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THE WEAVER

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Before me, in and for the State and county aforesaid, personally appeared Paul Bernat, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE WEAVER, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

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PAUL BERNAT, *Editor.*

Sworn to and subscribed before me this 29th day of September, 1937.

[SEAL] LOUIS M. PETERS, *Notary Public.*
(My commission expires April 29, 1943.)

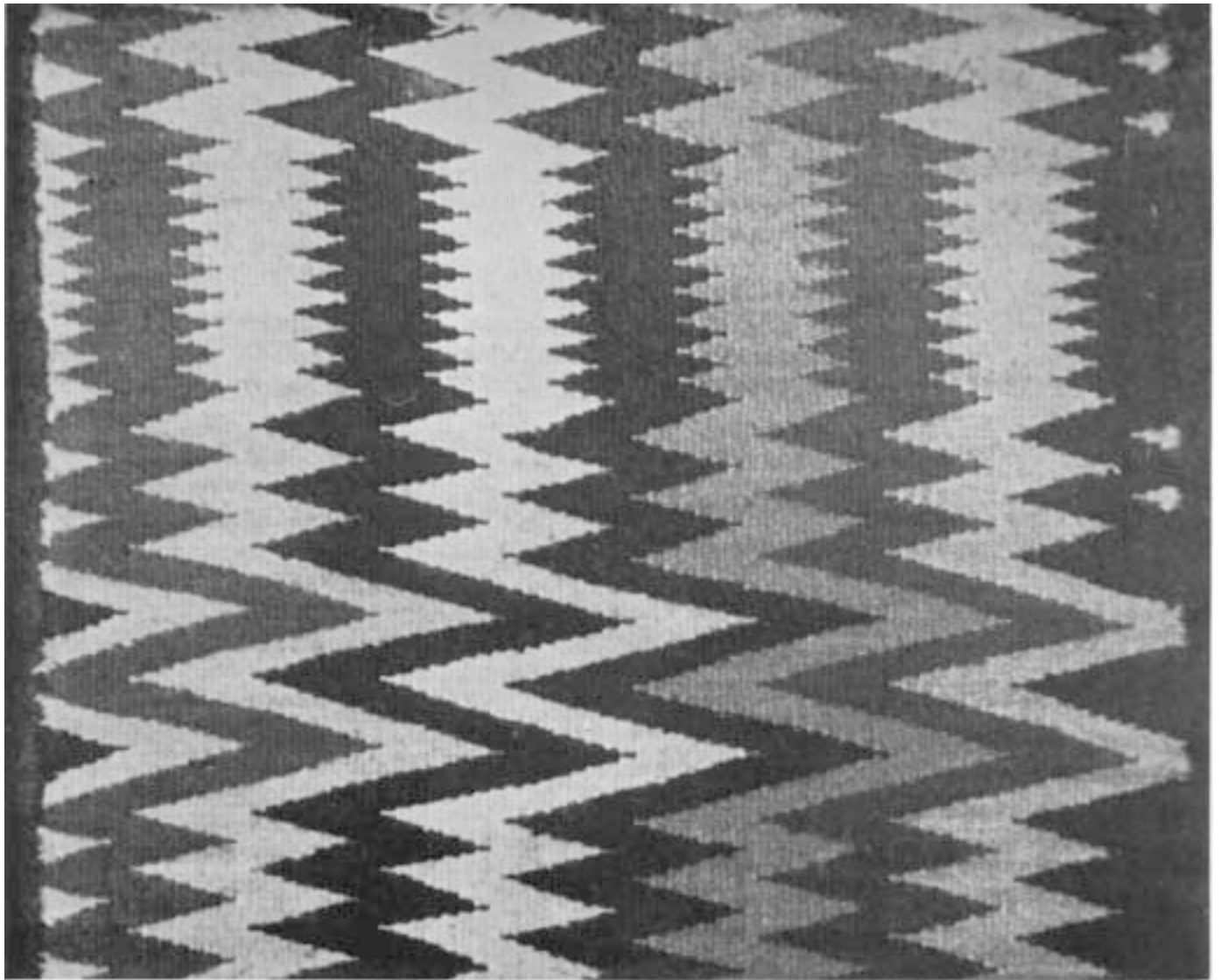


ILLUSTRATION NO. 1 — *Showing detail—photograph taken from wrong side of textile*

Scandinavian Art Weaving

NORWEGIAN LYNILDBORDVEVNING OR LIGHTNING WEAVE

BY ELMER WALLACE HICKMAN

LYNILDBORDVEVNING, or Lightning weave, is closely associated with the Åklæ weaving technique. The Åklæ technique was described in *THE WEAVER*, Volume II, No. 2.

One could weave the Lightning or the Åklæ technique without the knowledge of both, but knowing both weaves affords the weaver greater opportunity for enriching the web. The Lightning weave is different from the Åklæ technique. While the Åklæ weave consists of squares or disengaged lines, the Lightning technique is done by the building of diagonal lines that go in a zigzag manner.

Although, at first glance, one would suppose that the

Lightning technique permitted very little opportunity for extensive designing, nevertheless, the combinations of zigzags and diagonals are almost limitless. A great many finished textiles shown in the Norwegian textile books are combinations of Åklæ and Lightning weaves; others are done only in the Åklæ technique, while scores of other illustrations show wall hangings, etc., woven in the Lightning technique alone. (*Gammal Allmogeslöjd Från Malmöhus Län*, Volumes 1, 2 and 4. All Scandinavian books mentioned in these articles can be secured from Albert Bonnier, 561 Third Avenue, New York City, New York.)

Our own American Indian designs resemble greatly these

Norwegian designs, regardless of the emotional or unemotional content of their characteristic symbols. And I once saw a Hopi weaver using practically the same technique on his two-harness upright loom as that employed by the Norwegians in the Åklæe technique. I tried several times, while this Indian exhibit was at a local department store, to talk with this weaver, but each time that I went to the exhibit he was out on the outdoor stage holding a snake between his teeth and doing his exhibition snake dance. Since his taste — as was my impression — showed a greater appetite for reptiles than for weaving, my limited time prevented me from talking with him.

Because of the similarity of these American Indian and Scandinavian techniques, I have examined several American Indian blankets and rugs. I found that most of the interlocking took place *around* a single warp thread and not *between* two warp threads, as does the Scandinavian weaving. This interlocking around one warp thread produces, at the joining, a fringed effect in the Indian textiles. The Scandinavian joinings, or interlockings, are straight and clean-cut. There is one exception: Picture weaving or, as the Norwegians call it, Billedvevning. Can it be that there is some connection between the Norwegian designs and the designs of the American Indian? I do not know, but I can imagine that such is quite possible.

Gladys A. Reichard, in her excellent new book "Navajo Shepherd and Weaver," doubts that the above is possible, concluding from a statement that she made. In this book (published by J. J. Augustin, 30 Irving Place, New York City, New York) the author describes the zigzag built up in a diagonal technique, instead of a horizontal technique, in order to get a "scalloped" edge. This very trying diagonal building seems to me an extremely laborious process; and certainly the scalloped edge is what we, as weavers, try to avoid. I suppose that the crude looms and, at times, the poor stretching of the warp on the American Indian looms made

this an accident rather than a virtue. Such was the case, also, of the old Scandinavian textiles that were made on crude looms. The weavings show a crookedness of edge and design that might hold for some, today, a sentimental anti-quearianism, but for most of us weavers this crookedness holds only adverse criticism. If a scalloped edge is what is wanted, that is another matter.

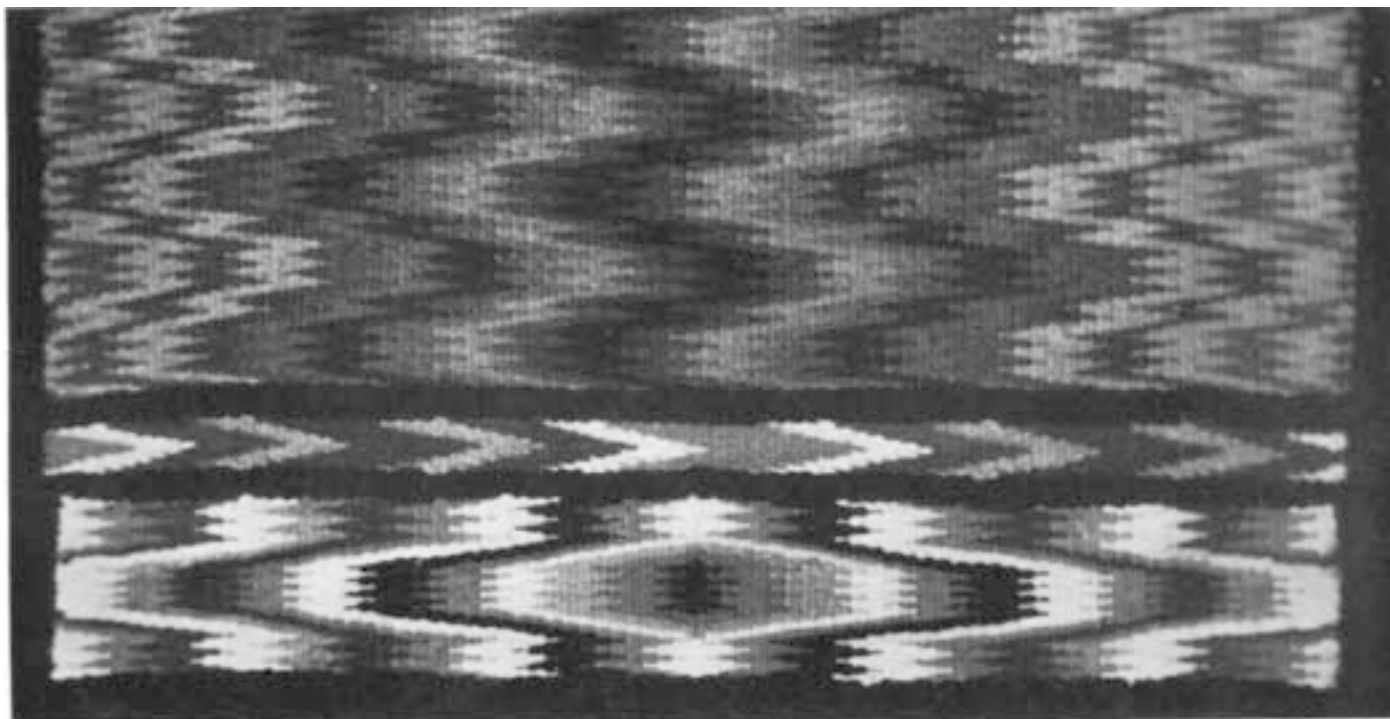
Assuredly, one should not strive for a scalloped edge today. Indeed one need not strive for it at all sometimes, in any type of weaving. A scalloped edge often has a peculiar faculty for stubbornly persisting in asserting itself.

Oddly enough, although our own American Indian weaving designs are strikingly similar to a great many Scandinavian designs, it is worth noting what Nils Lithberg says in a Swedish book called "Hemslöjd." He says:

To speak of Swedish homecraft in textiles in the meaning of one single style of craft with certain uniform features is absurd. The woven webs of Scania and Härjedalen, for instance, are widely different. The knotted rugs of Härjedalen are entirely unknown in Scania, while the tapestries and Röllakan (Åklæe in Norwegian) of Scania are quite unknown in Härjedalen. The Norrland rugs have strong color contrasts, red, green, white, yellow, and so on — resembling the open bearing and gay smile of the Norrlander in the midst of the dark mystery of the pine forests. In the Malmöhus weavings (where we find so much Röllakan and Lightning weaves) we get the same glow as in the evening's sunset, when it flames over the Southern plain of Scania. We get the "Skybragd" pattern in Norrbotten and Västerbotten. The "Skybragd" was, as late as the eighteenth century, the name for the Northern Lights.

I wonder, then, if this Lightning weave is not a reflection of that same aurora borealis — the shooting colored spikes into the heavens and their diffusion into one another. Some of the borders on the huge pieces of weaving, in the colored illustrations in the Scandinavian books, certainly lead one's imagination into that northern region where can be seen at certain times of the year this riot of color.

ILLUSTRATION NO. 2 — *Showing detail — photograph taken from wrong side of textile*



But, for fear of romancing, let us continue by saying that the Lightning technique produces just as heavy a fabric as does the Åklæ. The warp threads are entirely covered by the weft yarns, and the weaving is done, as in Åklæ, from the back of the work. *No interlocking, however, takes place within the Lightning weave, unless straight-side borders are used in the design.* The technique described below is done in such a way that it is difficult to tell the wrong side from the right in the finished product. (The photographs illustrating this article were taken from the wrong side of the weavings, after the ends were clipped off.) The weave can be done in several techniques, but the one given here seems the most satisfactory.

Before beginning the work it will help if the floor or table loom is raised from the back so that the loom will slant forward. In so doing, the work can be more readily seen on the loom. Also, less noise is made by the beater if a rubber kneeling pad is cut into four parts and one placed under each corner of the loom.

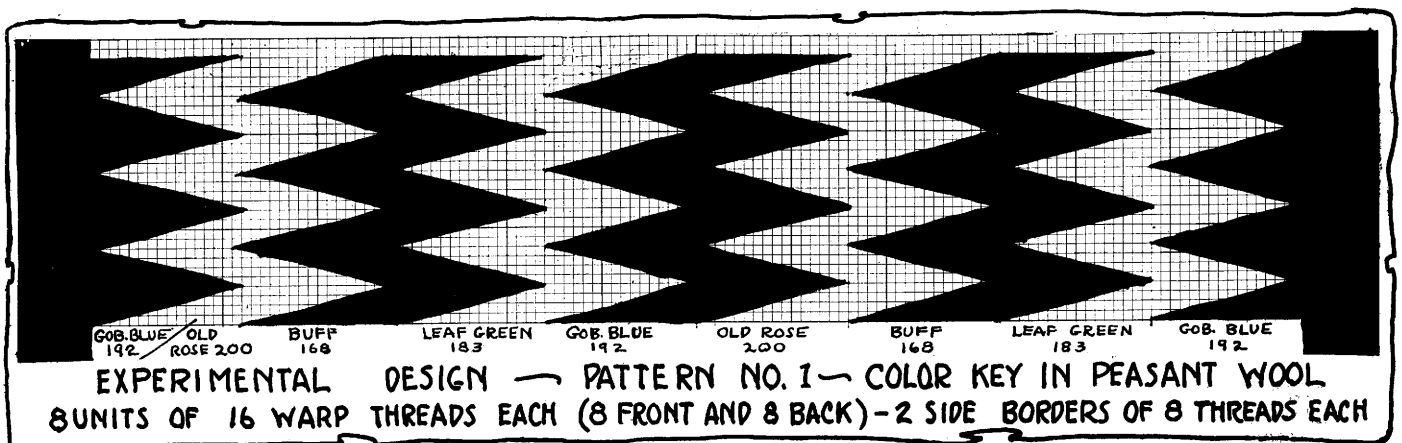
Although some Scandinavian weavers contend that the best effect is had from the use of several strands of single-ply wool for weft, I am sorry to disagree with them, as I have found that it is difficult to keep the strands even. Also the strands break easily when they get caught in the bobbins. I would, therefore, advise the use of three- or four-ply yarns, such as Peasant wool or French tapestry wool. If one cares to try the single-strand wool, use Bernat's Homespun doubled. Use a No. 8 reed and a 20/9 cable thread for warp, if possible. Carpet warp will do for experimental work. Wind the bobbins as described for Åklæ. Of course, as in the Åklæ technique, any loom can be used that will permit the making of two sheds as for plain weave.

For a practice or experimental piece I would suggest that the beginner use Pattern No. 1 for his design. Have an even number of warp threads, say 144; this will give eight sections of sixteen threads each (eight front and eight back warp threads) and allow eight threads (four front and four back) for each selvage or border. Make the colored bobbins — either as designated on the design or of your own selection — and weave the zigzag or Lightning a sufficient number of times, until you feel sure you know the process of advancing to the right; returning to the left; adding new bobbins, when needed; and dropping bobbins when the design no longer calls for them.

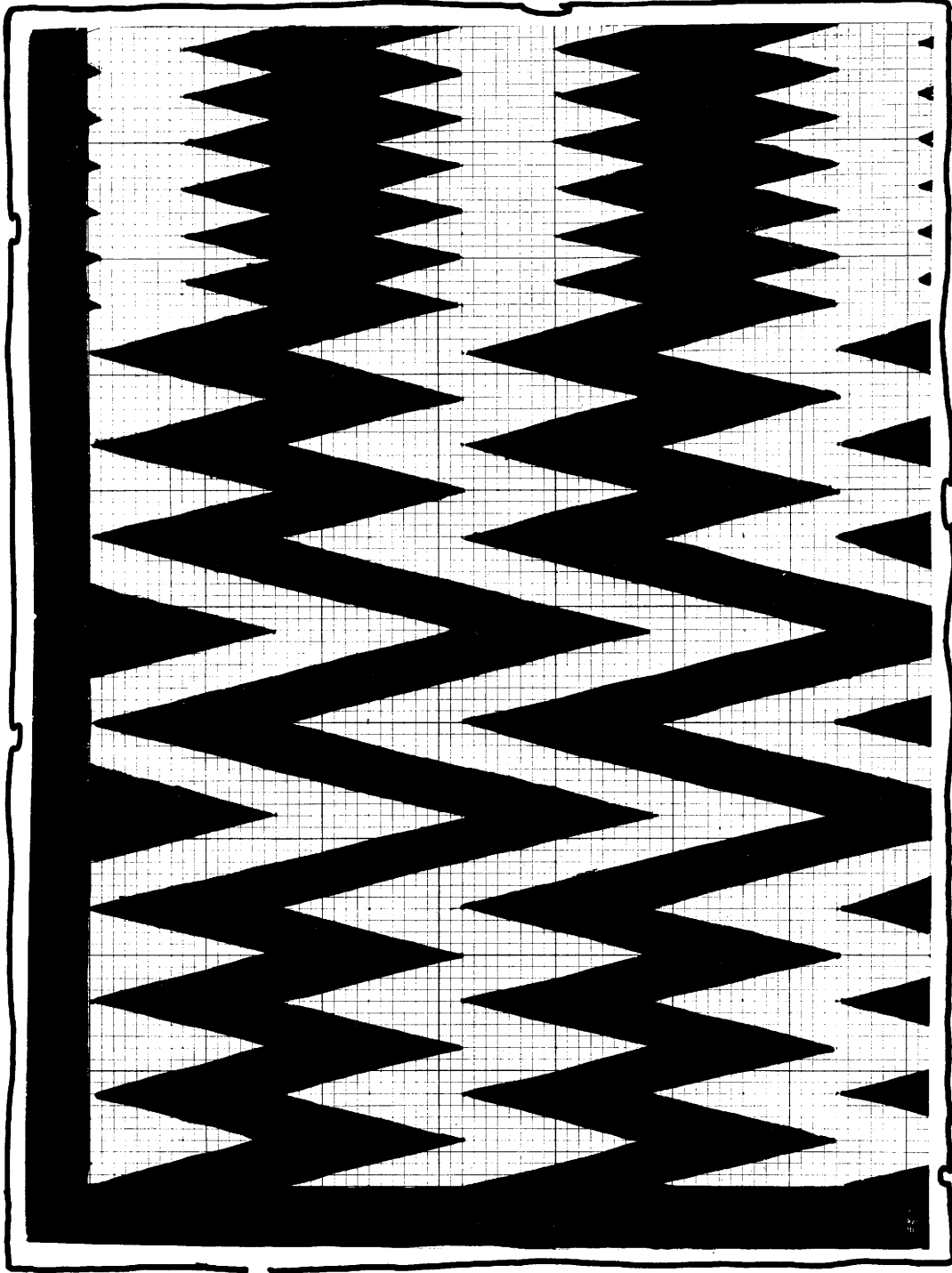
Make an inch heading with black wool weft yarn. This will act both as a heading and a bottom border. After you have done this you are ready to put in the bobbins that will make your zigzag pattern. Be sure that the first shed in which

you insert these bobbins is the same as the Interlocking shed in the Åklæ technique, that is, the first warp thread at the extreme left of the loom is at the back, or at the bottom of the shed, and the last warp thread on the right of the loom is at the front, or at the top of the shed. (The terms "front" and "back" are used for an upright loom, and the terms "top" and "bottom" refer to the position of the warp threads on a horizontal loom — most of our own American looms are horizontal looms.) Now divide your warp into sections of eight front warp threads, leaving four front and four back warp threads on each side of the loom for the border. No interlocking takes place within the zigzag pattern itself, but will occur at these side borders. In other words, you interlock only the black border bobbin at the left of the loom and the first zigzag bobbin beside it or, in this particular case, to the left of it. No interlocking occurs within the zigzag itself, because the weft shots fall one upon another in a diagonal line, so that no join is necessary. But at the sides of the weaving, where you have the borders, the line of meeting of the border bobbin and the zigzag bobbin is a straight line and requires joining or, as we say, interlocking (Figure No. 3, C).

Now suppose you have your Interlocking shed, insert the black bobbin at the left for four front threads, going in the left-to-right direction. The bobbin end of about two inches will be at the left selvage, and the bobbin itself will hang between the fourth and fifth front warp threads. Put in, next, your first zigzag bobbin. The end of this bobbin will be between the fourth and fifth front warp threads, in the same opening as the black border bobbin is hanging, and the zigzag bobbin will be carried through the shed for the distance of eight front warp threads, causing the zigzag bobbin to come out between the 12th and 13th front warp threads. Repeat this same process for the rest of the sections of eight warp threads with the zigzag bobbins (eight zigzag bobbins in all), and then there should be left four front and four back warp threads for the right-side border bobbin. Put the black bobbin through these four front warp threads. The end of this bobbin should be between the 68th and the 69th front warp threads, and the black bobbin itself will hang out at the right of the loom or weaving. There should be a bobbin and an end of the next bobbin hanging between the same two warp threads throughout the width of the weaving. Let the weft yarn lie loosely in the shed. If the weaver forms an arc with the weft, this will allow for the excess weft yarn necessary to cover the warp when the weaving is beaten down. In Colonial weaving we usually let the weft yarn lie on a diagonal line in the shed so that there will be sufficient yarn to cover the warp when the weft is



PATTERN NO.2 FROM ILLUSTRATION NO. 1



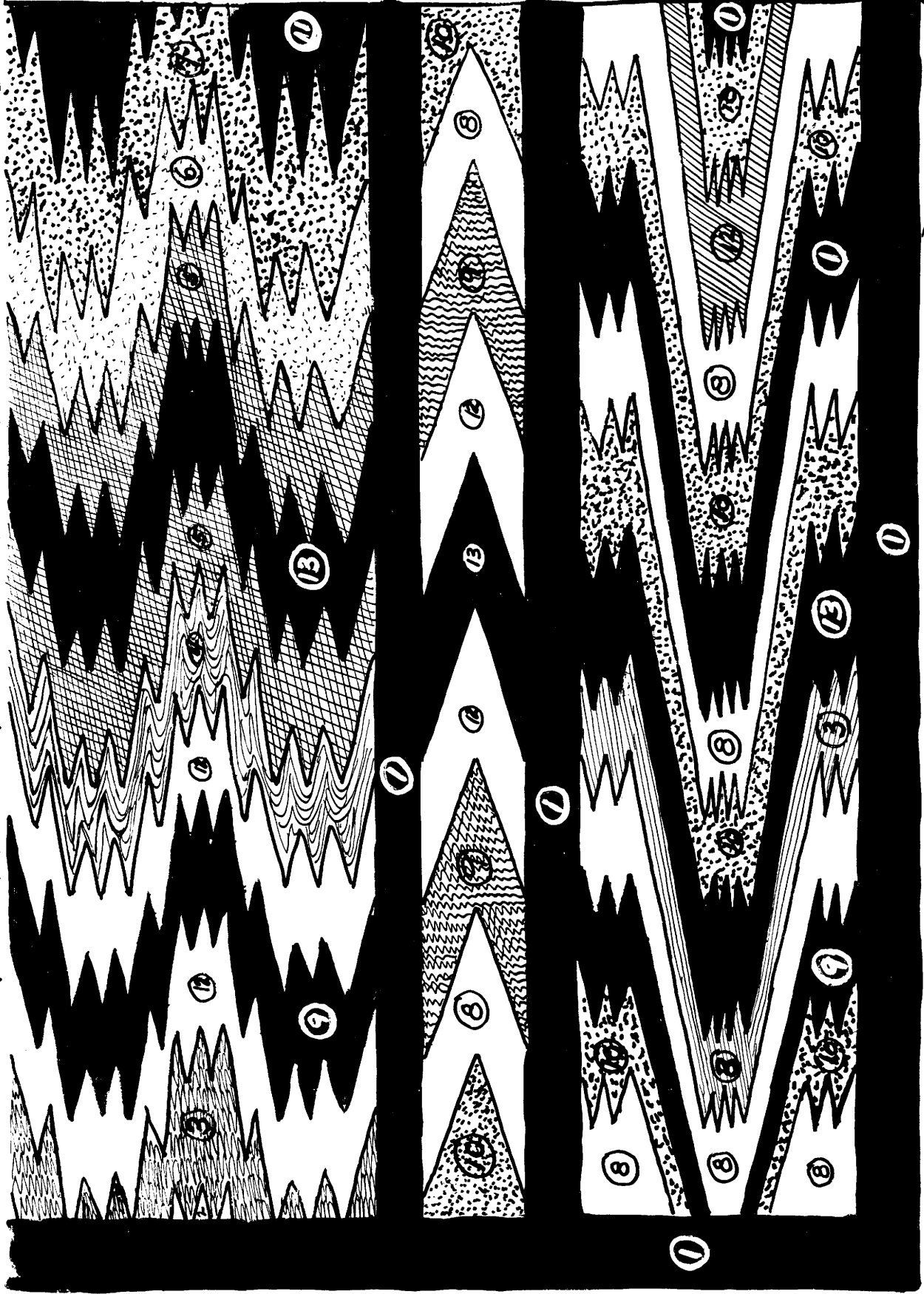
COLOR KEY IN BERNAT'S PEASANT WOOL EWY

ONLY TWO UNITS OF THE DESIGN ARE SHOWN. THE TEXTILE
MAY CONSIST OF AS MANY UNITS AS DESIRED. NINE UNITS ARE USED
IN THE ILLUSTRATION WITH COLORS IN ORDER AS FOLLOWS:

NATURAL-NO.197 BRICK RED-NO.186 NATURAL-NO.197 LEAF GREEN-NO.184
OLD ORANGE-NO.177 WOOD BROWN-NO.190 LEAF GREEN NO.182 RED-NO.186 NATURAL

PATTERN NO. 3 — LIGHTNING WEAVE

[EWI]



COLOR KEY
 1-BLACK 2-BROWN 3-TAN 4-MED. BLUE 5-GREEN BLUE 6-ROSE 7-MARCOON 8-WHITE CENTER
 9-GREY-GREEN 10-RUST 11-MAHOAGANY 12-GOLD 13-PK. BLUE

beaten down and also keep the selvage from “pulling-in.” This arc answers the same purpose. Interlocking of the borders on this beginning shot is not necessary. Change the shed and beat well (Figure No. 1).

You now have the Pattern shed as we had in Åklæe. Starting at the right of the loom, bring your black bobbin through the shed toward the left. Your bobbin will fall between the fourth and fifth front warp threads — from the right side of the loom. But on this Pattern shed your *zigzag* bobbins will be put in the shed for the distance of only *seven* front warp threads instead of eight, as you did on the Interlocking shed. This vacant front thread is left so that on the next shed (Interlocking) you advance one step forward, or over that vacant warp thread. This makes the progression in your zigzag and forms your lightning design. Put all your zigzag bobbins in for seven threads toward the left of the loom. When you come to the left black border bobbin, you put it through the four front warp threads out to the left side of the weaving. Your zigzag, then, will be going diagonally toward the right, while your border bobbins will be making a straight line up the sides of the weaving (Figure No. 2). Change your shed and beat well.

You now have the Interlocking shed. The next step is as follows: Starting at the left black border bobbin, bring it through the four front warp threads, or to where your first zigzag bobbin is hanging. Take the zigzag bobbin and put it under the black border bobbin — you are interlocking now — and bring it up over the black bobbin and through the shed for eight front warp threads. This means that this zigzag bobbin will overlap the previous zigzag bobbin from the preceding Interlocking shed; the vacant warp thread will now be covered. No interlocking takes place while you put the rest of the zigzag bobbins through the shed for the eight front warp threads. But when you come to the right black border bobbin you bring the black bobbin under the last zigzag bobbin, up around it and into the shed for the distance of the last four front warp threads, and out to the edge of the weaving (Figures Nos. 3 and 4). Change the shed and beat well.

You again have the Pattern shed. Repeat as you did for the other Pattern shed above. Keep the border always the distance of four front warp threads and insert the zigzag bobbins for a distance of seven front threads. This process continues until the points of the zigzag are as long as one desires. I would suggest at first that, for the length of your point, you go in the right direction on your diagonal for the distance of eight warp threads. Also, when you make the reverse direction of your diagonal, toward the left, that you go for a distance of eight front warp threads. Refer to Pattern No. 1 for this.

The first half of the zigzag is now complete, if you have gone as far toward the right as you wish the point to go. There remains, then, the technique for making what might be called the second half of the zigzag, or the reversal of what you have just done. It is done in this manner: after the last weft shot is put in on the right-to-left direction — having made your zigzag point as long as you wish — you begin the reversal, or making the diagonal go in the right-to-left direction. (The first half of the diagonal went in the left-to-right direction.) End the last row of the first half of your zigzag on the Interlocking shed. You now interlock the border bobbins and the zigzag bobbin next to it as before, but on the first inserting of the zigzag bobbins from the right-to-left you go through the Pattern shed for a distance of *eight*

front warp threads (instead of the seven you used on the same shed in the first half of the zigzag). This will appear to be a double row or shot on the same eight warp threads (Figure No. 6). This prepares you so that you can reverse the direction of the zigzag by taking the weft yarn through only seven warp threads on the *next following* shed — the Interlocking shed. (On this part or half of the zigzag you will go a distance, then, of seven front warp threads on the Interlocking shed, whereas on the first half of the zigzag you went for a distance of eight front warp threads. You are now reversing your zigzag, therefore the technical process is reversed.) This will cause your diagonal to advance in the opposite direction of the diagonal in the first half of your zigzag. Incidentally, you are still on the same first shed of the second half of your zigzag. Put in all the zigzag bobbins for the distance of eight front warp threads from right to left. Change your shed and beat. On the returning shed, which will be the Interlocking shed, you interlock your borders as usual, but you put the zigzag bobbins through the Interlocking shed for a distance of *seven* threads only (Figure No. 6). Therefore, a résumé of the procedure may be stated thus: on the first half of the zigzag, the zigzag bobbins go through eight front warp threads on the Interlocking shed and through seven front warp threads on the Pattern shed. On the second half of the zigzag, the zigzag bobbins go through the front warp threads for a distance of eight threads on the Pattern shed and seven on the Interlocking shed.

When your diagonal point is long enough in going in the right-to-left direction, you begin your reversal by taking eight front warp threads on your Interlocking shed and seven on your Pattern shed, as you did in the very beginning.

That is the technique of Lightning weave. It is really simple when one gets the swing of it. The telling of it seems complicated, but focus mentally on the description of the technique above and visually follow the process. One can learn it quickly.

A brief description of weaving Pattern No. 2 is as follows: the heading is put in as usual. The number of bobbins used can be found on the Pattern sketch. The first part of the design is the same as the design of the experimental pattern. The zigzag points extend for a distance of sixteen warp threads (eight front and eight back). As many of these zigzags can be woven as desired. After these have been woven you will advance in the same way until the point of the long diagonals is reached. These points extend for a distance of thirty-two warp threads (sixteen front and sixteen back). Reverse the direction of the diagonal and weave as many of these as necessary. The next zigzag (medium size one) is the same as the first zigzag. Weave your required number, then reverse in the right-to-left direction to get your small zigzags. They cover a distance of eight warp threads (four front and four back).

The small zigzag may answer for the main part of your weaving with a border at each end made of the middle size and the large size zigzags. The measurement is about 18 inches up to the small zigzags; the portion of zigzags measures about 9 inches, and the other end of the weaving about 18 inches. This makes, with the headings, a hanging of about 18 by 46 inches. There are 160 warp threads in the design.

Pattern No. 3 is somewhat more difficult to do. A beginner might weave the main body design with some patience. It is a progression of four front warp threads, making the advancing shed the distance of three front warp threads. The chevron stripe is easy, of course. But the bottom border is

LIGHTNING WEAVE TECHNIQUE — (LYNILD BORDVEVNING)

FIGURE-1
STARTING THE
BOBBINS
THE EIGHT THREAD
DIRECTION

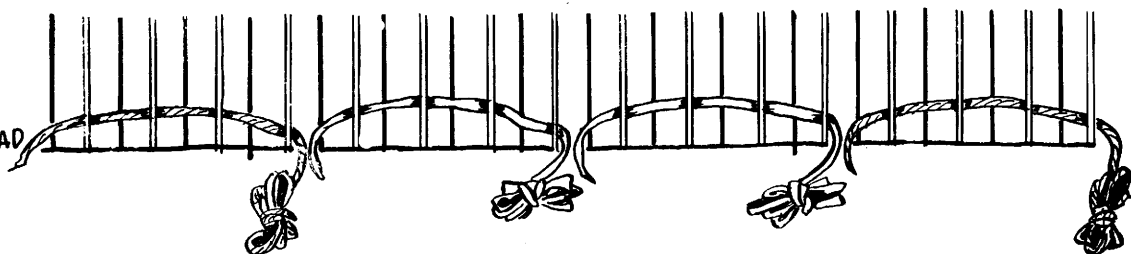


FIGURE-2
THE SEVEN THREAD
DIRECTION

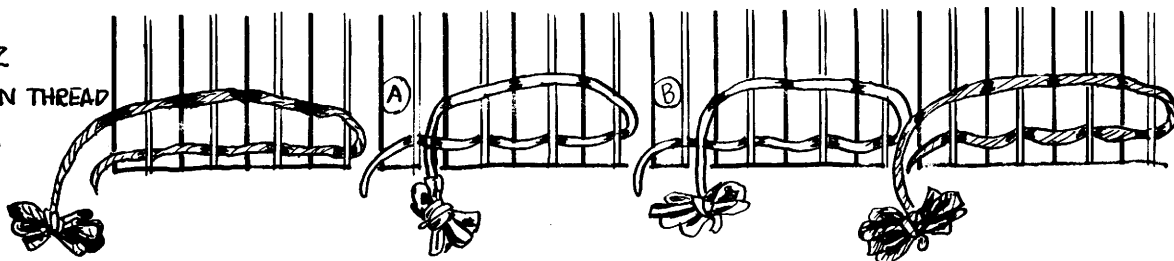


FIGURE-3
ADDING A NEW
BOBBIN (A)
(B) FILLING OR
ADVANCING THE
DIAGONAL OF
THE ZIGZAG
(C) INTERLOCKING THE
BORDER AND ZIGZAG BOBBINS

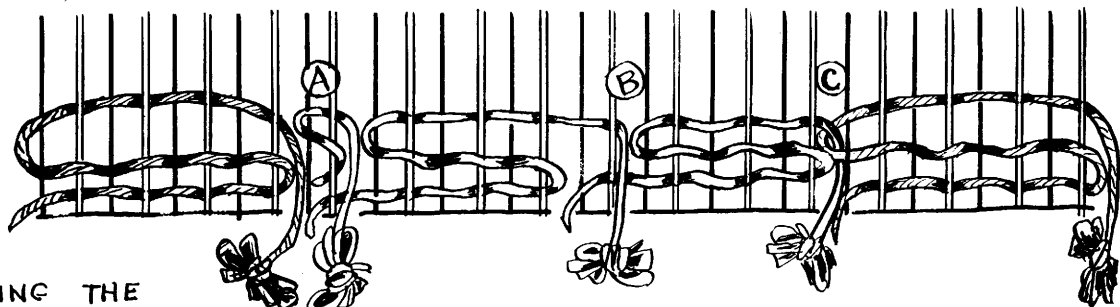


FIGURE-4
SHOWING VACANT
WARP THREADS
FILLED (A)

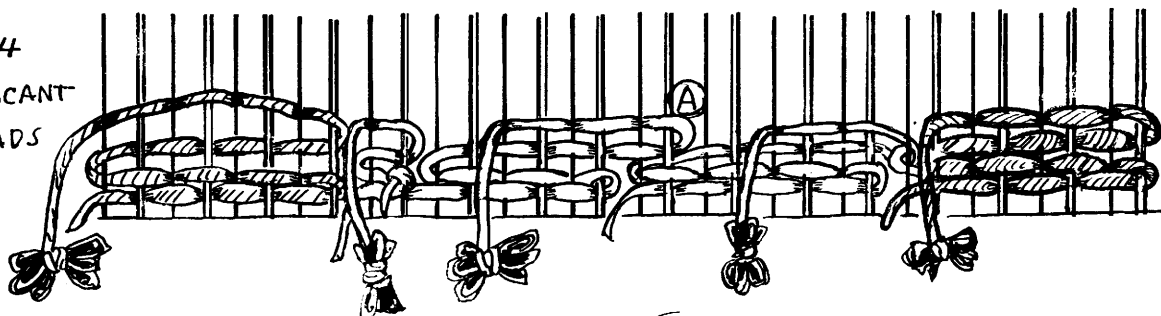
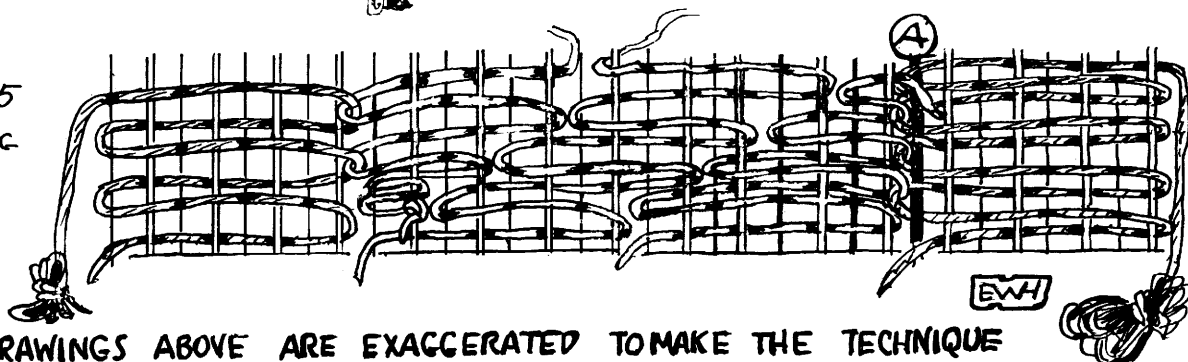


FIGURE-5
(A) DROPPING
A BOBBIN



THE DRAWINGS ABOVE ARE EXAGGERATED TO MAKE THE TECHNIQUE MORE CLEAR. FOR LACK OF SPACE **FOUR** FRONT WARP THREADS ARE USED IN THE DRAWINGS INSTEAD OF EIGHT ON THE INTERLOCKING SHED AND THE WEFT IS PUT THROUGH **THREE** WARP THREADS ON THE PATTERN SHED INSTEAD OF SEVEN.

not easy. One, while working on the left half of the design, is always one step ahead on the right half of the design. The right half is just the reverse of the left half; therefore, the reverse process of one goes on at the same time while weaving the other. It would take too long a description here to give the exact working order, so that must be left unsaid.

Suggestions from my experience in weaving this technique:

1. If, after you have planned your design, you find that the remaining warp threads that may be left for a border are uneven in number — as four front and three back — you will find that the weft will have to be wrapped around the last selvage thread of the uneven number — when that shed is uppermost — in order that the weft yarn will be held out at the edge of the weaving. We find that this same annoyance happens in some drafts in Colonial pattern weaving also.

2. When one wishes to add a new bobbin: Add a new bobbin on the same direction shed (Interlocking or left-to-right direction) as you added the original bobbins when beginning the piece of weaving. You will find that in going back from right-to-left direction you will need a new bobbin when your last bobbin at the left of the loom passes under the seven warp threads, and one front and one back warp threads are left vacant further to the left of this shot. If there is a border these two warp threads will be next to it; if there is no border these two warp threads will be on the selvage of the web. These two threads (one front and one back) are left uncovered until the shed is changed, and the bobbin is *then* added. This shed is the one that goes in the left-to-right direction (Interlocking shed). There need not be any interlocking at this point until the next Interlocking shed, as the end is not easy to interlock, and this will not be noticed when work is beaten down (Figure No. 3, A).

Practically the same method applies at the right side of the loom. When you have two warp threads (one front and one back) remaining with the furthest right zigzag bobbin, you leave these two warp threads vacant; the second zigzag bobbin is put in the left-to-right direction; the second right zigzag bobbin covers the two vacant warp threads and becomes the first right zigzag bobbin. This right zigzag bobbin will now be beside the black border, or out at the selvage if there is no border.

3. To drop a bobbin: in order to know when to drop a bobbin at the selvage or at the black border, suppose that

you are going in the right-to-left direction. Also, say, the black border — which is over and under four warp threads — and next to the black border you have a tan zigzag bobbin, and next to the tan bobbin is a green zigzag bobbin. To drop the tan bobbin you will find that when you put the green bobbin through the shed from right to left — through the eight warp threads — there will be two warp threads (one front and one back) that must be taken care of with your tan weft yarn. Put the tan weft yarn through the shed of one and one warp threads. Tie it off then with a slip knot. When the next row is started, you leave vacant these two warp threads, because the space must be left so that the green bobbin can advance on the second next shed. This applies in either direction of the weft yarns (Figure No. 5, A).

4. It is somewhat confusing to plan Lightning designs on cross-section paper unless the squares are as small as what two shots of weft would be in the woven fabric. A twenty squares to the inch can be had, however, and can be successfully used.

5. Start working at the right side of the loom when bobbins are pointing toward the right; start working at the left of the loom when the bobbins are pointing toward the left. It is well, also, to interlock the border bobbins with the zigzag bobbins at both sides of the weaving before weaving at all with the zigzag pattern bobbins. This keeps bobbins from getting tangled.

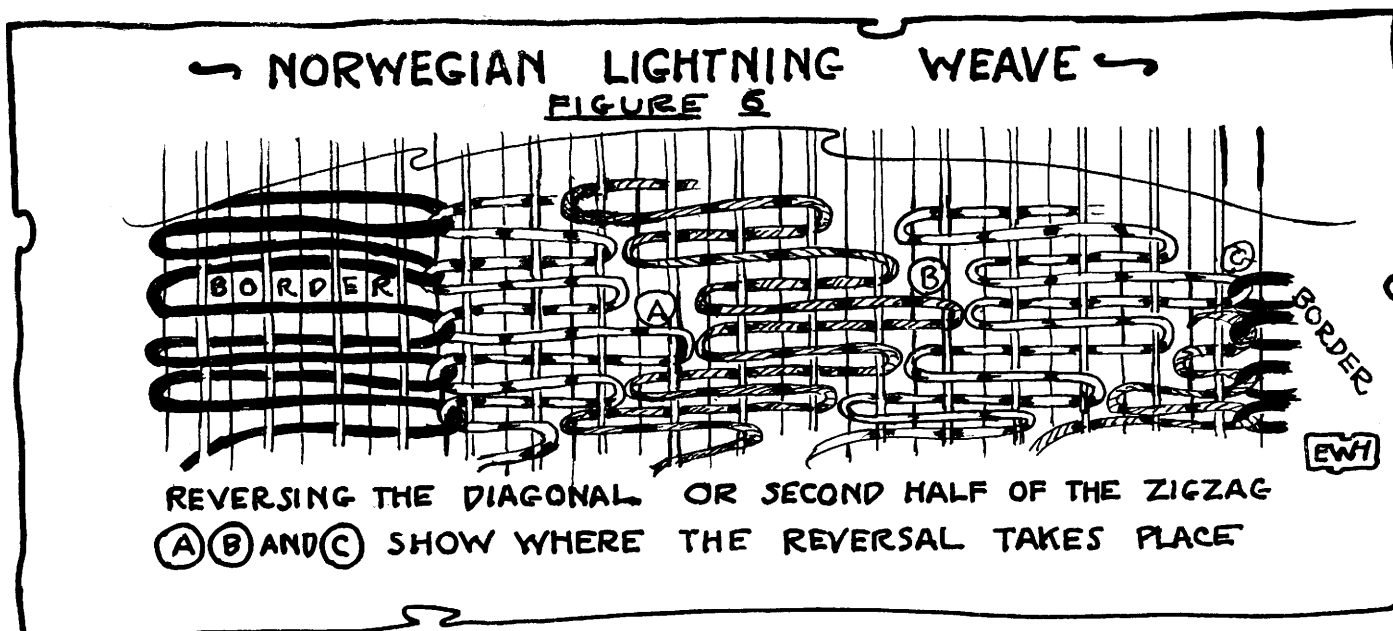
6. Be careful not to wrap a weft bobbin around a warp thread when putting it into the shed — refer to the drawing in the Åklæ article illustrating this (Figures 12 a, b, c and d).

Explanations of drawings: In Figure No. 6, the reversal places (A, B and C) appear to be *not* on the same row. In the real weaving of the web they will be. It was difficult to show this on the drawing — or perhaps I had rather blame it on my crude drawing technique.

Pattern No. 2 shows but three units of the design. Illustration No. 1 shows the full width of the design. The color key is at the bottom of the drawing.

Pattern No. 3 has but half of the design, but the entire design is shown in the photograph, Illustration No. 2.

There is a possibility that the Lightning technique might be easier for some to weave than the Åklæ technique. Why not try it? I am sure that your troubles will result in hours of enjoyment.



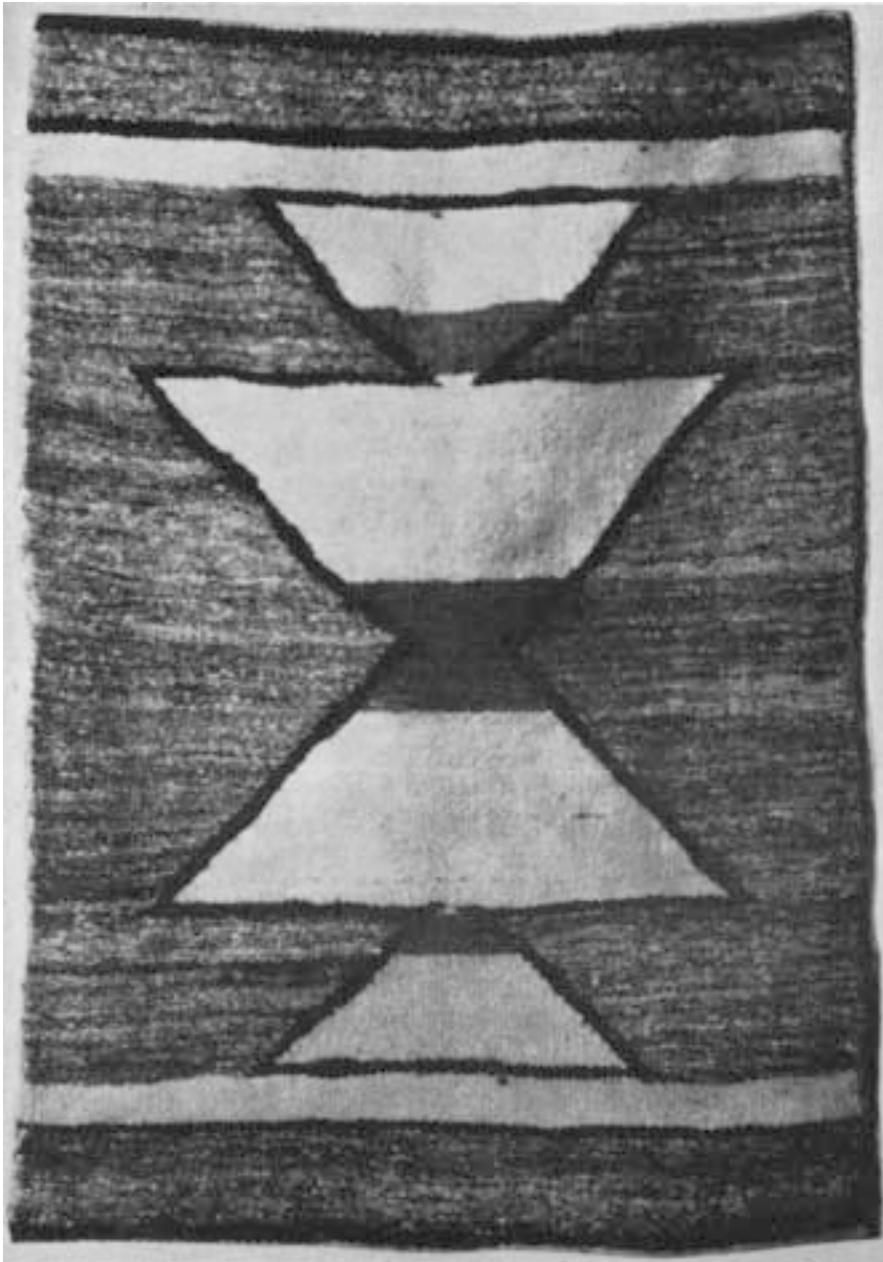


ILLUSTRATION NO. 1

Genuine Navajo Rug woven on such a loom as shown in Figure 1

of the Little Colorado River waiting for the water to go down enough so we could cross it. I put in most of my time watching the weavers, and only through the help of the trader and by making friends with children was I permitted to do this. The children go to school and speak English, while the elders do not or will not. By asking questions of the children I learned some of the methods of weaving and how to set up a loom. I bought blankets and a small loom. At home I took one of the blankets apart piece by piece and rewove it on my foot-power loom. It was tedious work, but I learned something.

A Navajo weaver has to make a loom each time she wishes to weave a piece. She first drives two long stakes in the ground as far apart as the rug is to be long, and then walks around and around these stakes putting on enough warp to make the desired width and only enough for the rug in mind.

Two upright poles are then set in the ground and crosspieces tied near the top and bottom, making a frame a little larger than the rug contemplated. From the crosspiece a smaller stick is suspended by a zigzag rope just as we attach our warp to the cloth beam. Another stick is attached to the lower crossbeam in like manner. The two sticks on which the warp has been made up are now hung on the frame. The weaver slips a strong cord underneath the first loop of warp on the makeup stick and over the suspended stick. She throws a loop over the stick and pulls the warp to the bottom of it, picks up the next loop and continues until all the warp is attached, spaces it evenly and then removes the warp stick. She repeats this at the bottom, and tightens the zigzag ropes for the proper tension.

For a heddle stick she chooses one a little longer than the width of the rug, attaches a long string to one end of it, then picks up the first warp, makes a loop around it and another around the stick, and picks up the third warp. Thus she goes across the warp picking up every other thread until the heddle is completed. She then adjusts the

length of the loops to make an even shed. To make the shed the weaver pulls this stick toward her just far enough to allow the passage of a wooden sword or knife; to hold the shed open she turns the sword on edge and then slips the filler through with her fingers. The Navajo weaver uses no shuttles, just has her yarn in small bunches and uses her fingers to put in all those complicated designs. She may sometimes use a long stick with a bunch of yarn on the end to make a throw the full width of the rug.

Navajo Weaving with Two- or Four-Harness Looms

BY ELLIS PRENTICE COLE

THIS is how I came to learn the Navajo (Nava-ho) weaving: To secure material for my lectures in the public schools, I was sent out to Arizona to study the Indian customs and mode of life and to get pictures for publication purposes. The Indians are difficult to approach and they do not like a camera, so I got a bad start. Up in the Navajo country our guide lost the trail and we were four days without water. Then we got so much of it the dry gullies were turned into raging torrents. I spent three weeks on the bank

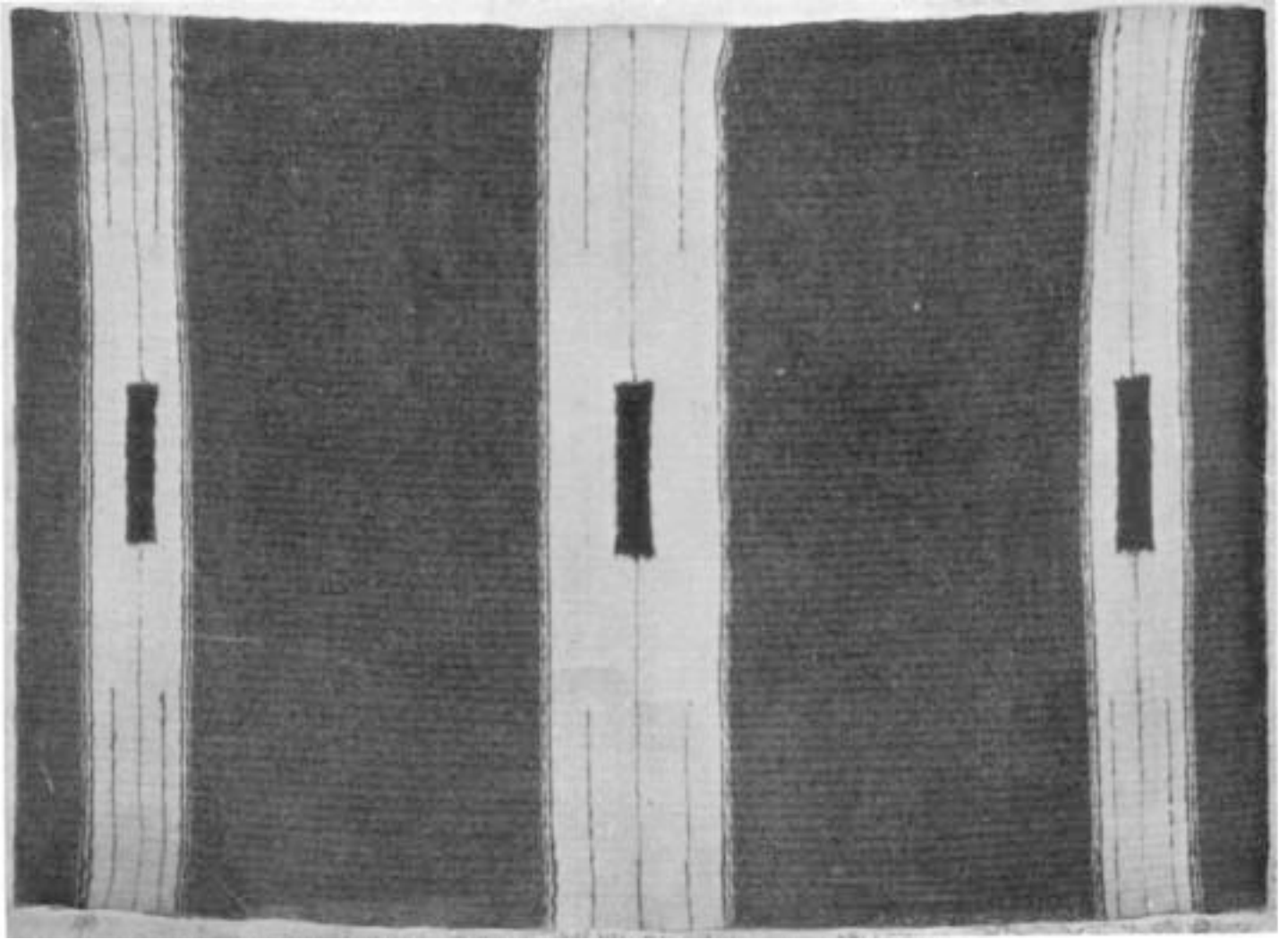


ILLUSTRATION NO. 2

Cloth woven by the author on a four-harness loom in the Navajo method; to be used for a sports jacket

For a beater she uses a wooden fork the tines of which match the spacing of the warp, and for long throws she uses the sword, which has one edge quite sharp, and pulls down on it until the warp is entirely buried. Putting in the designs she will make a shed of just the number of warps to be used in that color, then go on with the next color until she has completed the row all the way across, beat it all in and then open the next shed. The more complicated the design, the more pieces of yarn it takes to complete a throw. That is what takes the time and the patience and makes this style of weaving prohibitive for those of us who have other things to do besides weaving. (See Figure 1.)

Still, we can make "Navajo" rugs, blankets and ceremonial cloth on our own looms that cannot be told from the Indian weaving except that it will be more evenly done than can be accomplished in their primitive way. In making designs for their rugs the Navajo has but four directions for the outlines; parallel or across the warp as in stripes, upright or at right angles to this, and diagonal in two directions. There are no curved lines used. (See Figure 2.)

In making perpendicular edges to a design the weaver stops at a certain warp, opens the next shed and goes back around this warp. For the next section of the throw she goes around this same warp. (See Figure 3.) The Egyptians pick

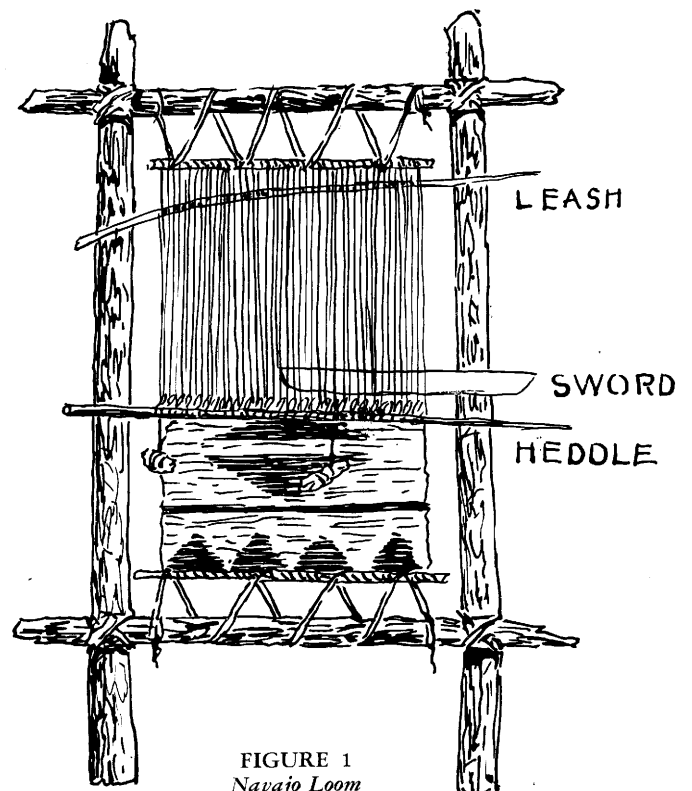


FIGURE 1
Navajo Loom

THE WEAVER

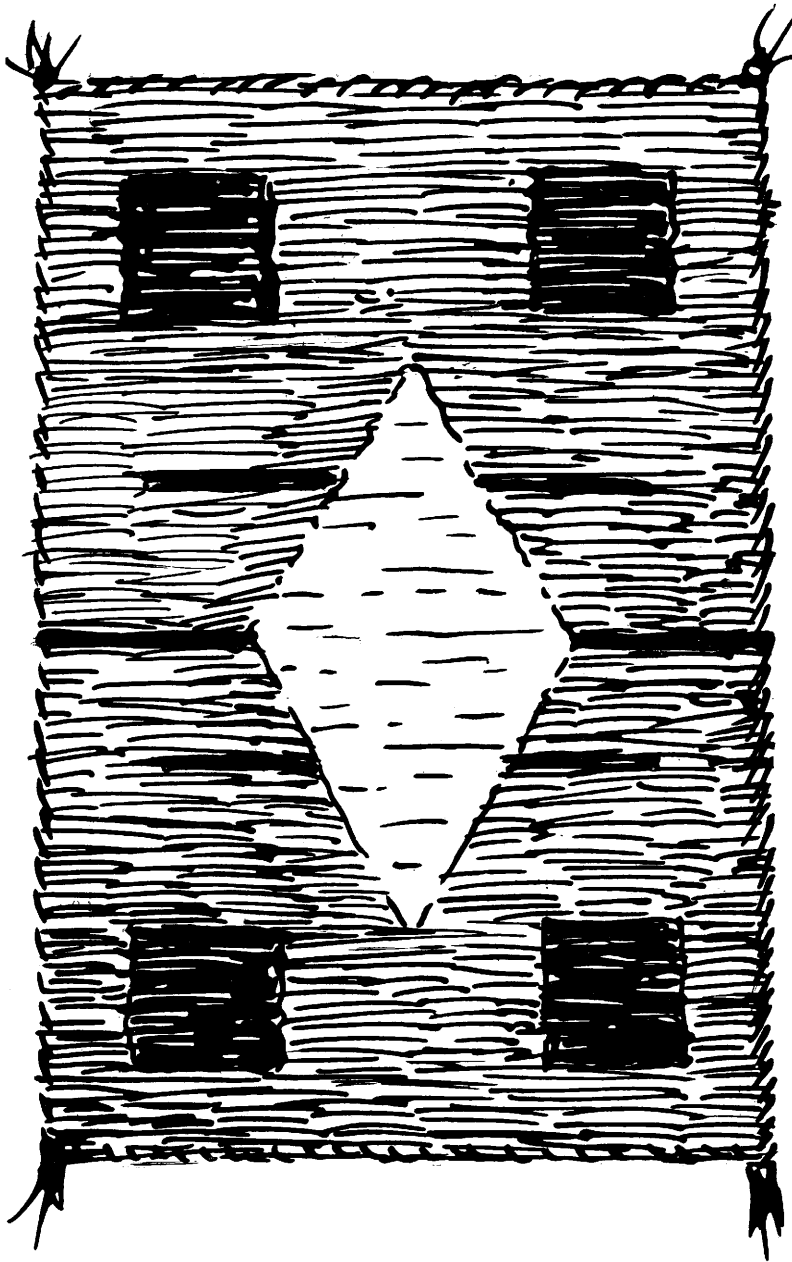


FIGURE 2
Simple Navajo design, easy to weave on two- or four-harness hand- or foot-power loom

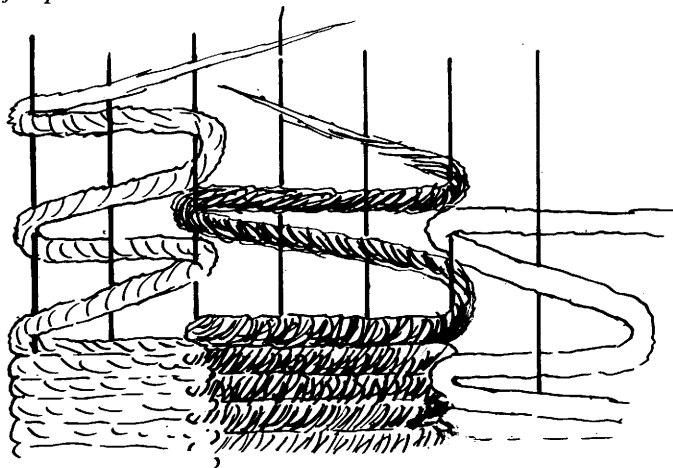


FIGURE 3
Method of putting in designs used by the Navajo weavers, and easily done on any loom

up the next warp, but that leaves a hole through the rug, while a Navajo rug, when well beaten up, will hold water.

For the diagonal lines the weaver picks up an additional warp each time going in one direction, and drops one going in the other. (See Figure 4.) The beating will crush the yarn together and the warp will not show at all. One secret in covering the warp is to have the warps farther apart than in regular tabby weaving; using soft spun yarns also aids, and if necessary the sword may be used to pull the filler up tightly.

Now let's put a Navajo on our own loom. Use cotton or wool warp, 3, 4, or 6 to the inch. This may be double-slayer for strength, or to give a rep effect. Barnet rug wool makes a heavy rug and, for lighter cloth, Peasant or homespun may be used. The Indians had few colors until German-town yarn came to them, and how they did revel in it. We may use a fringe on our Navajo, but it will have a more real look if it is started with a warp headband and bound or overstitched with a piece of the yarn used. The sides of selvage may have a stout cord twisted in as we go along.

Choose a simple design for your first one unless you have had considerable experience in finger weaving. Much time can be gained by using spool shuttles wherever possible and the flat shuttles for the smaller patches. The Navajo weaver frays out the ends of her yarn at the beginning of a design and blends it into the same shed, or matches it in if a new piece has to be added, before the design is completed, also at the finish of a design. This is a good trick to use in all weaving. Theoretically the yarn should be frayed to about half its size where it goes around the outside warp, to prevent bulging and an uneven selvage. Be very careful not to draw the filler tight, as there is every tendency in this style of weaving to narrow rapidly as it proceeds.

If the pictures and drawings do not give you a complete understanding of this kind of weaving, the writer will be glad to reply to any letters received.

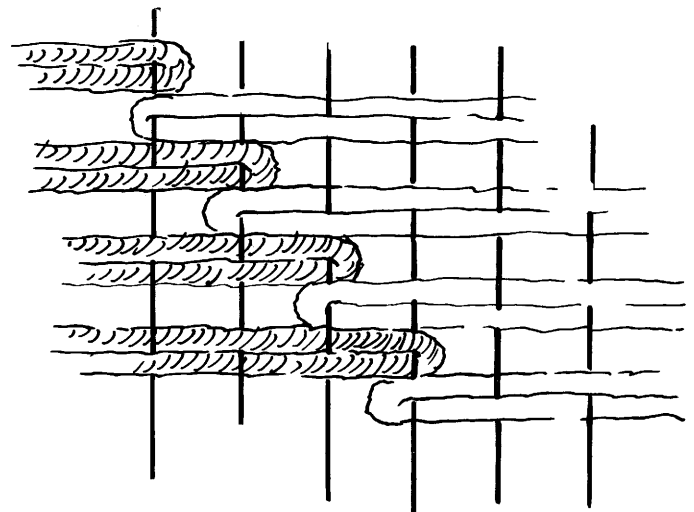


FIGURE 4
Manner of making oblique edges on designs

There are two ways of weaving a piece threaded with a tabby border in this manner. If the tie-up is made as at (a, 1), Diagram No. 1, the border will be in alternate shots of tabby weft and pattern weft, and in weaving the corresponding borders for the top and bottom of the piece the weaving should be done in the same manner.

For these top and bottom borders another treadle will be required — not shown on the diagram — tied: 1, 3, 5, and used instead of treadle (A) as shown — though it is more convenient to change the one tie involved. That is, tie 1, 3, 5 for treadle (A) and weave the plain hem for the bottom; change the tie on 5 to a tie on 6, and weave the pattern, changing back to 5 for the plain hem at the top.

On tie-up (a, 2) a different method of weaving is used. The tabby borders top and bottom are woven in tabby thread on (A) and (B), and for the pattern the tabby shots are thrown as usual from selvage to selvage, but the pattern shots are carried back and forth across the pattern threading of the center, only. When weaving in this fashion it is well to weave both the (A) and (B) shots each time between shots of pattern weft.

These are interesting tricks, but of course the pattern weaving is exactly like ordinary four-harness overshot work.

Of more interest are the six-block patterns. Ancient examples are comparatively rare, which perhaps makes them all the more interesting. Illustration No. 1 shows an ancient coverlet of this type.

There is a certain unbalance in six-block overshot patterns that is inherent in the weave. This is in the occurrence of the half-tone areas. In some patterns it lends variety, while in others it distorts the figures. It is therefore desirable to work out a proposed draft on paper — not omitting to indicate the half-tone — before putting one of these patterns on the loom.

This seems to me an interesting field for the weaver who enjoys making his own drafts. Many of the familiar figures acquire new interest when put into six-block form. Illustration No. 1 will be recognized as a six-block variation of the well known "Lovers' Knot" figure, and the two patterns illustrated on Diagram No. 2 are, of course, a six-block "Diamond" and a six-block version of "Chariot-Wheel."

The latter arrangement was made as follows: the large star of the first figure was put on one pair of sheds as in four-harness overshot; the large star of the second figure was written on a different pair of sheds, and the little "cross" of both figures on the third pair of sheds, — but the blocks for these small figures are written in reverse order so that they weave stars and roses.

Other six-block arrangements of this pattern might be made. For instance, the wheel figure might be written in the four-harness manner on two pairs of sheds, and the third pair of sheds could then be used for an intermediate figure or for a "table" of alternating blocks. Many other possible arrangements suggest themselves. As mentioned above, this is a fertile field for the writer of original drafts.

The most interesting manner to use six harnesses for over-

The Overshot Weave On Six Harnesses

BY MARY M. ATWATER

IN A previous article some notes were given on the "fabric" weaves possible on six harnesses. The present article will deal with some aspects of pattern weaving on six harnesses.

Most four-harness weaves have six-harness developments, and a number of eight-harness weaves can be adapted for six harnesses, so there are many interesting fields to explore. It may be best to begin with the overshot weave, as everyone is familiar with this weave on four harnesses and because the six-harness forms of this simple weave are interesting and handsome and appear to be little known.

One way of using the two extra harnesses is for a plain tabby border all around a piece done in ordinary four-harness overshot. This plain border may be as wide as one wishes, or may be narrowed to a tabby selvage of a few threads. For a coverlet or other large piece one may also weave squares of pattern weaving separated by areas of plain tabby.

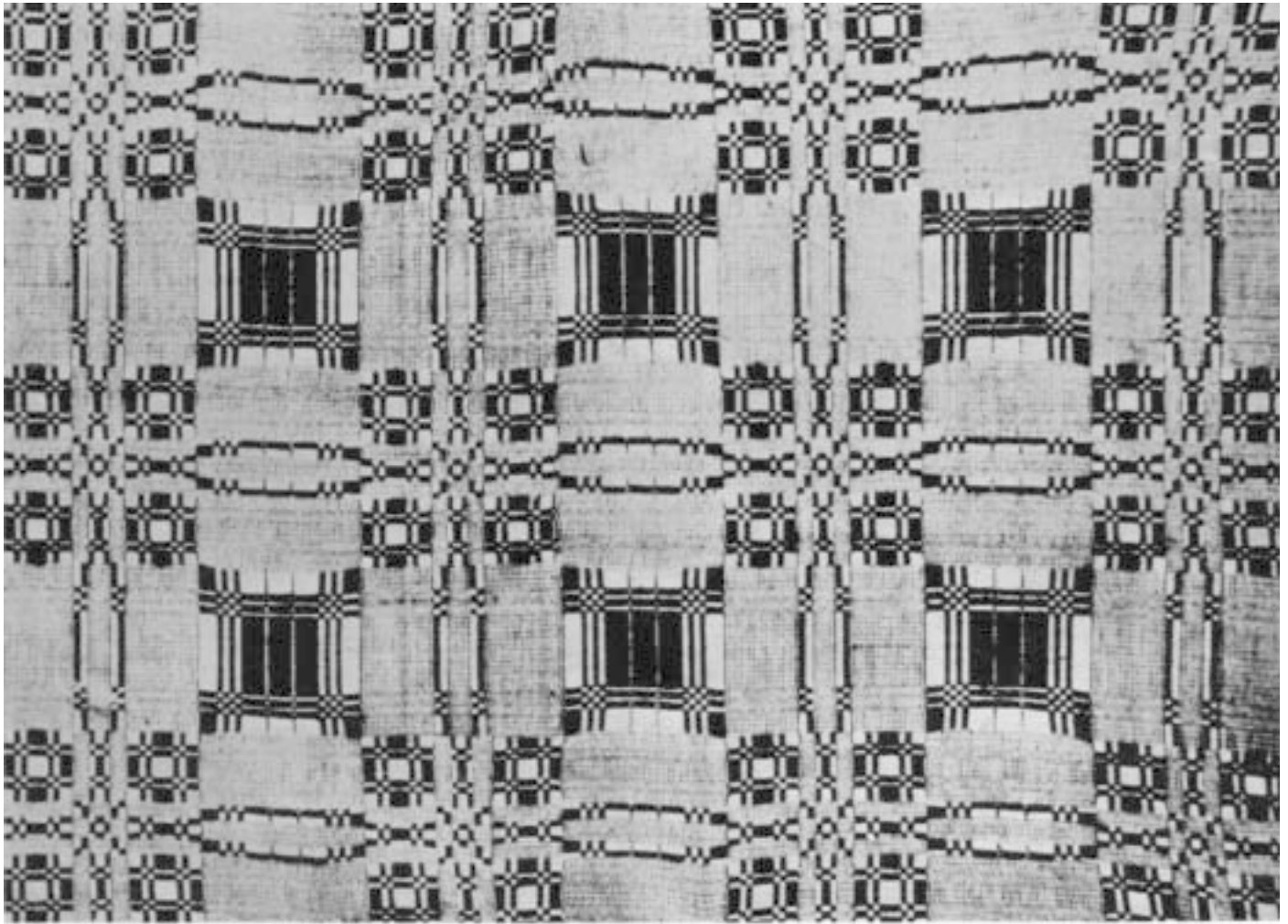


ILLUSTRATION NO. 2

shot weaving appears to me, however, to be the weave "on opposites." This weave is ordinarily written for eight harnesses, as shown in my Shuttle-Craft Book, drafts 148 and 149. But the weave may also be written for six harnesses by a system devised by myself. The effect when woven is exactly the same.

This is an ancient weave, probably of British origin. A few old coverlets done in this style turn up occasionally, though they are extremely rare. The weave is mentioned in the "Domestic Manufacturer's Assistant" among other English weaves.

The effect of this weave is, in my opinion, particularly handsome, and it seems to me a pity that weavers use it so

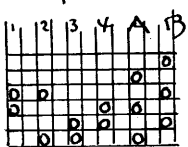
rarely. I hope the following notes will help to give it currency again.

Illustration No. 2 shows a piece of weaving done in this manner and gives an idea of the special effect mentioned. It will be noted that plain tabby blocks form the background of the overshot figure and that the half-tone spaces between the figures are in a uniform effect. This gives subtlety and brilliance to the pattern.

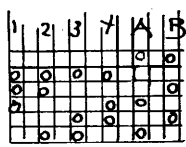
Another interesting feature of this weave is the fact that both sides of the fabric are equally handsome and both show a regular pattern. Not the same figure exactly, however. When one weaves stars on one side of the fabric, one weaves roses on the other side. For instance, a piece done in

Diagram No. 1.

tie-up (a)



tie-up (a1)



(these tie-up drafts indicate the harnesses tied to rise on each shed)

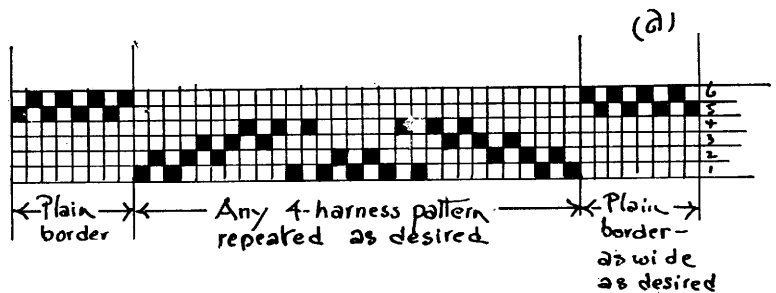
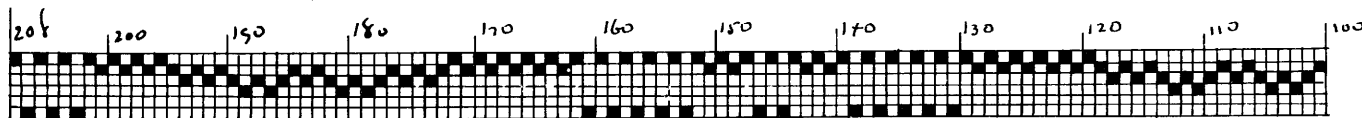
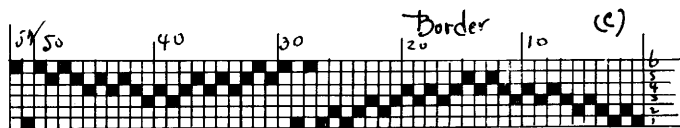
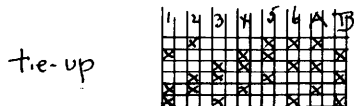
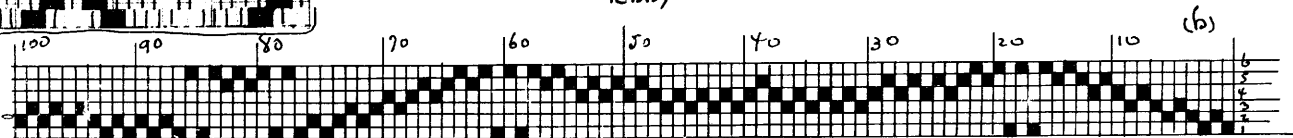
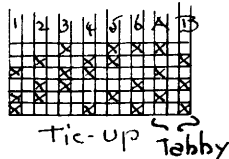
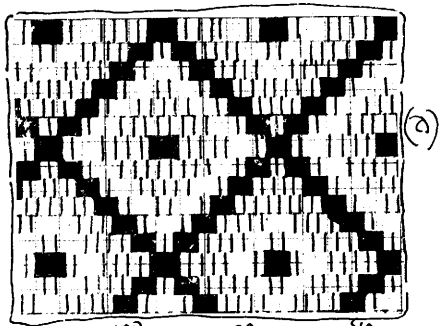


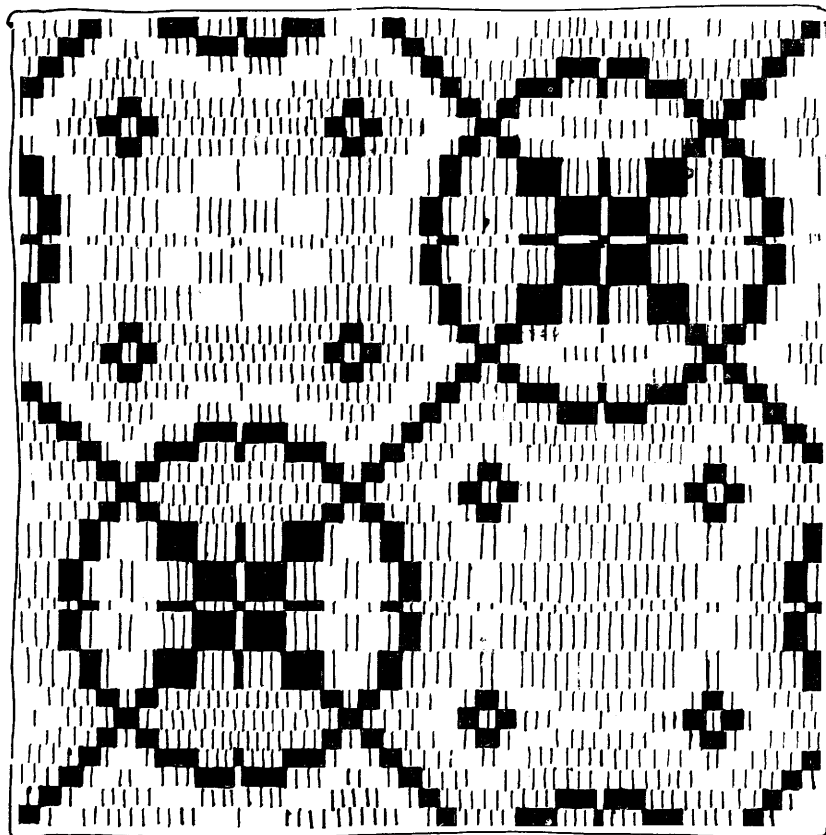
Diagram No. 2.



These patterns should be treadled as drawn in. The same tie-up may be used for all three — either of the two tie-ups shown is correct for all three, — or for other six-block patterns written in this manner.

Pattern (a) lends itself to many variations in treadling and will be found useful for upholstery and for a number of small articles.

Pattern (b)
Shariat-Wheel



M.M. Atwater, 1937

"Lovers' Knot" will be "Whig Rose" on the reverse. This is because the overshot blocks and the plain tabby blocks are exactly reversed. The half-tone areas are the same on both sides.

The pattern of the piece shown in Illustration No. 2 is a design from the old "John Landes" book of drawings in the Pennsylvania Museum. The draft is given on Diagram No. 3, and this will serve as a guide in writing other drafts in this style. The pattern blocks, it will be noted, are written on 1-2, 3-4, 3-6, and 2-5. Any of the four-block overshot patterns may be translated to this form and the tie-up as given on the diagram will serve for all patterns.

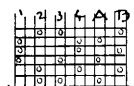
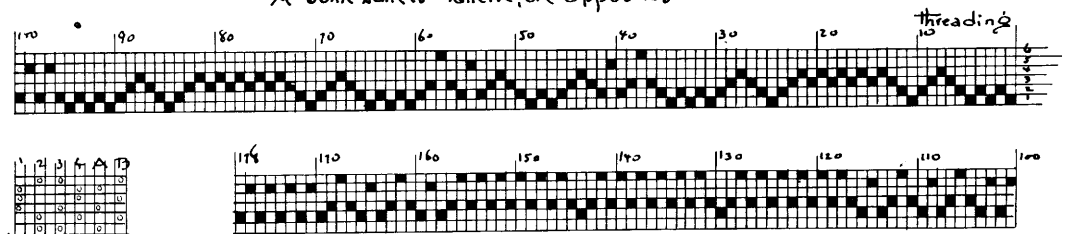
For a coverlet in the pattern illustrated the following arrangement is suggested:

Selvage: 1, 2, 3, 4, 5, 6.....	Threads	6
Border: thread 41-60, repeated 8 times.....		160
Complete draft, 6 times.....		1,028
First 48 threads of the draft (seam).....		48
		1,242

On a warp set at 30 ends to the inch this will make each

A "John Landes" Pattern, on Opposites

Diagram No. 3



Pattern tabby

Weave as follows:

Rose figure—	Diamond figure	Repeat Rose figure	Continue Star figure
treadle 2, 7 times	treadle 1, 2 times	large Star figure	treadle 3, 3 times
" 1, 3 "	" 3, 3 "	treadle 3, 7 times	" 4, 3 "
" 2, 3 "	" 1, 3 "	" 4, 3 "	" 3, 3 "
" 1, 11 "	" 2, 5 "	" 3, 3 "	" 4, 3 "
" 2, 3 "	" 1, 3 "	" 4, 3 "	" 3, 7 "
" 1, 3 "	" 3, 3 "	" 3, 3 "	
" 2, 7 "	" 4, 3 "	" 4, about 40 times	

strip a little over 41" wide in the reed. If a wider strip is desired add one or two repeats of the 20-thread repeat used for the border.

The pattern makes a handsome pillow-top. For this the following arrangement is suggested:

	Threads
Selvage: 1, 2, 3, 4, 5, 6.....	6
Thread 37 to end of draft.....	142
Two complete repeats of the draft.....	356
First 59 threads.....	59
Selvage: 6, 5, 4, 3, 2, 1.....	6
	569

For small pieces the first 60 threads of the draft may be

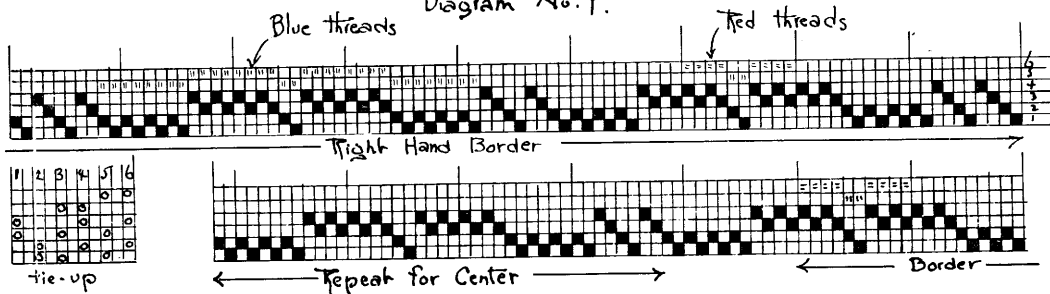
used as a repeat. This will give the little rose-figure and the diamond, without the large figure. It will prove attractive for bags and similar pieces.

All the six-harness patterns presented are strictly in the classic style and may be used with propriety for "period" American Colonial pieces. They are, however, out of the ordinary, and weavers who wish to give overshot weaving an unusual quality will find them of interest.

Diagram No. 4 shows an arrangement of warp and weft-pattern stripes in the "Monk's Belt" pattern, which is a favorite Central European pattern for linens. For small pieces the effect is of a pattern border on all four sides of a plain tabby piece. For large pieces such as tablecloths the pattern

(Continued on page 25)

Diagram No. 4.



Weave top and bottom hems and center of piece as follows:—in tabby weft—

treadle 3, treadle 4
" 5, " 6
" 3, " 4
" 5, " 6 alternately for 8 shots
" 3, " 4 " " 8 "
" 5, " 6
" 3, " 4 alternately for 8 shots
" 5, " 6 " " 8 "

Repeat—

(The above system of treadling should be followed throughout for the tabby shots—including the tabby shots woven alternately with the pattern shots for the horizontal borders)

Weave horizontal border:

treadle 2, 4 times— pattern weft, red
" 1, 2 " " " blue
" 2, 4 " " " red
18 shots in tabby weft
treadle 2, 8 times— pattern weft, blue
" 1, 8 " " " "
" 2, 2 " " " "
" 1, 8 " " " "
" 2, 8 " " " "
18 shots in tabby weft
treadle 2, 4 times, pattern weft, red
" 1, 2 " " " blue
" 2, 2 " " " red

M. M. N. 1937

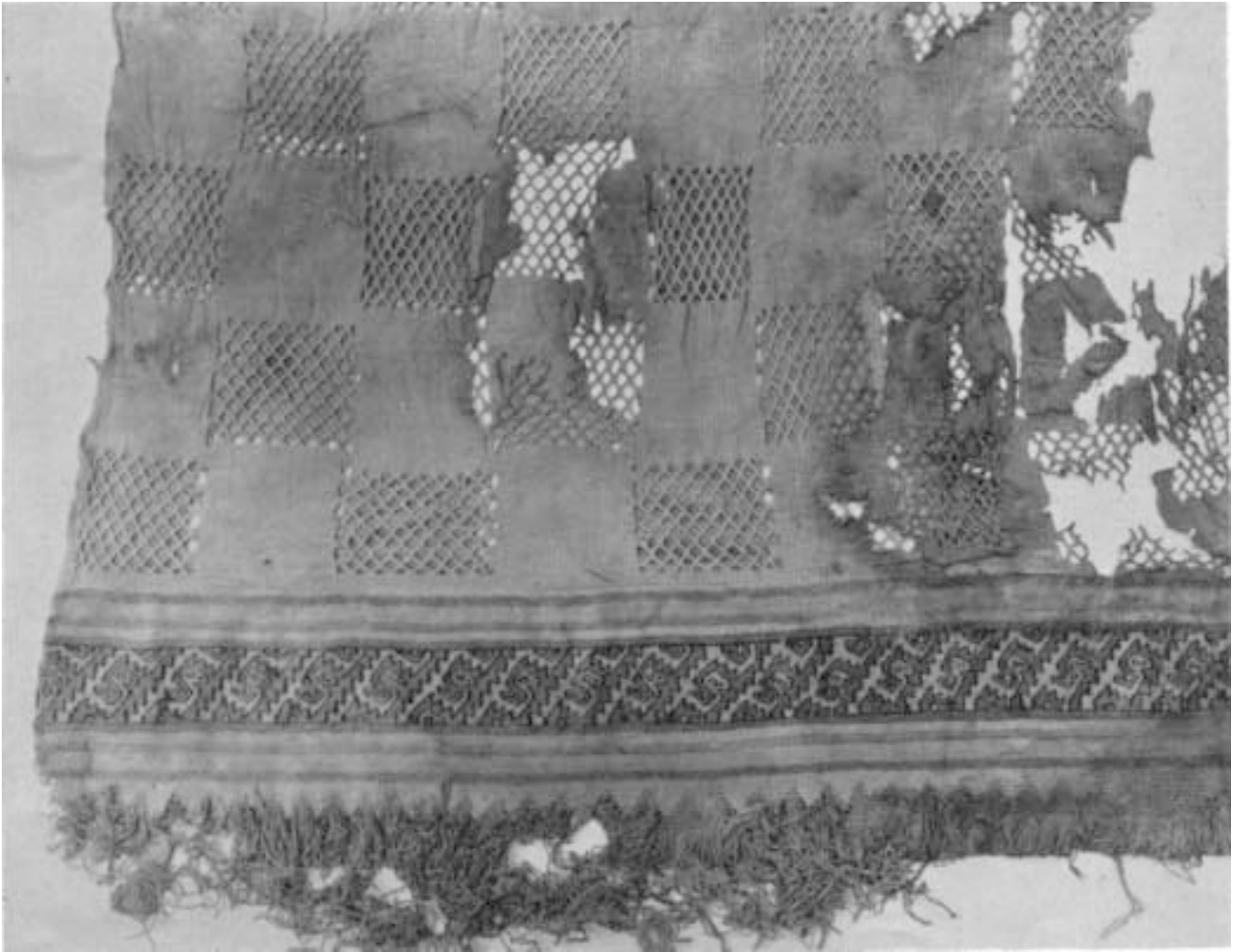


FIGURE 1

The Weaving Technique of Some Early Peruvian Textiles

BY VIOLA W. QUIGLEY

JUDGING from a detailed study of the technique employed in the production of a group of ancient textiles found on the west coast of Peru, the Peruvians were weavers of exceptional ability. Even greater uniformity of excellent work was observed in their spinning, for all materials, even when poorly woven, displayed admirably spun thread. In some cases careless and slovenly personalities could be pictured through the textiles, and again the true artist could be appreciated in the perfectly woven material and true execution of design. The majority of fragments showed such a wealth of intricate design and perfect execution of the loom that as a whole the Peruvians must have been a patient, methodical and beauty-loving race. The examination of many fragments showed no instance of the flaws so commonly found in

hand-woven materials, such as weft threads skipping over warp threads.

The variations obtained by the weavers in their designs were striking; furthermore, when the design of the whole of a piece of material, particularly a piece of tapestry, is examined one finds a clever repetition of a simple interlocking unit used with interchanging color combinations. Bird, animal, fish, human and inanimate conventionalized design units are most common.

It would be difficult to say in which line of weaving the Peruvians excelled, for they seemed adept in all simple types except the weft pattern weaving. Their tapestry was exquisitely executed with great detail of design. The double weaving is quite a surprise, for one cannot help but wonder

at the skill required to manipulate a double warp on the simple looms that were used. Also, their warp patterns showed a great dexterity in manipulating warp threads to give such beautiful and detailed patterns.

These features are well illustrated in the outstanding examples of the various types of Peruvian weaving to be found in the Field Museum, as the following descriptions delineate.

A most remarkable piece of weaving, showing infinite patience on the part of the weaver together with perfect technique is demonstrated in a short shirt shown in Figure 1 (Catalogue No. 77780). No error in weaving was found in the portions still intact. It was made of two strips of material 32 inches long and 18½ inches wide. These strips were

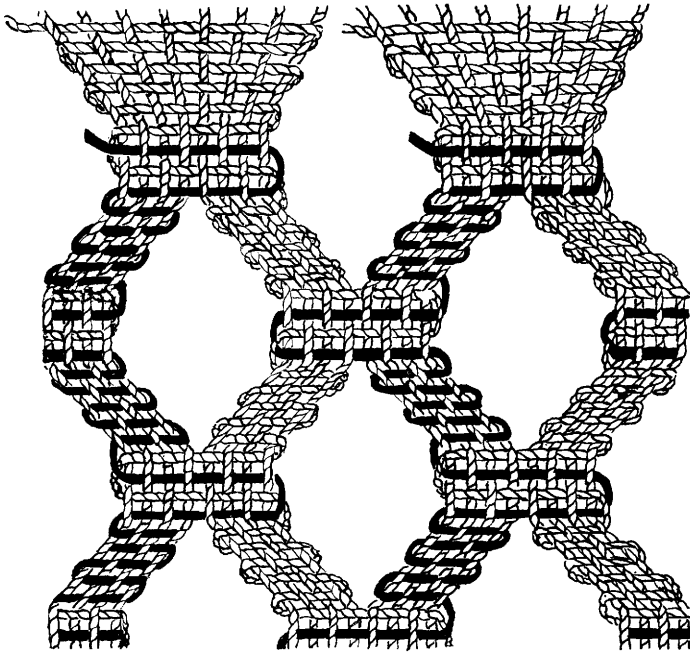


FIGURE 2

sewn together, leaving a short space unjoined in the center which forms the neck. The strips were then folded end to end and the sides of the shirt sewn together, leaving the upper edges unjoined to form armholes.

The material itself is of a very finely spun single strand natural brown cotton thread with 60 warps and 60 wefts to the inch. The whole was woven in oblongs of plain weave with squares of open weave, which will be referred to as "lace weave." The plain weave sections are 2 inches by 2½ inches, while the lace weave sections are 2 inches square. In changing from the plain weave to the lace weave, the warps were divided into groups of 16, making 7½ groups to the square. Each group was then woven in plain weave separately for a few rows until the warps were well drawn together, when a second weft thread, identical to the first, was thrown in the same shed with the first thread, but thrown in the opposite direction (Figure 2). This was repeated for several rows until the second weft threads were well tied, when the warps were again divided into groups of 8. These warps were then woven in plain weave with the two wefts started previously, each weaving the warp group on its side. This was continued for 3/16 of an inch, when each group of 8 warp threads was woven together with the neighboring groups of 8 threads. The two wefts were then

THE WEAVER

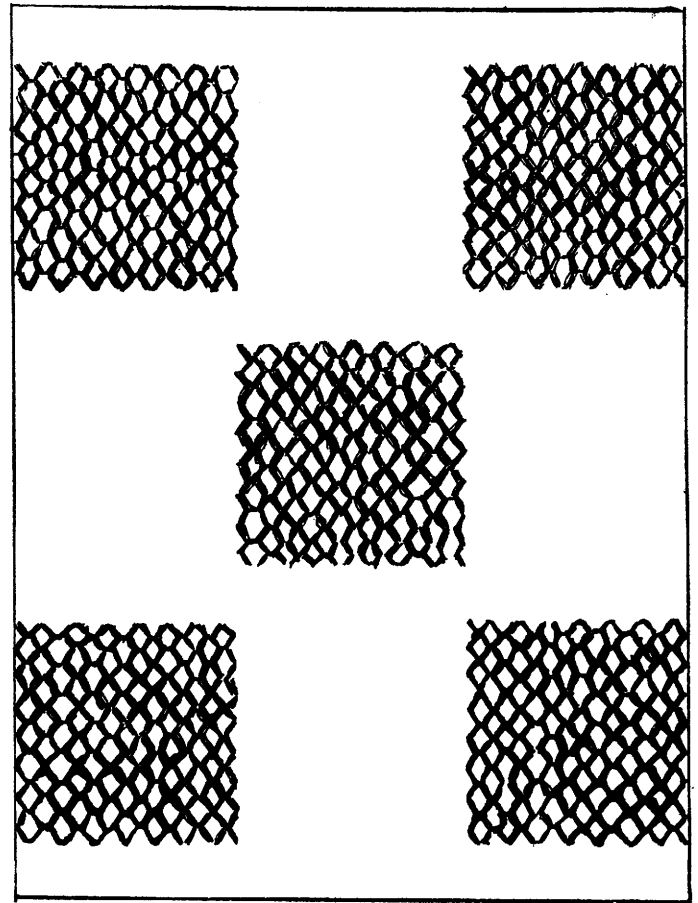


FIGURE 3

thrown in opposite directions in the same shed for 4 rows, when the wefts again separate and weave the original group of 8 threads for another 3/16 of an inch. The original 16 warp threads are again woven together for 4 rows. This technique is repeated 9½ times; the last group of warps

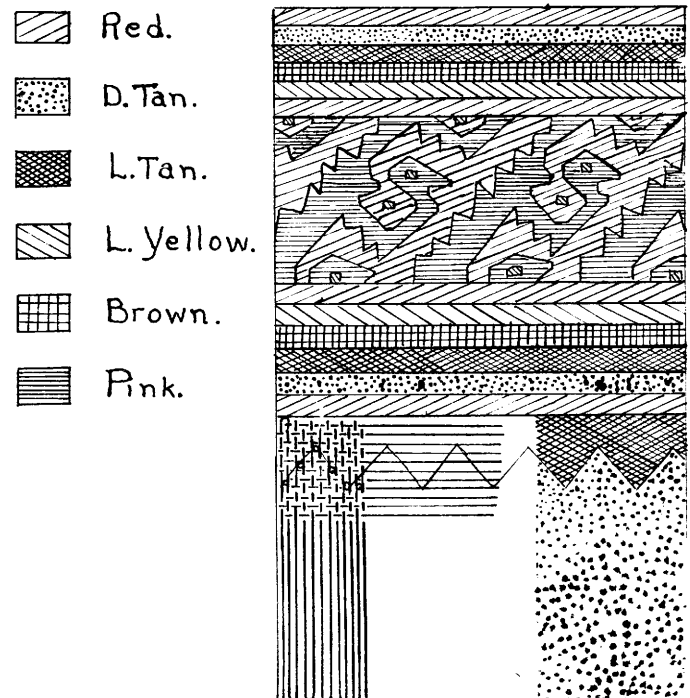


FIGURE 4

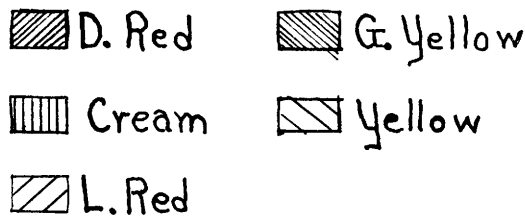
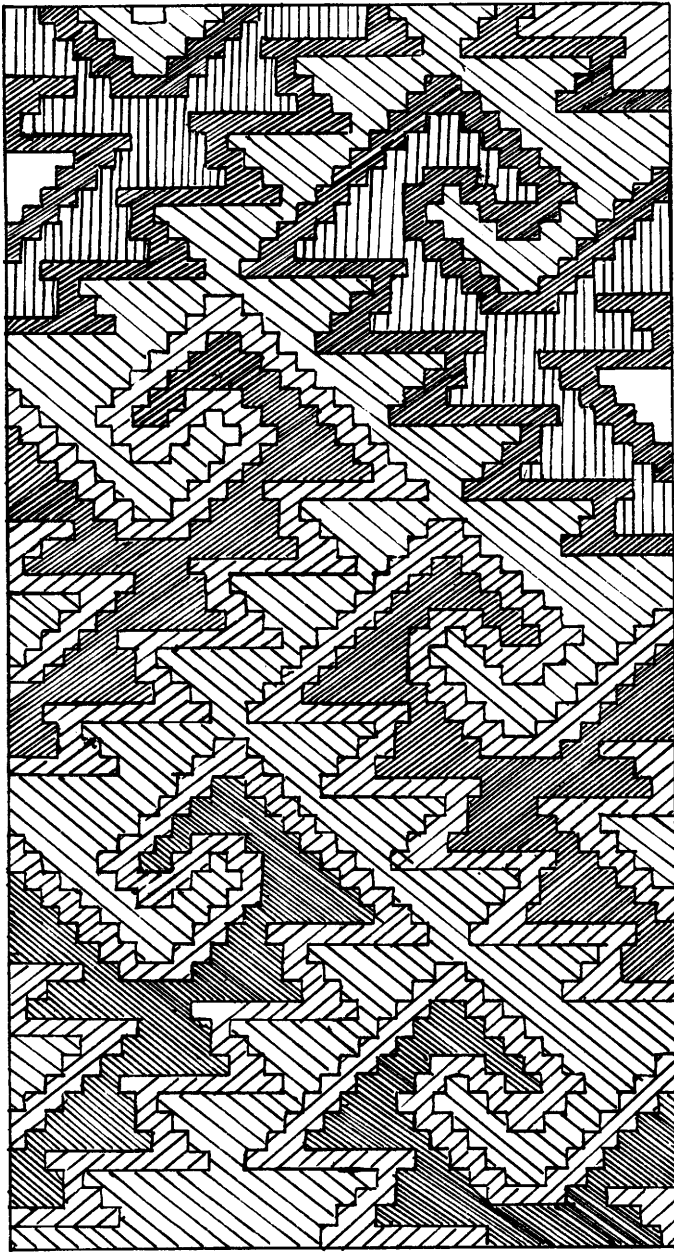


FIGURE 5

joined are from neighboring groups of the original 16. See Figure 3 for the diagrammatic plan of material, and Figure 2 for details of the technique of the lace weave.

Around the bottom of the shirt is a beautiful piece of tapestry woven on 32 brown cotton warps to the inch with 144 finely spun two-strand wool wefts to the inch. Narrow stripes of color outline the center stripe, which has an interlocking bird design. The colors in the central design are separated by one warp thread which was wound with black yarn, giving an outline to the design. Figure 4 shows the tapestry band and the woven fringe which was sewn to it.

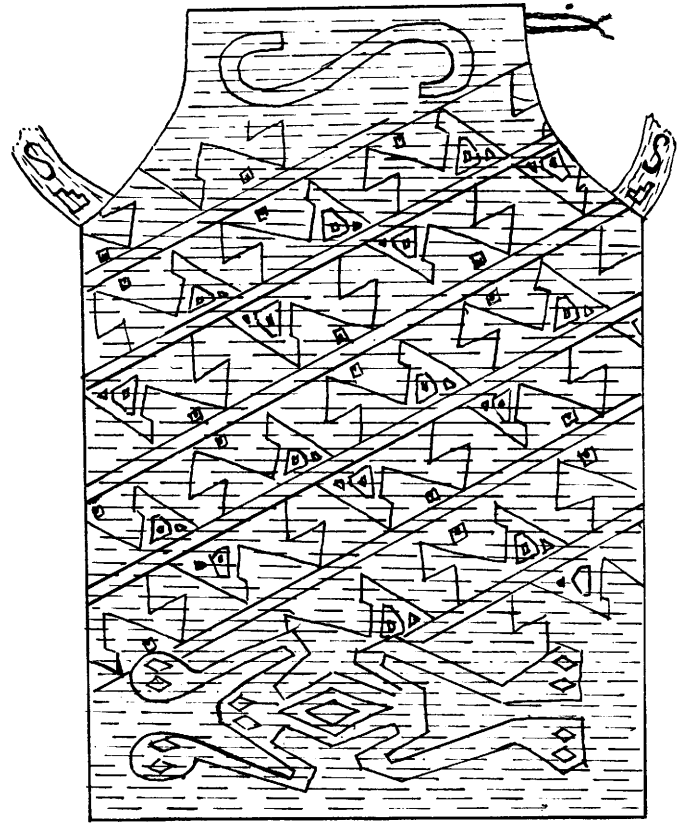
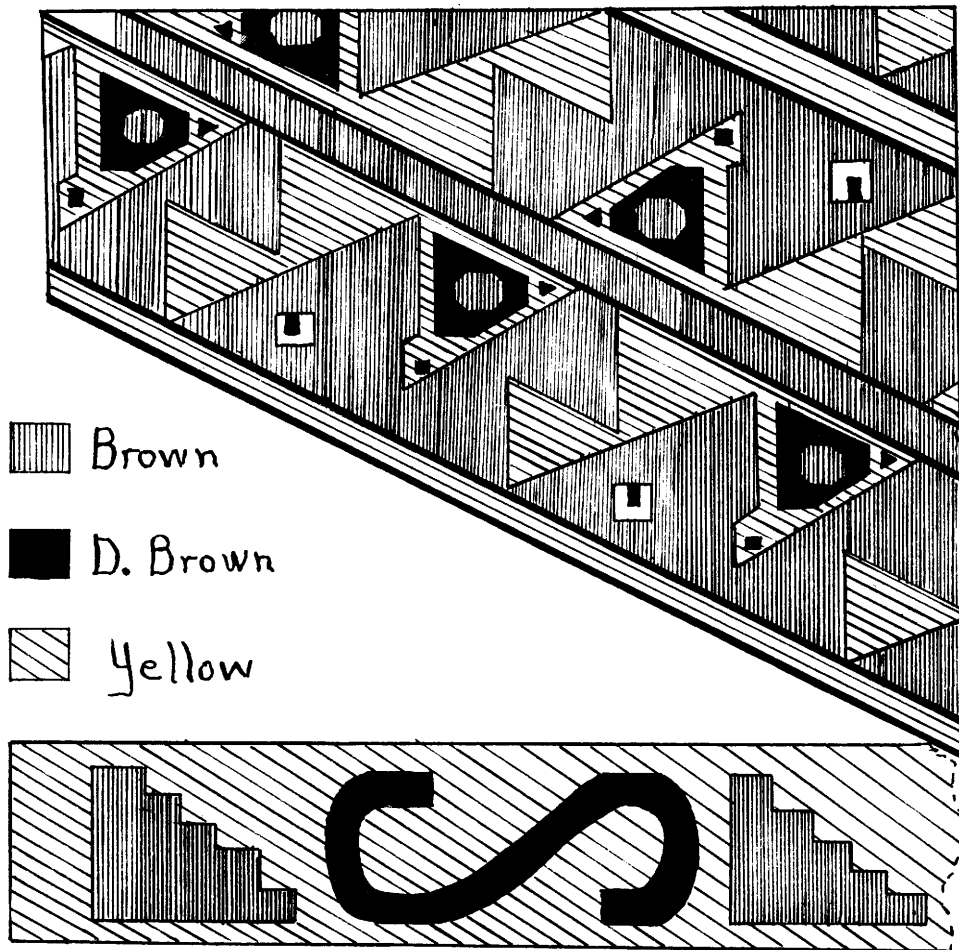


FIGURE 6

The fringe is most interesting in that it illustrates the painstaking care with which the Peruvians finished their garments. The simplest workable method to reproduce this woven fringe appears to be the following: eleven threads were warped in $\frac{3}{4}$ of an inch; another heavy thread was strung $\frac{3}{4}$ of an inch from the last warp thread. Two shades of tan were then woven in tapestry weave, as in Figure 4, the dark tan extending beyond the eleventh warp thread and looping around the heavy thread $\frac{3}{4}$ inch from the last warp. After the band was removed from the loom, this heavy thread was drawn out and the long loops of the dark tan made an ingeniously woven looped fringe.

An unusual bag (Catalogue No. 183748), probably intended to be carried from the shoulder, was woven in warp pattern (Figure 6). The two ends of the strap were not intact, but undoubtedly had been long enough to be used as shoulder straps. A small drawstring was run through the top, so the small opening could be closed. The interlocking fish design was executed in two shades of brown and yellow, as indicated in Figure 7. The manipulation of the warps to give such a design indicates the dexterity with which Peruvians handled their looms. The warp was of a medium-weight two-strand wool, and the weft brown cotton. The central figure at the bottom of the bag (Figure 9) strongly resembles a frog, although this particular animal is rare in Peruvian design. Figure 8 shows the design unit of the strap.

A small fragment of tapestry was found with a group of very coarsely and poorly woven simple cloth materials, apparently from the same mummy bundle. The threads of the various colors were interlocked so that no slits occurred. There were 27 warps and 64 wefts to the inch. Figure 5 shows the interlocking design, which unit is repeated with the variations in color.



FIGURES 7 AND 8

A pair of bag-like ornaments had two sides alike, but the two pieces of material are joined all the way around. They are woven entirely in the tapestry weave, the outer bands being tapestry strips $1\frac{1}{4}$ inches wide, sewn together, the inner edges of which were slightly gathered to make the strips lie flat around the corners of the central square containing two figures. The small conventionalized human figures were done in the slit tapestry weave. There were 15 brown single-strand cotton warps and 132 two-strand wool wefts to the inch. A large tassel fastened in the center at the bottom of the ornament was made in a rather ingenious manner. There was a core of material apparently stuffed with cotton, and to this firm core were attached a multitude of tiny tassels. Each small tassel had two more small tassels attached to it, thus forming a very full well-made tassel. At the top of the ornament fragments of cords were still intact. These were made of strips of material, one side of which was fringed, sewn around a core of brown cotton material

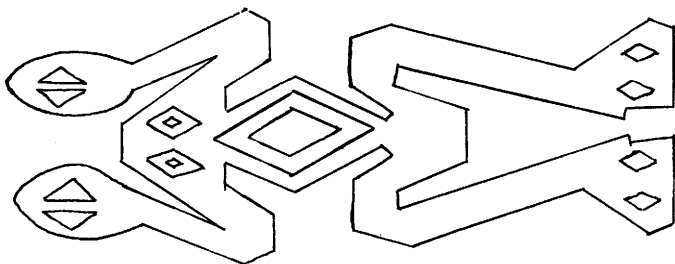


FIGURE 9

THE WEAVER

stuffed with cotton. This fringed cord was probably woven in the same manner as the woven fringe on the shirt described above, but in this case the looped ends around the outer cord were cut.

Ties must have been very popular in the Peruvian dress. Many ties were among the various fabrics, and practically all were done in double weaving in that portion where the design occurs. The centers, usually two pieces of material, were sewn together at the center back and had only the ends patterned. The centers were coarsely woven simple cloth of single-ply cotton thread. The extra warp must have been attached to the loom when needed, and this was generally colored wool. In some ties the double weaving is beautifully done, while in others it is very poor and coarse. In some cases where a border across the width of the material was desired, only the right-side warp would be woven, while the under warp would appear unwoven for the width of the stripe.

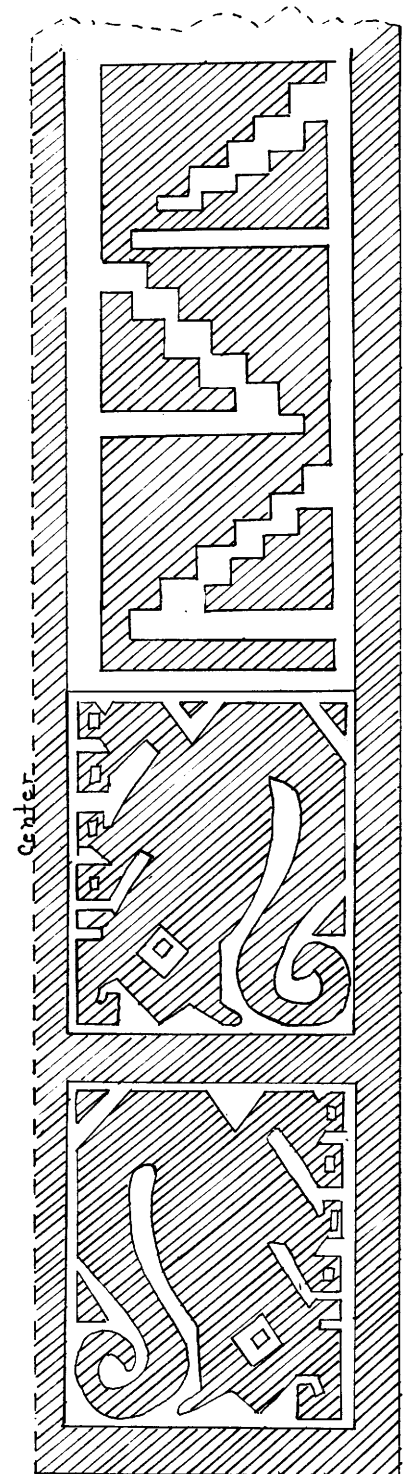
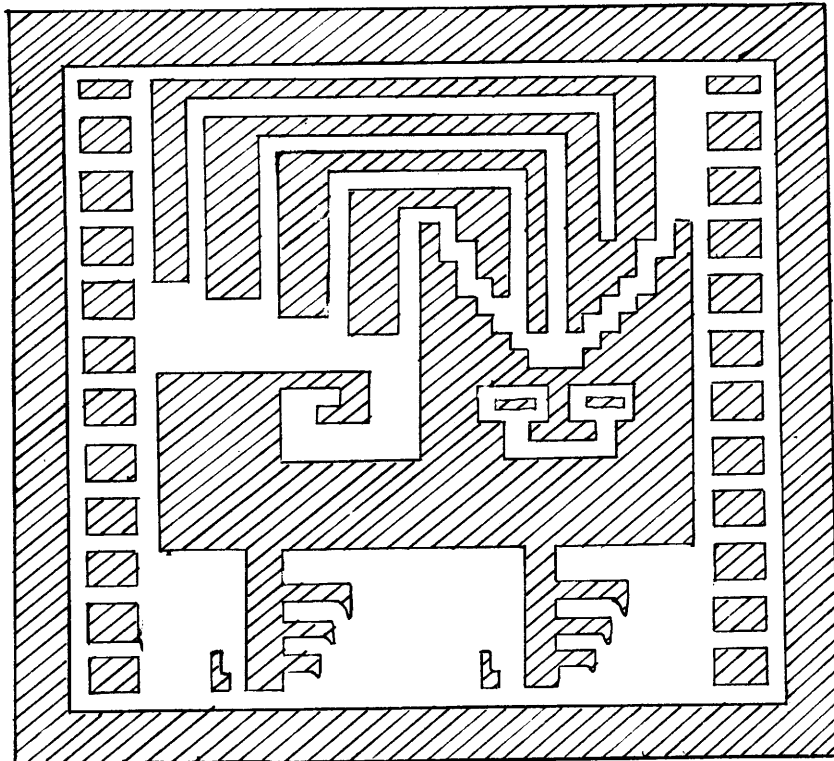


FIGURE 10



Red
 Green

FIGURE 11

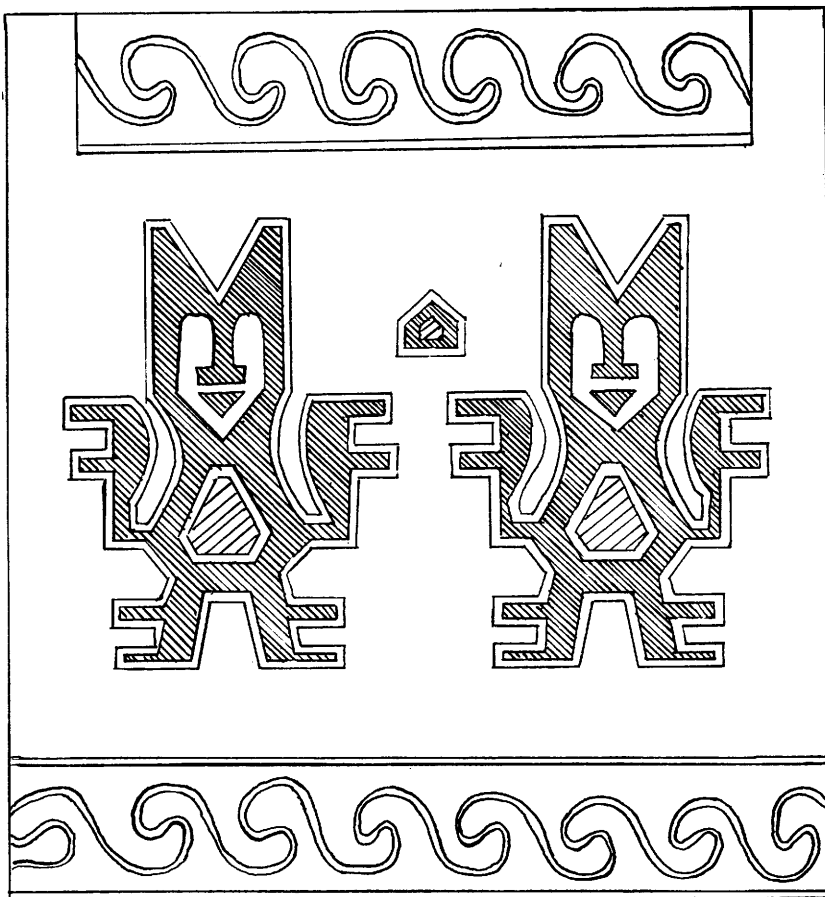


FIGURE 12

A few beautiful ties done in warp pattern weaving were obtained from the Ancon district of Peru. These ties were narrower than the ones done in double weaving; ranging from a half inch to 3 inches in width, and the designs were all small and geometrical. Three of the best and most characteristic of the double-woven ties are illustrated in Figures 10, 11, and 12. An unusual type of double weave was used in the latter. The warp and weft of one side is brown cotton, and the other of a red-brown wool. Supplementary wefts were used, one green and the other red wool, to form the designs. On the wool surface the red and green were woven where illustrated (Figure 12), with the brown wool floating between the two materials, and the green and red floating where it was not essential for the design. On the cotton surface the green was brought to light to outline the figures, interchanging with the brown cotton weft which was brought to the wool surface to outline the figures. The warps interplay only in the scroll border on either side of the figures.

Three long ponchos from the Lower Chillón Valley (Catalogue Nos. 170317, 170164 and 170328) are especially interesting because of the intricacy of method employed. They were all woven in the tapestry weave with the interlocking weft colors passing around the same warp. These were the only pieces I found with this method of changing from one color to another. Figures 13 and 14 show design of two of the ponchos.

The ponchos were made of two strips of material $17\frac{1}{2}$ inches by 52 inches and sewn together in the same manner as the shirt described in Figure 1, but in these garments the method of weaving is in striking contrast to the usual manner. Ordinarily the warp of material runs the length, and the weft is woven in from side to side across the narrow dimension. In these ponchos, however, the rule is reversed, and the design is woven the length of the material. As indicated in Figure 14, the eleven balls or shuttles of colored wool were woven over the brown cotton threads running from side to side. Thus the usual warp becomes the weft, and vice versa. The great difficulty in reconstructing the method employed arises from the fact that a perfect warp selvage appears across the two narrow ends, and a true weft selvage along the sides. The colors, however, had to be woven over the brown cotton foundation threads, for it would be impossible to warp the pattern threads in tapestry weave.

This material was probably woven in the following manner. Three to five warp threads were strung along either side of the warp frame.

The brown cotton weft was then woven across through the warps at either side, leaving long bare threads in the center. The frame was then turned on its side and the $17\frac{1}{2}$ -inch wefts became the warps, and the colored wefts were

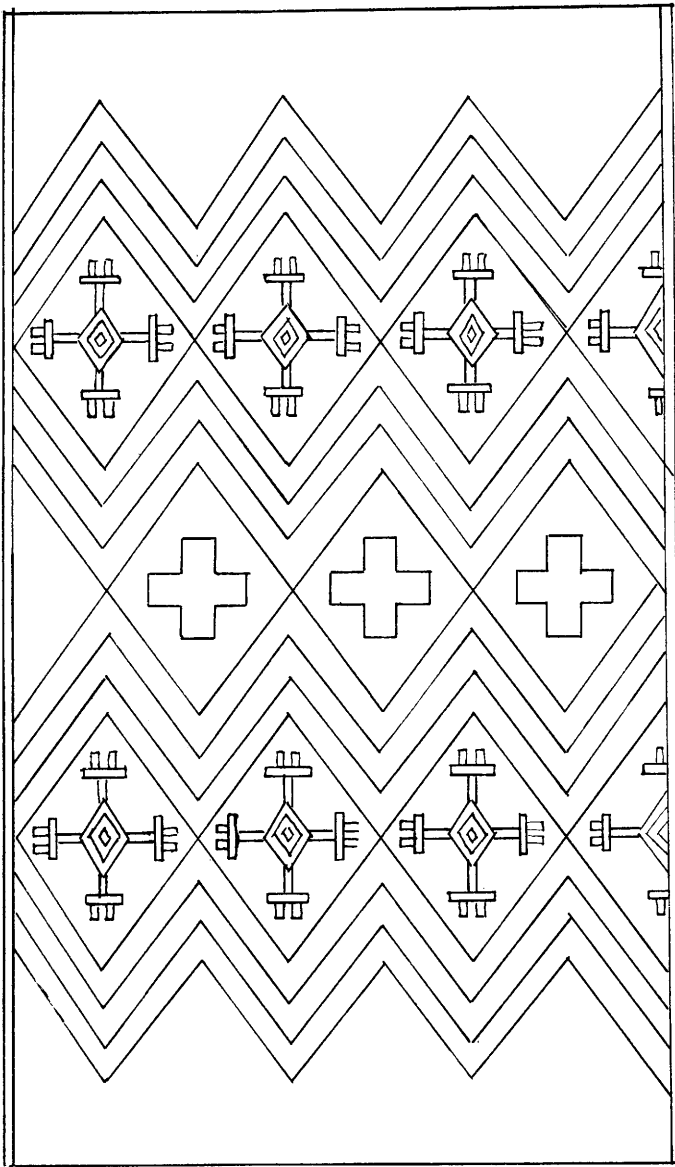
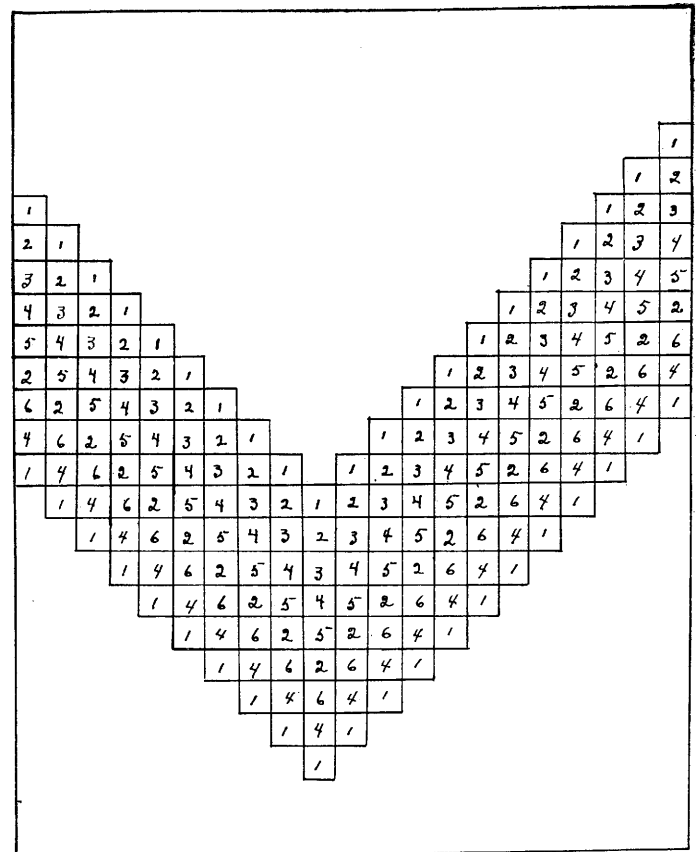


FIGURE 13

then woven along the 52-inch width of the material. This seems a very awkward method of achieving an end, but for some reason the weaver or weavers preferred to insert their pattern lengthwise of the material.

It is a pleasure to acknowledge my appreciation to the late Dr. Berthold Laufer and Mr. J. Eric Thompson for graciously making material available and for numerous valuable suggestions.

Notes: Simple cloth or plain weave: Warp threads and weft threads pass over and under each other alternately.



- 1. White.
- 2. Red
- 3. Yellow.
- 4. D. Blue.
- 5. Blue green.
- 6. Yellow green.

FIGURE 14

Warp pattern: Warps pass over and under wefts in various groupings to give a desired design. The weft plays no part in design, merely making a foundation.

Weft pattern: Weft pattern is the same principle as warp pattern, with the weft passing over and under warps in various groupings to give the desired design, and the warp thread forming the foundation.

Tapestry weave: A simple fabric of cloth weave, usually with vertical ribbing, in which the weft threads form the pattern and do not run the full width of the piece. Each weft is woven back and forth around the warp threads only where each particular color is needed.

Slit tapestry: A tapestry in which the various wefts are not interwoven with each other at their edges, and slits therefore appear between them.

Interlocking tapestry: A tapestry in which the various wefts, at their edges, are looped through each other so that there are no slits.



The Business of Weaving

BY KATE VAN CLEVE

WITH the increasing popularity of handwork of all kinds, loom weaving offers one of the most interesting as well as lucrative hobbies. The opportunity for combining colors is a never-ending source of pleasure, and the various textures which may be woven give a wide scope to even the simplest form of weaving. Whether one makes weaving a vocation or an avocation, the joy of producing lovely fabrics for coats and skirts, or even suits that the most fastidious man would be proud to wear, is enough to make one feel that the time has been well spent.

For the woman who revels in fine household linens, hand weaving makes it possible to have just the right color to give harmony to her china and lamps, and the odd size table may have a cover to fit. Chairs and sofas take on an added charm and dignity when covered with hand-woven fabrics. The weaving of upholstery is one of the most interesting types for the weaver who has imagination and likes to experiment. Beautiful coverings may be made on two- or four-harness looms and, of course, the very ambitious person may use the more complicated eight- and twelve-harness looms. Warps may be of wool, cotton, linen or silk, and wefts of wool preferably, although linen or cotton can be used. Simple one-color weaving may be used with good effect, or a combination of contrasting colors. The durability of hand-woven upholstery cannot be too much stressed, and gives pleasing results. If it is firmly woven, it will last a lifetime and always look well.

As to the selection of materials, the wise weaver will use only the best in her work. Fast colors are essential — colors both fast to sun and washing. Warps must be strong, whether fine or heavy. Broken warp threads will ruin the best piece of weaving as well as try your patience. Be sure your materials are wisely chosen for the work to be done. Linen warps give a much handsomer effect than cotton, but are more expensive and harder to weave. If you do not want to go to the expense and trouble of using linen, a good 20/2 cotton, either mercerized or dull finish, or Egyptian cotton may be used. These combined with linen wefts make a finished piece that launders well and wears well. The Egyptian warps are longer wearing, but do not combine as nicely with fine linen wefts. Either a No. 14 linen or No. 10 Perle cotton make a satisfactory weft for the usual work, but one may use silk or fine wool with any of these warps.

The selection of a suitable pattern is very necessary — woolen fabrics for wearing apparel and chair coverings should have short overshoots that will not catch and pull. Large patterns with bold effects should be used only for coverlets and the covering of large pieces of furniture. Choose the scale of the design in relation to the size of the room in which it is to be used.

The dream of every commercially-minded weaver is, of course, a shop of her own. Here she comes in contact with the customer, makes her sales and takes orders. For her a well-chosen stock is the first consideration. This should be varied enough to attract the attention of many people and be

changed often enough to keep their interest. The successful shopkeeper knows that she must follow the trend of fashion. Imagination and originality are most desirable, but saleable weavings must harmonize with their surroundings. Trade magazines are helpful, and a visit to the better shops will give many suggestions.

Special orders present quite a different aspect. The customers' ideas must be carried out, and often tact and judgment are necessary in making these workable.

The necessity of keeping an accurate record of all articles woven cannot be stressed too strongly, for one never knows when a customer may call for a duplicate of an article woven perhaps months, or even years, before. A record should also be kept of the amounts of materials necessary for the warp and weft of various articles, and the amount of shrinkage to be allowed for in each case. The latter may be estimated by weaving eighteen inches, measure it carefully in both length and width, then leave it slack on the loom over night and measure it again before tightening it in the morning. Beware of inaccurate tape measures, as the best of them will stretch, so use a yardstick, or better still, a steel tape measure. There will also be a certain amount of shrinkage to be allowed for in laundering in the case of cotton and linen fabrics and the finishing of wool suitings and dress materials.

The teaching of weaving is a constant joy if one enjoys watching the growth and pleasure another derives from a creative craft, and the development of the capacity to do things. It is one of the oldest of the crafts and probably started with the earliest races, as they wove grasses and reeds through twigs for shelter, then clothing.

The study of color must go into any weaving course and progress at much the same rate as the technical side of weaving. Beginning with very simple border of stripes in complementary or analogous color harmony with plain weaving (or tabby) on either a two- or four-harness loom.

Our next step in weaving would be a four-harness all-over pattern in one color and binder or tabby of a second, to be followed with a sampler showing variation of this pattern in borders that may be later used on towels, luncheon sets and bureau scarves. The color study may be brought in again by showing how the pattern is changed by the use and the variation of colors.

After a few pieces of weaving have been completed, it is time to teach warping and threading of the loom and drafting. There will always be some in every group who will not want to study this part, and a side line may be developed by the teacher, herself, in warping and threading looms.

To obtain the interest of your community in weaving, a loaned exhibition of all the choice pieces of hand weaving may be arranged. Have a loom and show how these cherished heirlooms were made, and a speaker if possible.

For equipment for large groups, table looms with one or two treadle looms work out nicely. There are always a few who will be willing to buy and use their own looms. Advantage of the table loom is that it may be carried home to complete projects between lessons. This speeds up the work of the whole class, and really practical articles may be made on it.

A most interesting texture may be obtained on the two-harness loom using two colors, one for warp and one for weft, in plain weaving. Then the warp may be neutral color with two finer threads of harmonizing tones used together for weft.

Homespun may be lightened up by an occasional mercerized thread in the warp. Rayon and wool may be used together in either plaids or stripes with a most happy result. For example, use eight threads of rayon and twenty-four threads of wool in the warp.

Here again one must consider the trend of fashion, whether smooth or nubby fabrics are most in vogue, and choose our materials accordingly.

If one wishes to try the more complicated weaves, the family of twills offers great possibilities.

Raw silk is a dull thread of rather rough appearance and

may be used with the many new novelty yarns that have come on the market year by year for the knitter.

With the popularity of the knitted jumpers, a skirt may be woven to match in one of the many twills. The broken twill makes an uneven pattern that is very attractive and is the best for a beginner to try first, as a little unevenness in beat is not noticeable.

After all is said and done, it cannot be emphasized too much or too often, if you use a good quality of yarn both as to the wool, silk, cotton or linen and colors of fast dyes, your work is bound to be interesting.

Questions and Answers

Address your questions to Mrs. Mary M. Atwater, Basin, Montana

Question: What is the difference between a "hand-woven" fabric and a "hand-loomed" fabric?

Answer: Properly speaking, there should be no difference in meaning between the two terms, — though the word "hand-loomed" is hardly a correctly constructed word for any meaning. A fabric is not "loomed," of course; it is "woven." Recently, however, the name "hand-loomed" appears to have been adopted by certain manufacturers as a trade-name for fabrics woven by machinery in imitation of hand-woven fabrics. If this meaning is clear to the purchaser there is no deception, but if the purchaser is led to believe that the fabric is hand-woven the use of this trade-name is clearly dishonest. The present vogue for hand-woven fabrics has, of course, stimulated imitators. For the protection of the craft hand-weavers should take note of fabrics labeled "hand-loomed" and offered for sale in shops and should make inquiry, and suitable protest if the case requires.

Question: How does one produce a fabric in which the warp is completely covered? A fabric in which the weft is completely covered?

Answer: This question has come up before, but it is asked so often that it may be useful to answer it again. For a weft-face fabric in which the warp is completely covered, use a coarse warp widely spaced in the reed, and a comparatively fine weft-material. For a warp-face fabric in which the weft is completely covered by the warp, set the warp very close and use a comparatively coarse weft.

Spacing the warp very far apart weakens it, of course, and a good rule is to use the same weight of warp required for an ordinary fabric. For instance, for a weft-face rug, set the warp at 12 ends to the inch and thread it double, or use a warp twice as heavy as ordinary carpet warp and set it at 6 ends to the inch. As weft for this setting use a heavy knitting yarn. If a coarser weft-yarn is used, set the warp farther apart or thread triple instead of double.

In threading double it is advisable to use a separate heddle for each thread, as: 1, 1, 2, 2, 1, 1, 2, 2, and so on, rather than to draw two threads through the same heddle. This applies to threading triple, also — 1, 1, 1, 2, 2, 2, 1, 1, 1, 2, 2, 2, and so on rather than three threads through the same

heddle. Some weaves, such as summer-and-winter weave done on "opposites," and the Indian saddle-blanket weaves, do not require quite so wide a spacing of the warp as plain weave.

No general rule can be given, applicable to all combinations of material. A bit of experiment may be required. If the warp does not cover, even when heavily beaten, either sley the warp further apart or use a fine weft.

For a warp-face fabric in which the weft is covered, set the warp extremely close. The number of warp-ends required can be determined roughly by laying strands of warp side by side on a board and counting the number of threads to cover one inch. Double this number will, naturally, be required in the setting, as the weft should be covered on both sides. A warp set close enough to cover the weft often sticks badly in the reed, so that the sheds will not open properly. It is practical to dispense with the reed and to govern the width by the weft-thread. A template may be used if necessary.

Either of these weaves produces a much thicker, heavier fabric than plain tabby in the same materials.

THE OVERSHOT WEAVE ON SIX HARNESSES

(Continued from page 17)

stripes are introduced into the warp at regular intervals, and the horizontal pattern stripes are put in at the same intervals, making a large check. Any two-harness figure in overshot weaving can be used in this manner, and the pattern stripes may be made as wide as desired. The effect might be useful for window curtains when worked out in suitable materials.

There are many other interesting six-harness pattern weaves — the six-harness patterns in "Summer and Winter" weave, for instance, and the six-harness forms of the "Bronson" or "Spot" weave with the allied openwork or "mock Leno" weave. These will be discussed in a later article.

(NOTE.—The tie-up drafts as given on the diagrams are for looms that operate with a rising shed, like the Bernat loom. The "o" indicates the harness tied to rise. On a loom operated by a double tie-up the rising ties should be made as indicated and the blank spaces of the draft indicate harnesses tied to sink.)

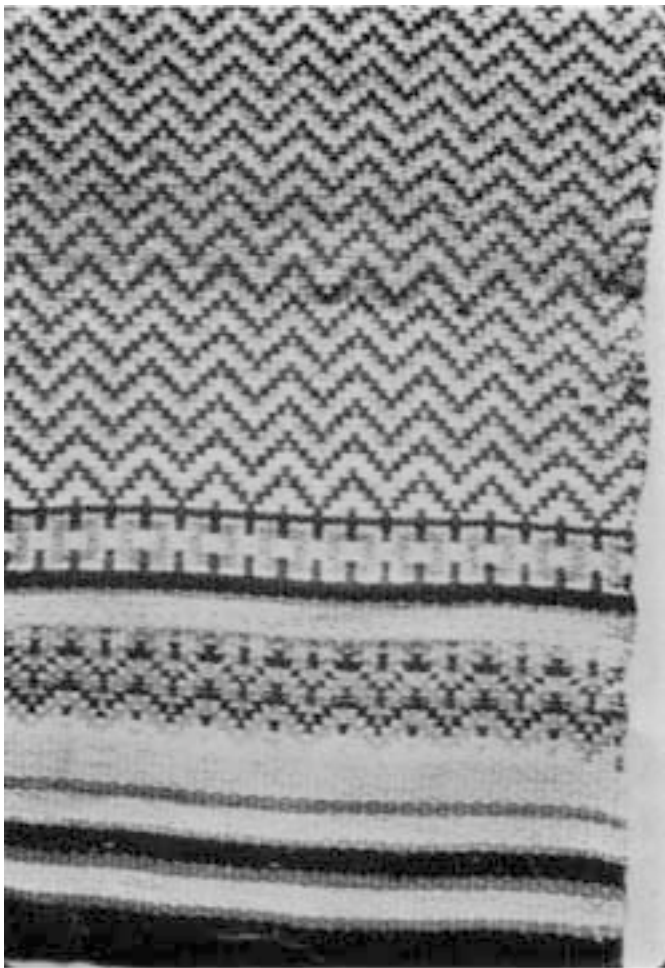


ILLUSTRATION NO. 1
Illustration of the "Flame Stitch" technique worked out as a student's practice piece in cotton carpet warp

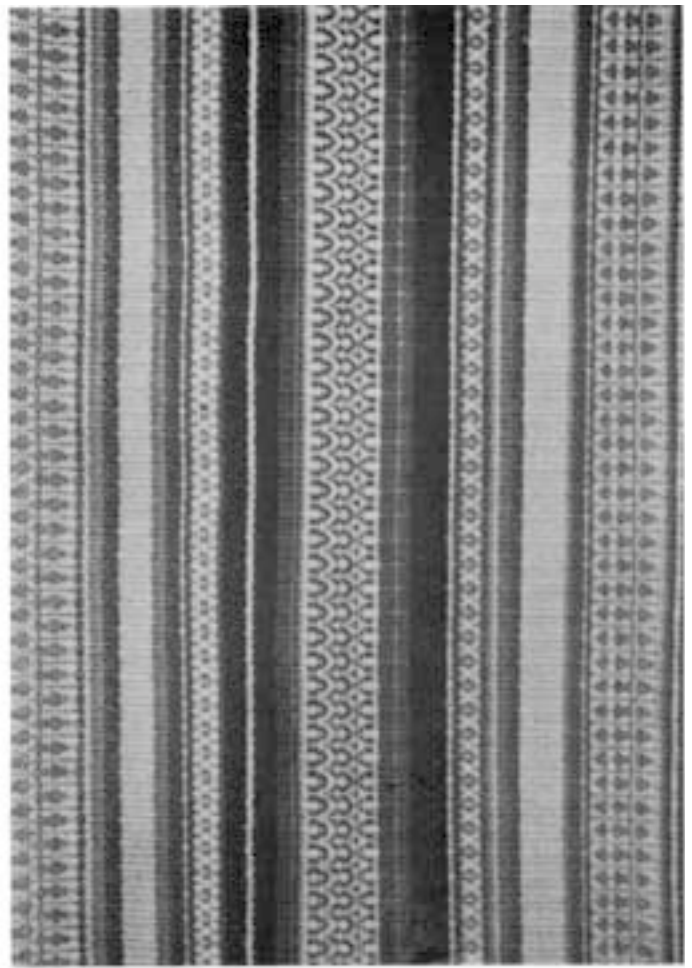


ILLUSTRATION NO. 2
Sampler of stitches on the "Rosepath" threading uniting the weave on "opposites" with that of the "single harness" technique

Final Development on the "Rosengang" Threading

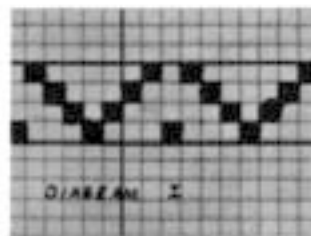
BY ESTHER HOAGLAND GALLUP

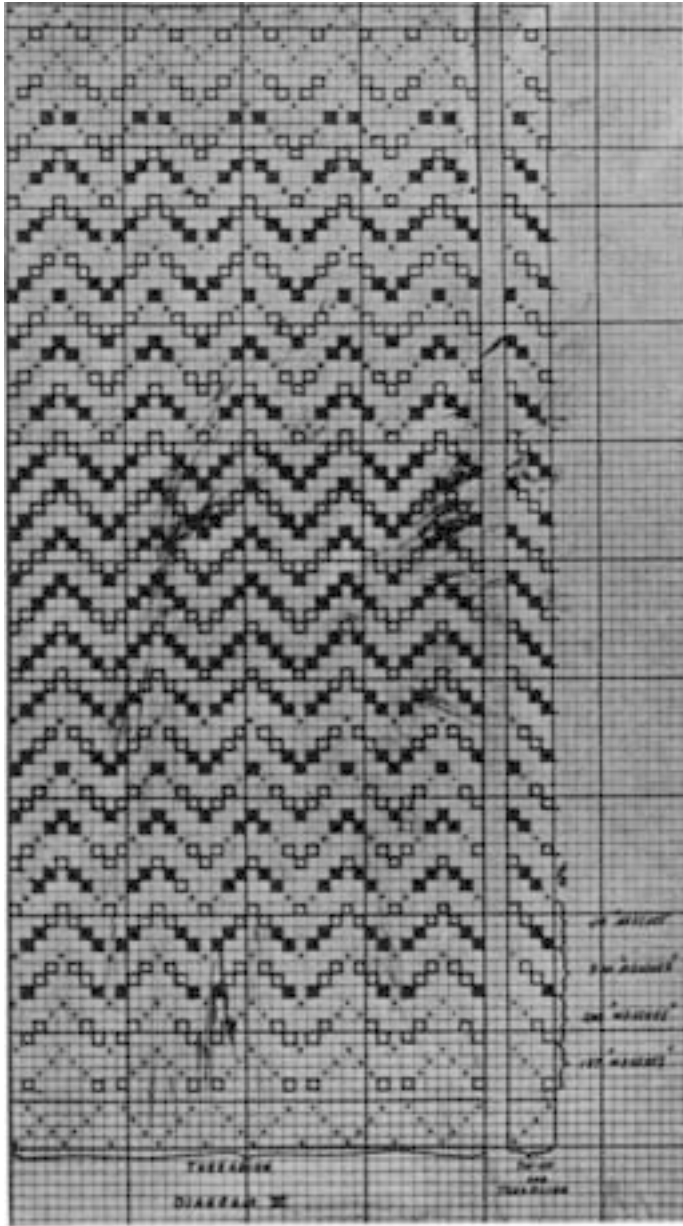
IN THE two preceding articles on decorative textiles, using the simple "Rosengang" threading, we have suggested rugs, wall hangings, cushions, or upholstery as the practical vehicles for its development.

The third variation, of which this article treats, is the one most eminently suited to upholstery, not only physically (because of the property of the fabric) but traditionally, because it is reminiscent of the fine needlework upholstery of the past. As a matter of fact it closely resembles the charming "Bargello" or "flame stitch" of Italian embroidery and is achieved, we think, with infinitely less time and tedium than by the needlework technique.

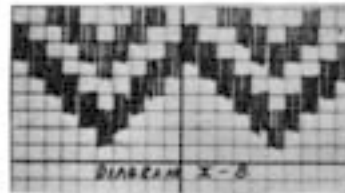
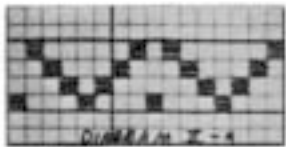
The "flame stitch" apparently has been widely used. Upon investigation one finds it listed as "Irish Point," "Hungarian Point," "Cushion Stitch" and "Florentine Stitch." It is described as a "canvas stitch used for working the particular zigzag patterns known as Florentine work.

The simplest form consists of straight stitches worked over four horizontal threads of canvas, each stitch rising or falling two threads below the last." (References for further information concerning this stitch are: "Dictionary of Embroidery Stitches," by Mary Thomas — Published by Morrow, and "Embroidery and Needlework" by Gladys Windsor Fry — Published by Pitman.) The weaver will recognize immediately the similarity in this stitch to the rising and falling points in the threading (Rosepath) and will recognize the inherent differences; namely, that in the embroidery the threads of the design move with the action of the stitch — i.e., vertically — while in the weaving they run horizontally.





Therefore, if we desire an extremely acute flame effect we must depend on heightened color and extension of design to counteract the crosswise directional effect of the design thread.



It should not be necessary to reiterate here the threading, tie-up or materials suitable for this weave. Suffice it to say that they are the same as for the designs suggested in our

article No. II. The order of weaving is also identical — harnesses No. 4, No. 3, No. 2, and finally, No. 1 drawn down consecutively and singly throughout the work.

It appears, then, that we are dependent upon color and color-order for the flame effect. In order to accomplish it we need only three shades at a time, which we shall call A, B, and C; all of these may and should be changed and/or intensified as the peak of the flame or central band of the design is reached, to be in turn modified and dulled on the “diminuendo.”

I have prepared a rather elaborate diagram of this design indicating the flow of color. If the reader will consult this diagram now, he will see that each unit of the design — that is, four picks (one to each of the four harnesses) — has been marked off as a separate “measure,” to use the musical phraseology again. Each “measure” indicates the introduction or continuation, or both, of a color value. The first “measure” shows the initial appearance of one of the major colors together with three picks of a subordinate color. The second “measure” shows the continuation and deflection of the first color. In the third “measure” a new major color appears, and so on. It will be seen readily that each major color appears twice before it is deflected to the next (adjacent) harness, where it again appears twice, only to be deflected again, etc.

So, if we choose our colors and follow the treading order most carefully, that is really all there is to it!

Consider, for instance, a background of palest dull gold. It is broken first by a delicate note of chartreuse; the chartreuse continues and is fortified by a tawny gold. From this beginning the work may grow into gorgeous chrysanthemum colors — bronze, ochre, rusty red and flame and a touch of pure lemon yellow; or we may wish to suggest a real flame and so begin with a dull purplish dark, grow through violet and indigo to green, to gold and perhaps add a bit of cadmium orange.

Let us remember, however, that our color will be effective only so long as we control it. Often *one* thread, occurring at the absolute peak of movement and color intensity, is ample to highlight it. I can think of nothing more painful than a brilliant effect of pointed stripes, and nothing could be further from my conception of the flame stitch in this connection.

It should be quiet at the start, rising and falling in a gentle undulation, gradually gaining in strength and intensity, flaring up to one point of light and beauty and falling back again to smoulder, and fade out at last.

The flame design, as in the preceding single-harness work, may be elaborated and lengthened at will, simply by repeating each “measure” as many times as desired before continuing to the next “measure.” Each repeat, however, must be a complete one, consisting of four picks, one for each of the four harnesses. An illustration might be, for instance, a fabric to be used as chair upholstery. In this case the flame effect could be limited to a narrow stripe or band in the center of the seat (or back), or might be elaborated to become an all-over design. For whatever purpose, it is a most flexible pattern, and we hope many uses and delightful variations will suggest themselves to the interested weaver.

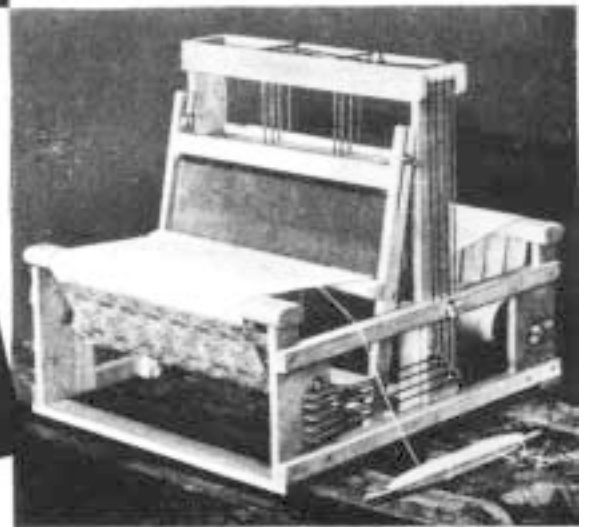
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