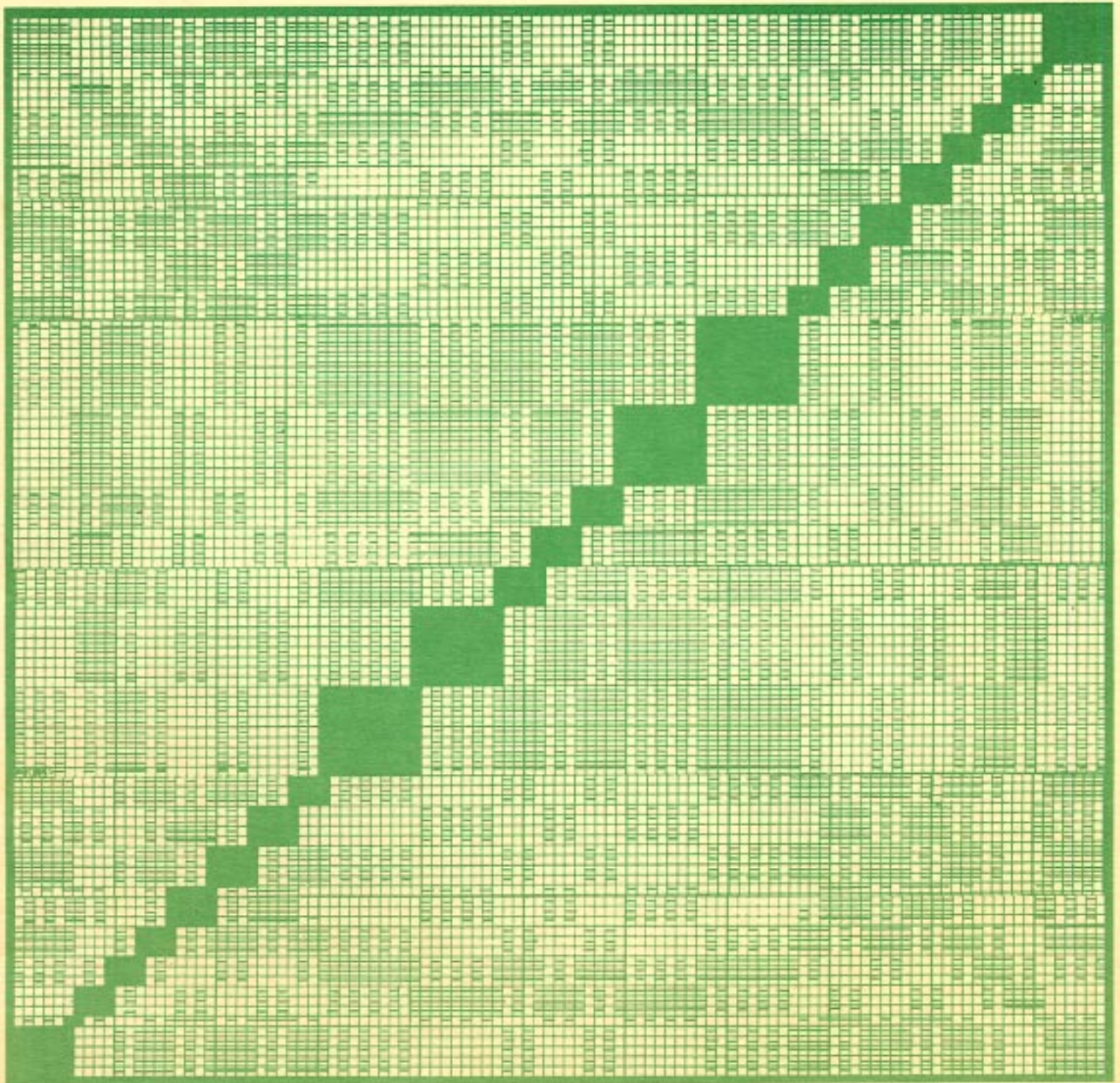




WEAVING ON THE DIAGONAL



By HELEN DANIELS YOUNG



Weaving on the Diagonal

By Helen Daniels Young

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"WEAVING ON THE DIAGONAL" or, How to Weave a Pattern without Specific Directions.
Written especially for the Novice Weaver.

"Weaving on the Diagonal" is a method of weaving the specific pattern for which a warp is threaded through the heddles, without using any written directions. All of the information necessary for this method is to be found in the "design - spaces" which appear across the width of any warp when the Pattern sheds are opened. It is possible to use this method with minor variations for many kinds of weaving, including multi-harness types. For weaving simple plaids in plain Tabby on 2-harness looms, for the weaving of all but a very few Overshot patterns (for example the Whig Rose type) and for Summer and Winter weaving the Diagonal method is ideal. It may be used with equal facility for Ms and Os, Lace Bronson, Double-faced Twill or simple Damask and for Double weaving. Since each of these techniques has its own individuality in the way it must be woven, a knowledge of the structure of each type of weave must be combined with the method of following the pattern on the diagonal.

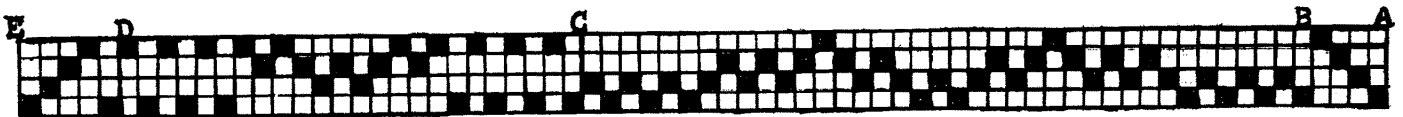
When this method of Pattern-weaving is fully understood and followed it will free the weaver from using any written instructions, including a draft, and from using elusive pins to keep the place when trying to follow either a written draft or a set of treadling directions. While these directions were written to start the novice weaver on an easy way of following a Pattern, they may also prove to be a time-saving aid for other weavers. Any weaver who wants to weave freely and rhythmically will be wise to master this useful Diagonal technique.

As any would-be weaver discovers before even throwing a shuttle, a whole new vocabulary must be learned in order to read or to talk intelligently about this craft. Certain terms used in the directions for Weaving on the Diagonal may be unfamiliar to the novice. These are explained in the sections which follow those directions. Also included in those sections is a discussion of the Theory involved. The inexperienced weaver is advised to read the description of the method of Weaving on the Diagonal first to see how much of that is clear and then to study the definitions and the theory.

"WEAVING ON THE DIAGONAL"

To weave "on the Diagonal" use only the warp itself to direct you. The following steps will help you to determine the sequence of the sheds to use in weaving the pattern in the exact order in which it was threaded (even though you should not know what that pattern was). This method will bring out every pattern detail. Read all of the steps first, then re-read the first step, follow the directions given in it and proceed thus, step by step. As a suggestion, try out this method for the first time on a draft for a pattern which contains chiefly large Blocks. A draft made up of many small Blocks is apt to confuse one learning this technique.

Diagram 1. Use this Draft to try out the directions for weaving "On the Diagonal".



PROJECT - "WEAVING ON THE DIAGONAL".

Make a short warp using the Overshot Draft given in Diagram 1 for your Pattern. The Warp and Tabby Weft may be 20/2 white or natural cotton. For Pattern Weft 5/2 pearl cotton is correct. Use a #15 Reed threaded at 2 Threads per dent.

The Threading Plan is -

A - B (Selvage)	4 Th. x 1 =	4 Threads
B - D	62 Th. x 4 =	248 "
B - C	38 Th. x 1 =	38 "
D - E (selvage)	5 Th. x 1 =	5 "

295 Th. ÷ 30 = 10"-.

Now, using this warp, follow the instructions given below for Weaving on the Diagonal without referring to the Draft at all while weaving. The Draft contains different sizes of Blocks, from 3 to 8 threads, which offers a challenge in squaring them.

1. Open successively each of the Pattern sheds - 1&2, 2&3, 3&4 and 4&1. Study the spaces opened in each shed, noticing also the small group of threads at the right hand edge, beyond the design-spaces. This is the SELVAGE and the number of threads in it should be determined. Usually 4-8 threads are allotted to this part of the warp. The Selvage makes a firm edge since it carries no pattern skips in it. A 1-2-3-4 twill threading is commonly used here. Four threads are usually adequate and make the selvage inconspicuous. Once any warp has been studied to find the selvage width, the selvage is then ignored and the Pattern weaving may begin.
2. Select the shed which opens the Design-space nearest to the right hand selvage, but exclusive of it. This space may be from 2 to 16 threads wide. Having used the draft in Diagram 1, it will be 8 threads wide. On a counter-balanced loom (sinking shed) with harnesses 1 and 2 down, these 8 threads may be counted on the "floor" of the shed or the empty dents may be counted, numbering 2 threads for each dent. The design space will be 1/4 inch wide.
3. With the information learned in #2, weave this first Block so that the Pattern weft threads form a square, 1/4 inch in height. Remember that the 8 threads of the warp which made the width of the design-space were all 20/2. In the weft, however, 20/2 Tabby and 5/2 Pattern threads will alternate so that 8 threads would make the block too high. Another factor determining the number of shots needed to square a block is the firmness of the beating of each thread into place. This varies with each weaver. It is better to have the block slightly too high rather than too low because of shrinkage both from relaxing tension when the textile is taken from the loom and from laundering it. Notice that the Pattern weft appears in all of the design-spaces opened by the 1 & 2 shed all across the warp. BUT we are concerned with ONLY ONE SPACE here, the one in the extreme right hand corner of the textile. Square IT and ignore all others.
4. Find the second design-space to be woven. Disregard every space except the one which opens EXACTLY NEXT to the block just squared. The second block will be at the upper left corner of the first one, touching it and perhaps sharing a thread in common with it. This may be determined by finding tiny dots of the Pattern weft thread in the woven area at the left of the first block. These tiny dots are known as "half-tones" and indicate that one of the harnesses used in Block 1 will be repeated in Block 2. We say that these two blocks have "threads in common". Since Block 1 was on harnesses 1&2, Block 2 must be on a pair of harnesses repeating either 1 or 2 and it will be 2 & 3 in this case.

PROJECT - "WEAVING ON THE DIAGONAL"

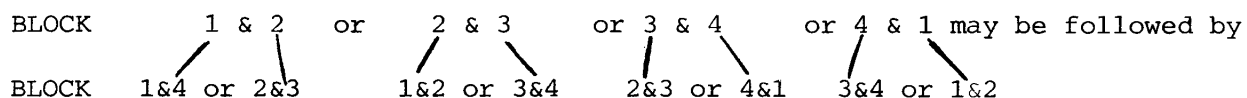
4. (Cont'd)

Count the threads in this 2&3 block and square it. When Block 2 is woven, "half-tones" will show at its right, just above Block 1.

It might be well for the novice to make notes on paper of the blocks as squared, with the number of pattern shots used for each. Then as the pattern is repeated time will not be wasted in figuring out again how many shots to use. Also this record will be helpful in checking the blocks in the textile to locate ones place there. This sort of aid will not be needed after the first piece of weaving on - the - diagonal has been done.

The next diagram is given as a guide to show how threads are shared in common between the four Pattern Blocks which are used in Overshot weaving. These Blocks result from the Overshot technique of combining 2 harnesses at a time for every shot of both Pattern and Tabby weaving. The top line indicates the denominations of the four Pattern Blocks. The second line shows which blocks, with threads-in-common, may follow any of the four Pattern Blocks in line 1.

Diagram 2. A guide showing the sequence of Blocks with Threads-in-Common.



5. The third block to be woven will be in the design-space above and to the left of the second block, which was woven on 2&3. Diagram 2 shows that either 1&2 or 3&4 may follow Block 2&3. Try both of these combinations to see which is nearer to Block 2. Here it should be the 3&4 harness combination. It is smaller than the first two blocks. Square it carefully, make note of the number of shots used for it and move on to the fourth block. Note the "half-tones" indicative of shared threads

6. Continue to weave each block, squaring each one on the diagonal line which extends, perfectly straight, through the Pattern Blocks from the lower right corner to the upper left corner of the completed textile. The whole piece of pattern weaving should be a square and every block on the Diagonal Line should also be square. These individual blocks make up the design elements which combine to form the characteristic Overshot Patterns. These design elements are known as Tables, Stars, Roses, Diamonds, etc. from their shapes, and are formed from the small blocks which were squared so carefully on the diagonal line. But, though square on that line, blocks of the same denomination elsewhere take on other shapes depending on the number of pattern wefts they acquired when their pattern combination was woven on the diagonal line. It is in this manner that the delightful Overshot Patterns are developed in which tables, roses, wheels and other design elements combine to make a unified, over-all pattern. The monotony felt in weaving only squared blocks pays off in the end when the completely balanced Pattern is seen as a whole. As this technique of WEAVING ON THE DIAGONAL is mastered one becomes very sensitive to the size of each key block and concentrates on weaving each one with the right number of pattern wefts. The reward of weaving carefully each tiny, individual key block as a perfect square is the perfection of the well-rounded design of the complete Overshot Pattern which is obtained by this method.

Note: The title of this pamphlet is "Weaving On the Diagonal" and the information included here is pertinent to that method. In concentrating on this particular method, however, one must not forget that many variations in the weaving of all patterns are possible. These are made even more obvious to those who understand the method described here.

PROJECT - "WEAVING ON THE DIAGONAL".

WEAVING THEORY.

Certain phases of Weaving Theory, especially as applied to Overshot weaving, are given briefly here to help the beginner interpret more easily the directions for Weaving on the Diagonal.

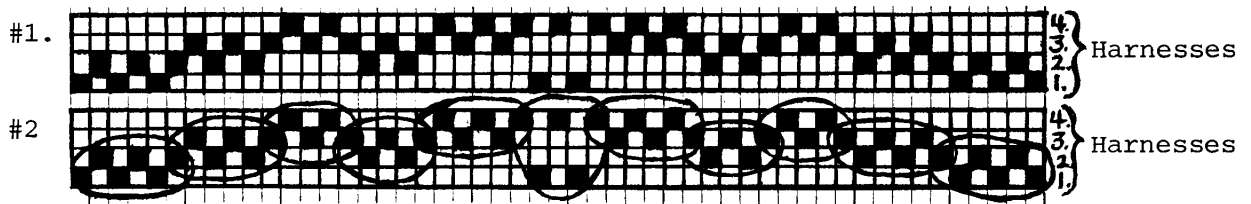
1. DRAFTS. The drafts in this pamphlet are to be read and threaded from the right.

A Draft is a conventional method of writing the directions for threading a warp to weave a specific pattern. The various symbols used in these drafts are:

1. The 4 horizontal rows represent 4 Harnesses - #1 is at the front.
2. The small squares represent Heddles on the harnesses.
3. The solid squares represent Threads in Heddle-eyes on a specific harness.
4. The order in which the "Threads" occur shows the Sequence in which they are to be threaded through the heddle-eyes on a given harness.
5. A Draft may also be lettered to indicate the various parts of the Draft, such as the selvage, the border, the repeats, the 'balancer', etc.

2.A TYPICAL FOUR-HARNESS, OVERSHOT DRAFT. A 4-BLOCK Draft.

Diagram 3.



The two short drafts given above are for study purposes and should not be used for threading a warp without some changes and additions.

#1 This draft shows all of the symbols found on simple four-harness drafts, except for the lettering for the different parts. See Diagram 1 for this.

In weaving any Overshot pattern 2 harnesses are used together to form the plain background cloth as well as to make the patterns so typical of this weave.

The two harness combinations 1 and 3 & 2 and 4 are the harness pairs reserved for making the plain background against which all Overshot Patterns are seen, as well as for any plain cloth. This plain weave is known to all weavers as TABBY. When the warp threads on harnesses 1 and 3 are raised, those on 2 and 4 are on the floor of the shed. Half of the warp threads are on each of those two pairs of harnesses. The threads are evenly spaced at one per dent in both the Tabby combinations, thus making unpatterned cloth. The Tabby shots alternate with each other for plain cloth and, continuing this same alternation and direction of shot, alternate with the Pattern Weft shows also when any Pattern is woven.

There are six possible, 2-harness combinations, which may be used in Overshot weaving. The first two have already been discussed in the preceding paragraph, describing the Tabby weave. So, we have four of these 2-harness combinations reserved for Pattern weaving. The four Pattern combinations are: 1 and 2 ; 2 and 3 ; 3 and 4 and 4 and 1

When these Pattern harnesses are operated, design-spaces, corresponding to Blocks in the Draft, open at intervals across the warp and in these spaces of assorted sizes the Pattern weft threads will appear to be formed into woven Blocks.

PROJECT - "WEAVING ON THE DIAGONAL".

WEAVING THEORY.

#2. The second Overshot draft shown in Diagram 3 is identical with #1 except that rings encircle all of the groups of "threads". These groups of threads enclosed within the circles are known as BLOCKS and the encircling of them is known as "ringing the Blocks". It is a very simple way of demonstrating which groups of threads belong together. It also shows graphically the inter-relations of the blocks of different denominations. Still another feature brought out by ringing the blocks is the presence of Threads-in-Common between various blocks. These Threads-in-Common are the ones which are enclosed by overlapping rings at either end of each Block. By now you have probably defined BLOCK for yourself. See if your definition has included all of the following points. BLOCKS are found in textiles as the woven expression of draft symbols. In a draft a BLOCK consists of several thread-symbols written alternately on just two harnesses. This group of threads or BLOCK has definite size limits in Overshot weaving. The number of threads in a single block may vary from 2 - 16 threads. Recall that in Overshot two harnesses must be used together typically. This implies having at least one thread on each harness in any pattern area. The limit of 16 threads is imposed for practical considerations since, at a standard threading of 30 threads per inch, the width of a 16-thread block is 1/2 inch. Any longer weft-skip is not practical.

Let us study the first BLOCK in #2. We find 6 threads alternating between harnesses 1 and 2. The 7th thread is on harness 3. By definition, a BLOCK consists of threads alternating between JUST TWO harnesses. So, this thread on harness 3 must be in another block. In this second BLOCK the threads alternate between harnesses 2 and 3. The 6th thread is on harness 2 so that it is shared by the first BLOCK (1&2) and the second BLOCK (2&3). In ringing the BLOCKS this 6th thread must be included in both BLOCKS. But in counting warp threads it counts as just one thread. So there are 6 threads in both the first and second BLOCKS and 5 each in the third and fourth BLOCKS.

Threads shared between two BLOCKS with one harness in common, like 1&2 and 2&3 are known as Threads-in-Common. See Diagram 3#2. Here all of the adjacent blocks have threads-in-common. In textiles these threads show as one-thread Pattern-weft skips, like dots, so they are called HALF-TONES. They are found in all Overshot patterns using Blocks of all four denominations.

DESIGN-SPACES mentioned frequently in previous pages have, of course, a direct relation to the BLOCKS in a draft. For when any pair of harnesses is lowered the threads on those harnesses will go down. If harnesses 1&2 go down, not only will all groups of threads, or BLOCKS, be depressed but also every single thread on either harness 1 or 2. The depressed groups of threads form the DESIGN-SPACES while the single threads form the half-tones. The weaver develops Patterns directly from the way in which the BLOCKS are woven but the HALF-TONES are by-products of Threads-in-Common between the Blocks which are used.

PROJECT - "WEAVING ON THE DIAGONAL".

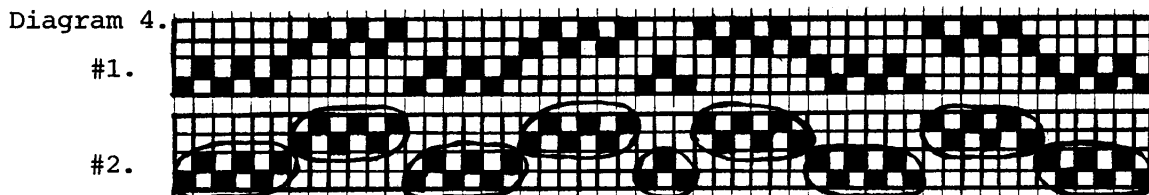
WEAVING THEORY.

#2. (Continued)

One more term should be discussed here. That term is UNIT. For each different "weave", such as Overshot, Bronson-Lace, Summer and Winter, etc., there is a small group of threads of specific size and with a definite sequence of threads on the harnesses, known as the BASIC UNIT of that weave. These UNITS may be repeated to form BLOCKS, whose size limit depends on the structure of each different weave. Our present concern is with Overshot only so we shall concentrate on that. Since two harnesses are needed for each pattern combination in Overshot, there must be two threads for the smallest UNIT of Overshot. The Pattern-weft threads which form the designs in this weave, against a Tabby background, should never be longer than 1/2", from the standpoint of wearing qualities. At the standard threading of 30 Threads per inch, that means that the largest BLOCKS should contain only 16 threads. In terms of BASIC UNITS the largest BLOCKS should never contain more than 8 UNITS. It is sometimes necessary to have an uneven number of threads in some blocks and so a half Unit (1 thread) may be added. This is necessary for any block which is located between two blocks of like denomination. So, within the limits of 2 to 16 threads, there may be blocks of any size with an odd or an even number of threads. Study #2, Diagram 3 in relation to UNITS. The first two Blocks, with 6 threads each, have 3 UNITS. The third Block on 3&4 has 5 threads, or two and a half UNITS. Notice that this third Block is between two, 2&3 harness Blocks.

3.A TYPICAL FOUR-HARNESS, SWEDISH OVERSHOT DRAFT - A 2-BLOCK Draft.*

*The term "2-Block Draft" refers to the number of 2-harness Pattern combinations, not to the actual number of individual blocks in the draft.



The two short drafts given above are for study purposes and should not be used for threading a warp without some changes and additions.

- #1. The draft in Diagram 4, #1 is similar to that in Diagram 3 in being written on four harnesses for an Overshot pattern. In the Diagram 3 draft, all four Pattern combinations were used, while in the draft in Diagram 4 there are only two Pattern-harness combinations, namely those written on harnesses 1&2 and 3&4. The type of pattern woven from such a 2-Block draft is called by several names - Patch Pattern, 2-Block Overshot, Pattern-written on-Opposites or Swedish Overshot. The latter name is given because this type of pattern is found more frequently in Swedish than in Colonial weaving (Overshot). The same draft might also have been written using the 2&3 and 4&1 harness pairs for the same result.
- #2 Ringing the Blocks in this draft shows clearly that there are no real Blocks on any but the 1&2 and 3&4 combinations. True, there are 2-thread combinations of 2&3 and 4&1 where 1&2 meets 3&4 and where 3&4 meets 1&2. These 2-thread combinations are known as "ACCIDENTALS" since they result from the normal threading sequence which follows a rule that in Overshot drafts no 1-3, 3-1, 2-4 or 4-2 is written in a draft. Accidentals are never woven.

PROJECT - "WEAVING ON THE DIAGONAL".

WEAVING THEORY.

3. A TYPICAL FOUR-HARNESS, SWEDISH DRAFT - A 2-BLOCK Draft. (Continued.)

The appearance of a textile "written on Opposites", or with no "threads-in-common" is very striking. It has no half-tones anywhere, though otherwise it is like Overshot. Since there are no half-tones, there are just two elements in a textile so woven, namely the Pattern-blocks which are the color of the Pattern-weft and the plain Tabby background, the color of the warp-tabby union. It will also be noticed that these 2-Block patterned textiles have more square patterns and fewer circular effects, which make the 4-Block designs so graceful - hence the name "Patch Patterns". Woven with white warp and tabby the clear background stands out in striking contrast to the pattern.

A weaver, familiar with these 2-block Overshot patterns, recognizes them very quickly knowing that since there are no blocks of more than 2 threads on either 2&3 or 4&1 those harnesses are not to be used in developing the pattern. The novice may ask what the effect would be if the Accidentals were woven. Nothing drastic would happen, of course, and cloth with a pattern would still result. But if the Accidentals were woven on the diagonal, half-tones would then border each block, interrupting the clear tabby background. These small blocks would not add to the all-over design while the half-tones would actually detract from it.

In weaving on the Diagonal one may recognize a Pattern "written on opposites" from a study of the design-spaces in the warp, alone. As usual, open each of the four Pattern sheds in succession. Then, if you find that on two of the sheds the design spaces do not show, try the 1&2 and 3&4 sheds to see if they alone carry the Pattern. Put a piece of heavy, dark yarn in each of these sheds and if the pattern blocks of one shed are next to those of the "on-opposite" shed, then this warp is threaded for a 2-Block Overshot pattern and only the blocks on these two sheds should be woven. Squaring these pattern blocks is important if the all-over pattern is to be woven, as the simple designs of such patterns depend on having them square for the best results.

So, if there are no indications of half-tones around any of the blocks which are squared, the indication is that there are no Threads-in-Common with the next block to be squared and that block will be "on opposites". The next diagram shows this.

Diagram 5. This diagram shows the sequence of "Blocks written on Opposites".

1st pair of	Weave - 1&2	OR	Weave - 3&4	Weave with Tabby
"on opposites"	Then - 3&4		Then - 1&2	& square Blocks.
Blocks				

OR

2nd pair of	Weave - 1&4	OR	Weave - 2&3	Weave with Tabby
"on opposites"	Then - 2&3		Then - 1&4	& square Blocks.
Blocks				

The 1st pair of "on opposites" is the pair most commonly used for these drafts.

More rarely both pairs of "On Opposites" are used in one pattern. The textiles which have such patterns are conspicuous for a preponderance of half-tones which may obscure the over-all pattern. There are also large numbers of clear background areas which stand out clearly but do not enhance the design.

It is not uncommon for textiles with 4-Block, Overshot patterns to contain some figures written on "on opposite" combinations. Once aware of this possibility, the use of these combinations is readily recognized.

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