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Unusual Knitting Bags on "Opposites"

BY ELMER W. HICKMAN

LARGE KNITTING BAGS are seemingly in great demand, but, from the consensus of opinion, they should be unique.

Therefore, for the hand-loom weaver who has been seeking a solution to the weaving of a knitting bag that is distinctive and unusual in both color and texture, or to the weaver who would enjoy some compensation for his conscientious efforts at the loom, the bags described in this article should prove to be a satisfactory answer to the weaver's quest as well as a most gratifying source of income.

I, because there was no escape from a persistent friend's importunate appeal for an exceptional knitting bag, experimented with several patterns, different textures and many color schemes.

The first experiment was a bag of a Scandinavian technique. The pattern draft was similar to the one that was used for the back cover design on Sigrid Palgrens' weaving books; the colors, restrained ones, were carefully chosen, but the result proved—in the eyes of this particular color-crazed young lady—highly unsuccessful. "Something more daring" was wanted.

I next tried a fabric woven of crêpe wool on a mercerized cotton warp using the familiar "Honeysuckle" threading for the pattern draft. Illustration No. 1 shows this bag. The material was woven in solid color pattern stripes of brilliant blue, bright green, scarlet and black. An orange No. 5 mercerized Perle cotton was used for the "on opposites" weft shots. Each pattern stripe was connected by half-inch

stripes of variegated Rayon floss in plain weave. I once had been told in a color class that when one wished to pull colors together one could use orange, but in this case the orange Perle cotton was too strong and the proportions of it too evenly distributed with the pattern wool, so consequently most of the principal pattern colors were killed by its introduction into the scheme. The resulting fabric was only partly satisfactory. This bag really makes a better showing in the photograph than the bag about which I most desire to tell you—but is actually not nearly so handsome.

I realized by this time that what was wanted was a color combination that was entirely foreign to my first two experiments.

In working farther a bag was produced that seemed to have captivated every knitter who saw it. A pair of white woolen mittens from Czechoslovakia embroidered in raw harsh colors suggested the color combination for this astonishingly appealing bag. The coloring of these peasant mittens had always held a fascination for me, but I never before had analyzed the coloring to discover where lay its charm. Simple enough it was after a little careful study. Although the principal colors were almost direct complements of each other, the happy harmonious effect came from the proportion in which they were used. Each color, therefore, enhanced its complement. A vivid green, a luminous blue, a blazing red, a sunny yellow, a glaring cerise and a neutral natural white all combined to make a color scheme that was gay, attractive and, as Mrs. Atwater once put it, "amusing." Further interest was accomplished in the choice of colors for the knitting bag by adding gradations of tones of each of the principal colors used. To accentuate even more this daring combination, a medium yellow No. 5 mercerized Perle cotton weft thread was used for the "on opposites" shots. This gave a sparkle and vibrancy to the finished product.

The color problem was solved. The pattern draft was not so terribly important. "Maltese Cross," because it lent itself ideally to stripe arrangement, was chosen. One of a great many other threading drafts might have been selected; such as "Single Chariot Wheel," "World's Wonder," "Rosepath," etc. Any of these patterns, and many more, may be found in Mrs. Mary Meigs Atwater's book, "The Shuttle-Craft Book of American Hand Weaving." In weaving with the "on opposites" treadling, or lever combinations that give the pattern sheds on the Structo looms, pattern drafts should be avoided in which too long or too short skips predominate. Too long skips in a knitting bag would prove impractical for usage, and too short skips would have a tendency to cause indistinctness in the design.

The resulting fabric was astonishingly beautiful. I had many, many orders for this particular bag in the color

THE WEAVER



COLORS
BLACK GREEN BLUE RED BLACK RED BLUE GREEN BLACK

ILLUSTRATION NO. 1
Plain stripes of variegated Rayon floss

combination mentioned as well as other combinations. Continual requests for these bags seemed destined to make my recreational weaving hours only toilsome periods of a manufacturing establishment. The end of a twenty-yard warp came as a convenient excuse for not making any more. But after having looked recently, out of curiosity, at some of the knitting bags in New York City shops, I do not wonder at the numerous requests that I had for these strikingly colorful bags.

Since the attractiveness of the material depended considerably upon the "on opposites" treadling, it might be well at this point—for the sake of beginning weavers—to give an explanation of the term. "On opposites" means just this: When one is using a four-harness loom, the first weft-shot is put in the shed formed by a certain treadle combination, such as treadles 1 and 2 used together. If the loom has six treadles instead of four, and a six-treadle tie-up is used, harnesses 1 and 2 are tied to one treadle, and the above combination is made with one treadle. The next treadle combination to be used for the second weft-shot will be the treadle or treadles that will bring down those harnesses that were not used the first time. In this case they are harnesses 3 and 4. In making this knitting bag, a shot of colored weft wool was used in the shed made by the first treadling combination; in the second shed a weft-shot of yellow mercerized Perle cotton was used. When the combination of treadle or treadles that bring down harnesses 2 and 3 is used, the following shed will be made by using the other two harnesses that were not used, or 1 and 4. Colored weft wool will be used on the 2 and 3 combination and yellow mercerized Perle will follow on the 1 and 4 combination. These groups of treadling combinations may be used as many times as one wishes. A study of the directions given for the bags described in this article will illustrate this explanation of "on opposites."

The following selected notes may also prove helpful in weaving these knitting bags: A good firm stroke of the beater is necessary to drive the weft into place. By so doing the weaver will be assured of a fabric that is rich in texture.

Although the warp is almost entirely covered by the weft in "on opposites" weaving, the warp should be of good quality and preferably of a neutral tone, such as Bernat's 10/2 natural mercerized cotton. There are little islands of warp that show in places, therefore should the warp be discordant to the main pattern colors the finished material will show a disagreeable muddy effect. For the main pattern stripes it is advisable to use soft wools thicker than the warp and the "on opposites" weft yarn. The knitting wool and the Shetland wool colors given in the directions are taken from Bernat's color cards. Silk floss, such as Bernat's Art Silk and Vittora Strand six-ply cotton, can be used very advantageously for pattern stripes should one not care for a wool weft yarn.

Each piece of material should, when taken from the loom, measure about 20 inches by 22 inches. Each bag is made up with the fold lengthwise of the fabric, the selvages serving for the top of the bag. After the sides are seamed to within two inches of the top they are folded in and tacked down, forming triangles on the inside of the bag. A boxed corner

on the two sides of the bottom gives the bag a good shape. It is then sewed into 12-inch or 14-inch handles with straight perforated edges.

If the weaver cares to use 12-inch handles the two end pattern stripes should have fewer weft-shots than are given in the directions; and but two and one-half inches of the white Shetland wool, at the beginning and at the end, should be woven. The directions are really for material to be used on 14-inch handles. To use cheap handles on your work is disastrous. The handles for these bags were purchased in dozen lots from a firm whose address Mrs. Atwater gave in one of her recent monthly weaving bulletins. I believe that the plain roundish top handles that I used most make the best appearing finished product. The bag in the illustration has an ugly handle, but that bag was the only one that could conveniently be procured to be photographed. The material should be sewed to the handles either with a strand of the yellow Perle cotton or a single strand of one of the pattern weft color yarns.

The bag may or may not be lined. Some of the people who bought the bags lined them with brilliantly colored plain sateens that matched one of the pattern yarn colors. When the bag becomes soiled the material may easily be turned, as the wrong side is quite as attractive as the right side.

Although the hinged handles—such as are shown on the one bag—are more expensive, they give, by far, a smarter and richer finish to the bag. At first it was thought that a pattern would have to be cut to fit the material into these handles, but it was found that the material could be seamed up like that suggested for the straight handles and sewed on the perforated ridges in the same manner as was done on the straight handles—allowing sufficient free space at the top of the seams to fit snugly up against the hinged portion of the handles. The bottom was first shaped in a circular form before it was sewed onto the handles. This shaping was done with the bag turned wrong side out.

In weaving you will have many short pieces of yarns because, sometimes, only one shot of a color is woven. The ends of all pattern yarns should be turned around a selvage

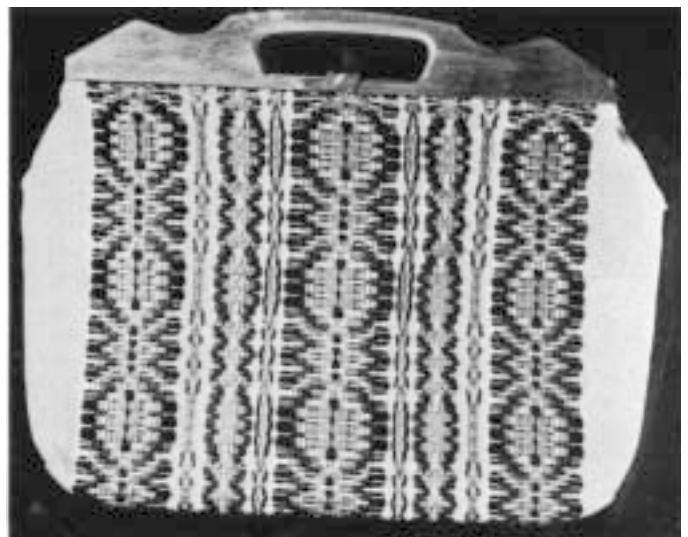


ILLUSTRATION No. 2

warp thread and placed in the same shed as its own color weft yarn, otherwise the colors at the selvage will not appear clearly defined.

WEAVING DIRECTIONS:

Warp: Bernat's 10/2 mercerized cotton, natural color, set at 20 threads to the inch. Use a No. 10 reed.

Weft material: Bernat's 4-ply knitting yarn for the wider stripes. Bernat's Shetland yarn in white or natural, and colors for the narrower stripes and body of the bag. Shetland yarn colors should correspond to the 4-ply wool yarn colors.

Thread:

Selvage—1, 2, 3, 4.....	4 threads
Pattern—six times.....	468 "
Edge (to balance)—1, 2, 1.....	3 "
Selvage—4, 3, 2, 1.....	4 "
	—
	479 "

Color key for pattern weaving (numbers refer to Bernat's knitting and Shetland yarn cards):

B—black, No. 1196	DB—dark blue, No. 1161
M—maroon, No. 1153	MB—medium blue, No. 1160
OR—orange, No. 1158	LB—light blue, No. 1159
S—scarlet, No. 1152	BG—blue green, No. 1154
C—cerise or rose, No. 1174	Y—yellow, No. 1156
MG—medium green, No. 1171	W—white Shetland, No. 801
YG—yellow green, No. 1182	PY—yellow Perle cotton No. 5
DG—dark green, No. 1172	—No. 220

TREADLING DIRECTIONS:

Weave one-half inch in plain tabby with yellow Perle cotton—for seams. Three inches in plain tabby with white Shetland wool yarn. Each pattern shot is followed by a shot on the opposite shed—except between two different pattern sheds. If more than one color is woven on the same combination of harnesses—as 1 and 2—a shot of mercerized Perle cotton must be woven on the opposite between the different colors in order to make the shed. This occurs at the beginning where maroon and black are inserted into the shed made by the same harnesses.

Stripe (a). All pattern shots in four ply wool. "On opposites" all in yellow Perle cotton.

Pattern:
 Treadle 1, twice, color B
 Treadle 1, twice, color M
 Treadle 2, 3 times, color OR
 Treadle 3, 3 times, color OR
 Treadle 4, 4 times, color S
 Treadle 1, 3 times, color C
 Treadle 2, 2 times, color MG
 Center. Reverse, beginning with the cerise shots.

Opposite:
 Treadle 3, twice, Y (Perle cotton).
 Treadle 3, once
 Treadle 4, twice
 Treadle 1, twice
 Treadle 2, 3 times
 Treadle 3, twice
 Treadle 4, once

Stripe (b). All pattern shots in Shetland yarn. Opposites in white Shetland yarn.

Four tabby shots in white Shetland.
 Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, in white Shetland—no tabby.

Pattern (colored Shetland):
 Treadle 1, once, color M
 Treadle 2, once, color M
 Treadle 3, once, color C
 Treadle 4, once, color C
 Treadle 1, once, color YG
 Center. Reverse, beginning with the cerise shots.

Opposites (white Shetland):
 Treadle 3, once
 Treadle 4, once
 Treadle 1, once
 Treadle 2, once
 Treadle 3, once

Then: Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, in white Shetland—no tabby.

Four tabby shots in white Shetland.

Stripe (c). Four-ply wool. Opposites in yellow Perle cotton.

Pattern:
 Treadle 1, twice, color DG
 Treadle 2, twice, color DB
 Treadle 3, twice, color MB
 Treadle 4, twice, color LB
 Treadle 1, twice, color BG
 Treadle 2, once, color Y
 Center. Reverse, beginning with the blue-green shots.

Opposites:
 Treadle 3, once
 Treadle 4, once
 Treadle 1, once
 Treadle 2, once
 Treadle 3, once

Stripe (d). Four tabby shots in white Shetland.

Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, white Shetland—no tabby.

Pattern (colored Shetland):
 Treadle 1, once, color MB
 Treadle 2, once, color MB
 Treadle 3, once, color BG
 Treadle 4, once, color BG
 Treadle 1, once, color YG

Opposites (white Shetland):
 Treadle 3, once
 Treadle 4, once
 Treadle 1, once
 Treadle 2, once
 Treadle 3, once

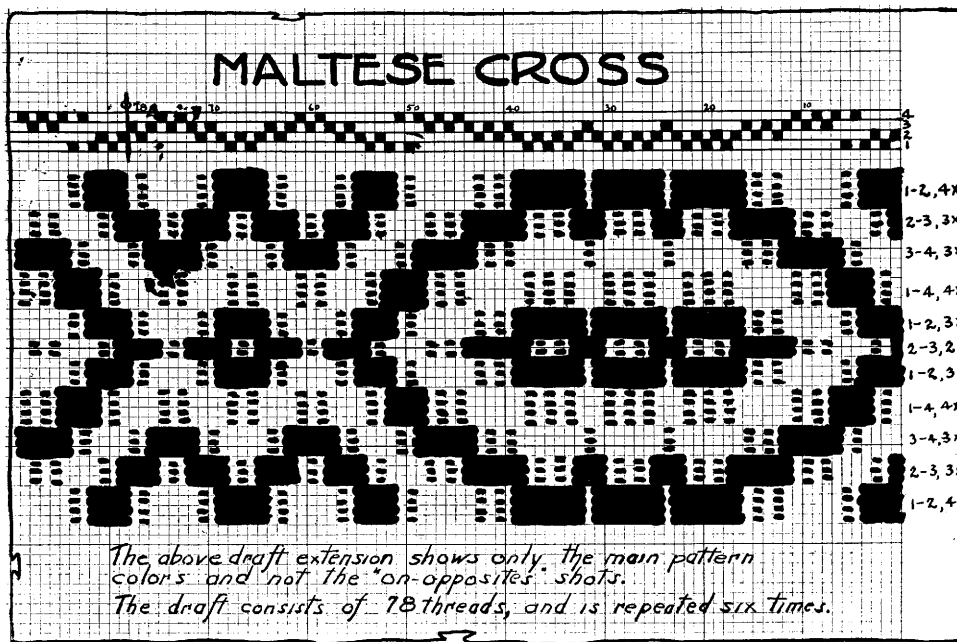
Center. Reverse, beginning with the blue-green shots.

Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, white Shetland—no tabby.

Four tabby shots in white Shetland.

Stripe (e). Wide middle stripe.

Pattern (four-ply yarn):
 Treadle 1, twice, color B
 Treadle 1, 3 times, color M
 Treadle 2, 3 times, color OR
 Treadle 3, 3 times, color OR
 Treadle 4, 5 times, color S
 Treadle 1, 4 times, color C
 Treadle 2, twice, color MG
 Opposites (yellow Perle):
 Treadle 3, twice
 Treadle 3, twice
 Treadle 4, twice
 Treadle 1, twice
 Treadle 2, 4 times
 Treadle 3, 3 times
 Treadle 4, once
 Center. Reverse, beginning with the cerise shots.



Repeat stripes (d), (c), (b), (a). Begin with the four tabby shots of white Shetland. At the end of the material weave three inches tabby in white Shetland and one-half inch tabby in yellow Perle mercerized cotton as was done at the beginning.

Another interesting color combination—autumn colors—that proved extremely attractive is the one given below. Because the treadling differs somewhat from the one above, it, also, is given.

Key to colors:

Black—B, No. 1196	Rust—R, No. 1179
Brown—BR, No. 1190	Blue—BL, No. 1192
Scarlet—S, No. 1152	Dark green—DG, No. 1184
Orange—O, No. 1158	Light green—LG, No. 1182
Medium orange—MO, No. 1157	Blue green—BG, No. 1151
Yellow—Y, No. 1156	Lavender—L, No. 1164
Green (leaf)—MG, No. 1183	Purple—P, No. 1165

Weave the beginning before stripe (a) as above.

Treadling directions:

Stripe (a).

Pattern (4-ply wool):

Treadle 1, twice, color B
Treadle 1, twice, color BR
Treadle 2, 3 times, color S
Treadle 3, 3 times, color O
Treadle 4, 2 times, color MO
Treadle 4, 2 times, color Y
Treadle 1, 3 times, color MG
Treadle 2, twice, color P

Opposites (yellow Perle):

Treadle 3, twice
Treadle 3, once
Treadle 4, twice
Treadle 1, twice
Treadle 2, twice
Treadle 2, once
Treadle 3, twice
Treadle 4, once

Center. Reverse, beginning with the MG shots.

Stripe (b). All pattern shots in colored Shetland. Opposites in white Shetland.

Four tabby shots of white Shetland.

Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, in white Shetland—no tabby.

Pattern (colored Shetland):

Treadle 1, once, color BR
Treadle 2, once, color BR
Treadle 3, once, color R
Treadle 4, once, color R
Treadle 1, once, color MG

Opposites:

Treadle 3, once (white Shetland)
Treadle 4, once
Treadle 1, once
Treadle 2, once
Treadle 3, once

Center. Reverse, beginning with rust.

Then: Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, in white Shetland.

Four tabby shots, white Shetland.

Stripe (c). Four-ply wool. Opposites, yellow Perle cotton.

Pattern:

Treadle 1, twice, color BL
Treadle 2, twice, color MG
Treadle 3, twice, color MG
Treadle 4, twice, color LG
Treadle 1, twice, color BG
Treadle 2, twice, color L

Opposites:

Treadle 3, once
Treadle 4, once
Treadle 1, once
Treadle 2, once
Treadle 3, once

Center. Reverse, beginning with the blue-green shots.

Stripe (d). Four tabby shots, white Shetland.

Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, white Shetland.

Pattern (colored Shetland):

Treadle 1, once, color BR
Treadle 2, once, color BR
Treadle 3, once, color S
Treadle 4, once, color S
Treadle 1, once, color MO

Opposites (white Shetland):

Treadle 3, once
Treadle 4, once
Treadle 1, once
Treadle 2, once
Treadle 3, once

Center. Reverse, beginning with the scarlet shots.

Treadles 4, 3, 2, 1, 2, 3, 4, one shot each, white Shetland.

Four tabby shots of white Shetland.

Stripe (e). Wide middle stripe.

Pattern (four-ply yarn):

Treadle 1, twice, color B
Treadle 1, 3 times, color BR
Treadle 2, 4 times, color S
Treadle 3, 3 times, color O
Treadle 4, 3 times, color MO
Treadle 4, twice, color Y
Treadle 1, 3 times, color DG
Treadle 2, twice, color P

Opposites (yellow Perle):

Treadle 3, twice
Treadle 3, twice
Treadle 4, 3 times
Treadle 1, twice
Treadle 2, 3 times
Treadle 2, once
Treadle 3, twice
Treadle 4, once

Center. Reverse, beginning with the dark-green shots.

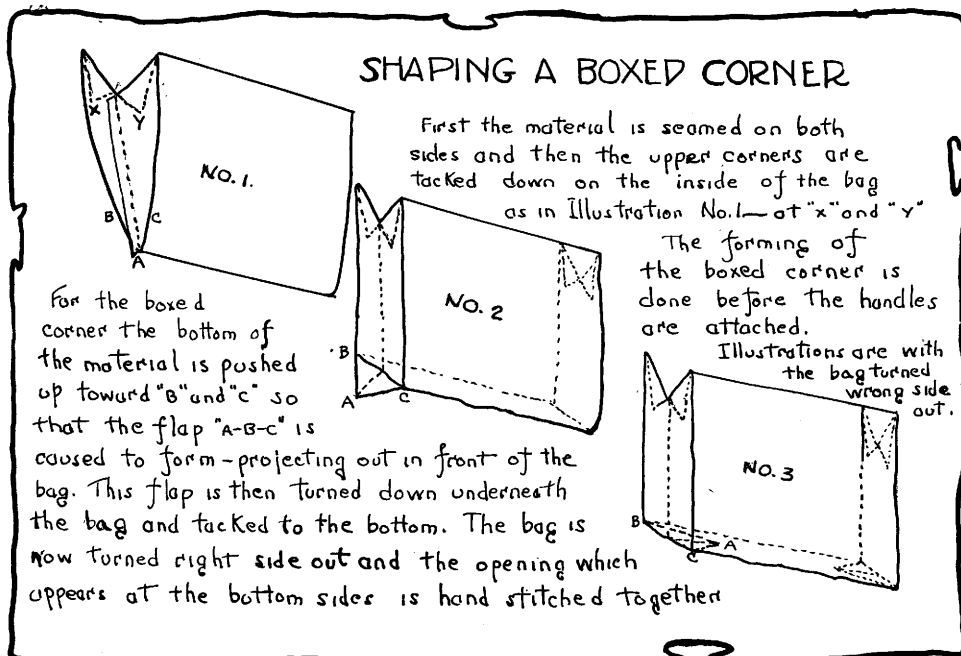
Beginning with the tabby white Shetland shots, repeat stripes (d), (c), (b), (a).

Weave three inches tabby in white Shetland, one-half inch tabby in yellow Perle mercerized cotton.

Some of the bags were made using blue as the predominating color, but these proved the least attractive when finished.

All material, when taken from the loom, should be pressed with a damp cloth laid over the face down fabric.

The above weaving may be applied to materials for many other uses, also, such as: pillow tops, runners, drapes, etc. I am sure that anyone who experiments with "on opposites" treadling with brilliantly colored wools, wisely chosen, will feel more than repaid for the effort given.



Hand Woven Materials for Clothing

BY RUTH BOLINGER

IN MAKING MATERIALS for clothing, there are certain points necessary to keep in mind. In the first place, it is essential to know the number of yards of finished material required before the amount of yarn needed for weaving can be determined. It is often best to get the pattern by which the garment is to be made first, as nothing is more disastrous than not having enough material.

Second: Allow for waste in warp. From previous weaving you will know how much waste there is in your weaving and on your loom. Depending on the weaver the waste is from one half to one yard.

Third: Allow for the shrinkage of material after it is taken from the loom. Different yarns act so differently in this respect that no definite rules of amount of shrinkage can be given. But soft, loosely twisted yarns shrink more than tightly twisted yarns. Loosely woven materials shrink more than tightly woven materials. Lustre yarns, because they are combined with silk, shrink very little. It is best to allow plenty for shrinkage, as a little too much material is much better than not enough.

Fourth: Test the yarn for strength before warping. If it is a very fine yarn, as Afghan or fabri, or a loosely twisted yarn, as Shetland Floss, or a yarn that fuzzes, as camel's hair, always put a heavy dressing on it. Even such yarn as homespun and Laurel make a better warp if a thin dressing is used. This is really very easy to do, and should either be done while the yarn is still in skeins or, if warped on a warping reel, it can be done after the yarn has been measured. A very satisfactory and cheap dressing is made with flaxseed. Boil the flaxseed in water until you have a thick gelatinous liquid, which should be strained off. The flaxseed can be boiled in fresh water as many as four times, so that a small quantity of flaxseed makes a large amount of dressing. This will keep in a sealed jar so that it is ready for use. Use almost full strength for fine yarns. Dilute with water to consistency of thin starch for stronger yarns.

Fifth: One reason hand-woven fabrics are so much more desirable and lovely than machine-woven fabrics is that they are handled less after coming from the loom. The intense process of washing to cleanse the fabrics woven in grease on a power loom, and the ironing and fulling processes take away from the alive quality that hand-woven materials have. Besides making the materials less lovely than hand-woven ones, it reduces the wearing quality of the materials. As you know, hand-woven materials wear and last for years and years. Fifteen years ago material was woven for a suit that has been made over and remodelled a number of times, and today the material is just as good as new and the suit extremely smart.

There is a certain amount of finishing necessary for hand-

woven materials, but the less they are handled, within reason, the softer, more alive the materials feel. Washing is an essential finish for any woolen material.

Washing does three things to materials: (1) It removes the dressing that has been used on the yarn, and cleans the material. (2) It brings out the loveliest color and all the beauty of the yarn. (3) It shrinks the material all that it ever will shrink, which means that a garment can be washed any number of times afterwards and it will always hold its shape.

Certain points to remember in washing all woollens are: (1) Use lukewarm water—never hot water. (2) Keep water the same temperature throughout. (3) Use a good, mild soap. (4) Make a suds of the soap in the water before putting in the material. (5) Rinse water should be the same temperature and just slightly soapy. (6) Wash the goods gently. (7) Use a tub big enough to easily cover all the material with the soapy water.

The type of material and the amount of dressing used determine the amount of washing necessary. That is, a fine piece of cloth will be washed enough if it is put into one very sudsy water and one rinse water. As in washing of any kind, these materials should be washed until clean, and sometimes they take several sudsy waters and the rinse water. A yarn that has been spun and woven in the grease, as the Scotch hand-spun yarns, makes a very greasy material. This must be very thoroughly washed and can often best be done in a washing machine of the kind that is easy on clothes. After the material has been rinsed in slightly soapy water, wring as dry as possible. If it is a sheer material, wrap in a towel to partially dry. If it is a firmly woven or a heavy material, it can be hung on the line to partially dry. Be sure to hang it straight and do not let it dry completely on the line.

In pressing, the essential point to remember is to use as little heat as possible. We had some materials finished on a steam pressing table where the heat is intense, and they were not as lovely as the materials that were washed and then pressed with an iron or on a mangle. Use a dry cloth over the damp material and press.

Sixth: Care should be taken in making up woven materials. If at all loosely woven, they have a tendency to ravel. The piece should be stitched on both ends when taken from the loom and before it is washed. In cutting the material, each piece should be stitched before sewing together.

There are many lovely woven fabrics that can be made on hand looms; very sheer materials for light-weight dresses, slightly heavier, tighter woven materials for suits, and very heavy materials for warm winter coats.

A lovely woven fabric for a thin dress and jacket is made



ILLUSTRATION No. 1

by combining an all wool yarn, such as fabri with a silk and wool, such as Bernat's Lorneau. The combination gives a texture that is lovely to feel and has that loftiness of touch so desirable in materials. At the same time it is fine enough so that it makes up beautifully and has body enough to hang well.

Use the fabri for warp. In this loosely woven material, warp should be set up at least three inches wider than width of material desired. For instance, a warp 38 inches wide when through the reed will make a 35-inch material. Warp the fabri ten threads to the inch—making it 38 inches wide—means you will need 380 warp threads. The length you have determined, remembering to allow for shrinkage of material and waste on the warp. For this material allow at least four inches shrinkage per yard.

After threading the loom, using Draft No. 1, sley warp as follows: Use a fifteen-to-the-inch reed. Sley four threads, one through each dent—leave two dents without any threads and again sley four threads, one through each dent and the next two dents leave empty. Repeat this for the whole set-up. This makes the threads come in groups of four, with the space between equal to two dents on the reed.

Weave four threads of Lorneau, using the treadles in order, that is, 1, 2, 3, 4, then leave a space equal to spaces left in warp threads, and weave four more weft threads and again a space. This makes a material that has four threads

woven together with a small square hole at each corner.

Fabri warp will require 380 yards of yarn to a yard, or a little over one and one-half ounces. Lorneau weft will require two and a quarter balls to the yard.

This same idea of an open fabric can be varied in many ways. Using Lorneau, according to Draft No. 1 and the instructions given above, a slightly heavier and more bumpy material is the result. In Draft No. 1 the threads in the little squares are woven together, so that in spite of the open material it is a comparatively tightly woven material. If Draft No. 2 is used, the center threads of the square are longer, and the result is a thicker fabric. This is a good weight material for a street dress or a light suit.

This material requires four and one-half balls of Lorneau to the yard. Allow for six inches shrinkage per yard. Warp ten threads to the inch, and after threading according to Draft No. 2, sley through a fifteen-to-the-inch reed. Two dents on the reed should be left empty between the threads on heddle sticks two and three each time, making the threads come in groups of four with a space equal to two dents between each group. Use the tie-up given with Draft No. 2 and treadle as given. The first and fourth treadles are used twice, or the thread doubled and a space equal to two dents of the reed is left between the second and third treadles.

A very sheer and open material can be woven by using



ILLUSTRATION No. 3

a fine wool, as fabri or Afghan, for both warp and weft, and either of the above patterns may be used.

A striking corded or monotone striped material can be woven of either fabri or Afghan, by using Draft No. 3, warped twenty threads to the inch. This makes a firm fabric with two stripes running vertically through it at half-inch intervals. This fabric is made on a 1, 2, 3, 4, set-up and the stripes are made by running three threads through three heddles on the same stick, and three more threads through three heddles on the next heddle stick. It is woven with a plain weave. Trimming for the dress or material for a cape or jacket to go with the dress can be made by checked pattern by weaving three threads together, the same as the three threads come together in the warp to make the stripe. Illustration No. 1 is a dress and cape made of black fabri in this weave. The dress is striped and the jacket checked.

One pound of fabri will make two and one-half yards, one yard wide, of material as described above. Afghan will make a finer material and one pound will make four and one-half yards. Allow at least four inches a yard for shrinkage, and remember to allow for the waste in warping.

Another beautiful fabric, this time coat material, is made from Bernat's Glorine yarn. There are some beautiful colors in this lustre yarn for coats, and Glorine yarn makes a good weight fabric.

A very soft material and still practical in its wearing

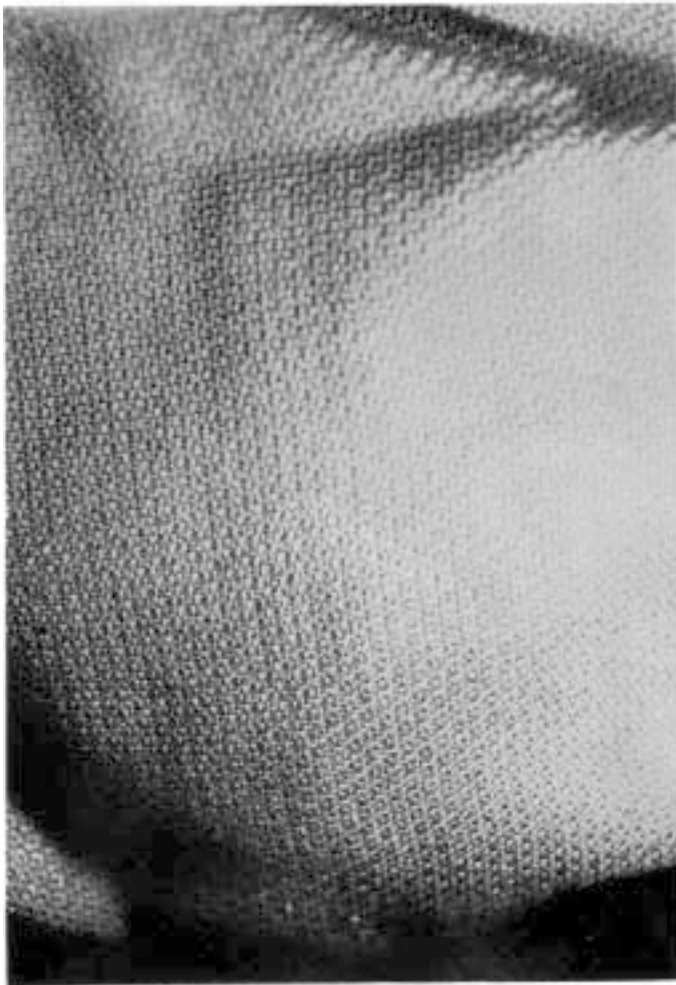


ILLUSTRATION No. 4



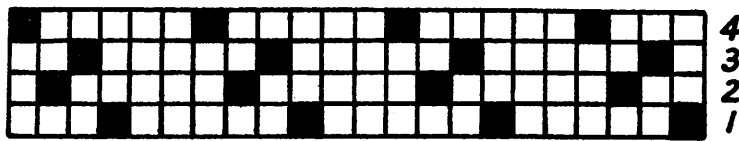
ILLUSTRATION No. 2

qualities is made by using ten threads to the inch for both warp and weft of the Glorine yarn. A 39-inch material finished means a 41-inch set-up. Allow for three inches shrinkage per yard in the material. Three quarters of a pound of Glorine yarn to the yard is required, using Draft No. 4, at ten threads to the inch. Use tie-up given with draft and treadle it 1, 2, 1, 3, and repeat.

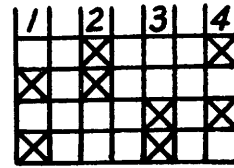
The outstanding characteristic of this material is the vertical lines made by two warp threads every half inch. These are the threads that stand out, the rest of the threads forming the background. This is what makes it such a practical coat material for those who like to look as slender as possible. Illustration No. 2 gives the back of a tailored coat made of a silver grey lustre yarn and woven in the pattern above described.

Draft No. 5, using Glorine, or a similar weight yarn, at twelve threads to the inch, makes a material of an outstanding weave. It has little squares with four threads coming out of the center of the square. In certain lights one sees a vertical line, in another light diagonal lines running both ways. Illustration No. 3 shows eleven yards of this material, woven of a wine-colored lustre yarn. Illustration No. 4 gives a close-up of the weave. A three-piece ensemble was made of this material. The skirt was straight line with a short split on either side. The jacket was quite plain and fitted and buttoned up the front. The coat was made on loose swagger

DRAFT NO. 1

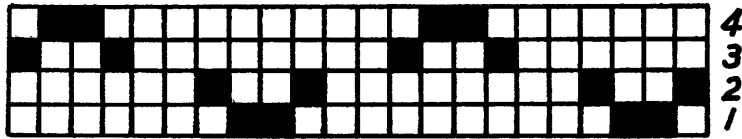


Thread 1, 3, 2, 4 ; 1, 3, 2, 4.
Sley 4 threads - Skip 2 dents.

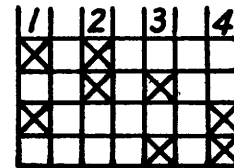


Treadle 1, 2, 3, 4.

DRAFT NO. 2



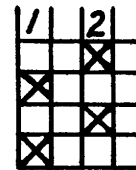
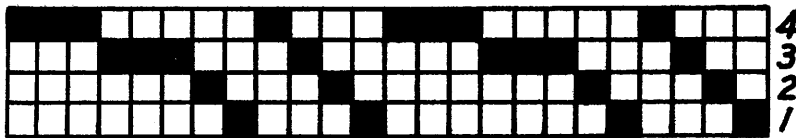
Draft showing two empty dents between threads on 2nd. & 3rd. heddle sticks.



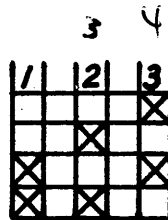
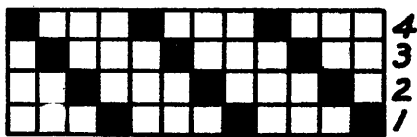
Treadle

1 - 1 time
2 - 2 times
1 - 1 time
3 - 1 time
4 - 2 times
3 - 1 time

DRAFT NO. 3

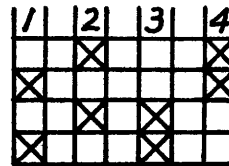
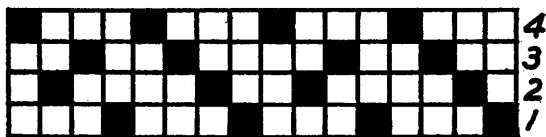


DRAFT NO. 4



Treadle
1, 2, 1, 3.
Repeat

DRAFT NO. 5



Treadle
1, 2, 3, 4.

lines, with lovely full sleeves coming in tight at the wrist. The weight of this outfit, worn together, makes it warm enough for rather cold weather, while either the suit or coat worn separately makes it practical for warmer weather.

A lighter weight ensemble could be made of a lustre yarn similar to Laurel, by using Draft No. 5, with fifteen threads to the inch. The weave is the same as described above but tighter and finer. This material would require a little over a half pound to the yard.

Only a few fabrics have been described. There is an

almost unlimited number of materials one might make, using different yarns and different combinations of yarn. And hand-woven materials do make such beautiful clothing.

But one of the essential points in hand-woven garments is that they must be well tailored. Your material may be ever so beautiful, well woven and of lovely yarn, but if the finished product is not well made, so that it hangs correctly, fits, is smart, has the right lines, it will not be as beautiful an article of clothing as every piece of hand-woven material deserves to be.

Questions and Answers

ADDRESS YOUR QUESTIONS TO MRS. MARY M. ATWATER, BASIN, MONTANA

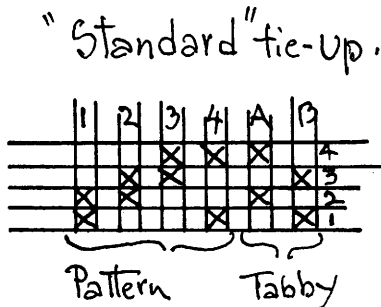
Question No. 1: I have an old coverlet in such and such a pattern (several questions on this subject have been received)—how can I sell it? and what is it worth?

Answer: Collecting coverlets has never become a fad like collecting old bottles, so old coverlets have no high artificial value as antiques. As a rule they sell for less than modern coverlets. The top price, under ordinary circumstances, is \$50. I have bought many excellent old coverlets for \$10 and \$15. To realize the \$50 price it would be necessary to sell the coverlet yourself to someone who wished it for use and not for re-sale. Dealers will rarely pay as much as \$25. The pattern and weave of an old coverlet appear to make little difference in the selling price, as the buying public is not well informed in these matters. To be saleable an old coverlet must be in good condition, however. The best chance to sell an old coverlet is to someone who is fitting up a house in "period" Colonial style. An outstanding piece might possibly be sold to a museum, though as a rule the coverlet collections in museums have been acquired through gift and few pieces are purchased.

Question No. 2: How can treadling directions written for a six-treadle tie-up (four-harness) be transposed for use on a four-treadle loom?

Answer: The method of making the transposition depends, of course, on the tie-up for which the treadling directions were written. This is given in the tie-up draft, always supplied. On these tie-up drafts the harnesses tied to sink on each shed are indicated by "X" marks. The Shuttle-Craft "standard" tie-up given herewith is used by many weavers. In this the treadles are counted from left to right and the harnesses from front to back of the loom. Treadle No. 1 is tied to sink harnesses 1 and 2—the two front

harnesses. Therefore, to make this shed on a four-treadle tie-up, use the two treadles that sink these two harnesses. If the treadles are numbered from left to right it will be the two treadles on the left, and if the loom is tied the other way about it will, of course, be the two treadles on the right. And so



for the rest of the treadles. Some weavers use a different arrangement of the six treadles, and for some special weaves a different tie-up is used, so that no general rule to fit all cases can be stated. The transposition must follow the tie-up draft. For the Structo loom, which operates by raising instead of sinking the harnesses, the transposition must be made to opposites, or the fabric will weave wrong side up in the loom. For the standard tie-up as given the plan of transposing is as follows:

TREADLE LOOM

For Treadle No. 1	use treadles 1 and 2
For Treadle No. 2	use treadles 2 and 3
For Treadle No. 3	use treadles 3 and 4
For Treadle No. 4	use treadles 1 and 4
For Treadle A (tabby)	use treadles 2 and 4
For Treadle B (tabby)	use treadles 1 and 3

STRUCTO, OR ANY "RISING SHED" LOOM

For Treadle No. 1	use levers 3 and 4
For Treadle No. 2	use levers 1 and 4
For Treadle No. 3	use levers 1 and 2
For Treadle No. 4	use levers 2 and 3
For Treadle A (tabby)	use levers 1 and 3
For Treadle B (tabby)	use levers 2 and 4

Question No. 3: In weaving toweling in the "Bronson" weave or "spot" weaving, is it necessary to use for weft exactly the same linen used for warp?

Answer: Strictly speaking, yes. In this weave the pattern appears in weft-skips on one side of the fabric and in warp-skips on the other. If a weft is used that is a good deal coarser than the warp, the effect will be skimpy in appearance on the side that shows the pattern in warp-skips. However, two linens similar in grist, though different in twist, may be used as warp and weft in the same piece with satisfactory results; and even slight differences in grist are allowable. I experimented once by making a number of towels on the same warp using different wefts,—one piece was woven in English "flourishing thread," which is a very fine and lustrous linen floss; another was woven in linen like the warp, and a third in Bernat's linen "weaver." All three were satisfactory. The warp was Bernat's "special" singles linen warp set at 36 ends to the inch, and the pattern used was an eight-harness "point" threading in Bronson weave. The above notes would apply, of course, to any pattern in this weave, if woven for toweling. The weave can be used for many other purposes and woven in many other ways.

Question No. 4: Please tell me how much material, by weight, is required per square yard of fabric in each of the following yarns—warp and weft of the same material: Bernat's "Fabri," "Weaving Special," "Afghan," "Miro" and "Heatheryarn."

Answer: The quantity of material required per yard of fabric depends not only on the yarn used but also on the weave, the warp-setting, and the beat. The following calculations are for a plain tabby fabric, woven with the same number of weft-shots to the inch as there are warp-ends in the setting. Twill fabrics should be set and woven closer and take more material, making a heavier fabric.

"Fabri" yarn: warped and woven at 24 to the inch: 2/5 lb. per square yard.

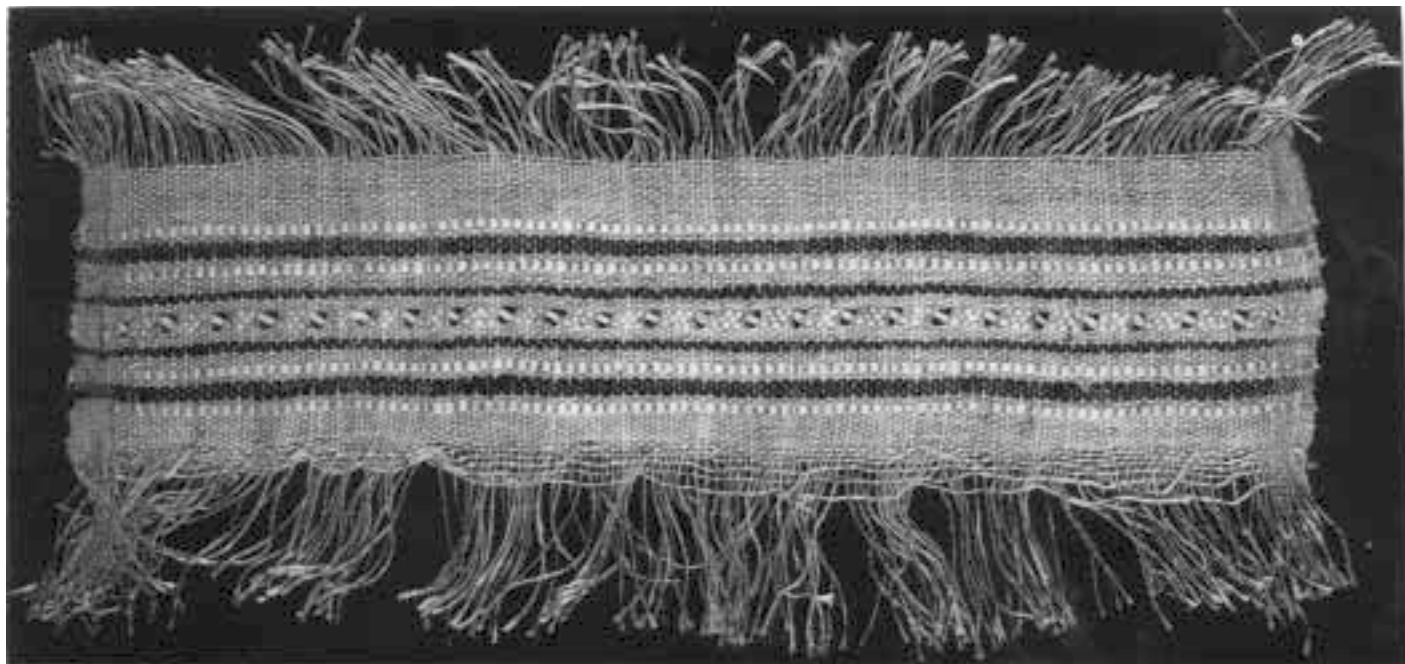
"Weaving Special": warped and woven 20 to the inch, 3/8 lb. per square yard.

"Afghan" yarn, warped and woven 30 to the inch, 5/16 lb. per square yard.

"Miro" yarn, warped and woven 18 to the inch, 7/16 lb. per square yard.

"Heatheryarn," same as Fabri.

In calculating material for a length of fabric an allowance must be made for wastage and shrinkage. The shrinkage is greater for a loosely woven fabric and for a lightly twisted yarn than for a closely woven fabric and a hard-twisted yarn. And it should be borne in mind that it costs less to have a little material left over than to run a little short. A shortage may mean much loss of time and also involves the risk of not getting an exact match on a re-order. The figures given are close calculations and the allowances should be added.



The Spanish Stitch

BY GERTRUDE WHITMAN HOWELLS

SO MUCH INTEREST has been shown in the Spanish stitch, and so many inquiries have come to me regarding the technique and the best yarns to use, that THE WEAVER seems the most far-reaching way to explain as much as I can about it.

It was about ten years ago, when in Seville, Spain, that I came across a linen strip which had most unusual weaving in the border; I bought it for a song but did not realize how rare it was. I have never seen nor heard of another like it, except for very old coverlets, mostly in tatters, in the collection of Mrs. Byne, in Madrid, Spain.

I had hoped to find some weaver who could show me how to weave it, but Mrs. Byne told me that it had not been woven for many, many years and that no one knew how to do it. The stitch had been brought to Spain, probably, by the Arabs after they had conquered the country, and it had been woven in the Province of Toledo, near Lagartera. It seems to have been used especially for valances on bedspreads, as a decoration, where, regardless of scale, one finds long processions of animals and figures, all of the same size, and quite conventional; the stitch being used as a background for the solid figures. Sometimes very elaborate designs—Abraham and Isaac, the Agnus Dei, St. James riding a camel—were made in this way and used for altar linen; but the district where the stitch was woven seems to have been very limited, and it fell into disuse.

I was looking for something absorbingly interesting to do and to redeem this stitch seemed promising, so I set myself to learning to weave and then to experiment. I knew nothing about yarns and knew no weavers. Every piece was a trial

piece. I was soon convinced that anything well woven and balanced need not be a failure. Now I have the great joy of having won out and having given the stitch to the weavers to use as their individuality may determine; and the field seems wide.

The stitch is made on a tabby shed, and is in three movements:

1st movement—Pick up the last threads of the previous stitch, plus as many more threads as are required for the new stitch. Beat, change shed, beat.

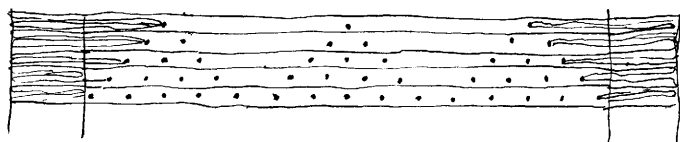
2nd movement—Back to the previous stitch. Beat, change shed, beat.

3rd movement—Forward, adding the threads for the new stitch. Beat, change shed, beat.

The work may be begun from either the right side or from the left, and the return may be either a shot across, or the stitch in reverse.

If the thread is thrown across, all the slanting threads will run in the same way and the effect will be less open; but if the stitch is used in returning, the slanting threads are above one another and in the opposite direction, and the effect is more lacy.

A stitch is completed when the return is made to the original side; hence, when the double stitch is used, it is





higher than when the thread is shot across. This is useful to remember when one wishes to run a design around all four sides of a piece, for, in that case, the stitch should be as square as possible, which depends upon the relation of the warp threads to the weft.

A one-inch selvage followed by a row of pyramids will be a simple way to explain the technique of the stitch.

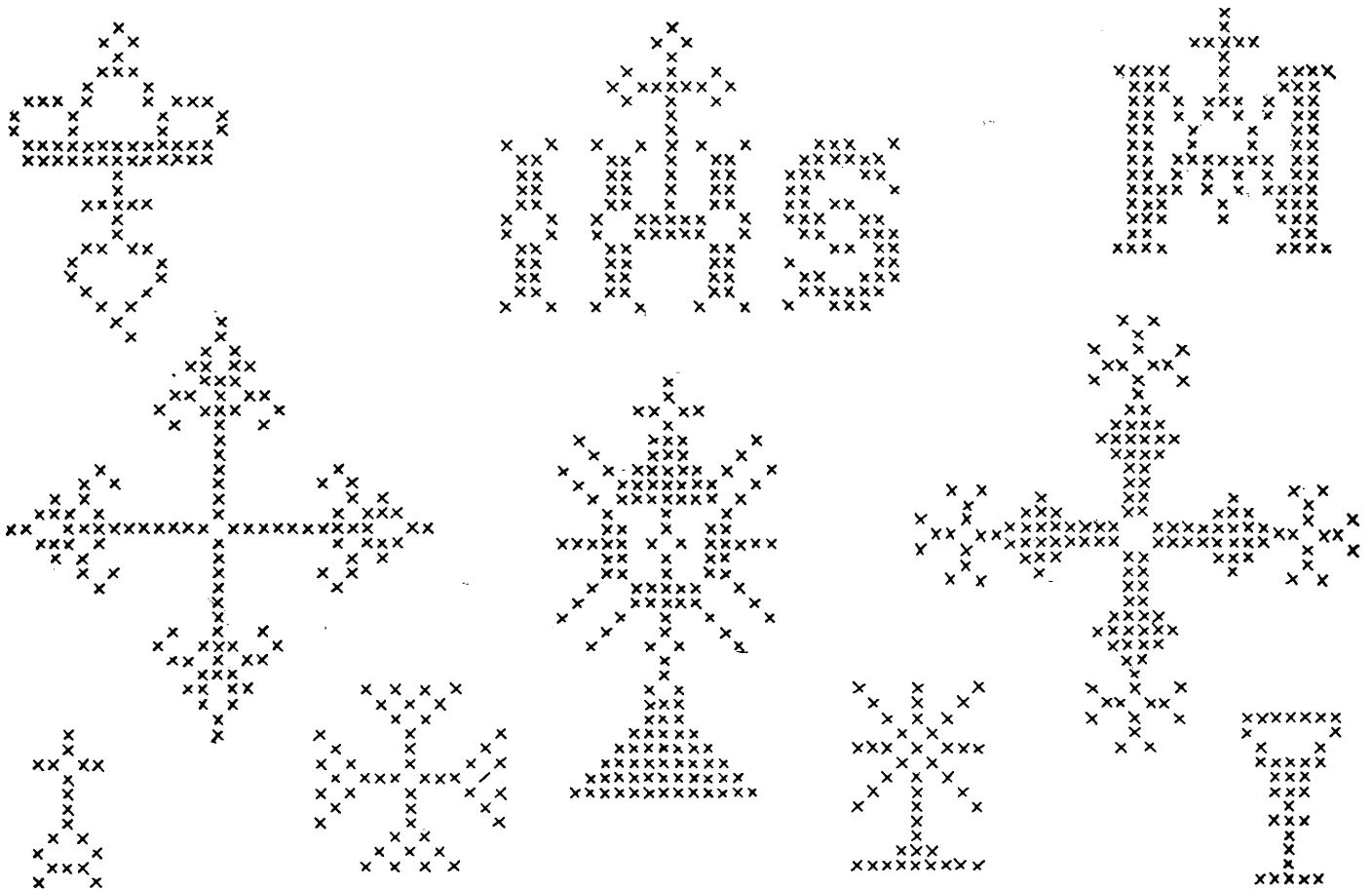
Pick up one inch of threads, on the upper warp on the right-hand side, pull the shuttle through, beat, change shed, beat. Go back to the selvage, beat, change, beat. Pick up the original threads and six more, b., c., b. Go back six threads, b., c., b. Pick up the last six threads and six more, b., c., b.

Continue in this way up to one inch of the left edge, when, instead of picking up six threads, include all the threads to the edge for the selvage, b., c., b. Pick up the selvage threads, b., c., b. Go back to the edge. This completes the first line across.

Throw the shuttle across to the right side, b., c., b.

For the second row of holes, pick up the selvage plus three threads, b., c., b. Go back to the edge, b., c., b. Pick up all of these threads and six more, b., c., b. Go back six threads, b., c., b. Go forward these six threads plus six more, b., c., b. Go back six threads, b., c., b; and so on for four holes. Then pick up twelve threads to begin on the next pyramid.

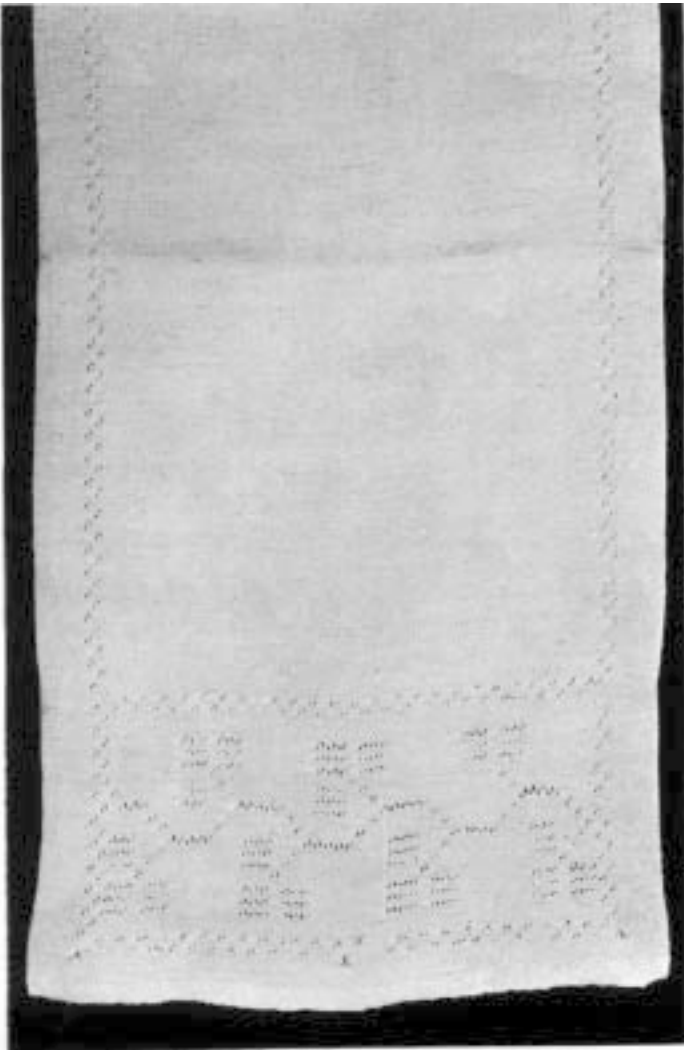
For the third row of holes, pick up six extra threads beyond the selvage; for the fourth row, pick up nine extra threads; for the fifth row, pick up twelve extra threads for the one stitch at the top of the pyramid.



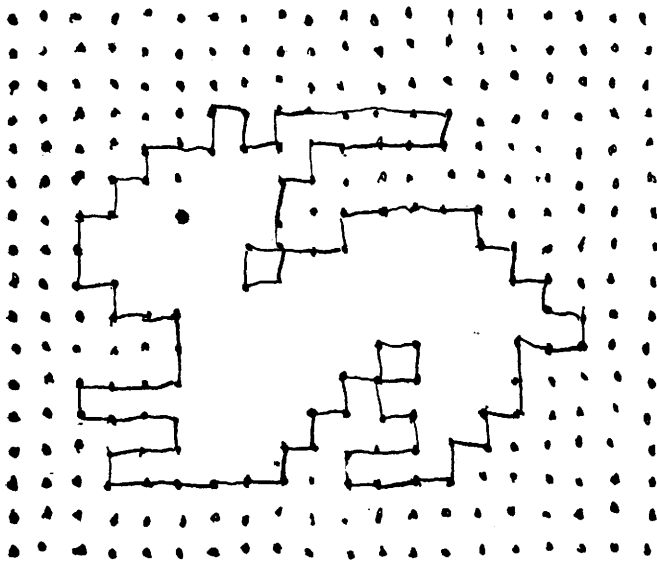
A page from "The Spanish Stitch, and 17th Century Cross Stitch"



Redeemed pattern of original and ancient piece



Easy mistakes are: to pick up the wrong number of threads and then mistake the shed when correcting; to be misled in the second movement by openings in the row below, and



With stitch used as background

not go back to the previous stitch; not to complete the last stitch in the selvage.

Confusion may also come in reading the second half of a pattern when the counting is reversed.

The *hole* corresponds to the cross stitch.

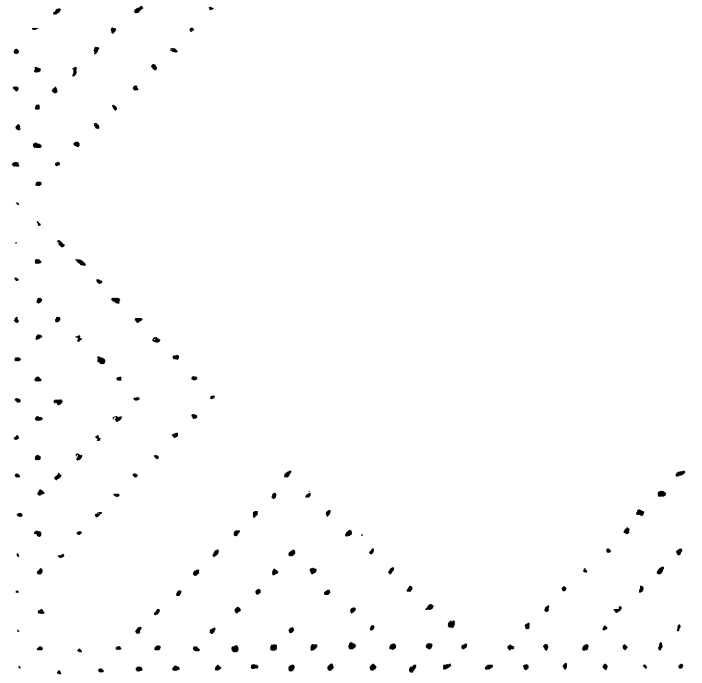
My advice is, at first, never to leave a mistake, but to examine the work closely in order to avoid leaving a mistake too far behind.

I use a 15 or 20 reed, with one or two threads to a dent, depending upon what I wish to weave; 40/2 or 40/3 yarns are useful as warp, and linen floss or heavy linen are effective as weft. Warp should be a well-twisted linen yarn as it must stand constant beating, while the weft gives a prettier result if it is soft and untwisted. But every weaver will make his own experiments as to warp and weft.

A great help to me has been a foundation warp. It is of colored, twisted, mercerized knitting cotton of two colors; one color on the middle of the warping beam with two threads of a different color to mark the exact middle, and the other color on each side. This gives the warp in quarters, which makes reckoning very simple. I tie my lease-sticks loosely so that the cross is never lost.

This warp is quite short, and I thread it to the pattern I wish and draw it through the reed, with about six inches to spare. To these ends I tie my true warp, pulling each thread through its dent when it is tied. If the warp is too wide for the piece to be woven, it can be wound around the warping beam until needed; the cross will be lost, in this case, but can easily be replaced.

When this Spanish stitch is once mastered, it will be found to be easy and fast, with many original possibilities.



A simple and effective corner

Weaving the Scotch Tweeds

BY ROBERT F. HEARTZ

THE mention of tweeds usually brings to mind the salt-and-pepper fabric, woven with a white weft on a black homespun warp. This is but one number of a large and interesting group of homespuns and tweeds, that are more suitable for general use and wear than might be thought practical for this type of fabric. Tweeds cover a large classification of fabrics, not all of them Scotch, some are Irish, and a number of checks and plaids are also included. There are Cumberland Tweeds, Harris Tweeds, Devonshire Tweeds, Donegal Tweeds, Ardassie Tweeds, Shetland Tweeds and Sutherland Tweeds, to mention some of them; then there are Hill Checks, Glen Checks, Gun Club Checks, Shepherd's Checks, Hound's-tooth Checks, Tattersall Checks and Glen Urquhart Plaids, to cite some of the pattern names. There is also a large and varied assortment of materials and fabrics of different weights and weaves that are by no means limited in the uses to which they may be put. There are combinations using red, orange, blue, green, brown and tan in addition to the more familiar grey, black and white combinations. The heavier weights are suitable for women's and men's coats, the lighter weights for suits, and the more conservative numbers are suitable for business as well as sport wear.

With the present strong interest in fashions for tailored suits and coats, there is naturally a keen interest in the fabrics suitable for them. It is also interesting to the hand-weaving field to know that BERNAT'S have arranged to import these Scotch yarns and to have an available supply to meet the needs of the hand-weaving trade for the weaving of these fabrics. The fabrics described and illustrated in these pages are based on these yarns.

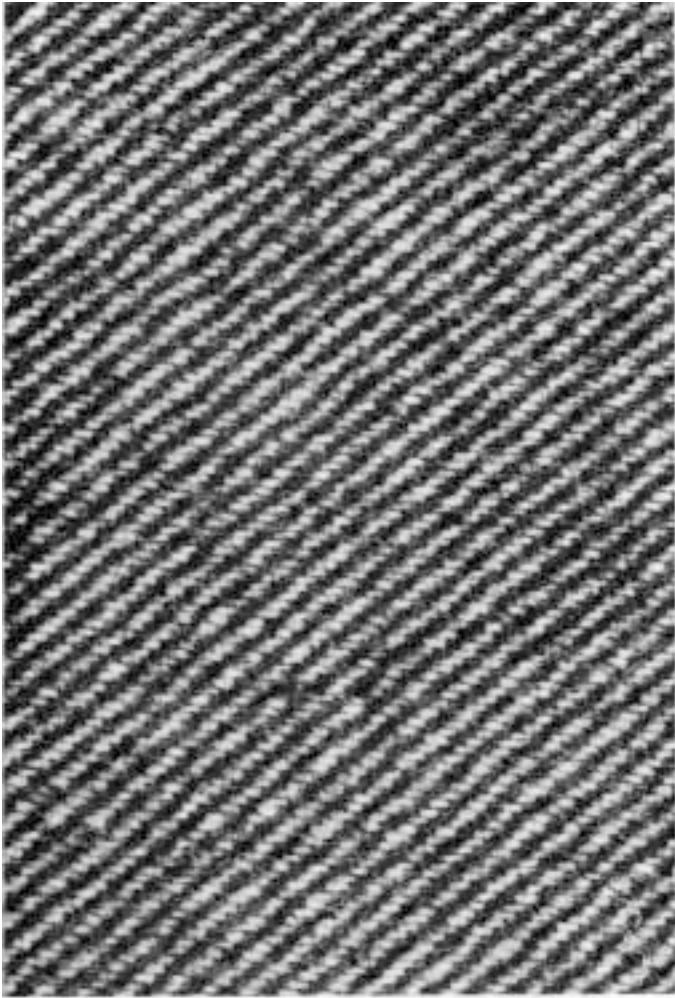
Before going into detail about the structure and patterns of some of these fabrics, I should like to stop and review two processes of interest to the hand-weavers, and about which little has been said, namely the spinning of the yarn and the finishing of the woven cloth. In many of the more isolated and rural sections of Europe and America, the old method of spinning and finishing is still being carried on just as it was in times past, when no other way was known, and, in certain cases, it is still a matter of necessity rather than choice. While it is not a matter of necessity today, it is interesting to know the procedure, as it is still practical in some cases for small yardages.

SPINNING. — The wool as shorn from a single sheep is called a fleece or clip. As it is clipped from the sheep it falls away in a single fleece or spread. The clip is rolled and stored for future handling and grading. A single clip or fleece may all go into one grade of yarn in hand-spinning, or sorted into several grades for several qualities of yarn; a clip in commercial sorting may go into as many as fourteen

or fifteen grades. In the homespuns the whole clip went into one carding and mixed for a fairly even grade of yarn that was used for all household purposes, weaving and knitting both. This can be done in hand-spinning, but in commercial- or machine-spinning the machine must be set for different staples, so the wool must be more finely sorted. After the clip was made the wool was picked over by hand and all foreign matter, as stocks and burs, were removed. With all the dirt and impurities removed, the wool is next put through a washing or scouring process. This is done on the bank of a neighboring stream, whenever possible, as the wool needs considerable washing and rinsing. In the scouring all of the perspiration and natural oil of the sheep is removed and a soft prepared oil is later sprayed into the wool to soften it for handling in spinning. When the washing was finished the wool was spread on cloths out of doors to dry, then was stored for carding later. Sometimes the wool is dyed in lots, or natural clips of different colors are mixed in the carding process to obtain the mixes, greys and heathers. The carding process is one of brushing the wool with metal-toothed brushes to get the fibres in a more or less parallel order for spinning. It is carded into rolls which in spinning are pulled out and slightly twisted by hand to hold together for the spinning wheel. In the earlier and more primitive days the entire process was one of hand labor. Then followed the use of the distaff which was later mounted, and the spinning wheel developed. There are the two wheels used for spinning, the larger or woolen wheel, and the smaller or flax wheel. I have been told by a woman, whose mother did spinning, that a spinster might walk in the neighborhood of twenty miles in a good day's spinning with a large wool wheel. Gradually the flax or linen wheel has superseded the wool wheel and is now used for wool spinning as well. In the more rural districts it is still the practice to hold spinning "bees," when the spinsters of the neighborhood gather with their wheels to spin and gossip.

FINISHING. — The light-weight wool was woven into a general utility fabric. When woven it was cut from the loom and rinsed in lukewarm, soapy water. In the soap for finishing the wools, only the softer oils and fats were used. After being washed the fabric was not wrung out, but squeezed out, then all members of the household were called to help shake out the water. This process is similar to tossing someone in a blanket; they got good hold on the ends and along the edges and shook the cloth till most of the water was out, then it was spread on the grass till nearly dry, then pressed.

In the shrinking process plenty of tepid or lukewarm water was used; for the pressing process, some water (moisture), plenty of heat and pressure are required. Too much water and working with the heat will cause further shrinking and



PATTERN No. 377

felting, which is undesirable. In each household were several very heavy irons that were kept for the finishing of the cloth. On finishing day all of the heavy irons in the neighborhood were borrowed and kept on a good hot fire. The cloth is first gone over with a thin piece of wet muslin to steam the fabric if it has dried out too much, then it is swiftly pressed with the bare hot iron to give it the hard, smooth, glossy finish; to work slowly is to burn the fabric. The fabric is pressed "with the warp," the irons being run back and forth in the direction of the warp threads; to press the cloth the other way results in a wavy fabric.

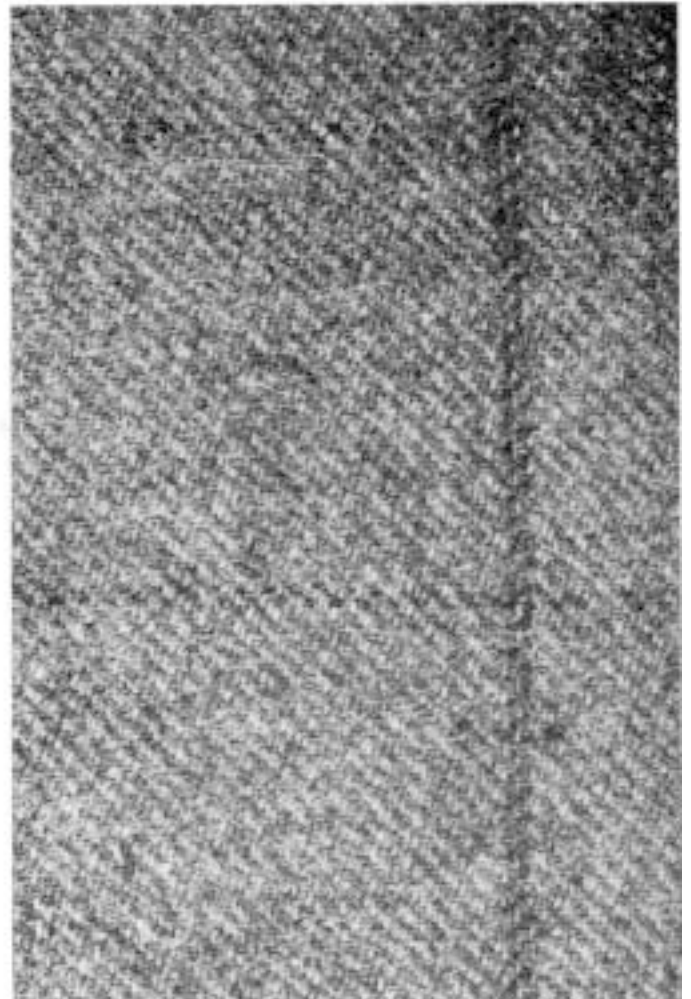
The finished material was stored for future use. When new wool sheets were desired, two lengths of material were cut from the long roll, seamed, and the cut ends whipped with a length of colored wool. For underwear a length was cut off the roll, made up white or dyed red. The lengths for outside use, suits and dresses, were dyed blue, brown and other chosen colors, all dyed with vegetable dyes.

In localities where there were mill facilities available, the custom came up of taking the wool to the mill for carding and scouring. Sometimes they waited for their wool or helped with the preparation, to reduce the cost of the preparation, or they took a quantity of prepared wool in exchange for their raw wool. When the cloth was woven it, too, was taken back to the mill for finishing, especially the

heavier weights, the lighter weights still being finished at home.

TWEEDS. — I have before me a group of Ardassie, Shetland and Sutherland Tweeds, some patterns of which I am going to give the weaving directions. To speak of tweeds by a district name does not classify them by pattern, as the patterns are generally known and are similarly woven in the several districts. To speak of a Glen Check, Tattersall Check, Herringbone Twill is to refer to a very definite type or color plan of pattern.

In studying the weaves they are practically all 4-harness twill or derivatives. There are a few 8-harness weaves and some plain 2-harness fabrics, but the majority are developed on 4 harnesses. I am going to work only with those in the 4-harness group. In weaving a homespun, although it may be a 2-harness fabric, it will weave much easier on a straight 4-harness twill, drawing in with less friction and breakage. A twill will always weave up into a softer, fuller fabric with more ends and picks to the inch than when the same set-up is woven plain. In this group they are all the regular 2 up and 2 down twills; some irregular or novelty twills may run 1 up and 3 down or 3 down and 1 up, or a combination of the regular and irregular twills, but all of this group are woven in the regular order.

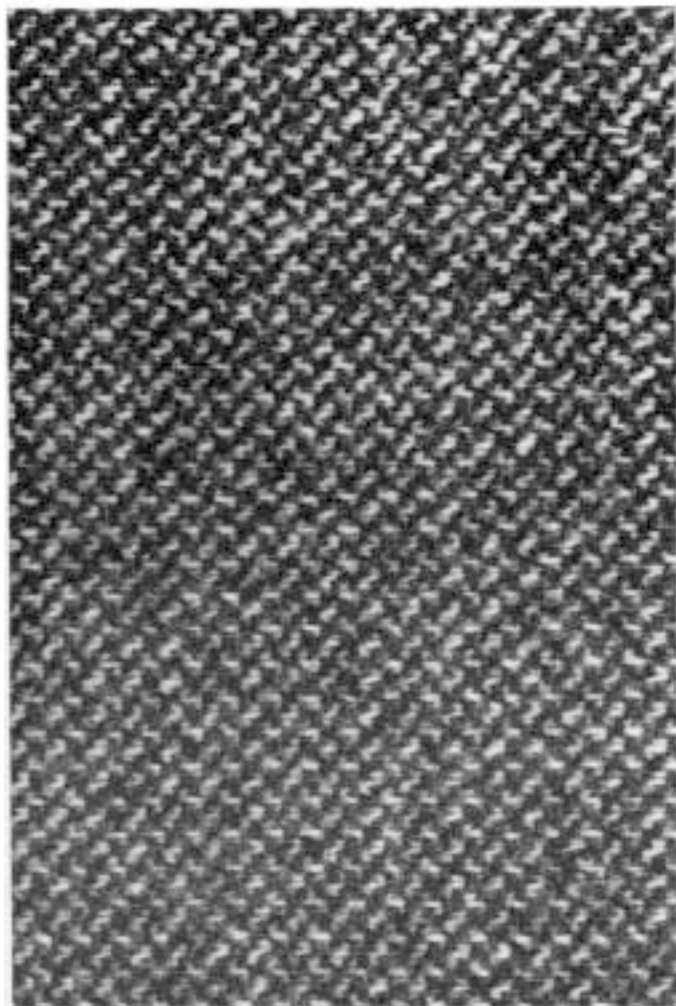


PATTERN No. 074

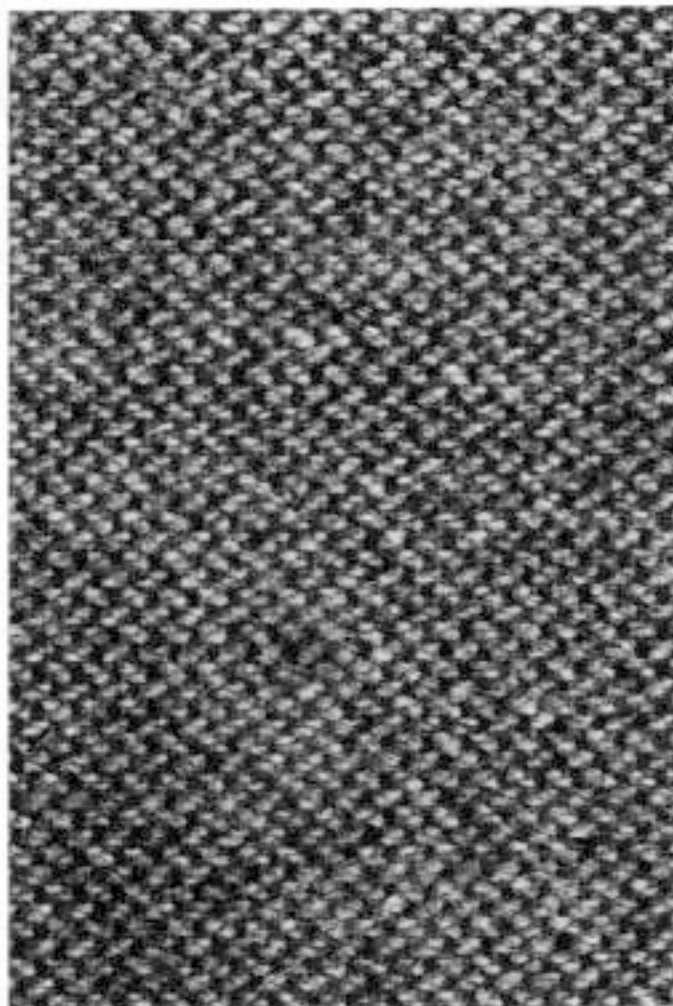
The colors range from a black and white shepherd's check through checks of several and more brilliant color combinations, the more sombre plaids, herringbones, to solid colored diagonals and twills. There are several weights of yarn, and these are set at varying counts to the inch, from 12 to 32, resulting in several weights of fabrics suitable for light-weight suitings to topcoat and overcoat materials. In examining the yarns further, there are solid whites that may be natural, sulphur-bleached or otherwise bleached, and I am told that there is now a white dye on the market, but I do not think that any of these yarns are so treated. There are solid blues, greens, reds, oranges, browns, tan, and black; there are also a large number of mixes and heather mixes that were dyed before spinning. There are also a number of flecked yarns, yarns that have tufts or nubs of different and contrasting colors mixed in during the spinning but allowed to spot in the yarn rather than thoroughly carded or mixed in.

Perhaps the easiest way to discuss the fabrics is to classify them by weave, then discuss the possibilities of the weave also, discussing the variations and colors used for further interesting effects.

Although there are but very few plain weaves here, there are one or two which may be well worth mentioning. The first is a fine hound's-tooth check. It is drawn 2 dark green, 2 brilliant green, and is woven in the same order; the yarn



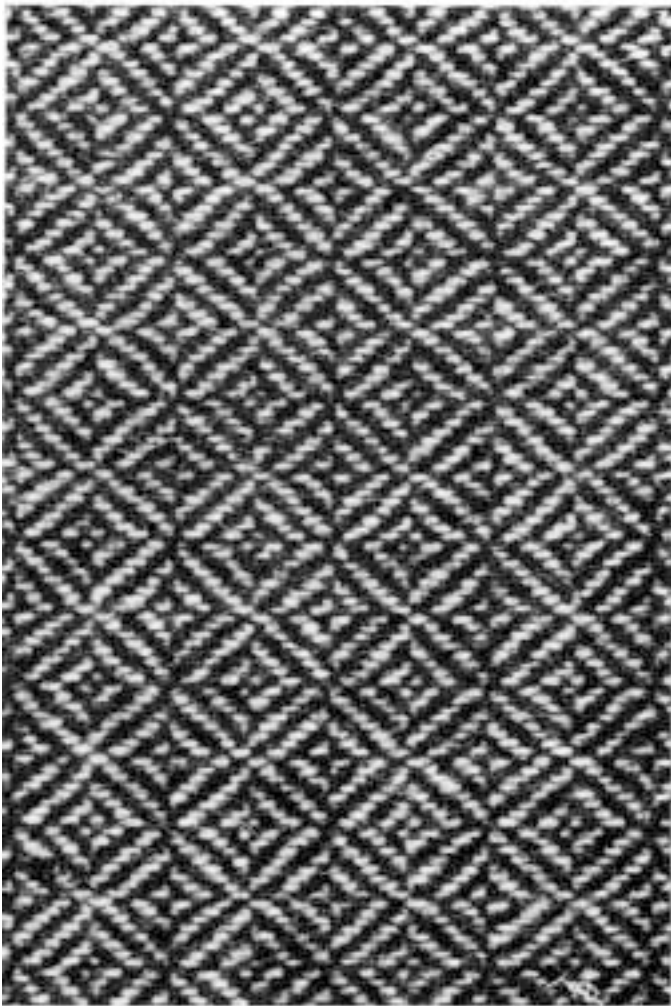
PATTERN No. 385



PATTERN No. 378

is fine and makes a fine light-weight suitable for women's coats. There are similar numbers in bright blue and white, two shades of blue, brown and white, and brown and tan. It might be well here to distinguish between a shepherd's check and a hound's-tooth check. For either check the warp is set the same, 2, 4, 6, 8, or any number of each color, and woven in the same order. The difference is in the treadling and the order in which the color is started. For the shepherd's check the check may be woven plain, except for the 2-end combination which will be hound's-tooth. In a shepherd's check it is so treadled to bring out the square effect, and in the hound's-tooth check the protruding angles that seem to connect the figures is the effect to work for.

The next group to work up are the regular 1, 2, 3, 4 twills. Most tweeds can be woven on this drawing in, and most are woven on the regular 12, 23, 34, 14 tie-up, though some are woven on an irregular or different tie-up. This drawing in and tie-up is the regular tartan plaid, and any plaid; though the color plan may be correct, nevertheless, the plaid is not correct if it has not been woven in this manner, as the mixed diagonals that connect the solid color areas are what make the tartans attractive. This twill may be woven regular in solid colors in several weights of materials; there is a large group so woven. The solid colors and heather mixes in this weave make up a nice assortment of



PATTERN NO. 308

fabrics suitable for conservative and business wear. Draft and pattern 377 is an example of this fabric. Light-weight, firm weave, suitable for suits; heavier fabric for overcoats.

To liven this group up a little for a person not quite so conservative, a fine over-plaid or pencil check is introduced. Every 28, 32 or more ends, a pair of ends of contrasting or harmonizing color may be drawn, weaving it in the same order. The two new ends may be drawn 1 plaid, 1 regular color, 1 plaid and so woven. This result is an over-check about 1½ to 2 inches, according to the number of ends to the inch. Several colors may be used in making the plaid, and the plaid may be made larger or smaller by changing the number of ends between plaids. Draft and pattern 074. For suits and overcoats.

This same draft may also be drawn 1 light and 1 dark throughout, and woven in the same order. Another suggestion is to weave it in a dark color on a light warp. It may also be wove in an irregular color scheme, as 1 light and 2 or 3 dark.

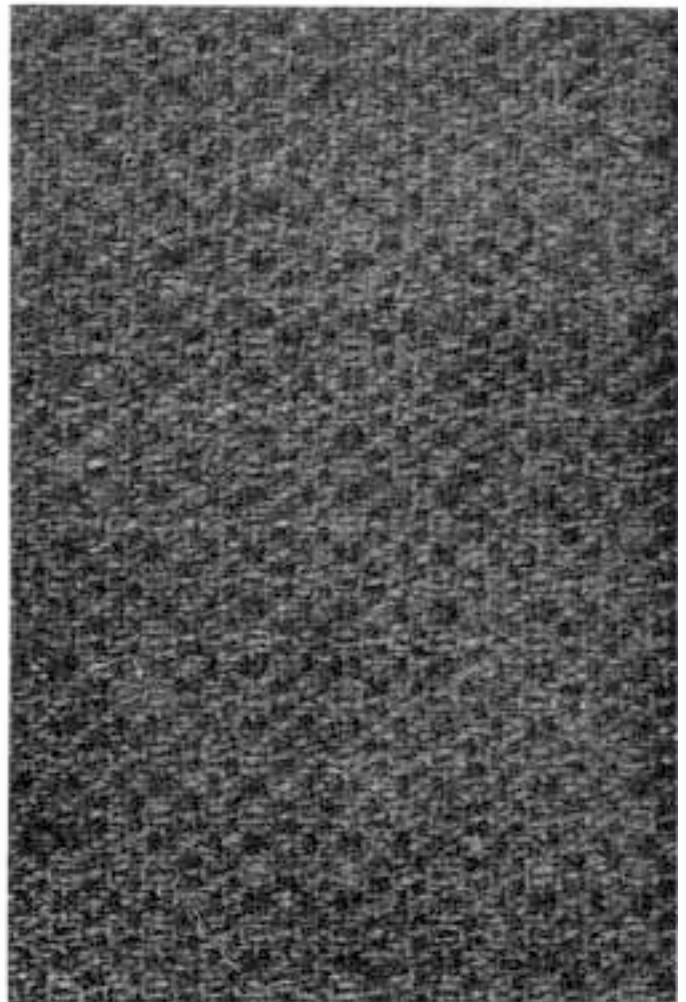
A quite common arrangement of this twill is called the broken crow, and is effected by changing the order of the treadling only, and is woven 12, 23, 14, 34. Pattern 385. This method of treadling simply breaks the straight, diagonal line that results from the regular treadling. Fine weave, very satisfactory for suits.

Another variation of this weave is tan warp woven on this treadling: 12 brown, 24 tan, 34 brown, 13 tan. Fine, interesting weave for suiting. Draft and pattern 378.

The first step away from this regular twill is the herring-bone twill, which is this twill, and every 6, 8 or more repeats a reverse line is inserted. This reverse line may be just a 3, 2, or may be 3, 2, 1, 4, 3, 2, making a wider reverse stripe. It is woven in the straight twill order, and the suggestions for the above twill may be used. This twill may be woven in a solid color, or in a dark color on a light warp, but is in itself enough of a variation without the addition of any more color. The reverse may take up as many ends as the regular stripe; this regular reverse may be woven in the same order, reversing the treadling just as the stripe was reversed. A diamond pattern will result. A very useful fabric. Weave solid and dark on a light warp; also 2 alternating colors on warp of third color.

VARIATION. — In the draft given at 308, the end through the third frame is dropped, making a slight but interesting break in the pattern. This draft may be woven regular, as suggested for 385, or as follows: 2, 3, 4, 1, 2, 3, 4, 1; 3, 2, 1, 4, 3, 2, 1, 4. Solid and alternating colors, fine and coarse weaves are both suitable in this draft. Draft and pattern 308.

At 361 is given a reverse or diaper twill that repeats on



PATTERN NO. 361

five ends. It is a familiar draft to most weavers, and it has a great many uses both in weaving tweeds and other fabrics. In this instance and for the pattern shown also at 361, it is woven a little differently. The tie-up is regular and it is woven with alternate tan and brown weft on a tan warp. The treadling is 1, 4, 1, 2, 3, 4, 3, 2, 1, 4, 3, 2, the first throw of weft on No. 1 treadle being brown.

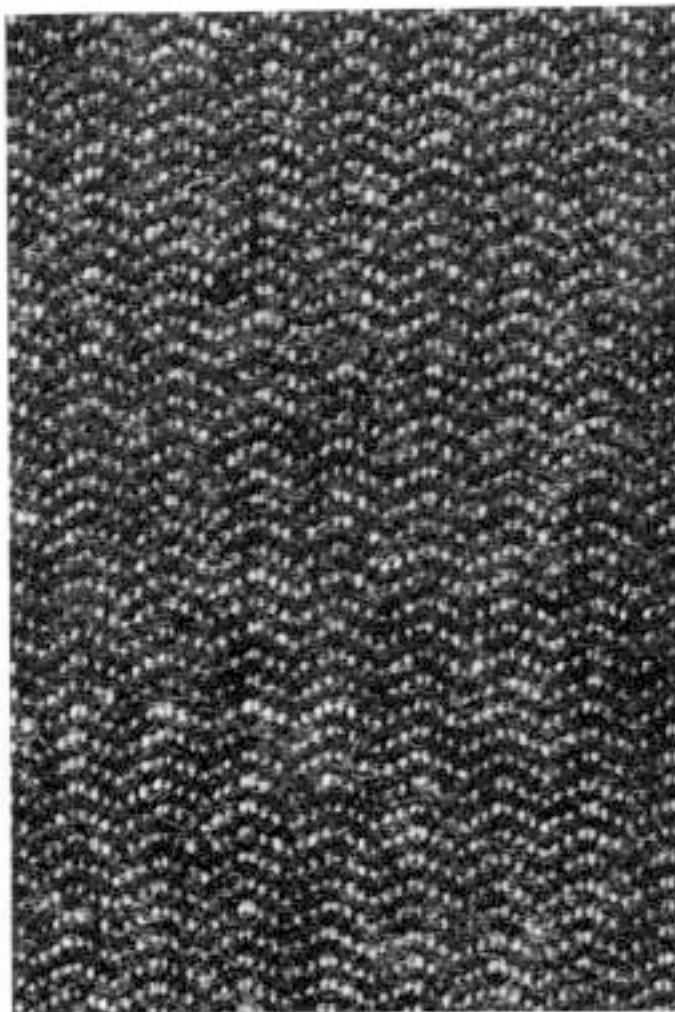
An interesting and practical suit fabric that may be woven in two colors or in three colors is given at Draft 012. The texture is a small overshoot over three ends on a plain ground, but it comes in such a way that there is an effect of small arrowpoints between each overshoot. The colors may be brown overshoot on a tan ground, or a brown warp may be set and woven with the tan ground weft and an orange overshoot. Any similar color arrangement may be planned. For suiting a fine yarn set 24, 28, or 30 ends is most satisfactory. Woven in the straight 1, 2, 3, 4 order.

Another interesting and practical variation for suiting is that given at 067. It is a twill variation, but is not a regular twill, and is a firmer weave than the regular twill. It, too, may be woven in a two- or three-color combination and should also be woven with a fine warp set close. The warp may also be set in alternating colors. Woven in the straight 1, 2, 3, 4 order.

An interesting weave that is practical for suiting in fine



PATTERN No. 012

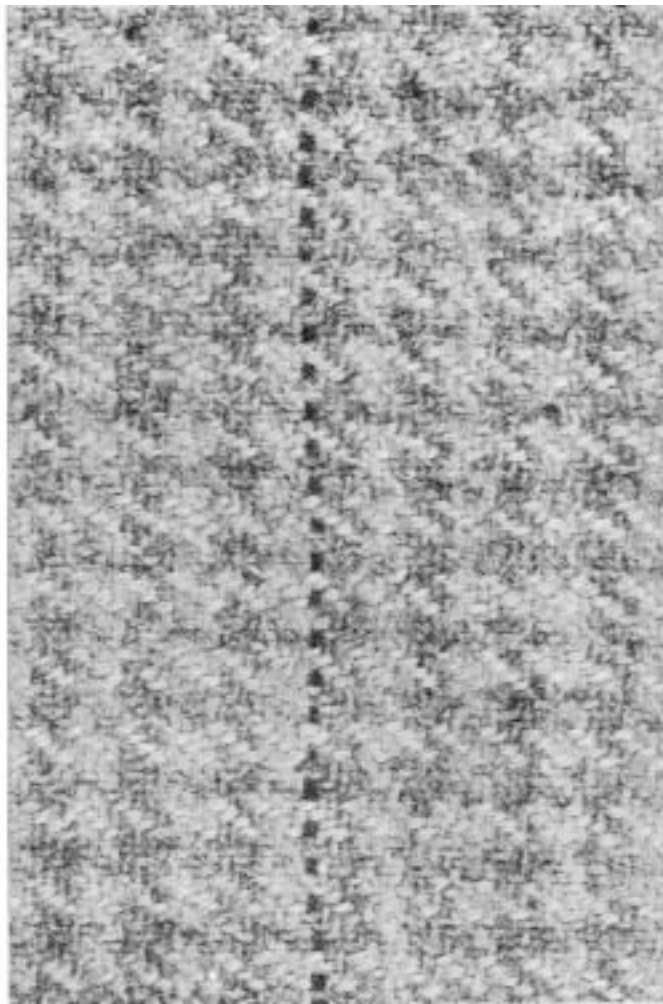
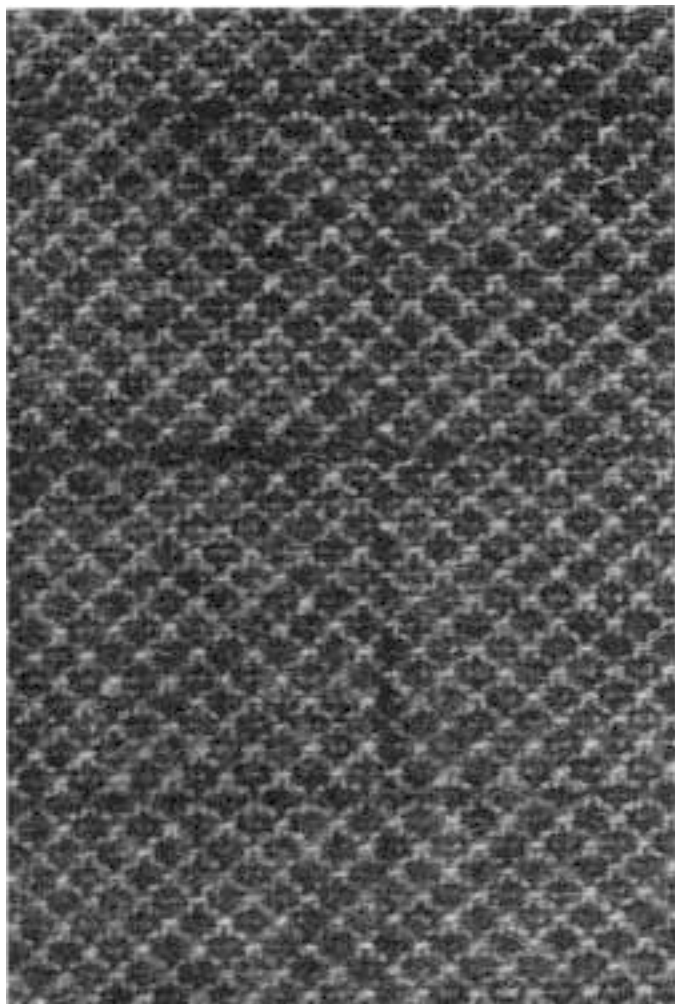


PATTERN No. 067

weight and for coat material in heavier weights is the diamond weave shown at 029. It is an irregular drawing in and it may be woven on a solid warp or on a two-color warp, as was the sample shown. The tie-up is shown and the treadling is in a regular, reverse order and is 1, 2, 3, 4, 1, 4, 3, 2. A variation of color combinations may be used for this weave. The sample was woven alternate brown and tan on a brown and tan warp.

The foregoing are only a few of the possibilities that can be worked up and most of them are all based on the regular 1, 2, 3, 4 drawing in and treadling draft. It is impossible in the space allowed to define and illustrate the development of all of the various plaids, checks and various color combinations, but I would like to go through this group of samples and note some of them, but with the color card and weights of the different yarns at hand many more and interesting arrangements will suggest themselves.

There are the solid color fabrics in every color and weave made up in varying weights of yarn. Following the solid color group are a number of samples in two colors, using a solid color warp and a darker or contrasting yarn for the weft. Another effective combination is the use of alternating shades of weft on a solid warp, or that, too, may be in alternating color or of a third shade. All combinations using solid and alternating colors in regular or irregular order result in



an all-over variation of color. Following this group is another, depending on pencil stripes and crossbars and checks of strongly contrasting color to develop a very definite and pronounced pattern, very different in character from those depending upon weave for their effect.

It is in this field that there is such a chance for the development of the checks and plaids all based on the straight 1, 2, 3, 4 draft. The first of these are the regular two-color checks in all sizes and combination of color. The regular checks are further varied by over-checks of a third color, variations of which are the Gun Club and Tattersall Checks. Some of these checks are very pleasing and subdued, while others are full of color and satisfying to the most sporting of tastes.

To return to the more practical part of planning a tweed is the problem of weights of yarn, amounts and shrinkage; the finishing of the woven fabric having been given earlier in this write-up.

There are several weights of yarn available. The lighter weights of yarn should be set 24, 28, 30 or 32 ends to the inch for most satisfactory weights of fabric. These yarns run about 3200 yards to the pound. The medium weight of yarn works up well set 16 to 24 ends to the inch, and the heavier yarn can be set 12 to 16 ends to the inch. These yarns run about 2200 yards to the pound. The different weights of yarn may also be combined to produce a wider

range of weights of fabrics. They may be combined as were the colors; all one weight of weft with warp of different weight; alternating weights of weft and warp in a varying number of ways.

In estimating the amount of yarn to a pound of material, no set rule can be given because of the various weights of yarn available and because of the varied number of ends to the inch that may be set. Following is the rule for estimating the amount needed, and is figured after the yarns, ends to the inch and other details are determined.

$$\frac{\text{Ends to the inch} \times \text{width of the material (inches)} \times \text{length of the material (yards)}}{\text{yardage per pound of yarn}}$$

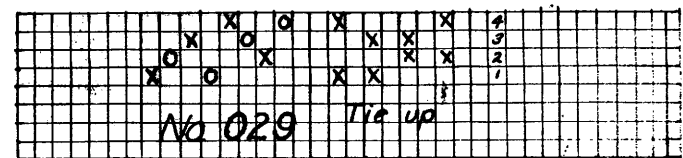
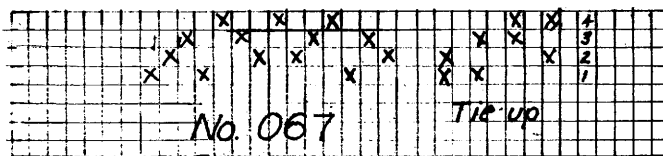
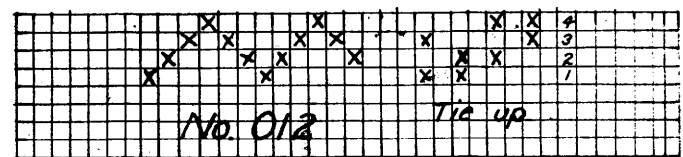
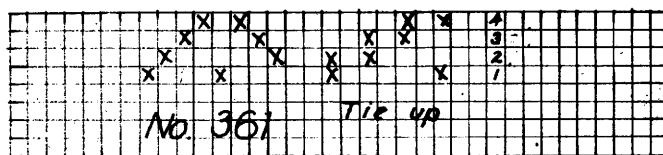
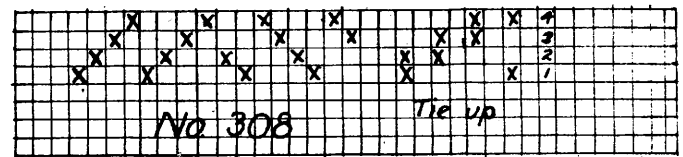
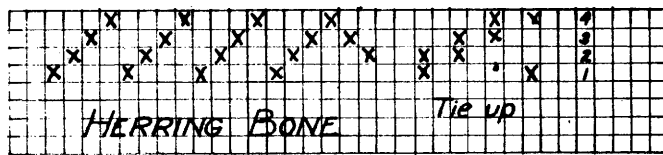
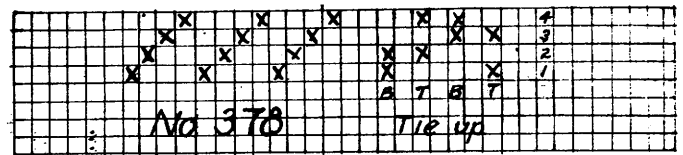
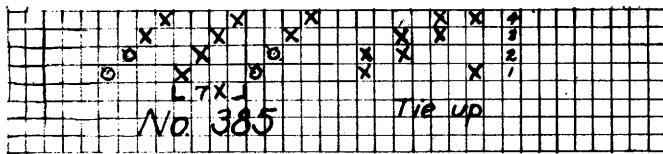
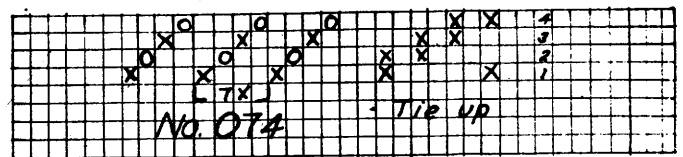
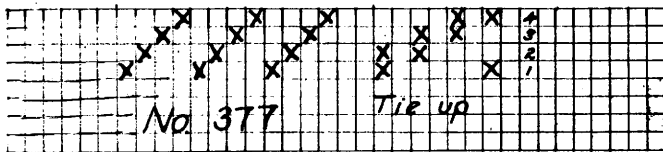
The result of the above formula will be the number of pounds required for the length of fabric. This number doubled will be the amount needed for the complete piece. When several weights of yarn are used in a single piece, the several weights should be figured separately. From these figures the cost of the yarn for the piece and by the yard may also be determined.

Take-up, shrinkage, and loss of yarn must be allowed for in estimating amounts. "Take-up" is the amount of take-up of the warp ends in working around the weft in weaving. This figure varies with the tension of the warp in weaving. If the warp is set very tight the take-up may be less in weav-

ing, but the shrinkage in finishing may be greater, so that one practically offsets the other. When the tension is released the fabric immediately shrinks some and, in handling, "sets" or shrinks a little more, but most of the shrinkage is in the finishing process. In the mills, in commercially finishing the fabric and where yardage is an important item, the goods are stretched in the finishing process. Beyond small limits this is undesirable and may result in injury to the fabric and lessening of its wearing qualities. Loss of yarn that must be considered is the amount that is lost in tying on the warp and the amount that is lost on the end that cannot be woven through the heddles because of the knots. This amount of waste depends upon the individual weaver. For short lengths (under 10 yards) the allowance should be about 1½ yards for take-up shrinkage and loss in weaving; for longer lengths the proportion may be reduced. The exact figures each weaver will have to work up as the tension of the warp, beating up of the weft and handling changes the

figures. The shrinkage in the width must also be allowed for, and is a matter for each weaver to determine; 3 to 4 inches shrinkage from width drawn in the reed to the finished width is average.

In inquiring about yardages necessary for making up different items of apparel, a more or less varying rule is accepted for the amounts required. The standard for men's wear is the size 36 for coats and suits, and size 18 is the standard for women's wear for both suits and coats. The amount of yardage for a size 36 coat or suit, or size 18 coat or suit, is the same in all cases, the standard amount being 3¼ yards double width and 6½ yards single width per garment; the width of the material being 27 inches single width and 54 inches for double width. A more generous width allowance is 29 inches single width and 58 inches double width, as a better cutting can be made with this width without skimping and may be more economical in the long run.



DRAFTS AND TIEUPS FOR TEN SCOTCH FABRIC DESIGNS

Seamless Afghans and Bags

BY AGNES K. NEILSON

THE WEAVING of double-width cloth and seamless tubing is a very interesting subject.

On eight harnesses a four-harness pattern, double-width fabric may be woven suitable for coverlets and pillow covers. On six harnesses a tubing with a four-harness pattern top and a plain back suitable for pillow covers may be woven. A plain tabby weave four times as wide as the loom may be woven on eight harnesses in plain tabby weave; on six harnesses a fabric three times as wide as the loom may be woven in plain tabby weave.

On four harnesses a double-width fabric and tubing may be woven in the plain tabby weave and, to get any kind of pattern in it, it will be necessary to put in stripes of colors in the warp which, if woven with stripes of colors, of course will produce a plaid effect.

Double-width fabrics in tabby weave have many uses, as for dress and coat material, blankets, afghans, etc.

The threading for this weave is the "Twill" threading, 1, 2, 3, 4, 1, 2, 3, 4, etc. Harnesses 1 and 2 are used for the upper layer and harnesses 3 and 4 are used for the bottom layer. The warp should be sleyed with double the number of threads as in ordinary weaving. For dress material made of "Fabri" yarn, sley the loom 44 or 40 to the inch and the material will come out 22 or 20 to the inch. Thus it is possible to weave dress material 38 inches wide on a table loom. An afghan made of knitting worsted should be sleyed 18 or 20 to the inch and will come out 9 or 10 to the inch, which is a very good texture for the purpose. Perle No. 10 sleyed 24 or 30 to the inch is good for bags and pillows.

The sleying is done in the ordinary way, two threads in each dent, the threads from harness 1 and 2 in one dent and the threads from harness 3 and 4 in the next dent, etc., and the fabric will come out smooth and even as if woven on two harnesses. The warp in the illustrated bags and pillows is in one color, and the decorations different colored stripes in the weft and figures in tapestry weaving. The two pillows, the saddlebag and the zipper bag are all woven on the same warp, 300 threads sleyed 30 to the inch. It gives 10 inches of warp in the reed and the finished weaving is about 9 inches wide. The pillows are woven 13 inches long, making them 9 x 12 after shrinking. The knitting bag is sleyed 24 to the inch, 16 inches wide, making the bag 15 inches wide. Directions for threading and tie-up are given on the diagram. When threading for tubing, be sure to put in one extra thread after the last repeat, as there must be an uneven number of warp threads in tube weaving to avoid a double thread on one side. Omitting one thread in the last repeat will, of course, have the same effect.

To weave Pillow No. 1, begin with a few tabby shots by

stepping on treadles A and B alternately; these tabby shots close the pillow in one end. Then weave one shot on treadle 1, one shot on treadle 3, one shot on treadle 2 and one shot on treadle 4. Repeat these four shots until 13 inches of tubing are woven, then step on treadle 5 to open the tube and insert the pillow in the tubing, taking care to arrange it nice and even. The warp may be loosened a little to make the arrangement easier. Tighten the warp again and weave a few tabby shots on treadles A and B alternately. This will close the pillow. The warp may now be cut and, when the fringes have been tied on both ends, the pillow is finished with the cover on without a single stitch taken with a needle.

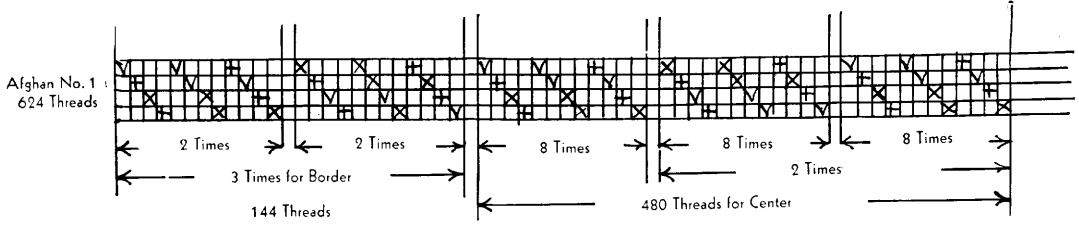
For Pillow No. 2, first a few tabby shots on treadles A and B alternately, then, starting from the left, weave one shot on treadle 1, one shot on treadle 3, one shot on treadle 2 and one shot on treadle 4. Repeat these four shots until 3 inches are woven. Then weave one shot on treadle 3, one shot on treadle 1, one shot on treadle 2 and one shot on treadle 4. Repeat these four shots until 7 inches are woven. Then weave one shot on treadle 1, one shot on treadle 3, one shot on treadle 2 and one shot on treadle 4. Repeat these four shots until 3 inches are woven. Then finish with a few tabby shots on treadles A and B alternately. There will be an opening in the middle of one side where the pillow may be inserted.

In the making of the saddlebag the procedure is the same as for Pillow No. 2, only on a larger scale. First weave the tabby shots to close the bag at the bottom, then weave a tube for about 7 inches, weave the opening at the side for about 16 inches. This center part should be beaten loosely to make it soft. Then weave 7 inches of tubing and close the bag with a few tabby shots. This length allows for shrinkage and makes the bag well proportioned.

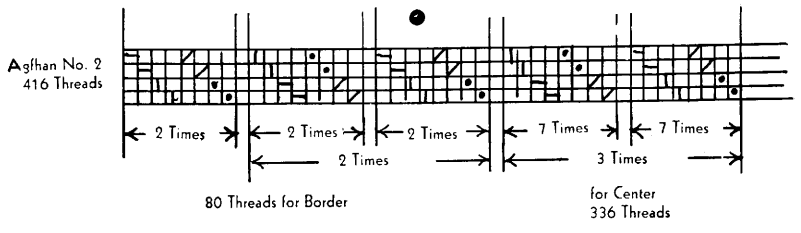
The zipper bag is very simple. Begin with the tabby shots to close the bag, then weave a length of double width the same as the center part of Pillow No. 2, and finish with the tabby shots. When the fringes are tied at both ends, sew the selvage to the zipper.

To make the knitting bag, begin as usual with a few tabby shots to close it at the bottom, then weave a tube 8 inches deep. Then an opening must be made at each side to make the two flaps to sew on the rings. Make these about 9 inches, more or less, depending on the size of the rings. To weave these flaps, two shuttles are necessary. With shuttle No. 1 weave one shot on treadle 1 and one shot on treadle 2. Then with shuttle No. 2 weave one shot on treadle 3 and one shot on treadle 4. Repeat these four shots until the desired length is woven.

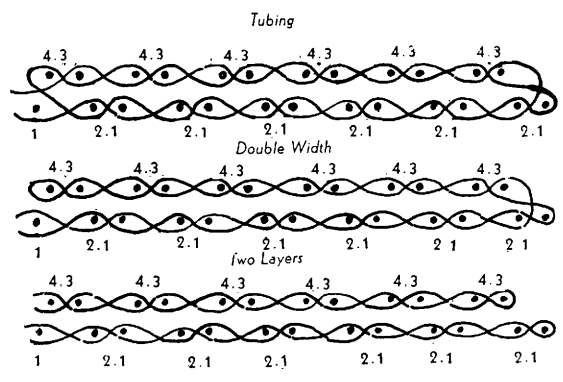
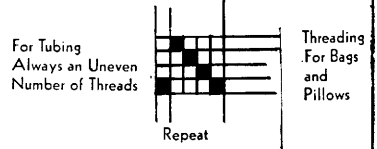
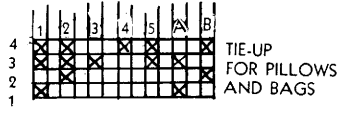
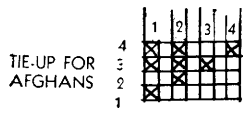
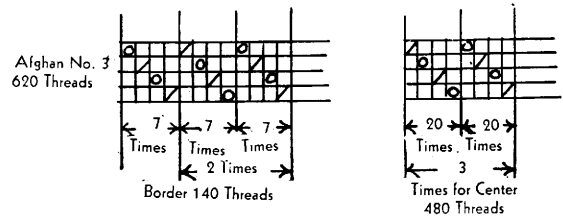
-  Blue
-  Tan
-  Brown



-  Black
-  White
-  Red
-  Gray



-  Taupe
-  Red



Agnis K. Nielsen.

Treadle 1 once }
 " 3 " } Repeat for tubing in pillows and saddle-
 " 2 " } bag and knitting bag.
 " 4 " }

Treadle 3 once }
 " 2 " } Repeat for double width as in center parts
 " 1 " } of Pillow No. 2 and saddlebag and for
 " 4 " } zipper bag.

Shuttle No. 1, treadle 1 once }
 " " " 2 " } Repeat for two layers as in
 " No. 2 " 3 " } the knitting bag.
 " " " 4 " }

Treadle A once }
 " B " } Repeat for tabby.

FOR STRUCTO-LOOMS

Press on Lever 2 once }
 " " " 1-2-4 " } Repeat for tubing in pillows,
 " " " 1 " } saddlebag and knitting bag.
 " " " 1-2-3 " }

Press on Lever 1-2-4 once }
 " " " 1 " } Repeat for double width as
 " " " 2 " } in center parts of Pillow No. 2
 " " " 1-2-3 " } and saddlebag and for zipper
 bag.

Shuttle No. 1, press on Lever 2 once }
 " " " " " 1 " } Repeat for two
 " No. 2 " " " 1-2-4 " } layers as in the
 " " " " " 1-2-3 " } knitting bag.

Press on Lever 2-4 once }
 " " " 1-3 " } Repeat for tabby.

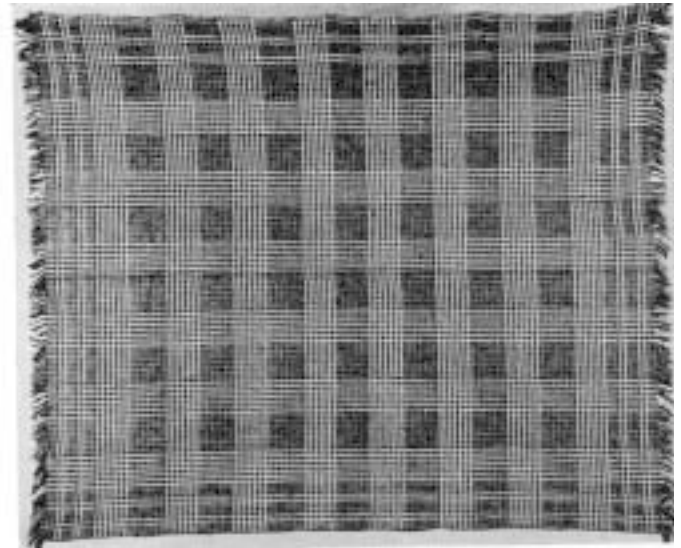
* * * * *

Afghan No. 1 is woven with knitting worsted sleyed 20 threads to the inch, 624 threads in all, making it a little more than 31 inches in the reed. It measures 61" x 80" after finishing. It is warped in alternating stripes of brown and blue and tan and blue, and woven the same.

Threading is given on the diagram. Weave as follows:

Treadle 1 brown }
 " 3 " }
 " 4 blue }
 " 2 " }
 " 3 brown }
 " 1 " } Weave this repeat once for small square
 " 2 " } or four times for large square.
 " 4 " }
 " 1 blue }
 " 3 " }
 " 4 brown }
 " 2 " }





Treadle 1 tan	}	Weave this repeat once for small square or four times for large square.
“ 3 “		
“ 4 blue		
“ 2 “		
“ 3 tan		
“ 1 “		
“ 2 “		
“ 4 “		
“ 1 blue		
“ 3 “		
“ 4 tan		
“ 2 “		

Weave six small squares for border, alternating one brown and one tan. Then weave as many large squares as wanted for the center and finish with six small squares for border.

Afghan No. 2 is woven with heavy peasant wool sleyed 15 threads to the inch, 416 threads in all, a little more than $27\frac{1}{2}$ inches in the reed. The finished afghan measures 53" x 63". It is warped and woven with black and white and red and gray in alternating squares. The threading is given on the diagram. Weave as follows:

Treadle 1 red	}	Weave this repeat twice for small square or seven times for large square.
“ 3 “		
“ 4 “		
“ 2 “		
“ 1 gray		
“ 3 “		
“ 4 “		
“ 2 “		

Treadle 1 black	}	Weave this repeat twice for small square or seven times for large square.
“ 3 “		
“ 4 “		
“ 2 “		
“ 1 white		
“ 3 “		
“ 4 “		
“ 2 “		

Weave five small squares alternating red and gray and black and white, beginning and ending with the red and gray. Then weave large squares for center, as many as

wanted, beginning with black and white and ending with red and gray. Then finish with five small squares for the border, beginning and ending with the black and white.

Afghan No. 3 is in the well-known log-cabin style woven in dark red and taupe knitting worsted sleyed 20 threads to the inch, 620 threads in all, 31 inches in the reed, and, after finishing, it measures 61" x 75". Threading is given on the diagram. Weave as follows:

Treadle 1 red	}	For small square weave this repeat once and then the four shots at the bottom. For large square weave this repeat ten times.
“ 3 “		
“ 4 taupe		
“ 2 “		
“ 3 red		
“ 1 “		
“ 2 taupe		
“ 4 “		

Treadle 1 red		
“ 3 “		
“ 4 taupe		
“ 2 “		

Treadle 1 taupe	}	For small square weave this repeat once and then the four shots at the bottom. For large square weave this repeat ten times.
“ 3 “		
“ 4 red		
“ 2 “		
“ 3 taupe		
“ 1 “		
“ 2 red		
“ 4 “		

Treadle 1 taupe		
“ 3 “		
“ 4 red		
“ 2 “		

First weave five small squares for the border, then weave the large squares for center, as many as wanted, and finish with the border.

An afghan has many uses in the home and in the car, and is a delightfully worth-while possession. It may be woven in colors to blend with its surroundings, or in bright colors to lighten up a dark corner. If made with moth-proof yarns it will last a lifetime and become a cherished heirloom.

Some Ancient Peruvian Textiles

BY MARY M. ATWATER

WE OF THE MODERN TIME, with our radios and automobiles, our aeroplanes and air-conditioned houses, are inclined to a certain feeling of pity for those who lived before us in the far distances of time. We think of them as crude and simple. But—were they?

The modern craftsman who studies in some museum the scraps and fragments of ancient art that have come down to us from the old time is apt to come away from that study with a new humility and a new respect for the dignity and infinite variety of his art. His own efforts may appear crude and childish as compared with the intricate beauty, fineness and precision of things made for ordinary daily use by the skillful hands of "poor ignorant savages" and the craftsmen of forgotten civilizations.

"Art is long,"—before the dawn of history it was already old. There can be no "progress" in art as there is in science, for art is not a building up of bits of knowledge. It is the satisfaction of that hunger for beauty that is one of the deepest needs of the human heart. Who can define beauty? Beauty cannot be rationalized or reduced to a formula,—it can only be felt. The more we discuss beauty and are learned and intellectual about it, the further we are away from it. We become timid and distrustful of our own instinctive reactions, and we wait for some "expert" to tell us whether or not a thing is beautiful before we venture to admire. We are in art a little like the unfortunate centipede who found it impossible to walk after he was asked to explain how he could manage so many feet at once. We can't just take a lump of clay or a strand of colored yarns and produce beauty instinctively as the "ignorant savage" can—and does.

But perhaps out of our fumbblings and uncertainties a new art will be born. It is interesting to note that many of the decorative forms we label "modernistic" and "new art" today are curiously akin to the patterns of primitive decoration. And this does not appear to be due to imitation, but to be the outgrowth of the fresh, new attitude toward art apparent in these thrilling times. This seems to me to prove that these decorative forms are somehow fundamental—that they express something basic in human nervous structure and in our instinctive reactions to the world we live in.

To the ancient craftsmen many of these decorative forms—perhaps all of them—were symbols of definite meanings. But a symbol is not invented out-of-hand, it must grow out of an inherent relation between form and meaning. And though the old forms may not mean to us exactly what they meant to the ancients, they have an amazing force far deeper than words.

In the remarkable modern apotheosis of the swastica we have a case in point—an ancient symbol that has suddenly blazed into new and tremendous power.

We can rationalize and intellectualize and complicate life as much as we please, but in spite of all that we are still primitives at heart—human beings, living and working in a world of mystery.

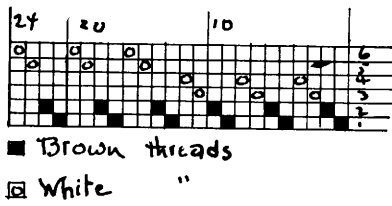
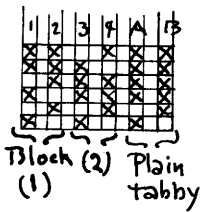
The art of weaving is one of the oldest among the arts of man. It is so old that there has been nothing basically new in it for almost two thousand years,—for the mere harnessing of power to do our work has made no basic change in the art itself. Modern machinery has never produced linens as fine as the incredibly filmy linens of ancient Egypt, nor any fabrics more gorgeous than the ancient brocades of China. Perhaps there will never again be anything basically new in weaving. For all that, it is new every year, like a tree that puts out new leaves and flowers every spring. There is, I think, great joy in having a part in so ancient and so beautiful an art.

Among the ancient craftsmen in our art the weavers of old Peru hold a proud place. Many examples of their craft have survived and may be found in museums, though little or nothing is known of the history of their times. These ancient weavers were amazingly versatile. Among their weavings we find "double" fabrics similar in construction to the famous double-woven coverlets of Colonial days, though usually much more elaborate in design; also a form of double-face weave, four-ply, similar in structure to the web produced by the card-weaving process but probably not made by that method. Also gauze fabrics—from simple to extremely complex, resembling sometimes pillow lace. Tapestry, of course—the tapestry technique appears common to all ages and all countries. Also some astonishing embroideries, and many very elaborate forms of braiding in which hundreds of strands are combined. There are, besides, many weaves that appear to be peculiar to ancient Peru.

I have recently been studying some of these marvels in a very interesting and beautiful book, "Textiles Anciens du Pérou," by Raoul d'Harcourt. The notes are in French, but the fine plates would prove interesting, without the notes, to any weaver.

The book, unfortunately, gives no information about the loom or looms used by these weavers. Possibly this is something that nobody knows. When I lived in South America a number of years ago, I observed Indians weaving blankets and ponchos, but as I knew nothing of weaving at the time I did not make detailed notes. I have greatly regretted the lost opportunity. The "looms" I saw in use consisted of nothing but a warp pegged out flat on the ground; the sheds were produced by a system of shed-sticks, and the weaver worked squatting over the warp in what appeared a very inconvenient manner. It seems likely, however, that the ancient weavers worked in much the same way.

Pattern (a)

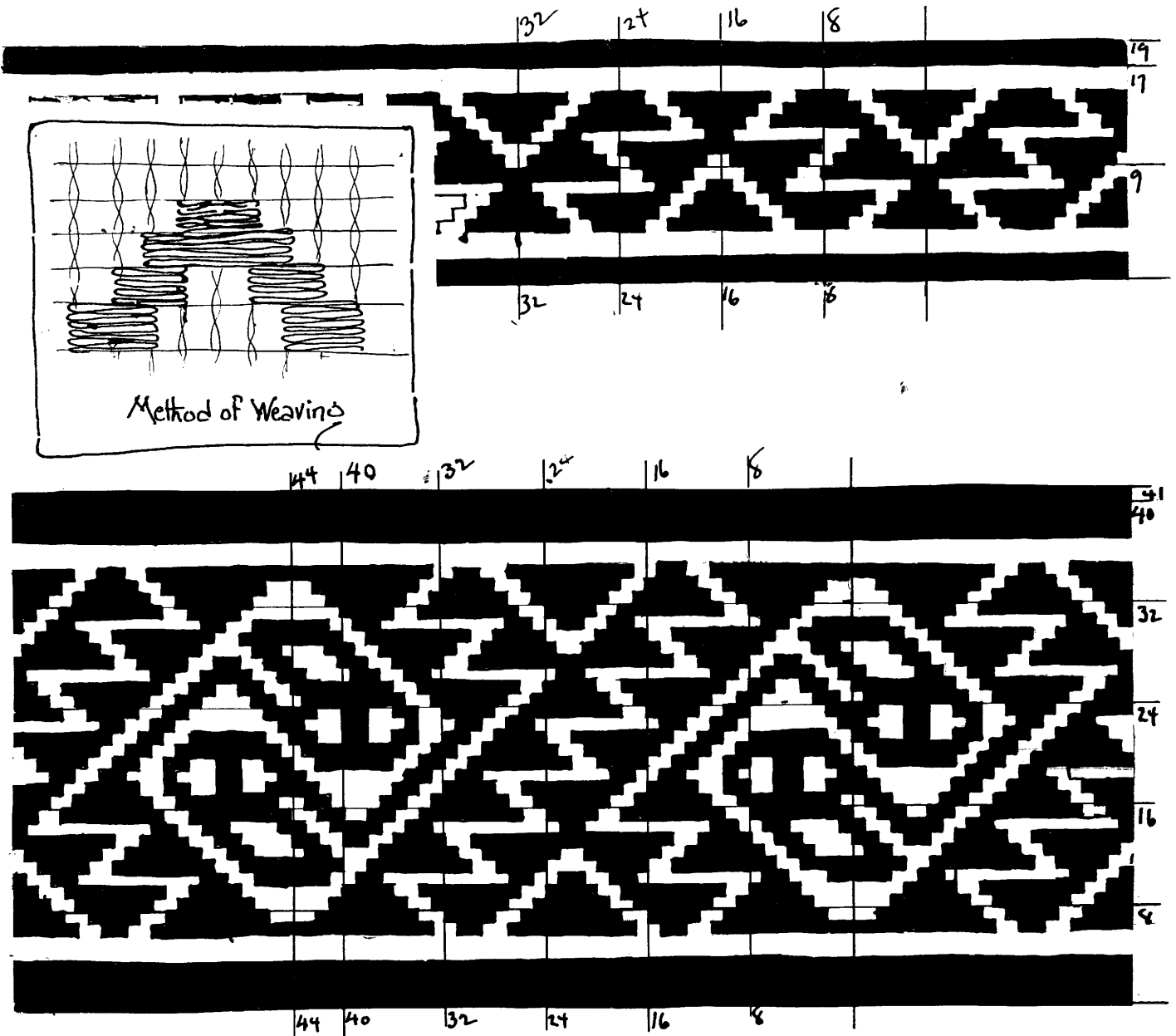


An Ancient Peruvian Weave

Modern American weavers would not care for this method of weaving, but of course the mechanism used for making the sheds makes no difference in the end-result, and is

merely a matter of greater or less convenience. Many of the ancient Peruvian weaves can be translated for use on our modern hand-loom, and some of these adaptations are given here in the hope that they will prove of interest to modern hand-weavers.

One odd weave that appears to be peculiar to the ancient Peruvians consists of plain tabby, in which each figure of the design has a separate warp and weft. These warps and wefts interlock along all the edges of the blocks. Just how this web was produced one can only guess. Most of the designs in this weave are very simple, composed of square blocks of different colors. In some pieces the squares were apparently woven separately and sewed together in the manner of patchwork, but each patch was made in the size and



Borders in Tapestry over Gauze — after d'Harcourt

Pattern (b)

shape desired, with selvages all around. This weave is mentioned because it might afford an interesting "community project" for a school class. The separate squares could be woven on little frames set with small nails, the weft being put in with a tape-needle.

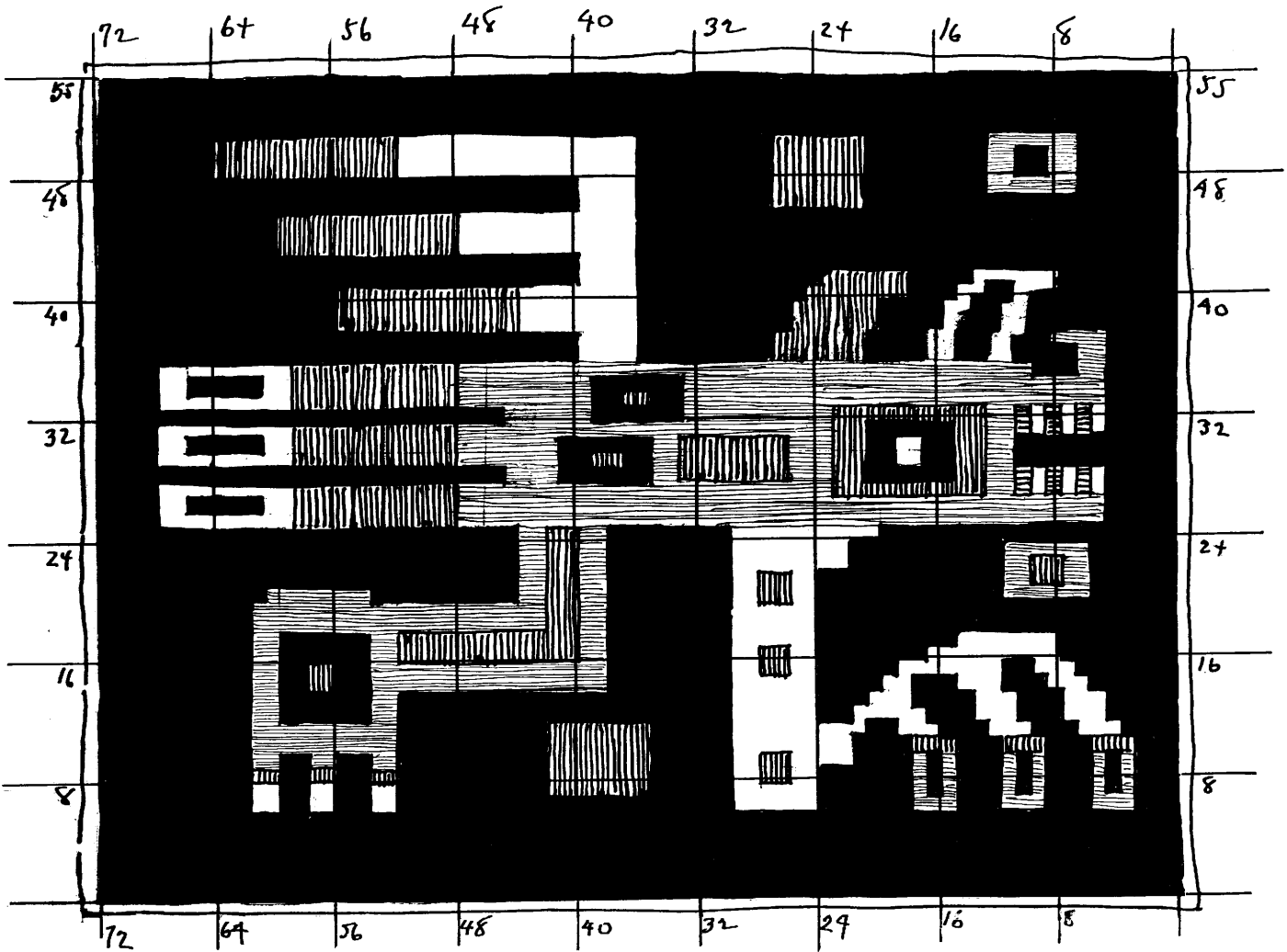
A simple, but effective fabric—suitable for bags and upholstery—is shown at (a) of the diagram. It produces alternating squares of tabby and "rep," the rep squares showing three narrow lines in contrasting color. The wrong side of this fabric shows long floats of pattern-warp, so this would not be a good weave for a piece in which both sides of the fabric are in evidence. The warp for this should be set twice as close as for tabby weaving. That is, the brown foundation threads should be set as for plain tabby. The white threads, which may be of a somewhat coarser material, are introduced along with the other warp. Suppose, for instance, that the foundation material is linen floss and the white threads a fairly heavy wool yarn: sley a linen thread and a wool thread through each dent of a 15-dent reed. Treadle the first square on treadles 1 and 2 alternately, and the second

square on treadles 3 and 4 alternately. All weft-shots should be in the material of the foundation-warp.

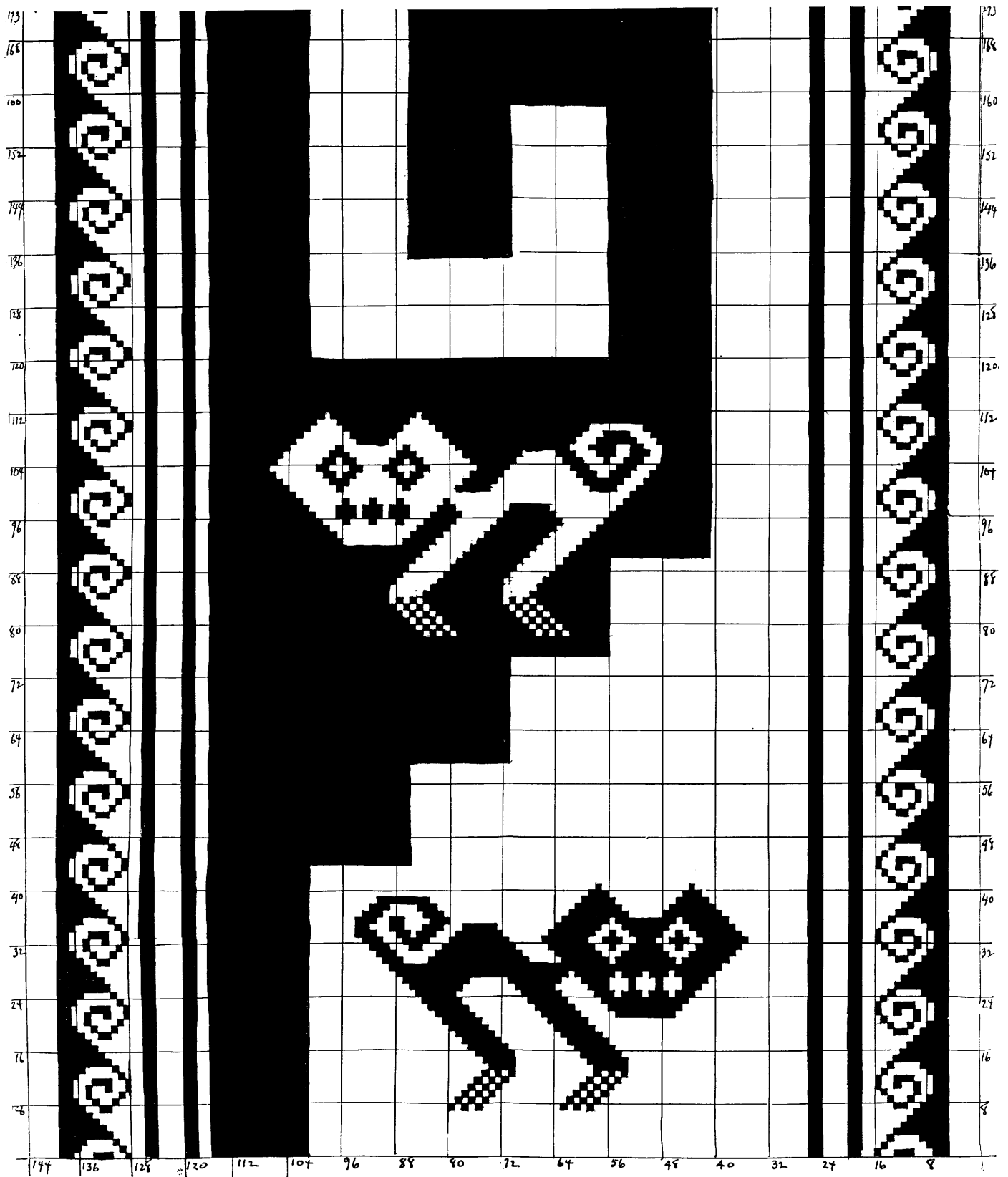
The original of this weave is shown on Plate XXV, 2 and 3, of the d'Harcourt book, and the original fabric according to the notes is in cotton about the weight of a 10/2, set at 36 ends to the inch. This makes a rather small figure, and for upholstery the coarser linen and wool fabric suggested above would be more effective.

Treadles A and B as shown on the diagram weave plain tabby all across, and these treadles are used only for the ends. These ties might be omitted.

An interesting weave that appears to be peculiar to the Peruvian weavers is composed of a plain gauze foundation overlaid with pattern weaving in tapestry. The effect is unusual and handsome and could be used with splendid results for curtains. To make plain gauze, in which each pair of threads is twisted together, is simple enough, though it requires, of course, a special gauze harness. For the tapestry work each pair of threads should also be threaded as for plain tabby, on two additional harnesses.



Figure—"Male Condor"—from a Peruvian Tapestry—after d'Harcourt
Pattern (c)

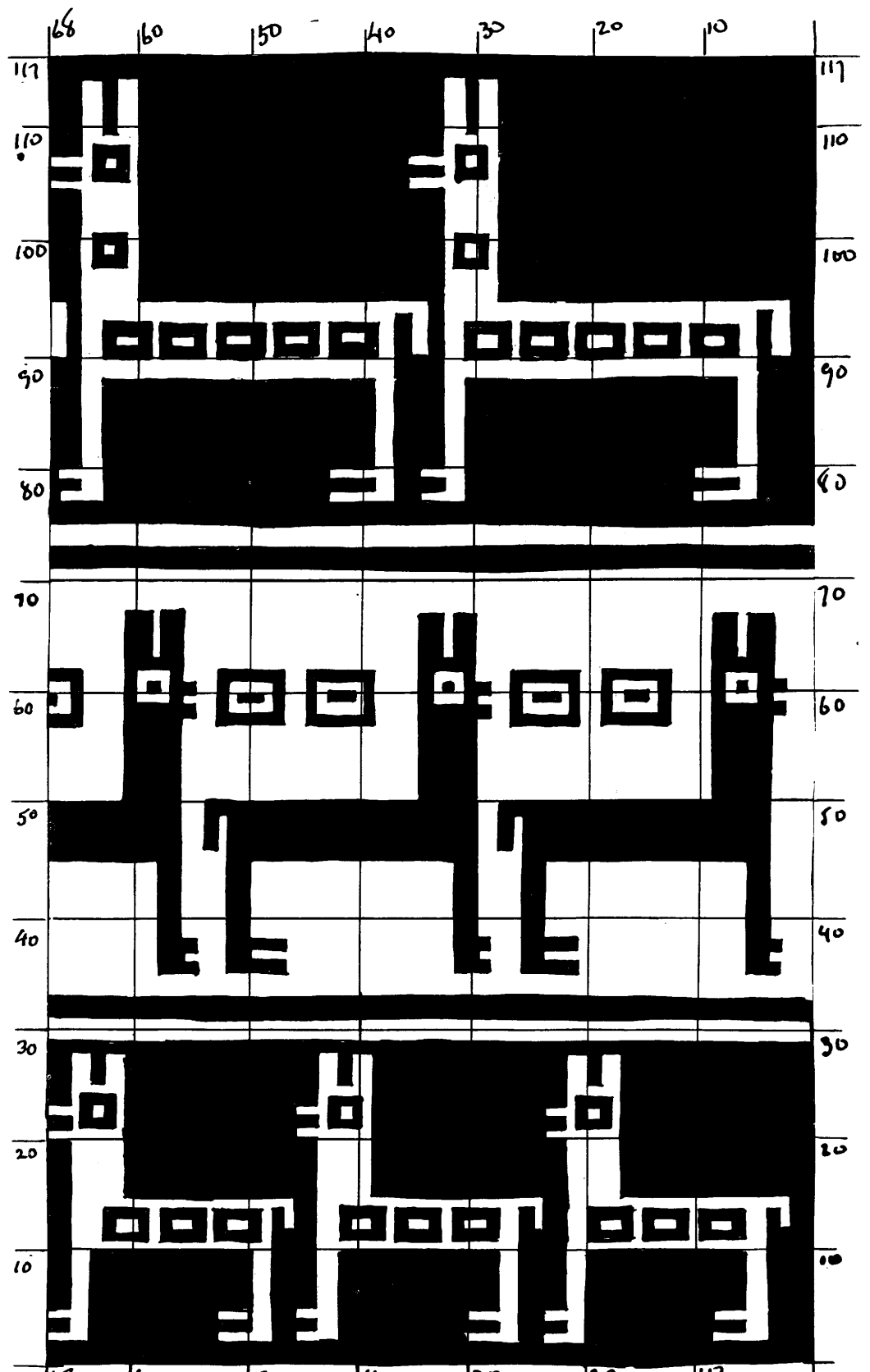


Ancient Peruvian Double Weaving—after d'Harcourt—
 Pattern (d)

The pattern shown at (b) of the diagram is for this type of weaving, each square of the design corresponding to two warp-threads—one pair of the gauze weave. This pattern is from the piece shown on Plate XI, 2, of the d'Harcourt book. The original, according to the notes, is in natural cream color, the warp in cotton and the tapestry in wool. The warp-setting is 30 ends to the inch. For curtains a wider spacing of the warp would be more effective. The figure represents the heads of pelicans, much stylized.

The handsome bird at (c) of the diagram is from a tapestry piece done in alternate squares of light and dark. The bird as sketched appears on the dark squares. On the light squares the same bird appears, but with the body omitted. Some of the birds are headed in the opposite direction, and there are some slight variations from one figure to another. According to the notes, the creature is a "male condor," and the colors used in the piece are: dark blue, light blue, red, violet, green and yellow. Just what the symbolism of the bodyless bird may be, the notes fail to explain.

Perhaps the most interesting of the ancient Peruvian pieces are those in double weaving. How they were woven appears to be unknown, but the patterns lend themselves readily to the four-harness "Finnweave" technique described in a recent issue of the HANDICRAFTER. Pattern (d) is an arrangement for this weave after the fascinating piece shown on Plate XXVIII of the d'Harcourt book. The original is in beige and brown cotton, quite fine. The total width of the piece is given in



Processions of Llamas, in Double Weaving, from an Ancient Peruvian Bag—after d'Harcourt
 Pattern (e)



Method of Braiding Pattern (f)

the notes as six inches. It takes little imagination to see in this design a representation of day and night, enlivened by a delightfully horrific creature of the cat-variety. The interlocking light and dark "key" figure is a decorative form that appears again and again in the Peruvian decorations. The little running border might have come from the Greek. The simplicity and rhythm of this design seem to me superb.

The processions of light and dark llamas shown on pattern (e) are also delightful in their placid dignity. This pattern is from a bag with a long braided handle shown on Plate XXX of the d'Harcourt book. The original is in carmine wool and white cotton, the warp being set at fifty ends to the inch. The braided handle is in a rather simple flat braid in several colors and there is also a slender round braided thong of interesting construction and unexplained purpose attached to one side of the bag. The top of the bag is finished in coarse needle-work in two colors, and the side-seams are similarly finished.

The d'Harcourt book is a real treasure to the handweaver. It contains many more fascinating patterns adaptable to modern weaving than the few selected for illustration with this article,—open-work patterns that could be executed in the Spanish open-work weave, fascinating patterns for embroidery, and the truly marvellous braiding—but space is lacking to describe them all.

A useful flat braid, easy to make and excellent for braided belts, is sketched at (f). As many strands may be used as desired for width, but the ends should be in multiples of four, eight or twelve. The strands are braided singly from right to left and in groups from left to right, as indicated on the sketch. The effect is diagonal bands of color. This braid appears in the d'Harcourt book on Plate LVI, No. 2. The original is composed, according to the notes, of nine groups of twenty-four threads each, and these are divided into two strands of twelve threads each on the return, but it is easier to use a coarser material in bands of eight threads divided in fours on the return. The colors of the original are: yellow, red, violet, prunc, dark green and dark blue. The much more elaborate piece shown at No. 3 of the same plate is similar in technique though much more complicated to execute, and I will not attempt a description.

In making this braid I find the simplest technique is to pick up alternate threads all across, omitting the group of four at the extreme left-hand edge. This forms a shed through which the heavy strand may be drawn. Of course from time to time the strands emerging at the right must be braided back singly over succeeding coarse strands. The braiding should be close and even, and produces a firm and heavy fabric excellent for a belt or—when made narrow—for handles for a bag.

The d'Harcourt book will be found in many libraries, and it is hoped that the examples given here will inspire readers to consult this book for themselves and discover the many other marvels that the book contains.

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