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More Developments

BY ESTHER HOAGLAND GALLUP

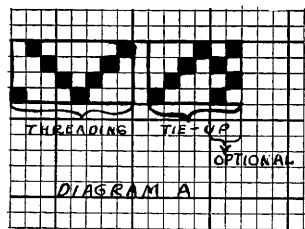
READERS of THE WEAVER may recall a recent article on designs for weaving on "opposites," using the familiar Rosepath of "Rosengang" threading as a basis for its development.

The current article presents a variation which is less commonly known and more fascinating and flexible in design, we believe, than the weave on opposites.

This weave is done entirely on single harnesses — that is, by depressing the threads of one harness only, at a time.

A four-harness table-type loom is recommended, therefore, for its accomplishment, at least until one becomes familiar with the technique of the weave. As the experienced weaver knows, in this type of loom, each harness is operated without any dependence or effect on the other harnesses whatsoever: an independence of movement which does not exist in the regular floor loom. For the benefit of the novice we remind him that the latter type of loom works by a system of balance — two harnesses which are up, opposing two which are down — for the majority of its weaving operations. The counter-balanced floor loom (using two sets of lams) such as described in the Edward F. Worst book, "Foot Power Loom Weaving," would do splendidly, as it can be "tied-up" for any unequal combination of harnesses; but few weavers are fortunate enough to have access to one of these looms! The single harness designs can be done perfectly well on the regular floor loom, but the shed will not be as wide or clear, since the balance is one harness against three.

The following diagram gives the threading once again and the tie-up for the six-pedal, four-harness loom.



(The fifth and sixth pedals are optional, the plain weave being done equally well, though not quite so quickly, we think, by the use of two pedals at a time.)

The texture of this weave is firm and smooth, entirely suitable for upholstery, cushions, table mats and hangings; but

unlike the weave on opposites, it is not suitable for use where both sides of the material will show, as the wrong side is rough compared to the right, and, too, the long, loose over-shot threads make the wrong side of the design incomprehensible as well as the surface less durable.

The same kind of warp as suggested in the previous article will do nicely. It should be smooth and strong, and sleyed openly enough (not more than 10 threads to the inch) to allow the weft thread (which due to the single harness method will at no interval cover more than one warp thread at a time) a generous space in which to assert its color.

The choice of weft is also important. As stated in the first article, it must have body enough to cover the warp easily without hard beating and at the same time must be soft and springy in order to produce a supple fabric. A very fuzzy or fluffy weft thread will not be desirable because it will detract from the clarity of the designs.

The designs are, in our opinion, so traditionally and quaintly charming in effect that they deserve to be incorporated in a fabric of heirloom quality — linen warp, about

the weight of "linen weaver" and a soft, fine quality wool of the tapestry type, for the weft. In case tapestry wool is used, unless very fine, two strands together should be heavy enough to cover the warp well; or as an alternate I should suggest a Germantown or Peasant type wool. At the same time it is possible that the average institution, for instance, may be limited to less expensive materials; therefore, for such use, an Egyptian cotton warp of, say, 16-4's and a 6-strand cotton filler as weft should produce beautiful effects provided the colors are well chosen.

And now we have reached the *modus operandi* of our designs.

The treadling is simplicity itself: harness 4, followed by harness 3; then harness 2, and finally, harness 1. *This order treadling, i.e., Nos. 4, 3, 2, 1, is the only treadling used in the designs throughout the development.*

NOTE. — On the table loom, since the harnesses raise instead of lowering, the treadling must be transposed. The easiest way to do this, in my opinion, is to think of the No. 4 lever, for instance, as being *left up* while the other three levers are depressed. This gives the same result as depressing the No. 4 harness on a floor loom; in either case the threads on the No. 4 harness are down, while those on the other three harnesses are up. Then, continuing the treadling order, *leave up* lever No. 3 (press levers Nos. 1, 2, 4); then, *leave up* lever No. 2 (press levers Nos. 1, 3, 4); and finally *leave up* lever No. 1 (press levers Nos. 2, 3, 4).

In case of confusion, forget the harnesses and the mechanical devices by which they may be operated, and think only of the warp threads; those which are to be covered by the weft thread in making the designs must be the bottom threads when the shed is formed.

Unlike the development on opposites, the plain areas of color in this weave should be done after the usual manner of the plain weaving: i.e., harnesses 1 and 3, followed by harnesses 2 and 4; or another effect may be achieved by twilling the areas of plain color. The latter method (drawing down one harness at a time and in consecutive order) will keep the level and texture of the work exactly the same as that maintained throughout the designs; but the twilling effect may detract interest from the pattern areas and can cause uneven edges unless watched carefully. Unless a particular effect is desired we believe the normal plain weave to be more satisfactory for the plain areas.

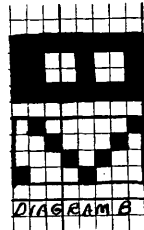
The design areas, also, in order that the sequence of plain and patterned spaces may present an unbroken edge line, must be carefully woven. This is especially important in a wall piece which is to be hung against a contrasting background. To keep an even edge it will be necessary to "go around" the end warp thread with the weft whenever the treadling order leaves out the extreme end thread.

Color plays an enormously important part in the creation of beautiful textiles, and these designs are no exception. But here, as in all design, the color can be supremely lovely only if it maintains unbroken the rhythmic balance of dark and light throughout the fabric. After the technique of the pattern has been acquired we think it a wise plan to sketch or indicate in a general way the balance of dark and light to appear in the finished weaving.

These areas of dark and light may be broken up and varied in themselves, by color and pattern changes, provided the initial balance of the piece is not destroyed. Subtle color changes (which keep the same value of darkness or lightness) often add interest to large plain areas without breaking up their unit as a whole. For the most part the patterns themselves require a dark and a light element in each in order to bring out the design.

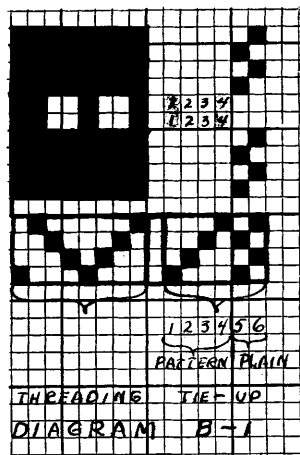
Now let us look at Diagram B. It is the simplest of all the single harness designs, and should be studied with the directions, which are as follows:

Plain weaving with black weft thread — 4 picks.
 Pattern treadingling { Pedal 4 with black weft thread
 Pedal 3 with chartreuse weft thread
 Pedal 2 with chartreuse weft thread
 Pedal 1 with black weft thread
 Repeat the pattern treadingling through, once.
 Then do:
 Plain weaving with black weft thread — 4 picks.



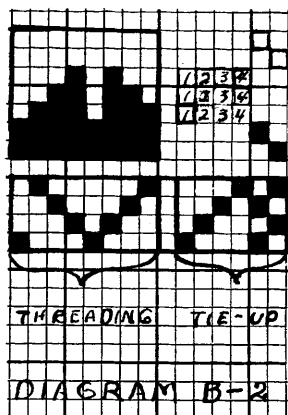
Now let us look at the same design with the key added for reading the color (and treadingling, incidentally, though the latter, it must be remembered, remains the same throughout the designs) (Diagram B-1).

Or, saying the identical thing in the old diagrammatic



way, Diagram B-1A:

But — and here is the charming surprise — the designs do not look like Diagram B-1A. When woven, the beater packs down the threads; there is no binder to separate them; hence, the result is like Diagram B-1!



In order that the designs shall appear as they really do when woven, we have hopefully devised the following diagram or key (the same as employed in Diagram B-1) which we believe the average weaver will have no difficulty in using. A complete analysis of the next design (Diagram B-2) is as follows:

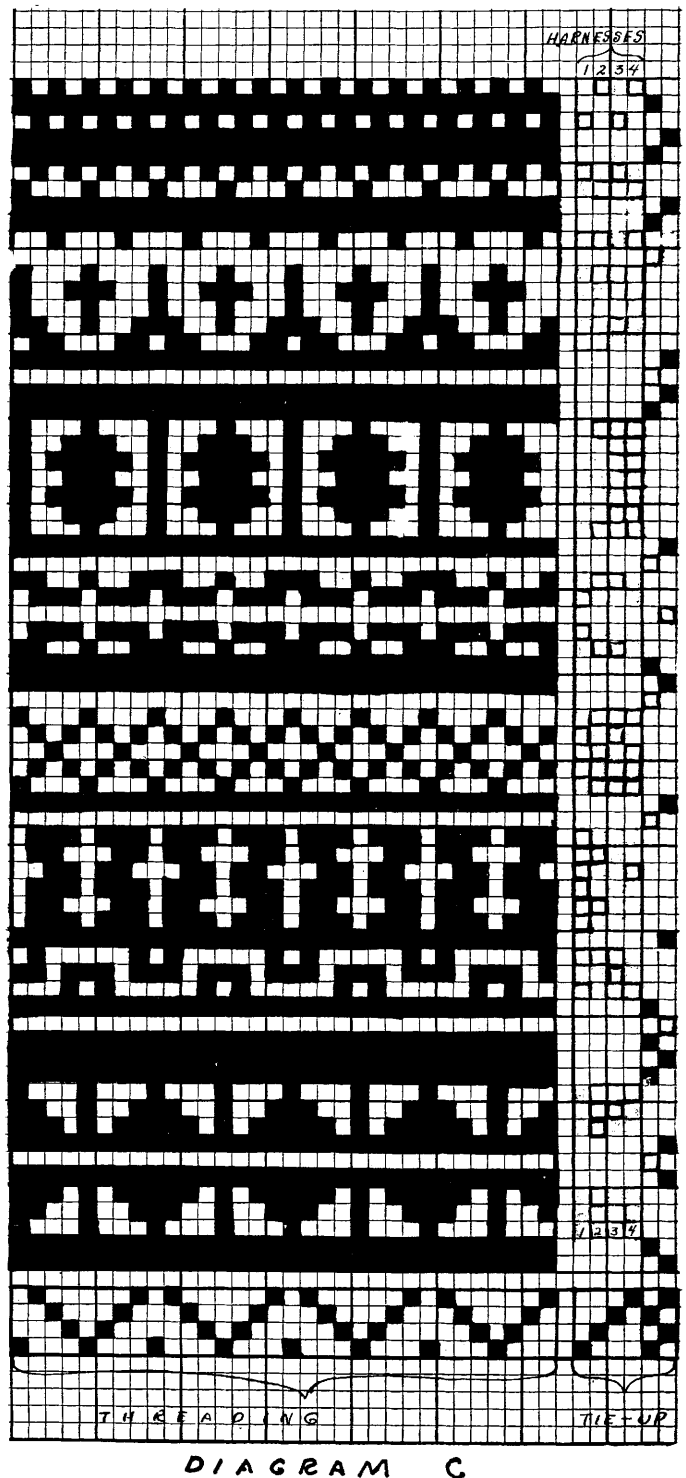
In Diagram B-2 the plain weave is indicated as two picks, only (of, say, a moss green); though, of course, the width of the plain band is entirely de-

pendent on the pleasure of the weaver. Following this and reading from right to left on the diagram, the next step of the border begins the pattern treadingling, and is:

- No. 4 with moss green
- No. 3 with moss green
- No. 2 with moss green
- No. 1 with ivory

The next step is:

- No. 4 with ivory
 - No. 3 with moss green
 - No. 2 with moss green
 - No. 1 with ivory
- (Continued on page 14)



Scandinavian Art Weaving

NORWEGIAN ÅKLAE TECHNIQUE

BY ELMER WALLACE HICKMAN

I CHOSE to write about Norwegian Åklæ rather than Swedish Röllakan because the finished fabric is more satisfying, even though the working process is a trifle more intricate. (Åklæ is pronounced aw-kli.)

The information given in this article is, to the author's knowledge, the first time that such material has appeared in print in the English language.

In this Art Weaving technique one can create both in form and color any design that can be put on cross-section paper. With any type of weaving there arises the question: whether to imitate the designs of the past, or create ones anew. Eventually and unavoidably, imitation becomes commonplace, but, again, creation may be just as undesirable if, in creating, there is no reflection in our designs from that which is characteristically distinctive of that type of weaving. Let us, then, *sanely* adapt designs that are nationalistic to our needs.

Instead of working with a few colored yarns as we often do in some of our own American weaving, one has the opportunity of working with as many colors as a painter might use on his palette. One is not inhibited in the design by the harnesses of the loom, but only inhibited by the extent to which the design fits onto the graph paper. No curve can be simulated as in real tapestry, but an approximation of curved lines can be approached as is shown in the illustration of the Viking. This special design is somewhat unique for this type of weaving since the designs are ordinarily geometric, consisting of squares and star-shaped figures. Mr. Gene Johnson, a Norwegian artist, of Brooklyn, New York, especially designed this Viking so that I might weave it to have for this article in *THE WEAVER*. Although it is woven with vegetable-dyed wools imported from Den Norske Husflidsforening in Oslo, Norway, the color key that I give in Bernat's French Tapestry wools for the chart approximate the original exquisitely.

The loom for the Norwegian Åklæ can be any loom that permits the making of two sheds or plain weave. There are looms, both table and treadle, primarily made for this work in the Scandinavian countries. Any of our table or floor looms can be most satisfactorily used. A loom, however, on which the warp stands upright is a little more easy to operate for this type of weaving, principally because the numerous bobbins remain out of the way and the weaving can be more readily seen. If a two-harness loom is used, thread the heddles as for plain weaving. If a four-harness loom is used, thread the loom with a twill threading or any pattern threading that will produce the two sheds necessary for plain weaving.

In making the designs, cross-section paper with eight divisions to the inch is preferable, as a No. 8 reed is ordinarily used. I would suggest that a beginner put his design on a four to the inch cross-section paper, as the design can be more easily followed. This is, of course, not absolutely neces-

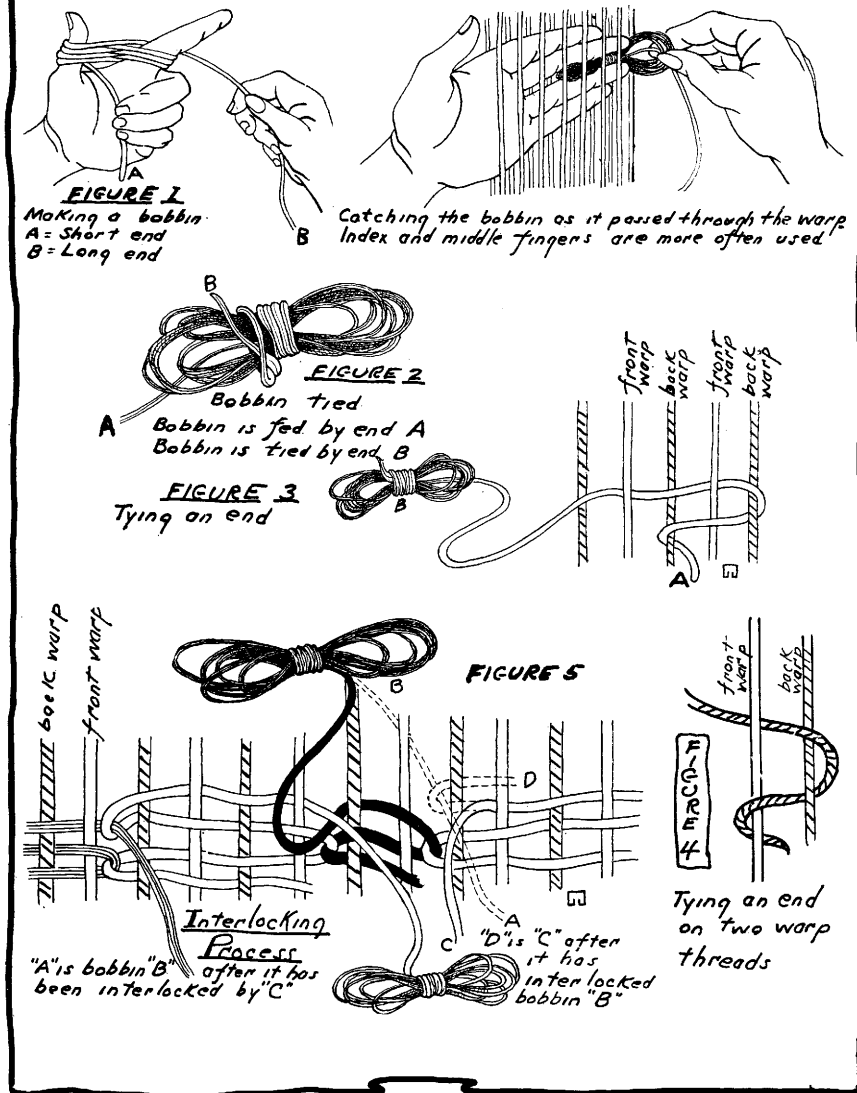
sary. Let each square on the paper represent your smallest unit of warp threads (i.e., two warp threads to a square, or four warp threads to a square, etc.). In weaving pictures in this technique, as the Viking, one square of the graph paper should represent one warp thread. This is necessary in order to get a better form to the figure. In less complicated designs — especially geometric forms — this would really be a waste of paper. The usual unit of warp threads is four — two front threads and two back threads. This unit can be clearly represented by one square on the cross-section paper. In the design for which the detailed working process is given — Pattern No. 1 and Illustration No. 1 — one square represents four warp threads.

The warp used in Norwegian Åklæ should be of a stout cotton twine. For experimental work ordinary carpet warp may be used, but only for experimental work. The Scandinavians use a 12/6 soft Fiskgarn twine, but it is practically impossible to get that count in this country. The nearest twine procurable, I have found, is a "20/9 Cable Thread." There is very little difference in the two twines, except that the imported Scandinavian Fiskgarn is a trifle thicker and



Illustration No. 1

NORWEGIAN ÅKLAE



of a different twist. A linen warp is absolutely unsuitable because it lacks elasticity. A wool warp is also undesirable, for it would hardly stand the continuous pulling on the warp threads that the work demands. A No. 3 Perle cotton might prove satisfactory.

The weft yarn used by the Scandinavians is a three-ply wool yarn, rather tough but soft. The yarn should not have a glossy appearance. Vegetable-dyed wools are greatly used and their colors blend beautifully. Knitting wool or Zephyr yarn would do to experiment with. Bernat's Peasant wool can be very successfully used. The all-over Norwegian star piece was woven of this yarn. Although the Peasant wool is less expensive, a more suitable yarn is Bernat's French Tapestry wool because the colors more closely resemble the imported yarn. Since there are several hundred beautiful tones in Bernat's French Tapestry colors one can very easily approximate the vegetable-dyed wools. A softness, both in coloring and texture of the yarn, is necessary to duplicate the ancient weavings of Norway and Sweden and give to the finished product the appearance with which those weavings were invariably associated. And this appearance is a "homespunny" one. Some Scandinavians use a single-ply wool, similar to Bernat's Homespun, winding

two or three strands on a bobbin. Many claim that a single-ply weft yarn gives a more satisfying result in any of the Art Weaving techniques.

As has been indicated above, a No. 8 reed is used.

It is well to surmise that the person who begins to weave this technique knows nothing about it. Therefore, for the sake of clearness, the following seemingly inexpedient directions will be greatly in detail:

The first step is to learn to wind a bobbin (Figures 1 and 2). The word "bobbin" is used to mean a small hand-made shuttle of wool. A length of yarn about ten or twelve feet long is unwound from the skein. We shall designate the end of the yarn that one picks up first as A, and after the yarn is put in the left hand we shall call the remaining thread B. The left hand is held as in the illustration, stretching the thumb and the index finger as far apart as possible. End A is taken by the right hand and put in the palm of the left hand, allowing the end A to extend about eight inches below the palm of the left hand. The end B is put back of the thumb and brought around the thumb to the front. The last three fingers of the left hand now hold the A end of the yarn while the right hand takes the end B and brings it over to the index finger, back of it, around the index finger to the front, between the index finger and the second finger — which is now bent over — and is then crossed over the thread now between the thumb and the index finger as before. Then the process continues — always making a cross between the thumb and the index finger. A figure "8" is thus formed. When the yarn has been wound to nearly its full length, the thumb and the index finger are

relaxed, permitting the group of crosses to be easily removed from the hand. This cross is like the Portee cross used in making a warp. This group of crosses is now grasped in the center by the thumb and the first finger of the right hand; transferred to the left thumb and left first finger, held securely, and wound around with the remaining B end several times and finally fastened with a slip knot so that all the crosses will be held firmly. The end A, which hung below the palm of the left hand, is the end that is pulled from the bobbin and is the end that is attached to the warp threads when beginning to weave.

At first this bobbin winding will seem laborious, but one will find that instead of actually winding the yarn with the right hand in the path that the yarn follows around the thumb and index finger of the left hand, an extremely rapid winding will result if the left hand is rocked back and forth, picking up the yarn with the thumb and index finger while the right hand remains practically still and only feeds the yarn. About six bobbins of each color should be made before beginning to weave so that one will have a sufficient number on hand.

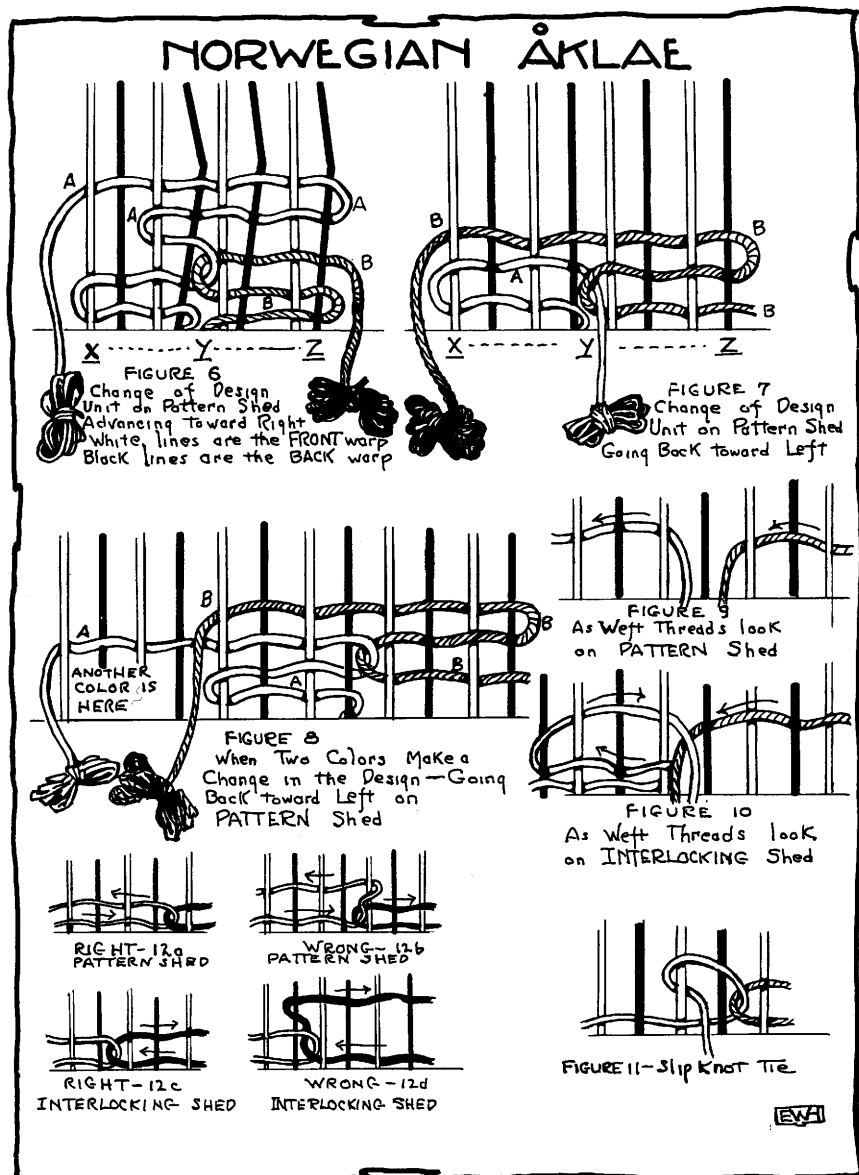
Two sheds are necessary in order to weave this technique. For convenience, let us call them "the first or Pattern shed"

and "the second or Interlocking shed." This will facilitate matters. All starting bobbins and newly added bobbins — those added during the progress of the work — are tied onto the warp in this first or Pattern shed. The bobbins on this Pattern shed run in the direction of right to left of the loom. The bobbins returning on the Interlocking shed run in the direction of left to right of the loom. In starting to weave, see that the sheds are arranged thus: the Pattern shed must have the first warp thread on the left of the loom *front or on top* of the shed; the last warp thread on the right is at the back or on the bottom of the shed. Of course the Interlocking shed will be just the reverse. This arrangement is necessary in order to save complications later.

The first or Pattern shed is now on the loom. The first bobbin — starting from the right of the loom — is put in the shed from the right to left as far as the unit of design requires. If the unit of design is eight threads — four front and four back warp threads — the left hand pulls out the four front warp threads; the right hand inserts the bobbin; the first and second fingers of the left hand catch the bobbin — the third and fourth fingers of the left hand are still holding out the four front warp threads — and the bobbin is pulled through until the yarn is within two inches of the end of the thread (Figure 3). The bobbin is held in the left hand and the weft thread in the shed is pushed upward so that the end A may be tied in. The right hand now takes the end of the weft thread; turns it under the back warp thread that is to the right of your unit; brings the yarn around over the next front warp thread which lies to the left of the back warp thread just used, then over the next back warp thread, around it and out to the front. All this is pushed down with the fingers to the already finished work — whether that finished work be the plain tabby that is first put in for a heading or some completed part of the design. This tying must always be done when a bobbin is added, and is one of the important first steps to know thoroughly.

When the unit of designs covers only two warp threads and it is necessary to tie in a bobbin, the tie to the warp threads is like that in Figure 4. The bobbin is put in the shed; pushed upward and the end A wound around the two warp threads — around the back warp thread, over and in front of the front warp thread, around it to the back and pulled out to the front in between the two warp threads.

When a bobbin runs out and you wish to tie off the end, the following is the procedure: Allow the end to be long enough to carry through the Interlocking shed — say two inches — so that it can be tied off in the Pattern shed (Figure 11). The end is tied to the front warp thread in the Pattern shed by a slip knot. This is pulled down rather tightly. If this method is followed a great deal of trouble will be saved the weaver. This same system applies also to tying off a color bobbin that is no longer needed in the design.



The reason for tying off the yarn in the Pattern shed is because, by doing so, the yarn has been interlocked before it is tied off, causing no hole or slit in the weaving and making for greater security. Some weavers object to using this slip knot. They simply let the end hang.

When you put in all the bobbins in the Pattern shed you will find that there is one back warp thread that appears to be empty between the two front warp threads — where one bobbin ends and the other begins. This must always be apparent throughout the weaving (Figure 9). If it isn't, then you have made the mistake of wrapping a bobbin *around* a front warp thread instead of simply laying the weft thread forward in the shed. Figures 12a and 12b show the right and wrong way of laying the weft in the Pattern shed. By wrapping around a front warp thread means that you have picked up a front warp thread that belongs to the previous unit. This applies to both directions of sheds. If this is done your design will be ruined. When you come back from left to right on the Interlocking shed the weft thread will be as in Figure 10. The weft thread just brought forward will fall beside the old one that was there from the previous Pattern shed with no back warp thread between

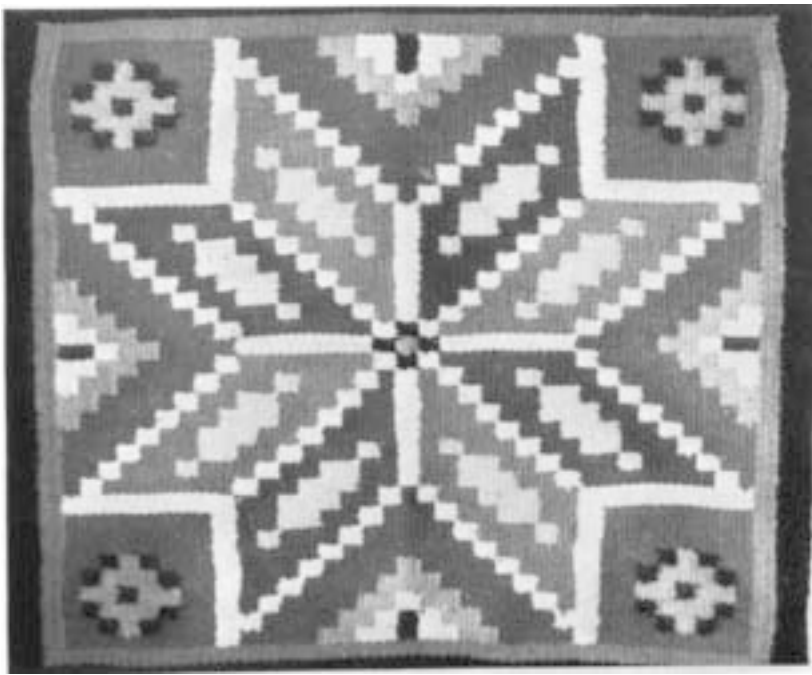


Illustration No. 2

the two weft yarns. This may sound complicated, but it isn't. Figures 12c and 12d show the correct and incorrect way of laying the weft in the Interlocking shed. The above hints will help eliminate constant mistakes that happen at first unless one is ever watchful.

When both the Pattern and Interlocking sheds are put in, the weft threads must form an arc upward in the shed — the longer the length of the unit, the greater the arc. This is to allow for the extra weft taken up by covering the warp threads. This will also keep your work from "pulling in at the waist." On the Interlocking shed, especially, the weft is permitted to lie loosely in the shed with no excess loop at the point where the interlocking was done. But in working on the Pattern shed a slight pull is given each bobbin as it is put in the shed so that the design will have a straight vertical edge between each pattern unit. Although this "pull" is necessary on this Pattern shed, the arc must still be preserved in order that the weaving will not be "drawn in."

In Swedish Röllakan the interlocking takes place in both directions. This is compulsory so that changes in the design can be made. But the wrong side of the Swedish Röllakan is a mass of interlocking threads caused by the technique process, thus preventing the use of the wrong side of the fabric. The Norwegian Åklæ, because of the process now to be described, eliminates this condition on the back of the work and permits not only a clean cut appearance on the back of the fabric but also the use of that side of the weaving. If the work is done well it is difficult to tell which is the right or wrong side.

The ingenious method that the Norwegians employ is this: in making a design change in the weaving, that is, if you wish to advance a white weft thread over to the right for, say, four warp threads and this advancing falls over a black unit of four warp threads, the following process takes place. In Figure No. 6 consider the space of eight warp threads lying between X and Z. A is the white weft thread and B the black weft thread already put into the weaving. At Y the interlocking had taken place from the previous shed. You

now have treadled for the Pattern shed. *All pattern changes in the design must take place on the Pattern shed.* The white thread A is put back one front warp thread in the Pattern shed — that is, to the left — and brought around this same front warp thread. Then, using the fingers of the left hand you will pull out three back warp threads clear out in front of the front warp threads (the drawing represents these back warp threads by black broken lines) and the white weft yarn A is put in back of these back warp threads to the right. This makes the white weft yarn A lie in front of the original front warp threads. You then let the three back warp threads return to their places. The white weft yarn A is now caught by the last back warp thread. This advances the white block design four warp threads — two back and two front warp threads. This white weft thread A *must now* be brought back toward the left to its original unit block which is within the space of the four warp threads X and Y. The three back warp threads were pulled out because the first belongs to the old unit of design and the other two to the new advancing unit. What is really done, when the back warp threads are pulled out to the front with the fingers, is simply

making the other shed (the Interlocking shed) without taking the trouble of changing the complete width of the warp with the use of the treadle or hand levers. Your white weft now covers space XZ.

If the black block ends in the design, you will already have slip-knotted the end and cut it off, leaving about an inch of yarn hanging. But if the black block advances in the design similar to the white unit of design, then the same principle must be followed as was described for the advancing of the white unit. And, in this case, the black unit must be advanced *before* the white unit is advanced.

Should the unit of design go back toward the left the method outlined by Figure 7 is used. The unit of black is between Y and Z and the unit of white is between Y and X. If you wish the black weft yarn B to go from Z to X, then you just lay the black weft thread in the Pattern shed back toward the left from Z to X. This makes a unit of black over eight warp threads (four front and four back).

If the white unit of design ends after having completed its height in the weaving, then the white yarn A is slip-knotted and cut off, *but* if the white part of the design continues toward the left, then the white weft yarn A must first be taken back to where it belongs before the process with the black yarn B is carried out. This is shown in Figure 8. You will find, in a case like this, that you will have two weft yarns in the same shed for a certain distance (white and black), but this is all right. However, unless — in a case like this — you change the white first, your weft threads will lie in the shed in a white-black-white order. This will cause a mixture of color, and is not good. Therefore, the order of the weft in the shed must be white-white-black. This occurs where the colors overlap in the same shed. This seems confusing telling it, but one will readily see, and quite easily, what is meant by the above when the work is in progress.

If the design advances toward the right *and* toward the left, both principles of advancing just described are employed. These few "secrets" of the working technique make possible the really desirable Norwegian method.

It is unwise to advance on the Pattern shed for more than five back warp threads (this means advancing the design for a unit of four back warp and four front warp threads, one back warp belongs to the old unit). It is unwise, because too much overlapping weft yarn will lie in the Pattern shed, and this looks bad. If too long an advance is taken you will find also that you have an extra weft thread in your block which keeps from squaring the block neatly. Rather than advance too far, tie and cut off the bobbin and tie it in again at the right at the place where you wish to begin or advance the unit of design.

Peasant wool and French Tapestry yarn require about eight or ten double shots of weft to complete a square — that is, this number of shots on the Pattern shed and the same number on the Interlocking shed. There must be, of course, two shots of weft made — one on the Pattern shed and one on the Interlocking shed — to cover the front and the back of each warp thread in each row.

The following notes from experience will prove beneficial to the beginner of this Norwegian Åklæ technique:

1. You change design *only* on the Pattern shed — the same shed as you started with when you begin to weave.

2. After you have woven an inch or so of web, the ends that are hanging may be cut off — if they have been properly tied in with the slip knot. This slip knot does not show,

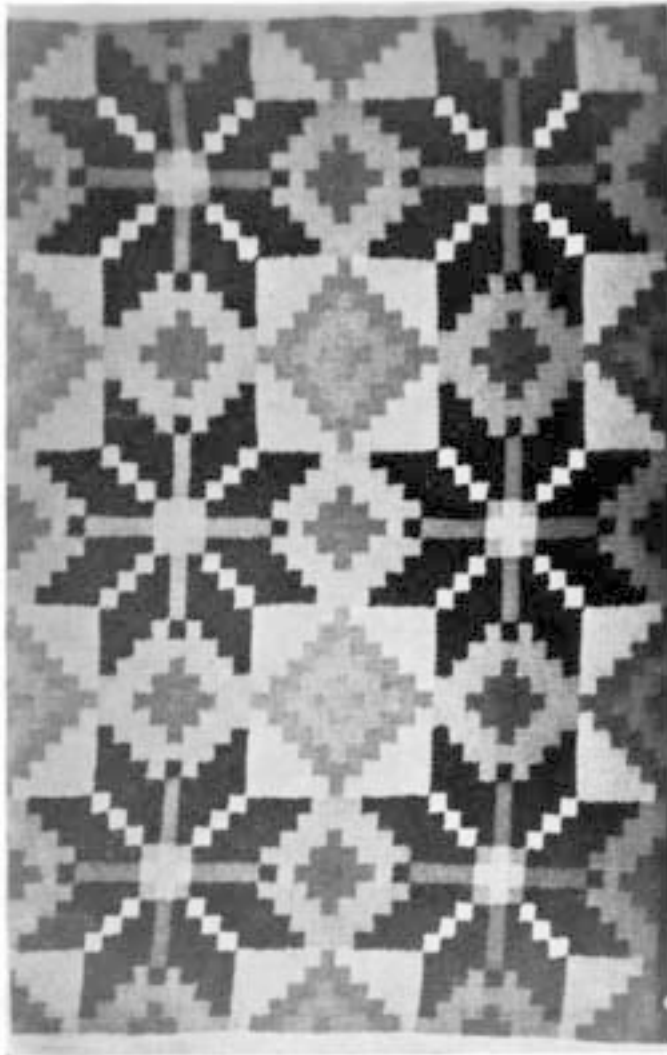


Illustration No. 3



Illustration No. 4

if it is pulled sufficiently tight, as it is beaten down by the reed.

3. It saves time and is easier to work from the left side of the loom to the right, regardless on which shed you are working.

4. It is well to draw a line through each row of squares on the cross-section paper when you have finished that particular row.

5. If possible, do not leave the loom until you have finished all the shots of color in a full row. If necessary to do so, stick the bobbin to be used next in between the warp threads so that you will know where you have left off.

6. It takes one shot of weft to the left and one shot of weft to the right to make one covering of the warp threads. When you go to the left on the Pattern shed you must return to the right on the Interlocking shed in order to complete one row of weaving. Remembering this will save many discouragements.

7. In making design changes — either to the left or to the right — do the farthestmost advancing one first. This will eliminate a great deal of confusion to the beginner and keep each weft color to itself.

8. To acquire speed: when a bobbin is caught — coming from left to right — by the right hand, speed is gained by holding that bobbin and putting it in place while the left hand picks up the next bobbin and interlocks over the weft thread just brought from the left and just put into place. That is, the right hand is holding a bobbin while the left hand proceeds to pick up a new bobbin. A rhythmic movement is thereby acquired together with less entanglement



Illustration No. 5

of the bobbins. (Don't worry about the bobbins getting tangled — they are easily put right.) Of course when the left hand has picked up its bobbin, the right hand lets go of the bobbin it was holding in order to take hold of the front warp threads and pull them out so that the left hand can pass, through the shed thus made, the bobbin which it holds. The right hand at this point catches the bobbin as it comes through the shed and the same process is repeated for the width of the weaving.

9. Wrap bobbins about twenty times (twenty figure "8's"). Do not have them too bulky, as they will be inconvenient to handle.

10. A new thread may be tied-in *anywhere* in the design on the Pattern shed as long as it is tied by the method given. When tying-off an end pull the yarn tight around the front warp thread, otherwise a bulky loop will show in the weaving. When this is done and a new bobbin of the same color is added to that unit, you may either tie the new end over the end that you have just slip-knotted or tie the new end beside the slip knot. The front and back warp threads have been covered by the slip knot. If the new end is tied over the slip knot — even though it appears bulky at the time — it will not matter as the reed will finally beat these "ties" down so that they will not be noticeable.

11. Sometimes the yarn, while being fed from the bobbin, will get entangled by a loop in the bobbin — a little patience will easily remedy this by untying the caught loop.

12. Adjust a white cloth under the entire width of the warp threads so that, while working, there will be no strain on the eyes.

13. Each unit of design requires a separate bobbin.

14. Clip off the ends, that hang from the weaving, very closely.

DETAILED DIRECTIONS FOR WEAVING PATTERN 1

Enlarge the design from the cut in the magazine and color it with colored pencils. This will make any design easier to follow. Use Bernat's Peasant wool yarn. The different colors of the yarn are indicated on the pattern draft. Carpet warp will do for the warp. Use a No. 8 reed or a No. 15 with the warp threaded through every other dent. In fact this No. 15 reed is the equivalent to the 10/30 reed (30 dents in 10 centimeters) that the Scandinavians use.

There are 29 squares in the design, each requiring 4 warp threads. This will necessitate having 116 threads in your warp. You will be working on the *wrong* side of your weaving — the under side will be the resulting right side. Have your warp stretched tightly.

Get your Pattern shed to begin with, and weave a heading of plain weaving for about an inch. Be sure that this plain weaving ends with the Interlocking shed as you must have your Pattern shed on which to begin the actual weaving of the design. The bottom border of Black (I shall spell the colors with capital letters) is more easily put in — since it is a long stretch across the entire warp — if the width of the warp is divided into three sections, say, 36 threads and 36 threads and 44 threads. When you have the Pattern shed open this makes 18, 18 and 22 front warp threads. The back warp threads of the same numbers make up the entire number of warp threads. Have 3 bobbins of Black yarn. These three divisions will make it necessary to interlock at two different places.

A. Have the Pattern shed open. Now begin to tie in the three Black bobbins. Beginning at the Left of the loom, count to the Right 18 front warp threads. Put your first bobbin in this division by taking the bobbin between the 18th and 19th front warp threads and putting it through the shed toward the Left — End A will be between the 18th and 19th warp threads and the bobbin will hang out at the Left selvage of the warp threads. The direction, remember, on



Illustration No. 6



Illustration No. 7



Illustration No. 8

this Pattern shed is that the weft goes from the Right to the Left. Tie in the end A as indicated in Figure 3. Next count to the Right 18 more front warp threads — that will be beginning with the 19th front warp thread on the loom. This will take up 36 front warp threads. Put in your second bobbin between the 36th and 37th front warp threads, letting the end A hang out about 2 inches to the front or top of the loom; carry the bobbin through the shed to the Left and bring the bobbin out where you tied in the A end of the first bobbin — that is, between the 18th and 19th front warp threads. Tie the A end of your second bobbin. Now, beginning at the Right-hand selvage, put your third bobbin of Black through the shed to where the second bobbin was tied in. The bobbin will come out between the 36th and 37th front warp threads. Tie the A end of this third bobbin around the last three warp threads of the Right-hand selvage. Let the weft of these three bobbins lie loosely in the shed; change to the Interlocking shed and beat well, twice. (Make it a point to change your shed before you beat with the reed and give the web two good hard beats.) The new shed now is the Interlocking shed. You will now have to interlock the weft threads because you are going in the Left to Right direction. Starting at the Left of the loom, take the first bobbin; put it through the shed to where the second

bobbin was left hanging. Leave a fairly good arc in the weft thread — this is a large area to cover — and let the bobbin No. 1 fall over the weft thread of bobbin No. 2. Take bobbin No. 2 and bring it up around the weft thread of bobbin No. 1 and put it through the shed over as far as the bobbin No. 3 is. Interlock in the same way here — bringing bobbin No. 3 around and up over the weft thread of bobbin No. 2, through the shed and out to the Right selvage. Change the shed and beat. Be sure that you make a good arc with the yarn on this Interlocking shed. This completes one row of weaving, or the covering once of the warp threads. To complete a row of weaving you must go over the warp once from Right to Left and once from Left to Right. (See Figure 5.)

B. You now have the Pattern shed. Continue this process as you did on the first two sheds for about 16 double rows — 16 shots on the Pattern shed and 16 shots on the Interlocking shed, clear across the loom. This should give you the bottom border — the squaring of two blocks. If not, add more weft shots clear across the loom, as some yarns require more or less weft shots to make a block square. By a block I mean the height of one of your squares on the graph paper. Tie off

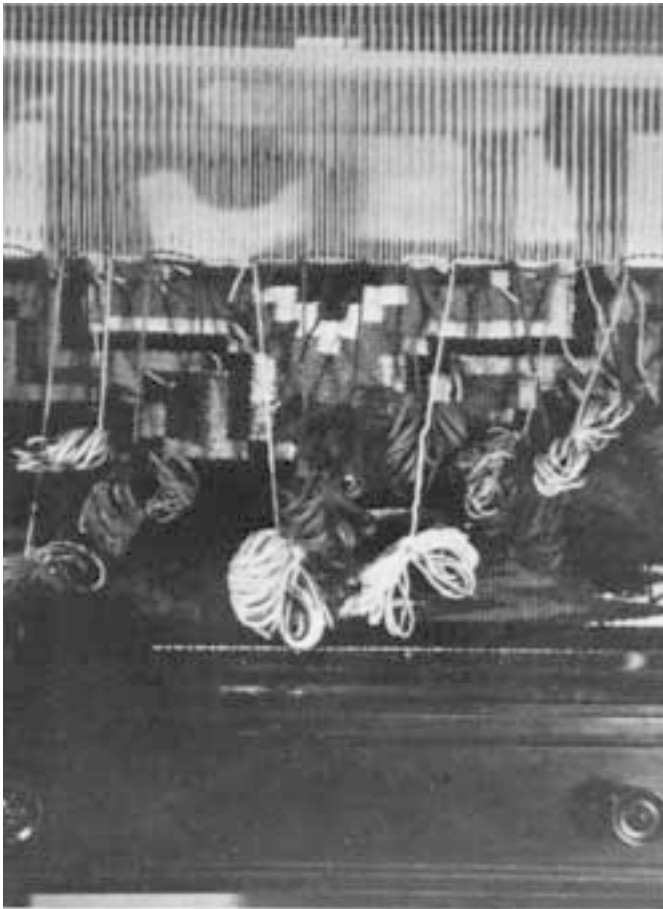


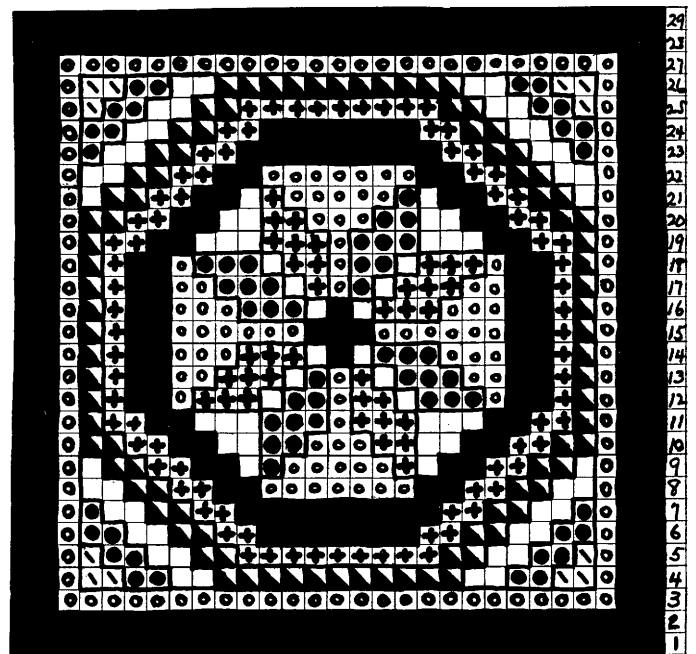
Illustration No. 9

bobbins 1 and 2. Bobbin No. 3 is in place for the Blackside border. Discard one of the Black bobbins and tie the other one to the warp on the Left side of the loom. This is for the 8-warp thread unit of the Left side Black border.

C. You now have the Pattern shed. When tying in the Black bobbin at the Left side border you will count 4 front warp threads toward the Right — 4 front and 4 back warp threads make this 8-warp thread unit, or two squares on your pattern paper. Let this Black bobbin hang out from the Left-hand selvage. Now take 3 Rust color bobbins. Divide the 50 front warp threads into three divisions — 17 and 17 and 16 front warp threads. This takes care of the 100 warp threads in the 25 squares of design — 50 front and 50 back warp threads, that the Rust color is to cover. Tie these three Rust bobbins in as you did the Black ones. You now have 5 bobbins on the loom — from Left to Right you have bobbins of Black, Rust, Rust, Rust, Black. Your first Black bobbin at the Left of the loom is going in the correct direction as also your three Rust bobbins should be — the weft yarn going toward the right from where the end was tied in. Your other Black bobbin at the extreme Right is now brought into and through the shed back of four front warp threads to where the end of your third Rust bobbin was tied, and out onto the top of the weaving. You now have a Black bobbin hanging from the Left-hand selvage, a Rust bobbin hanging between the 4th and 5th front warp threads from the Left, a Rust bobbin hanging between the 21st and 22nd front warp threads, a Rust bobbin hanging from between the 38th and 39th front warp threads and a Black bobbin hanging from between the 54th and 55th front warp threads.

Change your shed and beat. You now have the Interlocking shed. Starting at the Left of the loom, bring the Black bobbin through and interlock with the first Rust — don't forget the arc for each weft thread — bring the first Rust bobbin through the shed and interlock with the second Rust bobbin; then interlock the second Rust with the third Rust and finally interlock the third Rust over the Black — of course, taking each of these through the shed before interlocking. This completes one row of the third block. Continue with these 2 Black and 3 Rust bobbins for 8 double shots in order to complete the third block of design. Tie off Rust bobbins 1 and 2 and let Rust bobbin 3 hang on the Right side of weaving.

D. The Pattern shed is now open. Put the Left-hand Black bobbin through the shed out to the Left-hand selvage. Tie a Rust bobbin in behind 2 front warp threads (there are 2 back warp threads included in this unit, making the 4-warp thread for the square). A new Buff color bobbin is added and tied-in to account for the 2 Buff squares on the design. This Buff weft will be behind 4 front warp threads and going in the Right to Left direction. Next a new Blue bobbin is tied-in to take care of the 2 Blue squares on the design. A White bobbin is tied-in next for the space of 4 front warp threads. Then comes a space of 11 squares of Buff color. Use one bobbin to take care of the 11 Buff squares. These 11 squares will mean the space of 22 front warp threads and 22 back warp threads. A White bobbin is tied in next for a distance of 4 front warp threads; next a Blue bobbin for a distance of 4 front warp threads, and then a Buff bobbin for the distance of 4 front warp threads. The Rust bobbin is hanging on the loom at this point. Bring the Rust bobbin through the shed for the distance of 2 front warp threads or to where the last Buff bobbin was tied. And finally the Black bobbin for the remaining 4 front warp threads is brought through the shed to where the Rust color begins. Change your shed and beat. You now have the In-



PATTERN NO. 1
COLOR KEY IN PEASANT WOOL
 [Symbol] RUST-No. 179 [Symbol] TAUPE-No. 167 [Symbol] GREEN-No. 183
 [Symbol] BUFF-No. 168 [Symbol] BLUE-No. 192 [Symbol] White [Symbol] Black

terlocking shed. Starting at the Left, bring each of the bobbins through the shed to where the next bobbin lies, interlocking each where it meets the other. Change the shed and beat. This will complete one row of the weaving in that combination. Repeat this until 8 double shots are complete. You now have completed the fourth block of your design.

E. You are now ready to weave the fifth block of design. On the Pattern shed bring through at the Left of the loom the Black bobbin for 4 front warp threads; a Rust bobbin for 2 front warp. Then comes a pattern change. Look first at Figure 8 drawing. Lay in the Buff bobbin from where it ended. As it is now to cover only 2 front warp, bring it into the shed the same as you did for the 4-warp unit. But the difference will be that the Blue bobbin will start from where it ended and extend farther to the Left behind 2 more front warp and on top of the Buff weft thread. Pull the Blue bobbin through to the top of the warp. So far, then, you will have a Black bobbin extending out from the Left selvage, a Rust bobbin coming out between the 4th and 5th front warp threads from the Left-hand selvage, a Buff bobbin coming out between the 6th and 7th front warp threads from Left selvage and a Blue bobbin coming out between the 8th and 9th front warp threads. Next the White bobbin will have to advance and it will overlap the Blue weft and come out between the 12th and 13th front warp threads from the Left selvage. Now a Buff bobbin advances toward the Left and the Buff bobbin will come out between the 16th and 17th front warp threads. A new Green bobbin will have to be tied-in at a distance of 20 front warp threads from the 20 front warp already used, which are carrying 6 bobbins. This new Green bobbin is brought through the shed and comes out between the 20th and 21st front warp.

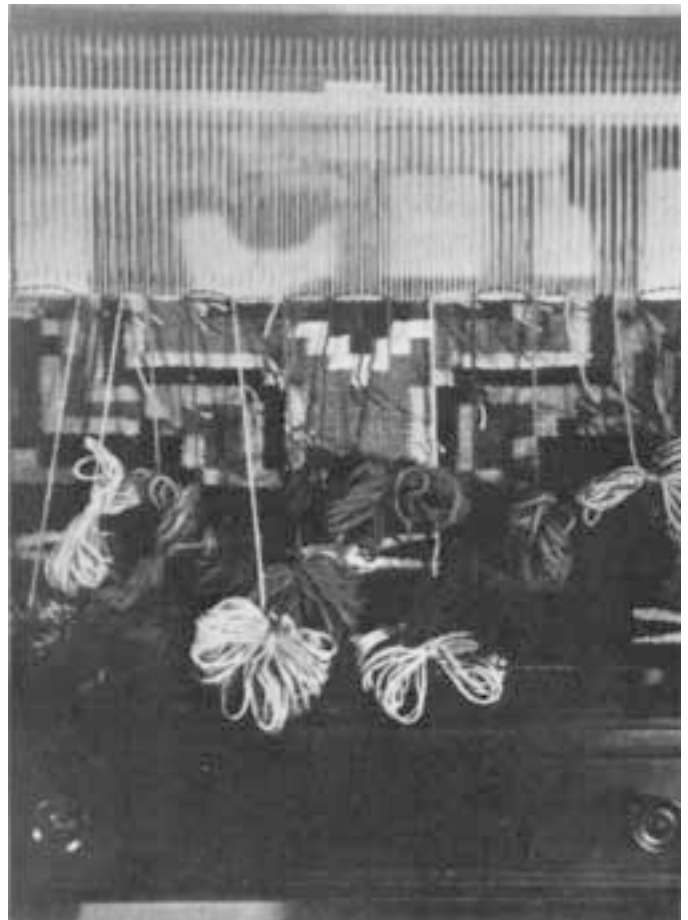
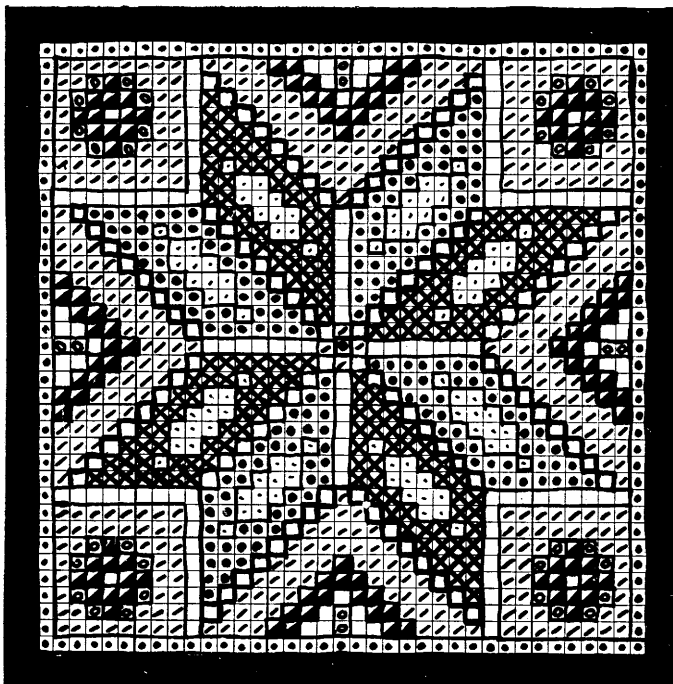


Illustration No. 10



PATTERN NO 2

PEASANT WOOL

164 WARP THREADS - 1 SQUARE = 4 WARP THREADS

[] RUST - 179 [] BUFF - 168 [] MAROON - 201
 [] GREY GREEN - 183 [] BLACK - 196 [] WHITE - 197
 [] YELLOW GREEN - 182 [] GOBELIN BLUE - 192

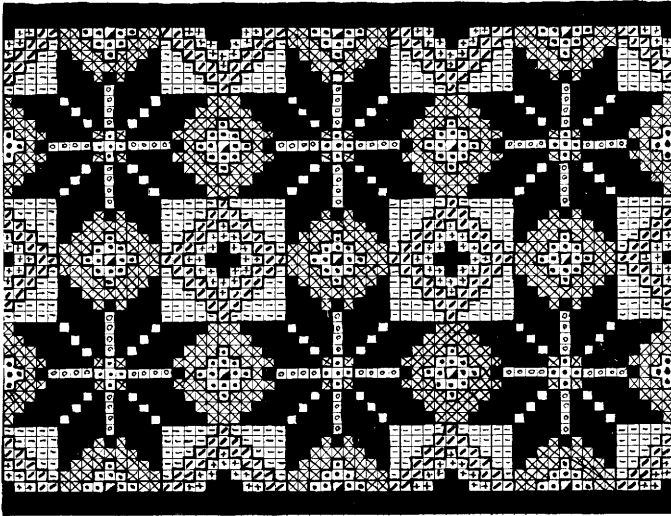
THE WEAVER

The next step is to advance your Buff, White, Blue and Buff bobbins towards the Right of the loom. Look at Figure 6. The easier and less confusing way to do this will be to advance your farthestmost Right Buff bobbin first, the one near the Rust color. Advance next the Blue, following with the White, and the last the Buff bobbin beside the Green color. Make this design change in this seemingly backward order because it is easier to do at first. However, try making the design change in the order that the bobbins are lying from Right to Left. This is probably what you will eventually do, after you have become acquainted with the working principle. It is not so difficult — in this particular instance — to make the design change in the order last spoken of, because each bobbin is visible and uncovered. If your first Buff bobbin advanced two squares (four front warp) instead of one square, your next bobbin would be covered and cause confusion.

Weave this combination for 8 double shots, and the fifth block of the design is finished. When this fifth block is completed you have accomplished all that is necessary to finish the entire design and any design — no matter how intricate or complicated — in Norwegian Åklæ technique that is made up of square block designs.

I hope, in other articles, to make our American weavers acquainted with the other interesting Scandinavian techniques.

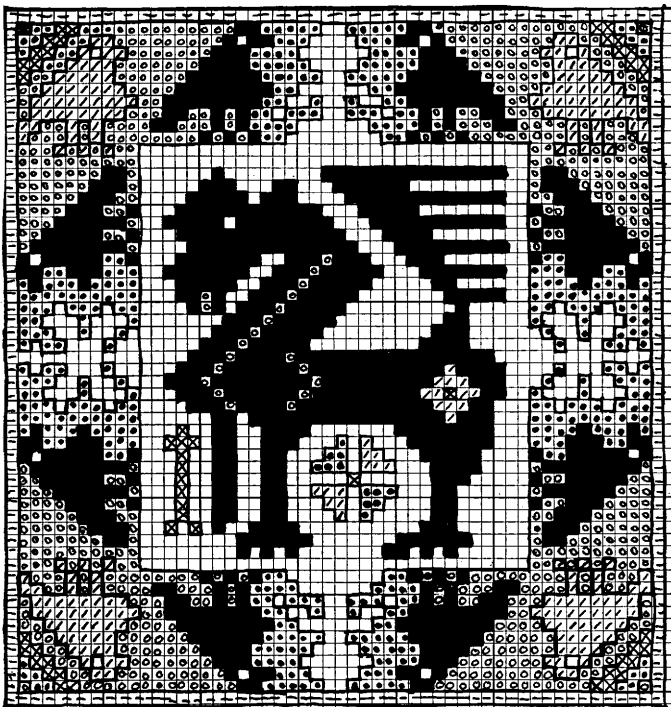
The weavings, from which the accompanying illustrations were taken, were woven by the author, with the exception of Illustration No. 6, which was woven by Mrs. Kindleberger.



PATTERN NO. 3
 PEASANT WOOL-236 WARP THREADS - 1 SQUARE=4 WARP THREADS
 ■ GREEN-183 ■ BLUE-191 ■ RED-186 ■ BLUE-192 ■ RUST-179
 ■ BLACK-196 ■ TAUPE-199 □ NATURAL-197 □ BUFF-168

The design of the Viking was made by Mr. Gene Johnson, and appears in print for the first time. The other pattern designs are adaptations, by the author, from old Norwegian books and weavings.

A description of the "Viking" is as follows: the weaving measures about 23 x 40 inches, required 180 warp threads, allowing one warp thread to each square on the graph paper and a No. 8 reed was used. One illustration shows the front of the weaving and the other illustration shows the back of the weaving before any of the ends were clipped off. These ends were purposely left on for the entire length of the weaving so that the photograph might give some idea of what the technique looks like during the process of



PATTERN NO. 4
 FRENCH TAPESTRY WOOL-108 WARP THREADS - 1 SQUARE=2 WARP THREADS
 ■ Y. RED-823 ■ OL. GREEN-683 ■ YEL. GOLD-943 ■ POW. BLUE-655
 □ CREAM-557 ■ ANTO. BLACK-806 ■ SAGE GREEN-894

weaving. At one place in the weaving of the boats 66 bobbins hung from the loom. There are 23 colors in the design and it will be necessary to translate the design numbers into the color numbers of the Bernat's Tapestry wool: (1) Gobelins Blue 855, (2) Bottle Green 634, (3) Bottle Green 632, (4) Tete De Negre 676, (5) Gothic Red 646, (6) Greenish Gold 943, (7) Red 765, (8) Golden Brown 903, (9) Golden Brown 905, (10) Gothic Red 647, (11) Yellow Green 866, (12) Olive Green 684, (13) Terra Cotta 924, (14) Terra Cotta 925, (15) Powder Blue 652, (16) Wood Brown 627, (17) Golden Brown 906, (18) Leaf Green 616, (19) Reseda Green 952, (20) Reseda Green 954, (21) Gold 502, (22) Golden Brown 904, (23) Gold 504.

MORE DEVELOPMENTS

(Continued from page 4)

And the final step of the pattern is:

- No. 4 with ivory
- No. 3 with ivory
- No. 2 with moss green
- No. 1 with ivory

Completing the border, the plain weave with ivory, is indicated for two picks.

NOTE. — Any of the borders — the above, for instance — may repeat each complete step of the pattern treading two or more times, depending on the desired size and height of the border. For example: The simplest treading of Border B-2 is written above. An expanded treading might be:

Plain weave with moss green — 8 picks.

First step of border	{ No. 4 with moss green No. 3 with moss green No. 2 with moss green No. 1 with ivory	Repeat through 2 times
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Second step of border	{ No. 4 with ivory No. 3 with moss green No. 2 with moss green No. 1 with ivory	Repeat through 2 times
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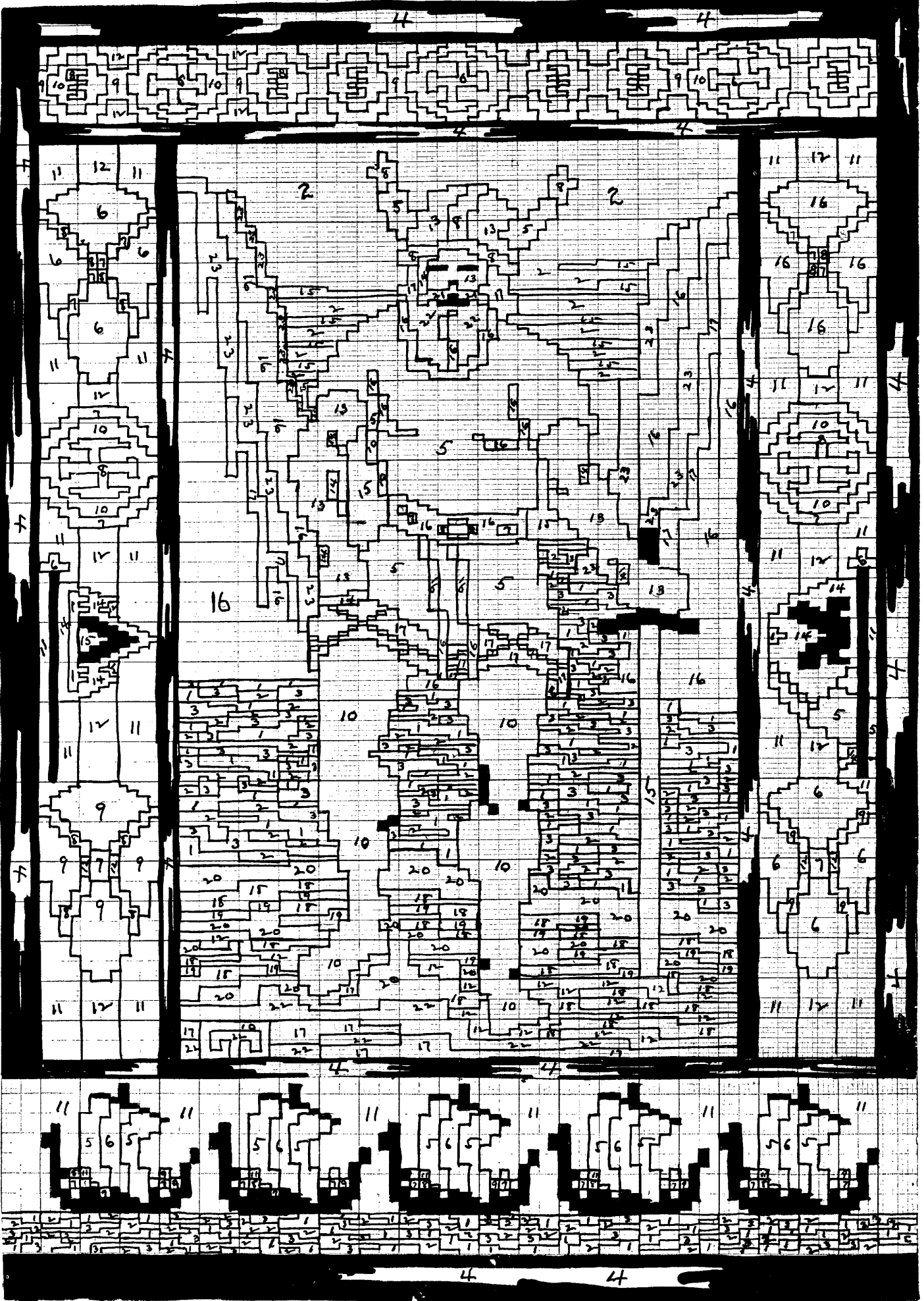
Final step of border	{ No. 4 with ivory No. 3 with ivory No. 2 with moss green No. 1 with ivory	Repeat through 2 times
-------------------------	--	---------------------------

Plain weave with ivory — 5 picks.

All of the remaining designs (Diagram C) will be given using this key. In general, each step of the patterns, because of the arbitrary limitations of the graph paper on which they are done, will be represented as occurring only once — and the plain weave areas in proportion. We think that by thus representing them, the true relation of width to height in the borders can best be shown. When the weaving is started the relative sizes of the warp and weft will determine quickly the number of repeats of each step necessary for the desired effect.

Colors, unfortunately, can be suggested in these diagrams only by an approximation of values in black, white and half tone.

But the writer hopes the material may prove inspirational and in some way provide that stimulus from which many new and lovely fabrics will result.



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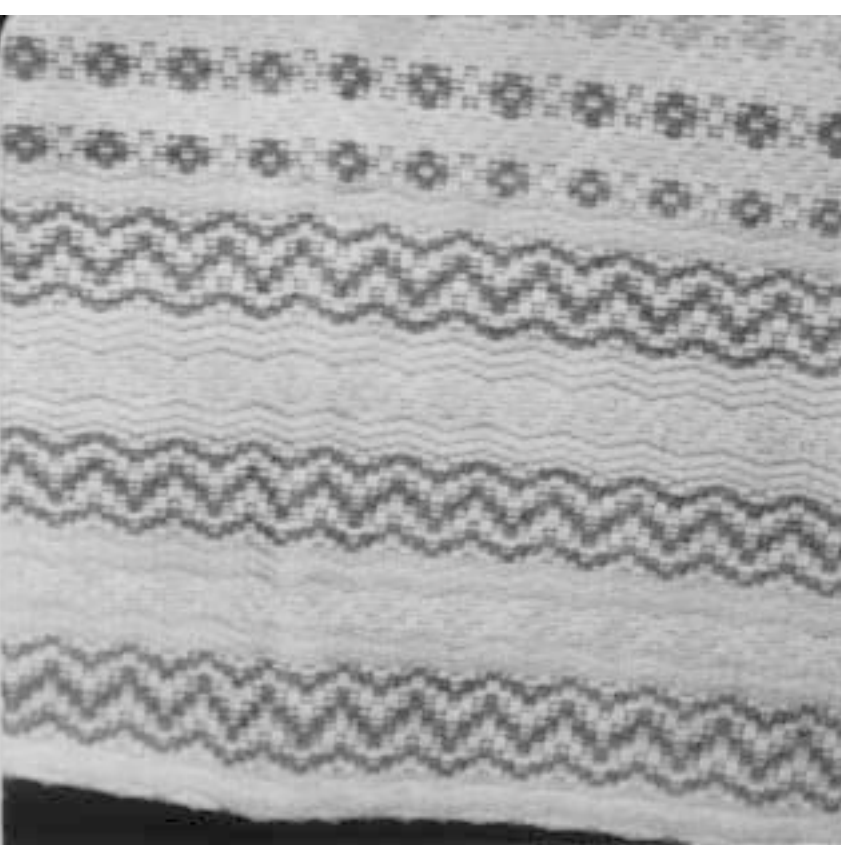
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Chaise Longue Coverlet

BY VEVA N. CARR
Tavares, Florida

A VERY pleasing and out-of-the-ordinary gift for a friend's chaise longue may be accomplished by the development of a spread in her favorite colors, or colors that will harmonize with her room. Such a spread made for one of those friends for whom it "is so hard to find a gift because she had everything imaginable," proved a boon to the giver as well as a delight to the recipient.

Nothing unusual was attempted in this particular case, except to select just the right colors and materials, and the finished product proved an article nice enough for any surroundings, and for the amount expended, far superior to anything to be purchased in the shops.

The familiar little diamond threading was used in a six-thread block. The warp, a white rayon, was set at 30 threads to the inch, and for the weft Bernat's Laurel wools were selected in pink, blue, lavender, green and yellow. A choice of the same color values, is of course, essential in the selection of the wools.

A two-and-a-half-yard warp would be ample on most looms, although it is far more economical to put on a longer warp and make a number of articles on the same stringing. On such a warp, pillows, bags, baby blankets, etc., could be made.

On a 45-inch loom, proceed as follows:

(Draft a) Selvage 1, 2, 3, 4, twice	8	threads
41 repeats of draft	1,312	"
1st 5 threads to balance figure	5	"
Selvage 4, 3, 2, 1, twice	8	"
	<hr/>	
	1,333	threads

Weave a half inch or more of plain tabby with the rayon thread. Rayon is exceedingly wiry, and it is well to allow ample for the many threads that will slip out before one has an opportunity to secure the edges when taking the work from the loom. It is well to stitch securely this rayon heading and use for the first turn in the hem as it is less clumsy than three thicknesses of the wool would be.

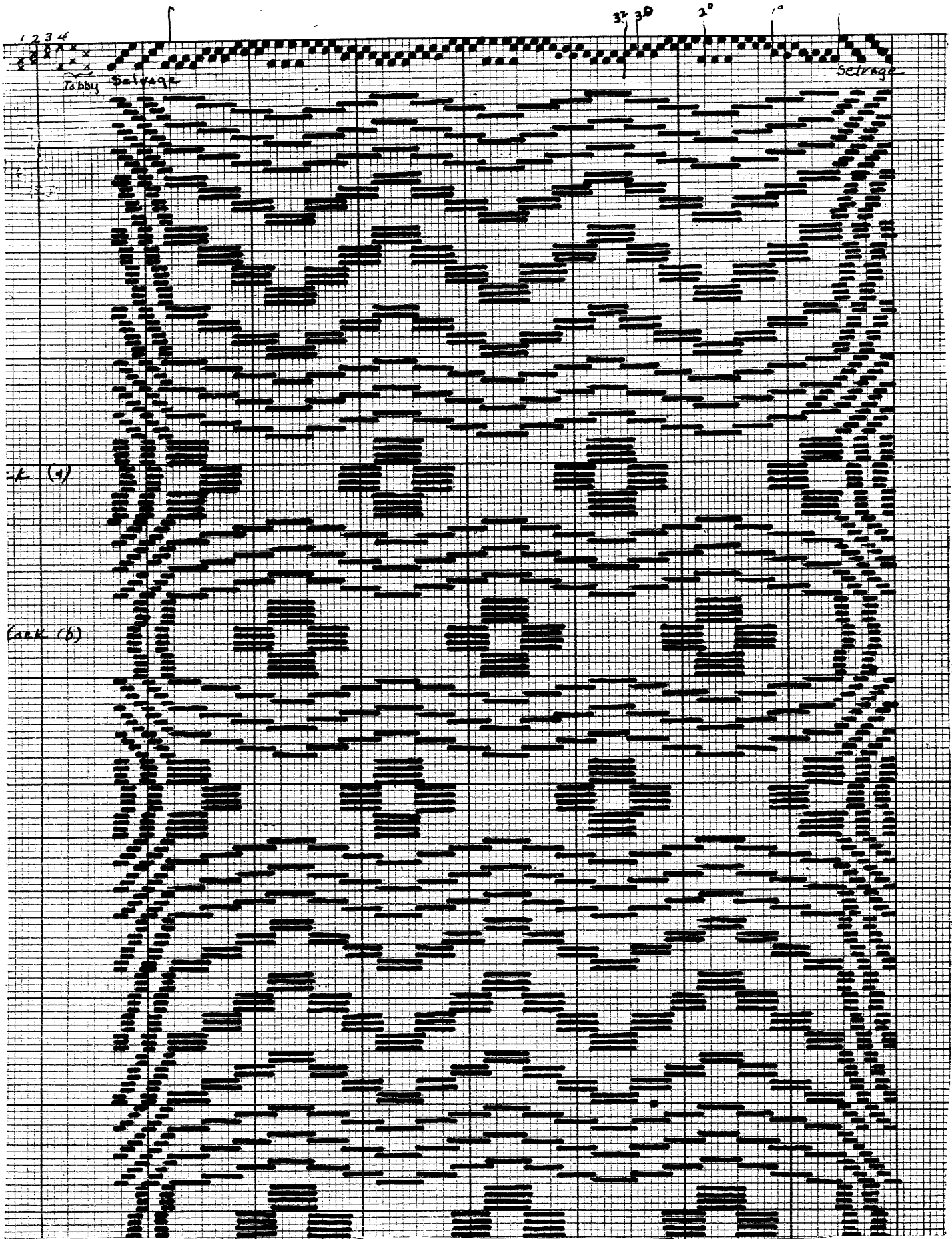
With yellow and white wool make the second fold of the hem by treadling 1, 2, 3, 4, two shots each, using alternate shots of yellow and white. (A rayon tabby is used throughout the piece.) This with the above rayon heading completes the second fold of an inconspicuous hem, which if carefully stitched on a machine will not show at all and be far more secure for this type of warp.

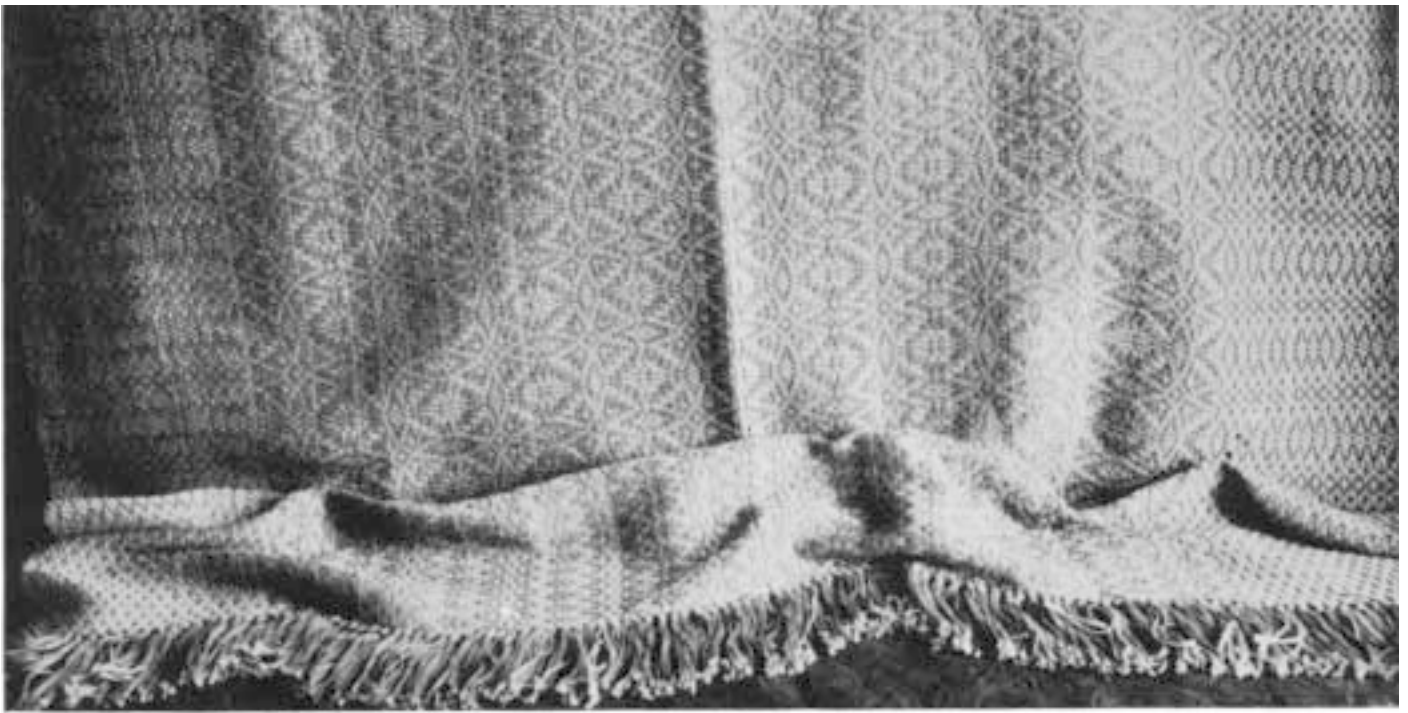
Treadle Nos.	1, 2, 3, 4,	1 shot each in	lavender
" "	1, 2, 3, 4, 1	" " "	yellow
" "	1, 2, 3, 4, 1	" " "	green
" "	1, 2, 3, 4, 2	shots each in	pink
" "	1, 2, 3, 4, 3	" " "	blue
" "	1, 2, 3, 4, 2	" " "	pink
" "	1, 2, 3, 4, 1	shot each in	lavender
" "	1, 2, 3, 4, 1	" " "	yellow
" "	1, 2, 3, 4, 1	" " "	green
" "	1	4 shots in	pink
" "	2	4 " " "	} a
" "	1	4 " " "	
" "	1, 2, 3, 4, 1	shot each in	
" "	1, 2, 3, 4, 1	" " "	yellow
" "	1, 2, 3, 4, 1	" " "	lavender
" "	4	4 shots in	green
" "	3	4 " " "	} b
" "	4	4 " " "	
" "	1, 2, 3, 4, 1	shot each in	lavender
" "	1, 2, 3, 4, 1	" " "	pink
" "	1, 2, 3, 4, 1	" " "	green
" "	1	4 shots in	yellow
" "	2	4 " " "	
" "	1	4 " " "	
" "	1, 2, 3, 4, 1	shot each in	green
" "	1, 2, 3, 4, 1	" " "	pink
" "	1, 2, 3, 4, 1	" " "	lavender
" "	1, 2, 3, 4, 2	shots each in	yellow
" "	1, 2, 3, 4, 3	" " "	green
" "	1, 2, 3, 4, 2	" " "	yellow
" "	1, 2, 3, 4, 1	shot each in	pink
" "	1, 2, 3, 4, 1	" " "	blue
" "	1, 2, 3, 4, 1	" " "	green

(Completes the border as shown in the drawing. The photograph shows a second variation of the stripes in the border.)

The center of the spread is made with alternate blocks of color and white, starting with lavender, yellow, blue, pink and green. That is, treadle Block (b), which is the sixth group in above tabulated list of directions in lavender; block (a), which is the fourth group, in white; Block (b) in yellow; Block (a) in white, and so on with the blue, pink and green, ending in the white. Repeat once, which reaches the center of the spread.

Reverse to the beginning, including the allowance of the underside of the hem and the rayon heading to be turned in. Weaving on rayon warps should always be stitched immediately when taken from the loom. After the hems have been turned and stitched, the spread should be pressed on the wrong side by using a slightly dampened cloth, a well-padded board, and an iron just warm enough to accomplish the pressing, as great care should be used in regulating heat on rayon materials.





Why Not Change the Color?

BY VEVA N. CARR

IN ONE of our larger Florida cities, a daily paper recently carried a story of a weaving exhibit. That article spoke of the many lovely hand-woven pieces and suggested a lovely old Colonial coverlet design for an evening wrap.

Now just why it should be necessary to cut up a coverlet for a wrap of any description seems just a bit out of keeping with the present trend of thought in clothing and architecture, and especially is that true in the state of Florida where it always seems one of the least appropriate things one could possibly use in the average home is a classic Colonial design, lovely as it is in the proper setting.

However, a very simple way to disguise that "coverlet look" for a more modernized purpose is by the use of color or slight changes in the design itself, and a rather glorified effect may be accomplished by cutting down the well-known Maltese Cross draft into miniature form and running wild with the colors.

Who would feel satisfied to use the Maltese Cross in its original form and color for a table cover in a modern Southern setting, but made of varied colored warp of Bernat's Perugian Filler with the pattern of a green-blue No. 5 Perle cotton and a salmon-colored line linen for tabby. The effect is modern enough, or shall we say "individual" enough for any setting, and far removed from the feeling of having borrowed our bed covering to bedeck our living room.

This particular article was made to cover a rather shabby, but most useful drop-leaf table that was continually being pulled out from some corner for the very reason that it could be spread to a nice workable size. So to get it out into the open where it could be readily brought into its ever constant use, a cover was designed, and it now stands serenely out in the daylight covered with a much admired spread.

This warp was made of odds and ends and is of many colors, blue, green, tan, orange and red predominating, and was strung with no thought of striping, set at 15 to the inch and threaded as follows:

(Draft b) Selvage 1, 2, 3, 4, twice 8 threads
 Border 17 repeats 102 "

1, 2, 3, 4 4 threads
 10 repeats of draft 420 "
 Start at beginning, first 37 "
 4, 3, 2 3 "
 Border 17 repeats 102 "
 Ending on 1 "
 Selvage 4, 3, 2, 1, twice 8 "
 685 "

Treadle as follows: *Treadle* *Times*
 Border 1 1
 2 1 } Repeat 17 times, ending on
 3 2 } Treadle 2, once
 2 1 } " 3, "
 1 2 }

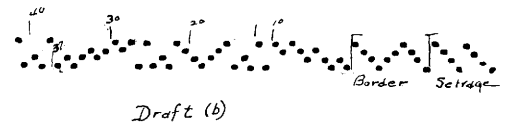
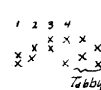
Treadle pattern as follows:

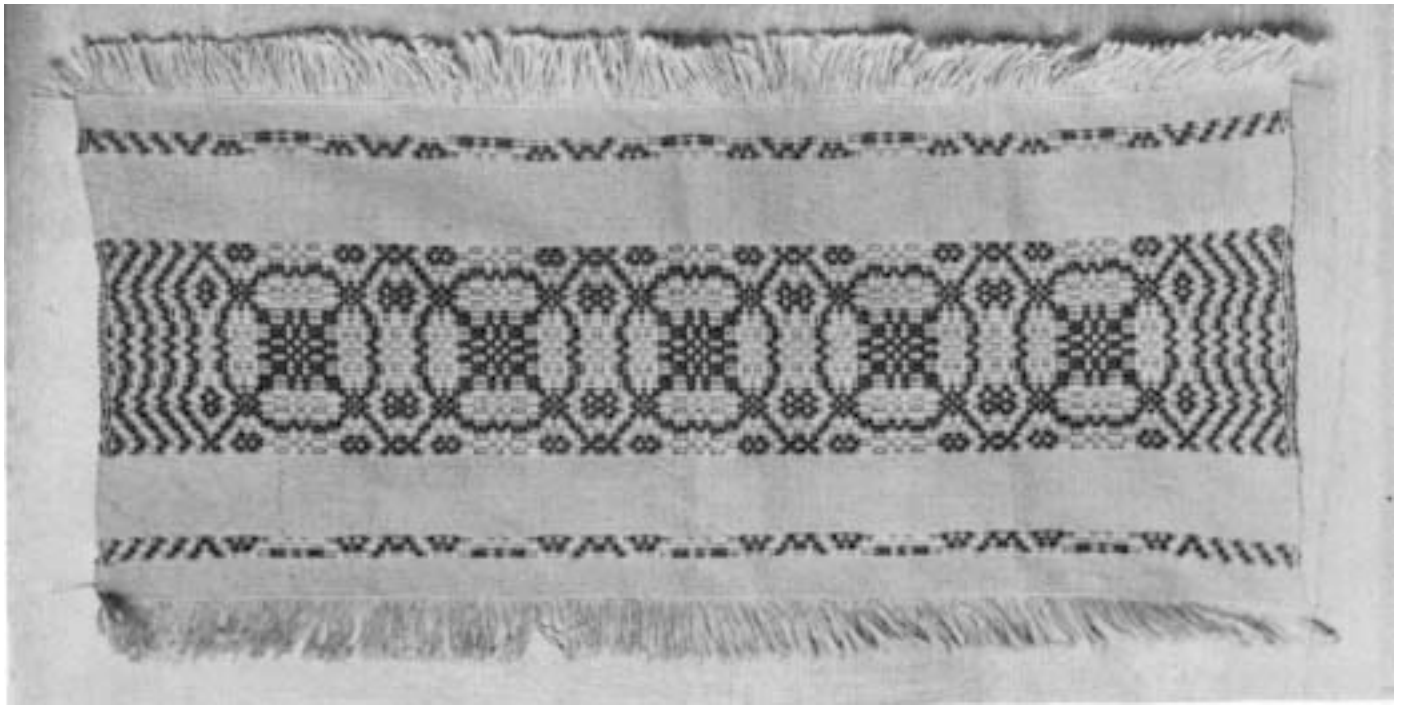
<i>Treadle</i>	<i>Times</i>	<i>Treadle</i>	<i>Times</i>
2	3	4	2
1	4	3	2
4	4	2	2
3	4	1	3
2	4	2	4
1	3	3	4
2	2	4	4
3	2	1	4
4	2	2	3
1	3	1	2

and repeat, until required length.

Reverse border.

The spread was woven one and a half yards long and finished with a tied fringe of the blue mercerized thread, which was made by cutting three strands of the cotton about 8 inches long, drawing through the edge with a crochet hook and knotted in the usual way.





Radio Runner

The Visually Handicapped Weave

BY ESTHER HERFURTH CHOMBEAU

ANYONE who has taught the visually handicapped is aware that both the adult and the child should be given training in all crafts available to them. From my own art-craft experience of the past seven years with adults and children (educationally blind) in their mental and manual development I have found that hand weaving often holds a very important place in such development. When a person has little or no sight he must know how to use his hands and develop his sense of touch to the full. Training of this sort is vital towards promoting individual independence — for personal needs or occupation, sometimes remunerative occupation.

Our schools for the blind, together with summer sessions and home teaching for adults, give instruction in some or all of the following industrial and art crafts: Woodworking, auto-mechanics, weaving, basketry, brush and broom making, rush and cane seating, pottery, metal work, sewing, knitting, crocheting and tatting. Weaving is by no means the least of these. It can be a direct stimulus for the student's all-round growth. As the working of threads brings forth lovely color designs, pattern, and texture, in a useful article so it also may add a helpful combination to the pattern of life of an adult who seeks readjustment in a darkened world.

In this article let us turn our attention to the adult. Perhaps it is a very young man who has recently lost his sight and needs careful readjustment. Perhaps it is a grandmother with failing vision who wishes to continue in life useful. Then, again, it may be a man or woman who had been a daily wage-earner but accident places him or her among the

visually handicapped. These and many others ask, "What is there left for us to do?" The world in general knows that they are taught to read and write in the Braille system and to typewrite. But I wonder how many weavers realize that a person who does not see can readily learn to do simple loom weaving. With the aid of Braille directions and according to his ability, he is able to work out any of the more complicated patterns. Likewise he can become accomplished in the threading-up process. Where there is no color-vision there must naturally be supervision in the choice and location of materials. When a number of shuttles are used each may be marked according to the color and type of yarn it holds — by means of string, adhesive tape, Braille letters, etc. One worker may prefer various shaped shuttles as his way of designating different yarns, while another finds it easier to "know his shuttles" according to the amount of of yarn they hold. Still another may have ways and means of his own.

Now to the weaving itself. We all know that we must approach the weaver to be as befits his desire, capabilities and needs. What did I give a man, age about fifty, who had been a day laborer with hands hardened and stiff from outdoor work?

I suggested there might be a number of articles that he could begin on. He was shown a jute carrying bag, a seersucker rug, and a cloth rug. He seemed to resent the bag for it was sewed together. The choice lay in the seersucker rug — perhaps because of the softness of the Rugro cotton roving filler. I was glad, for this particular rug is very easy



Following Braille directions in threading a loom

to make and the edges can be kept straight even by an awkward beginner, who must now depend entirely upon his sense of touch. I tied the warp, not because I did not wish him to learn this part of the work, but merely to avoid any possible discouragement. The threading and weaving directions were as follows:

Threading — For plain weaving one thread in each heddle
 Two in each dent (12 dent reed)
 Thread eleven dents (22 threads)
 Skip ten dents
 Thread eleven dents
 So on until desired width is reached.

Any color four-ply carpet warp is usable. A good combination is 2 black, 18 white, 2 black for the eleven dents. If a sectional loom is used, 33 threads to a section — 27 white and 6 black — filling ten sections. This gives a rug about 25 inches wide. When I warp from a spool rack I always place the black spools on the top row.

Weaving — Plain weaving for entire rug
 Selvage — 4, 6, or 8 rows — warp material
 Body of rug — cotton roving, single strand, good
 Body of one solid color — border striping of another
 Only one shuttle comes in use at a time this way
 Rose and white, blue and white, two shades of green are good. I wonder if a coarse colored jute might not make a serviceable porch rug made on dark warp.

Such a rug is not too heavy for Bernat's floor loom. This loom makes a good open shed, a special advantage to one who must feel for the opening.

Had the worker chosen the cloth rug, a very serviceable yet handsome and colorful rug could have been woven on the four- or two-harness looms by threading the desired width 1234 or 1122. Sleyed one to a dent (12- or 15-inch reed) with double threads in the four outside dents. Four-ply carpet warp in a number of colors threaded hit-and-miss fashion is exceedingly good. Bernat's carpet warp in blue, red, orange, yellow, brown, green and gray is a fine combination. Treadling should be for the Panama Weave (some call this a form of Basket Weave), that is, the treadling alternates the raising of harnesses 12 with 34 on the four-harness loom or 1 with 2 on the two-harness loom. The old-time method of using strips of old cloth sewed together and dyed could be used for filler, but I prefer to buy new dress material! Bright plaids of red and blue gingham with border stripes of plain blue or red color fabric makes a very happy combination. Many department stores will sell bolts or half-bolts in the autumn season for from 5 cents to 10 cents a yard. I have purchased from the large mail order houses, at special sales, color-fast wash prints and chambray at 8 cents a yard; ten yards weigh about two pounds. The bolts of material were taken to a printer's to be cut into 1½- or 2-inch width sections (width depends on weight of material). Some material which came in small lots I cut with a cloth cutter's knife. This knife cuts through as many as thirty thicknesses at one cut. A very sharp-edged kitchen knife will cut through a number of thicknesses at once. A "rag rug" of this kind, made up of gay material and bright color warp threads has a very different — more modern appearance. The Panama Weave gives a "nubby" surface. If a still "nubbier" surface is desired the threading and treadling may be for plain weaving but sleyed two in a dent for four dents, then skip four dents, repeating for the desired width. This is referred to as the Popcorn Weave. A heavy rug wool may be substituted for the strips of cloth as filler.

A diminutive elderly lady came to me, more than likely with the expectation that she would be placed at a hulky floor loom and be expected to pound out coarse ugly rag rugs. And how many people do think of weaving in terms of such rugs only! My lady had considerable useful vision, and when I showed her some of the daintier pieces she wished immediately to make something in linen. A tray cloth and

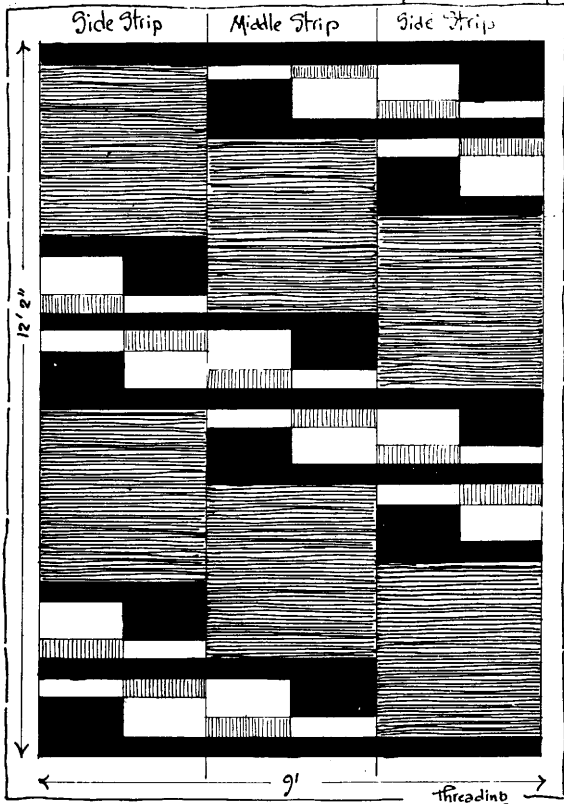


Using a Braille pattern in weaving

Series II, No. 7

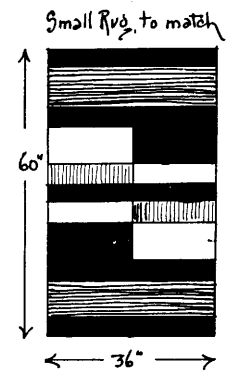
Shuttle-Craft Recipe for a Large Rug in three strips — for a Man's Room. Modernistic pattern in Crackle-Weave.

Series II, No. 7



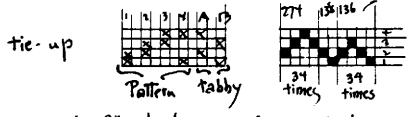
Warp and threading as for Series II, No. 6 (a).
 Weft, woollen rug yarn in black - 4½ lbs; red - 5¾ lbs; gold, 1¼ lbs; natural (tobby) 1½ lbs.

Weave as follows:
 Middle Strip:
 Tabby heading, ¾" black.
 (X) treadle 2, black, for 4 inches
 " 3, gold, " 4 "
 " 1, black, " 8 "
 " 2, " " 4 "
 " 2, red, 3 shots } Repeat for
 " 4, " 3 " } 36 inches
 " 2, black, for 4 inches
 " 3, " " 8 "
 " 1, gold, " 4 "
 Repeat from (X)
 treadle 2, black, for 4 inches
 tabby heading, ¾"



Side Strips (both the same)
 Tabby heading, ¾" black
 (Y) treadle 2, black, for 4 inches
 " 2, red, 3 shots } Repeat for
 " 4, " 3 " } 36 inches
 " 2, black, for 4 inches
 " 3, " " 8 "
 " 1, red, " 4 "
 " 2, black, " 4 "
 " 3, red, " 4 "
 " 1, black " 8 "
 Repeat from (Y)
 treadle 2, for 4 inches - black
 tabby heading ¾" black

Weave the small rug as follows:
 Tabby heading, ¾" black,
 treadle 2, black, for 4 inches
 " 2, red, 3 shots } Repeat for
 " 4, red, 3 " } 8 inches
 " 2, black, for 4 inches
 " 3, " " 8 "
 " 1, red, " 4 "
 " 2, black, " 4 "
 " 3, red, " 4 "
 " 1, black " 8 "
 " 2, black " 4 "
 " 2, red, 3 shots } Repeat for
 " 4, " 3 " } 8 inches
 " 2, black, for 4 inches
 Tabby heading, ¾", black.



For a rug 6' x 10' weave two strips — middle strip and one side strip, as above, — wearing the red part for 24" instead of for 36".

(For adaptation to the Structo loom see Series II, No. 6)

M. M. Atwater
 Bozoin, Montana, 1932

matching napkin for a bedfast friend were soon made of linen filler and cotton warp. These were made on a table loom threaded with 20/2 cotton for a 14-inch width, Pattern Series V, No. 6 (fingertip towels) from Mrs. Atwater's Recipe Book. At the time we paid no heed to the pattern, but worked as follows, doing only plain weaving:

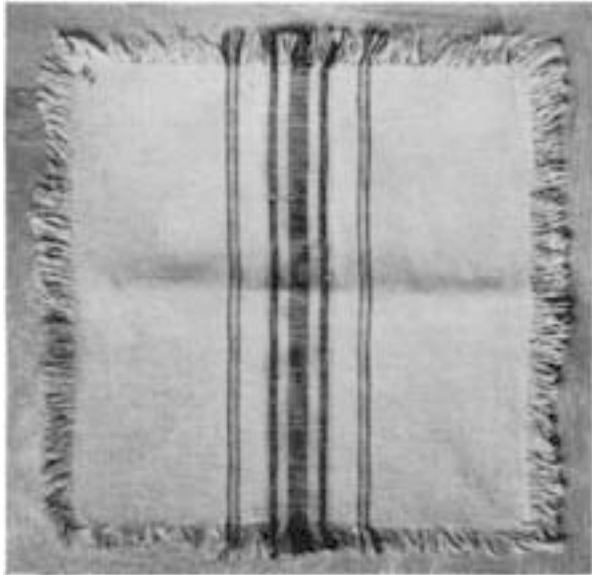
- Selvage — Six rows. This came out later, so leftover thread was used.
- Plain — Four inches Linen Special in natural. Good substitutes are: blue, green, yellow, deep orchid, tan.
- Stripe — Two rows dark brown No. 5 Perle cotton or Linen Weaver
 - Four rows yellow
 - Two rows orange
- Plain — Twenty rows natural
- Stripe — Four rows yellow
 - Two rows dark brown
 - Two rows orange
 - Two rows dark brown
 - Eight rows yellow
 - Sixteen rows orange (center). Work backwards from here.

I finished the pieces as follows: Two threads on each end next to the body of the material were drawn out as for hem-stitching and two threads from each side about an inch from the edge. The pieces within the drawn threads were square. Next came fine stitching on the sewing machine in the open spaces where threads were drawn. Twice around each

piece and a half inch over in order to make it hold permanently. The threads were then cut about two-thirds of an inch from the stitching entirely around each piece. This made it possible to pull out the loose threads for a fringe.

As you can see the fringed edges took care of any irregularities the beginner made on the edges. I often have a floor loom threaded with 24/3 Egyptian cotton 24 to 26 inch width on which as often are made two of the tray cloths at the same time, the one width serving for both. Many variations of stripings may be worked out, and little pattern combinations are lovely. Can you see the possibilities of a radio runner or luncheon set worked out on the same idea? My lady had much enjoyment weaving a variety of so-called linens. While her home life became richer and fuller with a table loom always at hand where she could find refreshment in a creative hobby, this lady helped another train her fingers to the weaving craft. Later they "swapped" ideas and sometimes even looms. One day while jokingly speaking to them I said, "Don't you think you have been weavers long enough? I shall be glad to buy your looms." "Oh, no," came a quick reply. "That would be worse than taking dessert away from a ten-year-old!" And I'm sure it would have been.

A young college chap came for training not because he had lost his sight but because he must expect to lose it within the next year or two. His tastes were not akin to kitchen rugs or dainty linens. Rather he questioned, "Is it



Tray Cloth

possible for me to make something modernistic?" I had Mrs. Atwater's Recipes on hand and let him see for himself some of the things that had gone modern in design. He almost begged to be allowed to try out the recipe for a large rug — for a man's room, Series II, No. 7 — and was enthusiastic with the idea that later he would try to work out patterns of his own. So we broke the general order of having for a beginning piece something small, simple and quickly made. The rug was made, well made, and many interesting pieces with original ideas followed. I do not know whether or not he is physically able today to see, but I do know that this young man's mind was so keenly alert during his weaving lessons that the beauty of good color and pattern combinations must surely have made an indelible impression upon it with possibilities for deeper and finer thought.

These are just four beginnings. Much, much more could be written concerning personal aims, efforts and results. Yes, I could even tell you of a lad wholly without sight or hearing who has found real enjoyment, exercise and expression through weaving. Perhaps his "great pride" is a wall hanging made for the entrance lobby of a beloved school where he is receiving most of his education. If only more



The visually handicapped weaver

of our people with defective vision could know that weaving may hold something in the line of culture, something in the line of pleasure and oftimes something in the line of profit. I wish they might all have a try-out in our craft, don't you? I shall be glad to correspond with anyone particularly interested in work for the visually handicapped.

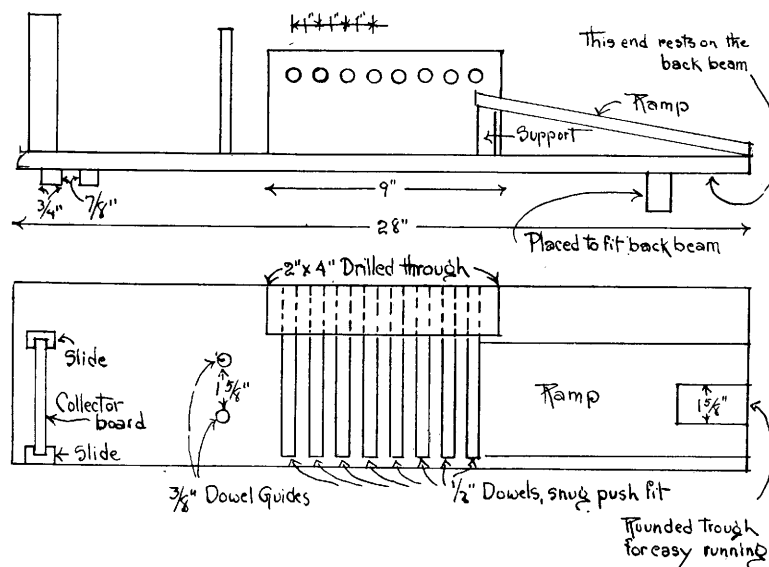
Questions and Answers

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

Question. "Sometimes when nearing the end of a warp I find that one or two sections have given out while other sections still have one turn around the beam. Before warping the beam I make what I call "key spools," one for each section, wound with exactly measured lengths of warp. When the key-spool gives out I cut the whole bout. By this method I am certain all sections are warped with the same length of warp. Hence I cannot understand why when they are woven off some give out sooner than others."

Answer. If the key-spools contain exactly the same length of warp the only reason they come out unevenly must be a

variation in tension in warping the different sections. It is very important to put each bout on the beam at exactly the same tension, — not only to make the warp come out even but also to have a smooth warp. The same person should hold each bout during the warping process. A better method is to use a tensioning device to insure correct tension. Such a device has been designed by a member of the Shuttle-craft Guild, Mr. A. B. Gardner, who generously contributed working drawings to the *Shuttle-Craft Bulletin*, from which they are reproduced herewith. This device can be constructed by anyone familiar with wood-working and will be found a great convenience in sectional warping.



Mr. Gardner's notes are as follows: "Starting at the left, I made my warp tensioner with upright slides to take what I call the collector board, made of maple punched with 80 holes." (This corresponds to the ordinary guide, and might to advantage be a narrow piece of reed. M.M.A.) "Next come two upright dowels, $\frac{3}{8}$ ", which form guides to bring the warp to a width of $1\frac{5}{8}$ ", which is the width of the section on the beam between the dowels. Next comes a piece of 2 x 4 set on edge and with eight $\frac{1}{2}$ " holes drilled through at 1" intervals, and 1" from the top on centers. These are for the dowels, which are not fastened in, since if it is found there is too much tension one or more should be removed. Then comes a ramp of $\frac{1}{2}$ " maple which makes it easy to collect the warp-ends as they are threaded round the rods. At the end is a trough $1\frac{5}{8}$ " wide, rounded off to make the warp slide easily over the end without going over a sharp corner.

"Underneath at the left are two cleats to fit each side of the top piece of a light horse that supports that end. At the right is one cleat of such size and so placed that when this end is

resting on the back beam the warp will slide nicely over and down.

"My practice is to thread all the warp from the spool rack through the collecting board. Then, commencing at the far side, take the threads one by one over and under the dowels. I pass the threads from the upper part of the collecting board under the first dowel and over the next, and so on; those from the lower part of the board I pass over the first dowel and under the next. They should alternate.

"I did not sandpaper the dowels, since friction is what is required to produce the tension. All parts of the tensioner are put together with screws except the slides for the collecting board which I mortised and glued."

With these clear and detailed directions I am sure no one will have any difficulty in making this tensioner, and it will eliminate the chief difficulty in making a sectional warp. I am sure Guild members will be grateful to Mr. Gardner for his generosity in sharing his excellent bit of practice with our membership.



A mountain road above Palmer Lake, with Pikes Peak

El Conejo Blanco

AN EXPERIMENT IN VOCATIONAL
TRAINING IN COLORADO

BY ANNE FISHER

A YEAR ago last September a camp for unemployed girls was established under Government auspices in Palmer Lake, Colorado. I was the house director and head of Home Economics during its two months' duration.

Palmer Lake is a village on the high road between New Mexico and the north, about twenty-two miles north of Colorado Springs and fifty miles south of Denver. It has an unenviable and largely undeserved reputation for a tendency to being storm-bound in winter. Driving casually through it on the way from here to there, a stranger's first query is, "Where is the lake? What? *That!*" Then noticing the grocery store, the lunch room that somehow expands into a little hotel, the more pretentious lunch room and bus station beyond, the small drug store, the numerous filling stations and the occasional "eating places" strung out along the way, they continue, "Well, what is Palmer Lake anyway? I thought I had heard it had something."

It has, stranger. Lift your eyes to the hills. Do you see the slopes dotted with chalets, — do you see a deep cleft drifting away into the mountains, — where if you are fortunate you will see a golden or a rosy glow lingering after

the day has left the valley below? That is the beautiful canyon beginning at the foot of Sundance Mountain, and that and its lovely surrounding mountains make this one of the most desirable spring, summer and autumn resorts in these parts.

On one of the golden October days at the camp two people, Mr. and Mrs. Charles Orr, came to see me. They had heard of my deep interest in handicrafts, especially in spinning and weaving, and they had something to suggest. They have a large ranch on the other side of the village where they raise silver foxes and Angora rabbits.

As we sat there watching the setting sun turn the mountains to a vivid deep rose, and the golden autumn leaves reflecting their radiance, while they told me about the rabbits with their ruby eyes and their long snowy wool with its possibilities for spinning and weaving, something clicked in my consciousness. It was then that "El Conejo Blanco" (the white rabbit) had its real birth.

Months have passed since then, months of trial, of discouragement, and sometimes, it has seemed, of defeat. But always the vision has held clear. Here was something for Colorado, an industry ready given to restore the native beauty that had flourished in the days of the Spanish Colonial settlers and of the craft-conscious Indians.

It has happened that I have wandered far in the world during much of my adult life. Behind that is a youth spent through the formative years in France, and still farther back a heritage of Scandinavian love of making with the hands all the necessities of life into things of daily beauty. Perhaps that same heritage has implanted the never-ending urge for construction, not only for beauty but for health, and for healing. Belonging as I do, to a generation where such things in this country were only a part of household life until the war found a wider outlook for them, it was inevitable that they begot a background of ever-increasing importance during three years of refugee work.

First in France, and later in Damascus, the answer to the deplorable aftermath in the mentality of refugee women and children, was *handicraft*, construction, beauty, things desirable enough for a return in money, — but always and again, *construction*. There was the possibility of re-birth from the devastation of the years of destruction which had become the only thing they knew.

As the years passed this thought became one of primary importance to me. I had seen the miracles done in restoring mental balance to young people and children. I had seen the enormous value of crafts in individual reconstruction as well as in the larger reestablishment of state and country. I had seen unrest and petty irritations, unkindliness of thought and judgment, yield to the fascination of industrious hands, and the "plotting and planning" of beauty. I had seen the desire of possession of such beauty, if it were authentic and unusual, bring willing purchase from others whose encouragement was part of the answer to the "why" of crafts. I had seen people of many countries, peasants, with nothing but time to possess, pore with infinite patience and fairy fingers over such marvels of needlework, weaving, wood-carving, that I have grown into an understanding of the infinite value of patient construction.

We Americans, as a people, are not patient. We have a national desire to be somewhere else. The far pastures are always greener. It seems to me this inborn restlessness is greatest in our women. Of course it is comprehensible enough in a nation settled principally by those of the nomad tendencies of other nations. There is little in the rural com-

munities for distraction. We have not been taught to find our means of living within ourselves as the older countries have. The young people have not learned what to do with their idle moments. They want movies, a radio, and when the school day is over and the games are finished they sit supine before a window watching the occasional movement of the life outside. They want "a chance" to be able to earn enough to give them the things that seem desirable. But nowadays it is only the fortunate who finds jobs.

Something must be done to help this unrest, this dissatisfaction, this rebellion. The Government recognizes it for the menace it is and is turning its deepest attention to the problem of youth. While we await its solution in time, we, who have learned its need, should spread the gospel of industry, of construction. In the greatest anguish of spirit, in the deepest worry, there is panacea, be it but temporary, in crafts. In planning a design or following a pattern there is such necessity of concentration there is no room for other thought. There is an involuntary satisfaction in seeing a thing grow under one's busy fingers, and there is comfort in the mechanical exactness.

So, at long last, I return to El Conejo Blanco, an experiment in vocational education. It is an experiment because, finally, I am trying to bring to this country of mine the lessons I have learned in others. The inspiration of seeing what vocational education has done for the Scandinavian countries, the breath-taking accomplishment in Sweden for the well and the handicapped is constantly with me.

For six months from December 1935 to June 1936, we were set up under Government auspices. It was inevitable that the restrictions in regard to their rules for time, personnel, etc., should make our ultimate aim an impossibility. This was to train a group of young women from different rural communities of the State, as teachers, or leaders in community work either in the towns or districts. We emphasized spinning and knitting of the Angora rabbit wool, expecting that the husbandry side, the care, feeding, shearing and breeding of the rabbits would follow as a natural sequence. Weaving was very desirable and so was dyeing of the wool with native dyes. But we had no equipment except such as was lent to us, — principally spinning wheels.

Since October 15th we have been set up with private funds, with the proviso of a year to prove this work of value to the State. We are able to take ten students for six months, or longer if desirable, changing when the time comes to end their training. During their residence here they are given the specialized training in spinning, weaving, knitting, dyes, design, etc., always with the thought that they will use it as teachers later. They also are given their living expenses, and a small sum weekly (\$2.00) for incidentals. This is in no way a relief project. Their obligation is to fit happily into the coöperative group, life, to have a real interest in crafts, to carry on their share of the household duties, and finally to pass on to others either in teaching, community work or in helping the handicapped, what has been given so freely to them.

The students carry on the household coöperatively. Each person here is allowed, or gives, \$4.00 weekly to the household fund. This pays for all the food, laundry and small supplementary rents for the cabins occupied by the director, and by the one young man student. Rent, light and coal is paid for from the funds each month. There is a pleasant and comfortable house where the girls live and where all meals are prepared. This is on top of a beautiful hill, and at its foot is the weaving room, temporarily available until May.



An outdoor classroom in the early days under Government auspices

We now have ample equipment of looms, weaving accessories, spinning wheels, etc., — enough to keep everyone busy all the time. Additions to the equipment are being made constantly.

The household work is planned and assigned every Sunday. Each day the cook changes, and the baker twice weekly. Baking of bread and its corollaries, rolls, coffee-cake, etc., is one of the necessary subjects here, and it is safe to say we will send forth a group of good cooks as well as craftsmen! All the household tasks are apportioned weekly, so, for instance, the floor-mopper is really good by the time she has finished her week at it. There is never a question of anything but willing and happy service throughout. All the household arrangements are in their own hands, and the director is called upon only in an emergency. In fact, in a carefully chosen group such as this it is an unusually happy and contented family. They are all thrilled and enthusiastic about the craft training. The youngest is eighteen. The oldest is a delightful woman of middle age, who, having launched in life a family of sons, has turned enthusiastically to this opportunity of returning to artistic and constructive achievement. Each one is encouraged to find her own best manner of accomplishment. There are no set rules or time except in the length of the day. Work begins in the weaving room at 8:30 each morning, where everyone stays until noon, except the cook of the day and the one who goes down to the village for mail. Lectures are given in the morning and usually last two hours, with questions and discussions following. After lunch, usually served buffet or "grab" fashion to save time, work is resumed at one and lasts till five. Then the weaving room is swept and put in order for the next day.

There has been a very great interest shown in this all over the State. Three of the first group of girls are making a spe-



A bunny before shearing

cial study of other crafts, on scholarships, at the Teachers' College at Greeley. Two of the present group hope to use this specialized knowledge to carry through a full course in college, beginning next year. Colorado is academic-minded, with two universities and several colleges. So it is a very great satisfaction to have interest and support on an educational basis. We have also the friendly backing of the State Board for Vocational Training. On the side of the Rehabilitation Service, our most interesting student is a so-called handicapped girl of nineteen. She is of immediate Czech ancestry, with the intrepid spirit of her race. Elizabeth's arm was torn so badly she lost it two years ago in February. It was the right arm, and when I first saw her in the camp that autumn she was just beginning to use an artificial arm and hand. I was much impressed by her cheerfulness and the spirit she showed. When she came here five months ago, she told me she had learned to sew and to embroider with her left hand. She is actually one of our best craftsmen now. She spins beautifully, knits more rapidly than anyone else, and uses any kind of a loom with ease. Her work is invariably good, her patience boundless. She will take anything out again and again until it satisfies her. She can finish her woven pieces with hemstitching or fringe, and she uses a circular needle preferably for her knitting. Once the principle of a craft is demonstrated to her she goes away by herself and evolves her own skillful method of handling it. She is an excellent cook and baker, and everything she does is quickly and efficiently done. She is one of the happiest and most cheerful girls I have ever known.

Although all this is a most comforting beginning for this work, there is always the underlying thought that the year is passing, and there is not yet enough to prove the perma-

nent value of such vocational education. I have used the term "Vocational Training School" in anticipation of the adding of other crafts, of the husbandry end to cover the raising of Angora rabbits, and of special sheep, for our wool, of the growing of flax for our use. We spin flax, silk, cotton, as well as the wools, for our fabrics. But we want the other things too, — wood, leather, metal, etc., — and there is a great possibility for it all here. Have we not our own Lester Griswold, master craftsman, in Colorado Springs? His excellent book on "Handicrafts" is just off the press, and I am the proud possessor of a complimentary first copy.

Last summer I was one of the fortunate persons who attended the Weaving Institute at Penland, North Carolina. When I found my own work would keep me in Palmer Lake this summer it occurred to me it would be a priceless opportunity to hold our own Institute here.

I remembered a day some years ago in Ditchling, Sussex, in the studio of Ethel Mairet, the greatest of dyers and dean of the English weavers, who had trained the greatest of them all. She turned to me with a book in her hand that she handled caressingly. "Do you know," she said, "it's curious. Everyone tells me that you in America are not craft-conscious as we are, and that your weavers are not experimentalists as we are, yet here is a book by an American that has never been equalled over here — and there are other American ones too." She handed me the book. There is not one of you who would not recognize that familiar jacket. Its name, "The Shuttle-Craft Book of American Weaving"; its author, Mary Meigs Atwater.

As I held it the years dropped away and I was young again, with my mining husband in Butte, Montana. Up the street to the corner, then three streets to the right, around the next corner, and four houses on, lived some friend of ours. I could see myself in a pleasant room talking to a beautiful young woman with her bright hair encircling her head in classic braids. She was showing me a magazine just out, — it was Scribners, I think, with a charming story of hers in it, and only knowing her as an artist I was much impressed that she should be a writer too. Now her book was in my hands, and it was about one of the most engrossing subjects in the world to me, and she was an expert on that subject. It was a thrilling experience and a happy one. Sometime later, not too long ago, I met that book in another country. This time it was in the lovely Dalecarlia country of Sweden, at Sätergläntan, in Insjön, a place known to many weavers. There was the hilarious evening when I acted as interpreter, at least in part, for the director of the weaving school there. She brought out the book, and asked for parts to be translated, as she "needed" it. We had no common language, unfortunately. So I read, in English of course, to a Norwegian friend who knows the spoken language, but not the written, and nothing at all about weaving. What he could not understand in English I tried to convey in French. When he seemed to have a working understanding of the text, he turned to our hostess, and slowly and distinctly translated into Norwegian, for he had no Swedish. She listened carefully and painstakingly and tried to take notes in Swedish. She had no Norwegian, but there seems a possibility of intercommunication between the two languages. I should like to be able to read Swedish if only to read those notes. I wonder how they would translate to Mary Atwater!

I have been interested in finding out the road that led Mrs. Atwater from that little household in Butte to the foremost authority on Colonial weaving, and one of the most

outstanding authorities on this Art. I knew her background as a decorative designer, and still further as one of a group of brilliant sisters in a delightful family in Keokuk, Iowa. It is a matter of particular interest to know how she began weaving, because it seems to prove my contention earlier in this article. She writes: "When we came to Basin I found I had a good deal of time on my hands and so did many other women in camp." So she started a little "industry." That led through stages to a hiatus caused by the war. She next found herself enlisted as a skilled craftsman in the Reconstruction Service at Camp Lewis Base Hospital, doing some of the most interesting work in the world, — occupational therapy for the disabled. It was not surprising that after her discharge from Army Service she went to the Watertown State Hospital in Illinois as a therapist.

Meantime she was constantly sought for information about weaving. Finally, while teaching design in Seattle, she started her Shuttle-Craft course. Later, when she went to Cambridge to live while her son was in college, this was followed by the founding of the Guild, and the monthly Bulletins in connection with her book. I understand she is the only hand-weaver in "Who's Who." She has had a vital effect on American weaving as an art and she has carried it on to such an extent that she is almost as well-known an authority abroad as she is here. Her knowledge of design, her extensive research in museums, her beautiful drafts are of priceless benefit to those who follow where she has led.

It is with profound gratification that I am able to say Mrs. Atwater will conduct our "Institute" at El Conejo Blanco in August of this year. It will begin August 16th, Monday, and will continue three weeks, until Labor Day, or actually ending on Saturday, September 4th. The two first weeks in August will be given over to beginners who wish preparation in anticipation of Mrs. Atwater's course. It will also be possible to continue indefinitely during September if one wishes to take advantage of the wonderful autumn in Colorado.

Mrs. Atwater will give special instruction for teachers, and in the teaching of the mechanics of weaving, from the knock-down loom to its preparation for advanced weaving. This will be of advantage to even experienced weavers. She will also instruct in the art of card weaving, and give particular emphasis to the reading and writing of drafts, textile analysis, etc. She will be assisted by capable persons either trained in her methods, or by equally experienced weavers under her direction. All kinds of spinning will be taught, including carding, and there will probably be other opportunities for crafts other than these.

There will be a wide choice of wonderful excursions to be arranged over the week-ends or before or after the Institute.



Spinning rabbit wool yarn

Many of the famous sights of the State are within easy access of Palmer Lake. There are beautiful walks in the canons and in the mountains near by, and for those who know and love the Rockies, or for those who see them for the first time, there will be an equal joy in finding Colorado, far and near.

The school is moving on May 1st to a quaint, charmingly old-fashioned place at the foot of Sundance Mountain. This is Estemere, with towers and cupolas, a big "Lodge," an extensive "Hall," and a "game room" large enough and light enough for many looms. There are huge porches for looms and spinning wheels, or to sit and rest while one's eyes feast on the mountains.

For further information write to Mrs. Anne Fisher, Director, El Conejo Blanco Vocational Training School, Palmer Lake, Colorado. Folders with complete details will be sent without delay.

"Weave as Drawn In"

BY MARY M. ATWATER

WHY do American hand-weavers insist on written treadling directions? This is one of the mysteries. Treadling directions are simply a bad habit. They are entirely unnecessary; they slow up the process of weaving; they cannot possibly be written so that they are correct for all combinations of material; they increase the chance of mistakes. Swedish weaving books do not contain these long lists of treadles, and neither do English weaving books, or — as far as I know — any weaving books at all except those published in America.

Of course for elaborate figures in the eight-harness and ten-harness weaves one must have a guide to the weaving, but this should be in the form of a diagram of the figure to be produced. For the simple four-harness overshot weave even this is not required.

I do not mean to say that treadling should be hit-and-miss, or that there is not a correct normal way to weave each pattern. It is true that any pattern may be treadled in a variety of ways to suit the weaver's fancy, but for each threading there is one definite treadling that produces the figure in symmetrical form, as it was designed. This method is to weave the pattern "as drawn in," which means to weave it in the order of the threading.

How is this done?

Nothing could be simpler. Take, for instance, the draft given in Diagram No. 1, — the threading for a simple little star-figure often encountered in four-harness weaving. For clearness of illustration the separate "blocks" of which the pattern is composed have been outlined and numbered. Reading the draft from right to left, as is customary, the first block is a small block on the 1-2 shed. Begin by weaving this block with the number of pattern shots on the 1-2 shed that may be required to make it square. In a coarse yarn two shots will be enough, in a finer weft three or more shots may be required. Next is a block of four threads on the 2-3 shed, followed by one on the 3-4 shed and one on the 1-4 shed, all of the same size. The fifth block is on the 1-2 shed again, but it is larger than the first block and should be woven square with a larger number of weft-shots, — three to six, according to the material used. The sixth block is on the 2-3 shed, like the second block, but is one thread wider than the second block and may require one more shot of weft to make it square. Then we have a little three-thread block on the 1-2 shed, which is the center of the figure.

There is nothing complicated about this, and anyone can write treadling directions from the threading draft with perfect ease, — but why write them at all? It is far simpler just to develop the pattern as it comes up on the loom.

A weaver of considerable experience once told me of a sad experience. Someone, she said, had sent her a loom all set up and threaded, but had failed to send treadling directions or a threading draft. After spending hours checking over the heddles in an effort to determine the threading, this weaver told me, she finally gave it up, — took out the threading and re-threaded the loom. When I asked her why she did not find out what the pattern was by *weaving* it, she was frankly sceptical that this was possible. But a few minutes at the loom made the thing clear to her. I wish I might hope that

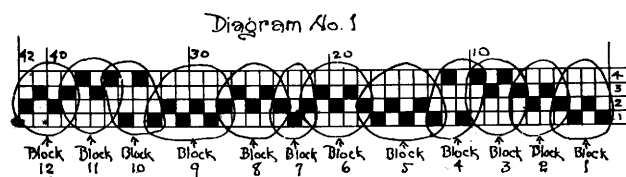
everyone who reads these notes will try the experiment for himself or herself and so be free from the nuisance of treadling directions forever — to the great improvement in speed and accuracy of weaving.

This is how it goes (I am speaking here of four-harness overshot patterns): Suppose you have a loom all threaded and tied in and ready for weaving. If someone else has done the threading and you have no idea what the pattern may be, so much the better. No threading draft or sample showing the pattern, no diagram of the figure, and of course no treadling directions. You know this: that there are six possible sheds, made by sinking two of the four harnesses and raising the other two. These sheds are: 1-2, 2-3, 3-4, 1-4, 2-4 and 1-3. Two of these sheds are reserved for the plain weave or "tabby" and the other four produce "skips" of which the pattern is composed.

Most drafts are so written that the tabby sheds are the 1-3 and 2-4 combinations. This is not invariable, however, as some ancient drafts are written with the tabby on 1-2 and 3-4, while a very few tabby on 1-4 and 2-3. The first thing to do is to find the tabby sheds. Open the 1-3 shed, — if it picks up alternate threads all across the warp it is a tabby shed, of course, and your pattern has the familiar 1-3, 2-4 tabby. If, however, 1-3 proves to be a pattern shed, try the 1-2 combination; if this also proves to be a pattern shed the tabby will, of course, be on 1-4 and 2-3.

Having established the tabby combinations you will know that the other four sheds make your pattern. For the sake of illustration we will suppose that you have the 1-3 and 2-4 tabby. The pattern sheds will then be 1-2, 2-3, 3-4 and 1-4. Try these four sheds till you find the one that corresponds to the first block of the pattern — that is to say, the one that makes a skip next to the selvage on the right-hand side. Suppose it proves to be the 1-2 shed: weave this first block with enough weft-shots on the 1-2 shed to make the block square.

As we know, in overshot weaving each block overlaps the one on each side of it by one thread; that is to say the last thread of the first block is the first thread of the second block. The two blocks that overlap a block on the 1-2 shed are, therefore, the 2-3 and 1-4 blocks. It is easy enough to determine which of these sheds makes the second block of the pattern, simply by opening first one and then the other of these sheds and observing which produces a skip that overlaps the first block. Say this proves to be the 2-3 shed: weave the second block square with the number of weft-shots required to produce the effect. The second block may be the same size as the first block or may be larger or smaller. Pay attention only to the size of the block as produced next to the first block and do not worry about the size of other blocks on the same shed.



Having woven the second block square, find the shed for the third block. This will be either a return to the 1-2 shed or will be a block on the 3-4 shed. Weave this square as before. If the block was on the 3-4 shed the following block will be either a return to 2-3 or else a block on the only shed left unwoven — the 1-4 shed.

Having come so far the weaver will observe a diagonal line running from the lower right-hand corner of the weaving through the blocks woven. This diagonal line runs through all these patterns when they are woven "as drawn in." It provides a useful guide to correct weaving. If the diagonal runs at too steep an angle, the figures are being woven with too many shots over the blocks and will be too high for their width; if the angle of the diagonal is too flat, not enough weft-shots are being woven and the figures will be squatty. If the diagonal breaks off, the wrong block has been woven at that point. If the diagonal runs true and straight, the pattern has been correctly treadled.

If the pattern is a very large and complicated figure the weaver may at times become confused as to which block on a particular shed is the one to be "squared." The diagonal is the guide. The block to be squared is the one that continues the diagonal.

This may sound complicated, as set down in words, but the process as carried out on the loom is really extremely simple and a child can do it. Having done it once, no weaver will ever again have any hesitation in weaving an overshot threading in the normal manner, and without treadling directions or other guide. The first time one carries through this process it seems almost magical — the way in which the whole of a complicated figure comes up on the loom. It is a charming bit of geometry.

In the same manner a draft may be "woven" on cross-section paper with a heavy pen, and one may thus prove an unfamiliar draft and have a look at the pattern without the trouble of threading it into the loom and weaving it. Many weavers make a practise of developing in this way any draft they plan to use. Any mistake in the draft will show up on the paper, and one may judge whether the pattern is pleasing and adapted to the purpose in mind. In this way much time may be saved and disappointments avoided.

To "weave" a draft on paper proceed as follows: first set down the draft across the top of the paper, putting in a repeat and a half or at least several blocks past the repeat. If a draft is faulty the mistake is more apt to occur at the point of repeat than anywhere else and, unless this is tested, it may escape notice. Diagram No. 2 shows a development of the draft given on Diagram No. 1 and illustrates the method of weaving on paper. This is exactly like weaving on the loom except that the pattern develops from the top downward instead of from the bottom upward, as in weaving on the loom. Cross-section paper ruled 16x16 to the inch is the best for this work, if one has good eyesight. A coarser ruling, 10x10 to the inch, is easier on the eyes but clumsier to handle, as it makes the drawing much larger and coarser. The figure as shown on the drawing will, of course, be much larger than when woven in fine material. On the 16x16 paper it will be almost twice the size of a woven figure on warp set at 30 ends to the inch, and on 10x10 paper it will be three times the size of the woven figure. To judge of the effect, pin the drawing to the wall and look at it from a distance.

In making these drawings it is always advisable to indicate not only the skips that compose the pattern, but also the half-tone blocks, that play a large part in the effect of a piece

of overshot weaving. The half-tone blocks are those over which the pattern weft tabbies, and in a pattern written in the regular manner one of these half-tone blocks occurs on either side of every pattern block. On the drawing the half-tone is indicated by rows of dots. A study of Diagram No. 2 will make this clear.

The best tool to use for this weaving on paper is a Payzant lettering pen, and the ink used should be regular drawing ink. The work can be done in crayon or even in pencil, but this is apt to become messy, and pen and ink are greatly to be preferred. If a mistake is made in the drawing it is not necessary to erase; simply cut a piece of cross-section paper to fit over the mistake and paste it down. The drawing can then be continued as though nothing had happened.

Something should be said about patterns not woven "as drawn in." Of course every threading can be woven in a number of ways, according to the fancy of the weaver. All these special treadlings are variations, and in order to reproduce them it is necessary to have either treadling directions or a picture or sample of the pattern. For most of these variations there is no rule and they are entirely individual. However, there are a few standard variations that can be made in the weaving of many overshot patterns. One of these is the Italian method of weaving "on opposites." This style of weaving produces a thicker, softer fabric than the standard method of treadling — with alternate shots of pattern and tabby — and gives some interesting color effects. The process is as follows: Use two weft-threads of the same kind and weight but different in color, as white and blue. Use the darker shade for the pattern-shots and the lighter shade for the background. Treadle a pattern block on the 1-2 shed this way:

1-2, pattern color
 2-3, background color
 1-2, pattern
 1-4, background. Repeat these four shots to square the block
 End: 1-2, pattern

Weave a 2-3 block this way:

2-3, pattern color
 3-4, background color
 2-3, pattern color
 1-2, background color. Repeat as required
 End: 2-3, pattern color

Weave a block on the 3-4 shed:

3-4, pattern color
 1-4, background
 3-4, pattern
 2-3, background. Repeat as required
 End: 3-4, pattern color

Weave a 1-4 pattern block:

1-4, pattern color
 1-2, background
 1-4, pattern
 3-4, background. Repeat as required
 End: 1-4, pattern color.

If there are no very long skips in the pattern used, it is not necessary to weave a tabby with this. If, however, there are very large blocks in the pattern it is advisable to put in an occasional tabby shot in a fine thread, after each four shots of the weave. This gives firmness and prevents the warp-threads from drawing together under the long blocks.

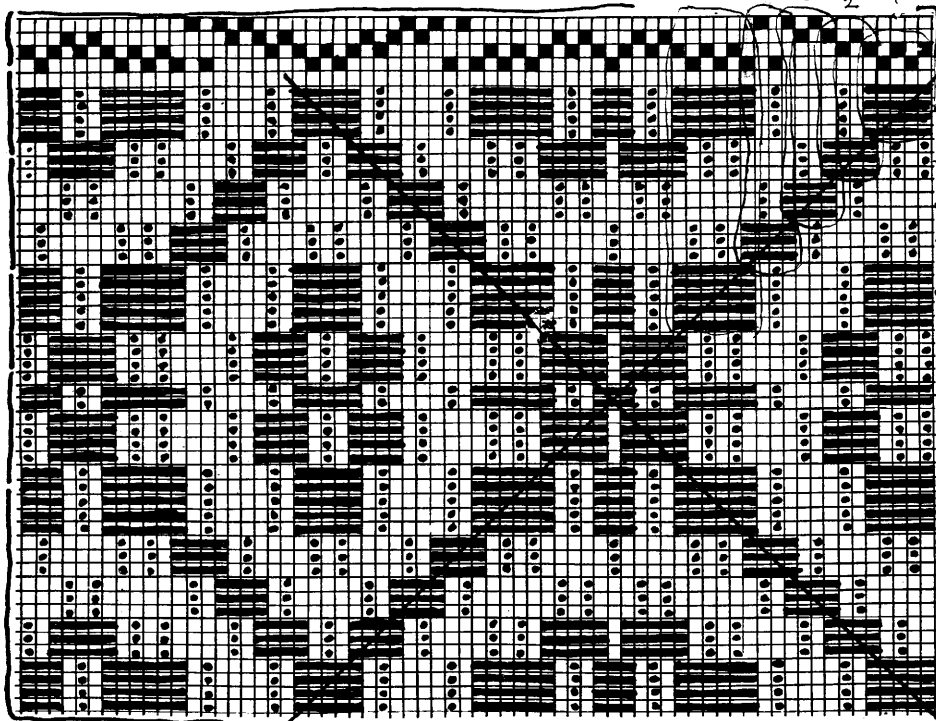
Three colors can be used in this weave, — the darkest shade for the pattern shots and the other two alternately for the background.

This method of weaving is very effective for patterns in the

Diagram No. 2

Pattern woven "As-Drawn-In"

(a)

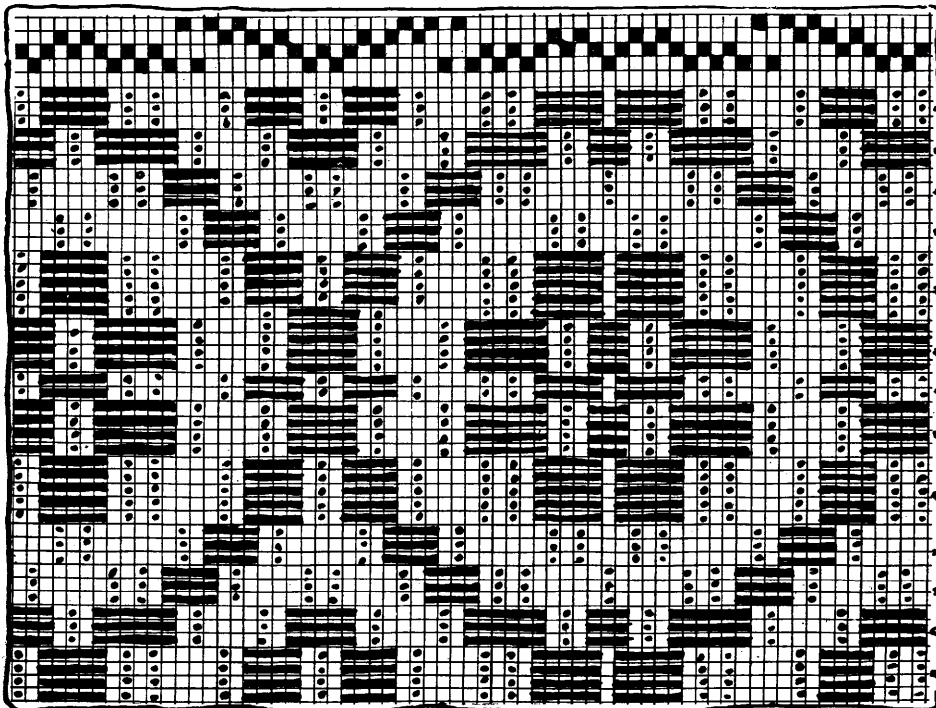


- ← Block No. 1, 1-2, 4 times
- ← " " 2, 2-3, 3 "
- ← " " 3, 3-4, 3 "
- ← " " 4, 1-4, 3 "
- ← " " 5, 1-2, 5 "
- ← " " 6, 2-3, 4, "
- ← " " 7, 1-2, 2 "
- ← " " 8, 2-3, 4, "
- ← " " 9, 1-2, 5 "
- ← " " 10, 1-4, 3 "
- ← " " 11, 3-4, 3 "
- ← " " 12, 2-3, 3 "
- ← " " 1, 1-2, 4 "

Note the diagonals

Pattern woven "Rose-Fashion"

(b)



- ← Block No. 2, 2-3, 4, times
- ← " " 1, 1-2, 3 "
- ← " " 4, 1-4, 3 "
- ← " " 3, 3-4, 3 "
- ← " " 6, 2-3, 5 "
- ← " " 5, 1-2, 4 "
- ← " " 7, 2-3, 2 "
- ← " " 9, 1-2, 4 "
- ← " " 8, 2-3, 5 "
- ← " " 11, 3-4, 3 "
- ← " " 10, 1-4, 3 "
- ← " " 1, 1-2, 3 "
- ← " " 12, 2-3, 4 "

M.M. Atwater, 1937

THE WEAVER

popular “crackle weave” and, as there are no long skips in this weave, the supplementary tabby shots are not required.

An important variation from the “as drawn in” system of treadling is to weave “rose-fashion,” to produce rose-figures instead of the familiar star-forms. There are many patterns that do not lend themselves to this variation, but any pattern that contains a star-figure can be woven “rose-fashion” as well. Sometimes the variation is so much used that it acquires a special name of its own. For instance, the same threading will produce the pattern known as “Lovers’ Knot” when woven “as drawn in,” and becomes “Whig Rose” when woven rose-fashion.

It is impossible to formulate a general rule for producing the rose-fashion variation, that will fit all patterns, but the effect depends on reversing the order of each pair of blocks of which the pattern is composed. In most patterns there are two figures, each made up of two blocks. In the pattern given on Diagram No. 1 the star-figure is composed of five blocks on the 1-2 and 2-3 sheds. In weaving this figure “as drawn in” we weave a 1-2 block first, followed by a 2-3 block, the small 1-2 block at the center of the figure, then 2-3 again and finally 1-2. To weave a rose instead of a star, reverse this order. That is, weave the 2-3 block first, then the 1-2 block, the small center block on 2-3, then 1-2 again, ending on 2-3. (See (b), Diagram No. 2.)

It is advisable to work out this variation on paper before attempting to weave an elaborate pattern rose-fashion, as otherwise it may develop some surprises. When done correctly the figures should be symmetrical and will take exactly the same number of weft-shots as are required for weaving “as drawn in.”

There is one class of overshot patterns that may present certain difficulties to beginners. I refer to patterns in which the figure, or part of the figure, is written on sheds that do not overlap. We call these patterns “written on opposites.”

The most familiar threading of this type is the famous “Monk’s Belt” pattern. In weaving this pattern only two pattern sheds are used, — the 1-2 and 3-4 sheds. These sheds are, as we say, “opposite.” That is: on the 1-2 shed harnesses 1-2 are sunk while harnesses 3-4 rise. The 3-4 shed is the exact reverse of this. There are a number of other patterns — “Lasting Beauty,” “Sugar-Loaf,” “Queen’s Patch” — that are similar in structure and are woven in the same manner, on two pattern sheds only.

There are also a number of patterns in which one figure or a part of a figure is on “opposite” sheds. A peculiar sparkle is given to an otherwise uninteresting pattern by this trick of the draft-writer.

But as it is impossible to pass from one block to its opposite

without passing through an intermediate shed, in a four-block pattern of this type we find a system of small “accidental” two-thread blocks. In developing such a pattern strictly “as drawn in,” each of these small blocks should be woven with a single shot of weft. This is entirely correct, and some of the old patterns “on opposites” are usually woven in this manner, but as a rule the small “accidental” connecting block is ignored in the treadling.

Diagram No. 3 shows a small figure similar to the one on Diagram No. 1, but written partly on opposites. The little two-thread “accidental” blocks are marked on the draft. In treadling these may be woven with a single weft-shot or may be omitted.

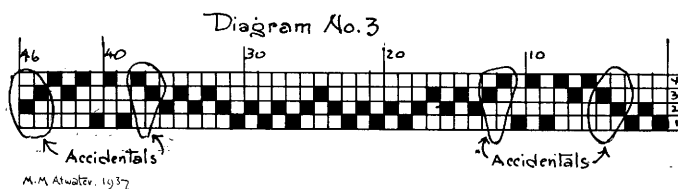
This article is intended to answer in detail the questions about treadling that are asked most frequently, and to relieve weavers of the nuisance of following written directions for treadling. I should like to say again that I hope every weaver who happens to read these notes, and who has been relying on written lists of treadlings, will make the experiment of weaving without directions as described. The practical advantages in this method of weaving are many. For one thing, it makes no difference in what order the treadles are tied, or whether the loom used happens to operate with a rising shed instead of a sinking shed, — one weaves the block as it occurs on the loom, no matter what levers or treadles are used to make the desired shed. There is, therefore, no necessity to transpose treadlings written for one type of loom and one system of tie-up in order to weave the pattern on a loom of different operation. For those who use the Structo loom this is particularly important, as most treadlings are written for treadle looms that operate with a sinking shed and, when followed on a Structo loom, produce the fabric wrong side up.

The improvement in accuracy is important on any kind of loom. As noted, written directions cannot be made to fit all combinations of material and if followed as written, in a heavy weft, will produce a figure much too long-drawn-out, while if woven in a fine weft the figures will be squatty. It is also easy to lose the place in a long list of treadlings and so make an unsightly mistake that may ruin an important piece of work. By weaving along the diagonal mistakes cannot occur.

The saving in weaving time is obvious. One may weave right along without stopping to refer to the directions.

Treadling directions for the more elaborate patterns woven on six and eight or more harnesses are even more impractical than for patterns in the overshot weave. It is true that these patterns are rarely woven strictly “as drawn in” and a guide is required, but this guide should take the form of a diagram of the figure, and the weaver will find it far easier to weave to reproduce the pattern illustrated than to follow the long and complicated set of treadling directions that would be necessary if the thing were written out in detail.

To those who do not believe that one can weave more quickly, more easily and more accurately without treadling directions than with them, all I can say is: Try it. A few minutes at the loom will prove convincing.



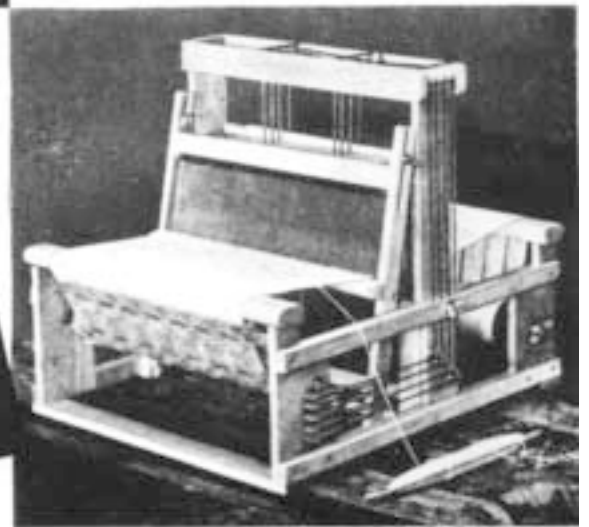
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