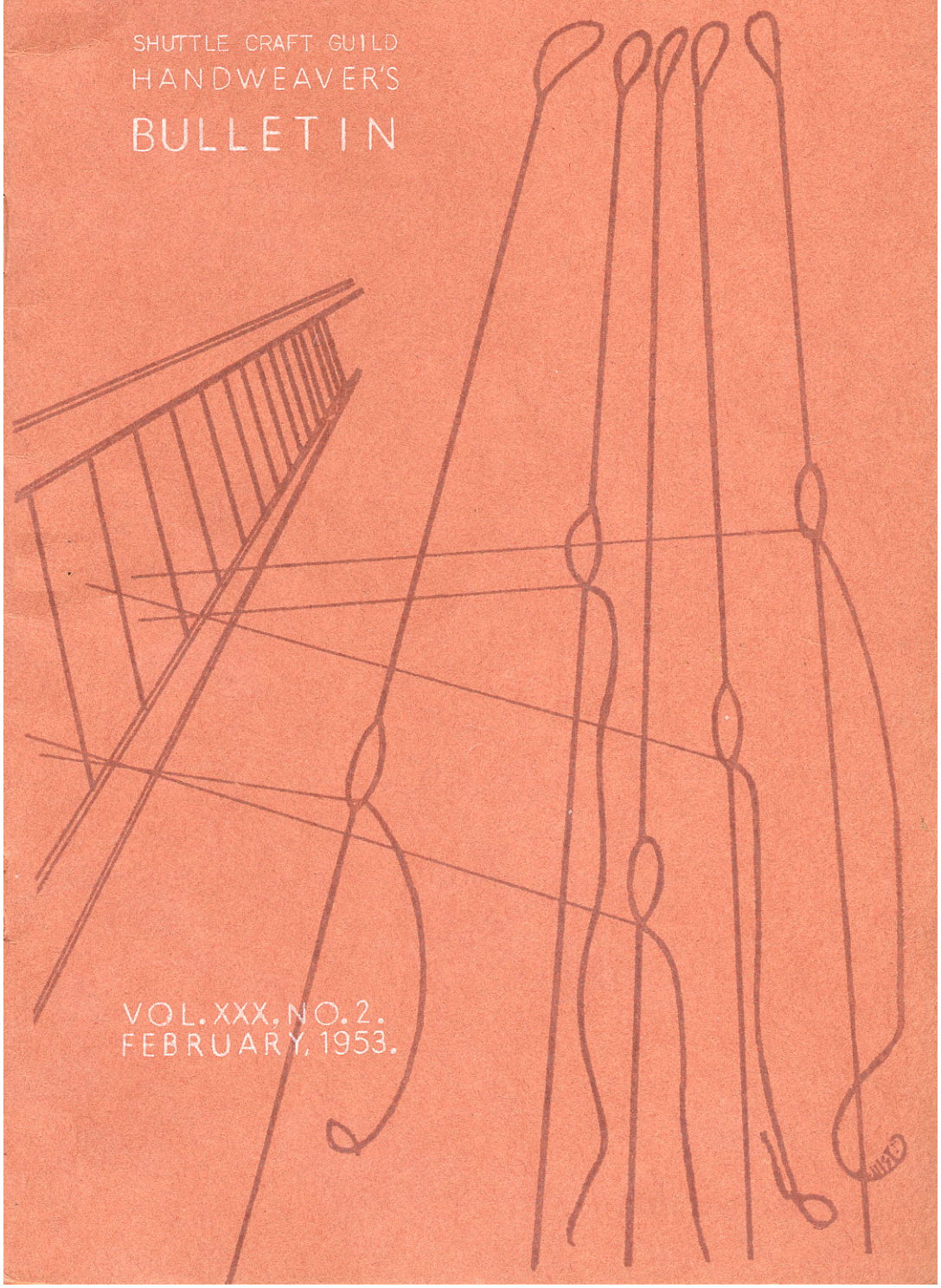
SHUTTLE CRAFT GUILD

HANDWEAVER'S BULLETIN



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There is a group of linen weaves, each one making a beautiful and useful fabric, which is worth considering together because of the mutual relationships of the three techniques. An understanding of one leads to the understanding of another, and the comprehension of the method for making drafts, tie-ups and treadling orders leads to fuller and more creative use of the weaves. These weaves are the Spot Bronson, the Swedish Lace and the Lace Bronson. This last technique, by far the most useful and versatile of the three, we propose to show in this BULLETIN is misnamed, and we therefore propose the change by handweavers to the use of the name Atwater Lace in honor of the originator of the weave. As far as weaving publications are concerned, we have found no drafts for this weave existing previous to Mary M Atwater's introduction of it in the Shuttle Craft BULLETINS in the 1920s. Although Mrs Atwater herself says that this is not one of her favorite techniques, its wide and justified popularity among handweavers, even those who have never heard of Mrs Atwater or used her publications, places Atwater Lace as a foremost handweaver's technique. The history of the development of the technique is given here as a deduction from the nature of the three draft and weave forms and is not necessarily factual.

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The SPOT BRONSON Weave

The Spot weave, called by the J and R Bronson brothers in their DOMESTIC MANUFACTURERS ASSISTANT published in 1817 the Diaper weave, was common for household linens among the colonial American weavers. Since it gave a fabric which was softer, more absorbant and more decorative than tabby, its chief use was in towels and table linens. This weave apparently came from England where it was known as the Spot weave meaning a pattern made up of small, isolated spots, whereas Diaper means a small all-over texture figure. The term Spot seems more definitive. The weave was reintroduced to handweavers in this country when Mary M Atwater found a copy of the old Bronson and realized the practical beauty of this weave for which the Bronsons gave 13 or their 35 drafts. It was logical that she credit this remarkable source by renaming the technique the Spot Bronson.

Draft (1) on the diagram is in the Spot Bronson technique. The threading here gives two alternating pattern blocks as shown in the profile draft (10), though profile drafting is not common for this Texture Contrast weave. Note that every alternate warp in the entire draft is on harness 1. Therefore harness 1 used alone will inevitably weave a tabby. Notice that threads occur in pairs on the harnesses beyond 1, which are known as the pattern harnesses. Each one of the pattern harnesses weaves spot units which cannot be called pattern "blocks" because each repeat of a unit is limited to 4 threads, 2 of them on harness 1 and 2 on a pattern harness. The only way a block can be built up is by alternating the threading between two of the spot units, as shown in draft (1). Since the pattern harnesses are those from 2 on to the end, only 3 pattern units are possible on 4 harnesses, and a draft such as the one illustrated which requires 4 pattern units must be threaded on 5 harnesses. Most of the early American linens were 5-harness threadings. Drafts in this tech-

nique for 4 or more harnesses are easy to construct. The A unit is 1,2,1,2; the B unit is 1,3,1,3; the C unit is 1,4,1,4; the D unit is 1,5,1,5, and so on for E, F, G units, or as many as the weaver wishes to use. These units may be put together in any desired order but one unit cannot be repeated unless a unit on a different harness separates the repeats. In some cases, particularly if very fine threads are to be employed and there was a desire for a softer, fabric, the basic units are increased to 6 threads: 1,2,1,2,1,2, or 1,3,1,3,1,3, etc. Whichever unit is selected, 4 or 6 thread, it should be used throughout. There are a few variations which occur in this weave. In some cases the A unit (1,2, repeated) is used throughout for weaving tabby borders or stripes to separate the pattern figures. In this case the 1, 2 or A unit may be repeated as many times as desired, but it can never be woven to give Spot texture. Some old drafts show units of irregular sizes but this type of drafting is seldom used as the effects are poor unless designed with great finnesse.

The Spot Bronson weaving system is simple and the tie-up easy to understand and make. As the weave is off-balance and the tie-up cannot be made standard the tie-up is given for only the rising-shed, jack-type loom. Difficulties will be encountered if one tries to weave this on a counter-balanced loom. Obviously, when the first harness is raised, a tabby shed of alternating warp ends up is formed. This is commonly given as the "b" tabby merely for the convenience of placing the lightest treadle weight farthest from the center of the loom. The "a" tabby will then have to be all of the pattern harnesses tied together regardless of the number of pattern harnesses employed. In making the tie-up for the spot texture, only the spots controlled by a single harness are woven at one time and the other harness group is tied to weave tabby background. On the "a" tabby the weft floats over all threads on harness 1, and if the number 2 harness is omitted from the tabby

tie-up the weft will float over all warp ends threaded on harness 2 as well, making the total spot skip over 1,2,1,2,1. To tie the four pattern combinations for the draft (1), simply tie 4 treadles, omitting one pattern harness on each treadle, in order, as shown in the tie-up (2).

In designing tie-ups for the rising shed loom, it is necessary to remember that when a pattern harness is raised, all warp areas controlled by that particular harness will weave in tabby (or background texture) while the areas controlled by pattern harnesses which are left down will weave in the pattern texture. This somewhat backward thinking is a bit difficult to absorb at the outset, but in this lies the basis for the tie-ups in many techniques and for doing free designing at the loom.

The Spot Bronson is woven, as are most of the linen weaves, to produce a perfectly balanced fabric. This means a warp-weft balance with exactly as many weft shots per inch as there are warp ends, and also a perfect balance of texture units and only one color. The weaving follows the threading units and 4 weft shots balance the 4 warp ends of each unit. Just as harness 1 is threaded to each alternate warp harness 1, tabby "b" is raised for each alternate weft shot. To weave the A or harness 2 units as texture, treadle 1 (which leaves harnesses 1 and 2 down and raises the other pattern harnesses 3,4,5) alternately with tabby, twice. The order is: treadle b, 1, b, 1. (These figures refer to treadles shown in the tie-up, and not to harnesses.) The B unit is woven on the second treadle in the order: treadle b, 2, b, 2; C is treadled b, 3, b, 3; D unit b, 4, b, 4; tabby is of course woven b, a, repeated. To weave alternating Spot texture squares on the threading given at draft (1) with tie-up (2):

treadle b, 1, b, 1, one shot each
b, 2, b, 2, " " "

treadle b, 1, b, 1, one shot each
b, 2, b, 2, " " "
b, 1, b, 1, " " "

b, 3, b, 3, " " "
b, 4, b, 4, " " "
b, 3, b, 3, " " "
b, 4, b, 4, " " "
b, 3, b, 3, " " "
Repeat the entire rotation.

Once the simple treadling rotation for each unit is fixed in mind, the weaver is able to do free designing directoy on the loom in the technique.

The draft, tie-up and weaving for the Spot Bronson, is taken up in detail even though it is not a widely usec technique these days, because in the understanding of thi simple weave is the foundation for understanding many of the more interesting unit weaves.

The LACE WEAVES and the TIE-DOWN

The weaves which produce contrasting open and closed textures are often known as Lace weaves, though the handweaver should be aware that the word "lace" is actually a misnomer here. True lace cannot be produced on a loom which uses tensioned warp crossed at right angles by weft. But because the term is a handy one to describe weaves in which there is a slight displacement of either or both warp and weft threads when tension is released, we continue to use it. The Swedish Lace and Atwater Lace are two of these psuedo-lace weaves.

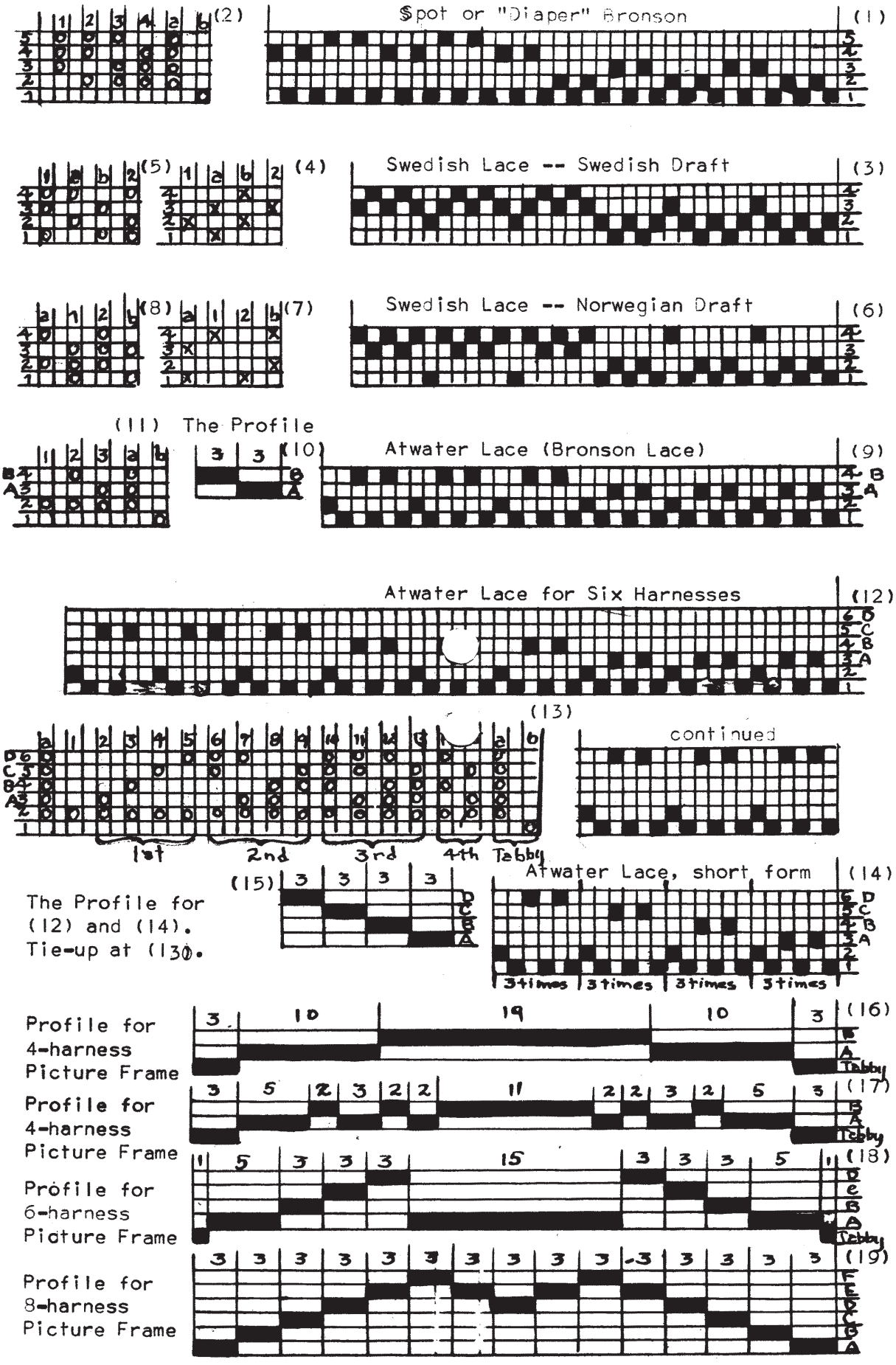
An understanding of the structure of the Swedish and Atwater lace requires a comprehension of the nature and function of the tie-down thread. A tie-down thread is a warp or weft end which occurs at regular intervals in the interlacement to tie certain warp or weft floats into the fabric. In the Swedish and Atwater Lace techniques there is a regular skip over 5 ends, of weft on

one side of the fabric and warp on the other. Between each of these 5-thread skips lies a single thread under which the float thread passes to hold it into the fabric in a substantial manner. It is this closely interwoven tie-down thread that dominates the weave, forcing the threads on either side of it which are bound by 5-thread skips, into groups, and creating small openings in the fabric on either side of it. The Swedish and Atwater Lace have both warp and weft tie-downs, and these two threads are detected bisecting the open spaces of the weave, forming the four little "panes" of the "windows" which are characteristic of both weaves. The tie-down thread does not appear in the Spot Bronson and consequently this is a closed fabric which would not be termed as Lace.

The SWEDISH LACE Weave

The Swedish Lace is a weave which has technical but not visual similarities to the Spot Bronson. It is a single color, balanced, linen weave which uses identical warp and weft. The texture is formed by pairs of warp ends on one side and weft ends on the other side which float over five threads. There the similarity ends. Drafts for Swedish Lace are given at (3) and (6), both of them following the profile (10) though this technique too is not threaded from profiles. The drafting method used by Mary Block and other Swedish writers is shown at (3) and the Halvorsen or Norwegian convention is shown at (6). Although basically the same, the Norwegian form is a little clearer for study purposes. Inspection of either draft indicates that the draft itself is actually the same as an overshot draft and follows all of the overshot rules. Woven as overshot it would make two small "opposite" tables in checkerboard order. But these threadings are never woven as overshot. They are woven as a single-shuttle lace technique on an unbalanced tie-up.

The structure of the weave becomes apparent if a


(2)
Spot or "Diaper" Bronson
(1)
(5)
(4)
Swedish Lace -- Swedish Draft
(3)
(8)
(7)
Swedish Lace -- Norwegian Draft
(6)
(11) The Profile
(10)
Atwater Lace (Bronson Lace)
(9)
Atwater Lace for Six Harnesses
(12)
(13)
continued
1st
2nd
3rd
4th
Tabby
Atwater Lace, short form
(14)
(15)
The Profile for (12) and (14). Tie-up at (13).
3 times
3 times
3 times
3 times
Profile for 4-harness Picture Frame
(16)
Tabby
Profile for 4-harness Picture Frame
(17)
Tabby
Profile for 6-harness Picture Frame
(18)
Tabby
Profile for 8-harness Picture Frame
(19)

card is held over the first three harnesses of the draft, leaving the top draft space showing a pattern in which white weft skips over five black warp ends, then under 1, over 5, under 1, over 5; then is alternated over and under 1 in tabby fashion, plainly making two different texture areas. Holding a card over the top 3 harness spaces of the draft indicates the same kind of arrangement on the harness 1 space, but in reverse order. To make the threaded loom weave the harness 4 arrangement it is necessary either to sink harness 4 or to raise harnesses 1-2-3. To make the loom weave the harness 1 arrangement, it is necessary to sink harness 1 or to raise 2-3-4. These combinations for either sinking or rising-shed, weave the characteristic lace texture when alternated with the correct tabby. The two tabbys, the only other shed combinations needed for the weave, follow the overshot convention of 1-3 and 2-4. One of these tabbys is used to weave the A block (1,2,1,2,1), the 2-4, while the 1-3 tabby is used in weaving the B block (4,3,4,3,4). Notice that the threading is grouped with 5 ends on a pair of harnesses, each group divided by an isolated thread on a different harness. This single thread is a tie-down thread under which the weft must pass after it goes over a group of 5 warp ends. The inclusion of this tie-down thread makes it possible to repeat the lace unit as many times as the designer wishes to form a lace-texture block of any desired size. Notice that when the shift is made from one block to the next, the tie-down thread for the first block becomes the first thread of the second block, and each block, regardless of how many times the unit is repeated, has an uneven number of threads. Since there is no separate tie-down between blocks, the two blocks cannot be combined to weave solid lace texture across the entire warp.

The tie-up for the rising shed or jack-type loom, on which this weave is most easily done, is given at (5) and (8), and the sinking-shed tie-up as in the Scandinavian books is given at (4) and (7).

The weaving of Swedish Lace follows the drafting system in that five shots are woven, followed by a tie-down shot, the six shots repeated as desired. Tabby always weaves in one pattern block and the lace texture in the other. The lace texture is formed by the alternation twice of a tabby with a texture shot, followed by both tabbys. For any of the four tie-ups given weave:

Block A -- treadles a, 1, a, 1, a, b;

Block B -- treadles b, 2, b, 2, b, a;

both units repeated as desired. When the shift from one block to the next is made, the last shot of the first block becomes the first shot of the second, so actually, one shot is omitted. In the Swedish lace manner of tie-up the pairs of threads which make the texture occur in the warp on the top side, in the weft on the bottom side. If the weave is done correctly, both sides will be identical except that one has warp texture and the other weft texture. The length of the floats should be identical on both sides.

FALSE TIE-UPS

In the use of a counter-balanced loom there is usually a mechanical difficulty when a single harness must be tied to sink. When the single-tied treadle is depressed, one harness will raise very high and the two remaining harnesses will not move, so there is no weavable shed. A "false tie" is required to correct this difficulty. To make a false tie, attach a long cord to the lam controlling the high-rising harness and the treadle, using the conventional snitch-knot tie. Snitch up the knot until it has brought the offending harnesses to exactly the same level, working with the treadle depressed. A forced, unbalanced shed may thus be made. Forced sheds (shed made by tying 1 or 3 harnesses to a treadle) are more easily made on some counter-balanced looms than on others, but at best they are much narrower than the standard sheds.

The ATWATER LACE Weave

A detailed study of the two previous weaves gives the foundation for understanding this far more interesting and versatile technique which is derived from both of them. One can imagine the weaver who, being thoroughly familiar with both the draft and the fabric of the Spot Bronson weave, saw for the first time a piece of Swedish Lace. One learns to understand the unknown by relating it to the known. Study of the new fabric indicates that it is composed of two textures, tabby as opposed to the texture made by pairs of weft threads floating over groups of 5 warp ends, with the opposite texture effect showing on the reverse side. Thus far the piece resembles Spot Bronson. However, the texture units are all separated by a single thread instead of by a small tabby spot, this single thread weaving as a tabby. It thus becomes evident that in making the texture a 5-thread draft unit could be repeated as many times as desired if it is separated from adjacent threading units by a single tie-down thread instead of by an entire group of threads. Thus, since the 5-thread float on the Spot Bronson is made by the first thread of the next unit, and since the second thread of the next unit always weaves as a tabby, the 4 threads of the first unit could be combined with the first two threads of the second unit to make a 6-thread unit which would give the required 5-thread weft float, with the 6th thread acting as a tie-down. And because of this tie-down, this unit could be repeated as many times as desired to give large blocks instead of small texture spots. The A unit would then be threaded 1,2,1,2,1,3, an arrangement which requires the basic tabby harness (1), a pattern harness (2) and a tie-down harness (3), or 2 harnesses plus the tabby for each pattern block. The second or B unit by this system would be 1,4,1,4,1,5. Further study of this rather awkward arrangement indicates that the tie-down thread can be the same for each pattern block, so it is more sensible to put all of the tie-downs on harness 2, calling this a tie-down

harness, which leaves the remaining harnesses to act as pattern controls. Therefore for a 4-harness threading, the first harness is the tabby harness, the second is the tie-down harness, the third is pattern harness A forming pattern block A, and the fourth is pattern harness B forming pattern block B. If there are 8 harnesses the 5th is pattern harness C, the sixth is D, the seventh is E and the eighth is F, making six pattern blocks in all. The threading for the units is as follows:

A block is 1,3,1,3,1,2, repeated,
B block is 1,4,1,4,1,2, repeated,
C block is 1,5,1,5,1,2, repeated,
D block is 1,6,1,6,1,2, repeated,
E block is 1,7,1,7,1,2, repeated,
F block is 1,8,1,8,1,2, repeated,
G block is 1,9,1,9,1,2, repeated, and so on.

This system has a number of advantages over the Swedish Lace technique which is for practical purposes limited to 2-block, 4-harness arrangements. (4-block patterns could be drafted on 8 harnesses, but the literature gives no evidence that this is ever done.) Only one pattern harness is required for a single block, so the number of possible blocks is the number of available harnesses less two. Because the same tie-down thread is used for all pattern blocks, it is possible to combine two or more pattern blocks by means of the tie-up to weave simultaneously. The entire threading weaves as lace texture if the tie-down harness is raised alone as the texture treadle. Tabby selvages, borders or dividers are easily made by threading the tabby and tie-down harnesses alternately, 1,2, repeated as desired.

The tie-up is made in a similar manner to the tie-up for Spot Bronson, except that the tie-down harness must be considered. Since the tie-down substitutes for the pattern harness on every 6th thread, and serves to tie each texture shot into the fabric, it is necessary to tie the number 2 harness to raise on each pattern or texture treadle. The tabbys are the same as for Spot Bron-

son: tabby a is tied to all harnesses except number 1, tabby b, the light tabby which is placed farthest from the weaver, is tied to harness 1 alone. Block A (the warp ends threaded on harness 3) weaves as tabby if harness 3 and harness 2 are tied to raise, while the remaining blocks weave as lace texture. To weave block A as lace texture and the remaining blocks as tabby, tie all of the pattern harnesses except 3, plus the tie-down harness 2, to a single treadle. To weave blocks A and B together as texture, leave pattern harnesses 3 and 4 untied but tie all remaining pattern harnesses, plus harness 2. For a 4-harness weave, this means simply raising the tie-down harness alone. Harness 1 is tied to no treadles except the b tabby.

The tie-up draft given at (13) shows every possible pattern combination which may be made on a 4-block, 6-harness threading. From these treadle combinations are selected the ones needed for weaving the desired pattern. The first 5 treadles are known as the skeleton tie-up, and this, plus the a and b tabbys is the tie-up most commonly used. The combinations shown in the 2nd, 3rd and 4th tie-up groupings may be made on the skeleton tie-up by depressing more than one treadle at one time. The tie-up is giving for a rising-shed only, as this weave is so strongly out of balance that it is not practical on a counter-balanced loom.

The treadling order for the Atwater Lace follows a strictly stylized order, as do most of the linen weaves. Since the entire threading is made in unbroken 6-thread units, the entire treadling is in 6-shot units which balance these exactly. A perfect balance between warp and weft is necessary, meaning that the beat must be adjusted so that exactly as many weft shots are thrown per inch as there are warp ends. This balance can be achieved only if warp and weft are identical in size and type. The custom of weaving linen weft on cotton warp is not suitable for this weave as even if the thread sizes can be matched exactly, the two fibers

have different textures, elasticities and shrinkages and consequently cannot give a balanced weave.

The 6-shot rotation of the weave includes the b tabby for each alternate shot of the entire fabric. A pair of shots is made on one of the pattern treadles and the final of the six shots is the tie-down, made on tabby a. This gives a treadle order: b, pattern, b, pattern, b, a; these 6 shots are repeated throughout. For example, to weave profile draft (15) to give squares of tabby on a lace background, with each block woven in diagonal order, use the first 5 treadles of tie-up (13).

Treadle: b, 1, b, 1, b, a, repeated 3 times (this will weave solid lace background texture),
Treadle: b, 2, b, 2, b, a, repeated 3 times,
Treadle: b, 3, b, 3, b, a, repeated 3 times,
Treadle: b, 4, b, 4, b, a, repeated 3 times,
Treadle: b, 5, b, 5, b, a, repeated 3 times.

When the same rotation is used for the second group of treadles shown in the tie-up (treadles 6 to 9) two adjacent blocks will weave together as tabby and two as texture, in overlapping twill order. The third group of treadles will weave similar to the first group except that the textures will be reversed and lace texture squares will be woven on a tabby background. The fourth group, or treadles 14 and 15 will combine two non-adjacent blocks into a checkerboard effect. The total of fifteen different pattern combinations which are possible on a 6-harness, 4-block threading, plus the plain tabby texture woven on a,b, alternately, gives a wide range of patterns which may be designed on paper in advance of weaving or on the loom as free designing.

The discussion of the Atwater Lace weave, with specific treadlings for the profile drafts (16) through (19) and instructions for adapting a profile draft for loom threading will be taken up in the March BULLETIN.