



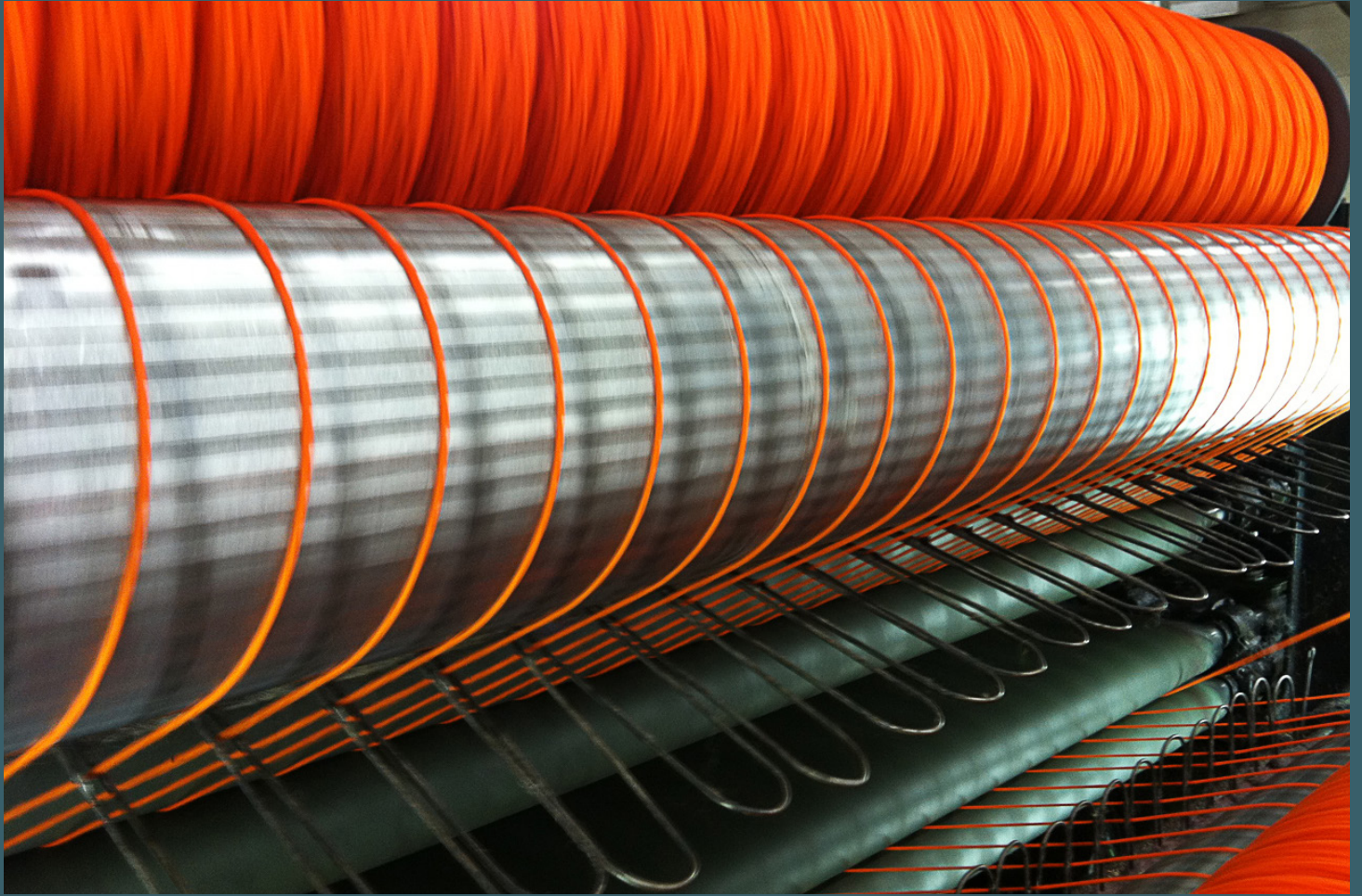
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I remember well the first item I ever wove in wool. I loved the way it looked on the loom and the way it looked when I unrolled it from the cloth beam. The thought of what might happen to it if I washed it was frightening. I took it to my guild, where they all told me that it would improve with wet finishing. That was enough peer pressure that, as soon as I got home, home, I put it in the bathtub (it was a coverlet) and crossed my fingers. They were right. The threads softened and slightly fuzzed without destroying the pattern I loved. Ever since, I've been experimenting with degrees of finishing. I wish I'd had this eBook from Day One. In it, you'll not only find a dozen great projects to weave in wool, but also all the rules-of-thumb for finishing wool fabrics that a weaver will ever need.

Madelyn

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The wonders of wool *by Liz Gipson*

It is easy to wax poetic about wool. It comes in a wide variety of natural colors and styles, from long and straight to superfine and crimpy. Wool provides endless opportunity for manipulating woven cloth. Depending on how the wool yarn is prepared, handwovens made with wool can be maneuvered in any number of ways, either with weave structure (think deflected doubleweave) or finishing (think throwing it in the washing machine), to create interesting textures and effects.

Properties to consider for weaving with wool

Wool's unique construction is what gives it its special properties. A protein fiber, wool has microscopic scales that allow the fibers to interlock easily with one another. The density and size of the scales determine the hand of the wool. Fine wool can have as many as 200 scales in an inch. These scales lock together during the fulling or felting process. The more scales, the easier the wool will full or felt. As the scales interlock through agitation, the spacing of fibers in the fabric becomes denser and denser—this is what causes wool to shrink. Remember, this process is not reversible!

How a wool yarn is prepared and spun will determine how it will perform in the finished cloth. Woolen yarns act differently from worsted yarns with wet finishing (see articles by Sharon Alderman and Laura Fry in this book).

Woolen yarns are loftier and have more stretch because of the air introduced to the yarn during the spinning process. You should take this stretch factor into account when determining sett and warp length.

Determining sett

A common method for determining the sett of a yarn is to wrap the yarn around a ruler for the space of an inch and then divide the number of wraps in half. This number can be used as the sett for a medium-density plain weave. Twills require a closer sett, lace a more open sett. Wool yarn

stretches under tension on the loom, but it bounces back once tension is released. When you are wrapping the yarn on the ruler, apply only moderate tension to allow the yarn to stay close to its natural state. If you apply too much tension as you wrap, you might end up with denser fabric than you anticipated. You also want to allow room for the yarn to bloom.

Although worsted yarns are smooth and dense and don't stretch quite as much as woolen yarns, it is still a good idea to use moderate tension for winding the warp and for weaving.

A yarn that blossoms

Both woolen and worsted yarns are compacted during the spinning process. Naturally occurring oils along with oils introduced during the spinning process coat the yarns. Wool yarn made for weaving and put up on cones is also sometimes treated with sizing to protect it. Because wool is naturally resilient and elastic, however, when the oils are stripped away during the finishing process, the yarn "blossoms" or rebounds to its natural state. Fabric that seems stiff and loose after weaving will become denser and softer with wet finishing.

Wools and wool blends with a plain-weave sett of 7 or fewer ends per inch are good for rugs and quick fabrics that have a chunky, casual look.

From top to bottom (at right):

Rug Wool from Halcyon Yarn, 100% wool, 260 yd/lb, dusty purple (#138), 4 epi (for rugs, usually used only as weft).

Wool Clasica from Manos del Uruguay, 100% wool, 630 yd/lb, Olive, 7 epi.

Jason Collingwood Rug Yarn from Webs, 1,000 yd/lb, 80% wool/20% nylon, Lichen, 7 epi (also usually used as weft for rugs).



100% Wool Yarns with a plain-weave sett of 8-10 ends per inch full beautifully, making them perfect for outerwear, bags, and cozy shawls.

From top to bottom (at left):

Nature Spun from Brown Sheep Company, 1,682 yd/lb, Arctic Moss (#N30), 8 epi.

Tekapo from Ashford, 996 yd/lb, Blueberry, 8 epi.

Bartlettyarns from Halcyon, 1,750 yd/lb, purple tweed (#223), 10 epi.

Highland 2-ply from Harrisville Designs, 900 yd/lb, High Cypress, 8 epi.



Above: Yarns that use a sett of 12 to 15 ends per inch for plain weave work well in lightweight scarves, blankets, and garments.

From top to bottom:

New York Sock Yarn from Wisdom Yarns, 75% superwash wool/25% nylon; 1,998 yd/lb, purple variegated (#223 colorway, top three stripes above), 12 epi. The new sock yarns on the market are an inexpensive way for weavers to use fingering-weight wools.

Gems Super Fine (fingering weight) from Louet, 100% wool, 1,750 yd/lb, 100% wool, Cloud Grey, 14 epi. This yarn has a firm twist and can be machine washed.

Colrain Lace from Webs, 50% wool/50% Tencel, 2,800 yd/lb, Purple, 15 epi. The resiliency of wool paired with the sheen of Tencel in this yarn is a winning combination!



*Basketweave scarf
instructions available
at weavingtoday.com*

Matching the finish to the yarn *by Laura Fry*

When any new yarn comes into my studio, I like to weave a number of samples and wet finish them to discover the yarn's nature and potential. This is especially true for woolen yarns. The wet-finishing process called fulling causes the scales of wool fibers to open up and lock together, softening and shrinking the cloth and giving it a denser, fuzzier texture.

Weaving the samples

First, I wrap the yarn around a half inch on a ruler (see Photo a) to determine the approximate number of warp ends per inch for a medium-density plain weave (with fairly fine, smooth yarns, I wrap tightly)—12 threads for Harrisville Shetland (1,800 yd/lb).

Next, I weave samples in both plain weave and twill at this sett, samples at a more open sett (10 epi for the Shetland), and samples at a closer sett (16 epi for the Shetland).

I didn't try it, but 20 epi in a 1/3 twill would probably work in this yarn for a heavier fabric to use for upholstery or a sturdy tailored coat.

Scouring the samples

Before fulling, the woven cloth must first be "scoured," as any oils (naturally occurring or added during spinning) will retard the fulling process. To scour a fabric, use soap with soft water but detergent with hard water. (In hard water, soap will bind with the minerals and not the oils.) Avoid any soap or detergent that has added whiteners or brighteners as these can cause damage to wool fibers.

A light soap or detergent solution repeated several times is more effective than one heavy application. Generally, I add enough detergent to the water (use warm water to fully dissolve the soap/detergent) to make bubbles a maximum of 1" high on the surface of the water and then add the fabric. The bubbles disappear as the soap/detergent binds with the oils in the yarns. If the bubbles disappear entirely, drain the water, add fresh water and soap/detergent, and repeat until a light skim of bubbles remains on the surface. A little bit of soap/detergent in the water will act as a lubricant and surfactant (breaking down the surface tension of the water) during fulling.

Fulling the samples

Fulling is a combination of moisture and agitation and only happens to most wools and other hair fibers. Not all wools will full, so if you anticipate fulling a finished fabric, sample before you commit to a large project.



a. Wrap 1/2" of yarn around a ruler.



b. Before wet finishing, the cloth is loose enough that the threads can be separated. Fulling causes the fibers to cling to each other for stability.

Several methods can be used to full wool. Small items can be done by hand and large items in a top-loading washing machine for a lofty fabric or in a front-loading washing machine or a dryer for a somewhat less lofty fabric. Increasing the temperature during fulling accelerates the process. If you are new at fulling, keep the temperature lower and the agitation less vigorous to begin with and monitor the fabric closely, especially when you are using the washing machine or dryer. Never turn on the machine and walk away, as the fabric may full beyond your intention. The degree of desired fulling depends on the intended function of the fabric. A shawl should not be fulled as much as fabric for upholstery, for example.

When you are fulling by hand, knead the cloth (like bread dough) or lift it and throw it down onto a hard surface. The fabric will gain body as the scales on the wool fiber open up and the fibers begin to migrate within the cloth, gradually entangling. As the fabric changes, check it by running your finger across the threads. While you can poke through the web before fulling (Photo b), the threads will resist moving aside as they full.

Prepare yardage to full in a top-loading washer by folding it in half lengthwise and loosely whipstitching the selvages together with sewing thread to make a long tube; this will keep the ends from finishing differently from the rest of the fabric. Place the tube around the central spindle of the washer. Make sure that the fabric moves freely, and as agitation proceeds, move the fabric so that the same area of the cloth does not come in repeated contact with the blades of the

spindle. For a front-loading washer or for a dryer, preparing the yardage in this way is not required as the tumbling motion moves the fabric more evenly.

To use a dryer for fulling, begin with the fabric wet from scouring and set the control to no or low heat. If the fabric dries before fulling is complete, simply rewet and resume tumbling. A small item can be fullled in the dryer more effectively by adding a wet towel or two.

The samples in Photos c-f were fullled in a dryer (this is slower than fulling in the washing machine, so it is sometimes a better choice for the new weaver/fuller). Photos c-e show, for each of three setts, one unfinished sample, one lightly fullled sample, and one sample fullled more extensively. The brushed sample in Photo f was fullled for 40 minutes in the dryer and then brushed with a pet brush (you can also use a scrub brush). All fullled samples were given a hard press except for the brushed sample.



c. Plain weave at 10 epi (left to right): unfinished, fullled 25 min, fullled 70 min.



d. Point twill at 12 epi: unfinished, fullled 25 min, fullled 70 min.



e. Point twill at 16 epi: unfinished, fullled 25 min, fullled 70 min.



f. Twill at 16 epi: fullled 25 min and 40 min (brushed).

PHOTOS BY LAURA FRY

Why full?

The benefits to fulling are many! Fulling reduces minor inconsistencies like reed marks, uneven beating, and places where new and old wefts overlap. It removes spinning oils, improves odors, and brightens yarn colors. Fulling greatly increases the insulating capacity of a yarn and changes the hand of the final fabric, from rough and stiff to soft and deliciously fuzzy.

Woolen- vs worsted-spun yarns

WOOLEN YARN is spun from rolags prepared by carding. The fibers can be relatively short and are not parallel as they entangle with each other, trapping air in the center. Woolen yarn is soft and lofty, ideal for garments and light blankets, especially when the fabrics are fullled with wet finishing.

WORSTED YARN is spun from long-stapled fibers prepared by combing, which keeps the fibers parallel and removes shorter ones. Worsted yarns tend to be stronger than woolen yarns and are therefore more ideally used for rugs and long-wearing items like blankets. Not all worsted yarns can be fullled with wet finishing.

You're not finished until it's finished

by Sharon Alderman

Here's a riddle for you: How is cloth on the loom like muffin batter? Answer: They are equally unfinished. The difference between cloth as it is cut from the loom and the same cloth after finishing is often as dramatic as the change that occurs when muffin batter is baked. Both are transformed. Both are made better.

Focusing on wool

Of all the fibers that weavers commonly use, the one that undergoes the most dramatic changes in wet finishing is wool, particularly woolen-spun wool.

The more expensive worsted wool yarns are made from longer staple wools, which are painstakingly combed to align the fibers, producing a smooth yarn. Handwashing in warm water with minimal agitation preserves the smooth finish of cloth woven with worsted wool.

Woolen-spun wool is shorter in staple and not combed. To help control the fibers and facilitate spinning, the wool is oiled during the spinning process. The lack of alignment of the fibers and the addition of spinning oil are critical factors affecting the way the resulting cloth is finished.

The spinning oil must be removed from the woven cloth, because it dulls the colors and tends to attract dirt. It also makes the cloth feel harsh. When woolen-spun cloth is washed, the yarns become softer, brighter, and loftier. With increased agitation during washing, the spaces between the yarns fill so that the cloth becomes more insulating and wind resistant.

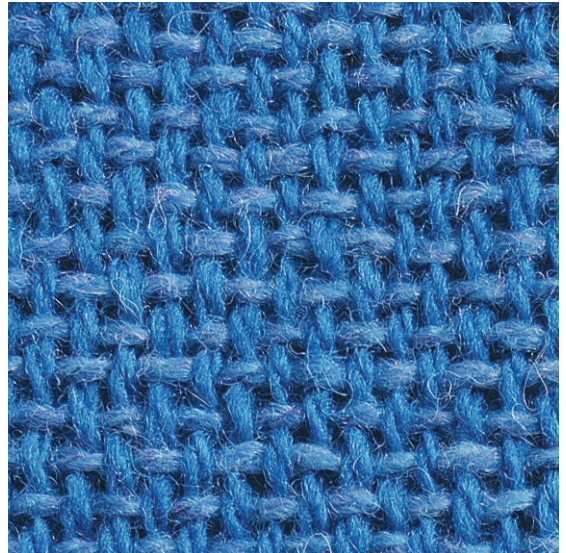
Finishing cloth woven with woolen-spun yarn

The samples shown here are all woven with Harrisville Designs Shetland, a 2-ply woolen-spun yarn, at two different setts in plain weave and twill. The samples in Photos a, b, and c, are sett at 8 epi and are woven in plain weave at 8 ppi (measured under tension on the loom).

The samples in Photos d, e, and f are sett at 14 epi and woven in plain weave at 14 ppi. The samples in Photos g and h are also sett at 14 epi and woven at 14 ppi, but in 2/2 twill.

These fabric samples demonstrate the effects of two types of finishing for two different setts and two different weave structures. One plain-weave sample of each sett (see Photos a and d) is left unwashed to show how the cloth looks as it comes off the loom. The samples in Photos b, e, and g are washed by hand using very warm water (110°F) with a mild dishwashing liquid such as Dawn rinsed well, and laid flat to air dry.

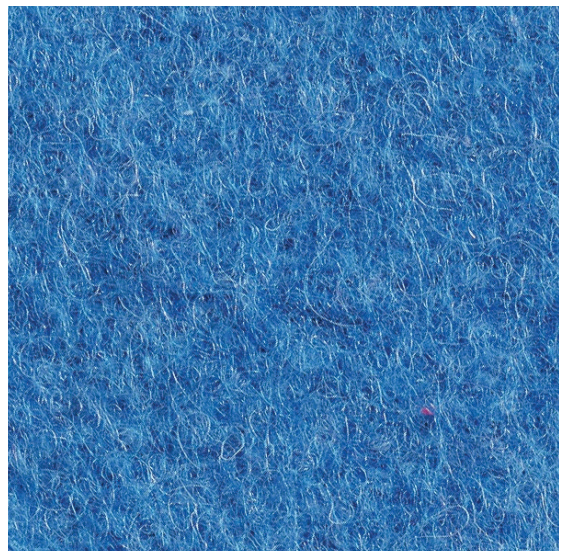
**a. 8 epi and
8 ppi, not
washed**



**b. 8 epi and
8 ppi,
washed
by hand**



**c. 8 epi and
8 ppi,
washed by
machine**





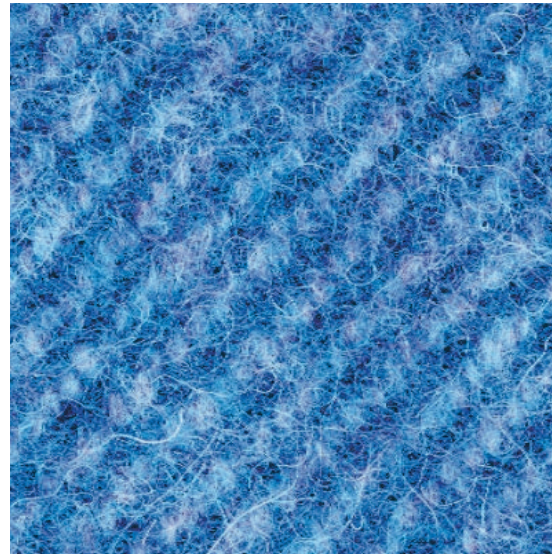
d. 14 epi and 14 ppi, not washed



g. 14 epi and 14 ppi, not washed by hand, 2/2 twill



e. 14 epi and 14 ppi, washed by hand washed



h. 14 epi and 14 ppi, washed by machine 2/2 twill



f. 14 epi and 14 ppi, washed by machine

The samples in Photos c, f, and h are washed in a front-loading machine for a full regular cycle, hot-water wash, warm-water rinse. As you might expect, the end results differ dramatically. The unwashed samples are harsh, open, and rather raw looking. The handwashed samples are much softer, and although they have shrunk somewhat, they are not very fuzzy.

The shrinkage is greatest for the machine-washed samples, and they are full to the degree that the surface is soft and fuzzy. All of the machine-washed fabrics would make ideal blankets, coats, jackets, or vests.

Always keep in mind the intended use for a fabric and stop the finishing process at any stage to get the finish you want.

Experiments in texture by Nell Znamierowski

For me, every new warp means discovery. Each warp also means samples and therefore an endless series of experiments (well, almost endless, depending on the length of the warp). One sample builds upon another, so that an idea or feeling merely glimpsed in one sample becomes reality in the next one or the one after that. Usually, I have an objective—an end use—but sometimes I also have a nonobjective aim—to find an interesting texture or pattern or structure or color idea or some combination of all of them. That is how the designs shown in the samples here came into being.

Samples 1-2

For this kind of experimentation, I usually start with a threading I want to work with and then see where I can go with it. For the navy warp (Samples 1 and 2), I used a threading for a rib weave from G.H. Oelsner's *A Handbook of Weaves* (Figure 228; see Resources, page 9). After trying several different treadlings on one tie-up that gave textured effects, I concocted a treadling that resulted in Sample 1 (at the right in the photo on this page; the photo shows the back side of the fabric as it was woven on the loom). I call it Daisy Chain because of its stylized linked-floral appearance.

Still in quest of texture ideas, I next chose a textured yarn that seemed to say to me: "Try surface-interest weaves." I replaced the navy yarn on shaft 1 with a fluffy white novelty yarn; compare the Drafts for Samples 1 and 2 on page 9. (I had to use a more open reed to accommodate the thicker novelty yarn.) I was after a polka dot effect but my "dot" ended up being more square than round. Both the Daisy Chain and Square Polka Dot fabrics would work well for garments. The Daisy Chain motif would be the most effective if there is strong contrast between the pattern and background colors. For the Square Polka Dot fabric, the novelty yarn could be a color more closely related to the background for a subtle textural contrast.



Above: Sample 1 (right), Sample 2 (left). On page 8: Sample 4 (lower left) shows a triangular motif with weft cords; Sample 5 (upper right) shows vertical offset cords (pale red) and stuffed weft (horizontal) cords (orange).

Samples 3-7

For the fabrics using the straw-colored warp, I used a point threading on eight shafts. The differences among the samples came from changing the tie-ups, treadling orders, and weft colors. These samples all belong to the general weaving category called cord weaves. Cord weaves display either vertical or horizontal ribs. The cords can be made more prominent by adding "stuffer" ends or picks, composed usually of a soft, thick yarn or bundle of yarns. In warp cords, the stuffer ends are part of the threading. As this is restrictive for continued experimentation, I prefer weft (horizontal) cords.

I started by working with different sizes of weft cords (Sample 3), changing both the colors of the cords and the color sequences. So that one cord doesn't dominate the others, the rib colors should be somewhat related in depth and intensity.



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For Sample 4 (this draft also appears in *A Weaver's Book of 8-Shaft Patterns*; see Resources), I wanted to interject a pattern motif (the small triangle) along with the structure of the cord. This idea led next to trying the double cord effect in Sample 5. The pale red warp cord is not stuffed, so it recedes into the background, giving the cloth added visual depth. In Samples 6 and 7, my main concern was to get lively color effects. Unstuffed vertical cords stop and start in Sample 6, while in Sample 7, unstuffed vertical cords in a contrasting color interrupt a herringbone pattern.

Because of the thickness and weight of handwoven corded fabrics, upholstery and pillows are their most appropriate end use. However, I'm sure some ingenious weaver will find other possibilities through continued experimentation! Start with the drafts for these samples, and you're sure to find other ideas to take you on your own exploration. (Specific yarn amounts are not given here since sample size can vary greatly.) To finish the samples, secure the raw edges and wash by hand until full as desired.

Warp

2-ply Harrisville Shetland wool at 1,800 yd/lb. Sample 1: Midnight Blue. Sample 2: Midnight Blue and loop mohair novelty from Henry's Attic at 250 yd/lb. Samples 3-7: Straw. See drafts for weft colors. For stuffer wefts, use as many strands of rib color as needed to fill each rib.

Weaving

For the weft cords, insert the stuffer weft the number of times needed (take the yarn around an edge thread and back into the same shed. For Sample 3, vary the number of times you weave the rib color and the number of stuffer wefts.

E.P.I. 12.

P.P.I. 11 (Sample 2, Sample 7);
12 (Sample 1, Sample 4, Sample 5);
13 (Sample 6); 14 (Sample 3).

Sample 1

8	7	8	7	8	7	8	7	8	7	8	7	8	8	8	8	8	8
6	6												6	6	6	6	6
	5	5		5	5												5
		4	4														4
			3	3		3	3										3
				2	2		2	2									2
					1	1			1	1							1

N = navy (Midnight Blue) w = white (mohair/wool)

Sample 2

N	N	N	N	N	N	N	N	N	N	8	8	8	8
N	N	N	N	N	N	N	N	N	N	7	7	7	7
										6	6	6	6
										5	5	5	5
										4	4	4	4
										3	3	3	3
										2	2	2	2
										1	1	1	1

N = Navy (Midnight Blue) L = white loop
Sley the navy 2-1; sley the loop with the adjacent navy.
in one dent

Sample 7

8	7	8	7	8	7	8	7	8	7	8	7	8	8	8	8	8
6	6												6	6	6	6
5	5			5	5											5
4	4			4	4											4
3	3			3	3											3
2	2			2	2											2
					1	1				1	1					1

G = Grass
C = Chicory

Samples 3, 5, and 6

8	7	8	7	8	7	8	7	8	7	8	7	8	8	8	8	8
6	6												6	6	6	6
5	5			5	5											5
4	4			4	4											4
3	3			3	3											3
2	2			2	2											2
					1	1				1	1					1

w = White
C = color (Aster, Azure, Zinnea)
S = stuffer
T = Camel
Z = Zinnea
O = Melon
M = Magenta
P = Poppy

* = vary these each time for larger or smaller cords.

The number of times you weave with the color in the cord (C) determines the size of the cord; for wide cords (repeat 20x, say) add more stuffer threads.

Sample 4

8	7	8	7	8	7	8	7	8	7	8	7	8	8	8	8	8
6	6												6	6	6	6
5	5			5	5											5
4	4			4	4											4
3	3			3	3											3
2	2			2	2											2
					1	1				1	1					1

w = Straw
M = Magenta
C = Cobalt
G = Grass
s = Stuffer

Resources

Oelsner, G.H. *A Handbook of Weaves*, New York: MacMillan, 1915, p. 50 (draft for rib weaves).

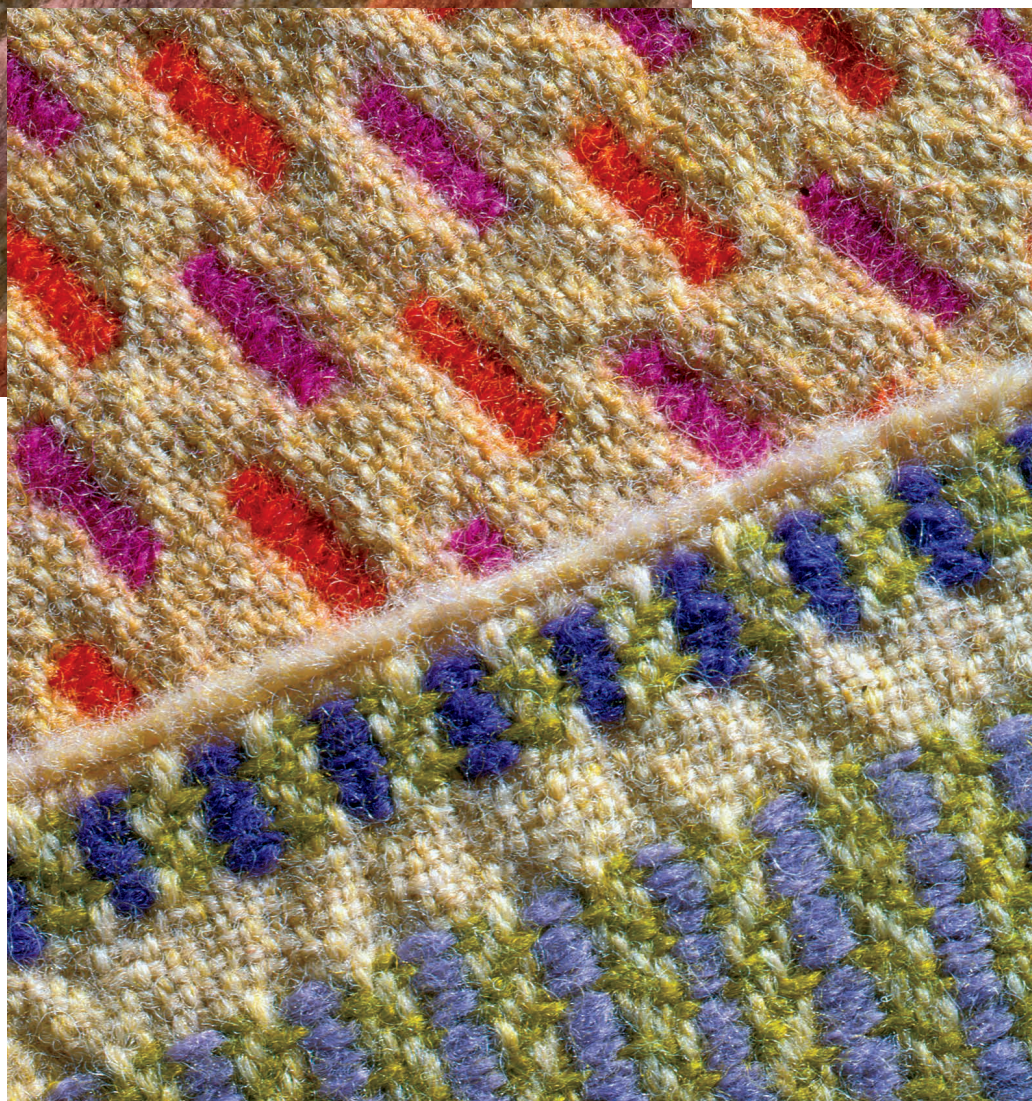
Strickler, Carol, ed. *A Weaver's Book of 8-Shaft Patterns*. Loveland, Colorado: Interweave 1991, p. 231 (draft for cords).



In Sample 3, varying widths of horizontal (weft) cords are woven in muted tones of related pastels. Choose a different color for each cord, weave the cord until the desired size is reached, and then weave the number of stuffer picks suitable for filling the cord.

In Sample 6 (the top sample in the photo), unstuffed offset vertical cords in two different colors pattern the surface.

In Sample 7, (the lower sample in the photo), unstuffed vertical cords alternate with a herringbone twill.



Color Forecasting *by Nell Znamierowski*

Color forecasting can stimulate our color creativity and assist us in choosing fashionable, yet long-wearing hues.

Color forecasting basics

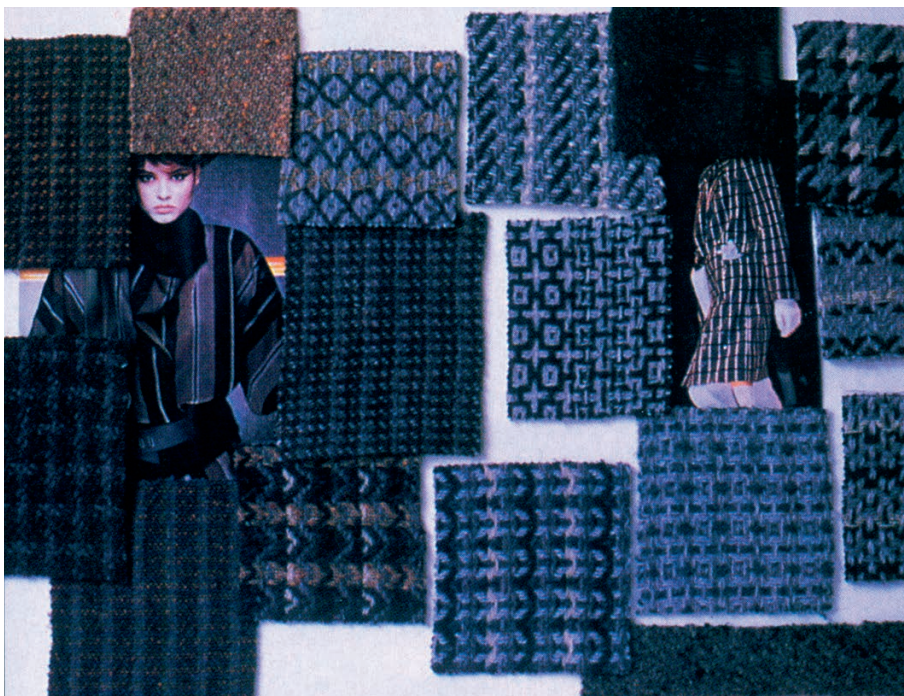
The color forecasting done by fashion and design houses affects us as weavers. If you are weaving fabric for a bright blue skirt to wear next season and you go to a department store to find a companion blouse or sweater, you may be out of luck if that blue doesn't follow the general color lines being presented by the forecasters. To production weavers, this means that their scarves or pillows might not be snapped up by buyers

Even to weavers who sell only rarely, consumers who have already bought garments or items in this season's colors may want other purchases to coordinate. One reason many weavers stick to white, off-white, and natural is that they can always be counted on to work well with most other colors.

The value of color forecasting to weavers

I find that color has importance and appeal to most weavers. Too often, it also overwhelms them, and in a quandary they retreat to safe or known colors. In order to fully savor color, one sometimes needs a nudge to get out of this "safe" corner and experiment. To this end, there are magazine articles, books, lectures, and classes on color available. I have found that yet another way to introduce and induce people to sample all the joys of color is to use color forecasting as an educational and experimental tool.

To answer questions from weavers about color, I developed color boards such as the one in the photo above. This color board features the palettes predicted in 1985 for the following year. A palette is a group of colors that have a common tonality based on similar values (light-dark characteristics) and intensities (bright-dull characteristics). They could be hot tropical brights, or romantic whitened pastels, or (as on page 14) neutrals that look weathered because of all the gray added to the hues. There can be from four colors to as many as nine or twelve in a palette,



Samples for this color board are woven in the neutral colorways that predominated in the winter of 1985-1986.

all looking as if they belong together. A color forecaster usually offers a minimum of four palettes for a season.

What I find so exciting with color forecasts is that they present a constant array of new colors to work with. Working with these new colors leads to more discoveries of what goes together and what doesn't. To those who love color, it is always an uplifting experience to try new combinations and become more aware of the subtlety and ever-changing aspects of color. When I say "try," I allude to what is perhaps my favorite word in the weaving language, "sample." Without samples, where would discovery be?

My color boards are the result of sampling. For the one shown above, for example, I started out with four very long sample warps, each reflecting a different palette, and varied the weft colors with each sample. The warps were each composed of four sections that had different color arrangements, but the colors were all in harmony because they were all of one palette (all neutrals together, all pastels together, etc.). I varied the weft colors with each sample. I didn't dye any yarn but depended on Harrisville Design colors in Shetland wool. The weave structures and color arrangements all followed a color-and-weave effect format. Experimentation is the clue to all exciting fabrics, and using color forecasts can be a catalyst for getting there.



This skirt and jacket ensemble (and the patterns that were used to make them) are from the mid-1980s and therefore not in style today. The fabrics, however, have timeless beauty. Use them with currently available patterns (or for blankets or throws). You can also use the color-and-weave drafts with other color pairs for contemporary color discoveries of your own.

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JACKET FABRIC DESCRIPTION

Color-and-weave twill variation.

Finished dimensions Yardage 28" by 6 yd.

Warp and weft

Warp: 2-ply Harrisville Shetland wool at 1,800 yd/lb, 1,791 yd each Russet and Evergreen. Weft: 1,500 yd each Evergreen and Black Cherry. (Black Cherry is substituted for the Purple singles tweed used in the original.)

Notions Jacket pattern (check yardage requirements before planning warp width and length), sewing machine, and materials required by pattern.

Total warp ends 434 (includes 2 floating selvages).

Warp length

8¼ yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 12. **Width in reed** 36¾". **P.P.I.** 10.

Take-up and shrinkage 22% in width and length.

Weaving

Weave the fabric at 10 picks per inch for about 7½ yd alternating 8 picks of Evergreen with 8 picks of Black Cherry.

Finishing

Remove the fabric from the loom. Secure raw edges with machine zigzagging. Machine wash on a 3 min cycle with detergent and hot water. Rinse twice with cooler water. Add Downy fabric softener to the last rinse for a softer hand. Lay flat or hang over a rod to air dry.

Using a jacket pattern, cut pieces lengthwise so the warp is vertical in the garment, matching plaids at sleeve and body seams.

SCARF FABRIC DESCRIPTION

Color-and-weave twill variation.

Finished dimensions

One scarf 10½" by 56" plus 1" fringe on each end.

Warp and weft

Warp: 2-ply Harrisville Shetland wool at 1,800 yd/lb, 219 yd each Cobalt Blue and Russet. Weft: 162 yd Evergreen and 83 yd Garnet.

Total warp ends 146 (includes 2 floating selvages).

Warp length

3 yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 12. **Width in reed** 12¾". **P.P.I.** 10.

Take-up and shrinkage 10% in width, 11% in length.

Weaving

Allowing 2" at each end for fringe, weave the scarf following the Weft Color Order and the treadling order in the Draft.

Finishing

Remove the fabric from the loom. Machine wash on a 3 min cycle with detergent and hot water. Rinse twice with cooler water. Add Downy fabric softener to the last rinse for a softer hand. Machine dry for 3–4 min on cool/low cycle to remove excess moisture. Lay flat to dry thoroughly.

Trim any loose threads and then trim fringe evenly to 1". The fulling process should keep the ends secure.

SKIRT FABRIC DESCRIPTION

Plain weave.

Finished dimensions

Yardage 43¾" by 107" (almost 3 yd).

Warp and weft

Warp: 2-ply Harrisville Shetland wool at 1,800 yd/lb, 800 yd Russet, 1,600 yd Cobalt Blue. Weft: 825 yd each Evergreen and Garnet.

Notions Skirt pattern (check yardage requirements before planning warp width and length), sewing machine, and materials required by pattern.

Total warp ends 600.

Warp length

4 yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 12. **Width in reed** 50". **P.P.I.** 10.

Take-up and shrinkage

12½% in width, 8% in length.

Weaving

Weave the fabric in plain weave for 3¼ yd alternating 8 picks Evergreen with 8 picks Garnet.

Finishing

Remove the fabric from the loom. Machine wash on a 3 min cycle with detergent and hot water. Rinse twice with cooler water. Add Downy fabric softener to the last rinse for a softer hand. Machine dry for 3–4 min on cool/low cycle to remove excess moisture. Lay flat to dry thoroughly.

Using a skirt pattern, cut pieces lengthwise so the warp is vertical in the garment, matching plaids at seams.

Draft for jacket

54x											
8							8	8		8	8
7							7	7	7		7
6							6	6	6	6	
5							5	5	5	5	
4							4	4	4	4	
3							3	3	3	3	
2							2	2	2	2	
1							1	1	1	1	

● = floating selvedge

/	/	/	/	/	/	/	/	/	/	/	/
---	---	---	---	---	---	---	---	---	---	---	---

Warp color order: jacket

26x ₁			
217	9	8	Evergreen
217	8	9	Russet
434			

Draft for scarf

18x											
8							8	8	8	8	
7							7	7	7	7	
6							6	6	6	6	
5							5	5	5	5	
4							4	4	4	4	
3							3	3	3	3	
2							2	2	2	2	
1							1	1	1	1	

● = floating selvedge

/	/	/	/	/	/	/	/	/	/	/	/
---	---	---	---	---	---	---	---	---	---	---	---

Warp color order: scarf

17x ₁			
73	5	4	Cobalt Blue
73	4	5	Russet
146			

Weft color order: scarf

Evergreen	
Garnet	
40	8
11x	8
216	8
11x	8
40	8

Draft for skirt

4		4
3		3
2		2
1		1

/	/
---	---

2		2
1		1

/	/
---	---

Warp color order: skirt

50x ₁		
400	8	Cobalt Blue
200	4	Russet
600		



This color board features the weathered look, a palette from Fall/Winter 1986–1987. It features hues that are very grayed and range from medium to dark. Warm blues are offshoots of indigo and denim.

Resources for color forecasting

The resources for color forecasting have changed since the original publication of this article. Here are some places to look for current and future forecasts as submitted by Daryl Lancaster. See also Daryl's articles on color forecasting in *Handwoven* (*Handwoven's* Fabric Forecasts, 2005–2008).

www.pantone.com (as soon Pantone puts up their color forecasts, Pro Chem publishes them along with dye formulas for acid and fiber reactive dyes)

www.prochemical.com/Forecast_Fall_2013.pdf

Design Options at www.design-options.com/shopUCAnnual.html#

Paint companies like Behr do a trend forecasting with design and color suggestions: www.behr.com/Behr/home#view=6;vgnextoid=85d662cc8fd8310VgnVCM100000176310acRCRD;channel=INSPIRATION

For forecasts beyond the current season, type in Color Forecast in Google and look for current content and images.

All about wet finishing *by Laura Fry*

Cutting your warp from the loom does not mean that the process of transforming threads into fabric is complete. It must be wet finished. Wet finishing consists of three progressive steps: scouring, agitation, and compression.

Scouring removes any natural or added chemicals such as oil, sizing, or wax used to aid the spinning and/or weaving processes. **Agitation** helps reduce or remove streaks in the cloth left by the reed and helps threads find their undulating path as they shift towards areas of least resistance. Weave structures that rely on threads shifting away from the rigid perpendicular, such as waffle, honeycomb, and lace weaves, are enhanced by the movement of threads to create dimples, curves, or openings as the fibers relax. **Compression** adds stability and increases light reflection—a quality especially prized in linens and silks.

All fabrics intended for clothing or household use must be wet finished, although there are a few exceptions, such as blankets and chenilles, that should not be compressed.

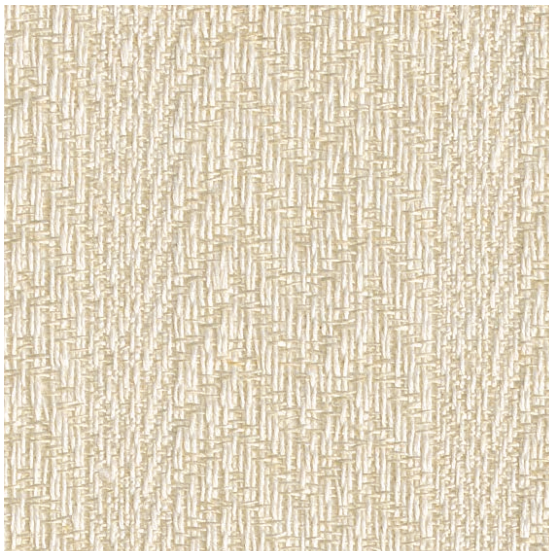
Cotton

When you are finishing cotton (see Samples a and b) use the hottest water available along with an ordinary detergent or soap to remove any natural or added waxes, and then agitate either by hand or in the washing machine set on a regular cycle. Allow the cloth to dry until just damp; then give it a hard press. A hard press means that the fabric is compressed with applied pressure. You can use a hand iron, but remember to press down firmly, rather than swishing the iron back and forth.

Sample a (left): unfinished 8/2 unmercerized cotton woven in an advancing twill at 24 epi and ppi.
Sample b (right): the same cloth, wet finished.



Sample c (left): unfinished 40/2 line linen woven in an advancing twill at 36 epi and 30 ppi.



Sample d (right): the same cloth, wet finished and pressed with a mangle.



Future laundering can be done using cool or warm water. The intended use of the cloth will determine whether to wash by machine or by hand. Most household cottons can be machine washed (see Sample b). Clothing may need to be handwashed, depending upon the cut of the garment and/or use of interfacings, trim, embellishments, etc.

Linen

There are a number of approaches to wet finishing linen (see Samples c and d). Linen is a stiff bast fiber that becomes softer and more supple the more it is used and laundered. Some people recommend that linen be taken from the loom and alternately treated to boiling hot water then ice water, which helps to break the fiber down and soften it. I have recently been introduced to the technique of cold mangling, which I now prefer for bast fibers.

A cold mangle exerts great pressure on the textile without adding heat. Small hand mangles consist of a large dowel,

about 2½ to 3" across, and a flat board with a handle. The cloth is wrapped around the dowel, and then the flat board is placed on top of the dowel at right angles to it. The dowel is pressed down hard and rolled back and forth. This rolling is done until the fibers flatten and the cloth surface becomes shiny.

A large cold mangle often weighs many hundreds of pounds and consists of a flat table, a large box containing heavy rocks or slabs of stone, and rollers on which the box moves back and forth. The cloth is rolled around one of the dowels, then inserted into the mangle between the table and the box, whereupon the weight of the box presses down on the roller and cloth.

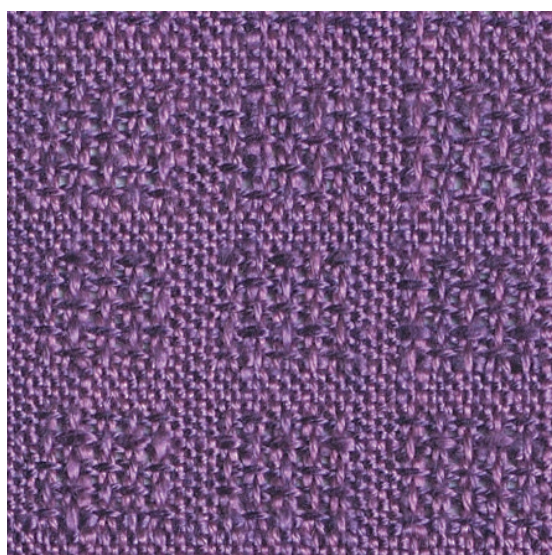
After wet finishing, linen should be handwashed in warm water, hung to dry, and then ironed. Machine drying is not recommended for line linen because it may dull the shine.

Cold mangling also improves the appearance of cotton—a 16/2 cotton table runner will look as though it was woven with mercerized cotton.

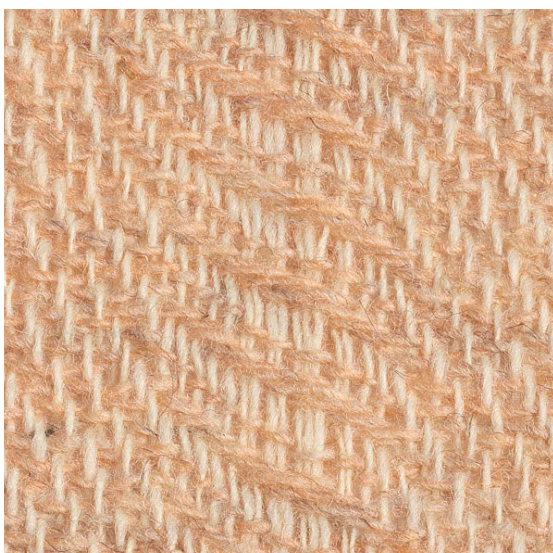
Sample e (left):
unfinished 20/2
spun silk woven in
huck lace stripes at
24 epi and ppi.



Sample f (right):
the same cloth,
wet finished.



Sample g (left):
unfinished wool
singles woven in an
undulating twill at
12 epi and ppi.

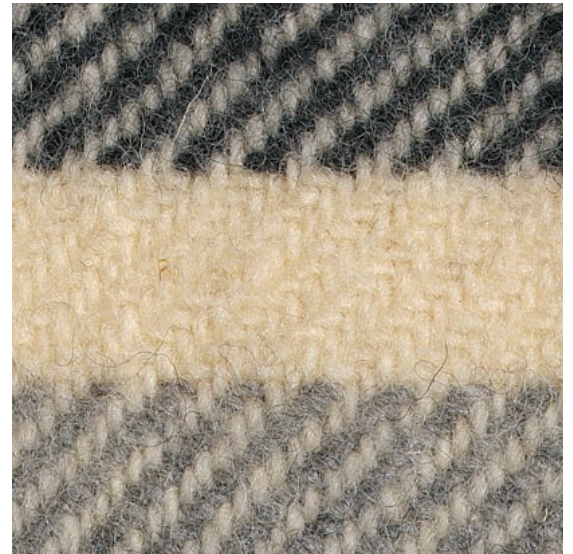


Sample h (right):
the same cloth,
wet finished by
hand.



Sample i (left): unfinished wool singles woven 2/2 twill at 12 epi and ppi.

Sample j (right): the same cloth, wet finished by machine.



Silk

Wet finish small silk items, such as scarves, by hand in warm water using a liquid soap. Swish the item gently through the water and rinse without squeezing. Then lay the scarf out flat to damp dry, or hang over a rack in the bathtub until the excess water drains out. Hard press immediately until dry, or almost dry—pressing directly onto silk brings out the shine. This method results in a very stiff fabric, but a little handling will soon soften it as will a few minutes tumbling in the dryer with no heat.

Silk yardage is machine washed using a gentle cycle and warm water. The dryer is used to remove excess water; then the fabric is given a hard press.

Wool

Wool and hair fibers are prone to a process called fulling. While not all wools will full, the majority of them will, even if only to a small degree. Fulling requires the application of agitation or intermittent compression. During fulling, wool fibers actually begin to migrate. Like inchworms, individual fibers elongate in the direction of the root and then contract, moving within the cloth. Not only do the fibers move, but they also shrink, which results in dimensional loss. The more heavily the cloth is fullled, the greater the shrinkage and dimensional loss will be, and the cloth becomes thicker. The weave structure becomes obscured as the individual fiber ends protrude from the yarn to create a surface fuzz or nap. Taken to its extreme, a significantly fullled cloth, such as Melton cloth or Wadmal, can look like felt.

Fulling is an incremental process; therefore, once the cloth has been developed to its final state, care needs to be taken to keep it as it is. Normal washing should not include agitation, or additional fulling with its attendant shrinkage and thickening will occur. Small items can be gently handwashed in cool water. Garments can handwashed or dry-cleaned.

Different wools respond differently from each other when finished. The same wool woven at different setts will result in a cloth with very different characteristics, as will varying the amount of agitation or fulling that is applied. Generally speaking, the more fulling intended, the more room should be left between the threads. Photos g and h, page 16, show an unfinished and fullled fabric woven in an undulating twill using a singles wool yarn for warp and weft.

The difference between a wool that has been agitated and one that has had intermittent compression will be noticeable in the hand or drape. Agitation alone creates a cloth that is soft, fuzzy, and drapable—perfect for blankets or scarves because air pockets are created by the fibers that poke out of the yarn and make the cloth warm to wear. (See Photos i and j.)

Fabric such as Wadmal is created by using a hammer mill. This form of intermittent compression produces a fabric that is dense and harder than a cloth that has only been agitated. This harder surface resists pilling and abrasion and stops wind from penetrating the fabric.

Woolen yarns have been spun with the expectation that some degree of fulling will occur. Although worsted yarns are not expected to be fullled, many will do so beautifully.

Sampling is essential when you are trying out a new wool yarn. Stop often as you wet finish samples to examine the stability and hand. Continue the process until it is “over” done, just to see what happens when fulling is taken to the extreme. Sometimes unexpected and interesting things occur, such as a 40/2 worsted wool that crinkles. If I hadn’t taken a sample to the extreme, I would not have experienced this phenomenon. The more wool you full, the better you will be able to forecast how a particular yarn will behave. The small investment in experimenting will pay off down the road when you want to use the full spectrum of effects.

Swatch collection #31 *by Sharon Alderman*

Antique oriental rugs were my inspiration for this collection; see page 20. After looking at yarn samples, I chose indigo blues and reds from both madder (the warmer side of red) and cochineal (the cooler side of red). As has always been the case for me, once I defined the colors, everything began to fall into place. My next decision had to do with the fabric use. For fall, a dressy suit, coat, jacket, and dress seemed appropriate.

First, I wanted to make a lightweight suit fabric that would tailor well and be a pleasure to wear. My need for suppleness suggested fine worsted yarns whose texture would have to come from the weave structure. I drew out several possibilities and wove a couple before settling on the cloth—plain weave for stability, and lightness with weft floats on ornamentation. The zigzag pattern (see the middle fabric at the right on page 20) came about when I thought about the dictum that styles are “unsuited for obvious diagonals.” While my fabric “zigs,” it also “zags.”

The coat fabric needed to be heavy for warmth, but I wanted it to be unusual. I thought it would be fun to make it reversible with a slightly different color on each face. Then the notion of plus signs struck me. The trick was making them show up on both sides without disastrously long floats. A quick pattern sketch helped me figure out a way to weave within an 8-shaft limit, and it worked (see the fabric at the left on page 20).

The jacket fabric is also heavier than the suit for warmth, and a looped mohair adds a bit of texture to the cloth (see the fabric at the top right on page 20). To keep the 2-block turned twill on eight shafts and yet have enough shafts to outline the blue squares with the red loop, I used a 3-shaft turned twill (2/1 twill vs 1/2 twill). One block is threaded and woven with the mohair loop at its beginning and end.

I chose 18/2 JaggerSpun Superfine Merino for the soft, lightweight dress fabric (at the bottom on page 20). I didn’t want a lot of texture next to the skin, but I did want visual excitement. I drafted four or five twill threadings and treadlings and finally settled on a pattern with no obvious diagonal or stripe in either direction. Using eight shafts, I wove it in a twill pattern I had not used before, and the result is an iridescent cloth with a wonderful hand.

It was great fun to design, perfect, and weave this collection of fabrics to celebrate the 20th anniversary issue of *Handwoven!*

Draft for suit fabric

8	8			8	8	8	
7	7			7	7	7	
	6	6		6	6	6	
		5	5		5	5	
			4	4		4	
				3	3		3
					2	2	
						1	1

Suit fabric description

Plain weave with weft floats on one side and warp floats on the other (middle fabric at the right).

Warp and weft

18/2 JaggerSpun Superfine Merino at 5,040 yd/lb, Raspberry and Claret.

E.P.I. 24.

P.P.I. 24.

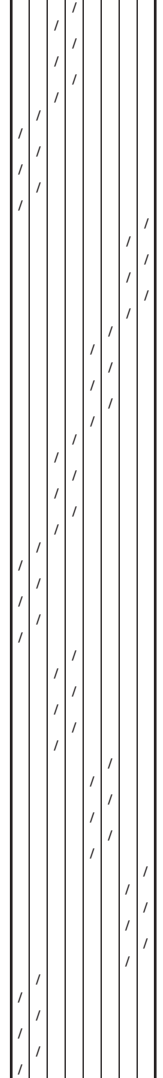
Take-up and shrinkage 13% in width, 12% in length.

Weaving

Follow the treadling in the draft using an even beat. When the warp and weft color are different, as they are here, any unevenness will show as color changes in the cloth. Be careful not to tug the weft so that it draws in at the sides. Where the floats fall at the edge of the fabric, the weft is not always caught in the selvedge. If you plan to use this cloth with the edges showing, use floating selvedges.

Finishing

Wash the fabric gently by hand in very warm water and mild detergent. Remove the excess water in the spin cycle of a washing machine or by rolling in towels. Press on both sides until dry to the touch.





*The collection,
clockwise from
the left:
coat fabric,
jacket fabric,
suit fabric,
dress fabric (at
bottom right).*

Rya pillow *by Janice Jones*

Tying rows of rya knots is a slow process, but design creativity is only limited by your imagination. You'll find yourself completely absorbed in watching the design grow, never thinking about how long it is taking.

For this pillow design, I leafed through books of peasant embroideries, rugs, and crosstitch patterns looking for motifs and borders that would work well in a small square pillow. The Shetland yarn used for the knots is soft, so not much finishing is needed, and the color selection is excellent. I used a temple to help maintain a consistent warp width.

Fabric description Plain weave with knotted pile.

Finished dimensions One pillow 12" by 12".

Warp and weft

Warp: 2-ply Harrisville Shetland wool at 1,800 yd/lb, 326 yd Sand #43. Ground weft: 2-ply Shetland wool, 310 yd Sand. Pile weft: 2-ply Shetland wool, 260 yd Sand, 40 yd each of Midnight Blue #33 and Poppy #65, 35 yd Camel #42, and 25 yd Hemlock #8.

Notions 12" polyester pillow form.

Total warp ends 186.

Warp length

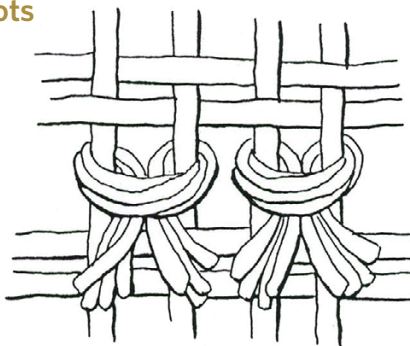
1¾ yd (allows for take-up and 27" loom waste).

E.P.I. 12. **Width in reed** 15½".

P.P.I. 12 picks and 6 rows of knots (measured off the loom).

Take-up and shrinkage 7% in width and length.

Rya knots



Place the weft strand over 2 warp threads. Wrap the ends of the strand around the 2 warp threads, bring them up between the 2 threads, and pull them tight. (The drawing shows a group of strands, but only one 2-ply strand is used for this pillow.)

Weaving

Prepare the rya weft by cutting the yarns into 17⁄8" pieces. With a firm beat, weave 1" plain weave. For the first row in the Graphed Design: Tie one row of knots (all Sand); weave 2 picks of plain weave; tie one row of knots in Sand; weave 2 picks plain weave. For the next graphed row, tie two rows of knots in Sand and Hemlock, following each row with 2 picks plain weave. Continue for each row in the Graphed Design.

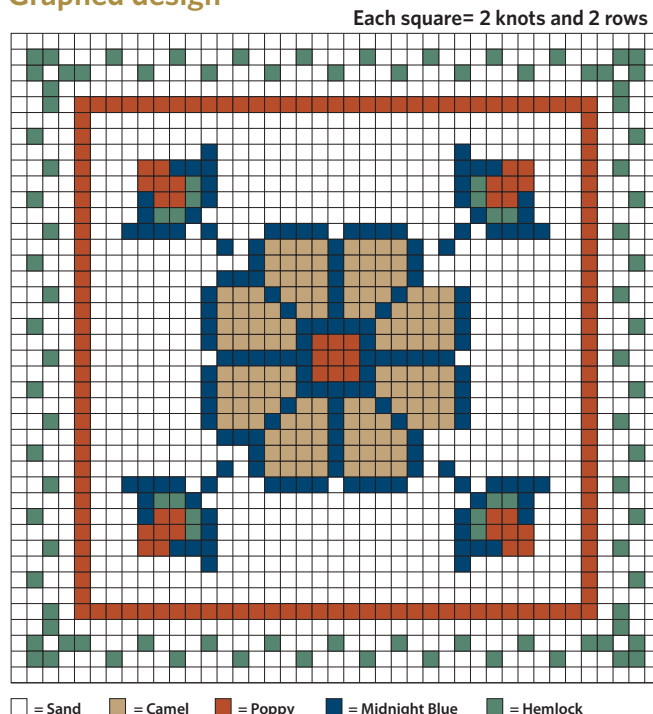
For firm selvages, I wove 2 extra picks about 1" wide at each side of every knotted row (i.e., from the right, open the shed, take the shuttle into the shed and bring it out 1" from the edge, change sheds, take the shuttle back into the shed and back to the right edge. Then, in the next plain-weave shed, take the shuttle all the way through to the left edge and weave the extra inch on the left in the same way.

End pillow front with 1" plain weave. Weave 2 picks in a contrasting color and then weave the back for 15" in plain weave.

Finishing

Remove the fabric from the loom, cut the front and back pieces apart, and secure the raw edges with machine stitching. Steam-press both pieces from the wrong side. Right sides together, machine stitch three sides with a 7⁄8" seam, using the edge of the pile as a guide. Turn the pillow right side out and insert pillow form, fold in seam allowances, and sew closed by hand.

Graphed design



Draft

46x			
4			4
	3		3
2		2	2
1		1	1
plain weave			
		/	/



For more about tying rya
and ghiordes knots, see
Peter Collingwood, *The
Techniques of Rug Weaving*.
New York: Watson-Guption
Publications, 1968,
pp. 225-235.

Originally published in *Handwoven*, January/February, 1990, pp. 54, 81-82.

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A throw from my stash by Fran Curran

As most other weavers do, I have many cones on my shelves with a little yarn left on each one—not enough for most projects, but too much to discard. This throw, woven in a color-and-weave-effect twill from *A Weaver's Book of 8-Shaft Patterns* (see Resources), turned out to be an ideal project for some of my leftovers. Different-colored stripes of 8 dark ends alternate with 8 light ends in both warp and weft. The one restriction I would recommend is to use only one type of fiber to prevent problems with finishing: all wool, all pearl cotton, or all silk, for example.

My leftovers (about 30 different yarns in this throw) were mostly Harrisville 2-ply wools, many of which are no longer available. I hope you'll use this throw as inspiration for working with the yarns on your own shelves.

Designing the throw

I sorted my cones into two groups of about the same size, one of medium-to-dark colors and the other of medium-to-light colors. Then, I arranged the yarns in each group from dark to light. Generally, the colors moved along the color spectrum, although a very dark purple ended up with other very dark colors instead of with the lighter purples.

I decided to place the darker colors along the edges and progress to lighter colors in the center so that the two sides of the throw mirror each other. After determining the order of the dark colors, I paired up the light colors with the darks, often choosing pairs of the same family (a light blue with a dark blue, for example). Sometimes, I used one color as a dark in one pair, but as a light in another—a middle-value gray as the dark yarn with a green in the center of the warp and as a light yarn with dark colors at the edges.

At first, it seemed that a few of the colors wouldn't work with any of the others. I admit to a few moments of anxiety as I placed a pale raspberry and a pale lilac in the warp. However, despite my initial misgivings, I decided that these relatively light and bright colors might just spark the design, and indeed that proved to be true.

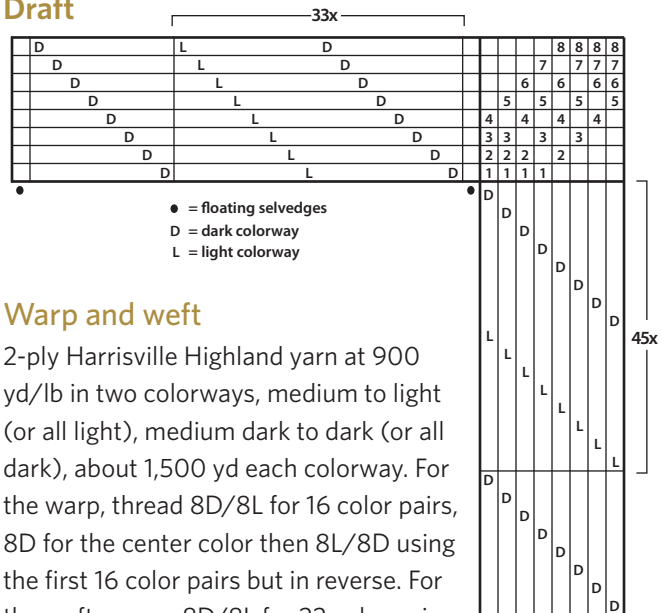
My yarns were in two different weights (Harrisville Highland at 900 yd/lb and Harrisville Shetland at 1,800 yd/lb), so the 8-pick weft bands measured two different widths. Suggested setts here are for Harrisville Highland.

Fabric description Color-and-weave effect twill.

Finished dimensions

One throw 43" by 64" plus 5" braided fringe at each end.

Draft



Warp and weft

2-ply Harrisville Highland yarn at 900 yd/lb in two colorways, medium to light (or all light), medium dark to dark (or all dark), about 1,500 yd each colorway. For the warp, thread 8D/8L for 16 color pairs, 8D for the center color then 8L/8D using the first 16 color pairs but in reverse. For the weft, weave 8D/8L for 22 color pairs, 8D for the center color, then 8L/8D using the first 22 color pairs but in reverse for 72" total. Note that each warp stripe requires 24 yd, each weft stripe 14 yd.

Total warp ends 538 (includes 2 floating selvages).

Warp length

3 yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 10. **Width in reed** 53 $\frac{1}{2}$ ". **P.P.I.** 10.

Take-up and shrinkage 20% in width and length.

Warping and weaving

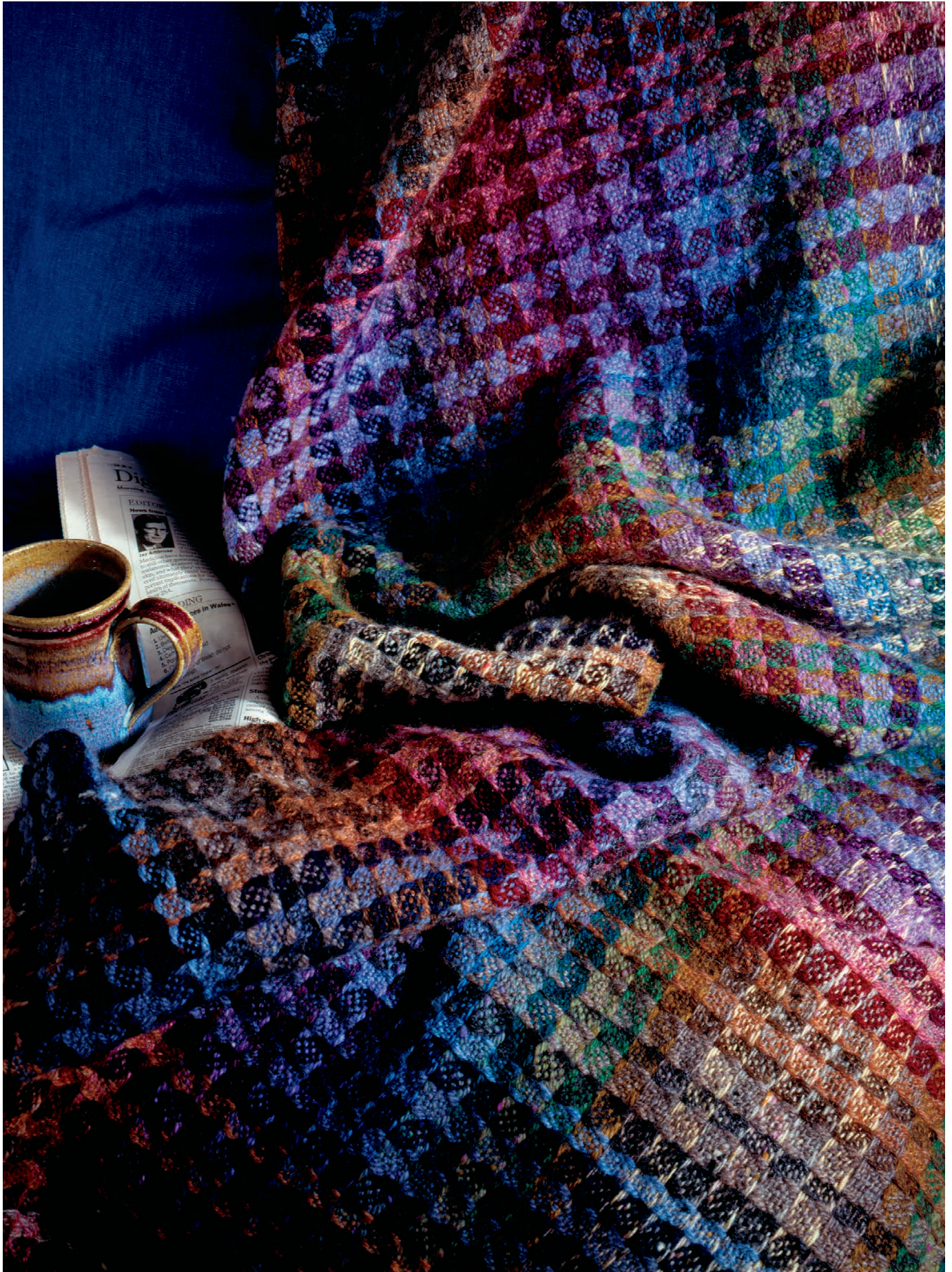
Wind a warp alternating stripes of 8 ends each dark color alternating with 8 ends each light color. Weave the throw for 72" following the treadling and using the colors as described above.

Finishing

Remove the fabric from the loom, and using 16 ends at a time and aligning the braids with the colors, braid a 4" fringe in 3-strand or 4-strand braids (or work a twisted fringe). Machine wash, warm water, gentle cycle, with mild detergent for 4–5 min. Machine rinse, warm water, short spin cycle; add a little fabric softener to the final rinse. Hang to dry until slightly damp and steam press. After this initial finishing, careful handwashing or dry cleaning is recommended.

Resources

Strickler, Carol, ed. *A Weaver's Book of 8-Shaft Patterns*. : Loveland, Colorado: Interweave Press, 1991, p. 20.



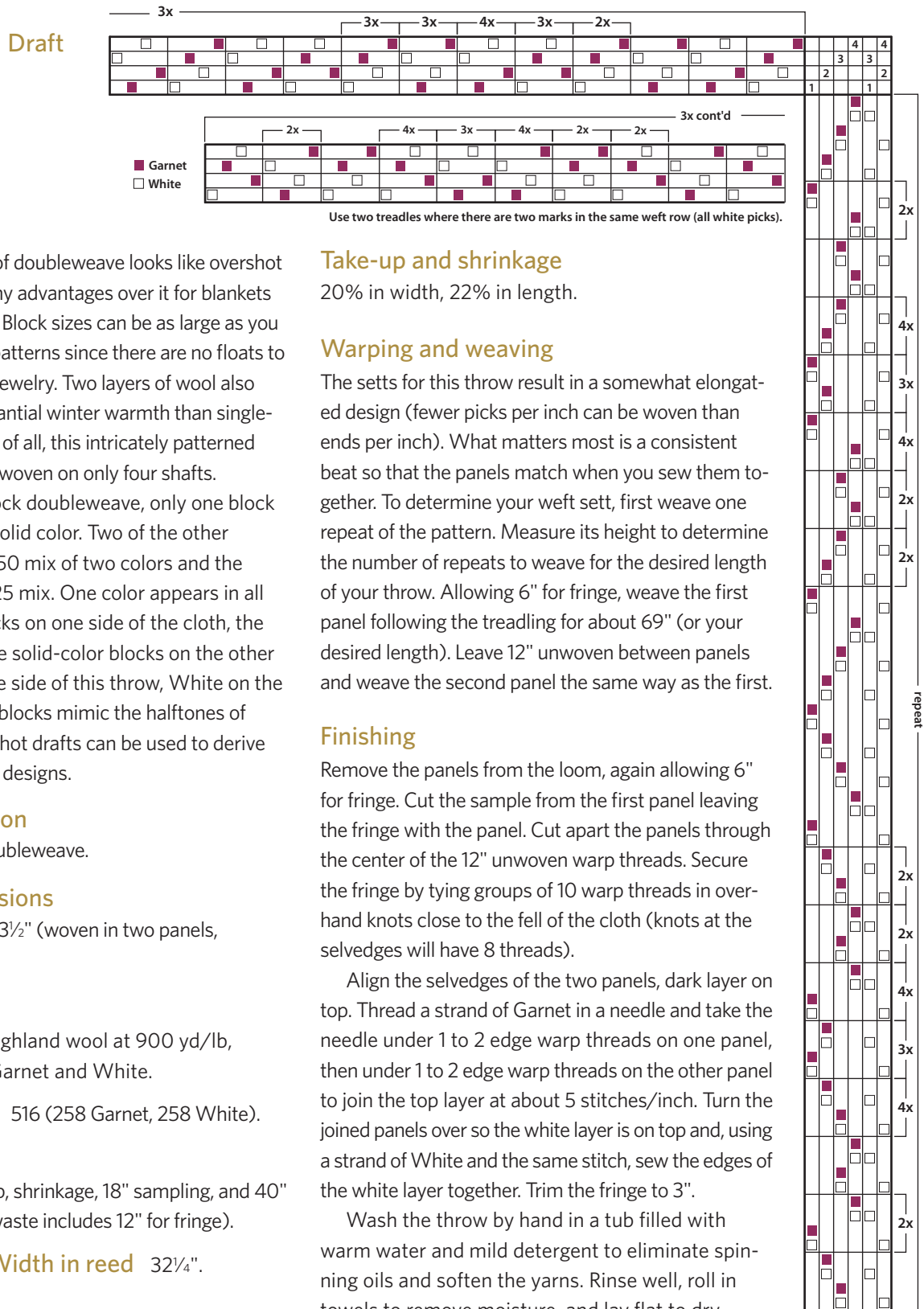
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4-shaft, 4-block doubleweave throw

by Louise Cortelyou



This version of doubleweave looks like overshot but has many advantages over it for blankets and throws. Block sizes can be as large as you like for large-scale patterns since there are no floats to catch on fingers or jewelry. Two layers of wool also provide more substantial winter warmth than single-layer overshot. Best of all, this intricately patterned doublecloth can be woven on only four shafts.

In 4-shaft, 4-block doubleweave, only one block at a time shows a solid color. Two of the other blocks show a 50/50 mix of two colors and the fourth block a 75/25 mix. One color appears in all the solid-color blocks on one side of the cloth, the other color in all the solid-color blocks on the other side (Garnet on one side of this throw, White on the other). The 50/50 blocks mimic the halftones of overshot, and overshot drafts can be used to derive these doubleweave designs.

Fabric description

4-block, 4-shaft doubleweave.

Finished dimensions

One throw 52" by 53½" (woven in two panels, 26" by 53½" each).

Warp and weft

2-ply Harrisville Highland wool at 900 yd/lb, 2,320 yd each of Garnet and White.

Total warp ends 516 (258 Garnet, 258 White).

Warp length

6 yd (allows take-up, shrinkage, 18" sampling, and 40" loom waste; loom waste includes 12" for fringe).

E.P.I. 16 **Width in reed** 32¼".

P.P.I. 10

Take-up and shrinkage

20% in width, 22% in length.

Warping and weaving

The setts for this throw result in a somewhat elongated design (fewer picks per inch can be woven than ends per inch). What matters most is a consistent beat so that the panels match when you sew them together. To determine your weft sett, first weave one repeat of the pattern. Measure its height to determine the number of repeats to weave for the desired length of your throw. Allowing 6" for fringe, weave the first panel following the treadling for about 69" (or your desired length). Leave 12" unwoven between panels and weave the second panel the same way as the first.

Finishing

Remove the panels from the loom, again allowing 6" for fringe. Cut the sample from the first panel leaving the fringe with the panel. Cut apart the panels through the center of the 12" unwoven warp threads. Secure the fringe by tying groups of 10 warp threads in overhand knots close to the fell of the cloth (knots at the selvages will have 8 threads).

Align the selvages of the two panels, dark layer on top. Thread a strand of Garnet in a needle and take the needle under 1 to 2 edge warp threads on one panel, then under 1 to 2 edge warp threads on the other panel to join the top layer at about 5 stitches/inch. Turn the joined panels over so the white layer is on top and, using a strand of White and the same stitch, sew the edges of the white layer together. Trim the fringe to 3".

Wash the throw by hand in a tub filled with warm water and mild detergent to eliminate spinning oils and soften the yarns. Rinse well, roll in towels to remove moisture, and lay flat to dry.



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Cloud Light Lap Robe *by Sharon Alderman*

Wet finishing, whether by waulking, handfulling, or fulling in the washing machine, transfigures woolen fabrics. This fringed lap robe demonstrates the profound effect fulling has on an open and gauzy—but not soft!—woolen web. Careful machine washing transforms the thready woolen that looks like cheese-cloth on the loom into a wonderfully light and fluffy blanket. The warp is sett at 8 ends per inch and the weft barely nudged into place to weave square. After soaking, the fabric is machine washed for about five minutes (with careful monitoring!). Over-fulling could make the fabric stiff and board-like.

Project notes

The open sett makes this project quick to warp and weave. The most difficult part is to maintain a steady and even 8 picks per inch. It is also difficult to see the difference in the colors on the loom, so care must be taken to count the picks of each color carefully.

Fabric description

Plain weave.

Finished dimensions

One lap robe 35" by 52" plus 5" fringe at each end.

Warp and weft

2-ply Harrisville Shetland wool at 1,800 yd/lb, 700 yd Chicory, 558 yd Lilac, and 691 yd Silver Mist.

Total warp ends 374.

Warp length

3 yd (allows for take-up, shrinkage, and 27" loom waste).

E.P.I. 8. **Width in reed** 46³/₄". **P.P.I.** 8.

Take-up and shrinkage 25% in width and length.

Weaving

Allow 7" unwoven warp at each end for fringe. Hemstitch at each end in groups of 5 or 6 warp ends; these groups will be used to make the plied fringe later, so line them up with the warp stripes. Weave following the Warp Color Order (weave the repeat 5x instead of 3x).

To maintain an even beat of 8 picks per inch: Throw the shuttle, change the shed, and then nudge (don't beat!) the weft into place. Count the number of picks of each color carefully as you go.

Finishing

Remove the fabric from the loom and make a twisted fringe including two hemstitched groups in each fringe; secure with an overhand knot. Bring the two selvages of the fabric together to make a tube and use a smooth slippery yarn to baste the selvages together by hand. (this will prevent ruffling and irregular fulling of the edges during washing).

Fill the washing machine to its lowest level with very hot water and about 1 Tb of liquid dish-washing detergent. Agitate to mix the detergent and water, turn off the machine, and add the cloth. Push it under the water and let soak for 4 hr. After soaking, begin agitation on a regular cycle. The total agitation time will be about 5 min, but check the progress frequently. Stop the agitation just short of desired fulling because rinsing continues the fulling process. To determine fulling amount: Take a handful of cloth, squeeze out the water, and look at the fabric. There should be some

fuzz everywhere and no open spaces between threads—the individual threads should look blurred.

Spin out water, remove the fabric and refill the tub with warm water and a bit of fabric softener to reduce suds. Rinse with minimal agitation and spin out water. Repeat the rinse and spin cycles two more times without fabric softener. Remove the basting yarn from the selvages, open up the robe, and shake it well. Hold the cloth with one selvage in each hand and snap it apart in the weft-wise direction, section by section. Drape over a rack to air dry.



Warp color order

	3x						
134	16	16	2	16	16	16	Silver Mist
104			2	16	16	2	Lilac
136	2	16	16	2	16	16	Chicory
374							

Draft

4			4
3			3
	2		2
	1	1	
2		2	/
1	1		/
	/		/



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A family blanket *by Terry Collard*

Let's say everyone in your house is gone for the weekend and you get to do anything you want: no food to fix, no chauffeuring to do, no games to supervise, no sleepovers to chaperone. You're Home Alone!

How about diving into a pool of yarn and color and surfacing two days later with a finished blanket? This blanket would also make a great project for a weekend workshop; its beautiful colors and the magical texture of waffle weave will keep everyone mesmerized at the loom until the last pick brings the joy of a big, glorious, tangible reward.

Waffle weave

Waffle weave is especially thrilling to weavers because without any special effort on our part, the fabric takes on dimension before our very eyes. Its name is perfect—when the fabric is removed from the washing machine, something as unlikely as yarn has turned into the deep cells of a Belgian waffle. The waffle-weave draft used for this blanket requires seven shafts, although a similar blanket can be woven on four. The difference between the two versions is only that seven shafts produce bigger and deeper waffle-weave cells.

Fabric description Waffle weave.

Finished dimensions

One blanket 32" by 62" plus 3½" fringe at each end.

Warp and weft

2-ply Harrisville Shetland wool at 1,800 yd/lb, 495 yd each of Peacock, Plum, Poppy, Iris, and Topaz.

Total warp ends 480.

Warp length

3 yd (allows for take-up, shrinkage, and 30" sampling and loom waste; loom waste includes fringe).

E.P.I. 12 **Width in reed** 40". **P.P.I.** 12

Take-up and shrinkage 20% in width, 18% in length.

Warping and weaving

Wind a warp of 480 ends following the selected color order. Thread following the selected draft, beaming the warp under firm tension, packing carefully with paper or sticks. Unthread the last warp end on each side to use as a floating selvedge and weight. Weave a header to space the warp. Insert separators (1" wide cardboard strips) to allow 6" for fringe.

Begin and end the blanket with a few picks of scrap yarn. Weave the blanket following the same color order in the weft as in the warp. There are 840 picks in the blanket! Estimate the time it will take you to weave the blanket by timing your first 24 picks or so. Tuck weft tails around the floating selvedge and back into the shed 2–3" leaving about 1" extending from the cloth to trim after washing. Alternate sides as you begin each color.

Finishing

Allowing 6" for fringe, remove the fabric from the loom. Prepare a twisted fringe with two groups of 6 ends in each fringe removing scrap yarn as you go. Fill the washing machine with barely warm water and a small amount of liquid Dawn. Immerse the blanket and let soak 15 minutes. Do not agitate, skip to rinse cycle, rinse, and spin dry. Trim fringe and weft tails evenly.

7-shaft draft

40x						
7						
6	6			6	6	7
5		5		5	5	5
4			4		4	4
3				3	3	3
2			2		2	2
1				1	1	1

4-shaft draft

80x			
4			4
3	3		3
2		2	2
1	1	1	1

Warp and weft color orders

7-shaft threading

8x	
96	12
96	12
96	12
96	12
96	12
96	12
480	

4-shaft threading

16x	
96	6
96	6
96	6
96	6
96	6
96	6
480	



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Doublewidth blankets on four shafts

by Margaret Gaynes

Even if my loom were wide enough for a blanket, my arms aren't long enough! One can always weave a blanket in two panels and stitch them together, but the seam is almost impossible to hide. My favorite solution is to weave the blanket twice as wide as the width of my loom—in two layers with a fold at one side.

On a 4-shaft loom, two shafts are available for each layer. Several possible threading arrangements can be used. With the draft given here (at right), shafts 1 and 3 weave the top layer, shafts 2 and 4 the bottom layer. To weave plain weave in the top layer, shafts 1 and 3 are raised alternately. To weave plain weave in the bottom layer, 2 and 4 are raised alternately. So that the bottom layer remains underneath the top layer, both top-layer shafts (1, 3) are raised when the bottom layer is woven. Examine the path of the weft shown below the draft. The weft travels across the top layer (under 1, over 3), across the bottom layer (under 2, over 4, and under top-layer shafts 1 and 3), back across the bottom layer (under 4, over 2, and again under top-layer shafts 1 and 3), and then returns to its starting point, traveling back across the top layer (under 3 and over 1).

Inspiration for this blanket

Areas of color separated by a blue grid in David Hockney's painting "Garrowby Hill" are the inspiration for this blanket. Unless you are a dyer, which I'm not, yarn color choices are limited by those available commercially. Harrisville Designs Shetland wool comes in a wide color range and is especially suitable for blankets.

Like the background and grid colors in the painting, the colors in the large blocks in the blanket (Periwinkle, Aster, and Seagreen) are close in value to each other and to Aegean (blue), which is used for the stripes that represent the grid. The focal point of the painting is the bright center section in yellows and oranges. Center stripes of Cornsilk and Seagreen form the corresponding focal point in the blanket.

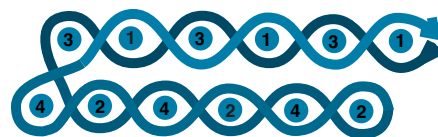
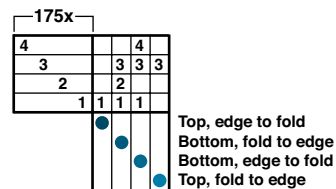
Warp color order: single layer

	12x													
288	72	24	24	24		24	24	24	72					Aegean
216	48		48		2		48		48					Seagreen
72								72						Periwinkle
72		72												Aster
52					4		4							Cornsilk
700														

Warp color order: two layers

	6x						72x							
288		48	48		48	144								Aegean
216	4		96			96								Seagreen
72					1									Periwinkle
72						1								Aster
52	4	8												Cornsilk
700														

Draft for doublewidth blanket



Warping for double width

To plan warp color orders for doublewidth blankets, first design color arrangements for the blanket as a single layer (see Warp Color Order: Single Layer). Winding the warp and threading the loom for a doublewidth piece is easiest if the stripes in the two layers line up with each other and even easier if they are the same colors in both layers. This color order is then "folded" to make two layers. The fold for our color order is on the left side in the center of a narrow yellow stripe.

Because the stripe sequence is symmetrical, the stripes in the two layers line up with each other. They are the same colors in both layers except for the Periwinkle and Aster stripes; the top layer is Periwinkle and the bottom layer is Aster.

One challenge to weaving doublewidth fabrics is that the sett is twice what it would be for a single layer. This blanket, at 12 ends per inch as a single layer, becomes 24 ends per inch when it is woven doublewide (2/dent in a 12-dent reed). If you warp from the front (i.e., thread before beaming), to reduce abrasion, prevent sticking, and ease the warp through the heddles, raise shafts 1 and 3 and put a dowel under these heddle frames on each side of the loom (on my loom this holds shafts 1 and 3 up about 3"). This will separate the threads as they wind on, making the beaming process much smoother and easier.





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The fold

Another major challenge to weaving doublewide fabrics is the fold. If draw-in occurs at the fold edge, crowded warp threads will show in the center of the blanket when it is opened. If the weft is too loose, weft loops will show.

To provide an invisible fold, my trick is to thread a taut fishline with each of the last 2 warp threads at the fold edge. Use two lengths of 25-lb test fishline about 1 yd longer than the warp. Tie them onto the front apron rod and sley them both through the same dent as the 2 warp threads. Thread each fishline through a separate heddle on the same shaft as the corresponding warp thread (on shafts 3 and 4 for this blanket). Add a weight of about 2 lb to each fishline. Use milk or bleach bottles filled with water or sand—or use cooking pots as I do!

Warping and weaving

Wind the warp following the Warp Color Order: Two Layers on page 31. Since ends from each layer alternate in the warp; wind the warp for the Periwinkle/Aster section holding 1 end Aster, 1 end Periwinkle, keeping them separated with a finger.

Thread following Draft for Doublewidth Blanket. For the Periwinkle/Aster stripe, thread Periwinkle on shafts 1 and 3; thread Aster on shafts 2 and 4.

Before starting to weave the blanket, raise shafts 1 and 3 to check the threading. Be sure that the Periwinkle/Aster stripe shows all Periwinkle in the top layer. The fishing line should also be installed before you start the blanket so you can practice using it. Make sure the weft turns snugly against the fishline, leaving no loops.

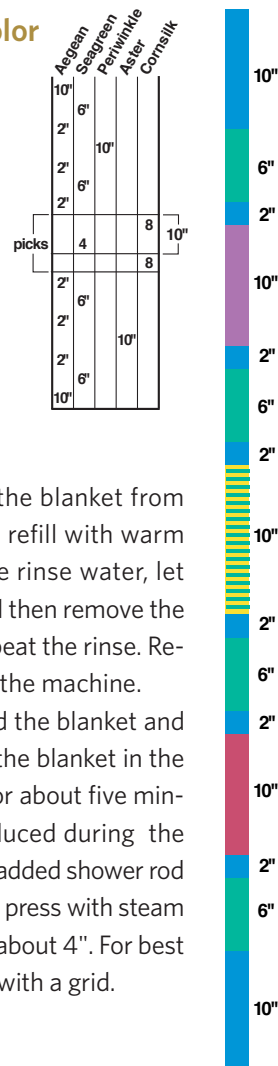
Allow 12" at each end of the blanket for a twisted fringe. Weave a header with scrap yarn using the treadling sequence in the Draft, then raise the top layer again to check that the two layers are formed properly with the fold at the left side.

Weave the blanket following the treadling in the Draft and the Weft Color Order using each weft color for the number of inches or picks indicated. (One pick in the center section means one trip through the shed with the shuttle.) Begin and end weft threads on the selvedge side.

Finishing

Cut the fabric from the loom. Prepare a twisted fringe using two groups of 6 ends for each fringe. Harrisville Shetland contains spinning oils and must be washed to remove oil and allow the yarn to bloom and soften. The finishing process can be done in the bathtub, but it is easier in the washing machine, and it takes less water. The complete process does take some manipulation of washing machine settings. If you don't want to bother with this, you can use the machine for the agitation and the spin processes only and do the rinsing in a washtub or bathtub.

Weft color order



If you choose to use the washing machine, fill it with hot water and add a mild detergent. Stop the machine and put the blanket in the water to soak for thirty minutes. Then agitate the blanket, gentle cycle, for six minutes, stopping halfway through the agitation to reposition the fabric.

Stop the machine and remove the blanket from the water. Empty the machine and refill with warm rinse water. Add the blanket to the rinse water, let agitate for about thirty seconds, and then remove the blanket. Empty the machine and repeat the rinse. Remove the blanket again and empty the machine.

Setting the machine on spin, add the blanket and spin for about thirty seconds. Fluff the blanket in the dryer on the air setting (no heat!) for about five minutes to remove any wrinkles introduced during the spin cycle. Hang the blanket over a padded shower rod to finish drying. When dry, if needed, press with steam on a wool setting. Trim the fringe to about 4". For best results, use a rotary cutter and mat with a grid.

Fabric description

Plain weave, woven doublewidth.

Finished dimensions

1 blanket 49½" by 76½" with 4" fringe at each end.

Warp and weft

2-ply Harrisville Shetland wool at 1,800 yd/lb, 1,700 yd Aegean (blue); 1,350 yd Seagreen, 465 yd each of Periwinkle (blue-violet) and Aster (red-violet), 345 yd Cornsilk (yellow).

Total warp ends 700 ends.

Warp length

3½ yd (allows for take-up, shrinkage, and 36" sampling and loom waste).

E.P.I. 24 (12 epi/layer).

Width in reed 29¼".

P.P.I. 22 (11 ppi/layer).

Take-up and shrinkage 15% in width and length.

Wadmal vest: an easy project *by Jane Patrick*

Wadmal, a bulky, heavily full wool fabric, has a long, well-documented history in Scandinavia and the British Isles. In these cold, damp climates, resourceful people discovered wool to be excellent for warmth as well as for repelling moisture or wicking it away from the body. Surprisingly, wadmal also served as sailcloth when in the seventh century the Vikings looked for ways to alter their open boats for long ocean voyages. Wadmal, supported with leather strapping, was used for the large square sails on these ships.

We see further evidence of this rough, coarse fabric recorded in Icelandic sagas, where it shared status with silver for payment of wages and fines. Woven on warp-weighted looms of yarns spun only on a drop spindle, wadmal was highly labor-intensive to produce—no wonder it became a valuable commodity! Lief Erickson, on a prolonged stay at the Faroe Islands, mollified a young woman for his obvious dalliance (she became pregnant) with a gold ring, a walrus tusk belt, and a wadmal mantle. Recorded evidence tells of the manufacture and use of wadmal for mittens, coats, and even horse harnesses in fourteenth-century England.

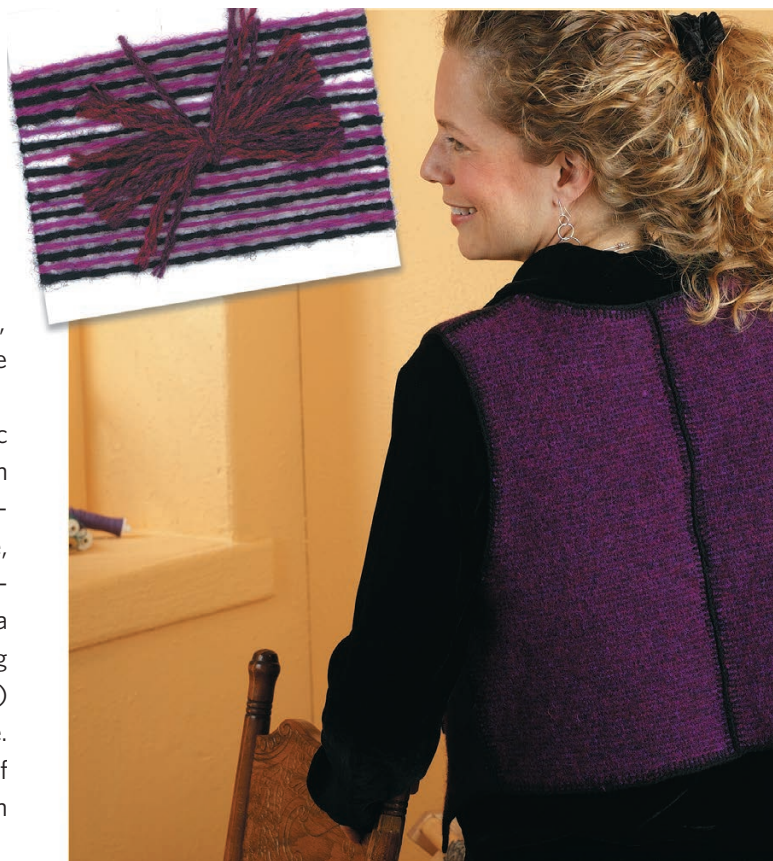
Today, we Westerners cannot imagine ordinary cloth valuable enough to note in household inventories or to use for paying wages or fines. But in some parts of the world this is still so. A Russian friend of mine once worked in a factory that paid its workers in Polish socks. Knowing all this will perhaps lead you to embrace this wooly vest for its simple, useful beauty when it warms you on a cold winter's day.

Weaving fabric for a wadmal vest

A woolen-spun yarn that will full well is the essential ingredient for wadmal. Harrisville's 2-ply Shetland is excellent for this purpose. Black and Plum alternate 1-and-1 in the warp; Black-berry and Garnet in the weft. After the fabric is washed, the four colors become a rich, heathery blend.

The vest fabric is woven on a 25" rigid-heddle loom, though a narrower loom can be used if the pattern layout is rearranged (with pattern pieces placed end-to-end instead of side-by-side and warp length increased). The fabric can also be woven on a 2-shaft or 4-shaft table or floor loom.

The weaving is easy and fast with only 9 picks per inch—I warped and wove the entire piece (not including prior sampling) on a Saturday afternoon. Hand-finishing the edges and seams,



however, takes more than 20 hours to complete, but you can carry your work along with you, much as you would your knitting.

Warping and weaving

Wind the warp holding 1 Black, 1 Plum together, separated by a finger. Thread the loom for plain weave and weave for 70".

Finishing the fabric

Machine zigzag raw ends to prevent raveling. Machine wash, regular cycle, hot water, with Wisk laundry detergent. Because this fabric was sufficiently felted after washing, I did not put it in the dryer but instead laid it flat to dry. Give it a hard steam press using a press cloth.

Cutting and sewing the vest

Lay out pattern as shown on page 35 and cut out the pieces (except pocket). Machine zigzag raw edges with black sewing thread. With Black Shetland wool, blanket stitch (see page 35) around all edges of all pieces. Keep the stitches uniform (my stitches are $\frac{1}{4}$ " apart, $\frac{3}{8}$ " deep), as they form the base for the crochet trim.

For the edge trim, using a size C crochet hook, single crochet into every blanket stitch loop, working with the right side of the fabric facing you. Join side and shoulder seams with single crochet (crochet each seam in the same direction). Set the stitches with a good steam pressing on the wrong side of the fabric using a press cloth, hot iron, and lots of pressure.

Cut the fabric for the pockets against the grain, and add them after the vest is assembled. Machine stitch in place and then overcast the top edge by hand with black sewing thread to protect the edges against fraying. Stem stitch around the edges and across the top with Black Shetland. Add pocket embellishment as desired. Steam press as before using a press cloth.

Fabric description Plain weave.

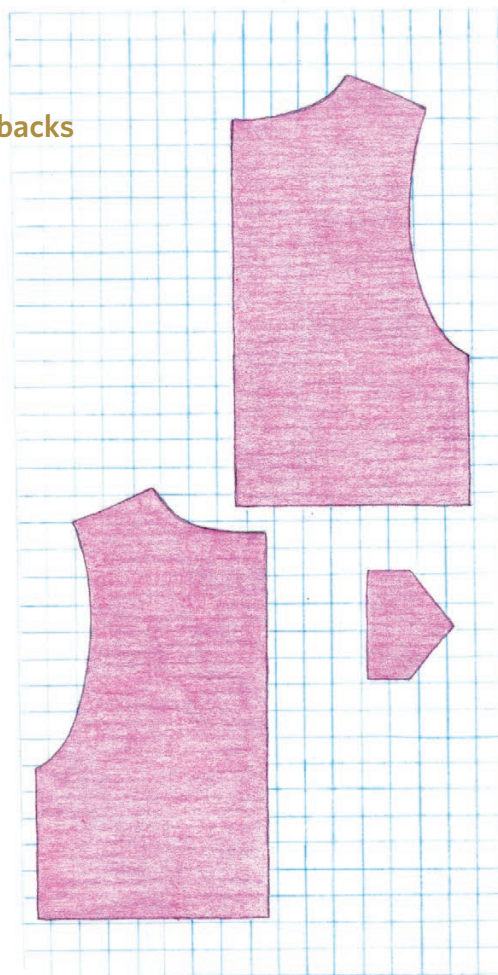
Finished dimensions Fulled yardage 18" by 62" for a small vest, chest circumference of 34½".

Warp and weft

Warp: 2-ply Harrisville Shetland wool at 1,800 yd/lb, 460 yd Black (includes amount for crochet trim), and 378 yd Plum). 2-ply Harrisville Shetland wool, 510 yd each Blackberry and Garnet.

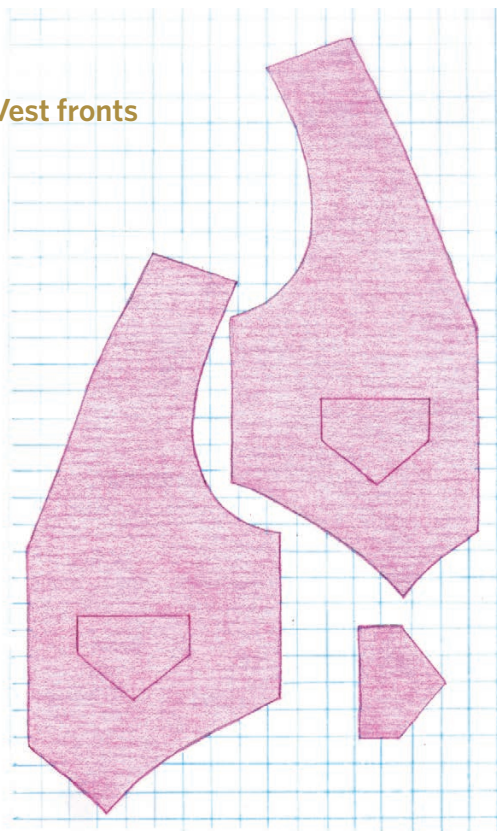
Notions Tapestry needle, size C crochet hook, black sewing thread, beads and buttons for pocket trim.

Vest backs



1 sq - 1"

Vest fronts



1 sq - 1"

Total warp ends 252.

Warp length

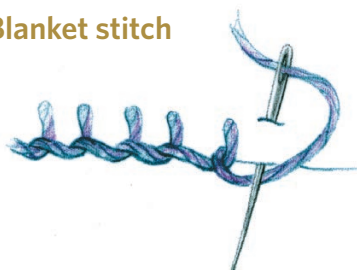
3 yd (allows for take-up, shrinkage, and 34" sampling and loom waste).

E.P.I. 10 **Width in reed** 25¼".

P.P.I. 9 (alternate 1 Blackberry, 1 Garnet).

Take-up and shrinkage 28% in width, 16% in length.

Blanket stitch



Stem stitch





Fair Isle patterns in overshoot *by Jean Scorgie*

I've always been fascinated by the intricate play of colors in knitted Fair Isle sweaters. Being more of a weaver than a knitter, however, I wanted to achieve a similar look in handwoven fabric.

Traditional knitted Fair Isle sweaters are made up of bands of pattern motifs. In many designs, a rather complex pattern band alternates with a band of border pattern, or a very narrow "peerie" pattern (Shetland vernacular for "small"). The motifs in the bands are symmetrical from side to side and from top to bottom and have an odd number of pattern rows, with the center pattern row in a contrasting color for emphasis. Only two colors are usually used in each band of motifs.

Overshot patterns, with their variety of detail and symmetry, lend themselves to Fair Isle interpretation. Although most overshoots are woven as all-over pattern, they can be easily cropped into decorative bands separated by successive picks of tabby.

A search through the collections of overshoot drafts in Resources, page 39, will reveal many that are suitable for Fair Isle designs. You can choose patterns with diagonals, ovals, or rectangles in various combinations. Avoid large motifs that have many ends in a single block—these have long floats that will easily snag if they are used for clothing. Drafts for miniature overshoot designs are ideal. As you look at drawdowns and photographs, slide two pieces of paper apart and together over the designs to isolate bands of pattern.

Look for a major motif that has an interesting center block where you can use a contrasting color. You can add variety to your design by choosing a pattern in which the minor motif (the smaller motif that joins the major motifs in many overshoot drafts) is different from the major motif. (In some overshoots, such as the one I used for these vests, they are actually the same).

Before deciding on a specific overshoot draft, check the scale of the pattern and bands you intend to use. To determine the width of the repeat, divide the number of ends in one repeat of the threading by the sett of your warp yarn. The height of a pattern band is the number of pattern/tabby pairs divided by the total number of picks per inch. Be sure to visualize how these measurements will fall on the body in the finished garment.

Fabric description

Overshot and plain weave.

Finished dimensions

Yardage 26" by 90" for three vest fronts (vest chest circumference is 42" and length from shoulder to hem 25"). Check pattern for specific amount of finished fabric needed.

Warp and weft

Warp for three vest fronts: 2-ply Harrisville Shetland wool at 1,800 yd/lb, 1,256 yd White. Weft: 2-ply Harrisville Shetland wool.

Weft for gold vest (see photo of fabric on page 39): 320 Straw (tabby weft), 80 yd Foliage, and 43 yd each of Teak, Gold, and Hemlock.

Weft for blue vest (see vest photo on page 38): 320 yd Cornflower (tabby weft), 75 yd each Chickory and Periwinkle, and 25 yd Aster.

Weft for gray vest (see photo of fabric on page 39): 320 yd Oatmeal (tabby weft), 70 yd Charcoal, 110 yd Camel, 100 yd Pebble, and 60 yd Sand.

Notions

Vest sewing pattern and lining fabric (in colors that coordinate with vest colors) and notions required by pattern.

Total warp ends 314 (includes 2 floating selvages).

Warp length

4 yd (allows for take-up, shrinkage, and 40" sampling and loom waste).

E.P.I. 10.

Width in reed 31 $\frac{3}{5}$ ".

P.P.I. 20 (10 tabby, 10 pattern).

Take-up and shrinkage 16% in width, 10% in length.

Weaving

Follow the treadling sequence for 33" for fronts of each vest using a tabby weft before each pattern pick (note that several picks of tabby weft without a pattern weft also separate the bands of overshoot).

Finishing

Remove the fabric from the loom and machine wash in warm water with mild detergent on a gentle cycle for 3 min. Hang or lay flat to dry. Cut and sew vests following vest pattern, handling pieces carefully or stay-stitching raw edges.



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TIPS FOR PLANNING, HEMSTITCHING, AND FRINGING

TAKE-UP AND SHRINKAGE

Weft take-up and shrinkage. As you weave, extra weft length (beyond the width of the warp in the reed) must be placed in the shed to allow for weft take-up (in *Handwoven* projects, this amount is included in required weft yardage). The fabric then draws in as the weft bends over and under the warp threads, so that the width of the woven cloth is narrower than the width of the warp in the reed. The cloth narrows further after it is removed from the loom, and shrinkage narrows it even more if it is washed. To calculate the percentage of weft take-up and shrinkage, divide the finished width by the width of the warp in the reed.

Warp take-up and shrinkage. As you weave, the warp bends over and under the weft threads so that fabric length is less than the length of the warp threads that produce it (*Handwoven* projects give the number of inches allowed for this take-up under Warp Length). When you release tension and remove the fabric from the loom, the fabric takes up in the warp direction. If you wash the fabric, shrinkage further decreases its length. To calculate the percentage of warp take-up and shrinkage, divide the finished fabric length by the woven length (measured under tension on the loom) plus the inches given for warp take-up.

To calculate how long to weave a fabric for a specific finished length, use the percentage derived by dividing the finished length listed in the project by the woven length measured under tension on the loom (for this percentage, do not include the inches allowed for take-up in the warp yarn).

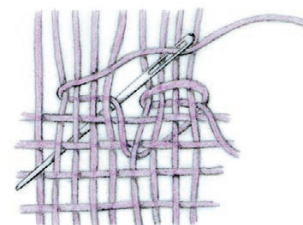
TWISTING (OR PLYING) THE FRINGE

Divide the number of threads for each fringe into two groups. Twist each group clockwise until it kinks. Bring both groups together and allow them to twist around each other counter-clockwise (or twist them together in that direction). Secure the ends with an overhand knot. (Use the same method to make a plied cord by attaching one end to a stationary object.)



SIMPLE HEMSTITCHING

Weave several picks of plain weave, ending with the shuttle on the right side if you are right-handed, left side if you are left-handed. Measure a length of weft three times the warp width and cut, leaving the measured length as a tail. Thread the tail into a blunt tapestry needle.



Take the needle under a selected group of ends above the fell and bring it up and back to the starting point, encircling the group. Pass the needle under the same group of ends, bringing it out through the weaving two (or more) weft threads below the fell. Repeat for each group of ends across the fell. Needleweave the tail into the selvedge and trim. (See * below.)

DOUBLE (ITALIAN) HEMSTITCHING

Weave several picks plain weave, ending with the shuttle on the right side if right-handed, left side if left-handed. Measure a length of weft four times the warp width and cut, leaving the measured length as a tail. Thread the tail into a blunt tapestry needle.

Take the needle under a selected group of warp ends above the fell and bring the needle back to encircle the ends. Next, pass the needle under the same ends but come up two or more weft rows down from the fell. Then bring the needle back around the same group of ends below the fell. Then begin again, encircling the next group of ends. (See * below.)

**For both methods: To hemstitch the first end of a piece, weave a header, weave four or five picks of plain weave (or of the basic weave structure used in the piece), and hemstitch over the top two or three weft rows. Weave the piece and then hemstitch the other end over the last two or three weft rows. Remove the fabric from the loom and discard the header and weft threads below the first hemstitching.*

