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HANDWEAVER'S
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The Shuttle Craft Guild
 Handweaver's BULLETIN
 Volume XXXII, Number 8
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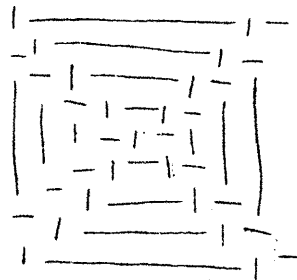
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THE WAFFLE WEAVE

The handweaver's waffle weave is known to the trade as honeycomb -- that is, among power loom textiles it is classified along with the other technique which produces three-dimensional fabric with deep recesses. The handweaver's honeycomb has oval recesses arranged in patterns, while the waffle weave is a perfectly regular, symmetrical, all-over texture of squares with deep centers, actually resembling a waffle.

Each waffle square is formed by a long float on each of the four sides, with floats of gradually decreasing length on either side of this, toward a center spot of tabby. The long floats stand up to form the top surface of the three-dimensional fabric, while the shorter floats recede gradually. Another tabby interlacement spot at the corners of the square, forms the deep center of a square on the opposite side of the fabric. This weave gives the greatest texture depth of all weaves, and is consequently useful when this three-dimensional quality is desired.



Variations in the type of threading, the type of thread, the closeness of the warp and weft set, and the arrangement of warp and weft colors, can give considerable variation to the weave, making it more adaptable to various uses than realizes at first. It is a balanced weave, requiring as many weft shots per inch as there are warp ends, and usually identical material is used for warp and weft. But here too one may make imaginative variations.

The threading basis for the waffle weave is the point twill, with one return point at the center of the waffle square, the other one at the long, outline

WAFFLE WEAVE -- DRAFT AND TIE-UP STUDY

The usual waffle weave is drafted on eight ends, and the complete figure requires nine, the first thread of the next draft repeat serving as the balance thread which completes the figure. Though a larger draft may be used for special circumstances, only the 8-end waffle will be taken up here.

To study the structure of the cloth, the method for finding the draft once this structure is placed on drafting paper, and then arriving at the tie-up, we shall start diagramming from the description. The problem is to produce a square figure, outlined on four sides by the maximum length floats the 8-thread draft allows, descending to a deep center in the manner of an inverted pyramid. Both warp and weft floats graduate from the edges down to this center through diagonal lines of interlacement which stair-step from each corner to the center.

To diagram the arrangement, mark off a square nine small squares wide and high, on cross-section drafting paper. Above the square, number the small squares from right to left: 1, 2, 3, 4, 5, 6, 7, 8, 1. This indicates the eight threads of the draft and that the ninth square is a repeat of the first. At the right-hand side, number the small squares from top to bottom in the same manner. This series numbers the weft shots, with the ninth being a repetition of the first. (The #1 drafting pen is best to use for lines and figures) Within the area, fill in the small squares in two corner-to-corner diagonal lines which cross in the center. In the right-hand vertical space, under the figure '1' fill in the five center squares, the ones marked 3, 4, 5, 6, 7 at the right. In the second vertical row, fill in the three center squares marked 4,5,6 at the right. In the third vertical

row, fill in the center square, on the '5' line. Reproduce these at the left-hand side of the draft in the vertical rows numbered 1, 8, 7. This now is the entire texture diagram of the weave, and in the language of the power-loom weaving books such as Oelsner and Dale, Watson, Strong, and others, this little **diagram** is both the draft and the tie-up, since power-loom designers are trained to read draft and tie-up from such a diagram as easily as from the specific drafts and tie-ups which the handweaver usually uses. The method for reading the draft and tie-up is given in detail below, as handweavers who use these technical books must learn the system.

The filled in or black squares on the diagram represent warp ends on the surface; the white squares represent weft on the surface. This is the reverse of the system used in developing pattern weaves such as Overshot, but it is the easiest one for all single-shuttle texture weaves, in fact, for most weaves except the 2-shuttle pattern weaves where the diagramming is done to show pattern rather than interlacement system.

The draft is derived by making a dogmatic assumption at the outset, and then filling in by comparisons. Directly above the draft set down the top and bottom lines to define an 8-harness draft. Eight harnesses are assumed first, because there are eight threads in the draft and each one might be different. In fact, the numbers which are placed above the diagram indicate that the first assumption was that the draft would be an 8-harness twill. Between the two lines defining the draft, number the horizontal spaces from 1 to 8, at the right of the first space, which lies directly above the first vertical line of the diagram, numbered 1. The dogmatic assumption is now made, and this is that the first two threads of the draft are on harnesses 1 and 2, so fill in the first draft square on the harness 1 (lowest) row, the second on the harness 2 row. (One could have placed these two first threads on any of the

harnesses, but starting with 1 and going forward is logical.) The position of the third thread, and all those following, must be determined by comparisons. Each one must be different from the one which lies next to it, but it may be threaded on the same harness as any of the others. Therefore it is possible that the third thread may duplicate the first and be placed on harness 1. To determine this one compares the spots on the vertical rows under the draft. Row 1 shows 1,3,4, 5,6,7, raised, while row three shows warp raised on lines 3, 5, 7, only. Therefore the third thread of the draft is on a different harness and is placed on 3. To determine the position of thread 4, one must compare the vertical line under it with those for 1 and 2. Since it is different, it is drafted on harness 4. The comparison for the fifth thread show that its arrangement is different from the first, second and third, so it is placed on harness 5. When the comparisons with the first, second, third and fourth threads are made to determine the placement of thread six, it is found that both six and four show identical arrangement, so the sixth thread is drafted on harness four. Comparisons for the seventh thread show that it is identical to the third, so it is placed on harness 3. The eighth thread is identical to the second, so it is placed on harness 2. It was established at the outset that the last thread was a duplication of the first, and the first thread of the draft repeat, so it is not included. Thus, one has arrived at the minimum and final draft, which is a 5-harness point twill, threads arranged: 1, 2, 3, 4, 5, 4, 3, 2, repeat.

This is the method which is used for determining the draft for any sample or photograph of a textile in an unfamiliar technique. One must start by making an accurate diagram of the interlacement pattern. There is no short-cut to this, but one finds that the little thread counter magnifying glass makes the work much easier. If the technique in which the textile is woven is a familiar one, then the only

thing one need determine is the arrangement of the units which compose the pattern. This is a comparatively simple process for which one need not set down the structural diagram. Thus, as one's experience grows, and one becomes familiar with more techniques, the analysis process becomes much easier.

The next step is to determine what treadle tie-up will produce the diagrammed texture. Since, on the diagram, the vertical spaces represent warp ends, the horizontal spaces indicate weft shots. Black squares along a horizontal space indicate lifted warp ends, and one refers from the diagram squares to the draft square above to learn which harnesses are raised. On the first line, only the first thread is lifted, the thread drafted on harness 1. Place the figure 1 to the left of the diagram, in the first space. Progressing to the second line, it is noted that the second and eighth threads are both lifted; referring to the draft one finds that both of these are on harness 2, so 2 is placed on the second line, to indicate that it is tied to the second treadle. The third line shows the first, third and seventh threads raised, and checking with the draft one learns that these require the lifting of harnesses 1 and 3; place 1-3 on the third space at left. (Dashes between figures indicate harnesses which are tied together on the same treadle. Dashes connecting figures should not be used to mean anything else, or confusion will result.) The fourth line shows the first, second, fourth, sixth, and eighth threads raised, so 1-2-4 is placed at the left, indicating the fourth treadle tie-up. The fifth line shows all but the fourth and sixth threads raised, so 1-2-3-5 is placed at the left. For the remainder of the lines, comparisons such as were made in determining the draft show that the sixth line is the same as treadle 4, the seventh as treadle 3, the eighth the same as treadle 2, so these would not be duplicated. Now that the harnesses for each of the required 5 treadles are determined, these may be converted to a standard tie-up, if desired.

There is only one element left to be determined, although the drafter already has the information required. This is the order in which the treadles are operated. Although one knows through making the tie-up from the diagram that the treading order is: 1, 2, 3, 4, 5, 4, 3, 2, repeat, this is pointed out for a very definite reason. It is plain that the texture requires exactly the same number of treadles as there are harnesses in the draft, and that the order of treading these is simply a duplication of the draft. This is the situation which exists with most single-shuttle, balanced weaves, and may be taken as a general rule. Thus: with the tie-up correctly made, in orderly fashion, simply treadle the draft to get the basic fabric for the threading. Variations of the basic texture, of course, provide exceptions to this rule. This is weaving-as-drawn-in for single-shuttle techniques, and the process is so simple that giving written treading orders for such weaves amounts to an absurdity.

The 5-harness draft is the minimum draft for standard waffle weave. However, because of the dominant use of 4-harness looms, it is desirable to work out an adaptation of waffle weave for 4 harnesses. On examining the diagram made for determining the draft and tie-up, it is seen that the weft floats are stronger than the warp floats since the length-progression is 7, 5, 3, 1, while the warp float progression is 5, 3, 1. Therefore it is logical that an adjustment be made which reduces the weft-float area rather than the warp-float. The requirement is the elimination of the fifth harness, without reducing the size or general contour of the texture, by placing thread five on harnesses 1, 2, or 3. Examination of the diagram shows that if it were placed on harness 1 it would destroy the long outline thread in the weft, and the same would happen if it were placed on harness 2. Also, if on harness 3 it would destroy the potential of the draft for weaving a tabby because the progression would be even-to-even instead of even-to-odd.

Therefore harness 3 is selected. This makes only one change in the diagram: on the third and seventh shots the center thread is warp instead of weft, this shot becoming a 1-3 tabby. As far as the resulting fabric is concerned, this spreading of the tabby in the center of the waffle has a tendency to flatten it out a little and to give a fabric with a less strong 3-dimensional texture, but the main outlines of the waffle weave remain. Another point is sacrificed in that the fabric is attractive on one side only, instead of on two. But in reducing the harness requirement below minimum, it is expected that some texture points be sacrificed. The tie-up for this 4-harness draft remains the same, except of course the elimination of the fifth harness (on the fifth treadle), and the substitution of 3 here. But since this 4-harness threading is a distortion of a 5-harness threading, one must retain the five treadle tie-up, and treadle according to the 5-harness draft instead of according to the adjusted, 4-harness draft.

Continuing with the 8-thread waffle weave, there is an 8-harness variation, woven on an 8-harness straight twill instead of a point twill, which has more texture interest than either the 4 or the 5-harness waffle. The added interest is gained by setting the weft-float and the warp-float areas on the diagonal instead of parallel to warp and weft, and offsetting the diagonal interlacements which lead to the recess. Two interlaced warp and weft threads form the deep section, and a pair of long, off-set floats form each side of the square. The diagram made from the tie-up, looks like one of the 8-harness fancy twills, which is exactly what it is. A diagram shows the fundamental texture or interlacement pattern, but it cannot show the 3-dimensional texture, nor the position distortions which occur on the loom. After this textile was woven, and this article was written, the same textile was noticed in the June AMBASSADOR magazine, page 82, in wool and rayon, two threads of black, six of white.

Waffle Weave, DRAFTS and TIE-UPS

Five-Harness Waffle Weave

8 Draft				Tie-Up					
		5		5					5
	4		4	4				4	
	3		3	3			3		3
2			2	2	2			2	2
			1	1	1			1	1
			1			1	1		
						2	3	4	5

Four-Harness Waffle Weave

8 Draft				Tie-Up					
		4		4				4	
	3		3	3			3		3
	3		3	3			3		3
2			2	2	2			2	2
			1	1	1			1	1
			1			1	1		
						2	3	4	5

Eight-Harness Waffle Weave

8 Draft				Tie-Up									
8				8		8		8					8
	7			7	7	7	7	7	7			7	
		6		6	6	6	6	6	6	6		6	
			5	5	5	5	5	5	5	5	5		5
			4	4	4	4		4		4	4		4
			3	3	3							3	
			2	2		2	2						2
			1	1	1		1						1
						1	2	3	4	5	6	7	8

The tie-ups are all given for rising shed. This follows the usual convention; rising-shed tie-ups for looms with more than 4 harnesses, since these are jack-type, and for off-balance 4-harness tie-ups. If using forced sheds on a counter-balanced loom, tie to the blank spaces instead of to the numbers.

DESIGNING FABRICS in WAFFLE WEAVE

Suitable materials for waffle weave are various and include almost any smooth yarn except linen. Linen is unsatisfactory because the outline floats of over 7 ends, under 1, are too long for the wiry fiber and make a stringy fabric. Also, the texture is too deep to be practical for this fiber which requires very severe, heavy ironing.

Warp settings are usually best if made slightly closer than the setting which produces a good, firm tabby -- should be about the same as for a firm twill. Thus, if a good tabby is produced by setting the yarn at 20 per inch, then set it at 24 for a firm waffle, if 30 per inch makes a good tabby, set the waffle 36.

As would be expected of a fabric which has so much texture depth, the waffle weave fabric is quite elastic and there is more take-up in both warp and weft directions than for most textiles. No strict rules for the take-up can be given, because this will vary with the draft used and the set of the warp. Since the 4-harness waffle is shallower than the 5 or 8-harness, the take-up is less. The work done by the Shuttle Craft Guild indicates that with warp settings slightly closer than for tabby, the take-up for the 4-harness waffle is about one-eighth, and for the 5 and 8-harness waffles, about one-sixth.

Color interest may be added to the waffle weave, and an increased illusion of depth, by warping and weaving a second color in the recess. For the 4 and 5 harness threadings, use 3 threads of the second color in each 8-thread draft, placing them at the point: on harnesses 4, 3, 4, of the 4-harness, on 4, 5, 4 of the 5-harness. This 2-color effect is even better on the 8-harness draft, and requires 2 threads of one color, 6 threads of the other, threaded 1, 2, accent color, 3, 4, 5, 6, 7, 8, main color. Another good variation, if one wishes to weave stripes

or plaids in waffle weave, is to place various colors at the outline position which is on harnesses 1, 2, 3, and 3, 2, of the 4 or 5-harness drafts. By using the waffle weave for stripes and plaids in this manner, one takes advantage of the long warp and weft floats to gain a color stripe which is much stronger than any other technique will give, and which blends in a pleasantly curved outline into the foundation color used in the recesses of the texture. If the designing objective is to achieve this strong color effect, rather than to make a very deep fabric, set the warp wider -- at the setting which will produce a good tabby. The fabric will be much more spongy than a tabby fabric, but it will still be good. For the 8-harness weave, place the color stripes on harnesses 3, 4, 5, 6, 7, 8, with the foundation color on 1 and 2.

By the way, the forecasts for fall and winter in clothing as well as all kinds of decorating fabrics, shows that the popularity of plaids is increasing. Plaids have been so strong in the textile field for the past half dozen years, that an increase hardly seemed possible, but now we find towels, drapery, upholstery, and even rugs and bed sheets in plaids. It seems that one just can't go wrong with a plaid. So try a plaid waffle weave for a fall project.

A Coat Fabric in Waffle Weave. A length for a short, boxy coat was woven in the 8-harness waffle weave, which proved to be remarkably handsome. The material used was the Lily Mills Handweaving Wool (Article 110) 2/16 French-spun worsted, set at 24 ends per inch. Three colors were used for the warp: wine for all threads on harnesses 1 and 2, and 6 grey ends on harnesses 3, 4, 5, 6, 7, 8, alternated throughout with 6 dusty rose ends on the next 3, 4, 5, 6, 7, 8. One length was woven with the warp colors reproduced exactly in the weft. This gives a two-sided fabric, both sides excellent and it is difficult to decide which is more attractive, though both are quite

different. (See first PORTFOLIO sample.)

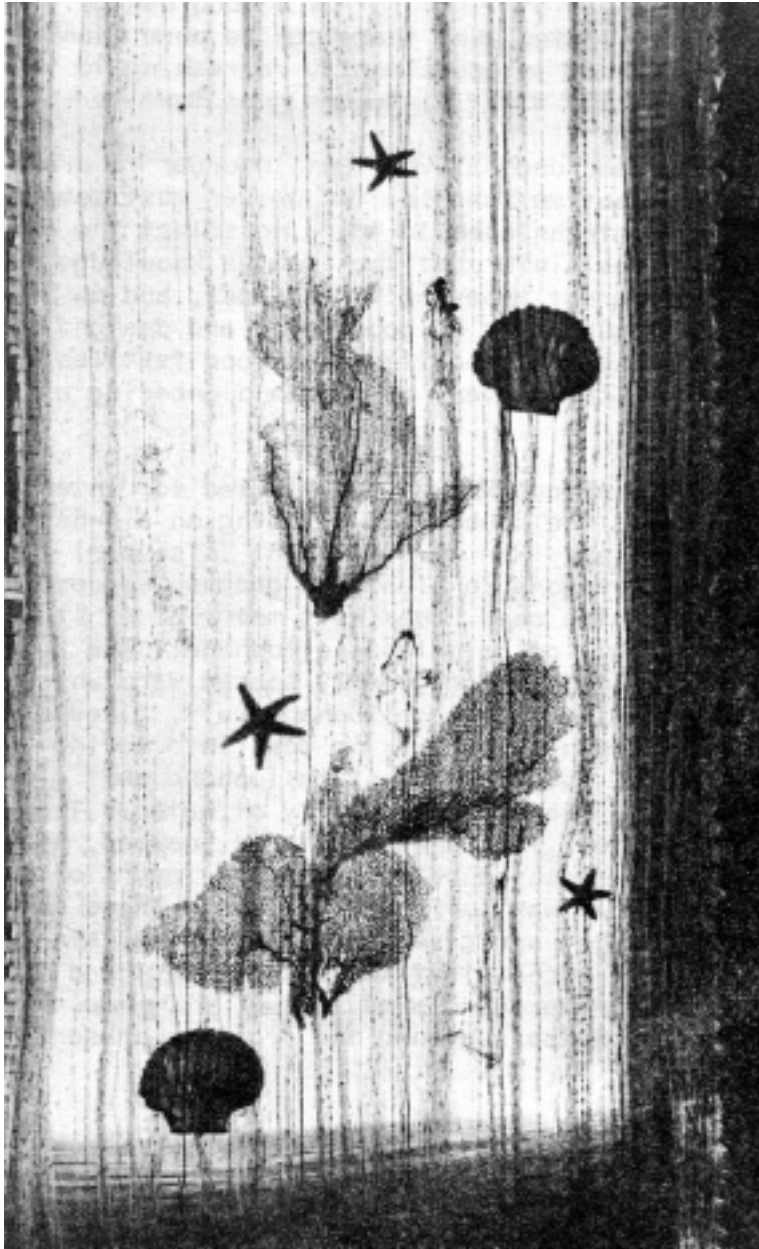
Another length was woven with the wine color only. Although the treadling of both fabrics was identical (1, 2, 3, 4, 5, 6, 7, 8, repeated) the two looked so different that it was hard to believe they were both woven on even the same threading. Both sides are good, but the one in which the wine color dominated seems the most attractive, at least in these colors. (See second PORTFOLIO sample.)

Towels, Wash Cloths, Dish Cloths: In the very absorbant 20/6 cotton (Lily Article 914) the 8-harness waffle made very attractive, practical, and unusual towels and wash cloths. The 4-harness threading would be equally attractive. The deep texture increases the absorbancy of the fabric, and gives the desirable roughness. Part of the attractiveness of the towels lies in the fact that strong colors can be used effectively, and that stripes and plaids, with colors coordinated with the draft, are excellent

IMAGINATIVE, SUBJECT-MATTER WEAVING

The photograph shown opposite is of an unusual handwoven textile of almost breathless beauty. It is a transparent, decorative panel entitled WATER, woven by Dorothea Hulse as one of a series on THE ELEMENTS. The other textiles in the series were interpretations of EARTH, FIRE, SKY. This panel and the EARTH one, were presented to the Shuttle Craft Guild collection by Mrs Hulse. The FIRE textile is now hanging in the California-Designed Exhibit, a juried, invitational exhibit of the work of California commercial artist-craftsmen, now at the de Young Museum in San Francisco.

The Photograph of WATER is presented here to illustrate a functional textile, which the one function is decoration. It illustrates also the necessity



WATER, A Decorative Panel, by Dorothea Hulse

an idea as the starting point of a good design. And then it illustrates that there can be pure "fun" textiles -- that it is occasionally refreshing to take an idea and play with it, to design a textile which is unconventional in every sense, but is beautiful, expressive, and decorative. But in order to create a good Imaginative Textile, the weaver must have a knowledge of techniques so as to select the one which will best interpret the idea, a knowledge of the way different types of threads act, and an awareness of the qualities of good color and design. These are the necessary foundations for good textiles of this kind which in every case mean pioneering a new field.

The technique Mrs Hulse selected for interpreting water was the double-weave tubing on a 4-harness twill threading. Her warp material is several lightweight rough rayons in blues and greens, spaced irregularly in the reed. Her weft material is strips cut from a roll of colorless cellophane. The double thickness, with the irregularly spaced warp which displaces on the smooth cellophane weft, gives a feeling of depth, like looking down into moving water; while the transparent cellophane weft gives the shimmery, transparent quality of water. The realistic bits: flat shells, bits of seaweed, star fish -- were cemented between the two layers of the fabric after it was cut from the loom. These notes on the designing are given not for copying, since the spirit of such a textile is the thing, and the spirit could never be copied. They are given to show how Mrs Hulse reasoned the problems presented by her subject.

Most handweavers know the name Dorothea Hulse, because of her designing and weaving of the Robe, for the motion picture THE ROBE. The story of this interesting project has been given in HANDWEAVER AND CRAFTSMAN and a number of other periodicals. Mrs Hulse has left some of the yarn which was especially dyed and

spun for The Robe, and tells me that if any Shuttle Craft Guild member would like to have a miniature Robe -- an exact replica of the original -- her price for weaving and mailing it will be \$5.00. Write directly to Mrs Dorothea Hulse, 517½ North Robertson Blvd, Los Angeles 48, California. Mrs Hulse has been a commercial weaver-designer for twenty-five years. She has the added talent of being an exceptionally fine public speaker and has just returned from a two-month lecture tour. So if your Guild is looking for an outstanding lecturer for one of your special programs, you might like to write to Mrs Hulse about her next lecture tour.

UNDERSTANDING TIE-UPS

Because so many different systems for giving tie-ups are found, a little study of tie-up conventions will help a general understanding. First of all, an explanation of the tie-up system used on page 9. This is the cursive, graphic system, the system which, like the cursive draft, is suitable for informal systems of presentation such as this BULLETIN. It is the system which is plainest when writing drafts on unruled paper. The deviations between this and the graphic system are that cross-section rulings are not used, and the harness numbers are substituted for the customary tie-up symbols. The substitution is made for clarity, since without horizontal lines to differentiate harnesses, errors are more easily made. The standard tie-up conventions are:

Horizontal spaces represent harnesses, and these are numbered from bottom to top, according to the American system of numbering harnesses from front to back.

Vertical spaces represent treadles, and these are numbered from left to right according to

natural treading motion. A little expansion is in order here, because there has been a recent tendency for weavers to number treadles backwards, reasoning that if drafts are written in a backward direction (right to left) tie-ups should follow the same direction. The reasoning here is faulty because, whereas normal threading direction is right to left, normal treading direction is left to right. Test this by putting someone who is unfamiliar with weaving at a loom and telling him to operate the treadles in 1, 2, 3, 4, order. Almost without exception he will start with the left-hand treadle and work toward the right. This normal direction of foot operation is born out in other activities: marching order is left-right; in most cases a person will start down stairs with the left foot, and put on the left shoe before the right one. If mental blocks are to be avoided, the reasonable approach to treading is the following of normal activity direction, which means treading, and numbering treadles, from left to right.

There are three commonly used tie-up symbols (excepting the figures used in the cursive system). The "x" symbol in the square of a tie-up draft means that it is written for a sinking shed (a counter-balanced loom or the sinking lams of a countremarche loom). The "o" symbol means that the tie-up is written for a rising shed (a jack loom, or the rising lams of a countremarche loom). A solid square may be interpreted either way. Actually, the differentiation is not very important. The two types of tie-ups are opposite to each other and if a sinking-shed tie-up is made on a rising-shed loom, the designed surface will appear on the bottom instead of the top. To change this situation simply make the lam-treadle connections to the blank spaces of the tie-up instead of to the spaces with symbols. This applies whether the change is from rising to sinking, or from sinking to rising, and regardless of the number of harnesses involved in the draft.

As a generality, it may be assumed that any tie-up for more than 4 harnesses, or any tie-up for 4 harnesses which requires unbalanced treadles (3 or 1 harnesses per treadle) is written for the rising shed. Four-harness balanced tie-ups (2 harnesses to each treadle) are usually written for the sinking shed. For counter-balanced looms which employ some special means for making forced, unbalanced sheds, make the ties to the blank spaces of the rising-shed tie-up. There are not many countremarche looms in use, but tie-ups for these have both the rising-shed and sinking-shed symbols, as every harness must be tied to every treadle.

In numbering the treadles for a tie-up, only the treadles which control the texture or pattern blocks are numbered. Tabby treadles, if the tie-up includes these, are designated by a and b. If one or both tabbys are incorporated at a specified interval as part of the texture, instead of alternating with pattern shots, they are tied and numbered in the normal order for the weave instead of being considered separately as tabbys.

Different tie-ups show different systems for the actual treadle arrangement, and the weaver must adapt the arrangement to the demands of the loom. Regardless of the way the draft shows it, the order of treadles should be determined by the most efficient weaving system, except for experimenting. Efficiency factors to be considered are:

- Development of a quick, touch-system treading.
- Prevention of errors.

- Most logical foot order for the loom.

With these in mind, for all weaves which require a tabby alternating with a pattern shot, the a and b tabbys should be placed at the right to be operated by the right foot, the numbered pattern treadles to the left to be operated by the left foot. Never tie the two tabbys in the center, or at the two outsides, because these systems prevent

alternate foot motion, lead to errors, and make impossible the development of weaving rhythm or efficient touch-system weaving. If the weave requires two treadles only, tie these in the center. For weaves, such as the waffle, which do not require a tabby foundation, make the treadle tie-up according to the type of loom. Front-hinged treadles are best operated in walking fashion, so the odd numbered treadles should be tied, in order, at the left, and the even numbered treadles, in order, at the right. This permits the left-right alternate treading. Some weavers start the even-numbered treadles at the center of the loom and progress to the right, some start them at the right-hand side and progress to the left so the alternate treadles both move from the outside, in. Either way is satisfactory, according to individual preference. Rear-hinged treadles are best operated in a bicycle-like motion or by sliding the foot directly from one treadle to the next. Therefore, for weaves for which there is no tabby interruption, it is best to tie treadles in the order in which they occur in the tie-up. For an 8-treadle weave, for instance, one slides the left foot along treadles 1, 2, 3, 4, and the right foot along treadles 5, 6, 7, 8. Some prefer to make the right-foot tie-up in 8, 7, 6, 5 order.

A common question among weavers -- Should the tie-up be given at the left or the right of the draft? This seems to be a matter of preference and convenience. In most cases the tie-up appears at the left because the draft, which is written and read first, is read from right to left. But if space is left at the right for the tie-up, there could be no logical objection for placing it there.

Another common tie-up question is -- Which is the correct a tabby and which is the correct b? The question usually refers to the 4-harness twill-derived techniques for which the tabbys are 1-3 and 2-4. The answer is that it makes no difference. Either

1-3 or 2-4 can be a or b, and no logical reason (as far as I have been able to discover) points to a preference for either. For any off-balance tie-up for which one treadle requires more harnesses than the other, call the tabby with the fewer number of ties b. This places the lighter treadle at the outside of the loom and the heavier one nearer the center, which helps equalize the weight.

Threadbender
My dear Guild member: News Letter

We are making good progress with the new Home Study Course. The FOUNDATIONS book to accompany it is finished, and so is Part I of the Course. The response from many of the weavers who are already working on the ten lessons of Part I is enthusiastic we are glad to say. Almost everyone is unanimous in being amazed at how much information could be packed into just ten lessons. Although this course is devoted to simple techniques, every lesson has problems in designing and in making up actual practical fabrics, as well as in sampling to learn techniques and in learning the little tricks which will make the loom do what we want it to. In this course is given the foundation for the understanding of drafts and the drafting and analysis which will follow in the later parts. The course is planned in such detail that it should make the learning of handweaving perfectly simple, even for the person who has no familiarity with handweaving and no opportunity for any outside help. I believe that every teacher of handweaving will find a great deal of valuable help to her teaching, in these lessons.

It is about the FOUNDATIONS FOR HANDWEAVERS, the introductory book for the entire Course, that we

have the greatest enthusiasm, because this contains a great wealth of material which is not found in any (other published source for the handweaver. The ten FOUNDATIONS cover the subjects of Looms, Equipment, Color and Design, Yarns, Mechanics and Skills, Projects, Study Materials, Philosophy, Reference Material, Terms and Vocabulary. There is no duplication of anything given in the HANDWEAVER'S INSTRUCTION MANUAL. The sections on Color, Design, Project planning and Skills are probably the outstanding parts because these subjects have been generally avoided in the literature. There are about 80 8½ x 11 pages, so crowded that they would make a sizable printed book. This, I think, is the finest thing for weavers the Shuttle Craft Guild has ever put out, and I believe that every single handweaver would find it a constant source of help. It will be sold separately for \$7.50.

The pre-publication special offered in June is no longer valid. The "bargain package" is \$27.50. It contains one year Shuttle Craft Guild membership or renewal (\$7.50) FOUNDATIONS for HANDWEAVERS (\$7.50), HOME STUDY COURSE Part I (\$10.00), Part II (\$10.00) -- \$35.00 worth for \$27.50. With the PORTFOLIO edition of the BULLETIN, the bargain price is \$37.50.

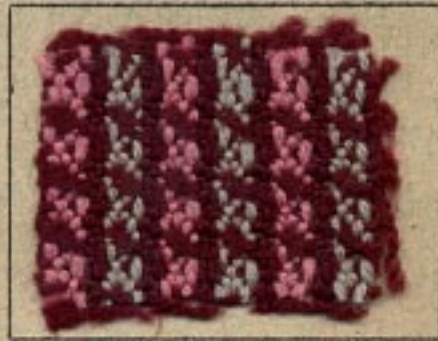
The Shuttle Craft Guild has been delighted to welcome several notable guests this week, weavers who have been names on cards and in publications before: Col and Mrs Fishback of Penland and Lily Mills, Mama Gravander (an old friend, always refreshing) and her famous sister, Mrs Sara Mattson Anliot. With our students, we enjoyed hearing of Mama Gravander's recent weaver's tour of Mexico. How fortunate those who joined the tour. Mama says she is planning to conduct a tour to the Scandinavian countries next summer, and we hope some Shuttle Craft Guild members will be joining her. Reports of hot weather have made us wish we might share our cool lake breezes. Three days at 90, but otherwise the weather has inspired all of us to lots of work, with a late afternoon swim for refreshing. The last of this month we shall be giving a 3-day Seminar at Medford, Oregon, while attending the Shakespearean Festival at Ashland.

Sincerely,
August 1955

Narris F. Tibbels



The
Eight-Harness
Twill Waffle in
Lily Article 110





This tiny sample is cut from a cheap, dime-store dish cloth but is added because it illustrates the true, 5-harness waffle weave. It made a poor dish cloth, because the warp was set too wide for the weight of the yarn, making a limp, sleazy rag, but for analysis purposes it is better than a better quality, more closely woven fabric. Notice the interlacement pattern, which makes the tie-up.

Shot 1 -- weft travels under 1, over 2, 3, 4, 5, 4, 3, 2;

Shot 2 -- over 1, under 2, over 3, 4, 5, and reverse;

Shot 3 -- under 1, over 2, under 3, over 4, 5, and reverse;

Shot 4 -- under 1, 2, over 3, under 4, over 5, and reverse;

Shot 5 -- under 1, 2, 3, over 4, under 5, and reverse.

Then shots 4, 3, 2 are duplicated.

To make the tie-ups from this analysis, use one treadle per shot and tie to the "unders", or the surface warp ends.

The sample at right is the 4-harness adaptation of this 5-harness twill. Compare it with the 8-harness weave on the cover to see that relative depth is not as great, though it is still an attractive, useful waffle. The thread used is 3/2 Pearl cotton (Lily Article 114, size 3), set and woven at 15 ends per inch.

The two wool samples are with identical tie-ups and treadling, but color arrangement is different and sides are reversed. There is a slight tie-up difference between this and the BULLETIN, but the BULLETIN is an improvement.

