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WINTER 2021

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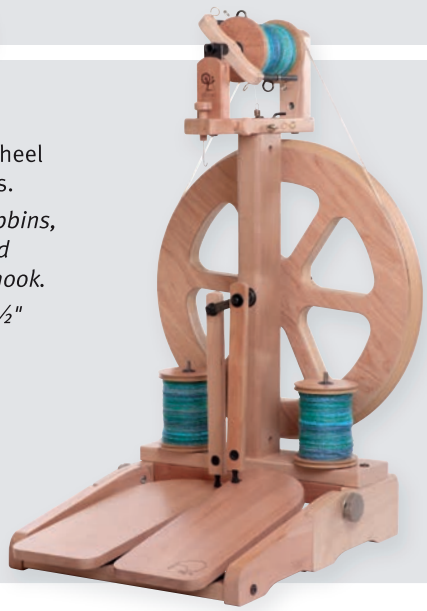

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On the cover: Explore stretchy embroidered knits on page 68. Also shown: modular spindle from KCL Woods. Photo by Matt Graves

spinoffmagazine.com

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Photo by Brian McCarthy

Spinners are a wildly creative group. For some, this is expressed in bold, textured skeins drenched in vivid hues. Other spinners might not think of themselves as artistic types as they unflinchingly adapt a combed top into a lofty batt or knit their handspun into a sweater that is peppered with creative modifications.

In fact, there are so many different ways to be creative as a handspinner that it can all feel a bit daunting at times. Adding structure to your practice—a framework as individual as yourself—can help you explore further afield. Adding structure to the creative process can make us all more creative!

A great example is **Brian McCarthy**'s "Sixty-Four Sheep in a Blanket" article, which is featured in this issue. Brian set out to collect and spin as many breeds as he could, found himself buckling under a deluge of fiber samples, and then used the framework of a blanket project to add order to what felt chaotic. The structure of his chosen project allowed him to focus on what he really wanted all along: to experience different wools.

Structure doesn't always mean more measurements and recordkeeping. Think of structure as providing a canvas, allowing you to control what fills it. Take a look at **Susan Z. Douglas**'s free-wheeling embroidery color studies built upon the natural grid of stockinette stitch. I'll be exploring handspun splashes of color this winter with Susan's method, and I hope you'll join me.

Wishing you peace and perfectly filled bobbins,

Overrun with beautiful but tiny skeins of handspun cotton, Kate started Melvenea Hodges's Chameleon Shawl (learn more on our website).

Photo by Kate Larson

Spin Off®

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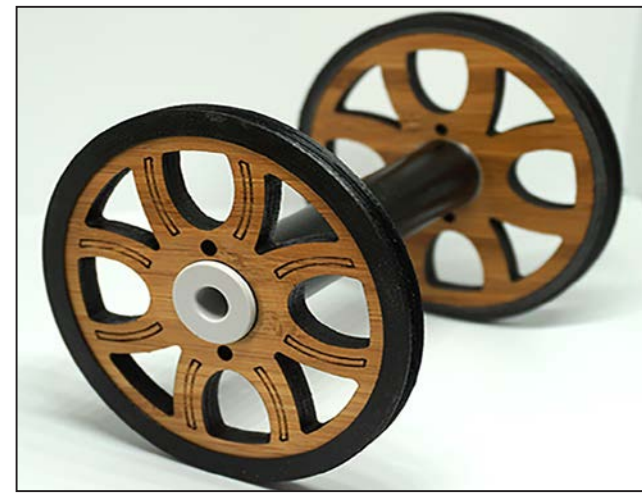

all you need to spin your dreams

THIS POLWARTH WOOL BLANKET (top left) *was dyed with cochineal and Kool-Aid. The finished size is 28 × 75 inches. This blanket was finished by washing in a machine on the gentle cycle, which gives the fabric a nice tracking appearance.*

I made the second blanket (bottom left) *from scratch and started with raw fleece. It measures 38 × 62 inches. I dyed the Corriedale with used tea bags. As I used the tea bags, I put them in the freezer until I had enough. Marguerite Porter Davison's book,* A Handweaver's Pattern Book, *has The Blooming Leaf pattern, which is my favorite. I repeated the Blooming Leaf with a little twill on each edge.*

The warp and weft of both blankets are thin two-ply yarns. I sized the warps with hairspray, finished the edges with crochet in the same yarns, and added fringe. I usually use a carding machine to prepare fiber, spin on my Ashford, and weave on an eight-harness Cranbrook (the Blooming Leaf pattern needed only four harnesses).

Dawn Landis
Robesonia, Pennsylvania

CORRECTIONS

Spin Off *Fall 2016*

In Amy Tyler's article "Ask a Spinning Teacher: Numbers" on page 22, we mistakenly published that there are "254 millimeters in an inch." There are 25.4 millimeters to an inch.

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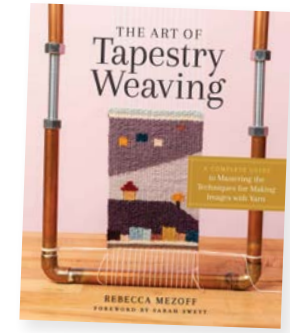

Rebecca Mezoff

Small tapestry weavings offer an opportunity to use up all of those leftover bits of handspun yarn. Not sure where to start? Weaver and handspinner Rebecca Mezoff introduces budding tapestry weavers to the basics in her latest book. Rebecca aims to provide a strong foundation in the fundamentals but also encourages new weavers to follow their own curiosity. Weaving, like any craft, has a language of its own, so Rebecca shares vital terminology in chapter one, helping new weavers pick up terms early. Along with plenty of information about weaving techniques, the book contains chapters dedicated to yarn construction and color theory. This information is especially useful for handspinners who want to spin and dye for their own projects. And for the do-it-yourselfer, Rebecca includes instructions for building a pipe loom.

North Adams, Massachusetts: Storey Publishing, 2020. Hardcover, 320 pages, $35. ISBN 9781635861358.

Drumcarding Basics & Beyond

Emily Wohlscheid

After a spinning wheel, a drumcarder often tops the list of coveted big-ticket tools for many handspinners. Having a knowledgeable mentor discuss the differences between different manufacturer's drumcarder features and show us how to make the most of our investment is invaluable. In her new online drumcarding course, fiber artist and instructor Emily Wohlscheid welcomes you into her Michigan studio for all this and more. Whether you dream of creating colorful blends or textured art batts, Emily takes you through the process step by step. While watching Emily work on her own carders, you'll notice her gentle handling of the tools. She doesn't force anything and adds small amounts of fiber, gradually building up her batts. Plus, Emily offers carding safety and maintenance tips. The total workshop runs about two hours, but it's broken down into manageable chunks to allow you to step away and try the techniques yourself.

Fort Collins, Colorado: Long Thread Media LLC, 2020. Online workshop, about 121 minutes, $39.99.

Journeys in Natural Dyeing:

Techniques for Creating Color at Home

Kristine Vejar and Adrienne Rodriguez

The cold winter months offer time to plan your locally sourced, natural-dyeing explorations for the coming growing season. Join authors Kristine Vejar and Adrienne Rodriguez on a tour of the color traditions of Iceland, Mexico, Japan, and Indonesia. The rich color photography and plentiful hand-dyed swatches will energize your creativity. But the real essence of the book exists in the stories of the dyers. Meet Manuel Loera Fernández, a maker living in Mexico who harvests and grinds cochineal. This tiny insect is prized for its red dye and lives on the *opuntia* cacti, commonly called prickly pear. Although much of the book assumes some dyeing knowledge, beginners can find an overview of the process at the end, including resources.

New York: Abrams, 2020. Hardcover, 240 pages, $29.99. ISBN 9781419747076.

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Lisa Souza

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Dear Fellow Travelers,
until we meet again,
throw creativity at 19!

Spinning Daisies: Chinese Fireweed

BY LINDA LIGON

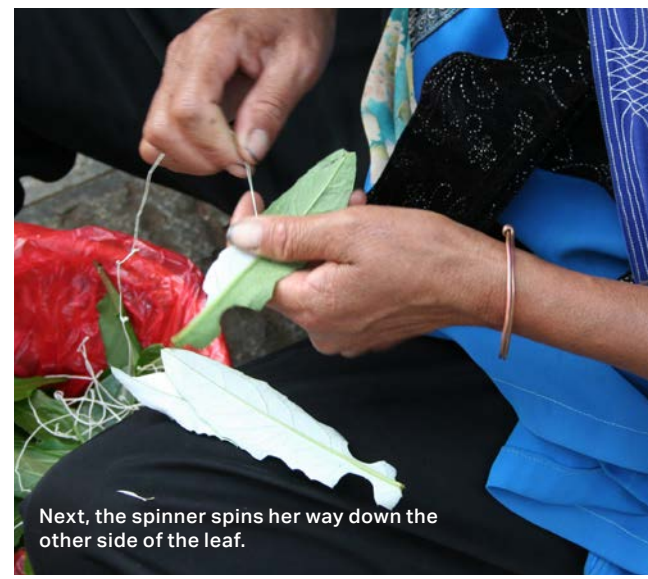
More than a decade ago, my son sent photos he had taken while hiking through Yunnan Province in southeast China of a woman making thread, somehow, from a leaf. I've spent the past 10 years trying to determine what the leaf was: rhododendron? Probably not, even though their leaves are of a similar shape, and the backs are velvety. Lambs ears? No. Both sides are hairy, and it just doesn't work. I've tried it. A Miao indigo dyer I met recently in Szechuan Province identified it as firegrass, which translates as ramie. Clearly, this is not ramie.

Finally, a random internet search turned up a widely cited paper by a group of Chinese researchers showing some ceremonial garments woven of . . . gerbera! It's best known here as African Daisy, that common, showy bloom to be found in every floral department of every grocery store. That species, also a popular garden annual, is generally *G. jamesonii* and tends to have smooth, even waxy leaves. The Chinese species is *Gerbera delavayi,* commonly known as firegrass or fireweed. It's not pretty, but the backs of the leaves are clad in a long, waxy indumentum, or fine hairs. The waxiness is extreme, making the plant easily flammable, and hence the common name.

According to the paper in *Economic Botany* (see Resources), fireweed fabric can be either a blend of fireweed and hemp or pure fireweed. The former is warm, lightweight, and durable but time-consuming to produce; the latter, soft, comfortable, and breathable. The fibers are similar to cotton in many respects, but four times as waxy, which would make it more easily spinnable.

The spinner finger spins down one side of the *Gerbera delavayi* leaf, from tip to stem.

The finely spun thread requires many joins.



Next, the spinner spins her way down the other side of the leaf.

Photos by Ethan Ligon

Fireweed fabric can be either a blend of fireweed and hemp or pure fireweed. The former is warm, lightweight, and durable but time-consuming to produce; the latter, soft, comfortable, and breathable.

Gathering the leaves is part of the Torch Festival, an important celebration among at least some of eight ethnic minority tribes known to use the plant. The fiber production has been designated an intangible cultural heritage, and the plant's flower, unprepossessing in size and color, is considered a lucky flower.

As the Chinese government becomes more supportive of traditional crafts of the ethnic minorities, demand for fireweed textiles is increasing. As with other crafts, though, younger generations are not learning and practicing its production. The elegantly simple vests, dyed with local flowers and treasured within families, are destined to be museum relics. The plant will continue to flourish along mountain paths, its special property the stuff of legends.

Resources

Wei Zheng, Xiaodan Xu, and Jun Wen. "The Ethnic Textile Use of Natural Fibers from Fireweed (*Gerbera delavayi*) in Southwest China." *Economic Botany* 71, 2017; 380–386.

Linda Ligon is one of the cofounders of Long Thread Media.

Teaching at Sätergläntan: A Spindle a Day

BY JOSEFIN WALTIN

Whenever I visit Sätergläntan Institute of Crafts, I see a love for all things craft everywhere I look. It is a place dedicated to education and to the people who have a passion for making. Students, teachers, and staff who come to Sätergläntan are there for the joy of crafting.

Sätergläntan is a craft and education center in the county of Dalarna in Sweden. Students can enroll in one- to three-year programs, immersing themselves in weaving, sewing, woodworking, and forging with opportunities to specialize in a certain field. The center also offers shorter five- to seven-day workshops in a wide variety of crafts, such as basket weaving, bodice sewing, embroidery techniques, spoon carving, or rya weaving. Sätergläntan attracts students and teachers from near and far.

Some days, spinning classes were held outdoors. Students were smitten by the Navajo-style spindle and learning how to use it.

Students learned to use handcards and prepare rolags for spinning.

Photos by Josefin Waltin

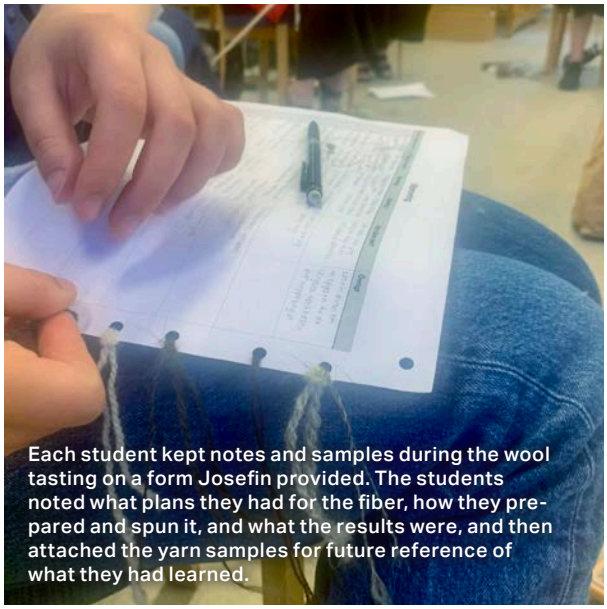
Teaching in a Pandemic

In June 2020, I taught a short spindle-spinning class at Sätergläntan; it was my third time teaching there. Because of the COVID-19 pandemic, many students canceled their applications, and the center canceled classes, following the rules for public gatherings. But my class, A Spindle a Day, was lucky enough to be held; I had five students ranging in age from nineteen to sixty-nine years old.

In the class, we focused on four different spindle types, one type a day for the first four days: suspended spindles, Navajo-style spindles, in-hand or grasped spindles, and supported spindles. We dove into each spindle style and the spinning technique used for that type of spindle. We also took a look at the whole process of spinning, from fleece to yarn.

I started this class the way I always do: with the fleece. The students learned about different wool and fiber types and how they could prepare them to enhance certain characteristics. By preparing their own wool with handcards and combs, the students got to know the fiber and how it behaved. They learned to listen to the wool and to analyze their preparation and spinning. Whenever they found a lump or thin spot in the yarn, I encouraged them to go back to the preparation to see what they could do to improve the prep.

The process of preparing wool by hand and spinning with spindles takes time, which allows students to slowly explore the steps and techniques. So much of the mechanics of spinning is in the body of the handspinner, especially when spindle spinning. Speed, twist insertion, take-up, and tension are, to varying degrees, governed directly by the sensitive fingertips of the spinner. The wool, the spindle, and the motions rely on the spinner's hands over and over



Each student kept notes and samples during the wool tasting on a form Josefin provided. The students noted what plans they had for the fiber, how they prepared and spun it, and what the results were, and then attached the yarn samples for future reference of what they had learned.

Students took notes and kept samples of all the wool breeds, preparations, and spinning techniques they tried.

again. The wool will softly whisper to the hands, and the hands remember. The spinner just needs to trust the wool and listen to it. In my eyes, spinning with spindles brings the spinner closer to the craft and provides the spinner with a deeper understanding of the process.

The Mindfulness of Spindle Spinning

The fifth day of the class was dedicated to mindful spinning. I invited the students to take part in a "wool tasting," and they received five different wool samples to work with, one at a time. Students investigated the wool, took notes, prepared and spun the fiber, and analyzed the results. To keep their creative flow uninterrupted, they did this in silence. After fifteen minutes, they moved on to the next wool sample and repeated the process. During the wool tasting, I sat and absorbed their diligence, focus, and excitement in putting their new skills and understanding to the test. My heart sang with joy as I found the key to each student's individual learning style, saw them develop and use their skills, and watched them grow. This is what fuels me as a teacher. After the fifth wool sample was completed, each student's wool-tasting chart was full of notes and samples, and the spinners went home with a map of what they had learned.

The very last thing we did in the class, before we went home, was a spinning meditation. I guided the students and did my best to bring their attention to the act of spinning rather than the resulting yarn. Their focus was on the process and being present in the here and now. For the last few minutes of the spinning meditation, I asked the students to close their eyes and trust that their bodies knew what to do. And they all did, even the student who was just a beginner when she came to the class a few days earlier. Afterward, she said the yarn she had spun during the meditation was a bit lumpy, but the part she had spun with her eyes closed was the most evenly spun yarn she produced during the workshop. Another student decided there and then that she would keep a wool basket dedicated to spinning without expectations, just for the love of spinning.

At Sätergläntan, love of craft is everywhere I look. I can't wait to go back. ●

| To learn more about Sätergläntan, visit **saterglantan.se**.

Josefin Waltin started spinning in 2011. She is a spinning teacher and offers workshops both online and offline. Josefin publishes instructional and documentary-style videos, and she manages a spinning blog from her home in Sweden at waltin.se/josefinwaltinspinner.

Lilly's Blanket

BY DANIELLE ROOTHOOFT

Fiber preparation I used hand-dyed roving, making rolags and mixing different colors on my handcards. The new blends became slight variations of the original colorways.
Wheel system/spindle I used suspended and Turkish spindles. My preferred spindles are made by IST Crafts on the Isle of Wight in the United Kingdom.
Drafting method I work fast and always allow some twist in my yarn supply. I draft while my spindle turns and spin without thinking. I like to call this yarn "my default thickness," but the thickness can vary a little.
Singles direction Z-spun.
Singles wraps per inch About 22 wpi.
Ply wraps per inch About 11 wpi.
Yarn classification/weight Handspun, about worsted weight; commercially spun wool sock yarn, Schoppel Wolle's Zauberball Crazy.
Crochet hook Size 10 (8 mm).
Finished size 31½" × 39½" (80 ×100 cm).

Photos by Danielle Roothooft

I am a freelance illustrator of children's books. Also, I stitch freestyle embroidery, design teddy bears under my brand name Pussman & co on Etsy, and I like to make all kinds of stuff on the sewing machine, especially bags. I always use a lot of color in my work and never use just plain colors.

I became a handspinner about three years ago. A friend of mine had wanted to learn to spin for a long time, and there was a two-day spinning class in our village, so she asked me to join her. Truthfully, I was not really tempted to do this because I thought, "I don't want all of that fluffy wool flying around in my living room." But in support of our friendship, I went along, and it turned out it wasn't all that fluffy. I was hooked instantly. In the first class, after a few hours of spinning chunky, curly, over-twisted wool yarn, I made a spindle out of a chop stick and a Meccano wheel. I learned to draft using the park and draft method on that handmade, wobbly spindle. I ended up ordering an Ashford Kiwi wheel the next week, and a few months later, I bought a Schacht Matchless.

This crochet project began when I needed to make a small blanket for my first grandchild, Lilly. I had a lot of hand-dyed roving, including Romney, Merino, and other unidentified fibers, that I had received as gifts. The spinning fibers were just sitting in a bag and taking up space in my house.

I am fond of the neutral scarf designs of Sophie Digard and the colorful scarves from A Very Fine Yarn (@sophiedigardofficial and @averyfineyarn on Instagram, respectively). But these scarves are all made of fine yarns, threads, and embroidery floss, and I just don't have that kind of patience. Using these designers as inspiration, I thought it would be fun to

invent my own blanket, using my hand-dyed fibers for the project. Also, since I spin to relax, I didn't want to overthink the spinning. The blanket had to be a mix of different weights of yarn.

I made the crochet pattern up after watching a YouTube tutorial about how to turn a circle into a square. I started crocheting circles within a square outer border, but some ended up being larger than others. That was kind of a problem. If the circle was already too big, the final square would certainly be too big, as well. I decided to leave those thicker yarn circles as they were and make the smaller ones into squares.

In addition, I was trying to figure out what color to use to bind all of the squares together, and nothing appealed to me. I took a look at my yarn stash, the leftovers from a lifetime, and even unused sock yarns. I came across a ball of yarn, Schoppel Wolle's Zauberball Crazy, and it matched perfectly with all of my colors. Although the yarn was thinner, that was no problem because I used the same crochet hook.

Danielle with her dachshund.

Danielle used small, colorful bits of handspun for her blanket.

Danielle's granddaughter Lilly is the fortunate recipient of the colorful blanket.

The looser gauge gave my blanket a really drapey feeling that I found very nice. And the thinner yarn stretched in all directions, filling in spaces where my circles and squares were uneven. This allowed the blanket to lie flat.

Find the pattern for Lilly's Blanket at pussman.etsy.com, and follow Danielle on Instagram, @pussmanandco.

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

Kim was inspired to create the Féth Fíadha shawl as she explored ways to rejuvenate loft and crimp in commercially prepared fibers. She spun a white Gotland sample with soft twist, allowing the fiber's natural tendency for haloing to emerge and evoking images of rolling mists. In the final yarn, she incorporated a sporadic dusting of gray Finn in one of the plies to soften the stark white woolen landscape.

Photos by Matt Graves unless otherwise noted

Loft & Crimp

Rejuvenating Processed Fibers

BY KIM McKENNA

Until five years ago, I did not often use commercially prepared fiber for my own projects. Why? Because these processed fibers did not seem as lively or responsive to my touch as my own freshly combed or carded preps. However, through experiments and sampling, I found a way to rejuvenate some of the crimp and loft in commercial preparations, making my spinning fingers happy.

A SPINNER EXPLORES

As I was spinning samples for an upcoming workshop, I wondered if the lack of perceptible crimp and loft in a commercially combed Gotland fiber affected my spinning. I retrieved some curly, lively Gotland fleece from my stash, carded and combed the locks, and compared it to what I had been spinning. As in the commercial prep, the crimp in my own fiber prep was slightly masked after carding and combing. The loft in my fiber prep, however, was significantly greater than that of the commercial prep, which had been compacted in storage and shipping.

I decided to treat the commercial Gotland fiber to a warm-water soak to see if that would help reactivate the fleece character. After it was dry, I spun my first sample. The result? It handled more like my hand-processed fiber preparation. Because this technique leads to some disarrangement of the fibers in the preparation, I set out to develop a method that regains the most crimp and loft with the least amount of disarrangement possible.

I have since tried this approach with other commercial fiber preparations and have had good success with nonsuperwash slivers from breeds such as Bluefaced Leicester, Corriedale, Falkland, Finn, Gotland, Merino, Polwarth, Shetland, and South American. In each case, I found that the soaking treatment enhanced my finished yarns and textiles.

When working with refreshed, rejuvenated fiber, my hands could make more informed decisions and determine my own spinning "calibrations" of sorts. This included the width of fiber I chose to spin from, how much to attenuate the fiber, my preferred drafting method, the length of my draft, and how much twist to

Merino sliver: (*from left*) untreated, treated, and the finished yarn.

Corriedale sliver: (*from left*) untreated, treated, and the finished yarn.

Finn sliver: (*from left*) untreated, treated, and the finished yarn.

Shetland sliver: (*from left*) untreated, treated, and the finished yarn.

add. Further, with the treated fiber, I can more readily spin to a finer grist with greater consistency.

I started sharing my process and results with friends and students. Some have embraced the technique, and others prefer the denser, smoother fiber as it comes from the mill. All, however, have another tool in their spinning arsenals for fine-tuning their spinning. Are you struggling to spin a consistent yarn? Seeking a finer gauge? Give this a try using about half an ounce (14 grams) of your prepared fiber. If you like the results, you can repeat the steps with a larger lot of fiber and adjust as needed.

TRY IT YOURSELF

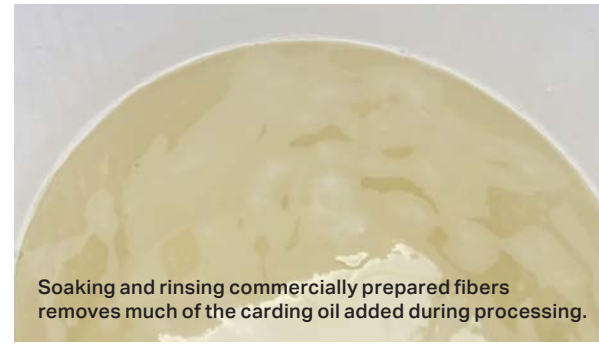
Note: You do not need to use the following method with handpainted sliver or roving as you are essentially spinning fiber that has already been treated.

1 Soak in warm water. Fill a basin with warm water at 100˚F to 110˚F (38˚C to 43˚C). For small sample amounts, add your fiber and gently push it beneath the water's surface. For larger amounts of fiber, place a large netted bag or plastic basket into the basin before adding the fiber to the water; this allows the fiber to be removed undisturbed. Place a thermometer in the water.

Leave the fiber to soak until the water has cooled to about 90˚F (32˚C). Lift the fiber from the water; loose fiber masses and netted bags should be supported with your hands from below. Allow some of the liquid to drain off before transferring to the rinse bath.

2 Rinse. Fill a basin with water that is the same or a slightly warmer temperature than the water the fiber was just removed from. Why warmer? Because wool felts if it goes from warm to cool water. Add the fiber as before.

When the second bath has completely cooled, remove the fiber and spread it out on a thick layer of thirsty cotton towels. Do not cover the fiber or squeeze out excess water; simply leave the wet fiber on top of the towels. Leave the fiber undisturbed for a few hours. It is ready for the next step when it feels slightly damp, not wet, to the touch.



Soaking and rinsing commercially prepared fibers removes much of the carding oil added during processing.

Photo by Kim McKenna

Kim uses her rejuvenated slivers to create a spinning preparation that closely resembles handcombed sliver. She winds these slivers onto a distaff for spinning.

Photo by Kim McKenna

3 Hang and rotate. Gently straighten out the sliver a wee bit and hang it over a shower curtain rod or something similar. (I use an extension curtain rod suspended in a doorway.) While the fiber is drying, occasionally change its position. The sections of sliver that rest on the rail dry more slowly, creating areas where loft does not recover as well. Changing position now and again will help to minimize this.

WHAT COMES NEXT?

Once the treated fiber is fully dry, you can spin it as is or do further preparation: strip it into smaller sections; predraft it; or use it for blending on a drumcarder, combs, or hackles. In my own spinning practice, I predraft strips of fiber to produce a spinning preparation as similar to handcombed and dizzed sliver as possible.

I most often spin yarns using a forward-worsted or backward-worsted draft. These drafting methods coupled with the treated sliver allow me to spin

Reactivating the crimp in commercially prepared slivers prior to spinning helps Kim create lively handspun yarns.

lightweight, airy yarns with beautiful drape for knitted or woven shawls and scarves. I think it is important for spinners to do what gives us the most joy and what works best in our practice, and I've found that rejuvenating the crimp and loft in commercial fiber preparations gives my hands more information to work with, helping them to know how best to spin the fiber at hand.

Kim McKenna gives lectures and workshops on the arts of spinning and dyeing. She shares her journey on her blog at claddaghfibrearts.com and on Instagram as @claddaghfibrearts. She also weaves a few days a week for Diana Sanderson at the Silk Weaving Studio on Granville Island. Be sure to drop by to say hello if you are ever visiting the beautiful city of Vancouver.

Opposing Plies
and the Quest for Elasticity

BY HEAVENLY BRESSER

An opposing-ply yarn doesn't often look different from other plied yarns at first glance, but an energized ply lies within.

Photos by Matt Graves

One of a handspinner's greatest superpowers is the ability to create new and intriguing yarn designs. It simply requires a fresh perspective, some basic skills, and throwing caution to the wind. My eyes were first opened to the realm of possibilities by Sarah Anderson's brilliant work in *The Spinner's Book of Yarn Designs*. After that, my desire to try creating different yarn structures began to take root. Sarah's book was one of my first encounters with the term "opposing ply," and the investigation began.

A LITTLE OPPOSITION

An opposing-ply yarn is a multiple-ply structure in which one or more of the singles are spun in the direction opposite that of the primary singles. This means that when the singles are then plied in the reverse direction of the primary singles' twist, the opposing ply or plies accumulate more twist in the direction in which they were originally spun. The result is an energized ply within the yarn structure. Spinning yarn this way creates an intriguing texture, and it has many uses.

One of the claims I hear from spinners in favor of opposing-ply yarns is that they make perfect yarns for socks. Once the technique is developed and honed, opposing-plied yarn often grows up to be a handspinner's treasured sock yarn. What makes this family of yarns so unique and knitworthy? To answer that question, I decided to take on a challenge and create various opposing-ply yarns using only wool and then see how the yarns performed in a knitted fabric.

For this experiment, I carefully selected a clean Shropshire fleece. This Down breed is native to the United Kingdom, and Shropshire fleeces in the United States today have varying fleece characteristics. The fleece that I am using has some crimp in the fibers and does not have a very blocky staple. The reason I have chosen this fleece is that it is already springy. I am curious to discover whether opposing plies will significantly increase the elasticity or bounce in an already bouncy fiber type. The fiber I have chosen measures 2½ to 3 inches in length. Although the fibers are fairly short and very suitable for carding, I wanted to try something different. To prepare the fleece for spinning, I used Valkyrie Fine wool combs to prepare the clean fleece into full, lofty bundles of handcombed top. This fleece was easy to comb and required only a single pass.

TESTING THE POWER OF ELASTICITY

To test the elasticity of each yarn structure, I decided to keep the grist the same for each single in the multiple plies, including the opposing ply itself. To start, I spun a tiny sample of a traditional three-ply yarn as a standard for comparison. Each single was spun worsted at 17 wraps per inch (wpi) with a 1-inch, short-forward draft using a spinning wheel ratio of 10:1. The aim for each plied yarn was an average twist between 25 and 30 degrees plied at a ratio of 8:1. Keeping all things equal and adjusting the numbers of opposing plies and total plies helped me to examine any slight differences in the sample yarns.

To measure the elasticity of the skeins, I decided to set the twist before measuring each one both relaxed and stretched. This allowed me to calculate the percentage of increased elasticity. I first measured the unstretched and then stretched traditional three-ply yarn sample; this would serve as my control sample. This control yarn displayed a 17 percent increase in length when stretched. Let's look at opposing three-ply, four-ply, and five-ply yarns and see how their results compared.

For her experiment, Heavenly chose a bouncy Shropshire fleece. One combing pass using fine wool combs was all that this clean fleece needed to prepare it for spinning.

Note that when measuring the twist angle, it is easier to measure the primary plies because the opposing plies can recede into the yarn structure, making it difficult to measure them accurately.

Opposing Three-Ply

I spun the first single Z, the second single Z, and the third single S, all measuring 17 wpi. The singles were plied together with S-twist. When plying, the single spun in the opposing-ply direction prefers to jump ahead of the neighboring strands. It takes a little bit of time to control but the slight taming is well worth it. The resulting yarn is textured, resilient, and squishy, measuring 8.5 wpi. When stretched, the opposing three-ply sample was 20 percent longer than when it was relaxed. This means that this yarn showed a 3 percent increase in elasticity compared to the control skein.

Opposing Four-Ply

Instead of creating a common four-ply, I decided to turn not only one but two of the singles into opposing plies. For this yarn, I spun two singles Z, and the other two singles S. Then I plied all of the singles with S-twist, resulting in a 7.5 wpi yarn. Of all the yarns, this one was the hardest to handle

during plying. The resulting springy yarn showed an elasticity increase of 8.6 percent when compared to the control skein. Within my entire sample set, this was the most elastic yarn. I also loved the look of this yarn the most. Tip: To a create an interesting barber-pole effect with this structure, use a main color for the two singles spun Z and a contrasting color for the two singles spun S.

Opposing Five-Ply

For my final sample, I wanted to try something really outside of the box. I spun three singles Z, two singles S, and plied all of the singles with S-twist. The result is a textured yarn with the two opposing plies nestled between the three primary plies. The effect is a round, plump yarn at 6.5 wpi. It's still squishy but slightly firmer and more resilient than the opposing three-ply and four-ply yarns. This opposing-ply yarn also

Tips for Spinning Opposing Plies

1. Mark your bobbins and stay organized. It is easy to confuse S- and Z-spun singles when they are the same color.
2. Don't forget to change directions when spinning opposing plies. Most spinners are accustomed to spinning in the clockwise direction for singles.
3. Too little twist in the plying step makes for a less resilient yarn that looks a bit wavy in appearance.
4. Opposing plies tend to nestle in between the primary plies as long as there is enough ply twist.
5. While yarns can be set by soaking, setting with steam is a great option if the fiber type allows.


Opposing plies tend to move toward the center of the yarn structure, making them less visible.

had the least amount of stretch and only increased 2 percent compared to the control skein. As much fun as it was to spin this yarn, it required some concentration to keep the singles from being tangled during the ply session. I plied all strands together using the spaces between my fingers to keep them separate, with the last strand tensioned between the knuckle of my thumb and my leg. Tensioned lazy kates are great when trying to manage this many singles. I can imagine using an opposing five-ply yarn for a knitted cowl or even a hat.

OVERALL RESULTS AND NEXT STEPS

As far as elasticity is concerned, the opposing four-ply yarn was the most elastic yarn. The three-ply came in second, while the five-ply came just shy of second but fell into last place. The increase in elasticity was not overwhelmingly significant, but present, nonetheless. One of the most noteworthy outcomes is that each of these opposing-ply yarns was more elastic than the traditional three-ply yarn. If spun thinner with more ply twist, any of these opposing-ply constructions would make a perfect durable, comfy sock yarn.

Note that when measuring the twist angle, it is easier to measure the primary plies because the opposing plies can recede into the yarn structure, making it difficult to measure them accurately. In this case, the samples were plied with a resulting twist angle varying between 25 and 30 degrees, which created a good knitting yarn. The yarn didn't split as it was knitted, but I did find that it untwisted a bit when knitted with an English or "throwing" method. The roundness of the yarn yields beautiful cables and a spongy fabric, which is also partly due to the fiber choice. Opting to comb and use a short-forward draft resulted in clear stitches, although the fiber itself is very lofty.

The best part of experimenting as an artist is the various curiosities that continually arise. Some next steps could be testing inelastic fibers to see if elasticity can be enhanced or testing the durability of thin opposing plies compared to thick ones. With so much versatility, it is no surprise that opposing-ply yarns have a place in so many handspinners' stashes. ●

Resources

Anderson, Sarah. *The Spinner's Book of Yarn Designs: Techniques for Creating 80 Yarns*. North Adams, Massachusetts: Storey Publishing, 2012.

Robson, Deborah, and Carol Ekarius. *The Fleece and Fiber Sourcebook*. North Adams, Massachusetts: Storey Publishing, 2011.

Heavenly Bresser is the owner of Heavenly Knitchet. She is an award-winning handspinner, antique wheel collector (28 beauties!), and teacher at major fiber events all over the United States. Aside from spinning and teaching, she can be found dyeing fibers and making jewelry. Her goal is to inspire, encourage, and uplift other fiber artists. Visit her online at heavenlyknitchet.com.

Indie-dyed Merino Silk Roving

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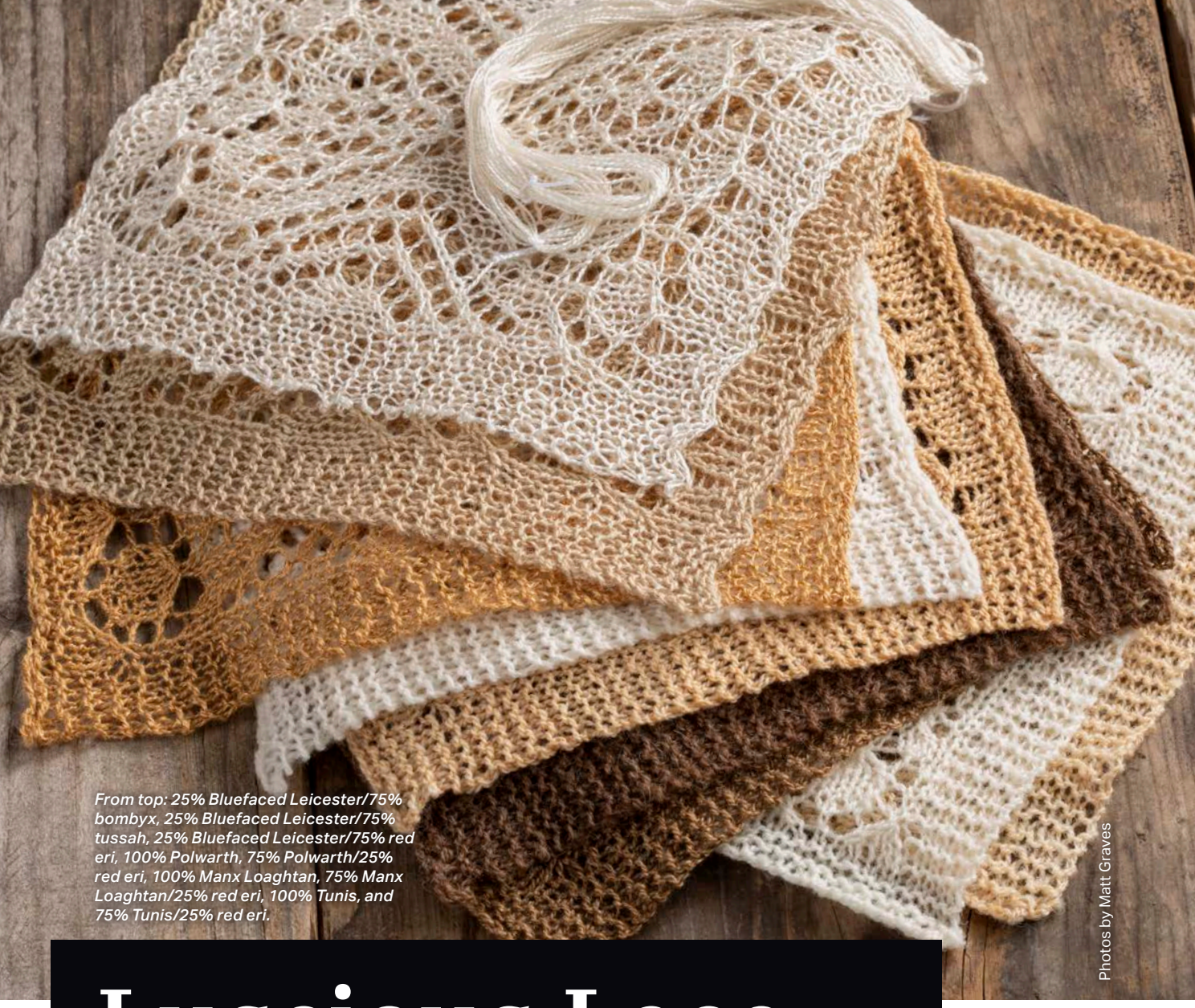


From top: 25% Bluefaced Leicester/75% bombyx, 25% Bluefaced Leicester/75% tussah, 25% Bluefaced Leicester/75% red eri, 100% Polwarth, 75% Polwarth/25% red eri, 100% Manx Loaghtan, 75% Manx Loaghtan/25% red eri, 100% Tunis, and 75% Tunis/25% red eri.

Photos by Matt Graves

Luscious Lace

Searching for the Perfect Blend

BY VANESSA BJERRESKOV

I knitted my first lace shawl in 2008, and I was hooked. Something about the confluence of angled stitches, open spaces, and plain knitting captured my heart. When I became a spinner in 2010, I knew I wanted to eventually spin yarns to make amazing knitted lace.

A year into my spinning journey, I began the Master Spinner Program through Olds College in Alberta, Canada. The program takes six years to complete, and over the course of the first five levels, my skills grew exponentially. In my sixth year, I was required to complete an in-depth study on a specific aspect of handspinning rather than the workbook of set skeins I produced in each of the previous levels. Because I was about to spend an entire year on one topic, I decided it should be something I was passionate about, so I set out to discover the best yarn for knitting lace.

THE STUDY

Knitted lace can be produced using any type and weight of yarn, but that doesn't mean the end product will be the fine, distinct lace fabric I love so much. In my research, I discovered that there are some commonly held truths about the yarns best suited to make lace designs "pop." I found general consensus on ply structure: a two-ply yarn will open the holes in lace more than a three-ply yarn. Thinner yarns were the preferred grist, and some knitters disliked halo in their lace knitting yarns, though some felt it added warmth and depth. (I do not fall in this camp, but to each their own!) With this information in hand, I set about designing my experiment.

There are well over 200 breeds of sheep and a variety of other fiber-producing animals available to spinners, not to mention all the plant and synthetic fibers, so I had to limit the scope of my search to something that could be completed in a year. I decided to see which combination of four commonly available protein fibers—Merino wool, Bluefaced Leicester (BFL) wool, huacaya alpaca, and bombyx silk—would best show off a knitted-lace stitch pattern. After blending and spinning the fibers at 100 percent and in pairs at 75 percent, 50 percent, and 25 percent, I knitted each yarn into a lace swatch that included common paired increases/decreases as well as a challenging five-into-one stitch.

I judged each swatch based on a rating system geared toward my ideal lace yarn: I started by rating the yarns on ease of knitting and then weighed and measured each finished swatch after blocking. I calculated the weight and surface area of the swatches because, for the purposes of the experiment, I assumed lighter and bigger swatches were better for typical lace projects such as shawls and scarves. I also asked 10 friends to rate each swatch on stitch definition, hand, and drape, then averaged the ratings for a final score. After the measurements and ratings were complete, I had my answer.

Surprising Results

Based on my rating system, the highest-scoring yarn was the 75% bombyx silk/25% BFL blend. Merino yarns were shut out of the top five and only appeared three times in the top 10—twice when blended with silk, and once with 75% BFL. Given the preponderance of commercial Merino lace yarns, I had expected the Merino yarns to score higher. My surprise was compounded by the fact that the BFL and alpaca I

VANESSA'S WINNING YARN

25% BLUEFACED LEICESTER / 75% SILK

Vanessa's winning yarn: 25% Bluefaced Leicester/75% bombyx silk.

100% MERINO

Despite being a common wool used in millspun lace yarns, 100% Merino performed poorly in Vanessa's study.

used for the study were of fairly poor quality. Instead, all but one of the top 10 yarns contained silk, and the lowest-scoring silk yarn (50% bombyx silk/50% Merino) placed 11th out of 22 samples.

The yarns at the bottom of the list were equally surprising. The poor quality of the BFL and alpaca fibers was revealed in the results as the percentages of those fibers increased in the blends. The lowest-scoring yarn was 100% BFL, followed closely by the 50% BFL/50% alpaca blend. The 100% Merino yarn came in third to last, scoring only 0.1 points higher than the BFL/alpaca blend. These low-scoring yarns generally lost points on weight, surface area, and drape.

The results of the study led me to conclude that silk and silk-blend yarns are best suited to the knitted lace I wanted. Silk blended with other fibers that also offer an inherent drape and luster, such as BFL, leads to lace yarns with drape, structure, and stitch definition. I also found that silk imparts drape, stitch definition, and a smoother hand to a soft, crimpy fiber such as Merino, using the blend to balance hand against other desirable lace qualities. (Read the full results of Vanessa's Master Spinner Program In-Depth Study online, see resources.)

NEXT QUESTION: DOES THE TYPE OF SILK MATTER?

Determining the absolute best fiber blend for knitted lace is a lifetime quest, but my study provided a good foundation. One of the questions that has been in my head since I completed the study in 2017 is, "Does the type of silk make a difference in my lace-knitting yarns?"

Bombyx mori, also called cultivated or mulberry silk, is widely available by itself or in blends, but it is not the only silk available. Wild silks such as tussah, eri, and muga have also found their way into many spinners' stashes. (See "Wild Silk: Blending Beyond Bombyx" in *Spin Off* Winter 2020.) Although all silks have certain characteristics such as luster, drape, and strength, they are not all the same. The diameter of individual silk fibers ranges from 9 to 25 microns, and different silks have different hand and light-refraction characteristics.

25% BLUEFACED LEICESTER/75% SILK

From top: Bluefaced Leicester/bombyx, Bluefaced Leicester/tussah, Bluefaced Leicester/red eri.

From top: Polwarth/red eri, Manx Loaghtan/red eri, Tunis/red eri.

To determine if using other types of silk would change the outcome of my previous lace yarn experiment, I re-created the top-rated yarn, 75% silk/25% BFL, with three different silks: bombyx, tussah, and red eri. To ensure as much consistency with the original experiment as possible, I sourced some new BFL and followed the same fiber preparation process: measuring out stacks of fiber in the 3:1 ratio, blending four times on a set of mini-combs, dizzing off into top, and spinning the yarn on my Hansen miniSpinner.

The first thing I noted was that the tussah and red eri were able to handle the blending process with less breakage; there were about half the number of nepps in those preparations compared to the bombyx. Another interesting note was that the new bombyx blend, which I spun first, came out significantly finer than either the tussah or red eri when I measured the finished yarn (36 wpi compared to 24 wpi). This was possibly due to the lower micron count of the individual fibers.

Each of the new swatches was consistent with the original experiment, but there were definite differences. Despite similar twists per inch and angles of twist, the bombyx swatch had a lovely, smooth hand; the tussah swatch felt crisp and almost coarse, with significantly less drape and an almost dull surface appearance; and the red eri swatch had the softness, drape, and shine of the bombyx with a crispness of hand similar to the tussah. The tussah swatch also weighed over 1.5 grams more than the red eri swatch, and the yarn weighed 25 percent more for the equivalent yardage.

One question, then, was answered: yes, the type of silk does make a difference to the final yarn. If you are looking for an end product that is fine, soft, and extremely lustrous, go with bombyx silk in your blend. Its weakness is fineness; it can be difficult to blend without breakage, which will impact the consistency of your yarn. Experimenting with different blending techniques—for example, blending on a drumcarder before combing once or twice—could reduce the number of nepps created. If you are looking for something a little more robust, say for a lace cardigan, blending with tussah will give you lace-enhancing characteristics with added strength. Red eri is a good middle-of-the-road silk.

ONE MORE QUESTION: DOES WOOL TYPE MATTER?

I made an assertion in the conclusion of my study about good lace yarns: "It hardly matters what you blend with silk, or in what ratio." After learning that the type of silk makes a difference, I began to wonder if that statement was correct. Many people are unable to wear the wools that I used in my samples—BFL and alpaca—against their necks. Lace knitters sensitive to these fibers might continue to use only Merino and be disappointed in the outcome. So, I decided to run another test, this time based on the sixth-place yarn in my original lace study: 75% Merino/25% silk (the top-scoring Merino yarn). I tried three different wools that have a reputation for next-to-the-skin softness: Polwarth, Manx Loaghtan, and Tunis. Based on my previous results with silk, I decided to blend each wool with red eri.

Using the same blending procedure, I combed and spun each wool at 100% and in a 25% silk blend. I hoped to see if adding silk would make the blended yarn more suitable for knitted lace—by increasing stitch definition or drape, for example—than its unblended counterpart.

Polwarth is an Australian breed derived from Lincoln and Merino sheep. Lincoln gives Polwarth fleeces some luster and drape, and the Merino genetics make the wool soft and wearable. My 100% Polwarth yarn had good stitch definition and drape as well as a soft hand, and I consider it perfectly adequate for knitted lace. The Polwarth/silk blend, however, was even better. The swatch had more luster and better drape, and the slight halo of the unblended Polwarth was tamed by the silk. Although the silk-blend swatch was 0.5 grams heavier, it was also 0.5 centimeters bigger in both height and width.

A conservation breed from the Isle of Man, Manx Loaghtan can be next-to-skin soft, and the wool is now being used as a blend in some commercial yarns. The wool typically has some inherent luster and has a fine micron count of 27. The 100% Manx Loaghtan yarn made a lovely, rustic swatch. As with so many primitive sheep, Manx Loaghtan wool often contains fibers of varying characters and lengths. This created

WOOL SWATCHES

From top: Polwarth, Manx Loaghtan, Tunis.

Vanessa's initial conclusions about the fibers she prefers for lace knitting yarns led to further testing using different wools and types of silk. *Top:* Golding RingSpindle.

About the Lace Pattern

Throughout these lace studies, I have used the same knitting pattern. I created my standard swatch using charts I found in *Stories in Stitches 2: Around the World—Knitted Samplers*. The charts were originally published by Dorothy Reade in 1970. I thought they were a good fit for my study because they included common motifs of paired increases/decreases as well as a challenging five-into-one stitch. To learn more, see Appendix 2 of my Master Spinner in-depth study (see Resources).

Vanessa found striking differences in blends using tussah silk *(left)* and red eri silk *(right)*.

a light halo in the finished swatch that I felt added to its appeal without detracting from the softness. Stitch definition was adequate, and although the hand and drape were a little lacking, this wool would be a good choice for a lace garment. The silk blend was another story: I would make anything out of it. The addition of silk increased the wool's luster and tamed the halo, and the red eri combined with the natural brown of the wool to make a beautiful golden yarn. The silk-blend swatch was marginally heavier and bigger than the 100% wool swatch.

American Tunis has some down-breed characteristics, most evident in the chalky feel of the wool and the blocky nature of the growth pattern in the fleeces I have experienced. I have not found it to be a wool well-suited to combing, but it is soft against the skin and versatile. The 100% Tunis yarn lacked drape compared to Polwarth and Manx Loaghtan and had a very chalky feel, but it still created a nice lace swatch. The chalky feel remained in the silk blend, but the silk gave the swatch more drape and luster, as well as a cooler feeling in the hand. Once again, silk added slightly to the weight of the swatch; it also increased its surface area.

This experiment determined that I was not wrong when I said adding silk would make any fiber better for the fine, classic, drapey knitted lace I love so much, but I was perhaps a little too simplistic in my statement. Choosing a base fiber that already has some good lace-knitting characteristics, such as drape or luster, will make the resulting yarn that much better. Based on the parameters of my experiment, I believe that adding silk to a fiber without those characteristics, such as Merino or Tunis, will produce a better end product than the base fiber on its own.

THE QUEST CONTINUES

Each time I explore this topic or spin a new silk-blend yarn, I learn more about what makes a great yarn for knitted lace. I may never determine that golden ratio of fibers, but with the knowledge I've gained, I know my yarns won't disappoint me when I knit them into my next beautiful lace textile. ●

Resources

Bjerreskov, Vanessa. "Simply the Best (Lace): Evaluating the Suitability of Commonly Available Protein Fibres for Lace Knitting" (Master Spinner Program thesis, Olds College, 2017). Available at libguides.oldscollege.ca/ld.php?content_id=34704875.

Druchunas, Donna, and Ava Coleman. *Stories in Stitches 2: Around the World—Knitted Samplers*. Barton, Vermont: Sheep to Shawl, 2013.

Robson, Deborah, and Carol Ekarius. *The Fleece and Fiber Sourcebook*. North Adams, Massachusetts: Storey Publishing, 2011.

Vanessa Bjerreskov has been working with fiber since she was a child. She started with crochet and cross-stitch before progressing to knitting and spinning, and she is a 2017 graduate of the Master Spinner Program at Olds College, Alberta, Canada. She now lives on the Sunshine Coast of British Columbia and is the host of the fiber-arts podcast *By the Fibreside*. Visit her website at bythefibreside.com or follow her on Instagram @sparqness.

Left to right: Stefanie sampled Upstream Alpacas 100% baby alpaca in Mossy Rock and spun it into fingering-, DK-, and bulky-weight gimp yarns.

Photos by Matt Graves unless otherwise noted

Uncoiling the Spiral of Gimp Yarns

BY STEFANIE JOHNSON

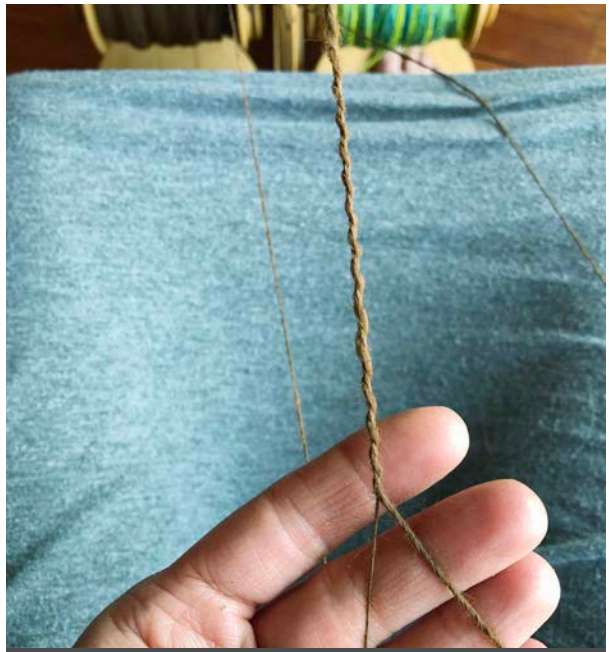
Spiral yarns are quite possibly my favorite types of yarn to create. I enjoy seeing the mesmerizing cascade of coils undulating from my basket of handspun. Although I admit that many of my handspun yarns remain in my basket for quite some time before becoming finished objects, the sense of energy in my spiral yarns makes them feel as though they're begging to be used! They're the wiggly students in class, yearning to participate.

Gimp yarns can be considered spiral-adjacent yarns, but occasionally, you'll find them classified with bouclé. In the textile world, the term "gimp" originally referred to thread that had a cord or wire running through the center; today, gimp is often used to indicate a braided or twisted trimming made from this type of thread. For the handspinner, gimp means something a little different. In her book *The Spinner's Book of Yarn Designs: Techniques for Creating 80 Yarns,* Sarah Anderson

explains that a gimp yarn is constructed from two singles plied together, with one single having half the diameter of the other. When plied, the thicker single produces bumps along the length of the yarn. The bumps fit together when knit, creating a durable fabric that is denser than a piece knit from a standard two-ply yarn with equal-diameter singles.

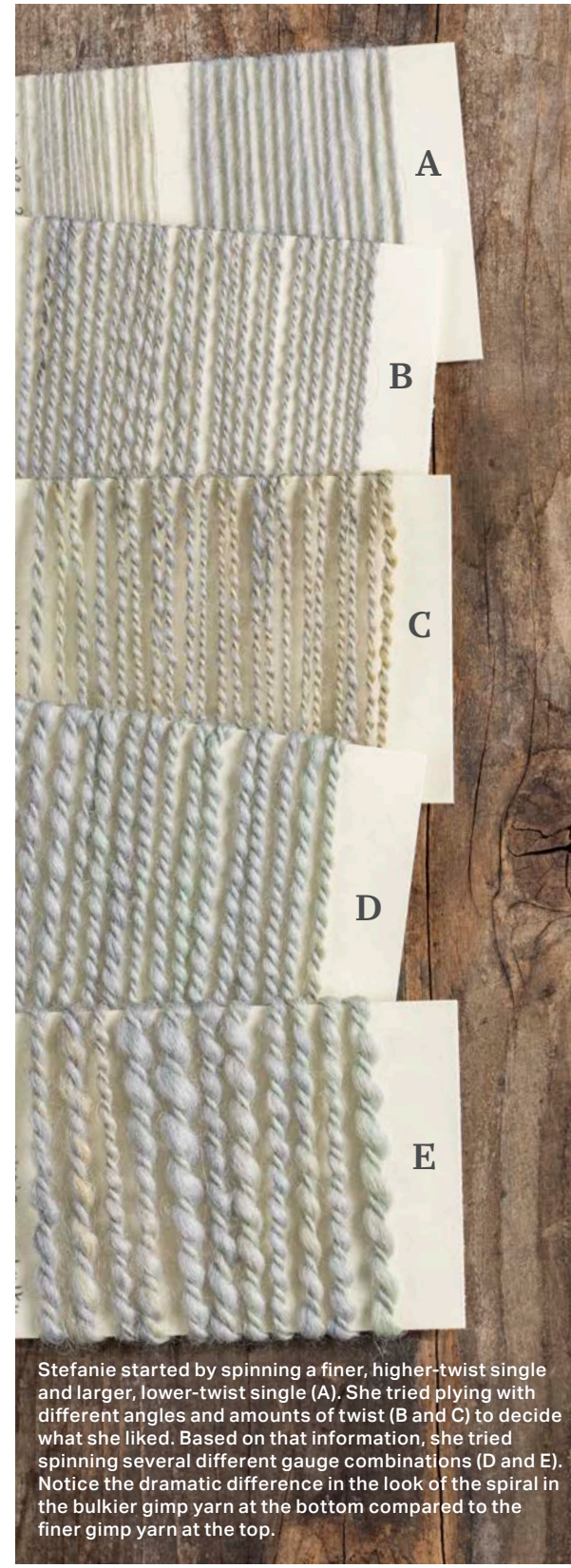
I find gimp yarns pleasing to both the eye and the hand. There is something attractive about the imbalance created by spinning a soft, fluffy single and a thinner, denser single and then plying them together with a high twist. I prefer to knit with high-twist yarns (when using yarns with loose ply twist, I often split the yarn with my knitting needle), so for me, a gimp yarn is a good way to produce a high-twist yarn that doesn't feel like twine.

The method of plying influences the extent of the spiraling, but with gimp yarns' differently sized singles, the yarn will inevitably appear to spiral, even when both singles are held so that they enter a spinning wheel's orifice straight on. For stronger



When plying a large and small single, the yarn will appear to spiral, even when the singles are both held at the same angle and with the same tension. To increase the spiral effect, hold the larger single at a stronger angle.

Photo by Stefanie Johnson



Stefanie started by spinning a finer, higher-twist single and larger, lower-twist single (A). She tried plying with different angles and amounts of twist (B and C) to decide what she liked. Based on that information, she tried spinning several different gauge combinations (D and E). Notice the dramatic difference in the look of the spiral in the bulkier gimp yarn at the bottom compared to the finer gimp yarn at the top.

Left to right: Farrow rib, stockinette, and plain-weave swatches worked in gimp yarn.

spiraling effect, hold the thicker single at a 45-degree angle to the orifice while holding the thinner single straight on. Note that the heavier the weight of the gimp yarn, the more visible the spiraling effect will be, so the difference in the thicknesses of the two plies looks more dramatic in a bulky-weight yarn than in a laceweight.

GIMP YARNS AT WORK

The durable structure of gimp yarn lends itself to knitted items that receive a high amount of wear, such as socks and mittens. Some spinners use gimp yarns for socks when they prefer not to spin more traditional three- or four-ply yarns. Knit up, gimp yarns give the surface of plain stockinette stitch a slightly textured, less uniform look, creating a more rustic quality.

When exploring other uses for gimp yarns, my thoughts wandered over to my looms. How does gimp yarn affect weave structure? To find out, I wove some small squares in plain weave on a 4-inch pin loom with both a gimp yarn and a traditional three-ply yarn. The traditional three-ply alpaca yarn, woven at 13 wraps per inch (wpi), was slightly thinner than the gimp yarn in the same fiber at 12 wpi; however, there was a noticeable difference in the openness of the weave structure. The gimp yarn's bumpy texture locked together, making the weave structure less open but giving it a beautiful drape. With a closer sett, that weave structure could be made tighter for a durable woven fabric that would be perfect for a cozy, lightweight throw.

Stefanie puts her gimp yarns to the test in her Alpaca Farrow-Rib Mittens on page 40. —*Editor*

Resources

Anderson, Sarah. *The Spinner's Book of Yarn Designs: Techniques for Creating 80 Yarns.* North Adams, Massachusetts: Storey Publishing, 2012.

Upstream Alpacas, upstreamalpacas.etsy.com

When **Stefanie Johnson** is not educating her community on how to minimize the spread and impact of COVID-19 and other communicable diseases, she enjoys creating unique items and helping others learn to spin, knit, and weave. More of Stefanie's work can be found in *Knitty* and *Knotions* and under Settlers Grove Designs on Ravelry.

Keep winter winds at bay with these cleverly constructed alpaca mittens.

Photos by Matt Graves

Alpaca Farrow-Rib Mittens

BY STEFANIE JOHNSON

After exploring the variety of gimp yarns (see page 36) I could spin—from subtle spirals to super spirals—I decided to knit a pair of mittens with a naturally colored alpaca gimp yarn. The interlocking nature of the gimp yarn's bumps made for a sturdy, less drafty fabric, which is a desirable quality for mittens where I live in the windy midwestern United States. Another benefit of this pairing was that the alpaca gimp yarn provided more structure than classic two-ply alpaca yarn, resulting in mittens with more durability and less drape.

Because I chose 100% alpaca fiber, I wanted a stitch pattern that would add some elasticity to the project, so I used a farrow-rib pattern throughout. This easy textured stitch provided some cushiness and a bit of spring to this otherwise inelastic fiber.

SPINNING NOTES

I spun a two-ply gimp yarn using two differently sized singles. One single was twice the diameter of the other, so I first split my fiber into three equal parts: one part for the finer ply and the remaining two parts for the thicker ply. This extra step helped me get equal yardage between the two plies and resulted in fewer leftover singles after plying.

For the singles, I used a ratio of 8:1, but for plying I chose a ratio of 6.5:1 to avoid putting in too much ply twist. I like to have control over my twist when spinning singles, and I find that for me, that is most naturally achieved with a short-forward draw. I wanted to ensure the singles twist would be adequate when the singles were plied together, so I added about twice the amount of twist to the finer single as compared with the thicker one. Once the two singles were plied, the result was a gimp yarn with a fluffier, thicker ply and a stronger, finer ply.

One of the most important aspects of creating a gimp yarn is the angle at which the singles are held relative to one another as the ply twist is inserted. I plied this yarn holding the thicker single at about a 45-degree angle, which created a moderate spiral effect. I prefer to ply gimp yarn without interruption, which helps me maintain consistency.

MATERIALS

Fiber 6 oz medium rose gray (brown) alpaca.
Yarn 2-ply gimp; 220 (275, 325) yd; 950 ypp; 12 wpi; DK weight.
Needles Size 2 (2.75 mm) (see Notes). Adjust needle size if necessary to obtain the correct gauge.
Notions Markers (m); stitch holder; tapestry needle.
Gauge 31 sts and 36 rnds = 4" in Farrow Rib patt.
Finished Size 7¼ (8¼, 9)" circumference and 9 (10, 10¾)" tall. Shown in size medium, 8¼" × 10".

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

Notes

- These mittens are worked in the round from the cuff up.
- The farrow rib pulls in quite a bit for a thick, squishy fabric. Choose a larger size if you prefer a roomy mitten or a size that is closer to your hand circumference for a more fitted mitten.
- Use the needles you prefer for working a small circumference in the round: double-pointed needles, two circulars, or one long circular for Magic Loop.

Stitch Guide

Farrow Rib: (multiple of 3 sts)
Rnd 1 *K2, p1; rep from * to end.
Rnd 2 *K1, p2; rep from * to end.
Rep Rnds 1 and 2 for patt.

MITTENS

Using the old Norwegian method, loosely CO 54 (60, 66) sts. Place marker (pm) and join in the rnd.

Work in Farrow Rib (see Stitch Guide) for 26 rnds.

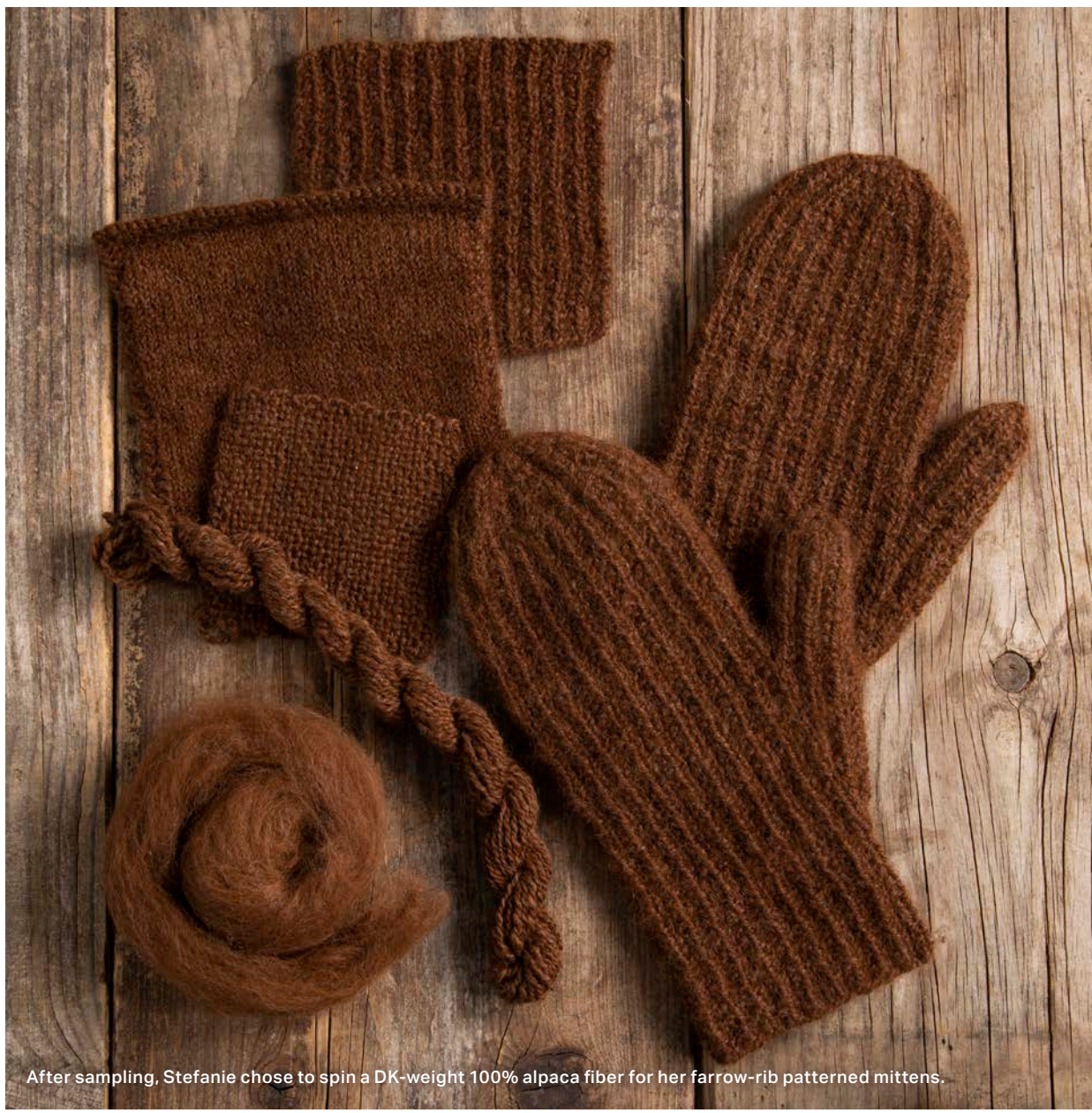
Thumb Gusset

Set-up rnd Work 3 sts in patt, pm, M1L, pm, work in patt to end—55 (61, 67) sts; 1 st between m.

Next rnd Work in patt to m, sl m, k1, sl m, work in patt to end.

Inc rnd Work in patt to m, sl m, M1R, work in Farrow Rib patt to m, M1L, sl m, work in patt to end—2 sts inc'd.

Rep inc rnd every other rnd 3 more times, working sts between m into Farrow Rib patt as established (with St st column centered between m)—63 (69, 75) sts; 9 sts between m.



After sampling, Stefanie chose to spin a DK-weight 100% alpaca fiber for her farrow-rib patterned mittens.

Work 3 rnds even in patt.

Rep inc rnd on next rnd, then every 4th rnd 4 (4, 5) more times—73 (79, 87) sts; 19 (19, 21) sts between m.

Work 1 (3, 3) rnd(s) even.

Next rnd Work 3 sts in patt, remove m, place next 19 (19, 21) sts on holder for thumb, remove m, using the backward-loop method, CO 3 sts over gap, work in patt to end—57 (63, 69) sts rem.

Cont in patt until piece measures 7½ (8½, 9¼)" from CO.

Shape Tip

Dec rnd *Work 7 sts in patt, ssk; rep from * to last 3 (0, 6) sts, work in patt to end—51 (56, 62) sts rem.

Work 2 rnds even.

Dec rnd *Work 6 sts in patt, ssk; rep from * to last 3 (0, 6) sts, work in patt to end—45 (49, 55) sts rem.

Work 1 rnd even.

Dec rnd *Work 5 sts in patt, ssk; rep from * to last 3 (0, 6) sts, work in patt to end—39 (42, 48) sts rem.

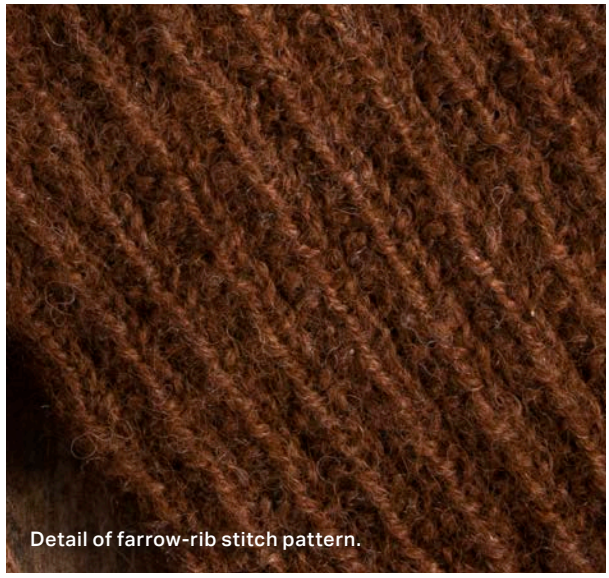
Work 1 rnd even.

Dec rnd *Work 4 sts in patt, ssk; rep from * to last 3 (0, 0) sts, work in patt to end—33 (35, 40) sts rem.

Work 1 rnd even.

Dec rnd *Work 3 sts in patt, ssk; rep from * to last 3 (0, 0) sts, work in patt to end—27 (28, 32) sts rem.

Work 1 rnd even.



Detail of farrow-rib stitch pattern.

Dec rnd *Work 2 sts in patt, ssk; rep from * to last 3 (0, 0) sts, work in patt to end—21 (21, 24) sts rem.

Dec rnd *Work 1 st in patt, ssk; rep from * to end—14 (14, 16) sts rem.

Dec rnd *Ssk; rep from * to end—7 (7, 8) sts rem.

Break yarn, leaving a 6" tail. Thread tail onto tapestry needle and draw through rem sts. Pull tight to gather sts and fasten off on WS.

Thumb

Return 19 (19, 21) thumb sts to needles and rejoin yarn.

Next rnd Pick up and knit 2 (2, 3) sts in crook of thumb, work in patt to end—21 (21, 24) sts total.

Pm and join in the rnd.

Work in patt until thumb measures 1½ (1¾, 2)".

Shape Tip

Dec rnd *K1, ssk; rep from * to end—14 (14, 16) sts rem.

Work 1 rnd even.

Dec rnd *Ssk; rep from * to end—7 (7, 8) sts rem.

Knit 1 rnd.

Dec rnd *Ssk; rep from * to last 1 (1, 0) st, k1 (1, 0)—4 sts rem.

Break yarn, leaving a 6" tail. Thread tail onto tapestry needle and draw through rem sts. Pull tight to gather sts and fasten off on WS.

FINISHING

Weave in ends. Handwash and wet-block mittens by soaking them in warm water with wool wash for a few minutes and then pressing out the excess water by wrapping them in a towel and squeezing them. Place them on mitten blockers (or pin them to a blocking board) to dry and block to shape. Do not block too aggressively, as alpaca is not an elastic fiber; it will not bounce back as wool does.

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The Settlers of Cape Breton

Nova Scotia's History Stitched in Stockings

BY DR. ANNAMARIE HATCHER AND BARBARA KELLY-LANDRY

Nova Scotia, "New Scotland" in Latin, received the bulk of its Scottish population between roughly 1770 and 1850. The Scottish Hebrideans left their homelands because of general industrial depression and the forcible removal of people from the Scottish Highlands to make way for sheep farms (often referred to as The Clearances). Thousands made their way to the eastern coast of Canada, including the Nova Scotian island of Cape Breton.

However, romantic visions of burly, kilted Scots working the farms of Cape Breton Island after the mass nineteenth-century emigration from their homeland may not be entirely accurate. Historical records indicate that many of these new landowners were very poor, slightly malnourished, and starting their new lives in English-style clothing.[1]

By 1871, settlers of Scottish descent outnumbered the rest of the population in Cape Breton by two to one.[2] During the Highlanders' early years in Cape Breton, they acquired herds of farm animals, which included the mongrel sheep that were abundant on the Nova Scotian mainland. These sheep produced meat and a short-stapled, medium to coarse fiber. Clothing produced from their wool was spun on a traditional whorl-less spindle called a *dealgan* (pronounced *jal-a-gan*), brought from the homeland, and the homespun wool was woven and knitted with little effort allocated to style or design.

The original inhabitants of Cape Breton, the Mi'kmaq, were joined by French fishers and traders in the fifteenth century, and the French influence in this part of Acadia has remained strong despite the island being ceded to the British in the mid-eighteenth century. The English Loyalists and the remaining Acadians were later joined by a huge influx of Highland Scots, and the descendants of these Highlanders have made fiddles and kilts integral to the fabric of the island.

Photo by Matt Graves

Scottish kilt hose (*left , see project on page 54*) featuring cuff with spider pattern, a significant motif in Celtic culture often used in decorative patterns. French stockings (*right*), in contrast, are utilitarian and made with no attempt to accentuate a shapely calf. Stockings spun and knitted by Barbara Kelly-Landry.

After the initial settlement period, traditional skills began to emerge. A talented spinner, knitter, or weaver could significantly increase family income.[3]

As Highlanders became established in the New World, many acquired spinning wheels, which made the production of yarn more efficient. The McIntosh family, after emigrating from the Inshes area of Inverness, Scotland, in the late-eighteenth century, established a spinning-wheel manufacturing plant in the early-nineteenth century. The plant would become a major employer in the nearby Pictou area.[3] The McIntosh wheels were a well-built double-drive Saxony-style with easily dismountable parts for efficient transport. Many of these wheels are still around today. The dealgan was still used, but primarily for plying because it was thought that the reverse direction required to ply yarn might unbalance the spinning wheel.[4]

STOCKINGS: UTILITARIAN OR ELEGANT?

Traditional knee-high stockings were prized items for sale to neighbors who may not have been as proficient in the fiber arts or who were too busy tending newly settled farms. With the availability of locally built spinning wheels, production of woven and knitted garments became a more efficient undertaking. Local carding mills shortened the preparation time for fleeces meant for spinning. By 1891, there were 21 carding and fulling mills in Cape Breton; they were often combined with sawmills, gristmills, or shingle mills.[5]

Stockings were the most popular legwear in Europe from the sixteenth to the nineteenth century and were named after the stocks that were used to hold felons by the ankle.[6] Kilt stockings could be either utilitarian or elegant, and each style employed different spinning and knitting techniques.

Everyday kilt stockings were made with thicker, more tightly spun yarn and little attention to detail. There was often a cuff that could be turned up over the knee—a throwback to the earlier Scottish "shooting stockings."[7] The cuff provided useful protection to the wearer as he crawled, stalking a deer or surveying an enemy camp. The stockings destined for this use would have been slightly overspun from a fleece with a longer staple using a worsted or semi-worsted preparation. The shooting stockings were designed for durability and protection. In the old

McIntosh wheel owned by Tuma Young and Nick Honig, members of the Unspun Heroes Handspinning Collective, Sydney, Cape Breton.

Photo by Nick Honig

Courtesy of Highland Village

Early Cape Breton *dealgan* from the collection of Baile Nan Gàidhael | Highland Village, a part of the Nova Scotia Museum.

Wool was spun on a traditional whorl-less spindle called a *dealgan* (pronounced *jal-a-gan*).

country, stockings were often knitted from a yarn spun using a blend of the darker Hebridean wool and the lighter-colored Cheviot. The preferred yarn was marled, which apparently disguised sweaty stains.[6]

Although the utilitarian style of stocking may have been required in the early days of settlement on Cape Breton, after the initial settlement period, men generally stayed upright in their regalia. For more formal occasions, kilt stockings were designed and made using handspun that closely resembled a modern fingering-weight sock yarn. This was probably spun using a flick-carded semi-worsted preparation with a short draw to provide warmth and a moderate degree of wearability. There was a tradition of decorating the turned-over tops with unique designs that the women who knitted the stockings collected and treasured. Dowager Veronica Gainford, who wrote the go-to resource on Scottish kilt stockings, said, "What pleasure there was in collecting the patterns for the

Early Cape Breton *dealgan* from the collection of the Beaton Institute. The bottom of the spindle has an incised cross *(top right)*, and the spindle tip features a small groove *(bottom right)*. Eveline MacLeod Collection 2013-10-17. Beaton Institute, Cape Breton University.

Courtesy of the Beaton Institute

Courtesy of the Beaton Institute Archives

Two women spinning yarn in Boisdale, Cape Breton Island, circa 1905. Donated to the Beaton Institute Archives by Jessie McKinnon. (77-1417-1551).

turn-over tops. Addicts wrote them into notebooks and exchanged them with friends or tried to work them out in unorthodox ways."[7]

Those cuff designs and patterns delicately adorned the top of the calf in the kilt outfit for evening or more formal wear. Because designs for evening wear did not have to consider the protection of crawling hunters and soldiers, these stockings were often designed without turned over cuffs. These were knitted with a garter stitch, finished with a crochet edge, and kept in place with a garter.[7]

The calf of the leg tells many tales, and the design of evening stockings emphasized many of these messages. For example, a well-developed calf tapering to a narrow ankle indicated that the stocking-wearer might be a nobleman who had time to engage in dancing. He would want his stockings to emphasize the anatomical attributes of his lower leg the way that early corsets and panniers, or side hoops, emphasized the higher anatomical attributes of his female companion.

For the most dramatic patterned effects on the cuffs, a three-ply homespun yarn was optimal. A singles yarn would offer good stitch definition but would be prone to pilling, particularly with the short-staple fleeces from the mongrel sheep in early Cape Breton. A three-ply yarn is rounded; the ply twist moves the strands inward, and they push toward each other when knit, enhancing the definition of cables. The refined, distinct cable on the stockings would pass the close inspection of any potential suitors admiring the calves of the stocking-wearer. If transported to modern times, a picture of the calf might suffice as a profile picture on a dating website.

Stylish stocking cuffs were designed with varying amounts of flair. "Neat and pleasant cuffs," according to Veronica Gainford, were produced using patterns called leaf, double rose, lover's knot, horseshoe, and bride's bouquet among others. The cuff design for evening stockings was a license for accomplished spinners and knitters to show off their creativity, and this work benefitted from slightly overplied, thinner, worsted handspun. The patterns that were originally used in Cape Breton kilt stockings were probably imported from the Scottish Hebrides with the original wave of immigrants.

THE CAPE BRETON FRENCH SETTLERS AND THEIR STOCKINGS

The French colony of Louisbourg was established on Isle Royale (Cape Breton) in 1713 for France to control the productive cod fisheries of the surrounding ocean and serve as a center of commerce.[8] During the occupation of Fortress Louisbourg (1713–1758), Catholic Scots lived and worked alongside their French counterparts. The handspun stockings that the French colonists wore served a similar purpose as the Scottish kilt stockings, but elements of their construction varied. They were of a simple design with no cuff, little attention to decoration, and no attempt to emphasize the wearer's calf. The construction of the two types of stockings provides a window into the distinct cultures that our ancestors brought to the New World from different areas of Europe.

Unlike the Scottish immigrants, the French colonists at the Fortress were not homesteaders. They purchased many supplies rather than growing or making them, reflecting the type of lifestyle that they came from. The Fortress sheep, which provided the wool for stockings, were purchased from farms in

The construction of the two types of stockings provides a window into the distinct cultures that our ancestors brought to the New World from different areas of Europe.

Quebec or from Acadian communities in Nova Scotia, Massachusetts, and Vermont. That wool was often supplemented from sheep that were imported from France. Standard breeds were virtually unknown.

White sheep with coats ideal for spinning and dyeing were more expensive than dark-fleeced sheep. Some of these lighter-colored sheep resided at the Fortress. Historical records indicate that most sheep imported into the Fortress were dark-fleeced and that the suppliers of the sheep (Acadian or Québécois farmers) retained many of the quality fleeces for themselves.

The stockings for soldiers defending Fortress Louisbourg were produced by knitters from the lower classes who could not necessarily read or write, so the patterns were simple, easily modified, and transmitted orally. The yarn was a heavier weight, similar to that used for the everyday kilt stockings, and was either spun by the knitter or purchased from a handspinner. Soldiers' stockings were spun from the lighter-color fleeces so they could be dyed to match their uniforms and were knitted with no decorative features. The French stockings had no cuff because they were held up by buttoned britches and garters.

Well-crafted stockings were prized, as we can deduce by a look at the sale of his personal effects after the Governor of Louisbourg died on October 9, 1744. His possessions, including his used stockings, were auctioned off to pay debts. They sold 11 wool pairs in total, and each pair netted 11 sol, about 37 percent of the annual wage for a servant. This put the sale price of the used stockings above the purchasing power of a servant but in the ballpark for the gentry.

Barbara Kelly-Landry created handspun French-style stockings similar to extant finds at Fortress of Louisbourg.

CAPE BRETON STOCKINGS TODAY

The tartan kilt–centered attire that is so common in Cape Breton today developed through the generations of Hebridean descendants who maintained a deep respect for the culture of the homeland. During the early periods of settlement for both the Scottish immigrants and French colonists, clothing was strictly functional. Protection from the brutal weather that blessed Cape Breton and the demands of many tasks to tame the wilderness dictated the amount of effort expended to produce clothing.

With the increased availability of spinning wheels and carding mills in the late-nineteenth and early-twentieth centuries, more attention was devoted to Scottish woven tartans and cleverly decorated kilt stockings. These traditions underpin the vibrant fiber culture that is evident on the island today.

Learn more about Cape Breton's textile history with Annamarie Hatcher and Barbara Kelly-Landry:

"The Hat in the Latrine." *Spin Off*, Fall 2018.

"Knit an Eighteenth-Century 'Latrine Hat,'" *Spin Off,* Fall 2018.

"Scottish Spinning Traditions in Cape Breton." *Spin Off*, Winter 2018.

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2. **Campey, Lucille H., *After the Hector: the Scottish Pioneers of Nova Scotia and Cape Breton, 1773–1852, (2nd ed)*. Toronto, Canada: National Heritage Books, 2007.**
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This article was inspired by the desire of these two "women of a certain age" to celebrate the return to the traditional male Scottish dress featuring handsome, handspun kilt stockings.

Annamarie Hatcher, PhD in Zoology from the University of Western Australia, is a freelance science writer and is studying to be a Master Spinner after 45 years of hobby spinning.

Barbara Kelly-Landry is a historian and veteran animator at Fortress of Louisbourg National Historic Site. She has spent 30 years teaching visitors to spin and knit in the French tradition, reflective of the mid-eighteenth-century period in which the Fortress was occupied.

Keep your shapely calves warm this winter with a fetching pair of eighteenth-century-inspired kilt stockings. The long, lustrous locks of Cotswold knit up into a sturdy pair of stockings with crisp stitch definition.

Photos by Matt Graves

Eighteenth-Century Cape Breton Kilt Stockings

BY BARBARA KELLY-LANDRY

As a professional historical interpreter at the Fortress of Louisbourg and a specialist in eighteenth-century history, I find it fascinating that there was a time when ladies' elbows were risqué and men's calves were sexy. The fashion of the time emphasized male calves with breeches reaching just below the knee and stockings. A well-developed calf tapering to a narrow ankle indicated that the stocking wearer might be a gentleman of means and perhaps a merchant or government official. This was a sign of someone who had devoted more time to dance than to hard labor.

FIBER AND SPINNING NOTES

When designing these handspun kilt stockings, I knew that the eighteenth-century, so-called mongrel sheep mentioned by Dr. Annamarie Hatcher (see page 46) were no longer available. So, I looked to the twenty-first-century sheep living at the Fortress of Louisbourg National Historic Site on Cape Breton Island, Nova Scotia, Canada. The Fortress currently has a flock of 14 sheep, including the Cotswold and Dorset breeds and, thanks to a gregarious Cotswold ram, a cross of the two. The characteristic fiber length and silky luster of the Cotswold breed are qualities desirable for stocking knitting in any era.

Once the flock is shorn by the Fortress's trusty in-house shearer, Terry Campbell, fleeces are available to the staff. I chose two, one a gray pure Cotswold (used in the stockings on page 51) and the other a white Cotswold/Dorset cross. I washed the fleece, flick carded the locks, and spun the wool on a Schacht Ladybug spinning wheel. Three-ply yarns are an excellent choice when knitting patterns requiring strong stitch definition. However, many historic examples show that a round, high-twist two-ply yarn also can provide crisp stitch definition. As I spun and plied my two-ply stocking yarns, I added some extra twist for strength, durability, and effect.

CREATIVE CUFFS AND CALVES

In the past, stocking cuffs were often knitted in stitch patterns that had meaning to the knitter or wearer. It was an opportunity to express skill and individuality. I chose a lace pattern adapted from *A Second Treasury of Knitting Patterns* (see Resources) that holds special meaning for me: First, the spider stitch has an obvious connection to spinners and weavers, and it seemed a good fit; second, legend has it that spiders had a special significance in Scotland, becoming the symbol of King Robert the Bruce in the fourteenth century. The king saw the spider as a symbol of hope and perseverance, for it spun and wove its web over and over again.

In the legs, I included seed stitch, a design element that would emphasize the calves and disguise the decreases that naturally occur down the back of a long, shapely stocking leg. A simple faux cable and rib pattern in the legs completes the look.

I designed these stockings with eighteenth-century men's calves and kilts in mind, but they're a warm, durable foot and leg covering for pairing with skirts or hiking shorts. Should you wish to don a kilt and full highland regalia, these kilt stockings provide a historically inspired finishing touch.

Resources

Fortress of Louisbourg National Historic Site, pc.gc.ca/en/lhn-nhs/ns/louisbourg

Walker, Barbara G. *A Second Treasury of Knitting Patterns*. Pittsville, Wisconsin: Schoolhouse Press, 1998.

Seed stitch adds visual interest to the calf shaping and conceals the decreases.

Barbara adapted a lace pattern, the spider stitch, from *A Second Treasury of Knitting Patterns* for the cuffs of the stockings.

MATERIALS

Fiber 12 oz Cotswold locks.
Yarn 2-ply; 670 yd; 1,050 ypp; 14 wpi; sportweight.
Needles Size 2 (2.75 mm) (see Notes). Adjust needle size if necessary to obtain the correct gauge.
Notions Markers (m); tapestry needle.
Gauge 24 sts and 32 rnds = 4" in St st.
Finished Size 11½" calf circumference, 9½" foot circumference, and 11" long from back of heel to tip of toe; foot length is adjustable.

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

Notes

- These stockings are worked in the round from the top down.
- At the beginning of the leg, the piece is turned wrong-side out and worked in the opposite direction for the rest of the stocking. Where the direction of knitting changes, there is a small hole that is hidden under the cuff.
- When shaping the leg, sometimes there will be two knits or two purls adjacent to each other in the seed-stitch section.
- Use the needles that you prefer for working a small circumference in the round: double-pointed, two circulars, or one long circular for Magic Loop.

Stitch Guide

Seed Stitch: (multiple of 2 sts)
Rnd 1 *K1, p1; rep from * to end.
Rnd 2 *P1, k1; rep from * to end.
Rep Rnds 1 and 2 for patt.

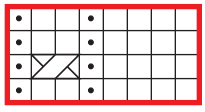
STOCKINGS

CO 84 sts over 2 needles held tog. Remove 1 needle. Place marker (pm) and join in the rnd.

Picot Edging

Knit 3 rnds.
Picot rnd *Yo, k2tog; rep from * to end.
Knit 3 rnds.
Fold along picot rnd with WS tog.

Faux Cable

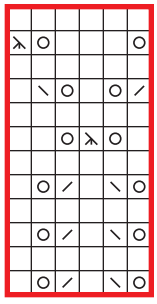


8-st rep

3

1

Lace



6-st rep

11 *

9

7

5

3

1

* Work as given in directions

knit

purl

yo

k2tog

ssk

sl 1 kwise, k2tog, psso

pattern repeat

k2tog but do not drop sts from left needle, knit first st again, drop both sts from left needle

Joining rnd *Insert left needle under 1 st from CO edge, k2tog (st from CO and next st on needle); rep from * to end—84 sts.

Knit 2 rnds.

Cuff

Work Rows 1–12 of Lace chart 2 times, working Row 11 as foll:

Row 11 Remove m, k1, pm for new beg of rnd, work in patt to end.

After chart is complete, cont as foll.

Dec rnd *K19, k2tog; rep from * to end—80 sts rem.

Work in k1, p1 rib for 2¼".

Leg

Turn work WS out (see Notes).

Knit 1 rnd.

Inc rnd *K20, M1; rep from * to end—84 sts.

Next rnd Work 10 sts in Seed st (see Stitch Guide), pm, work Faux Cable chart to last 10 sts, pm, work 10 sts in Seed st.

Work 6 rnds even.

Dec rnd P1, k2tog, work in patt to last 3 sts, p2tog, k1—2 sts dec'd.

Rep dec rnd every 8th rnd 7 more times (see Notes)—68 sts rem; 2 Seed sts at beg and end of rnd.

Work 7 rnds even.

Dec rnd K2tog, work in patt to last 2 sts, p2tog—66 sts rem; 1 Seed st at beg and end of rnd.

Work 7 rnds even.

Dec rnd K2tog (removing chart m), work in patt to last 2 sts, p2tog (removing chart m)—64 sts rem.

Cont in patt until leg measures 13", ending with Row 2 of Faux Cable chart.

Heel Flap

Set-up Row 1 (RS) Work 14 sts in patt, turn.

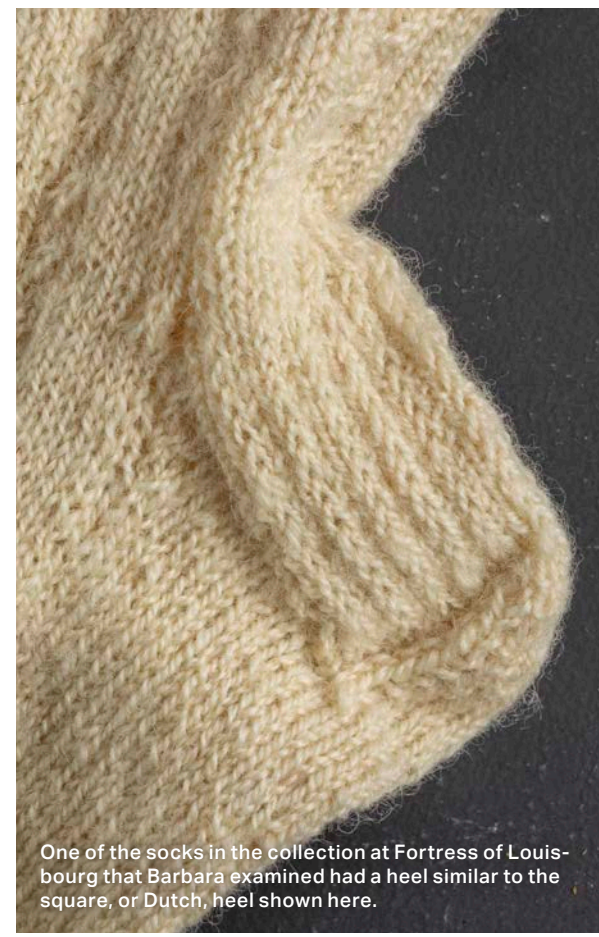
Set-up Row 2 (WS) Sl 1 pwise wyf, p31, turn.

Work back and forth on these 32 sts for heel flap; rem 32 sts will be worked later for instep.

Row 1 (RS) *Sl 1 kwise wyb, k1; rep from * to end.

Row 2 (WS) Sl 1 pwise wyf, purl to end.

Rep last 2 rows 13 more times.



One of the socks in the collection at Fortress of Louisbourg that Barbara examined had a heel similar to the square, or Dutch, heel shown here.

Turn Heel

Next row (RS) Sl 1 kwise wyb, k20, ssk, turn.

Next row (WS) Sl 1 pwise wyf, p10, p2tog, turn.

Next row Sl 1 kwise wyb, k10, ssk, turn.

Next row Sl 1 pwise wyf, p10, p2tog, turn.

Rep last 2 rows 8 more times—12 heel sts rem.

Gusset

Next rnd Sl 1 kwise wyb, k11, pick up and knit 14 sts along side of heel flap, pm, work 32 held instep sts as foll: k2, work 28 sts in patt, k2, pm, pick up and knit 14 sts along side of heel flap, k6 heel sts, pm for beg of rnd—72 sts total: 40 sts for sole, 32 sts for instep.

Next rnd Knit.

Next rnd Knit to 3 sts before m, ssk, k1, sl m, work instep sts in patt, sl m, k1, k2tog, knit to end—2 sts dec'd.

Rep last 2 rnds 3 more times—64 sts rem: 32 sts each for sole and instep.

Work even in patt until piece measures 8½" from back of heel, or 2½" less than desired finished length.

How Were Kilt Stockings Spun?

When they settled in Cape Breton, Gaelic women brought the preindustrial Scottish tools that they had used to make clothing for their families. The common tool for spinning wool and flax was a whorl-less drop spindle called a *dealgan* (pronounced *jal-a-gen*), which looks like a short wooden cone with a small knob on the end. On the wide end, two carved grooves form a cross resembling the end of an animal bone. The Gaelic name of this traditional spindle translates to "collar bone" in English, while the Gaelic name of a whorled drop spindle is *fearsaid*.

—Dr. Annamarie Hatcher.

Toe

Rnd 1 *Knit to 3 sts before m, ssk, k1, sl m, k1, k2tog; rep from * once more, knit to end—4 sts dec'd.

Rnd 2 Knit.

Rep last 2 rnds 9 more times—24 sts rem.

K6; do not finish rnd. Break yarn, leaving a 15" tail for grafting.

FINISHING

With tail threaded on a tapestry needle, graft sts using Kitchener st.

Weave in ends. Block using sock blockers, pinning out lace section and picots when damp to prevent edges from curling.

Barbara Kelly-Landry, a lifelong resident of Cape Breton Island, Nova Scotia, Canada, has been an employee of the Fortress of Louisbourg National Historic Site for the past 36 years. She has spent much of that time interpreting knitting and spinning traditions of the eighteenth-century for the visitors to the largest historical reconstruction in North America.

Sixty-Four Sheep in a Blanket

Stretching Beyond My Merino Mindset

BY BRIAN McCARTHY

Ouessants in Wales. Brian gathered wool from as many breeds as possible before beginning his blanket project.

Photos by Brian McCarthy

Australia's baby boomers, including myself, grew up with a strong awareness of sheep.

The country was "riding on the sheep's back" to the extent that in 1951 wool production accounted for over 50 percent of the value of production of all agricultural industries.

Postage stamps regularly featured sheep, and from 1938 until the introduction of decimal currency in 1966, the obverse side of the one-shilling coin was struck with the head of the British monarch and the reverse side with the head of a champion Merino ram.

In an interesting parallel, the official national anthem was "God Save the King/Queen," but its unofficial counterpart was "Waltzing Matilda," a ballad telling of a landowner enlisting the help of the mounted police to pursue an itinerant worker who had stolen one of his

flock. That swagman, however, clearly was not a spinner; he nabbed the sheep for its meat, not its fleece! A generation of Australian school children learned to sing "Click Go the Shears" and knew the words by heart.

The words "sheep" and "Merino" were virtually synonymous in Australia, and in the knitting world, "wool" was the generic term for whatever yarn you happened to be working with. Much has changed, but Australia currently has the second largest sheep population in the world and remains the most prolific wool-producing country. On taking up spinning in retirement, I soon came to realize that over the years, I had acquired a distinctively Australian perspective on sheep and fleece.

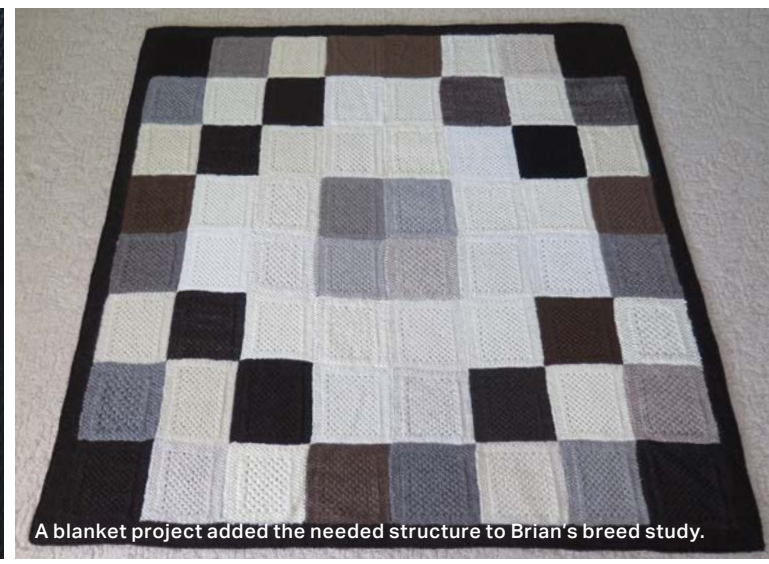
BRANCHING OUT

Not surprisingly, my earliest spinning efforts were with Merino tops: readily available and ready to spin. However, many members of the spinning group I joined had been spinning since the 1970s and had connections to woolgrowers, so the names of other breeds gradually began popping up in conversation. My curiosity was aroused.

Almost without thinking about it, I embarked on a vague, self-assigned, open-ended learning exercise. It was a nonurgent project that could roll along in the background, be picked up and put down easily, and would take shape as the work progressed: I wanted to sample fleece from as many different breeds as I could lay my hands on—most of them not grown in Australia. The plan was to buy 100-gram (3.5-ounce) samples. That doesn't seem like much, but it ended up amounting to a stash of more than 130 little packets! The samples were sourced from friends, country shows, shops, and small fiber-processing operations encountered in my family's travels, and, most importantly, the internet. Samples came from the United Kingdom, the United States, Canada, Europe, New Zealand, the Faroe Islands, and from within Australia.

It was surprising what turned up where. The Hungarian Racka, Hog Island, and Eider tops appeared on an Australian site; a friend who attended the North Atlantic Sheep and Wool Conference managed to get me samples of Soay, Manx Loaghtan, and Villsau; and on a trip to the United Kingdom, I visited a small farm in Wales where a woman was raising a flock of Ouessants. Australian customs regulations are understandably cautious about the importation of raw fleece, so samples from overseas were limited to scoured or processed fleece. Among the more memorable samples was a bundle of handwashed Galway fleece kindly sent by an Irish shepherd. The little bundle was wrapped in a plastic shopping bag tied up with string, a customs declaration, and handwritten address sticky-taped to the bag.

From 1938 to 1966, the Australian one shilling coin was struck with a Merino ram.


A blanket project added the needed structure to Brian's breed study.

Although some of the samples I obtained were pristine and easily prepared, some were not. The washed Kerry Hill sample was a tangled challenge, containing yolk, vegetable matter, and second cuts. My solution: ignore all the problems, handcard, make rolags, do a nonchalant long draw, then Navajo-ply.

SHARPENING THE FOCUS

My growing collection of fleece needed to be spun, and, if spun, turned into something useful. It was time to give the project clearer definition and structure. This set boundaries to what had gradually become a rather daunting, snowballing undertaking.

1. For collecting samples, I would only use distinct breeds. I tried to limit it to breeds listed in *The Fleece and Fiber Source Book,* which helped me situate my own project in the grand scheme of things as the personal dabbling of a newcomer to the wider world of sheep breeds.

2. For spinning, I would create three-ply yarns unless there was a compelling reason to do otherwise. Because this was a venture into the unknown, I would keep an open mind and not impose a gauge on the singles. I would allow the fiber to communicate how it wanted to be drafted and spun.

3. For the final textile, I would knit two sampler blankets composed of 20-centimeter (7.9-inch) knitted squares of knotted openwork with seed-stitch borders. The maximum functional size of a square blanket in my house would be eight squares per side (64 squares in all), or 160 centimeters (63 inches) square before adding a border. I proposed to knit two squares from each breed.

With the framework now set, I sorted through more than 130 accumulated bundles of wool. A cull sidelined crossbred samples and cases where I had multiple samples of the same breed in different natural colors. In two cases, I only had enough fiber for a single square, thus 66 breeds would be represented total.

HANDLING THE FIBER

Purchasing fiber sight unseen from the other side of the world can be a bit of a lucky dip, and some samples were higher quality than others. The fleece arrived in many forms: tops, roving, batts, washed fleece, and (within Australia) raw fleece. This provided opportunities to deal what seemed like the full catalog of challenges in preparing and spinning: brittle wool, heavily weathered tips, dust, vegetable matter, chalkiness, suint, yolk, dung, urine, kemp, grease, felting, matting, compression, the old and the stale, second cuts, scurf of both the dandruff and cradle-cap

It was time to give the project clearer definition and structure. This set boundaries to what had gradually become a rather daunting, snowballing undertaking.

varieties, tangles, batts or roving flecked with fibers from fleeces carded earlier on the same machine, and more. On the positive side, I didn't encounter any mildew or moths.

In some cases, I had multiple samples of fleece, and the one that found its way into the blanket was not necessarily a definitive example of the breed. The range of qualities between samples of the same breed confirmed Robson and Ekarius's observation in *The Fleece and Fiber Sourcebook* that, "Surprisingly, there may be more variability between individuals within a breed than there is between breeds, and there are usually regional differences in flocks around the country or around the globe."

When working with marled singles from plant-dyed fibers ("Natural Dyeing, Navajo Plying & the Australian Outback," *Spin Off* Winter 2019), I found Navajo-plying (also called chain plying) a useful technique for managing color transitions. The technique also avoids the almost inevitable yardage losses associated with using three bobbins of singles to create a three-ply yarn. For example, my little bag of Soay fleece was very precious, and, even with a Navajo-plying technique, I barely eked out the needed square. If I had been plying from three bobbins, I would have most certainly have been short.

Finishing Skeins

The production of so many skeins meant I needed to stay organized. Each skein was tagged with fiber identification, length in meters, weight in grams, and grist in grams/meter. As I worked through the project, I kept a small piece of unspun fiber and a small skein of plied yarn in an album with recorded measurements.

Most of the skeins in this project fell into the 0.45–0.75 grams/niddy-noddy-meter range. The densest was Lleyn (1.0) and the lightest was Polwarth (0.35). In terms of thickness, the yarns fell between 8 and 17 wpi, with the majority measuring 9–12 wpi.

Wet-finishing different breeds the same way allowed Brian to see how finishing impacted different wool types and preparations. Despite being skeined using the same niddy noddy, these washed and dried skeins are different lengths.

After settling on a project structure, Brian decided to work with 66 breeds: Black Welsh Mountain*, Bluefaced Leicester, Border Leicester, California Red*, Castlemilk Moorit, Charollais, Cheviot, Coopworth, Cormo, Corriedale, Cotswold, Devon and Cornwall*, Dorset Horn*, Eider, Est à laine Merino, Exmoor Horn*, Faroese, Finn, French Merino d'Arles, Galway*, Gotland, Gra Trondersau, Greyfaced Dartmoor, Hebridean*, Herdwick*, Hog Island, Racka*, Icelandic, Île de France, Jacob*, Karakul*, Kerry Hill*, Leicester Longwool*, Lincoln*, Lleyn, Manx Loaghtan*, Masham, Merino, Navajo Churro*, North Ronaldsay*, Norwegian White, Ouessant, Oxford Down*, Perendale, Polled Dorset, Polwarth*, Portland*, Rambouillet, Romanov, Romney*, Ryeland*, Scottish Blackface, Shetland*, Shropshire*, Soay, Southdown*, Stansborough Grey, Suffolk, Swaledale, Targhee, Teeswater*, Texel, Villsau*, Wensleydale*, Whitefaced Woodland*, and Zwartbles. (* identified as a conservation breed)

DOWN TO THE KNITTING

Because I decided not to control the size of the singles as I was spinning, I adjusted the number of stitches and needle size as required to produce a 20-centimeter (7.9–inch) square of each yarn. Knowing how to adjust was not always easy, as the thickness and elasticity of each yarn were not always obvious at first glance. The simplest solution was, for each new breed, to take a guess and be completely prepared to not get it right first up. I would cast on a test swatch and work five rows of the bottom border and up to ten rows of my stitch pattern. Then, I would slip the swatch onto a smaller needle, place it on a smooth surface so it could expand freely, and measure the width. If the width was wrong or the pattern looked too open or compressed, I would adjust the number of stitches, needle size, or both before trying again. The consolation to this fiddling came in knowing that, once I got it right for the first square, I didn't have to repeat the process for the second square made in the same wool.

The pattern shows up differently according to the characteristics of the wool type. In some squares, the stitches open up and round out, whereas in others—such as Cormo, Merino, and Targhee—the stitches pull in. The bulky wool of the Down breeds pumped up so much that I can see few gaps when the work is held up to the light. Other breeds—such as Greyfaced Dartmoor, Leicester Longwool, and Wenslydale—are less supple and lofty, creating squares like lacy screens.

Assembly: Dos and Don'ts

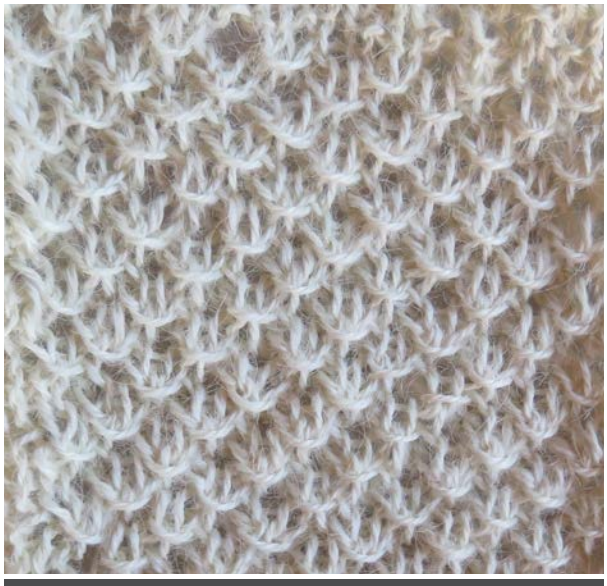
The squares fell roughly into two color categories: dark (blacks, browns, and grays) and light (whites and

creams). The various colors, tints, and shades sat well together, but distributing and assembling them was not as simple as just using the dark and light to form some sort of pattern. I had to consider which squares would sit comfortably next to each other in order to distribute their fiber characters—a lesson I learned the hard way.

When assembling the first blanket, I discovered—after sewing all the squares together in strips and sewing those strips together—that the inelastic Lincoln, Cotswold, and Wensleydale squares happened to be sitting together. This cluster formed a conspicuously saggy patch right in the middle of the blanket. The process of unpicking all the backstitching that secured each square, repositioning the squares, and re-stitching was not enjoyable.

Joining different numbers of stitches or rows in yarns of sometimes wildly different thicknesses, elasticities, and colors is not conducive to creating invisible seams. From the front of the blanket, the seams looked rustic even when blocked; from the back, the seams look positively primitive—like a waffle with a different blend of chocolate, caramel, or vanilla batter in each cell. Once I finished the blanket by picking up stitches around the outside border and knitting a frame of handspun Jacob, I was happy with the result.

A more poetic person than I might describe the pair of completed blankets as textile art, evoking visions of a shepherd's cherished flock huddled safely in the fold. The two blankets have become more than just samplers to me. Each square is familiar, has its own character, its own story, and its own lesson. They



Handspun Cormo (*top*) and Greyfaced Dartmoor *(bottom)* knitted with the same stitch pattern.

Brian used backstitch to secure each square to its neighbor because, while similarly sized, the squares had different stitch counts.

Clockwise from top left: The openwork center pattern Brian chose provides drape and movement. Cotswold square. Herdwick square. Brian's second blanket.

are tactile mementos of a set of experiences built up over a decade. I can touch these sheep as I count them off and dream about what I might do with all the leftover fiber and yarn and squares.

Epilogue: In the 12 months since I wrote this article, life for many of us has changed. In the spirit of Lisa Souza's statement in Spin Off *Summer 2020—"We will get through this. We will hug again. Now, make something!"—I set about mopping up as many of my wool study leftovers as I could. The superfluous squares became two six-by-seven square blankets. The softer yarns turned into five further blankets of different designs: mitred-squares, short-rows, abstract horizontal bands, and more. A pullover, a dozen beanies (quickly snapped up by family and friends), and an Oak Park Scarf further consumed my stash. Fiber still remains, yet to be spun, as the seasons change.*

Brian McCarthy lives on the south coast of New South Wales. He is a lifelong knitter who took up spinning on retirement after touching a skein of Merino that made him realize just what he was missing. His very patient wife, four children, and nine grandchildren have ended up with a lot of handspun jumpers, shawls, scarves, and afghans.

More Online

To see more images of Brian's breed-study samples and his impressive, ever-growing pile of beautiful finished work, visit spinoffmagazine.com.

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Flexible Embroidery and Decorative Darning

Stretchy Stitches for Knitted Fabric

BY SUSAN Z. DOUGLAS

Modified embroidery stitches will allow your embroidered knits to stay stretchy.

Photos by Matt Graves

Sometimes plain gray mittens are just the thing, but sometimes you want *more*—a shot of color, a little jazz, or the texture and character of slow cloth. Embroidery is a great way to add color—one or many—to the surface of your knits. While some embroidery stitches can stiffen the fabric and make knitted fabric feel more like woven cloth, I have found that many stitches can be adapted. Flexible embroidery using bouncy handspun yarns will still allow your knits to stretch.

Handspinners have a definite advantage in obtaining the perfect embroidery yarn because small amounts of purpose-spun yarn can be quickly produced on a whim, varying in grist, ply, fiber, color, sparkle, and shine. A few yards will do a good bit of

embroidery, so an afternoon of experiments could produce an embroiderer's dream of yarn options.

When I first began exploring embroidery on knitted fabrics, I started with counted-thread embroidery stitches. Stockinette stitch is grid-like, and counted-thread motifs are designed for the grid-like nature of woven fabric. However, I soon realized that the lateral stretch of knitted fabric could be compromised by the embroidery. There would be little to none of the stretch needed for pulling mittens over your hand or a cowl over your head. So, I modified the formation of several familiar embroidery stitches to preserve at least some of the lateral stretch inherent in the knitted base fabric. I didn't concern myself much with maintaining vertical stretch since fit and comfort often do not depend on it. It should be noted, though, that embroidery can change the row gauge. Stitch samplers on knitted swatches are a great way to give these stitches and motifs a try.

DESIGNING HANDSPUN YARNS

One of the most compelling aspects of embroidered knits using handspun is that a huge variety of base yarns, embroidery yarns, and motif combinations are possible. For practice, however, it's easier to work with smooth yarns so you can see the stitches clearly. A light-colored base yarn will also make it easier to see as you learn the stitches. I primarily use wool because it's naturally resilient; its forgiving nature is a boon; and I just love it.

For the stitch samplers shown here, I started by blending fiber for the base fabric using natural-color Merino top (37.5%); white Merino top (25%) for loft and softness; natural-color Bluefaced Leicester top (25%) for depth of color and a smooth, silky feel; and a sprinkling of white Cheviot top (12.5%) for a bit of loft and body.

I gave the tops a hot water dip and dried them. I find that the hot water bath revives the crimp, opens

Susan's samplers include a variety of stitches that are adapted to the lateral stretch of knitted fabric.

Susan blended two colors of Merino, Bluefaced Leicester, and Cheviot wools on her drumcarder to produce the soft, bouncy, resilient base yarn she needed for her flexible-embroidery samplers.

the fibers, and makes for a more pleasant spinning experience (see page 18). I attenuated the tops and carded them together on my Strauch drumcarder three times to create a thorough blend.

My semiwoolen spinning style, where the twist enters the fiber supply and I pinch the newly formed yarn and draft toward the wheel a few inches at a time, is a good fit for this drumcarded preparation. I aimed for a medium-twist, moderately puffy, two-ply yarn. My final skein was about 1,360 ypp (yards per pound). The twist is balanced, and the yarn is smooth, but it's not dense or cord-like. My stockinette gauge using size 4 needles (3.5 mm) is 23 stitches and 34 rows to 4 inches.

Spinning the Embroidery Yarn

The embroidery yarn should be compatible with the knitted fabric and the effects desired, but determining the "right" combination is pretty subjective. A dense, thick embroidery yarn can distort the background fabric but might still be perfectly suitable if you bear in mind that the gauge of the finished fabric is likely to change. The easiest yarns to stitch are smooth enough to travel through the stockinette holes without becoming too worn, although I wouldn't dismiss trying a fuzzier yarn for a special effect.

My embroidery yarn palette for this pair of stitch samplers consists mostly of commercially dyed Merino tops with some of my own hand-dyed Punta wool tops (a Corriedale-type wool from South America), commercially dyed silk, and occasional hand-dyed mystery wool thrown in if I needed a particular color. I didn't give the tops a hot-water dip first, but since I was blending very small amounts of colors on my drumcarder, it worked just fine. Some of these yarns used my "Never-Ending Blending" technique featured in *Spin Off* Spring 2014 (see page 71).

I wanted to again spin yarns with a smooth surface, while retaining loft and elasticity. I used the same semiwoolen draft and then chain plied, spinning and plying several colors consecutively on one bobbin and then cutting them apart. My finished yarns were about 1,280 ypp. They're similar in weight to the background fabric, but that's not absolutely necessary. For example, the little darned squares and the star motifs can easily use a stouter yarn, whereas a thinner yarn may be more appropriate for other stitches.

TIPS TO SMOOTH YOUR PATH

I discovered a few concepts along the way that are helpful to understand before you begin embroidering. If you want to modify some stitches of your own, you'll have a head start. Turn to page 74 to see how I modify several common stitches.

Read the Knitting

I worked exclusively on stockinette stitch for the embroidery presented here. Unlike evenweave fabric, where vertical and horizontal threads are separate entities, knitted fabric is all connected and interlocking. This makes the spaces where the embroidery needle is inserted seem a bit less clear. It helps me to think of peaks, valleys, and ladders. If a single row of knitting is isolated, the peaks and valleys are easily seen. When several rows or rounds of knitting are worked, the stitches interlock and stack. You'll see peaks and valleys in rows but also vertical ladders consisting of the peak tops and valley bottoms. The "hole" of a peak and the hole of its adjoining valley are a little offset. While all this might seem unimportant, it is useful to note it now to avoid possible confusion later when you begin embroidering.

Retain Flexibility

Many embroidery stitches, such as herringbone or feather stitches, lend themselves to knitted fabric without the need for modification, but some need an unconventional formation to avoid restricting knitting's lateral stretch. For example, straight, horizontal running stitches dramatically restrict the stretch of the fabric to the length of the embroidery yarn. Offsetting

Never-Ending Blending

Sometimes I use this as a warm-up exercise to jump-start my creative muse. Here, I'm using the technique to make a smorgasbord of colorful embroidery yarns. It's a little like making a soup that never stops. Whatever is left from yesterday's soup gets a new day's addition of ingredients. Here's how it works with fiber:

Start with two dyed combed tops or rovings that have a combined weight of, say, 6 grams if you want only small amounts of yarn and you have a suitable scale. If not, just eyeball an amount you're comfortable with. Blend well. I use a few passes through my Strauch drumcarder, but you can use handcards or even blend it by hand.* Split the blended fiber in half, set one half aside to spin, and continue blending with the other half. Add an equal amount of fiber (one color if you're cautious, more colors if you're daring) to the remaining half and blend thoroughly. Repeat forever.

This is a great way to build a nice palette of colors to spin for stitching. Many of my embroidery yarns are made from a never-ending blend. For more information about this technique, see "Never-Ending Blending," *Spin Off* Spring 2014.

**Blending by hand: Attenuate each top or roving gently into a longer, thinner piece, drafting along its length. Split each one to half its length, and stack the four shorter, thinner pieces together. Treat this bundle as one top and repeat the attenuation step as before. Of course, you can stop blending at any time and enjoy the tweedy color blend.*

horizontal stitches on the front with diagonal or vertical stitches on the back gains a little stretch from the borrow-and-take of the underside thread.

Vertical Stitches

Vertical stitches on the right side of stockinette-stitch fabric can get lost because they tend to nestle into the stitch ladders. One way around this is to use a thicker or denser embroidery yarn. Another method is to work supporting horizontal stitches first, then vertical stitches on top. If, for example, you wanted to work a field of crossed stitches, it might be better to make the horizontal bars first and the vertical crossing stitches second.

Separate Units

Placing small, distinct motifs saves some of the fabric's flexibility but creates more cut ends to weave in. With some practice, working in the ends of each embroidered motif is not as tiresome as it might seem. Another option is to create a knitted lining to encapsulate the ends. And yes, if you believe in them, small knots are helpful.

EMBROIDERY AND A SPINNER'S GOLD MINE

A handspun stash can be a gold mine of colors and textures for embroidery. While I would never underestimate the depths of a nonspinner's stash, handspinners probably have an advantage. Many of our stashes are brimming with handpainted braids that defied all project plans, abandoned spinning experiments too interesting to toss, and the odd skein that wasn't quite the same thickness as its mates. All of these may find a use at last. My own stash contained some early handpainted fiber that was spun and chain plied to produce long stretches of color. Each color was plenty for a bit of embroidery for this pair of samplers.

My favorite concepts—spinning and otherwise—are those that lead to good ponders, making my head buzz with ideas. Some who see this article may say, "this is not for me." And to them I smile and wave. To others who pause and say, "hmmm . . . ," I wish them good ponders.

Susan Z. Douglas has had an abiding craft crush on spinning for more than 25 years, an interest that only deepens as it sustains and enhances her forays into all things yarn-y. She enjoys a good ponder.

When running stitch is worked in vertical columns, knitted stitches retain their natural elasticity. *From left:* The right side shows horizontal running stitches, and the back side shows vertical bars.

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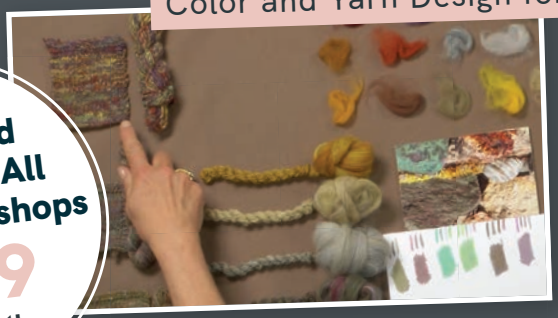

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Photos by Matt Graves

Stitch Primer

Flexible Embroidery and Decorative Darning

BY SUSAN Z. DOUGLAS

Small stitch samplers worked on knitted swatches are an easy way to begin exploring handspun and embroidered knits. You can use my swatches here as a reference for embroidery placement or doodle with only the stitches that interest you. The smaller swatch has a stockinette area that is only 21 stitches wide and 28 rows tall; border stitches can be added as you wish. With a small amount of yarn and time, you can add stretchy, colorful embroidery to your knits.

For all the stitches shown here, it's important to develop a light, just-right tension to make the stitches lie properly and to preserve as much elasticity as possible.

Some motifs, such as a field of closely placed crossed stitches or running stitches, can distort the fabric a little. Steam- or wet-blocking may help, but it's always best to get familiar with the behavior of your chosen stitches and yarns before embarking on a large project.

When working these types of stitches, I hold the knitted swatch in hand and use a blunt-tipped darning needle in a size appropriate for the embroidery yarn. To ensure that the stretchy nature of the knitted fabric is maintained, I may give the piece a little tug as I work to seat the stitches.

THE STITCHES

The familiar embroidery stitches are described here with flexibility in mind. Unlike traditional embroidery on evenweave fabrics, the stitch path behind the knitted work takes a diagonal or vertical path to preserve as much horizontal stretch as possible in the knitted fabric.

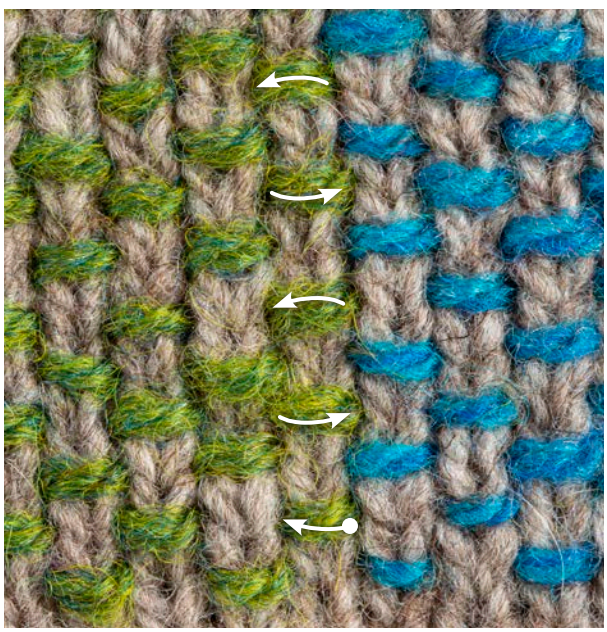
Running Stitch

Running stitch is typically embroidered in rows. However, working in columns will keep your knits stretchy. I like to start in the bottom right corner, bringing my yarn to the right side of the fabric, across one stitch to the left and down into the fabric on the other side of the stitch. With my needle now on the wrong side of the fabric, I move vertically up two rows before my needle returns to the right side to work a stitch from left to right. If I'm working several columns of running stitch as shown, I stitch up one column and down the next column, working across the fabric from right to left. I change colors as desired.

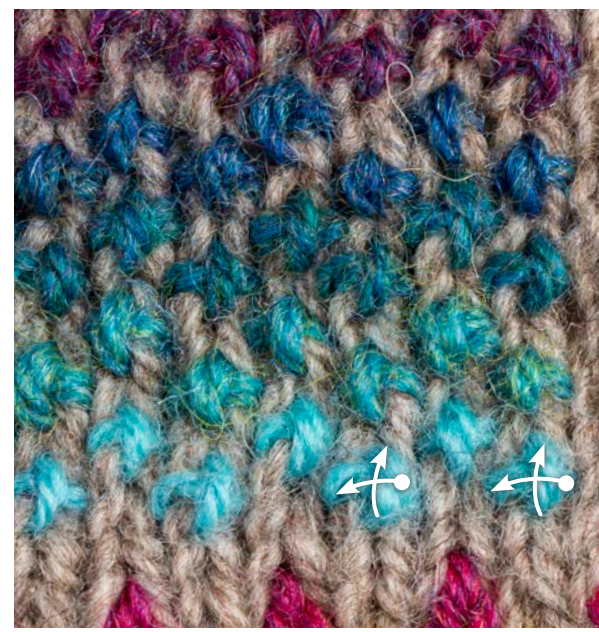
Crossed Stitches

These little crosses are great for blending colors, shading, and filling spaces. You can use one color or as many as you please. I adapt this motif in two ways to maintain flexibility in the base fabric: Each cross is formed separately before going to the next, which means that when the yarn travels between stitches on the wrong side of the fabric, it is moving horizontally. Second, I always place the horizontal bar first, followed by a vertical stitch on top. This prevents the vertical stitch from burying itself into the base fabric.

I begin by making a running stitch, which forms the horizontal bar of my crossed stitch. Then, I reinsert my needle into the center of the knitted stitch below my running stitch and pull through to the right side. The needle then passes through the center of the knitted stitch above my running stitch to create the vertical



Running Stitch



Crossed Stitch

bar of my cross. I then skip a knitted column before working another crossed stitch.

Border Stitches

As with the crossed stitches, for border stitches, I like to work each V before moving to the next. For the border motif shown, I worked two rows of V stitches in different colors before adding a lazy daisy petal stitch in the bottom of each V.

I begin at the base of the first V on the right, then insert my needle one column to the right and up two stitches. The needle then travels left behind two columns before returning to the right side of the fabric. I insert the needle where it started at the base of the V to complete. To continue working a row of stitches, the needle moves behind the work two columns to the left and is reinserted to the right side of the fabric at the base of the next V.

The lazy daisy petals are worked by inserting the needle up through the base of the V and back into the same hole, leaving a small loop. Behind the fabric, the needle moves up three rows, and returns to the right side, catching the petal loop. I pull the stitch through, being careful not to tug too tightly, and insert needle one row above to finish the petal.

Star Motif

The star motif is a freestanding stitch, so each motif is worked separately with as many stitches radiating out of the center as you like. For the yarn I used in this sampler, eight stitches filled the space but didn't crowd one another. I begin each stitch in the center, working the first stitch down the length of three knitted stitches. I continue working clockwise, anchoring each spoke so they are roughly the same length.

There will be two yarn ends to secure for each star, which can be easily done as follows: On the back, make half of a square knot with the two yarn ends. Work one end around the center of the flower (the hole) clockwise and the other end counterclockwise, ending where the half knot is. Cut the ends, leaving about a quarter-inch tail.

Decorative Darning

The other stitches described here are supporting players, but decorative darning is my favorite, my pet. These little darned squares have no work to do—they are just plain fun. They are freestanding like the star motif. The height and width can be changed for variety, as can the spacing. It's surprising that even when the squares are closely placed, the knitting retains some stretch.

I begin working a darned square in the bottom left corner. I lay the horizontal strands first, so they act as the warp. In the squares shown here, I've laid one warp yarn over every row of knitted stitches, working from bottom to top with the last row ending in the upper right corner. Next, I work the weft vertically, passing

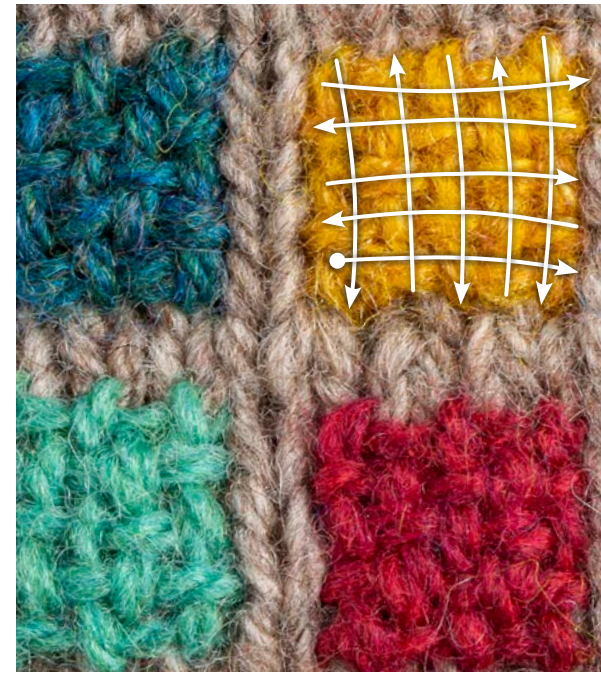
Border Stitch

Star Motif

the needle over and under the horizontal strands to weave the darn as shown. The yarn pierces the knitted fabric only at the edges to anchor the woven square.

As long as the squares start and end at the same corner (work over an odd number of whole stitches across and over an odd number of rows to achieve this), the yarn ends will be in the same corner just a stitch apart. To finish, make a little square knot on the back side, thread the ends one at a time in the tapestry needle, and pull them between the knitted fabric and the weaving. At the same time, with a little tug and coaxing, the knot will also tuck itself between the knitted and woven layers. Be sure to check the front to see that the starting and ending strands aren't being pulled too tightly and distorting the square.

Susan Z. Douglas has had an abiding craft crush on spinning for more than 25 years, an interest that only deepens as it sustains and enhances her forays into all things yarn-y. She enjoys a good ponder.



Decorative Darning

With a small amount of fiber and effort, handspinners can create a palette of solid, semisolid, and color-shifting colors for stitching.

A Structured Approach to Project Planning

BY ALANNA WILCOX

Alanna shares how she planned a complex project right from the start.

Photos by Matt Graves unless otherwise noted

One thing I love about handspun yarn is that it can be spun for fun and left in its yarn state, or it can be transformed further into wonderful garments or artworks. However, extending our creative process beyond just spinning for fun to creating end products can be daunting. What does that process look like? And where should we start?

Sometimes, spinners start with a fiber and then decide what to do with it after it is spun. At other times, spinners might have an end product in mind but spend very little time considering if the fiber is a good fit for the finished project. Both of these scenarios may lead to a disappointing outcome due to insufficient yardage, problems with gauge, or textiles that sag and pill.

Having lost countless hours to easily avoidable mistakes (such as heavy, low-twist cotton spun for what I now call my Self-Destruct Socks), I decided to develop a systematic method that would help me confidently embark on any spinning project knowing that what I'm about to create will help me realize my vision for the yarn's end use. What I share here is born out of a desire to make yarn that is functional for a specific end use. This structured, methodical approach has allowed me to experience more joy in my creative process and achieve greater success with my yarn and project outcomes.

ALANNA'S PROCESS: THE DUCK CARDIGAN

I'll walk you through my project-planning approach by sharing one of my handspun projects: a 1950s-style zippered cardigan—the "duck cardigan"—for my husband. These steps and instructions are geared toward spinners using knitting or crochet patterns designed using commercial yarns, but the process can be adapted to self-drafted patterns or other techniques, such as weaving.

When I am about to embark on a new project, I structure it as follows:

Step 1: Pick the pattern first—not the fiber

Step 2: Determine suitable fiber and yarn characteristics for the pattern

Step 3: Reverse engineer commercial yarn or design your own

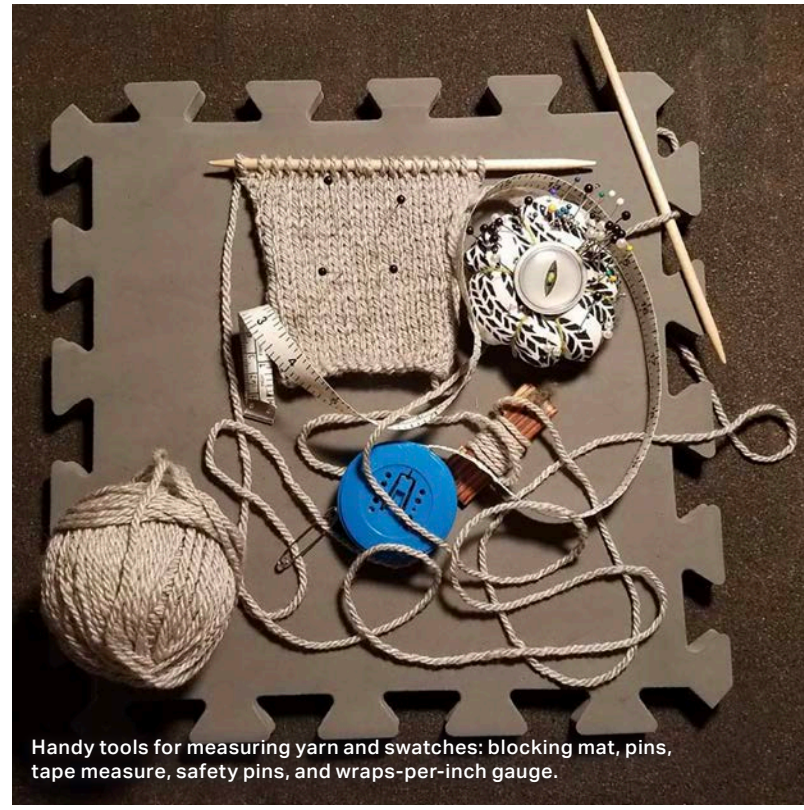
Step 4: Spin samples and record the methods used

Step 5: Create swatches

Step 6: Create the project

Step 1: Pick a Pattern

Before I start spinning, I define the yarn's end use. I think of spinning and creating art much like I think of cooking: there is some room to improvise, but the recipe and ingredients come first. For example, I could begin wanting to make spaghetti and meatballs for two, go shopping for those ingredients, but then change my mind and end up with something closer to lasagna. However, it would be very difficult with those ingredients to end up with a quiche that will serve four.



Handy tools for measuring yarn and swatches: blocking mat, pins, tape measure, safety pins, and wraps-per-inch gauge.

Photo by Alanna Wilcox

Reverse Engineer a Commercial Yarn

By deconstructing a commercial yarn, you can gather the information you need to reverse engineer the yarn and apply it to handspun, including what the singles look and feel like. Here's how I do it:

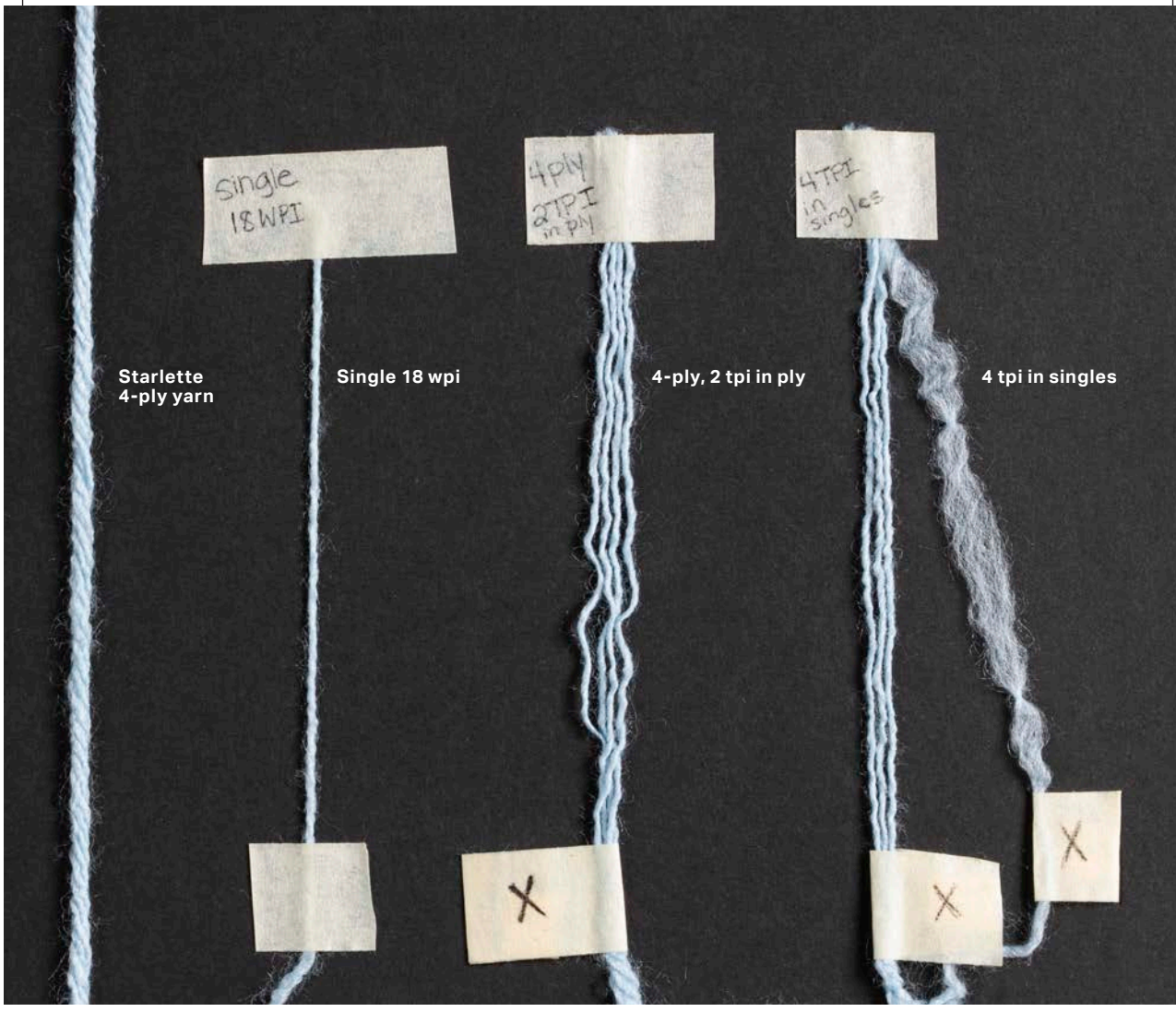
1. Start by firmly taping the commercial yarn to a hard surface, leaving an 8-inch tail. Measure 4 inches down from the initial tape and place a second piece of tape folded over itself on the yarn. Draw an X on one side of the folded piece of tape. Begin to twist the yarn in the opposite direction of how it was plied, counting every time you see the X, which indicates one revolution. (Most commercial yarns are plied counterclockwise (S), so you will rotate clockwise (Z) to unply.)

2. When the plies in the yarn between the pieces of tape are no longer twisted and are now lying side by side, stop twisting and counting. Divide the number of revolutions by the number of inches between the pieces of tape. This is the number of ply twists per inch (tpi) in the commercial yarn. For example, if there are 4 inches of yarn between pieces of tape and untwist 20 times, divide 20 by 4 to get 5 tpi.

3. Make a note of how many plies are in the yarn and lay a strand of the singles on a wpi tool or ravel enough yarn to wrap around a ruler so you can measure the diameter of the yarn. This will be the target width for spinning your singles.

4. As when you were measuring the ply tpi, place tape folded on itself with an X at the end of a single ply and untwist in the opposite direction in which the single was spun until the fiber grain is vertical, counting each revolution. Divide this number by the number of inches untwisted to find the tpi in the singles. For example, if I found 40 revolutions in 4 inches, the yarn would have 10 tpi.

Record your findings: singles wpi, singles tpi, ply tpi value, wpi of the plied yarn, and number of singles.



When I was a beginner spinner, I often purchased fiber without an end use in mind. This was case with the fiber that eventually became my husband's duck cardigan. Years ago, I bought two pounds of a cashmere, yak, silk, and Merino blend at a fiber festival. At the time, I figured two pounds would be enough to make a garment; years later, it wasn't enough for the duck cardigan. These days, I always start by selecting a project and having a clear vision for the outcomes I want. Then, I calculate how much fiber I will need to ensure I have enough material to complete the project—just like going to the grocery store for pasta ingredients.

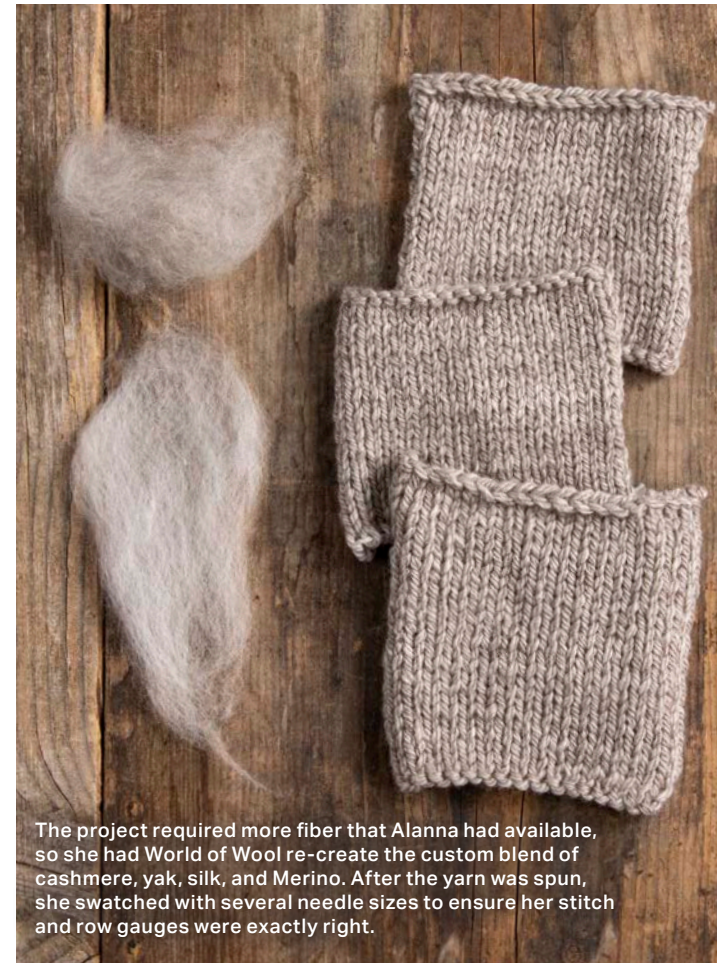
Step 2: Determine Suitable Yarn

Instead of picking a project and fiber and then spinning willy-nilly, I have learned it is incredibly helpful to pay attention to what commercial yarn a pattern designer recommends. If none is listed, I use websites, such as Ravelry, to help get clues about the types of yarns best suited to my project. I used a Mary Maxim pattern for the duck cardigan, so I reached out to the company because the suggested yarn for the pattern is no longer produced. They told me a comparable yarn was Mary Maxim Starlette, so I ordered a ball to analyze.

Step 3: Reverse Engineer a Commercial Yarn or Design Your Own

Sometimes, I deconstruct and reverse engineer commercial yarns (see page 80), but I also like to make my own decisions about my handspun. Just like chefs make slight recipe modifications to suit their tastes, I often take the liberty of spinning my yarn to suit my purposes and preferences. For my duck cardigan project, I spun my imitation Mary Maxim Starlette as a three-ply instead of exactly matching the four-ply commercial yarn. I knew I would be sacrificing the roundness of the yarn and the lofty quality of a four-ply, but in doing so I could spin thicker and faster and be done with the project quicker.

The two measurements I recorded from Starlette were the finished yarn's wraps per inch (wpi) and angle of twist. I then needed to design handspun singles that, when plied, had the same angle of twist and wpi as Starlette. I did this by spinning a series of samples, adjusting the gauge and speed setting on my Hansen miniSpinner, and folding each one into a generous three-ply ply-back sample. I measured the wpi and twist angle of these samples until I found the combination of factors that created the best match for Starlette.



The project required more fiber that Alanna had available, so she had World of Wool re-create the custom blend of cashmere, yak, silk, and Merino. After the yarn was spun, she swatched with several needle sizes to ensure her stitch and row gauges were exactly right.

Step 4: Spin Samples and Record Methods Used

I sometimes start the sample creation process by spinning practice fiber so that I can settle into the rhythm of the yarn I've chosen to spin. When I am able to match the wpi and twist per inch (tpi) of my handspun sample using practice fiber, I switch to the project fiber. (If you have extra project fiber, you can dive right in.) I was using an expensive fiber for the duck cardigan, so I wanted to wait until I had a feel for

Alanna's Project Planning Formula

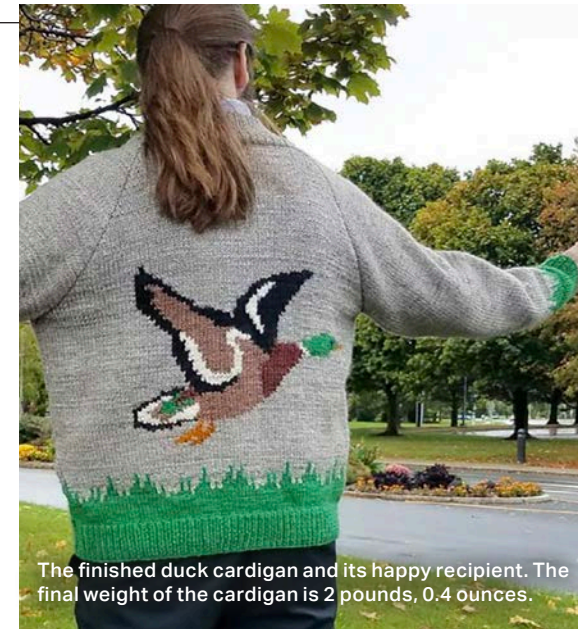
Create a control card for a pattern.

- If applicable, deconstruct a commercial yarn and attach a single of the commercial yarn to an index card. Record spinning details such as twist angle, tpi, wpi, fiber content, vendor, whorl/pulley used (traditional wheel), dial settings (electric spinner), or spindle used. Include any information you would like to reference in the future if your project is successful.
- Create a ply-back sample to use for reference during spinning.

Create a knitted swatch that is at least 6 × 6 inches in size.

Evaluate the pattern and swatch.

- Find the weight per stitch by dividing the number of stitches in the swatch by the weight of the swatch.
- Find the length of yarn used per stitch by marking the beginning of a row with a pin, raveling one whole row, and marking the other end with a pin. Measure the distance between the pins and divide by the number of stitches in the row raveled.
- Calculate the number of stitches in the entire project.



The finished duck cardigan and its happy recipient. The final weight of the cardigan is 2 pounds, 0.4 ounces.

Photo by Alanna Wilcox

Determine the amount of fiber and yarn needed.

- Find the total weight of fiber needed for the project by multiplying the weight per stitch by the total number of stitches in the project.
- Find the total yardage needed for the project by multiplying the length per stitch by the total number of stitches in the project. Don't forget that if you measure stitch length in inches or centimeters, you need to convert to yards or meters. I suggest adding 20 percent to the total just to be safe.

my target yarn. Once I was within range, I spun and plied about an ounce for swatching.

Step 5: Create a Swatch

Swatching not only allows me to figure out what needle or hook size I need; it allows me to figure out the exact yardage I need. To do this, I first counted all the stitches in the cardigan pattern. Row. By. Row. Why would I do this? To ensure I had enough fiber and yarn for the project. I estimated the duck cardigan would have roughly 60,000 stitches.

Next, I knitted my swatch, making sure I had the exact row and stitch gauge called for in the pattern. I then counted the number of stitches in my swatch (480) and weighed it (0.35274 ounce). By dividing the weight of the swatch by the number of stitches, I determined that each stitch weighed 0.00073487 ounce. The weight per stitch multiplied by the number of stitches in the cardigan gave me an estimated weight of fiber needed: 44 ounces. After adding 20 percent to be safe and factoring in the fiber used for sampling, I realized I was a bit short. It felt very much like coming home from the grocery store and realizing I got everything for the pasta dinner except the pasta.

I normally save every receipt and fiber tag, but for some reason I could not find this fiber receipt or blend information. I vaguely remembered the fiber content, but not the percentages. I called the vendor, but they

said the fiber was a one-off blend and they had no records for it. In the end, I took a very lucky educated guess and placed a custom-blend order from World of Wool. Much time could have been saved with better documentation and good record keeping. Now, I avoid impulse fiber shopping and wait until a project comes to mind before making a purchase.

Counting every stitch also allowed me to determine how much of each color was needed for the duck portion of the cardigan. I erred on the side of caution and budgeted about 20 percent extra fiber and yarn for each color, especially for things like weaving in ends and yarn floats. This methodical approach allowed me to dye enough of my handspun for each color area without having too much excess or running short.

At this point, you may be thinking to yourself, "This sounds like too much work!" I can assure you that my project was a pleasure to spin for once I knew I was on the right track, instead of just hoping that what I was spinning would work. Just like making spaghetti and meatballs, it is easiest to create something if you have a tried-and-true recipe to follow.

Step 6: Create the Project

Having done all the heavy lifting of figuring out what type of yarn—and how much of it—would be the most suitable for my project, I was able to sit back and enjoy the process of creating it! Although it seems that no project or handspun turns out perfectly, by following this systematic, structured approach, I can boldly go into any spinning project with confidence—and you can, too. Putting in the extra effort to create a plan and a process for executing your vision will help you achieve your desired outcomes.

Alanna Wilcox is a master spinner and expert fiber-arts instructor who loves sharing her passion with others and is constantly creating, especially with projects focusing on color. She wrote and self-published the popular book *A New Spin on Color* and has developed a method for creating dye formulas to match digital colors. You can learn more about her workshops and books on her website at alannawilcox.com or follow her on Instagram @spinnybuns.

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Contact Michaela Kimbrough for magazine standing order opportunities.
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Ginger Clark
Forensic DNA Analyst


Photos by Jane Dominguez

Ginger at work in her genetics laboratory.

Tell us about your day job.

I am a forensic DNA analyst with the Maples Center for Forensic Medicine at the University of Florida. I work only with animal DNA and mostly within the criminal realm—crime scene investigation (CSI) for animals. I deal with the poaching of our natural resources and animal abuse cases not only from Florida, but from all over the world. I process samples to extract DNA, looking for answers to questions, such as what species is the sample from and what gender is it? Does the evidence left behind from that individual animal match the evidence in a truck or on clothing? I identify and compare the DNA from different pieces of evidence to determine whether they have come from the same animal. It is very satisfying to be able to assist law enforcement and contribute to bringing poachers and other nefarious individuals to justice.

How did you become a spinner?

My then-husband and I bought a small farm so we could have dairy goats. As part of the farm, we got two sheep—Amos and Annie. Amos was aggressive and ended up in the pot, but Annie was sweet and gentle and spent her life on the farm giving wool. It was her wool that I learned to spin; my husband wanted a sweater from Annie. He bought me an Ashford Traveler, which I put together, and a book on how to spin. I eventually became proficient at it and was a commercial spinner for 10 years. More than 40 years and about 4,000 pounds of yarn later, I'm still spinning and still totally fascinated by the way the individual fibers twist together, yielding yarn that is strong enough to knit, crochet, and weave. I'm as amazed now as I was when I started!


Two takli spindles filled with naturally colored cotton and a spinning bowl on the picot, beaded edge of Ginger's Pi Shawl.

Do your job and your fiber/spinning hobbies ever overlap?

Because of my job, I need to be careful about animal fibers traveling into my lab. However, I have a takli on my desk that I spin cotton on, and I spin a lot of cotton. I spin on conference calls, when I need a break from lab work, when I have to think about how to proceed with a case, or when I'm writing a difficult report. Spinning occupies my physical side and frees my thought processes, allowing various solutions to pass by until I find the right one.

How does spinning fit into the rest of your life?

Spinning has always been my place of refuge. It is what I do when I can't do anything else, mentally or physically. It is where I go when I need to recover from a day, a week, or life in general. When 9/11 happened, I felt frozen in place. I spun miles of yarn while waiting to hear from loved ones and for some sense of normality to return.

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