Led by Kit Carson in 1863, hundreds of thousands of sheep and goats from Navajo flocks were killed. Fields and orchards were also burned, bringing some Navajo people to surrender at U.S. Army outposts. Families that were able to evade capture hid with their sheep. They hid in remote canyons that lacked water and shade during the hot summers and upon mountains where they were unable to light fires to keep warm for fear the smoke would give away their position. The Navajo that surrendered were forcefully marched hundreds of miles away to a barren land in eastern New Mexico called Bosque Redondo.

The survivors of the Long Walk and internment at Bosque Redondo recall a yearning to be reunited with their sheep. After four years of ethnic cleansing, sickness, poverty, and death, the Treaty of 1868 was signed between the United States government and the Navajo People. This treaty outlined a new boundary that was placed in northeastern Arizona and northwestern New Mexico, allowing the Navajo to return to a fraction of their original homelands. Upon returning from Bosque Redondo, Navajo families were issued two "native" sheep at Fort Defiance. And from those pairs of sheep, plus the flocks that managed to evade capture, the Navajo pastoral lifeway was restored.

From 1869 to about 1934, production of Navajo carpet wool and handwoven blankets claimed their place within local and global markets, thus piquing the interest of the Bureau of Indian Affairs (BIA) and the U.S. Department of Agriculture (USDA). So, in 1935 the USDA established the Southwestern Range and Sheep Breeding Laboratory at Fort Wingate, New Mexico. The USDA researchers collected what they saw as old-type Navajo sheep from flocks in the eastern region of the Navajo Reservation and began to crossbreed them with finewool and longwool rams.

The effort to create a finer-fleeced and meatier sheep for commercial production, while retaining the traits that made the sheep well adapted to the area, tanked the Navajo wool and blanket industries. Wool from this newly created sheep was short, greasy, and had a shrinkage of over 50 percent. Since this wool was now deemed "fine," it commanded a higher market price that no domestic carpet manufacturer was willing

to pay. Rather than buying individual finished blankets from Navajo weavers, local traders began to commission rugs "by the pound." The lustrous wool from old-type Navajo sheep, which once provided the brilliant sheen and durability seen in woven pieces before this time, was now replaced by the inferior wool from this crossbred sheep.

Meanwhile, in 1936, the Hoover Dam at the Arizona-Nevada border was constructed. This new dam would tame the Colorado River, producing hydroelectric power for growing cities and providing water to the thirsty desert. This time in American history saw the Great Depression and a severe drought that plagued the great plains during the Dust Bowl era, fueling worries that the Hoover Dam would fill with silt from seasonal monsoon runoff. Amid heightened fears of the dam's possible failure, eliminating Navajo livestock was targeted as a solution to control erosion. This led to the extermination of thousands, perhaps millions of "native" sheep and goats, the primary livelihood of the Navajo people at the time. This event in history has come to be known as the Navajo Stock Reduction.

"In 1982, when we started returning sheep to the Navajo, the elders would come up to the truck and look at the sheep while we were getting gas and start telling stories. They'd have tears in their eyes."

—Dr. Lyle McNeal, Navajo Sheep Project

Unimaginable horror stories shared by Navajo elders recount the newly elected Indian Commissioner John Collier assembling his federal agents to visit Navajo homesteads. Promises of compensation for surrendered animals were broken, and agents were later sent to kill Navajo livestock. Rarely were these animals done any kindness and shot at point-blank range, simply because there was not enough ammunition. Instead, Navajo families were forced to herd their flocks into narrow canyons or large corrals where the animals were then doused with kerosene and lit on fire. Ghastly sounds echoing between the canyon walls from the animals as they burned alive, accompanied by faint calls from lambs to their dead mothers, still haunt the memories of many Navajo elders, who would have been children when their family's flocks were destroyed.

RECOVERY

A lot like my ancestors, Navajo-Churro sheep are quite resilient. The flocks that exist today on Navajo Nation stem from sheep that evaded annihilation during the Long Walk and the Navajo Stock Reduction. These flocks were passed down from generation to generation, with their tales of survival and with prayers of continuance.

Navajo-Churro sheep also exist because of the many generations of Hispanic rancheros and weavers settled along the Rio Grande River, as well as the conservation efforts of non-Indigenous and non-Hispanic

A New Chapter: Rainbow Fiber Co-Op

As COVID-19 swept the globe in 2020, a group of influential fiber artists reached out to me via Instagram. Our conversation turned to ways we could help Diné shepherds and their sheep. The Navajo Nation was being ravaged with cases of COVID-19, and at one point, the Navajo Nation led in cases per capita in the United States. Many Diné lost their lives, and many Diné flocks lost their shepherds.

For nearly a century, Navajo-Churro wool—once the preferred wool used exclusively in the most well-made Diné blankets and rugs—has been deemed inferior, and shepherds were told that it has no place in the national or global market. In 2019, a handful of Diné shepherds felt lucky to be paid 1 to 5 cents per pound for their Navajo-Churro wool; others weren't as fortunate.

Navajo-Churro yarn from Rainbow Fiber Co-Op

I felt moved to do something, not just to support my own flock, but to do something on behalf of my fellow Diné shepherds. I joined forces with a friend and Navajo-Churro shepherd in California named Kelli Dunaj. We worked diligently on a plan to improve the financial sustainability of some of the largest remaining flocks of Navajo-Churro sheep on ancestral Diné land. From this, the Rainbow Fiber Co-Op was formed.

Partnering with Fibershed, a nonprofit organization that develops regional, land-regenerating natural fiber and dye systems, Rainbow Fiber Co-Op has blossomed into a new and exciting wool cooperative.

We are a Diné-led co-op that aims to create more equitable market outcomes for our flocks by starting up an e-commerce marketplace for Diné-grown Navajo-Churro weaving yarns and spinning fibers.

The co-op purchases wool from traditional Diné sheep-herding families at a fair price, pays for the wool to be milled into roving and Navajo-style weaving yarns, and offers these products for sale online. All sales revenue goes back into covering operational expenses for the co-op, and for the 2023 fall/winter season, we are hoping to make our first-ever member payout.

The Rainbow Fiber Co-Op is well into its third year of operation and, in April 2023, successfully completed phase one of the annual cycle of shearing, skirting, buying, packing, and shipping wool. In 2022, the co-op supported 35 Diné flocks by purchasing about 7,500 pounds of Navajo-Churro wool. The average price paid per pound was $2.60, for a total of $20,000 in wool payouts. In addition to wool payouts, the co-op distributed $35,000 in pay to Diné shepherds, fiber artists, teachers, and skilled laborers. Income generation in the Diné wool economy is an ongoing and critical aspect of our mission.

Learn more at rainbowfibercoop.org.

people. In the mid-1970s, Dr. Lyle McNeal of Utah State University saw the need to preserve and protect this heritage breed of sheep, a breed that he saw as well adapted to the Southwest and culturally important to the Navajo people. In 1978, he created the Navajo Sheep Project, which managed to form a nucleus flock of "old-type" Navajo sheep with animals located on ranches in California and Texas, as well as from flocks in isolated areas of the Navajo Reservation and from Hispanic ranchers and weavers in Northern New Mexico. According to the Navajo Sheep Project, fewer than 450 Navajo-Churro existed on the reservation by 1973.

In 1986, Dr. Lyle McNeal joined forces with Dr. Annie Dodge Wauneka, Goldtooth Begay, Milton and Irma Bluehouse, Connie Taylor, Ingrid Painter, Antonio Manzanares, and Maria Varela as well as conservation groups including Ganados del Valle, the CS Fund, and the American Livestock Conservancy to establish the Navajo-Churro Sheep Association. Breed standards were set for phenotypic conformation and

Navajo-Churros can have multiple pairs of horns or none at all.

wool characteristics from the accounts of Indigenous and Hispanic shepherds, from written documentation from the Southwestern Range and Sheep Breeding Laboratory, and from sheep that were being raised by the Navajo Sheep Project.

Today, Navajo-Churro sheep are listed as "critical" by the Livestock Conservancy, with fewer than 200 sheep being registered with the Navajo-Churro Sheep Association annually. Many Navajo-Churro sheep remain unrecorded on the Navajo Nation, across the United States, Canada, and in northern Mexico.

To Learn More

Begay, Nikyle. "Blue Sheep (*dibé dootłizh*): A Shepherd's Search for Natural Color." *Spin Off* Spring 2022, 26–31.

Livestock Conservancy, livestockconservancy.org.

Navajo-Churro Sheep Association, navajo-churro sheep.com.

Navajo Sheep Project, navajosheepproject.org.

Weisiger, Marsha. "Gendered Injustice: Navajo Livestock Reduction in the New Deal Era." *Western Historical Quarterly* 38, no. 4 (2007): 437–455. jstor.org/stable/25443605.

Wilkins, D. E. *The Navajo Political Experience*. Tsailé, AZ: Diné College Press, 1999.

Zeender, Jim. "The Navajo Treaty Travels to the Navajo Nation." *Pieces of History* (blog). United States National Archives, August 1, 2018. prologue.blogs.archives.gov/2018/08/01/the-navajo-treaty-travels-to-the-navajo-nation.

Nikyle Begay (they/them) is a Diné shepherd, fiber artist, and teacher based in Ganado, Arizona, on the Navajo Nation. Nikyle is the executive director of Rainbow Fiber Co-Op and brings a wealth of knowledge and expertise to the project. Nikyle has experience working in technology and the nonprofit sector as well as an extensive background in sheep flock management, wool production, traditional wool processing, and the weaving arts. You can find them on Instagram @navajoshepherd.

Unspun

Exploring Traditional Asia-Pacific Textiles through Foraged Fibers

EMILY ROBISON

Raw fibers extracted from *Sansevieria* leaves, shown with finished thread created with careful knotting.

Photos by Emily Robison unless otherwise noted

In my early twenties, I served as a Peace Corps volunteer on Yap Island in the Federated States of Micronesia, a remote nation in the western Pacific composed of 65 inhabited islands and more than a dozen distinct languages and cultures. Women from the Outer Islands of Yap and Chuuk weave and wear cloth skirts called *lavalava*, which are also used as burial shrouds, for trade, as peace offerings during conflict, and more. Though the materials and colors have changed significantly over the past several decades, lavalava weaving has largely survived colonization and globalization due to the complex role it serves in Yapese Outer Island and mainland cultures.

For the two years I lived in Yap, I was taught to weave by a family of women from Lamotrek, one of the more remote Yapese Outer Islands. I would sit at the

loom in their outdoor kitchen area and weave while they cooked or prepared local fibers. They taught me their knots, how to create string heddles during the warp-winding process, and how to fix broken threads. And when I was finished with my first lavalava, they gifted me a loom of my own that I still use nearly 15 years later.

Lavalava are lengths of backstrap-woven cloth about 24 inches (61 centimeters) wide and 60 inches (152 centimeters) long, or as wide as the length from a woman's waist to her knee and long enough to wrap around her one and a half times. The loom is made of a stationary frame that is anchored to a house post, or similar fixed structure, and holds front and back beams that support a continuous, circular warp. The backstrap is affixed to the front beam, and the weaver controls thread tension with her body by bracing her feet against the back frame of the loom. Today, these skirts are almost exclusively woven from the fine polyester thread first introduced in the mid-twentieth century. Traditionally, however, they were woven from fibers extracted from certain species of banana and hibiscus plants. For handspinners accustomed to twist-based techniques, perhaps the most surprising aspect of traditional lavalava is that they are constructed using threads that have been prepared without twist of any kind.

During my visits, I watched my teachers split long strips of banana fibers with their thumbnails and prepare them for weaving traditional cloth. They told me that the banana fibers were extracted from the plant by scraping the inner layers of the stalk until the bast fibers were exposed. These fibers were then dried and separated into thin strings that were tied together end to end to make thousands of yards of thread for weaving. Some were dyed and some were left white so that patterns could be woven into the final cloth. Hibiscus was prepared similarly, though the extraction process involved shaving the outer layers of bark from a branch and then retting it in the ocean for a few weeks until the inner bark fiber loosened and could be split and tied.

A typical style of *lavalava* that is popular today. While most modern examples are made with polyester, this one is primarily banana fiber. Made in Elato, a Yap Outer Island, and accessioned into the Smithsonian's collection in 1965

Catalog number E404186-0, Department of Anthropology, Smithsonian Institution

Modern polyester lavalava are lengths of warp-faced fabric that can have as many as 2,500 warp threads in a single cloth. The strength and smoothness of the polyester allow for a denser fabric, and all the knots for color changes are placed at one point in the warp that remains unwoven. Fabrics made from traditional local fibers, however, tend to have a balanced weave because the knots are distributed throughout the cloth and can cause snags and breakage during shed changes, thus requiring more space to move smoothly during the weaving process.

I learned many things during my time in Yap, but perhaps my favorite lessons involved making use of what was available around me. There was only one general store on the island, and import ships were infrequent, but the tropical jungle and surrounding ocean provided everything that the Yapese required for their daily lives. Food, shelter, clothing, recreation, medicine, and tools could all be found in the local environment. We turned tree branches into lazy kates and shells into scissors. We also repurposed PVC pipe as shed rods and ceramic power-line insulators as bobbins. I've taken this spirit of resourcefulness with me and have continued to find solutions and inspiration for my craft in my environment.

FINDING THREADS

The idea of foraging for fiber in Puerto Rico, where I live now, first came to me while I was exploring a local state park and noticed a few hibiscus trees. While I suspected that harvesting the trees might be illegal and retting them undisturbed at our public beach might be impossible, the discovery of one such fiber plant inspired me to look for more.

The unspun local threads of traditional lavalava are not unique to Micronesia, and examples of textiles constructed from processed, unspun fibers—both protein and cellulose—exist in climates and cultures all over the world. One such tradition is piña fabric made in the Philippines from the unspun fibers of a

Historical examples of thread from Kosrae, where weaving is no longer practiced. The shells shown were used as scissors.

Catalog number E206253-0, Department of Anthropology, Smithsonian Institution

variety of pineapple plants. The process of preparing these fibers for weaving is similar to what I know of Micronesian threads, but there is far more readily available documentation of piña cloth than there is of lavalava. Learning more about this fabric helped me identify locally available fiber plants and fill the gaps in my knowledge of how to process them.

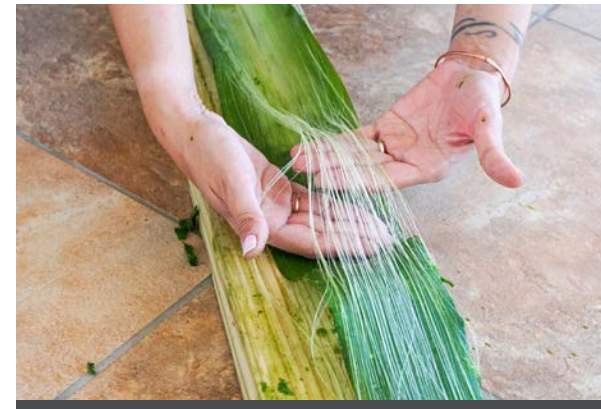
On one of my walks, I happened upon a wild stand of *Sansevieria*, also known as *Dracaena*, snake plant, mother-in-law's tongue, or bowstring hemp. I noticed long fibers fraying from the edges of many of the leaves, and I thought of piña. A little research revealed that this plant likely made its way to Puerto Rico for use as a fiber plant for ropemaking. I was interested to see if it could be used for weaving finer fabrics, so I brought a few leaves home to process the Micronesian way.

SCRAPING THE FIBERS

This method of processing fibers requires only one tool, a scraper. Many things will work for this purpose, but the edge must be straight and tapered enough to scrape efficiently and not so sharp as to cut the fibers in the process. A thin edge on a ceramic plate works great, but a recently broken ceramic edge is often too sharp. My first scraper was a broken piece of porcelain I found at a construction dump site on the side of the road. It worked perfectly but was accidentally thrown out one day (the perils of repurposing trash). I now use a small plate with a straight edge.

I harvest *Sansevieria* leaves that are at least 2 feet long before their stems begin to taper at the bottom, where the fibers become difficult to extract. If you are working with pineapple or something similar, remove the thorns before you begin scraping. Also be aware that this is a messy process, but a single leaf requires only a few minutes of labor.

A foot is placed on the end of the leaf as a scraper removes the plant matter and exposes the long fibers.



The fibers are gathered, lifted, and pulled away from the remaining leaf.

After rinsing and further scraping, the smooth, clean fibers are ready to dry.

Photos by Benjamin Weinberg

Step 1

Lay the leaf face side up on a flat surface. I use a 2-by-6-inch board placed on the ground. Use your foot to anchor the base of the leaf to the board. (*Note:* If you find this maneuver difficult, you may be able to clamp the board and leaf to a table or use a raised bench.)

Step 2

Using the flat edge of your scraper, scrape away the fleshy surface of the leaf until the fibers are exposed. I generally work in 8-inch increments, starting from the top of the leaf. Use both hands on the scraper to apply even pressure and scrape away from yourself.

Step 3

Use your thumbnail to lift the exposed fibers away from the back of the leaf in the middle section of the plant, then insert your hand between those fibers and the back of the leaf. Using even pressure, continue to lift the fibers away from the leaf until they are free at both ends.

Step 4

Lay the extracted fibers back onto your board and add some water. Scrape the fibers again to remove any residual plant pulp. You can also wash the fibers under running water and remove the rest of the pulp with your thumbnail. Wash and scrape the fibers until they are white and free of pulp. Hang to dry.

TYING THE THREADS

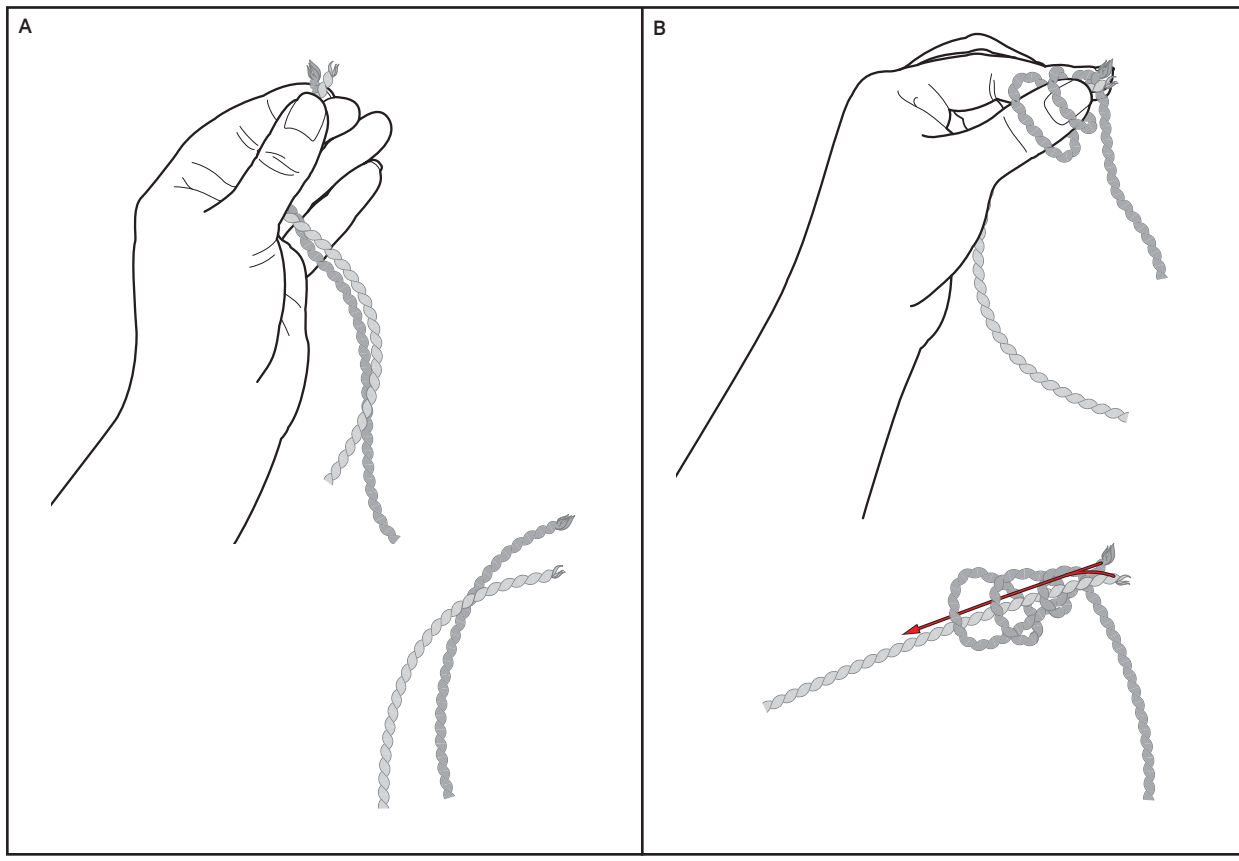
The fibers will clump together and stiffen as they dry. You can easily soften and separate them by running your thumbnail down their length. Once the fibers have been separated into single strands, they can be tied end to end and wound onto a bobbin.

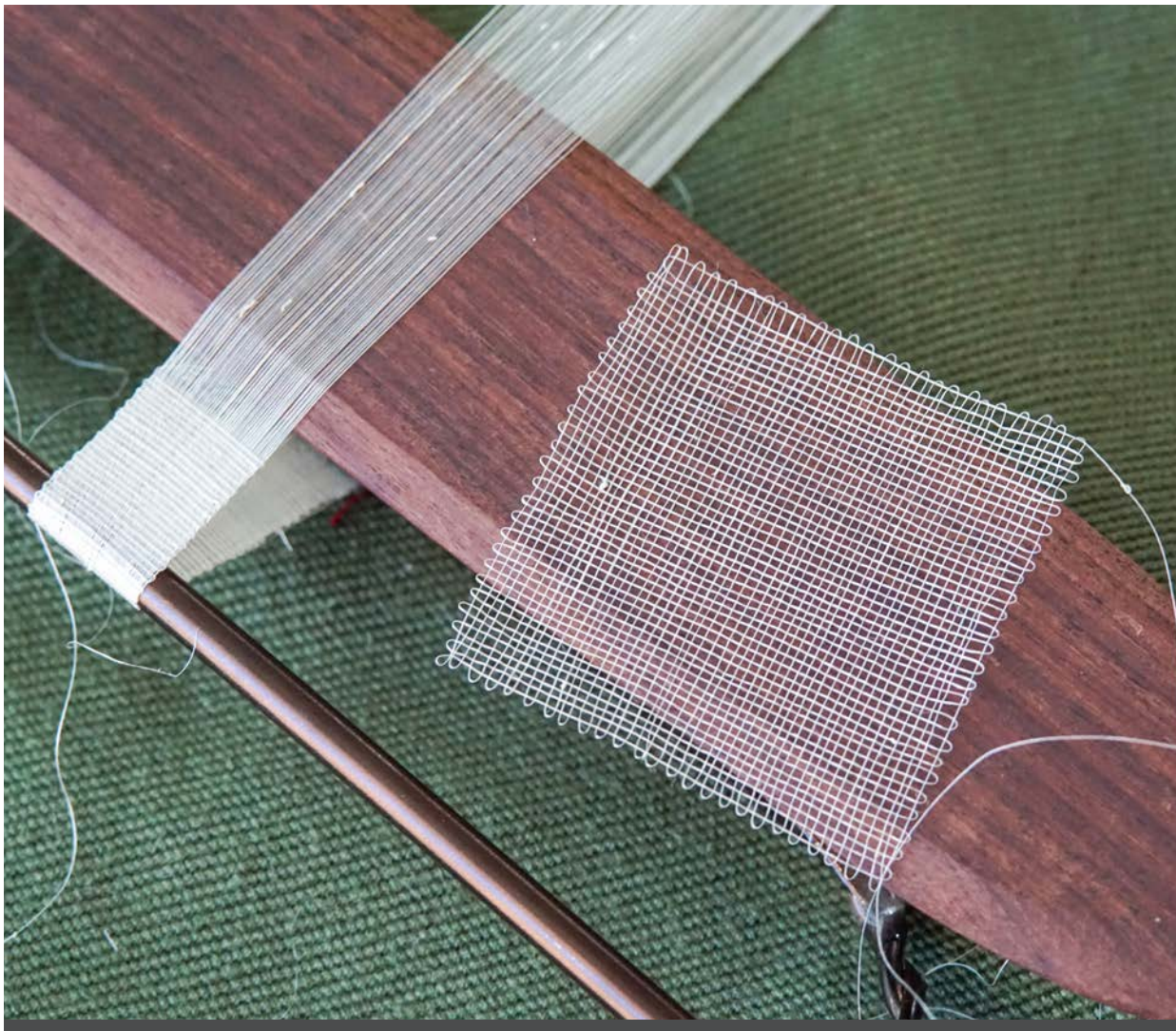
The knot that Micronesian weavers use to tie these threads is special and, with a little practice, easy. It is strong and secure, can be created quickly, and allows the threads to lie end to end without a bend or protrusion. In the Ulithian language, this knot is called *bug-bug* (the verb form is *bugsu*).

How to Bugsu

Hold the end of your working thread between the thumb and index finger of your nondominant hand. Cross the end of the new thread underneath the working thread and hold them together. Leave a tail of about 1 centimeter past the cross (A).

Wrap the new thread around your thumb and underneath (behind) the ends of the threads, anchoring the loop with your index finger. Do this a second time, making sure that the second loop does not cross over the first. Loop the new thread once more,





Emily's unspun threads at work. In both her pin-loom square and ribbon, the tiny knots connecting the plant fibers are visible. The background is a *lavalava* gifted to Emily by an Outer Island weaver.

but this time, loop only the tail ends and do not loop around your thumb. Fold the tail ends of both threads over the third loop and inside the first two that were made. Anchor this maneuver between your fingers again. Pull gently on the new thread until all the loops tighten and the tail ends are secure (B).

Trim the tails as close to the knot as possible and wind the tied thread onto a bobbin or something similar to keep it from becoming tangled.

USING UNSPUN THREAD

Once the knots are tied, the thread is ready for use. This knot is directional; the top side is smooth, and the side with the cut tails is more likely to snag during use. It is important to make the knots consistently so that the smooth side always faces the same direction. I find that the smooth side is best oriented toward the back of the loom when weaving so that the weft can slide smoothly over any warp knots when beating.

I tested my thread in two ways. Because the thread is so fine, I made a tiny pin loom using entomology pins and an 18-count aida cloth as a guide. This allowed me to create an even weave and test the strength of my thread. Next, I made a little loom using an old picture frame. I wanted to be able to weave a small sample with techniques similar to my backstrap loom (using a coil rod and string heddles) but without placing too much stress on the threads. With more than 100 threads in my warp, I was able to create a tightly woven, warp-faced ribbon 1 centimeter wide. I now know that my threads can withstand a tight weave, and I am inspired to try them on my backstrap loom with the help of a Japanese bamboo reed. I would also like to use them for *mundillo* (Puerto Rican bobbin lace).

As a handspinner, I'd spend so much time contemplating the degree and direction of my twist that the

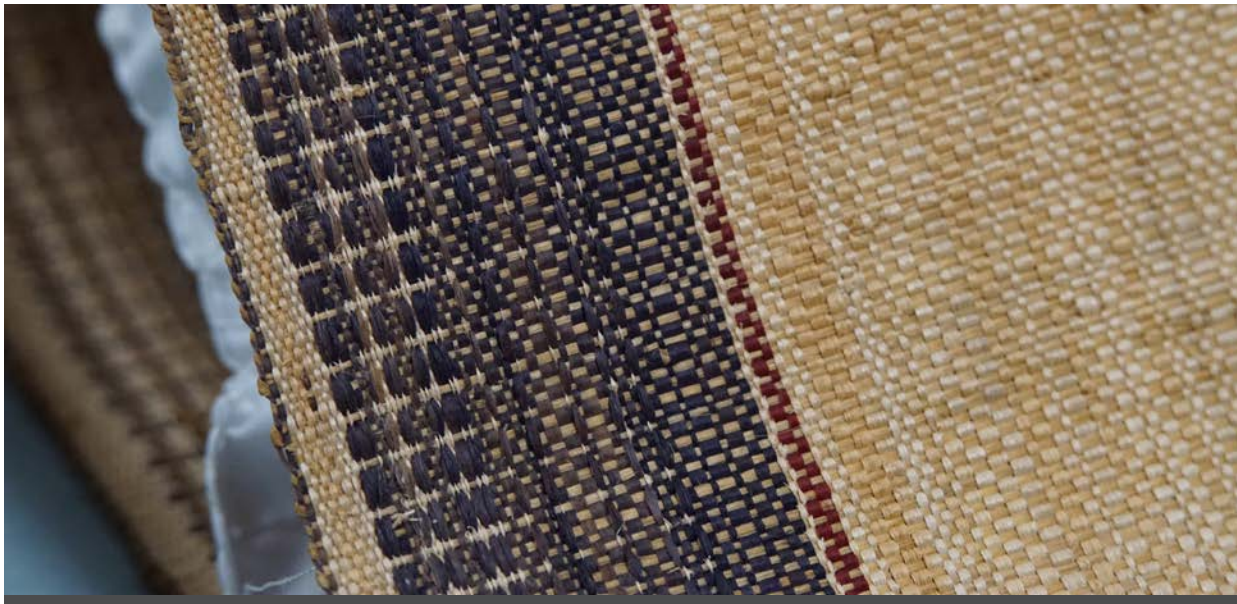
WeavingConnections

Hundreds of small islands are scattered across the vast Western Pacific Ocean and home to some of the most remote students on the planet. Diverse in culture and language, these far-flung picturesque islands of the Federated States of Micronesia, Republic of the Marshall Islands, and Republic of Palau form the geopolitical crossroads of the Pacific. The islands' dramatic role in centuries of global politics obscures persistent challenges of isolation, dispersion, and limited resources.

WeavingConnections is a project of Habele, a nonprofit established by former Peace Corps Volunteers who served in Micronesia focused on educational programs for Micronesian children.

Through WeavingConnections, volunteers aim to document the materials and context of the distinctive backstrap-loom weaving practiced in the western Caroline islands and by migrants from these Micronesian islands.

> For more information about weaving lavalava and how to make a Micronesian loom, visit weavingconnections.org.



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The typical edging on a *lavalava* woven from local fibers. Several knots are visible, connecting unspun threads.

twist itself became a fundamental, indisputable component of my threads. Yet, cultures across the globe have been utilizing prepared, unspun plant and animal fibers to create traditional textiles for millennia, and contemporary examples of these traditions can still be found on every inhabited continent. My exploration of unspun textiles has opened a new world of possibilities for my craft, not only one of new textures and drape but also one that has inspired me to connect with my own environment in new ways.

Resources

Special thanks to the weavers of Yap's Outer Islands.
Weaving Connections, weavingconnections.org.
"Weaving Piña Cloth." OurPhilippinesTV, February 14, 2012. youtu.be/yRvWiiGoOzI.

Emily Robison is an award-winning craft artist and researcher living in Vega Alta, Puerto Rico, with her husband, Ben, and their formerly feral cat, Sofi. She explores spinning, knitting, and weaving traditions from around the world, and her insatiable curiosity has driven her to investigate local craft in nearly 30 countries. Emily can be found on Instagram @thewovenworld or by email at thewovenworld@gmail.com.

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Courtesy of Petrie Museum, University College London

The linen Tarkhan dress (UC 28614bl) was found in an Egyptian tomb and is more than 5,000 years old, making it the oldest woven garment found to date.

Plant-Based Spinning

Back to the Basics

DR. ANNAMARIE HATCHER

I first learned to spin wool on my Ashford Traditional wheels. As I progressed along my spinning journey, I moved from wool to alpaca, llama, and mohair—all protein fibers from animals. Based on discussions with my spinning friends and on the dearth of plant fibers among the colorful offerings where I buy my spinning supplies, I felt that plant fibers might prove a challenge. What I have found working with plant fibers such as flax and cotton is that they are not more difficult to spin than wool if we understand how they grow, are processed into spinnable fiber, and have been traditionally spun throughout human history.

There are many differences between plant-based fibers and our animal-based familiars because plant fibers are largely composed of cellulose and animal fibers of protein. These two molecules have very different characteristics

that impact aspects of spinning and dyeing. Cellulose in plants is composed of carbon, hydrogen, and oxygen. Keratin, the protein making up animal fibers, also has these three atoms with the very important addition of nitrogen and sulfur. Fewer atoms in a less complicated molecular structure and larger cells make plant fibers lighter, stronger, and less flexible than animal fibers.[1]

I could see how these botanical attributes might be used to my advantage. I challenged myself to become more familiar with plant fibers, and my friend Barbara Kelly-Landry was easily convinced to join me on the journey (see Barbara's shawl on page 66). The history of plant-fiber use is much deeper than I had anticipated, starting with cave-dwelling early humans, which included our Neanderthal ancestors!

THE NATURE OF PLANT FIBERS

There is a bit of confusion about the classification of various plant fibers. I base this observation on my reading of several popular articles and on discussions with my handspinning group. Plant fibers can be classified as bast, seed, and leaf.[2] Common bast fibers are flax, hemp, ramie, and nettle. Cotton is the most common seed fiber. Leaf fibers such as pineapple are available to handspinners but are less common.

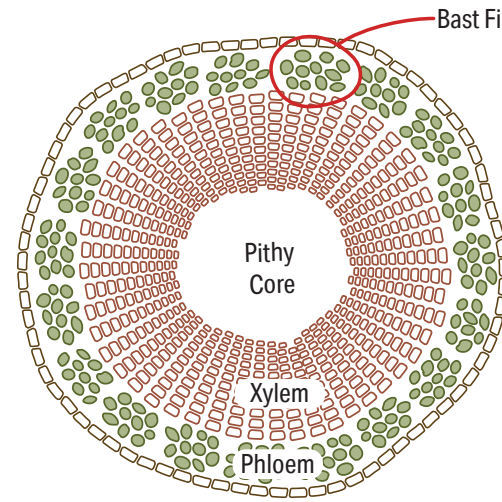
While the spinning characteristics of plant fibers vary wildly—from very short, fine cotton to very long and comparatively coarse hemp—they do have commonalities. Cellulose is the most important structural component in plant cell walls. Cotton is composed of 83% cellulose, while flax is 71%. The remainder is made up of molecules such as lignin and pectin.[3] The pectin in flax fibers aids the spinning process, as you'll see. These additional components in plant fibers affect the strength, flexibility, and color of the fiber and the spun yarn.

Bast Fibers

Each long bast fiber was a phloem tube, originally produced by the plant to carry water and sugars. The term bast derives from Old English *bæst*, and, according to the *Oxford English Dictionary*, originally referred to any flexible, fibrous bark but later was applied to other plants such as flax.[4] While we most often think of tall, thin flax plants as the quintessential example, bast fibers can be found in a variety of plant stalks and the inner bark of many trees. The fibers have a characteristic cross section with a central opening called a *lumen* surrounded by a cell wall. The lumen is what makes the fiber conductive to heat, ideal for summer garments. The thickness of the cell wall is the main factor controlling the stiffness of the fiber, and this varies with the type and age of the plant. Fiber from a young plant is fine and flexible, so the harvest of flax, hemp, and nettle often occurs before seeds develop.

Flax

Archaeologists believe that many of the earliest textiles were made of spun flax. Flax is one of the strongest fibers, twice as strong as cotton and four times stronger than wool.[5] It ages well and gets softer with wear and washing. Under the microscope, the fibers have a long cylindrical shape with bamboo-like joints. Each fiber is composed of bundled single cells called *ultimates*, and the joints are where the ultimates connect, adding to the flexibility of the fiber. Flax fibers range in length up to about 35 inches (90 centimeters), which is not as long as hemp, with lengths of 35 to 181 inches (90 to 460 centimeters).[6] This long length allows a handspinner to form a strong yarn, even with low twist to maintain maximum flexibility in this relatively stiff fiber.



A cross section of a flax stem shows the fiber bundles located in the phloem, just inside the outer bark.

Illustration by Angela K. Schneider

Photo by Matt Graves

Three antique flax stricks from Austria, courtesy of Christiane Seufferlein. The type of retting impacts the color of the flax.

The long phloem fibers are extracted from the stem of the flax plant through various processes that remove the other parts of the stem, and the individual fibers are combed out. The longest fibers will be nearly the height of the flax plant itself, and once processed, are referred to as *line flax* or, once bundled, a flax strick. As the line flax is processed, shorter irregular leftovers result, which are called *tow.* Longer tow fibers today are combed and sold as sliver.

When spinning flax, handspinners wet their fingers. I asked some handspinners why, and the answer was "to tame the little flyaway bits along the fiber." There may be something to that, but it is also important to wet the pectin that surrounds the fiber to form a sort of glue that helps hold the fibers together along the length of the yarn. It is important not to use too much water as the pectin can build up on the wheel orifice or produce a gummy mess of your fiber bundle if you're not careful. Although pectin compounds are useful during the spinning process, they will wash out of the finished yarn or textile over time, reducing the size of the spun fibers by up to 25 percent.[7] Have you noticed the loss of color in flax fiber when wet-finishing newly spun yarn? That is, in part, the pectin washing out. Washing out the lignin and pectin will also increase the sheen of the flax fiber. (Note to self: This loss of weight and volume emphasizes to me that I must wash the yarn before knitting a gauge swatch!)

Today, over 90 percent of the world's commercial spinning and weaving equipment is designed for fibers with the approximate length and diameter of cotton fibers.[8] Most regenerated fibers (see below) are extruded so they can easily be used in the machinery for the cotton system of textile manufacturing. To adapt bast fibers to this cotton-centric process, various processes break down the long fiber bundles that are similar in length to a cotton fiber. This flax-based fiber that can be spun on cotton equipment is referred to as "cottonized flax."

Photo by George Boe

Natural-color cotton

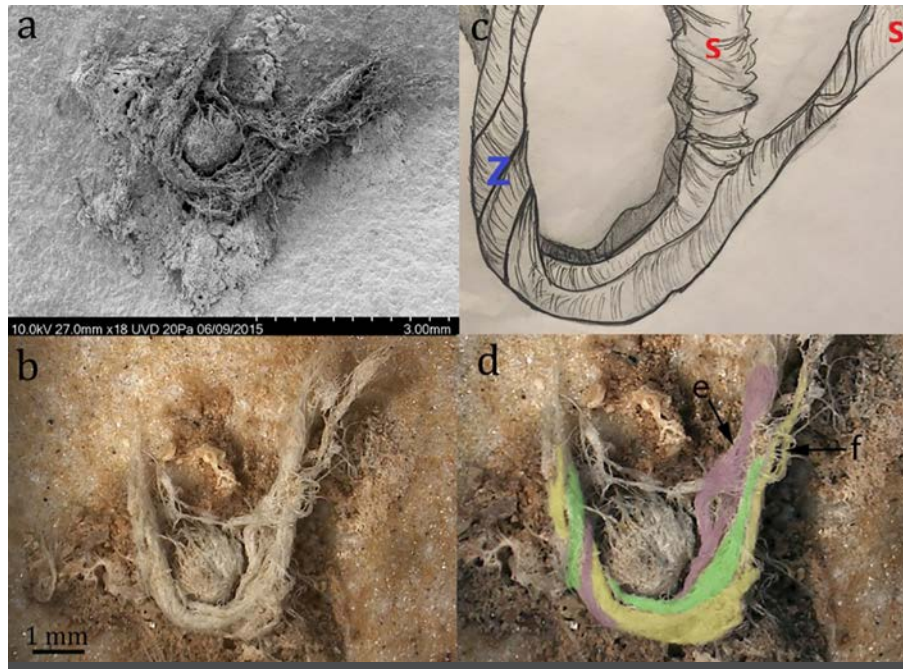
Seed Fiber

Cotton, another fiber that is popular with handspinners past and present, is not a bast fiber but is derived from the protective coating around the seed. Seed fibers have a softer hand than bast fibers and are much shorter. Cotton also has a long history of use. Archaeologists have identified the use of cotton in Pakistan more than 5,000 years ago.[9]

Cotton fibers resemble twisty ribbons when viewed under a microscope, and the twists develop after the cotton boll opens. The twists allow the short seed fibers to be spun together easily, resulting in a springier yarn than is possible with bast fibers.[10]

Leaf Fiber

Leaf fibers are not as popular with handspinners as seed and bast fibers in most parts of the globe. Leaf fibers are stiffer and coarser and might be spun into



Fragment of three-ply cordage attributed to Neanderthals: (a) scanning electron microscope photo of cord fragment, (b) 3-D Hirox digital photo of cord fragment, (c) schematic drawing illustrating S- and Z-twist, (d) enlarged Hirox photo with cord structure highlighted (e and f omitted). Licensed under CC-BY-4

coarse, utilitarian textiles. Researcher Emily Robison is studying the Micronesian tradition of handknotting individual leaf fibers to create fine woven cloth (see page 50).

Two leaf fibers that may be familiar are sisal and pineapple. Sisal is a leaf fiber derived from the agave plant (a cousin of the agave that is used to make tequila), and pineapple fiber is a leaf fiber from the pineapple plant that can be extracted after the fruit is harvested.

Regenerated Cellulose: Plant Molecules, Not Plant Fibers

There are several manufacturing processes designed to generate fibers that imitate specific natural fibers. These processes vary from the viscose process, which has a large environmental footprint, to lyocell, which does not. Although the process starts with plants, the regenerated fiber consists of a soluble derivative of cellulose, unrecognizable as cellulose under the microscope. The processed fibers do not have the strength of unprocessed plant fibers. A common spinnable fiber in this category is bamboo, which is produced using the viscose process. Individual bamboo fibers are very short (1.9 millimeters long), which is why bamboo cellulose must be processed and regenerated to produce a spinnable fiber.[11]

THE HUMAN HISTORY OF PLANT FIBER

Because we have not successfully produced a time machine, our understanding of the past has largely been based on the remains of ancient civilizations. Textiles are rarely preserved in the archaeological record, so we know about their history only from areas where climatic conditions are conducive to preservation. This includes peat bogs, some caves, frozen landscapes, and extremely dry areas. Let's look at what we do know, from caves in the country of Georgia to the banks of the Rhône River in France and then on to the famous mummies of Egypt.

Many of the ancient textile samples that have survived are linen, made from the bast fibers of the flax plant. Some of the deep history of flax fiber use has been elegantly documented in a cave in Georgia by the botanist Dr. Eliso Kvavadze. She found dyed, spun, and plied flax fibers (probably *Linum angustifolium*, a wild ancestor of our modern *Linum usitatissimum*) dating from about 31,000 to 36,000 years before present. To put this into context, during that period, humans were living in caves and developing stone tools.[12] That is truly back to the basics, isn't it?

At an archaeological dig situated on the banks of the Rhône River in France, Dr. B. L. Hardy and his colleagues found a three-ply cordage (twisted S and plied Z)

While surviving wall paintings show women wearing tunics of linen so sheer that the tint of their skin peeps through, much more robust clothing was valued too and can be found in the richest tombs."

—Kassia St Clair

attributed to the Neanderthals (*Homo neanderthalensis*), our distant ancestors who existed during the Pleistocene epoch (over 11,000 years ago).[13] The research team was able to identify the fiber as the inner bark of a tree that was most likely a conifer (evergreen). This bast fiber was from the fibrous layer of the inner bark.

The extremely dry climate of ancient Egypt has preserved many textiles that paint a picture of that civilization. A tomb painting of a rippling board (a tool used to remove seed heads from harvested flax) has been identified from the period of 1550 to 1292 BCE, and paintings of Egyptian flax fields exist that have been dated at 2649 to 2150 BCE. Flax was used in all sorts of textiles, cords, ropes, and nets. Almost all linen threads uncovered from ancient Egypt are S-twisted (counterclockwise).[14]

BLENDS: A HARMONY OF PLANT AND ANIMAL FIBERS?

In the Old Testament, believers were told not to "sow thy field with mingled seed: neither shall a garment mingled of linen and woolen come upon thee." In *The Golden Thread*, Kassia St Clair puts forth that some scholars believe that there was no moral objection to this blend.[15] Rather, it formed a special fabric that was reserved for priests alone, a symbol of their special social status. This perspective spurred Barbara and me to experiment, resulting in the Atlantic Shawl, and we now understand how the botanical attributes of flax may offer the handspinner intriguing options when blended with wools to create dynamic textiles.

Notes

1. Frederic Hungerford Bowman, *The Structure of the Wool Fibre in Its Relation to the Use of Wool for Technical Purposes* (1885; repr., HardPress Publishing, 2014), 10–11, Kindle.
2. Ivana Markova, *Textile Fiber Microscopy: A Practical Approach* (Hoboken, NJ: John Wiley and Sons, 2019), 1.
3. Markova, *Textile Fiber Microscopy*, xxiii.
4. *Oxford English Dictionary Online*, s.v. "bast," accessed September 20, 2023.
5. Kassia St Clair, *The Golden Thread: How Fabric Changed History* (London: John Murray, 2019), 44.
6. Council of Fashion Designers of America, "Fiber Guide: Flax (Linen)," cfda.com/resources-tools/materials-hub/article/fiber-guide-flax.
7. Stephenie Gaustad, *The Practical Spinner's Guide: Cotton, Flax, Hemp* (Loveland, CO: Interweave Press, 2014), 56.
8. Saskatchewan Flax Development Commission, "Flax Uses," saskflax.com/uses/fiber.php.
9. Nicoletta Maestri, "The Domestication History of Cotton (Gossypium)," *ThoughtCo.*, January 30, 2020, thoughtco.com/domestication-history-of-cotton-gossypium-170429.
10. Markova, *Textile Fiber Microscopy*, 1–2.
11. Markova, *Textile Fiber Microscopy*, 101.
12. K. Kris Hirst, "*Dzudzuana, 30,000 Year Old Cave in Georgia," ThoughtCo.*, March 23, 2020, thoughtco.com/dzudzuana-cave-early-upper-paleolithic-cave-170735.
13. B. L. Hardy et al., "Direct Evidence of Neanderthal Fibre Technology and Its Cognitive and Behavioral Implications," *Scientific Reports* 10, 4889 (2020), nature.com/articles/s41598-020-61839-w.pdf.
14. St Clair, *Golden Thread*, 40–42.
15. St Clair, *Golden Thread*, 3.

Acknowledgments

These studies (see accompanying article by Barbara Kelly-Landry) started with a Southdown breed study organized by Heather Thorne of the Atlantic Spinners and Handweavers guild. Blending wool with flax opened our eyes to so many possibilities. We would like to thank Heather and the other members of that breed study group for their inspiration and discussion.

Dr. Annamarie Hatcher is a freelance writer who enthusiastically blends handspinning and science. She is a retired research scientist with a PhD in zoology from the University of Western Australia and has been spinning for over 45 years in her free time. Intense spinning, knitting, and dyeing sessions with her fiber ally Barbara Kelly-Landry have helped them answer many *why* and *how* questions.

Journey from

FIBER to FINISHED OBJECT

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Flax How-To
4 Quick Tips

Are you a spinner without a hackle? A craft-store floral frog works a treat!

Photo by Matt Graves

Flax is having a moment, and many spinners are exploring this ancient fiber for the first time. Here are four tips from great resources that can help smooth your cellulosic path.

GIVE IT A BRUSH

Josefin Waltin has been on a deep exploration of flax spinning in her native Sweden and beyond. She recently wrote about a traditional tool that was new to many spinners: a Swedish brush made of hog bristles! Josefin brushes her rehackled flax stricks, removing short fibers and tangles, before securing them to a distaff.

Josefin Walton Spinner, "Flax Brush." August 1, 2020. waltin.se/josefinwaltinspinner/flax-brush.

SEED SLUDGE

Flax that is dampened as it is spun is stronger and smoother than dry-spun. Traditionally, saliva was often used, but many spinners use a flaxseed solution. As Linda Heinrich instructs in her flax compendium, "simmer 1 tsp. of flax seeds (any kind will do) in 1 cup of water for 10 minutes and strain." The result is a slippery liquid that can be kept for several weeks.

Heinrich, Linda. *Linen: From Flax Seed to Woven Cloth*. Atglen, PA: Schiffer, 2010.

NO DISTAFF, NO PROBLEM

While having a beautiful distaff (or 10) can be a joy, you can spin line flax without any distaff at all. In 2002, Jude Daurelle wrote an article for *Spin Off* about wrapping rehackled flax in a tea towel for spinning, a technique she picked up from Olive and Harry Linder. Jude simply tucks the wrapped bundle under the arm of her fiber hand and spins as one would with a distaff.

Daurelle, Jude. "Spinning Flax into Linen the Easy Way." *Spin Off* Winter 2002, 66–68.

A FROG FOR FLAX

Rehackling long line flax before spinning loosens fibers that have been compressed in storage; however not all flax-curious spinners have proper flax hackles. Raven Ranson of Crowing Hen suggests using a floral frog. These palm-size, inexpensive tools are used in flower arranging but can also work wonders in our spinner's hands. See Raven put it to good use on the Crowing Hen YouTube channel.

Crowing Hen, "How to Dress a Distaff with Flax," youtube.com/@CrowingHen.

Do you have a tip to share with your fellow *Spin Off* readers? Share it with us at **spinoff@longthreadmedia.com**.

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Photos by Matt Graves

The Atlantic Shawl

BARBARA KELLY-LANDRY

Stephanie Pearl-McPhee once wrote, "Some knitters say that they buy yarn with no project in mind and wait patiently for the yarn to 'speak' to them. This reminds me of Michelangelo, who believed that every block of stone he carved had the statue waiting inside and that all he did was reveal it. I think I've had yarn speak to me during the knitting process. . . ."[1] Yarn has certainly spoken to me during both the knitting and spinning of the Atlantic Shawl. With this project, the blended flax and wool yarns I created had a lot to say.

When my friend and spinning partner Annamarie Hatcher suggested we explore plant fibers, I was intrigued. I would not call my spinning experience with plant fibers such as flax extensive, but my maternal family in Ireland were flax buyers for the famous Irish linen industry. My mother has always been proud of this heritage, and she carefully transported woven Irish linen keepsakes to her new home in Nova Scotia.

After some discussion and debate, Annamarie and I decided to experiment with a flax and wool combination and a flax and silk combination. As with many spinning projects, deciding on the final knitted item helps to bring fiber and spinning choices into focus. I find that shawls are a good way to test new combinations because they allow for a large surface area of knitting to experiment with dye potential and stitch definition. Lace provides visual and textural interest and also allows the ability to test fiber combinations.

SPINNING NOTES

I enjoy designing and knitting shawls, and I particularly like shawls that are warm without being bulky. That's likely why our guild, Atlantic Spinners and Handweavers, gravitated toward a Down-breed sheep after being introduced to it during a breed study. Southdown is considered a quintessential Down breed, and in mixing it with flax, we hoped to retain some of the loftiness of the wool and add the strength of the flax.

To help us understand the contribution of the Southdown to the blended yarn, we used a longwool-type fleece as a comparison, choosing a Cotswold/Dorset crossbreed. Finally, we also chose a nonwool alternative blend of tussah silk and flax. We hoped to assess a silk and flax blend for stitch definition in the lace as we knew it would drape well. All fibers had similar staple lengths: 4 inches (10.2 centimeters) for the flax combed top, 5 inches (12.7 centimeters) for the tussah silk and Southdown, and 6 inches (15.2 centimeters) for the Cotswold/Dorset cross. While line flax or flax strick staples can be the full length of the flax plant, flax top typically has a shorter staple that is easily blended with other spinning fibers.

As Annamarie points out in her companion article (see page 58), flax can be a stiff fiber that softens with use and washing. That stiffness can translate to sharp lace definition, even when softened by blending it in the

Living next to the shores of the Atlantic Ocean means that its influence is never far away. Seabirds often fly overhead, and the sound of the surf is a constant rhythm in the background. With its sunset color and lacy additions, this triangular shawl evokes the wide wings of the gulls and the undulation of the waves as they rush to the shore.

Undyed fibers (*from top*): Cotswold/Dorset locks, Southdown combed top, flax top, tussah silk top, 70/30 Southdown and flax, 70/30 Cotswold/Dorset and flax, 50/50 Cotswold/Dorset and flax, 70/30 silk and flax. Onion-skin dyed fibers: 100% Southdown, 70/30 Southdown and flax, 50/50 Southdown and flax

right fiber combinations and proportions. To explore possible flax blends, we chose to create a 70/30 protein fiber/flax blend with each of the Southdown, Cotswold/Dorset cross, and tussah silk fibers. Then we added 50/50 protein/flax blends as well as a 100% Southdown sample. We spun all of the samples with a short-forward draw using a Schacht Ladybug wheel with a ratio of 4.7:1. The blends were spun to 24 wraps per inch (wpi) with 3.4 twists per inch (tpi) in two-ply yarns.

To add a bit of color interest to the shawl, we next explored onion-skin dye on our Southdown blends. The results were as expected—the Southdown took up the dye very well and the flax less so. The resulting heathery yarn gives the shawl an appealing and unique color quality.

KNITTING NOTES

I knitted the main body of the shawl in garter stitch with the 70/30 Southdown and flax yarn to use the softness of this combination close to the body. Garter stitch has memory that helps the shawl embrace the shoulders. Garters used to hold socks up in the seventeenth and eighteenth centuries were knitted in garter stitch to take advantage of this memory.

The Gull Wings lace insertion in the garter-stitch section of the shawl was placed just where the shawl drops from the shoulders, creating an eye-catching detail.[2] The Crest of the Wave lace pattern has been a favorite from the beginning of my lace-knitting journey.[3] It's visually strong as well as interesting to knit. I was extremely impressed with how beautifully the 50/50 Southdown and flax worked in this pattern. I have never seen it knit up so crisply.

The samples of the Cotswold/Dorset with flax and the tussah silk with flax were quite lovely and certainly would knit into a fine shawl. I would recommend the Cotswold/Dorset and flax combination for spring or fall, particularly because it didn't bloom as the Southdown did and would, as a result, not have the same degree of warmth. The tussah silk and flax would be a great combination for summer with its drape and airiness. However, you won't go wrong with a warm, lightweight shawl in Southdown wool and flax to protect you on cool evenings.

Clockwise from top left: 100% Southdown dyed with onion skin, 50/50 Cotswold/Dorset and flax, 70/30 Cotswold/Dorset and flax, and 50/50 silk and flax

Yarn does indeed speak to the spinner as it is being created. It often says to me, "Please do not treadle too fast or overtwist"; flax can be particularly harsh if overtwisted. When combined with the right wool and spun with a lower tpi, it creates a wonderful yarn that is easy to knit into a prized shawl. I hope you enjoy your flax journey as much as I did, and if you want to know my secret for not treadling too fast, it's to rhythmically recite a nursery rhyme as I spin: "Twinkle, twinkle, little shawl."

Notes

1. Stephanie Pearl-McPhee, *At Knit's End: Meditations for Women Who Knit Too Much* (North Adams, MA: Storey, 2005), 287.
2. Barbara G. Walker, *A Treasury of Knitting Patterns* (Pittsville, WI: Schoolhouse Press, 1998), 200–201.
3. Walker, *A Treasury of Knitting Patterns*, 201 and 205.

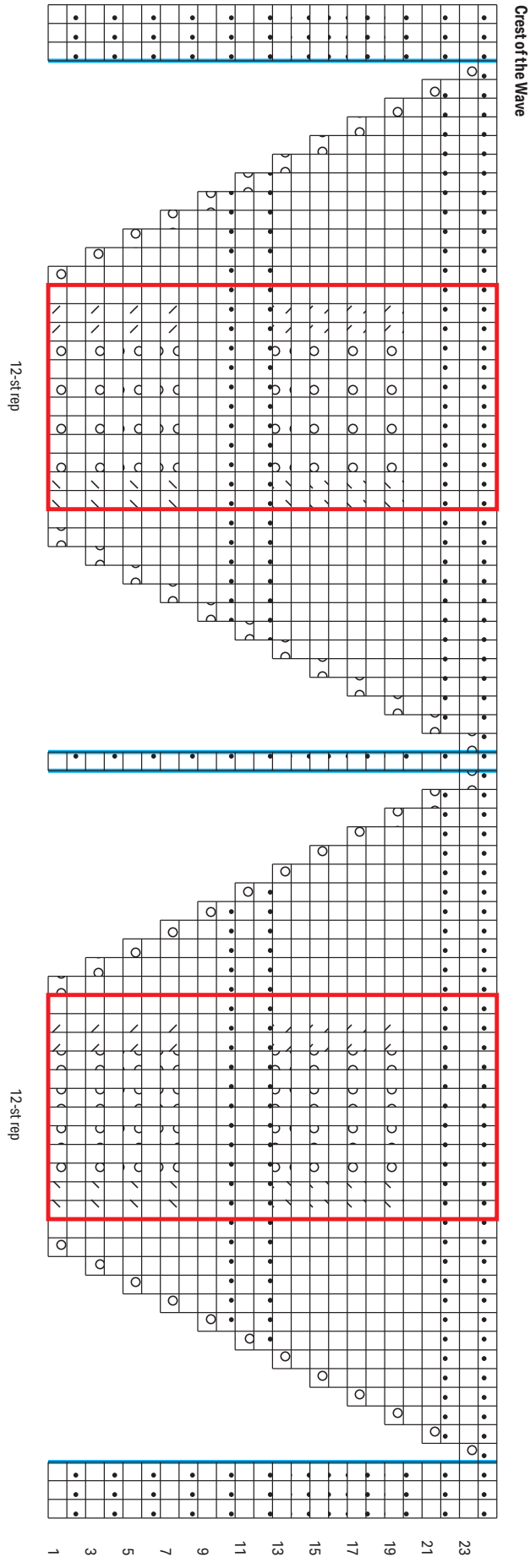
MATERIALS

Fiber 7 oz Southdown roving; 7 oz flax carded sliver.
Yarn 2-ply; 460 yd MC (70% Southdown/30% flax); 1,225 ypp; 24 wpi; laceweight. 2–ply; 460 yd CC (50% Southdown/50% flax); 1,349 ypp; 24 wpi; laceweight.
Needles Size 7 (4.5 mm): 36" circular (cir). Adjust needle size if necessary to obtain the correct gauge.
Other Supplies Markers (m); size E/4 (3.5 mm) crochet hook; tapestry needle.
Gauge 24 sts and 32 rows = 4" in garter st with MC.
Finished Size 74" wide × 37" tall.

Visit **spinoffmagazine.com/spin-off-abbreviations** for terms you don't know.

Notes

- This triangular shawl is worked from the center neck down and outward to the points.
- A circular needle is used to accommodate the large number of stitches.



k on RS; p on WS

k on WS

yo

k2tog

ssk

pattern repeat

marker position

The Atlantic Shawl Dye Recipe

While onion skins can be used to create a wide range of colors when combined with various mordants and modifiers, this widely available dyestuff also creates beautiful color on its own. In previous experiments, we found that we were able to create deep orange color without a mordant on the fibers explored for this project.

Onion-Skin Dyebath

- Fill a dyepot with 4 liters charcoal-filtered water (pH 7) and add about 20 grams of dry onion skins (as much dyestuff as you can add so water just covers).
- Bring dyebath slowly up to 70°C–90°C (158°F–194°F) and simmer for 60 minutes at this temperature.
- Turn off heat and allow the bath to cool to room temperature. At this point, the dyebath will be acidic (less than pH 7).
- Once cool, remove onion skins with a sieve or colander. Set dyepot aside.

Dyeing the Fiber

- Place fiber in a separate pan of charcoal-filtered water with 3 drops of dishwashing liquid. Submerge and leave at room temperature for 30 minutes.
- Remove wet fiber, squeeze out excess water, and add the fiber to onion-skin dyepot at room temperature. Slowly bring the temperature up to 70°C–90°C and simmer at that temperature for 60 minutes.
- Turn off the heat and allow the bath to cool to room temperature.
- Squeeze out liquid and rinse with room-temperature charcoal-filtered water until rinse water is clear. Allow to air dry.

STITCH GUIDE

Crochet Chain Bind-Off:

Insert crochet hook kwise through first st on needle, yo and draw through st, drop st from needle—1 st on crochet hook.

*Ch 5, sl next 4 sts pwise to crochet hook, yo and draw through 4 sts—2 sts on hook, yo and draw through 2 sts—1 st on hook; rep from * to end. Fasten off.

SHAWL

With MC, CO 7 sts. Do not join in the rnd.

Knit 2 rows.

Next row (RS) K3, place marker (pm), yo, pm, k1 (center st), pm, yo, pm, k3—9 sts.

Next row (WS) Knit.

Garter-Stitch Section

Row 1 (RS) K3, sl m, yo, knit to m, yo, sl m, k1, sl m, yo, knit to m, yo, sl m, k3—4 sts inc'd.

Row 2 (WS) Knit.

Rep first 2 rows 35 more times—153 sts; 73 sts between m on each side of center st.

Work Rows 1–4 of Gull Wings chart once—161 sts; 77 sts between m on each side of center st.

Rep Rows 1 and 2 of garter st section 5 times—181 sts; 87 sts between m on each side of center st.

Work Rows 1–4 of Gull Wings chart once—189 sts; 91 sts between m on each side of center st.

Work Rows 1 and 2 of garter st section 5 times—209 sts; 101 sts between m on each side of center st.

Work Rows 1–4 of Gull Wings chart once—217 sts; 105 sts between m on each side of center st.

Work Rows 1 and 2 of garter st section 32 times—345 sts; 169 sts between m on each side of center st.

Border

Change to CC.

Work Rows 1–24 of Crest of the Wave chart once, then work Rows 1–12 once more—417 sts; 205 sts between m on each side of center st. (***Note:*** Chart may be repeated as many times as yarn allows, or to desired length, ending with Row 12 or 24.)

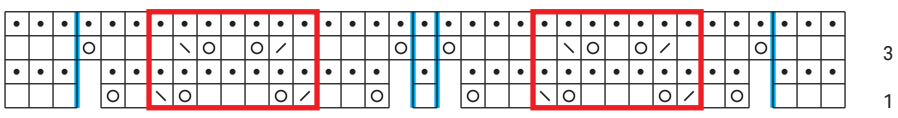
Using the crochet chain method (see Stitch Guide), BO all sts.

FINISHING

Weave in ends. Wet finish and block to measurements.

Barbara Kelly-Landry is a professional knitter specializing in historical knitting methods and traditional knitting designs. She has over 40 years of experience as a spinning and knitting interpreter with Parks Canada at the Fortress of Louisbourg. In her spare time, she is an avid spinner, and her thirst for new spinning explorations has led to many late nights at the wheel or hovering over a dyepot with her friend Annamarie Hatcher (see accompanying article).

Gull Wings



Daniel Kromski with a Sonata wheel

Photos by Alicja Kromska unless otherwise noted

Daniel Kromski

Artist and Designer, Kromski and Sons

How did you get into your craft?

I was born in Poland into a family whose inseparable part of life was a workshop in which my dad made spinning wheels. I spent a lot of time with him there, beginning at age five. Since there were not many attractions for children where I grew up, many toys were made by my grandfather and dad. In a natural way, I also started to invent and make various "choo-choo cars," cars, planes, houses, and other fun things. Over time, they became more and more complicated, equipped with moving parts. At the same time, my interest in drawing and sculpture grew. At school, I loved math, especially geometry.

How did you shift from hobby to business?

I gradually moved from a hobby—which never quite ended—to helping my dad in the workshop, especially during holidays or when there was a lot of work. I didn't get paid; it just felt natural for me to participate in the work alongside my father. I got my first pay when we received an order for several dozen castle spinning wheels from a contractor in France. A pivotal moment was the purchase of the first copying lathe because I had to redesign all of our products so they could be created in a way that used the capabilities of this new machine. It became an opportunity to enter the world of design, where I could combine my fascination with sculpture and my interests in technology. It was then that I started to implement my various small inventions, both artistic and technical. Work has become my great passion.

What is your favorite part of the process?

One of my favorite parts of the process is talking with and listening to the voices of spinners and weavers. I try to understand what their needs and dreams are. Equally interesting for me is the search for a solution that combines the needs of people with an interesting form and an innovative approach. I am proud of the fact that I managed to introduce many small inventions into my projects in addition to many innovative technologies that enable the creation of new or improved products. I am passionate about cooperation with engineers in the introduction of digitally controlled machines adapted to our specific needs.

What would you like us to know about your work?

I always try to maintain a very high technical solution

Minstrel wheels at the factory

Minstrel spinning wheel

Photo by Dona Carruth

combined with beautiful, traditional design. I want to give people well-made equipment that's beautiful, even if it costs more.

What should customers know about your work?

Our products are, to me, very beautiful and highly functional. We have many wheels for customers to choose from because every customer has different preferences. Our wheels come in an unfinished variety for customers that wish to create an individual look, or in natural clear, walnut, or mahogany finishes. The Prelude and Interlude are small in size and cost, which is good for new spinners with small spaces, and they travel well because of their size. The Fantasia is a modern-looking wheel that comes in a black finish or the color of the year, which is new each year, and it is also available in original unfinished, clear finish, and walnut. The Sonata is our travel wheel that folds up to fit in the included carry bag for users who like to travel. The Minstrel is a very ornate, high-castle wheel that is beautiful and traditional looking. And for the customer who wants a classic fairy-tale Saxony, we offer the Symphony and the Polonaise. We also offer looms, handcards, niddy-noddies, and more. So, as you can see, we try to offer something for everyone.

What are your plans for the future?

My dream is to pass on my skills and passions to the next generation. Currently, my two daughters, Daria and Agnieszka, are starting to take an active part in creating new projects. I hope the field of spinning and weaving will also be fascinating for them.

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The artisans of the Association Tithrite in Ait Hamza, Morocco, gather outside their workshop to celebrate *twiza*—the practice of working together to accomplish a labor-intensive task. Together they card, spin, and skein their wool for weaving, singing special songs as they work. *From left:* Itto Amzil, Kenza Oulaghda, Itto Chadli, Fatima Mimoun Oukhallou, Fatima Oukhallu, Itto Benhammi, Zahra Idrissi, and Nezha Aajda. Photos by Yassine Bouhouch

Spirit of Cooperation

Twiza in the Mountains of Morocco

KAREN ELTING BROCK

Traveling through the Middle Atlas Mountains of Morocco sometimes feels like passing through time gone by. Lone shepherds mind their flocks on the hillsides, donkeys amble down the road carrying heavy loads of firewood, squat adobe homes randomly appear on the horizon draped with colorful laundry flapping in the breeze, and pye-dogs crouch in ditches observing all. The tempo is slow, the mood peaceful.

At the northern edge of these mountains is Ait Hamza, an agricultural community of about six thousand people. Only an hour's car ride from the bustling ancient city of Fes, Ait Hamza feels remote, framed by a mountain wall and miles and miles of open fields. Small brick storehouses dot the landscape of wild poppies and tidy rows of onions. Women here have been working wool and weaving household necessities and clothing for generations. Even though the textile traditions have faced modernization, in the late spring, after the sheep have been shorn, women still gather at the Guigou River near the village and wash the fleece, leaving the wool to dry in the sun.

Within the narrow alleys of Ait Hamza and its clusters of adobe homes is the artisan cooperative, Association Tithrite (*tithrite* means *star* in Tamazight). Kenza Oulghada is the founder and leader of this group of about 10 women artisans. She formed the association in 2008 after she attended some inspirational Peace Corps exhibitions. A short while later, Dan Driscoll, a former Peace Corps volunteer who cofounded the Anou cooperative, trained the Tithrite

artisans to use their cell phones to photograph and sell their work online. By 2014, Association Tithrite was an active member of the Anou and continues to participate today. The members of this association gather in their small corner building in Ait Hamza to spin and weave and sell their traditional textiles, together.

TWIZA

The term *twiza* is an Arabization of the Tamazight word *tiwisi*, "to help." It is the ancestral tradition of working together, of cooperation. Because agricultural life requires long hours of hard work, it is imperative to have a system of mutual support—a perfect illustration of the adage, "Many hands make light work." When a group "does twiza," they do the work for one person at a time, or sometimes a family. Members of a community gladly assist others, knowing their turn will come. Twiza is largely related to agricultural activities but can also include other tasks, such as building a home.

The artisans of Association Tithrite in Ait Hamza celebrate twiza May through July, after the sheep are sheared and before the weaving and harvesting season begins in August. Twiza can take place at any time throughout the year, Kenza Oulghada explains, "anytime there is an important product that needs to be made."

The Amazigh, the diverse group of indigenous people who have lived in North Africa for thousands of years, populate the Middle Atlas of Morocco as well as other regions in the country. The Amazigh people (Imazighen, plural) are commonly referred to as *Berber*, but that term has a controversial history. It is thought to have derived from the Greek word *barbaros*, which means "barbarian" or "uncivilized." The Romans later used the term to refer to the Imazighen, and it has been used to describe them ever since. Most view Berber as pejorative and prefer Amazigh, which means "free people" in one of their languages, Tamazight.

Weaving the Tent

Itto Chadli, a member of Association Tithrite explains that twiza, in the context of working wool, was especially important in generations past because all the household work fell to the woman. A woman "gathers her female neighbors, and they prepare, card, and spin the wool, and help her for a few days. Then another woman in her neighborhood will need the same help, and they will give her a few days, too. Then the same thing for another, and when everything is ready for each, the women can start doing the weaving." Itto describes that a woman would have to "weave the tent," which is a way of expressing that she did all the weaving for the home. A woman would weave "everything," Itto insists, because in the past there was no

Wild poppies and other flowers bloom outside homes in Ait Hamza. Poppies flourish in the hillsides of the Middle Atlas and, in the past, were used for natural dyeing, although this isn't a common practice today.

Itto Amzil sits outside Association Tithrite's building preparing the fleece for carding, gently separating the individual fibers.

Itto Chadli skeins her spun yarn, using her spindle as a balancing point between her feet.

commercially made fabric, so after the yarn was spun, she wove the *silham* or burnouse; wove the *djellaba*, a long cloak usually with a hood, for her children and her husband; prepared the *laqtifaa*, a type of knotted rug, for her guests; wove the *haddouna* (or *handira*) or bed covering; and she made the bed itself, which was stuffed with wool. "That's what twiza means," says Itto, "when women gather to help."

Twiza in Ait Hamza Today

Traditionally, twiza begins with shearing the sheep, and some women in the association still have their own sheep, but most artisans buy their wool at the *souk*, a weekly market, in Guigou, a larger town nearby. Each day, a different artisan's fleece is washed. After the wool has been left to dry in the sun for a day, the women clean it, picking out any thorns or dirt. On this day, twiza begins when seven Association Tithrite artisans gather on the floor of their small workshop. One artisan, Itto Amzil, teases apart the wool by hand, preparing it for the carders. She works from a giant pile of freshly dried and cleaned wool in the center of the room. Taking a break from preparing the wool, she also makes and serves mint tea and brings nuts, bread, and *meloui* (pancakes) for the women to snack on as they work. Preparing and serving food is a significant part of twiza as it contributes to the well-being of each member as she works.

Six other women work in pairs: one cards by hand, forming uniform rolags for her partner who spins and piles her yarn into a round wooden screen typically

Fatima Oukhallu attaches a loose rolag to her spindle.

Itto Chadli prepares her wool before spinning. She supports her spindle by placing the tip in a small ceramic dish, seen at left.

Sheep are very much a part of the landscape and daily life of the Amazigh people in the Middle Atlas Mountains of Morocco, raised for meat and wool. Here a friendly Timahdite sheep grazes in an open field on the outskirts of Ait Hamza.

used for sifting flour. All three spinners practice supported spinning. Two anchor the tips of their spindles into saucers, the other into the fragment of a broken tagine cooking pot. When a spinner completes a giant pile of yarn, she places her spindle between her feet as a post to control the yarn and begins to gather the yarn around her hands, alternating from one hand to the other to make a giant skein.

Sometimes the artisans use combs to prepare the wool before carding, especially if they are weaving *tahendirt* or *aheddoun,* Tamazight words for women's capes also used as bed coverings, or djellaba and silham, the Darija [Moroccan Arabic] terms for men's capes. (The artisans use Darija and Tamazight interchangeably.) The yarn the women spin during this year's twiza will be used specifically for the weft of flatweave blankets, *bettaniya*.

The Songs

Above the rhythmic scratching of the carders, the women sing in Tamazight continuously while they work the wool. Singing is another significant dimension of twiza and one of Kenza's favorite aspects. Many of the twiza songs are forms of prayers to Allah and the Prophet Mohammed to protect the women and their work from any evil or harm. She notes the relationship between all things and God, and when the women sing, she says, all the bad spirits, all the bad events go away. The twiza songs vary, though, and others are more motivational; the women sing encouragement not to sleep and to continue their efforts until all the work is done. Laziness is considered a form of evil.

A sign the songs have evolved comes from one describing the frustrations and disappointment of the artisans. "We are washing, working the wool, but people don't value our work." The song continues, narrating how Moroccan people buy cloth and rugs from the stores, but "they forget we are here," they sing. Fatima Oukhallu expands on this idea when she talks about the young people's lack of interest: "We teach our daughters, and we want them to learn about this tradition. They do sit with us a little bit, learn a little bit, but then they go again . . . busy with the play of outside," by which she means modern life, modern technology.

The Anou: Connecting Makers and Markets

The Anou, Tamazight for "the well," is an artisan-focused, online cooperative that supports artisan communities throughout Morocco. The goal is for the artisans to achieve economic self-sufficiency from the sales of their crafts. The Anou was cofounded around 2010 by Brahim El Mansouri, a wood-carver in the High Atlas Mountains, and Dan Driscoll, a former Peace Corps volunteer. Both men wanted to help Moroccan artisans sell their work directly to consumers to avoid losing most of their profits to middlemen. What started as an idea to help El Mansouri and his fellow wood-carvers sell their woodwork online has grown into a thriving national cooperative of over six hundred individual artisans. In 2016, the Anou became an official partner with Morocco's Ministry of Handicrafts, Social Economy, and Solidarity.

Artisan Training

The Anou member artisans receive training, usually by someone from within their community, in how best to take pictures of their work, whether that's silver jewelry, handknotted buttons, or large flatweave rugs. Artisans also learn how to upload their images from their phones, price the items, and post them for sale. When a sale is made, the artisan receives a text message with information about the product sold and the recipient's shipping address, which can be anywhere in the world.

The Anou, in addition to providing technological training to the artisans, offers them occasional online English classes, so they are better able to communicate with clients and visitors. The artisans have also participated in design and marketing workshops.

The Anou opened its first brick-and-mortar shop in the old medina in Fes in 2021. The medina sees thousands of visitors annually, and the potential for sales and outreach is tremendous. Members of the Anou take turns managing the shop in Fes, one month at a time. The shop also hosts dyeing and weaving workshops with the artisans and will soon offer spinning workshops as well.

Visit an Anou Cooperative

If you're planning to travel in Morocco, you can schedule a visit to one of several Anou cooperatives through its website at theanou.com/experiences. Travel to the cooperative and have lunch with the artisans. Watch and learn as they practice their crafts and, of course, seize the opportunity to purchase handcrafted traditional Moroccan art.

To learn more, visit theanou.com.

Association Tithrite members celebrate twiza, working in three pairs of one carder and one spinner. They work in their association's workshop surrounded by their looms and handwoven rugs ready for sale. *(Left to right)* Itto Benhammi, Nezha Aajda, Zahra Idrissi, Fatima Oukhallu, Fatima Mimoun Oukhallou, and Itto Chadli

TWIZA TO COOPERATIVE

In generations past, women from Ait Hamza participated in twiza, enlisting the help of neighbors to prepare the wool to weave the tent. Now the women of Association Tithrite are members of a cooperative that automatically unites them to carry out the shared work. "Now we have a cooperative," says Kenza proudly. "Before, we had twiza." Regardless of the generation or the name assigned to this celebration of working wool, Kenza says, "the best thing is that we work together."

Resources

Davis, Susan Schaefer. *Women Artisans of Morocco: Their Stories, Their Lives*. Atglen, PA: Schiffer, 2018.

Karen Elting Brock taught English at Al Akhawayn University in Morocco for two years where she traveled the back roads of the country as often as she could, admiring traditional craft and traditional life. She would like to thank her colleague Professor Loubna El Abbadi for her valuable assistance in both language and cultural translation while visiting the artisans of Association Tithrite.

Yassine Bouhouch is a 23-year-old Moroccan with a passion for photography, graphic design, and film production. He holds a BA in Communication Studies from Al Akhawayn University in Morocco. He works as a lab instructor of digital photography and graphic design at Al Akhawayn and hopes to pursue an MFA abroad in either screenwriting or filmmaking.

(Half) Hitch in Your Drop-Spindle Technique? Try Two Methods

KATE LARSON

Low-whorl and mid-whorl drop spindles often have a simple, straight shaft without a hook to secure the yarn. Traditionally, these suspended spindles might have a notch cut near the top of the shaft; they might have a tapered, pointy tip; they might have a rough shaft that doesn't change diameter; or they might have some combination of these elements. In the archaeological record, spindle whorls often outlive their shafts, so we don't always know how different spinning cultures solved this perennial spindle issue.

We do know that many spinners around the world have long used a half hitch to secure yarn to the suspended spindle. This quick backward-loop technique is easy to memorize and adaptable to your hands and spindles. If your spindle starts to get too heavy for the half hitch to support the spindle, add two half hitches as they sometimes do when plying in Peru.

I see people use two main half-hitch methods, but there are others—see what you like best! I'm right-handed, but these work equally well with hands reversed.

Spinner using a cross-arm, mid-whorl spindle (LC-M36- 636). A close look shows a shallow notch carved into the top of the spindle, but the yarn is secured with a single backward loop—a half hitch. Identified as circa 1898–1919, Rām Allāh, West Bank

Courtesy of Library of Congress, Matson Photograph Collection

Thumb Method

THUMB METHOD

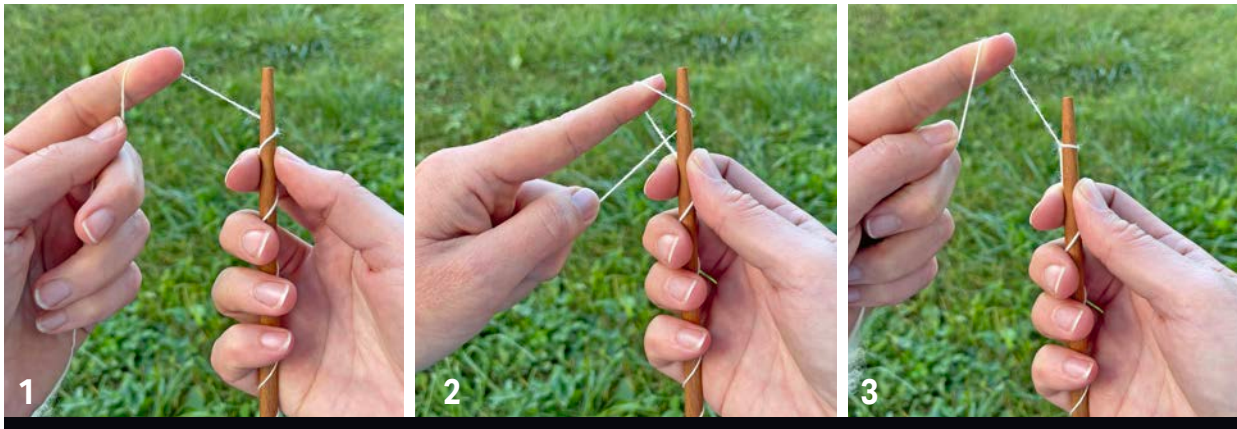
To see this method in action, check out Nilda Callañaupa Alvarez's *Andean Spinning* video. You'll have to rewind the video several times to watch Nilda do a half hitch; it's that fast and fluid!

1 After winding your yarn up the spindle shaft almost to the tip, hold the spindle with your fingers and position your thumb an inch or two away from the shaft.

2 Wrap the yarn around the front of your spindle shaft and thumb, around to the back, and then between thumb and spindle.

3 Place the tip of your thumb against the spindle tip and slip the newly formed loop onto the shaft.

4 Pull tight to create a half hitch.



Index-Finger Method

INDEX-FINGER METHOD

1 Wind your yarn around the spindle shaft a rotation or two and place your index finger under the yarn.

2 Move the tip of the spindle along your finger and into the loop that has formed.

3 Drop the loop of yarn off your finger and onto the shaft. Pull the loop tight.

Resources

Callañaupa Alvarez, Nilda. *Andean Spinning*. Video. learn.longthreadmedia.com.

Finewool sheep grazing in Oregon

Photos courtesy of Shaniko Wool Company

Shaniko Wool

From the Ground Up, A Sustainable Future for Traditional Wools

JEANNE CARVER

I had no idea when I began my textile journey in 1999 that it would take me back in time, while simultaneously propelling me into a future I couldn't have imagined. It would be the vehicle to timeless traditions and skills in textiles, taking me to their very roots, teaching me, and deepening my whole life perspective.

This journey opened a window through which I gained clarity on things I'd never thought about, bringing important and unforgettable people into my life. It built meaningful connections that in many ways erased the urban/rural divide for me, and even bonded this western girl to folks in the east in a way I'd never been nor would have been otherwise.

I saw those converting fibers to yarns and cloth for the first time—both locally and around the country—and how powerfully important their work is. It brought me to view our own work in agriculture with even deeper purpose. As I shepherded our wool along its journey to yarn and cloth, I formed important relationships with each person at each step, and so did those who bought the fiber or yarns, continuing the transformation of sunlight to grass to fiber to finished goods. We all needed each other, and my life became richer.

A BEGINNING

Our family has been raising sheep, cattle, grains, and hay in Oregon since 1871 on our historic ranch, Imperial Stock Ranch. We had been selling the shorn wool as a commodity to the same buyer for a century when, in 1999, the company closed the regional processing facility, took most of its manufacturing offshore, and left us with no wool buyer. Without warning, the shift to global supply chains arrived on our doorstep that day. We had a new challenge, and from then on, I took us from ranch to retail in wool yarns, fabrics, and apparel. Along the way, I built supply-chain relationships to transform the raw (grease) wool into products and developed wholesale and retail relationships with brands and stores across needle arts, apparel, and home fashion industries, eventually working with some of the most influential brands in America. This effort was built by pairing the wool with our heritage and the leading agricultural practices we had been implementing for decades. It resonated with authenticity.

A GLOBAL STAGE AND THE RWS

The success of our wool journey didn't happen overnight, and it took the support of many fiber artisans in my region to help get it off the ground. After 13 years of hard work, we got a call from Ralph Lauren that led to an order. That order became the yarns for the 2014 Team USA uniforms for the Winter Olympics in Sochi, Russia. And then, Ralph Lauren told our story. This influenced others, and more brands called on us. One of those, Patagonia, asked us to be third-party audited for our land and animal practices. Patagonia was part of an international working group organized by the Textile Exchange, a global nonprofit headquartered in the United States that was developing a new

Central Oregon spinner and fiber artist Dixie Vail

An auditor talks with a herder during the RWS/NATIVA Regen audit.

standard for sheep and wool production called the Responsible Wool Standard (RWS). With a mission to improve the sustainability of the textile industry as a whole, the organization focuses on the fiber or materials stage during which a large percentage of ecosystem and climate impacts happen. The Textile Exchange developed the RWS over a period of several years, involving a broad group of stakeholders.

The RWS is equally about land stewardship and animal care. In 2020, a third component was added, worker welfare, making the RWS a one-welfare standard: the care of land and animals and the people who tend both. To be certified, there are more than 270 criteria that must be met at the farm level. The RWS has become the leading standard in the world for responsible sheep and wool production. When it was officially launched in 2016, Imperial Stock Ranch became the first certified ranch in the world.

Around the same time, my husband's health was declining, and I needed to return my focus to family and his care. We sold the yarn and textile business, and I stepped away from the industry. Our ranching operation continued, as it still does today, now in our 152nd year.

A livestock protection dog with the sheep

SCALING UP

While I was on the sidelines, brands kept reaching out to us for a traceable and sustainable wool supply, driven by our RWS certification. I was attending the RWS global working-group meetings that had participation of grower groups from around the world—New Zealand, Australia, South Africa, and South America—and I witnessed a growing movement toward third-party certification of wool. I wanted American sheep producers like us to remain competitive. We already knew how challenging it was to sell

wool and make things in the United States, and I felt we would either lose more ground in the market or see this as an opportunity to make us stronger.

I established Shaniko Wool Company in 2018 to scale the supply of American wool that met RWS certification, choosing a name that honored a story greater than our ranch alone. I applied with Textile Exchange to become a "US Farm Group" supplying RWS wool. We were approved, and the next step was to find other ranches to join us. The first one I asked said yes! And that led to another and then another. I had wondered if anyone would join us, but they did. And they are truly great families that are progressive in their operations and strong state and national leaders in the sheep industry. They, too, saw this as important to the future.

With its 10 partner ranches today (and growing), Shaniko Wool Company delivers fully traceable, certified American wool to US designers, brands, and manufacturing partners for use in a variety of products and markets. Shaniko is dual-certified to the RWS and NATIVA Regen (Regenerative Agriculture Program), both global third-party audited standards (see Resources). Our efforts support family businesses, communities, and the US textile industry. Shaniko Wool streamlines the process for ranches, pays all certification fees, and buys wool at a significant premium. The wool is aggregated and moves to South Carolina for scouring and combing at Chargeurs Wool USA. In 2022, Shaniko Wool Company signed a licensing agreement with Chargeurs, the premier commercial processor of wool in the United States, strengthening the delivery of Shaniko wools. Diego Paullier, general manager of Chargeurs Wool USA, states, "With Jeanne's deep wool knowledge, Chargeurs's broad market reach, and the highest quality US wools available, we intend to deliver on the ever-increasing demand for traceable, sustainable, and certified wool."

Besides land, animal, and worker care audited under these standards, the labeling and documentation that begins at the ranches are audited at every step of the wool journey by a credible certification body. This makes for a strong chain of custody, which increases confidence in content claims. Auditing every step ensures that wool comes from farms and ranches that take a progressive approach to land management as well as animal and worker welfare.

Shaniko, Oregon

The name Shaniko comes from Oregon's most famous ghost town, located in north-central Oregon, just 12 miles from our ranch headquarters. Located a long way from markets, this vast plateau country was home to hundreds of thousands of sheep in the late 1800s and early 1900s who produced millions of pounds of fine wool each year. By 1900, the Columbia Southern Railroad built south from the Columbia River into the interior, getting closer to the ranches where food and fiber were produced. It was a welcome sight for the ranchers who struggled to deliver their harvests to market. Where the railroad was stopped by a tremendous canyon, the town of Shaniko was born in 1901.

It took about 15 years for the railroad to be built past the big canyon, and during that time, Shaniko was Oregon's second leading center of commerce. More wool shipped from Shaniko than from anywhere in the world, and it was known as the "Wool Capital of the World." Some remnants of its historical period are still evident, such as the giant wool barn and the Columbia Southern Hotel. Once the railroad built on, it was the beginning of the town's decline, and by 1959, it was officially a ghost town. Shaniko has a colorful and remarkable history.

Wool barn at the ghost town of Shaniko, Oregon

BEYOND THE STANDARDS

Since 1989, our family ranch has operated under a Conservation Management Plan, putting the health of natural resources as our top priority. Grazing animals such as sheep are a critical tool to help us do that. With decades of observations, yield data, species counts, and resource-agency testimony, we believed

we were improving land health. Grazing animals have an important role in maintaining plant communities. They bite plants, stimulating their growth and increasing root development and seed production. Their hooves put organic matter in contact with the soil and help prepare the ground to receive and hold water, and the animals spread nutrients back to the soil naturally through their manure and urine. Well-managed grazing facilitates plant growth and delivers multiple positive ecosystem impacts. But we had never actually measured these impacts.

In early 2020, Shaniko Wool responded to increasing concern over the ecosystem impacts of ranching practices in the production of fiber. Working with a team of range scientists from Oregon State University, a comprehensive research and measurement effort was launched: the Shaniko Wool Carbon Initiative.

The goal was to determine the ecosystem and climate impacts of each ranching operation with carbon as a key performance indicator. We know that if soil carbon levels increase significantly over time, additional positive benefits include increases in soil organic matter, nutrient availability, water infiltration and holding capacity, improved habitats and biodiversity, resilience to weather extremes, and disease resistance.

Our measurement model includes a combination of annual field sampling (soil testing and biomass samples) at every data point and the use of leading computer models to analyze our inputs and greenhouse gas (GHG) emissions. The entire program is peer-reviewed and third-party verified. With three years of data, the preliminary results have been impressive.

One example is our Oregon ranch located in a semi-arid high desert. We now know that during each of the last three years, we have delivered lamb, wool, beef, grain, and hay to markets, while having a net impact to

Julie Hansmire of Campbell Hansmire Sheep checks on the grass and flock.

Shaniko Wool Company's clip ranges from 17 to 25 microns.

the land of adding 60,000 tons of carbon into our soils. We drew down more than 218,000 tons of carbon dioxide from the atmosphere each of those years and have a net negative GHG emissions total.

This is very strong evidence that supports the benefits of well-managed grazing. Sheep have provided humankind with meat (food), wool (clothing), and skins (shelter) for more than 10,000 years. We can continue producing this bounty while making a positive impact on nature and climate through regenerative management practices. As fiber enthusiasts, we appreciate the miracle fiber wool, but we should also recognize and honor the greater role sheep can have.

The ranches of Shaniko Wool Company are currently located in Oregon, Nevada, California, Colorado, and Idaho. Collectively, we graze more than 2.6 million acres and produce 500,000 pounds of the finest Merino wool in the United States and North America. We raise Merino and Merino/Rambouillet cross sheep with some Columbia influence, and our microns range from 17 to 25. These range-raised white wools are generally higher yielding and work in a variety of products and markets. Wool with a micron count of 20 to 22 is the most versatile, and high-end fashion designers are using our standard 20-micron wool for amazing sweater designs with great success. These wools are also sought for the home-goods sector, hosiery, and all things apparel.

GIVE IT A SPIN

Spinners can find Shaniko Wool in stock at Meridian Mill House, one of our premier American spinning mills. The mill not only stocks a variety of yarns made with our wool but also combed top. Hannah Everhart shares, "Meridian Mill House displays the Shaniko fibers alongside regular Merino in similar micron and the difference is astonishing. Fiber lovers easily form a bond with Shaniko wool once they have felt the lush fiber. They return again and again just to feel the wool. If you haven't felt Shaniko wool yet, especially our 80/20 Shaniko/silk blend, your senses have not experienced ultimate luxury." Meridian stocks Shaniko top in other blends as well as in untreated and shrink-treated offerings. It also sells Shaniko wool top to dyers; you can find those dyed tops at KnitzAndPearls Fiberworks, Zephyr Creek Farm, and Apothefaery Luxury Fibers. The ranchers of Shaniko Wool invite you to join us in using this miracle fiber.

We recognize that we are temporary stewards of these places where sheep graze, tending both the land and the sheep. We also recognize the importance of those who transform the wool with timeless skills and that, together, we can honor the place sheep have in the history of humankind and their continued importance today.

Resources

NATIVA Regen, nativapreciousfiber.com.
Shaniko Wool Company, shanikowoolcompany.com.

Jeanne Carver is the founder and president of Shaniko Wool Company, the first farm group in the United States to be certified to the Responsible Wool Standard and NATIVA Precious Fiber, marketed as NATIVA Regen–Shaniko. Jeanne is an award-winning agricultural entrepreneur and a leading voice for American wool, and she was awarded the American Sheep Industry Innovation Award in January 2023.

Suri locks (*from left*): unwashed, washed, and opened. Jacqueline used Louët two-pitch combs to create a sliver.

Photos by Matt Graves unless otherwise noted

Suri Alpaca: Select, Prep, and Spin a Silken Fleece

JACQUELINE HARP

In the handspinning community, the words "suri" and "alpaca," when used together, evoke the image of a cute, doe-eyed creature made entirely from silk ribbons. Suri alpacas produce a luxury fiber that captures the imaginations of handspinners because of its next-to-the-skin soft handle, superb luster, and excellent drape. Moreover, it is naturally lanolin-free, making it easier to scour and less likely to cause allergic reactions in some people.

Yet before you can spin and hold a gleaming skein of hand-prepped handspun suri alpaca yarn, you have to overcome the intimidation of choosing the right raw fleece to start your adventure. Then, after making an educated choice of raw fleece, you can gain confidence here by learning some outstanding tips to access the extravagance that is suri.

Suri alpacas are incredibly rare, and it may take some effort to find a reputable source from which to procure a raw fleece. Word of mouth; fiber festivals (online and in person); fiber guilds; or breed associations, such as the Suri Network (see Resources) are all good ways to locate a fleece. Businesses that deal with

raw fibers or yarn production, such as fiber mills, may provide a lead. You may also want to check your local or not-so-local yarn shops for potential sources.

THE SELECTION

Ideally, you hope to see the fleece in person, but the same process applies even if you are purchasing a fleece online. Once you have zeroed in on a suri fleece that catches your attention, keep the following tips in mind.

Always Buy from the Blanket

The blanket, also referred to as "prime," is where the finest, most uniform fleece of a suri alpaca is found. The blanket is located from the shoulders to just short of the tail of the animal. When shorn and skirted properly, it resembles a large rectangle that excludes the coarser fleece from the neck, belly, legs, and tail. The fleece weight of a suri alpaca blanket varies from 2 to 12 pounds. Alpaca producers typically will have a whole, half, or partial blanket available for purchase.

Staple Length

When shorn once a year, suri alpaca locks can be 4½ inches (11.4 centimeters) or longer in length. Make sure to double-check the staple length before you buy a fleece to avoid working with a staple length that you might find unmanageable.

Fleece Soundness

The locks should be strong, flexible, and difficult to break. If the animal has experienced stress or has a health condition, the locks may have one or more fleece breaks along the length. Locks exhibiting fleece breaks drastically reduce the quality and usability of a fleece.

Color and Luster

The levels of luster and color are guided by personal preference. Color may matter more if you wish to dye your fibers. White is the most common fleece color, but you can choose from over 20 natural colors. Suri locks should have a noticeable, satin-like sheen when handled in good lighting. Avoid dull locks that do not meet the quality standard for a suri fleece. Suri does take dye well, and I enjoy overdyeing fawns and grays to achieve rich, darker hues.

POTENTIAL FLEECE PROBLEMS

Unfortunately, for every good fleece available there is the risk of finding a bad fleece just around the corner. Before taking the leap to bring a raw fleece into your spinning space, consider the following practical tips on how to spot a less-than-ideal suri fleece.

Pests

Watch out for wool moths, carpet beetles, mice, and other creepy-crawlies. Only settle for fleeces in great condition because it is not worth risking contamination of your current stash by trying to salvage a fleece that is compromised by pests.

Suri locks can range from tight curls to waves to straight.

Courtesy of Tahoma Vista Fiber Mill and La Vida Alpaca

Lice

Inspect the raw fleece for rice-like egg casings from lice. Alpaca lice are species specific and cannot be passed to humans, so do not worry about the transmission of lice as a personal health risk. The problem for fleece processing, however, is that the egg casings this parasite deposits onto a fleece cannot be washed out or dyed over.

Unskirted Fleeces

Fleeces that have not been skirted will contain a lot of vegetable matter (VM) and coarse fibers from the outer edges of a fleece. In other words, try to purchase only the prime blanket. An unskirted fleece may not be a deal-breaker for you, but keep in mind that you may not want to pay extra for VM or undesirable fibers.

Mold, Mildew

If a fleece smells off-putting or has become discolored, it cannot be saved. These are signs of rot, which happens when a fleece is not allowed to dry after shearing in damp conditions or is not stored properly.

Second Cuts and Felted Locks

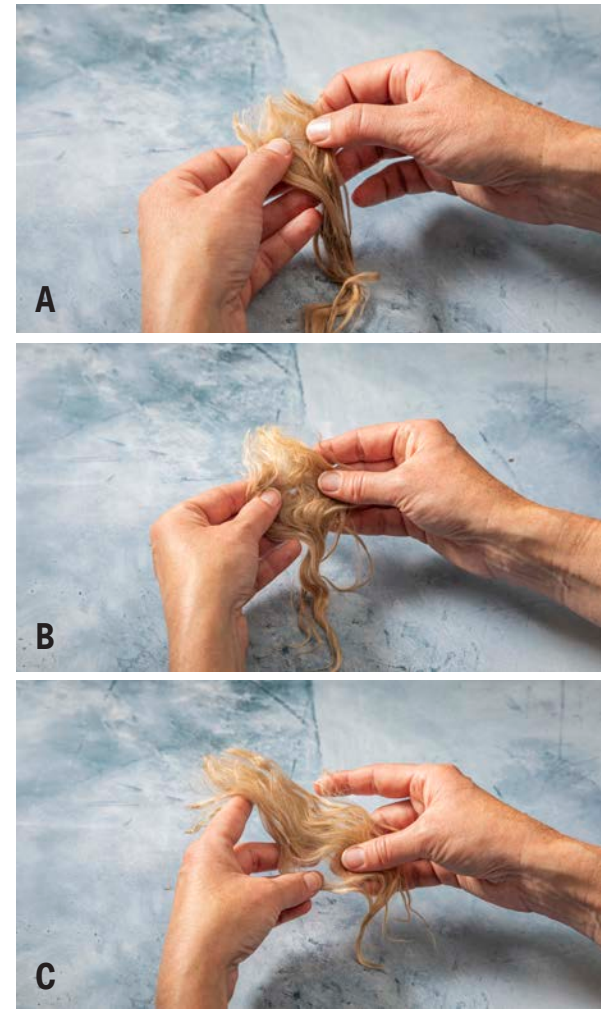
Second cuts are caused when a shearer cuts the same place twice, which can drastically shorten the locks and cause nepps to form in the final yarn. Suri fibers can felt both on and off the animal. If a fleece has too many second cuts or has a large number of felted areas, it is worth passing up for a better fleece.

LET'S MEET OUR SURI!

Being able to source raw suri fleece directly from an alpaca farm is a special experience, and I would like to thank Jean Van Effen for providing fiber from her suri alpaca named Zephyr, a lovely dark fawn with an impressive 8-inch staple. Jean is the owner of La Vida Alpaca and Tahoma Vista Fiber Mill, located in Yelm, Washington.

Preparation

Once the suri fleece arrived at my studio, I divided it into manageable piles weighing 2 ounces (57 grams) each. Within each pile, I carefully separated the locks completely. I placed a single layer of locks in a bucket of warm, soapy water and allowed them to soak for 15 minutes before rinsing them until the water ran clear. To avoid felting the locks, I was careful to keep the temperature the same and agitation to a minimum. After washing, I rolled a layer of locks in a towel to squeeze out excess water before moving to the next stage.



Opening the Locks: Two Methods

Suri locks are known for being overly twisted, but they can also be wavy or almost straight. The key to unlocking any suri lock formation is using your hands! This is a labor-intensive process, but it helps you get a better feel for the fleece. While the locks were still damp, I opened them starting from the blunt (cut) end, using my fingers (A). I worked down the lock gently opening the middle (B) and all the way to the tips (C). Damp locks do not produce static and should pull

easily apart. After opening a lock, I laid it on a rack to dry. Once the locks were fully dry, I used one of two methods to turn my locks into top—a tool-free method or combing.

By Hand When I was ready to spin the opened locks, I first pulled each lock in half lengthwise. I overlapped the two halves to stagger the fibers in the lock like a small piece of top (D). Holding the two halves, I began drafting and allowed the fibers to slip past one another and attenuate (E). I continued attenuating to produce a sliver (F). It is important to note that this toolless preparation is not a perfect top since the fibers are partially aligned, but it can be surprisingly consistent. I like the gentle texture it produces in the final yarn.

Using Minicombs If you want a smoother top, use fine combs to make hand-pulled top or spin directly from your combs. I used two-pitch minicombs from Louët, which are a great fit for these long, fine fibers. Here's how it's done: Start by loading a lock onto one comb with the cut end on the tines (G). Continue to fill your comb with locks to about halfway up the tines. Now you are ready to comb! To begin, hold your loaded comb tightly with the tines facing up. Hold your empty comb with the tines facing sideways and away from you, insert the tines into the tips of the locks, and pull through the locks and away from you (H).

As you continue combing, the shorter fibers will stay on the stationary comb, while the longer fibers will build onto the moving comb. The shorter fibers, also known as "combing waste," should be discarded throughout the session to make sure it doesn't get mixed into your newly combed fibers. Also, don't forget to be kind to your back, wrists, and arms by making sure to take breaks every so often throughout a combing session.

Begin working the fiber back to the original comb (left here). At this point, you can either spin directly off the comb or gently pull the fibers off to make top (I).

Suri "blanket" is the prime area of the fleece. The blanket starts at the shoulder and extends to just short of the tail.

Courtesy of Tahoma Vista Fiber Mill and La Vida Alpaca

Suri alpacas—acting like oversized chinchillas—like to dust bathe. This quirky ritual helps them stay healthy, but it can leave their fibers filled with dust that will get all over your hands and spinning equipment. Washing your suri, even lightly, can help reduce the mess. You can also better gauge the color and luster of your fibers since a layer of dust can hide these important attributes.

Combed top fibers are aligned, opened, and a dream to spin. This is especially true if you are fond of worsted drafting methods, such as the short-forward draw.

Spinning

Interestingly, suri fiber is similar to human hair, with each strand of fiber having a hollow core with no discernible crimp. These factors contribute to the suri fiber's slippery and sleek nature. It is a blessing and a curse when spinning. Too much twist, and it will feel like rope. Too little twist, and it will fall apart.

I spun my not-so-perfect and combed suri tops using my small Galina Turkish spindle. I kept my hands well moisturized with lotion throughout the spin to keep static at bay. Both suri preparations spun like a fluffy cloud and drafted easily.

After spinning, I had two skeins of suri singles spun from two different, yet very similar, fiber preparations. I decided not to ply my singles. I washed the small skeins in cold water and gave them the "whack" treatment against the edge of my bathtub to help set the twist and encourage the yarn to bloom. Lastly, I hung the singles to dry unweighted.

The final skeins from Zephyr's fleece were 20 wraps per inch, buttery-soft, lustrous, and balanced, and they draped beautifully with little elasticity. It is interesting to note that the skein spun from combed top was noticeably sleeker than its not-so-perfect top counterpart, which featured a more rustic look and texture.

Knitting

The suri singles from both skeins knitted easily, and the resulting swatches were surprising. The yarns were awakened when knitted, and the fabric sprang back after being stretched. The swatches felt lighter than the yarns because the weight of the fibers was dispersed throughout the fabric. The stitch definition from the not-so-perfect top was minimized by the halo. Both swatches were warm and very soft to the touch. I think these swatches inspire thoughts of projects that need a touch of elegance, smooth richness, and drape, such as a lace scarf or cowl.

Completing the task of sourcing a quality suri fleece and watching it transform into a stunning handspun yarn provides its own satisfaction. For a handspinner, there is nothing like taking something that is formless and raw and transforming it into a stunning yarn that will delight and inspire. So, what are you waiting for? Give suri a spin and remember to savor the moment when it finally flows through your fingers!

Resources

Jean Van Effen of La Vida Alpaca and Tahoma Vista Fiber Mill, tahomavistafibermill.com.
Suri Network, surinetwork.org.

Jacqueline Harp is a freelance writer and multimedia fiber artist who spins, felts, weaves, crochets, and knits in every spare moment possible. She is also a former certified Master Sorter of Wool Fibers through the State University of New York (Cobleskill) Sorter-Grader-Classer (SGC) program. Her Instagram handle is @foreverfiberarts.

Jacqueline prepared her suri locks two ways and created samples. *Left:* toolless hand-prepped locks chained for safekeeping, spun singles, and knitted swatch. *Center:* top-whorl spindle by Vermont Spindles. *Right:* combed suri pulled into a sliver, combed handspun singles, and knitted swatch

Contact Michaela Kimbrough for magazine standing order opportunities.
mkimbrough@longthreadmedia.com

Retail Shop Directory

ALASKA

Untangled Yarn & Fiber
1624 Tongass Ave
Ketchikan, AK 99901
(907) 225-YARN (9276)
www.untangledyarnandfiber.com
Ketchikan's key stop for fiber artists. Ashford dealer. Looms, wheels, supplies, hand-dyed yarn local and sourced directly from dyers. Open year-round or see our website.

ARIZONA

Fiber Creek
Suite 123, 1046 Willow Creek Rd
Prescott, AZ 86301
(928) 717-1774
fibercreekprescott.com

Tempe Yarn & Fiber
1415 E University Dr
Tempe, AZ 85281
(480) 557-9166
tempeyarnonline.com

COLORADO

Blazing Star Ranch
3424 S Broadway
Englewood, CO 80113
(303) 514-8780
blazingstarranch.com

Entwine Studio
4003 North Weber St
Building H
Colorado Springs, CO 80907
(719) 761-1211
entwinecos.com

Lambspun of CO
1101 E Lincoln Ave
Fort Collins, CO 80524
(800) 558-5262
lambspun.com

Longmont Yarn Shop
454 Main St.
Longmont, CO 80501
(303) 678-8242
www.longmontyarn.com

Piney Creek Yarn
15460 E. Orchard Rd
Centennial, CO 80016
(303) 953-1967
www.pineycreekyarn.com

Serendipity Yarn & Gifts
PO Box 5120
Buena Vista, CO 81211
(719) 395-3110
serendipityyarn.com

CONNECTICUT

Madison Wool
56 Wall St
Madison, CT 06443
(203) 245-5921
madwool.com

IDAHO

Yarn Underground
409 S Washington St
Moscow, ID 83843
(208) 882-7700
yarnunderground.com

ILLINOIS

Esther's Place
201 W. Galena St. (RT 30)
Big Rock, IL 60511
(630) 556-9665
esthersplacefibers.com

Fiber Universe
305 Southwest Water Street
Peoria, IL 61602
(309) 673-5659
thefiberuniverse.com

INDIANA

Spinnin Yarns
145 N Griffith Blvd
Griffith, IN 46319
(219) 924-7333
spinninyarns.com

KANSAS

Yarn Barn of Kansas
930 Massachusetts
Lawrence, KS 66044
(785) 842-4333
yarnbarn-ks.com

KENTUCKY

LSH Creations
1584 Wellesley Drive
Lexington, KY 40513
(859) 321-7831
lshcreations.com

The Woolery
Ste 1A, 859 E Main St
Frankfort, KY 40601
(800) 441-9665
woolery.com

MAINE

Belfast Fiber Arts
171 High St
Belfast, ME 04915
(207) 323-5248
belfastfiberarts.com

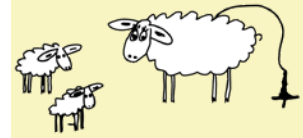
Halcyon Yarn
12 School St
Bath, ME 04530
(800) 341-0282
halcyonyarn.com

One Lupine
170 Park St
Bangor, ME 04401
(207) 992-4140
maineyarnandfibersupply.com

MARYLAND

Black Sheep Yarn Shop
9602 Deereco Rd.
Timonium, MD 21093
(410) 628-9276
blacksheepyarnshop.com

MASSACHUSSETTS



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thefiberloft.com

WEBS - America's Yarn Store
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Northhampton Rd., MA 01060
(800) 367-9327
yarn.com

MICHIGAN

Heritage Spin & Weaving
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Lake Orion, MI 48360
(248) 693-3690
heritagespinning.com

Leelanau Fiber
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(231) 271-9276
www.leelanaufiber.com/

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https://bellasflock.com

Rocking Horse Farm Knitshop
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(320) 252-2996

Weavers Guild of Minnesota
1011 Washington Ave S, #350
Minneapolis, MN 55415
(612) 436-0463
weaversguildmn.org

MISSOURI

Hillcreek Yarn Shoppe
4093 E. Ketterer Rd
Columbia, MO 65202
(573) 825-6130
hillcreekyarn.com

Yarn Social
1707 W 45th St
Kansas City, MO 64111
816-867-0522
yarnsocialkc.com

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Hastings, NE 68901
(402) 462-2490

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Box 384
Wolfeboro Falls, NH 03896
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www.FiberAlchemyNH.com

Lilac + Finch Yarn and Weavery
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Suite 303
Manchester, NH 03101 US
(603) 856-5457

NEW JERSEY

The Spinnery
33 Race St
Frenchtown, NJ 08825
(908) 996-9004
thespinnery.square.site

NEW YORK

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2080 Western Ave
Suite 138
Guilderland, NY 12084
(518) 779-9985
www.ceceswool.com

Fiber Kingdom
137 E Broadway
Salem, NY 12865
(518) 854-7225
fiberkingdom.com

Spinning Room of Altamont
190 Main St / PO Box 427
Altamont, NY 12009
(518) 861-0038
spinningroom.net

NORTH CAROLINA

Silver Threads & Golden Needles
41 E Main St
Franklin, NC 28734
(828) 349-0515
silverthreadsyarn.com

Studio 256
106 S Greene Street
Wadesboro, NC 28170
(704) 507-1160
Studio256.online

The Tail Spinner
109 North Wilmington Street
Richlands, NC 28574
(910) 324-6166
www.thetailspinner.com

Three Waters Farm
5330 Three Waters Lane
Grahm, NC 27253
(866) 376-0378
threewatersfarm.com

Yadkin Valley Fiber Center
321 East Main Street
Elkin, NC 28621
(919) 260-9725
yadkinvalleyfibercenter.org

OHIO

Gwen Erin Natural Fibers
44 N Main St
Hubbard, OH, 44425
(330) 269-9511
gwenerin.com

OREGON

Eugene Textile Center
2750 Roosevelt Blvd
Eugene, OR 97402
(541) 688-1565
eugenetextilecenter.com

Little Hawk Yarns
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Roseburg, OR 97470
(458) 262-0046
www.littlehawkyarns.com

Teaselwick Wools
1313 Mill St SE
Salem, OR 97301
(971) 304-7050
teaselwickwools.blogspot.com

PENNSYLVANIA

ChickenKnitz
562 Main St
Harmony, PA 16037
(724) 473-4900
https://chickenknitz.com

Twist Knitting & Spinning
5743 Route 202
Lahaska, PA 18931
(215) 794-3020
twistknittingandspinning.com

SOUTH CAROLINA

LoftyFiber
415 E 1st Ave
Easley, SC 29640
(864) 810-4747
loftyfiber.com

SOUTH DAKOTA

South Dakota Natural Colored Wool Studio
109 N 2nd St
Groton, SD 57445
(605) 397-4504
sdnaturalcoloredwool.com

TENNESSEE

Smoky Mountain Spinnery
466 Brookside Village Way Ste 8
Gatlinburg, TN 37738
(865) 436-9080
smokymountainspinnery.com

Sunshine Weaving and Fiber Arts
327 W. Main Street
Lebanon, TN 37087
615-440-2558
sunshineweaving.com

Yarn Patch
68 N Main Street,
Crossville TN 38555
(931) 707-1255
www.yarnpatch.com

TEXAS

Yarnorama
130 Gonzalez St
Paige, TX 78659
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yarnorama.com

UTAH

Desert Thread
29 E Center St
Moab, UT 84532
(435) 259-8404
desertthread.com

Needlepoint Joint
241 25th St
Ogden, UT 84401
(801) 394-4355
needlepointjoint.com

VERMONT

Six Loose Ladies Yarn & Fiber Shop
287 Main Street
Chester, VT 05143
(802) 875-7373
sixlooseladies.com

VIRGINIA

Dances With Wool
1229 Sycamore Square
Midlothian, VA 23113
(804) 594-5849
www.danceswithwoolrva.com

The Knittin' Coop
7 S. College Ave
Salem, VA 24153
(540) 588-2447
www.theknittincoop.com

WASHINGTON

Cabled Fiber & Yarn Studio
125 W 1st St
Port Angeles, WA 98362
(360) 504 2233
cabledfiber.com

Northwest Yarns
1401 Commercial St.
Bellingham, WA 98225
(360) 738-0167
nwyarns.com

WISCONSIN

Icon Fiber Arts
590 Redbird Cir
De Pere, WI 54115
(920) 200-8398
iconfiberarts.com

Fiber Garden
N5095 Old Hwy. 54
Black River Falls, WI 54615
(715) 284-4590
fibergarden.com

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The Fiber House
146 Coffeen Ave
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Oatlands, TAS 7120
402 149 404
www.theluckyewe.com/

JAPAN

Kakara Woolworks
580 Yagami
Akaiwa-shi, Okayama-ken
709-0734
Japan
+81-(0)86-995-9988
kakara-woolworks.com

UNITED KINGDOM

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Peasmarsh, Guildford GU3 1LZ
United Kingdom
01483 565 800
www.georgeweil.com

The Handweavers Studio and Gallery
140 Seven Sisters Road,
London N7 7NS
020 7272 1891
handweavers.co.uk

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17 Ailsa View
West Kilbride North Ayrshire
Scotland, UK, KA23 9GA
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info@weftblown.com

Advertiser Index

Small Change Scarf

SUSAN Z. DOUGLAS

If small-batch dyeing exercises have left you rich in miniskeins of many colors, then this stitch pattern can be your payoff. It's a bit sneaky. Even a seasoned knitter might be fooled into thinking it is worked with a stranded knitting technique, but it derives its punch from easy slip stitches alternating with plain rows.

Why "Small Change"? First, a small change to a rather unexciting knitting pattern—as happened when I first explored this motif and shifted from four rows of each color to two—is a fascinating way to explore color design. Second, this scarf pattern uses up minimal amounts of individual colors of yarn—small change in terms of yarn capital.

Color Placement and a Note about That Screaming Color

As mentioned in my article "Slipped-Color Exploration" (*Spin Off* Spring 2023), value is important to make this pattern effective. For the patterned side, I generally used light colors for the solid-color rows and dark colors for the slipped-stitch rows.

Above all, though, my objective was to have fun and enjoy seeing the juxtapositions of lots of colors. There is one *really* bright color in my scarf. Do you see it? This color is a personal favorite of mine on its own, but I paused after knitting it into the scarf. It was so loud next to the other colors. There's a pop of color, and then there's a *scream* for attention. I considered ripping out that stripe and replacing it with a safer, quieter color, but then I thought, "Nah, where's the fun in that?" I plugged my ears and let it scream.

If you subscribe to this magazine, log in to get your bonus pattern at LT.Media/SmallChange.

Remember the old toy commercials that urged kids to collect 'em all? Now retired and living in Maine, **Susan Z. Douglas** loves all the colors, and her goal is to collect 'em all.

Photo by Matt Graves

As 2023 comes to a close, our wish is that you give yourself permission to play and time to use your handspun! As a thank you to our subscribers—and a nudge to use some precious leftovers or spin some fresh color—we have released a bonus knitting pattern.

*Susan Z. Douglas created this scarf after writing "The Curious Colorist: Small-Batch Dyeing for the Dabbler" (*Spin Off *Spring 2023). The article was accompanied by a group of brilliantly colored swatches worked in a slipped-stitch technique. Susan developed those design seeds into this two-sided, self-fringed scarf, and we are thrilled to share it with you here.*

Best wishes to all of you from all of us at Long Thread Media!

—Kate Larson and the Spin Off *team*