

Weaving the Scotch Tweeds

BY ROBERT F. HEARTZ

THE mention of tweeds usually brings to mind the salt-and-pepper fabric, woven with a white weft on a black homespun warp. This is but one number of a large and interesting group of homespuns and tweeds, that are more suitable for general use and wear than might be thought practical for this type of fabric. Tweeds cover a large classification of fabrics, not all of them Scotch, some are Irish, and a number of checks and plaids are also included. There are Cumberland Tweeds, Harris Tweeds, Devonshire Tweeds, Donegal Tweeds, Ardassie Tweeds, Shetland Tweeds and Sutherland Tweeds, to mention some of them; then there are Hill Checks, Glen Checks, Gun Club Checks, Shepherd's Checks, Hound's-tooth Checks, Tattersall Checks and Glen Urquhart Plaids, to cite some of the pattern names. There is also a large and varied assortment of materials and fabrics of different weights and weaves that are by no means limited in the uses to which they may be put. There are combinations using red, orange, blue, green, brown and tan in addition to the more familiar grey, black and white combinations. The heavier weights are suitable for women's and men's coats, the lighter weights for suits, and the more conservative numbers are suitable for business as well as sport wear.

With the present strong interest in fashions for tailored suits and coats, there is naturally a keen interest in the fabrics suitable for them. It is also interesting to the hand-weaving field to know that BERNAT'S have arranged to import these Scotch yarns and to have an available supply to meet the needs of the hand-weaving trade for the weaving of these fabrics. The fabrics described and illustrated in these pages are based on these yarns.

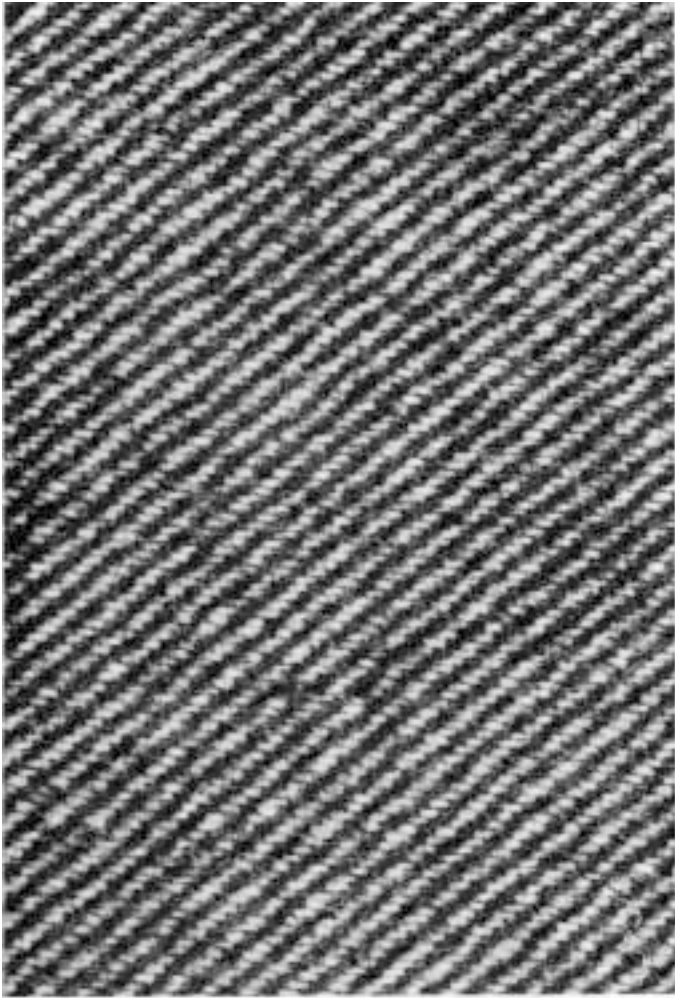
Before going into detail about the structure and patterns of some of these fabrics, I should like to stop and review two processes of interest to the hand-weavers, and about which little has been said, namely the spinning of the yarn and the finishing of the woven cloth. In many of the more isolated and rural sections of Europe and America, the old method of spinning and finishing is still being carried on just as it was in times past, when no other way was known, and, in certain cases, it is still a matter of necessity rather than choice. While it is not a matter of necessity today, it is interesting to know the procedure, as it is still practical in some cases for small yardages.

SPINNING. — The wool as shorn from a single sheep is called a fleece or clip. As it is clipped from the sheep it falls away in a single fleece or spread. The clip is rolled and stored for future handling and grading. A single clip or fleece may all go into one grade of yarn in hand-spinning, or sorted into several grades for several qualities of yarn; a clip in commercial sorting may go into as many as fourteen

or fifteen grades. In the homespuns the whole clip went into one carding and mixed for a fairly even grade of yarn that was used for all household purposes, weaving and knitting both. This can be done in hand-spinning, but in commercial- or machine-spinning the machine must be set for different staples, so the wool must be more finely sorted. After the clip was made the wool was picked over by hand and all foreign matter, as stocks and burs, were removed. With all the dirt and impurities removed, the wool is next put through a washing or scouring process. This is done on the bank of a neighboring stream, whenever possible, as the wool needs considerable washing and rinsing. In the scouring all of the perspiration and natural oil of the sheep is removed and a soft prepared oil is later sprayed into the wool to soften it for handling in spinning. When the washing was finished the wool was spread on cloths out of doors to dry, then was stored for carding later. Sometimes the wool is dyed in lots, or natural clips of different colors are mixed in the carding process to obtain the mixes, greys and heathers. The carding process is one of brushing the wool with metal-toothed brushes to get the fibres in a more or less parallel order for spinning. It is carded into rolls which in spinning are pulled out and slightly twisted by hand to hold together for the spinning wheel. In the earlier and more primitive days the entire process was one of hand labor. Then followed the use of the distaff which was later mounted, and the spinning wheel developed. There are the two wheels used for spinning, the larger or woolen wheel, and the smaller or flax wheel. I have been told by a woman, whose mother did spinning, that a spinster might walk in the neighborhood of twenty miles in a good day's spinning with a large wool wheel. Gradually the flax or linen wheel has superseded the wool wheel and is now used for wool spinning as well. In the more rural districts it is still the practice to hold spinning "bees," when the spinsters of the neighborhood gather with their wheels to spin and gossip.

FINISHING. — The light-weight wool was woven into a general utility fabric. When woven it was cut from the loom and rinsed in lukewarm, soapy water. In the soap for finishing the wools, only the softer oils and fats were used. After being washed the fabric was not wrung out, but squeezed out, then all members of the household were called to help shake out the water. This process is similar to tossing someone in a blanket; they got good hold on the ends and along the edges and shook the cloth till most of the water was out, then it was spread on the grass till nearly dry, then pressed.

In the shrinking process plenty of tepid or lukewarm water was used; for the pressing process, some water (moisture), plenty of heat and pressure are required. Too much water and working with the heat will cause further shrinking and



PATTERN No. 377

felting, which is undesirable. In each household were several very heavy irons that were kept for the finishing of the cloth. On finishing day all of the heavy irons in the neighborhood were borrowed and kept on a good hot fire. The cloth is first gone over with a thin piece of wet muslin to steam the fabric if it has dried out too much, then it is swiftly pressed with the bare hot iron to give it the hard, smooth, glossy finish; to work slowly is to burn the fabric. The fabric is pressed "with the warp," the irons being run back and forth in the direction of the warp threads; to press the cloth the other way results in a wavy fabric.

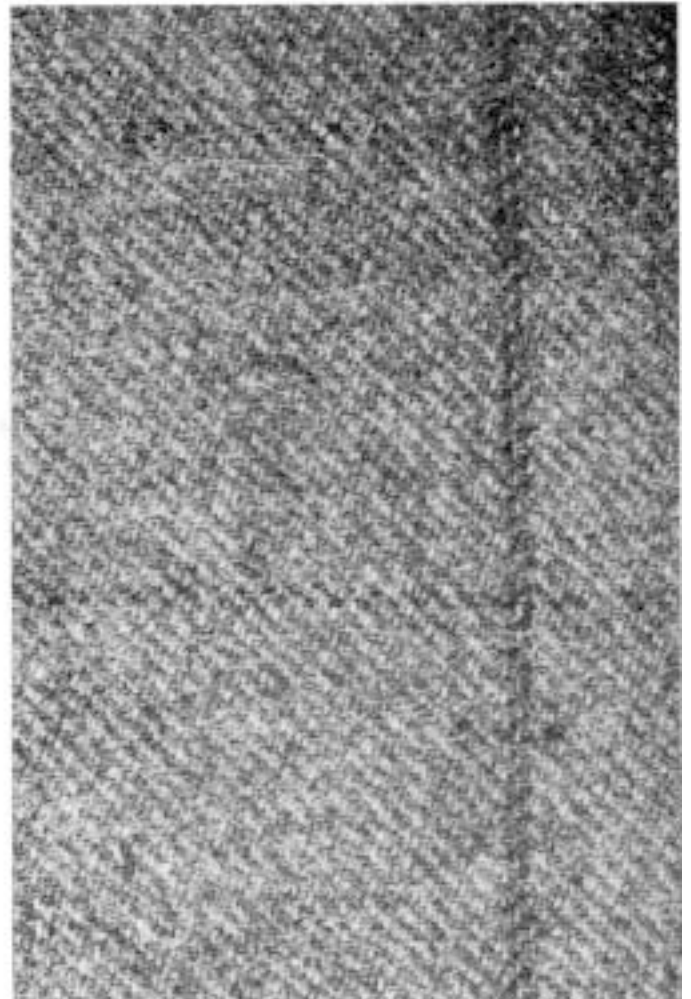
The finished material was stored for future use. When new wool sheets were desired, two lengths of material were cut from the long roll, seamed, and the cut ends whipped with a length of colored wool. For underwear a length was cut off the roll, made up white or dyed red. The lengths for outside use, suits and dresses, were dyed blue, brown and other chosen colors, all dyed with vegetable dyes.

In localities where there were mill facilities available, the custom came up of taking the wool to the mill for carding and scouring. Sometimes they waited for their wool or helped with the preparation, to reduce the cost of the preparation, or they took a quantity of prepared wool in exchange for their raw wool. When the cloth was woven it, too, was taken back to the mill for finishing, especially the

heavier weights, the lighter weights still being finished at home.

TWEEDS. — I have before me a group of Ardassie, Shetland and Sutherland Tweeds, some patterns of which I am going to give the weaving directions. To speak of tweeds by a district name does not classify them by pattern, as the patterns are generally known and are similarly woven in the several districts. To speak of a Glen Check, Tattersall Check, Herringbone Twill is to refer to a very definite type or color plan of pattern.

In studying the weaves they are practically all 4-harness twill or derivatives. There are a few 8-harness weaves and some plain 2-harness fabrics, but the majority are developed on 4 harnesses. I am going to work only with those in the 4-harness group. In weaving a homespun, although it may be a 2-harness fabric, it will weave much easier on a straight 4-harness twill, drawing in with less friction and breakage. A twill will always weave up into a softer, fuller fabric with more ends and picks to the inch than when the same set-up is woven plain. In this group they are all the regular 2 up and 2 down twills; some irregular or novelty twills may run 1 up and 3 down or 3 down and 1 up, or a combination of the regular and irregular twills, but all of this group are woven in the regular order.

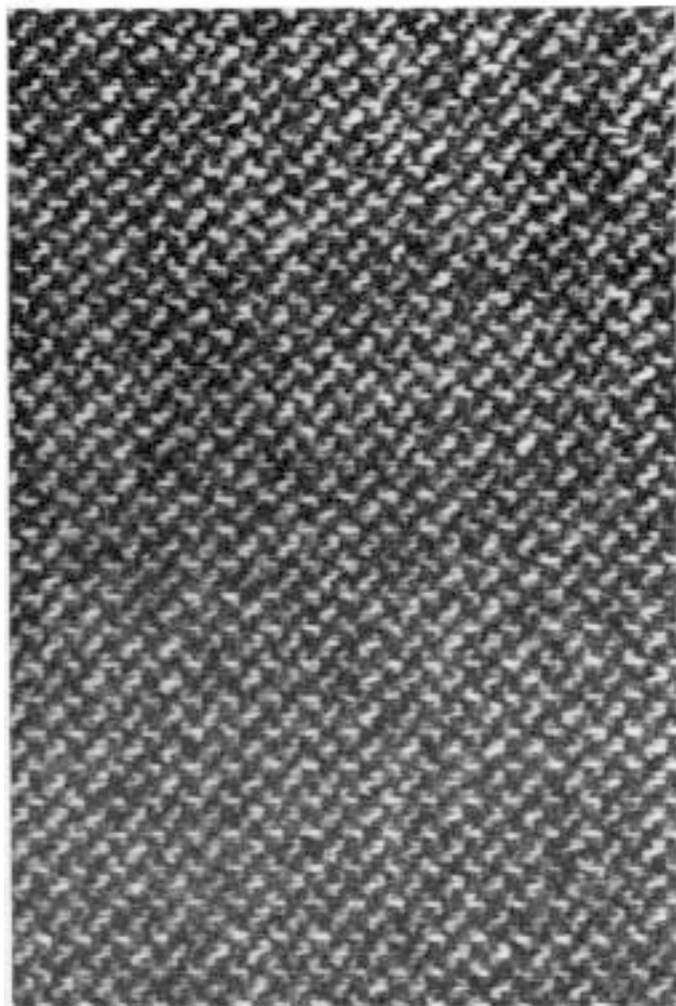


PATTERN No. 074

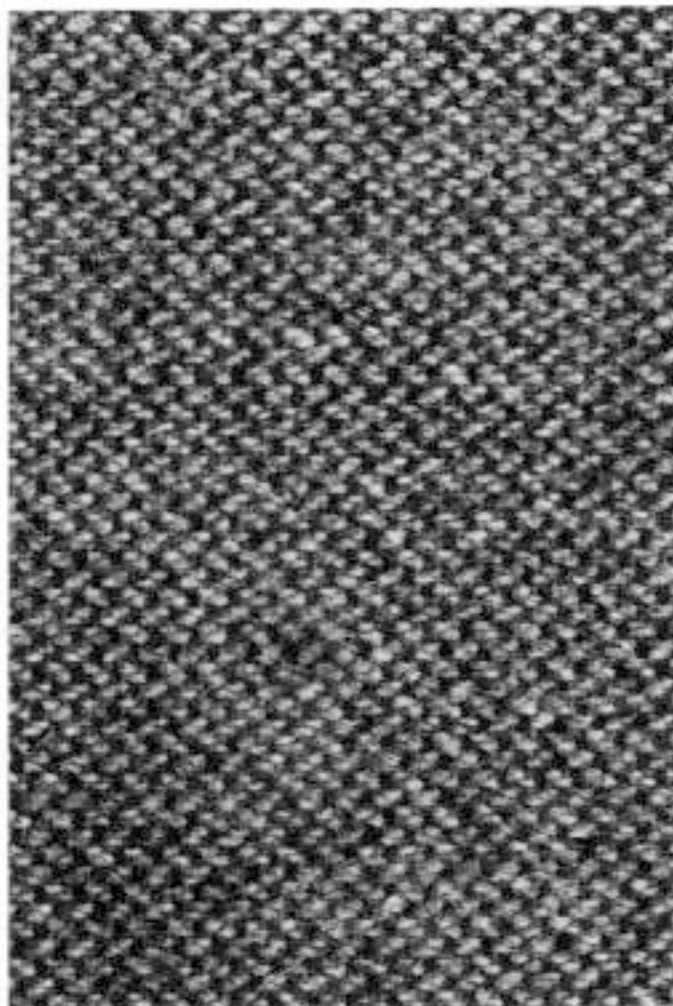
The colors range from a black and white shepherd's check through checks of several and more brilliant color combinations, the more sombre plaids, herringbones, to solid colored diagonals and twills. There are several weights of yarn, and these are set at varying counts to the inch, from 12 to 32, resulting in several weights of fabrics suitable for light-weight suitings to topcoat and overcoat materials. In examining the yarns further, there are solid whites that may be natural, sulphur-bleached or otherwise bleached, and I am told that there is now a white dye on the market, but I do not think that any of these yarns are so treated. There are solid blues, greens, reds, oranges, browns, tan, and black; there are also a large number of mixes and heather mixes that were dyed before spinning. There are also a number of flecked yarns, yarns that have tufts or nubs of different and contrasting colors mixed in during the spinning but allowed to spot in the yarn rather than thoroughly carded or mixed in.

Perhaps the easiest way to discuss the fabrics is to classify them by weave, then discuss the possibilities of the weave also, discussing the variations and colors used for further interesting effects.

Although there are but very few plain weaves here, there are one or two which may be well worth mentioning. The first is a fine hound's-tooth check. It is drawn 2 dark green, 2 brilliant green, and is woven in the same order; the yarn



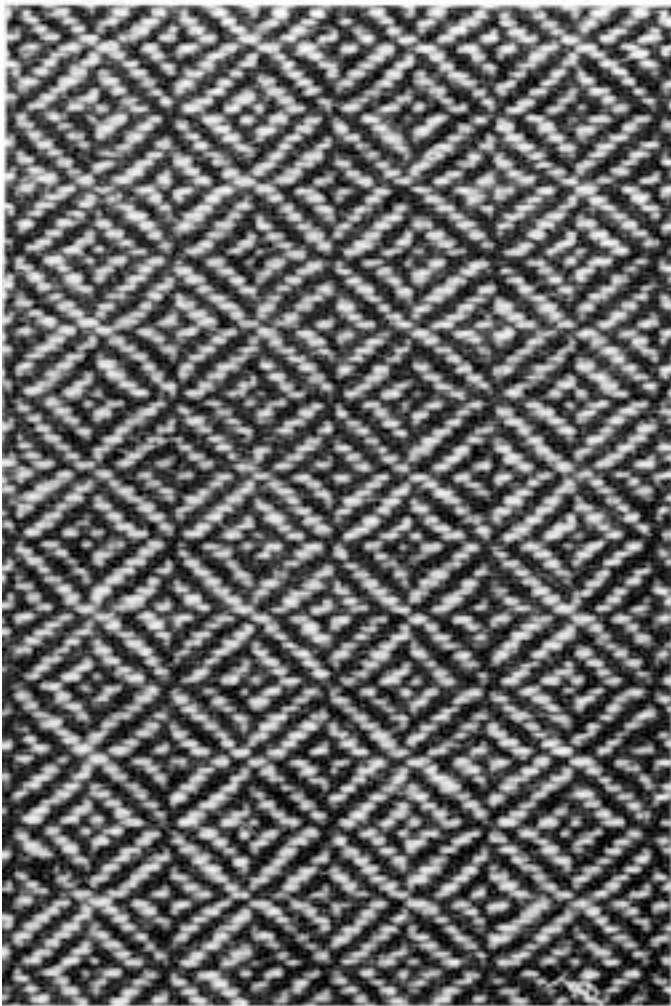
PATTERN No. 385



PATTERN No. 378

is fine and makes a fine light-weight suitable for women's coats. There are similar numbers in bright blue and white, two shades of blue, brown and white, and brown and tan. It might be well here to distinguish between a shepherd's check and a hound's-tooth check. For either check the warp is set the same, 2, 4, 6, 8, or any number of each color, and woven in the same order. The difference is in the treadling and the order in which the color is started. For the shepherd's check the check may be woven plain, except for the 2-end combination which will be hound's-tooth. In a shepherd's check it is so treadled to bring out the square effect, and in the hound's-tooth check the protruding angles that seem to connect the figures is the effect to work for.

The next group to work up are the regular 1, 2, 3, 4 twills. Most tweeds can be woven on this drawing in, and most are woven on the regular 12, 23, 34, 14 tie-up, though some are woven on an irregular or different tie-up. This drawing in and tie-up is the regular tartan plaid, and any plaid; though the color plan may be correct, nevertheless, the plaid is not correct if it has not been woven in this manner, as the mixed diagonals that connect the solid color areas are what make the tartans attractive. This twill may be woven regular in solid colors in several weights of materials; there is a large group so woven. The solid colors and heather mixes in this weave make up a nice assortment of



PATTERN NO. 308

fabrics suitable for conservative and business wear. Draft and pattern 377 is an example of this fabric. Light-weight, firm weave, suitable for suits; heavier fabric for overcoats.

To liven this group up a little for a person not quite so conservative, a fine over-plaid or pencil check is introduced. Every 28, 32 or more ends, a pair of ends of contrasting or harmonizing color may be drawn, weaving it in the same order. The two new ends may be drawn 1 plaid, 1 regular color, 1 plaid and so woven. This result is an over-check about $1\frac{1}{2}$ to 2 inches, according to the number of ends to the inch. Several colors may be used in making the plaid, and the plaid may be made larger or smaller by changing the number of ends between plaids. Draft and pattern 074. For suits and overcoats.

This same draft may also be drawn 1 light and 1 dark throughout, and woven in the same order. Another suggestion is to weave it in a dark color on a light warp. It may also be wove in an irregular color scheme, as 1 light and 2 or 3 dark.

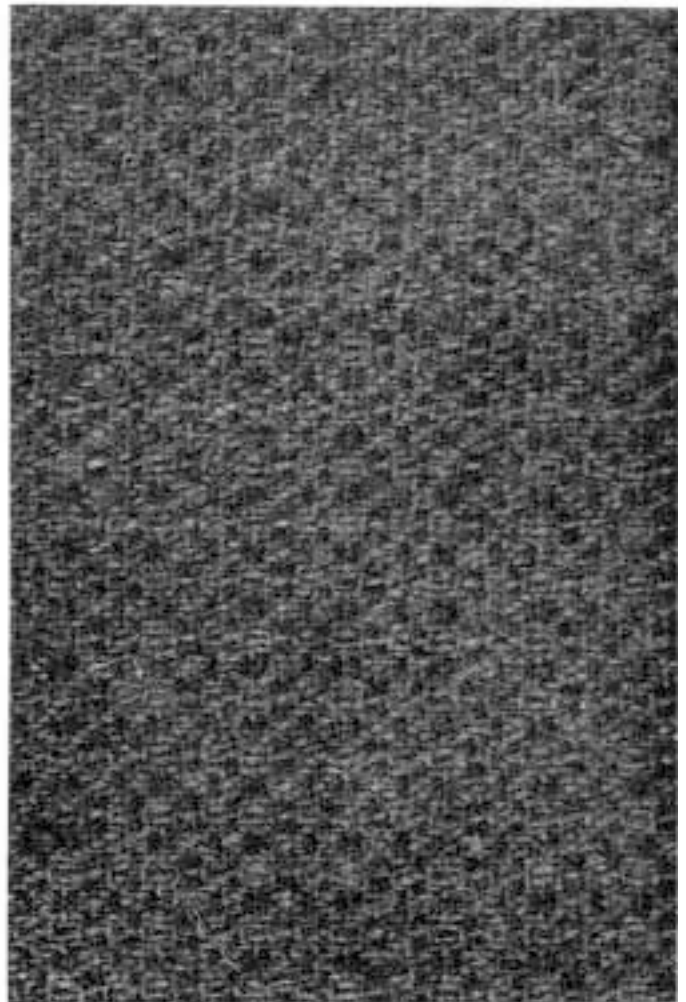
A quite common arrangement of this twill is called the broken crow, and is effected by changing the order of the treadling only, and is woven 12, 23, 14, 34. Pattern 385. This method of treadling simply breaks the straight, diagonal line that results from the regular treadling. Fine weave, very satisfactory for suits.

Another variation of this weave is tan warp woven on this treadling: 12 brown, 24 tan, 34 brown, 13 tan. Fine, interesting weave for suiting. Draft and pattern 378.

The first step away from this regular twill is the herring-bone twill, which is this twill, and every 6, 8 or more repeats a reverse line is inserted. This reverse line may be just a 3, 2, or may be 3, 2, 1, 4, 3, 2, making a wider reverse stripe. It is woven in the straight twill order, and the suggestions for the above twill may be used. This twill may be woven in a solid color, or in a dark color on a light warp, but is in itself enough of a variation without the addition of any more color. The reverse may take up as many ends as the regular stripe; this regular reverse may be woven in the same order, reversing the treadling just as the stripe was reversed. A diamond pattern will result. A very useful fabric. Weave solid and dark on a light warp; also 2 alternating colors on warp of third color.

VARIATION. — In the draft given at 308, the end through the third frame is dropped, making a slight but interesting break in the pattern. This draft may be woven regular, as suggested for 385, or as follows: 2, 3, 4, 1, 2, 3, 4, 1; 3, 2, 1, 4, 3, 2, 1, 4. Solid and alternating colors, fine and coarse weaves are both suitable in this draft. Draft and pattern 308.

At 361 is given a reverse or diaper twill that repeats on



PATTERN NO. 361

five ends. It is a familiar draft to most weavers, and it has a great many uses both in weaving tweeds and other fabrics. In this instance and for the pattern shown also at 361, it is woven a little differently. The tie-up is regular and it is woven with alternate tan and brown weft on a tan warp. The treadling is 1, 4, 1, 2, 3, 4, 3, 2, 1, 4, 3, 2, the first throw of weft on No. 1 treadle being brown.

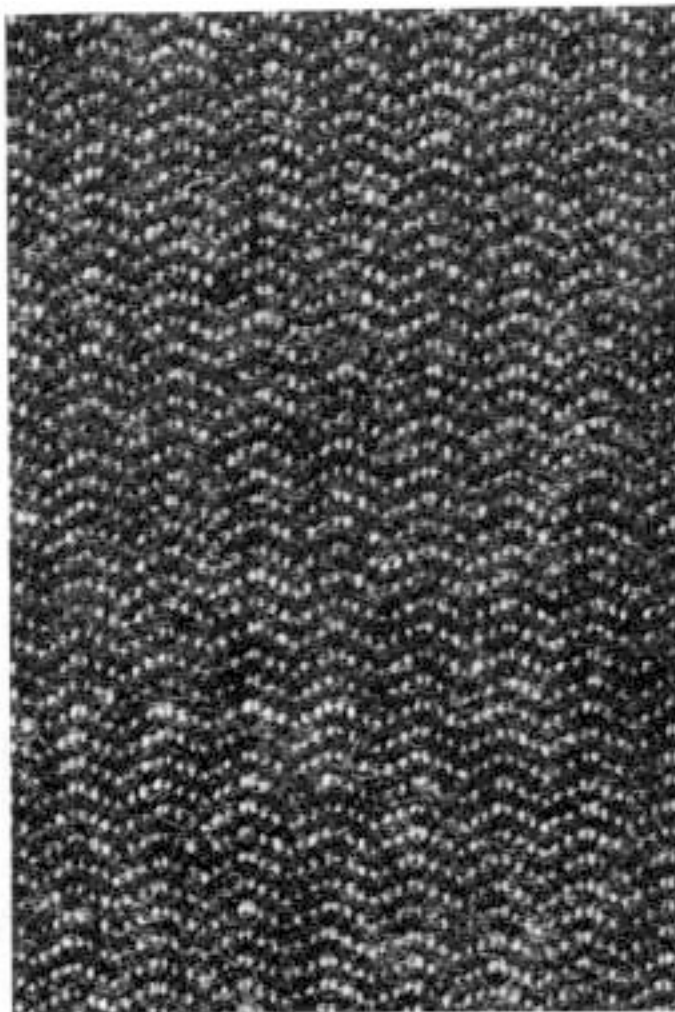
An interesting and practical suit fabric that may be woven in two colors or in three colors is given at Draft 012. The texture is a small overshoot over three ends on a plain ground, but it comes in such a way that there is an effect of small arrowpoints between each overshoot. The colors may be brown overshoot on a tan ground, or a brown warp may be set and woven with the tan ground weft and an orange overshoot. Any similar color arrangement may be planned. For suiting a fine yarn set 24, 28, or 30 ends is most satisfactory. Woven in the straight 1, 2, 3, 4 order.

Another interesting and practical variation for suiting is that given at 067. It is a twill variation, but is not a regular twill, and is a firmer weave than the regular twill. It, too, may be woven in a two- or three-color combination and should also be woven with a fine warp set close. The warp may also be set in alternating colors. Woven in the straight 1, 2, 3, 4 order.

An interesting weave that is practical for suiting in fine



PATTERN No. 012

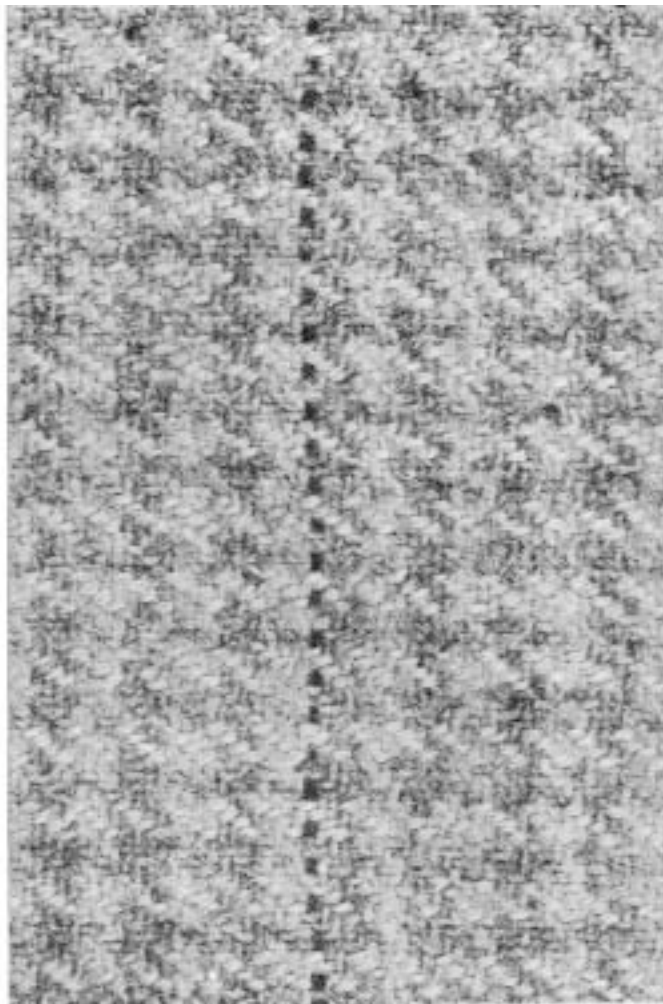
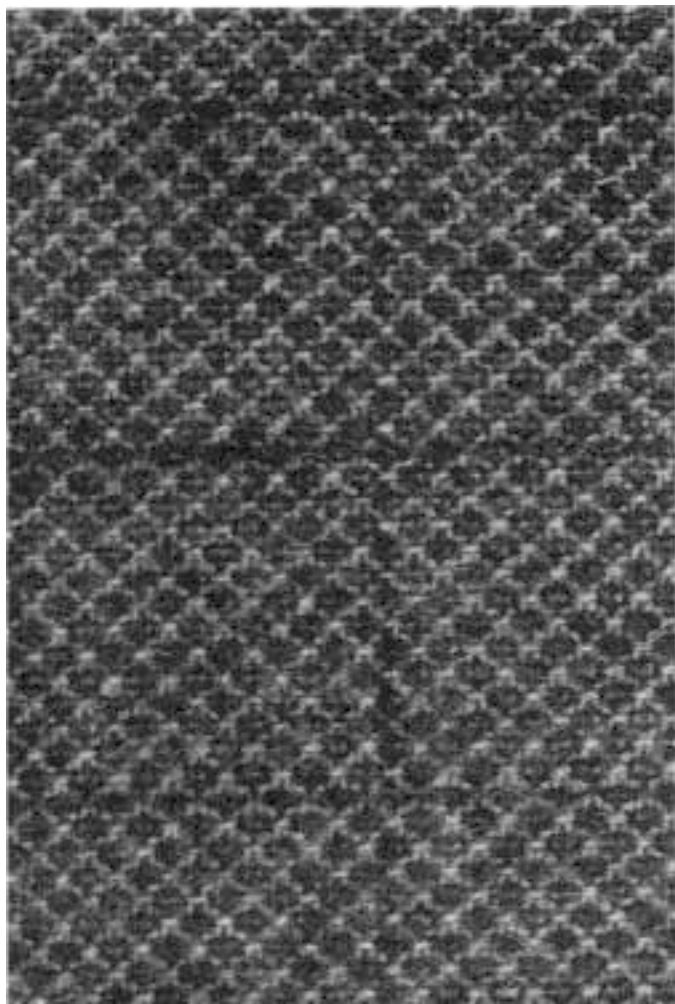


PATTERN No. 067

weight and for coat material in heavier weights is the diamond weave shown at 029. It is an irregular drawing in and it may be woven on a solid warp or on a two-color warp, as was the sample shown. The tie-up is shown and the treadling is in a regular, reverse order and is 1, 2, 3, 4, 1, 4, 3, 2. A variation of color combinations may be used for this weave. The sample was woven alternate brown and tan on a brown and tan warp.

The foregoing are only a few of the possibilities that can be worked up and most of them are all based on the regular 1, 2, 3, 4 drawing in and treadling draft. It is impossible in the space allowed to define and illustrate the development of all of the various plaids, checks and various color combinations, but I would like to go through this group of samples and note some of them, but with the color card and weights of the different yarns at hand many more and interesting arrangements will suggest themselves.

There are the solid color fabrics in every color and weave made up in varying weights of yarn. Following the solid color group are a number of samples in two colors, using a solid color warp and a darker or contrasting yarn for the weft. Another effective combination is the use of alternating shades of weft on a solid warp, or that, too, may be in alternating color or of a third shade. All combinations using solid and alternating colors in regular or irregular order result in



an all-over variation of color. Following this group is another, depending on pencil stripes and crossbars and checks of strongly contrasting color to develop a very definite and pronounced pattern, very different in character from those depending upon weave for their effect.

It is in this field that there is such a chance for the development of the checks and plaids all based on the straight 1, 2, 3, 4 draft. The first of these are the regular two-color checks in all sizes and combination of color. The regular checks are further varied by over-checks of a third color, variations of which are the Gun Club and Tattersall Checks. Some of these checks are very pleasing and subdued, while others are full of color and satisfying to the most sporting of tastes.

To return to the more practical part of planning a tweed is the problem of weights of yarn, amounts and shrinkage; the finishing of the woven fabric having been given earlier in this write-up.

There are several weights of yarn available. The lighter weights of yarn should be set 24, 28, 30 or 32 ends to the inch for most satisfactory weights of fabric. These yarns run about 3200 yards to the pound. The medium weight of yarn works up well set 16 to 24 ends to the inch, and the heavier yarn can be set 12 to 16 ends to the inch. These yarns run about 2200 yards to the pound. The different weights of yarn may also be combined to produce a wider

range of weights of fabrics. They may be combined as were the colors; all one weight of weft with warp of different weight; alternating weights of weft and warp in a varying number of ways.

In estimating the amount of yarn to a pound of material, no set rule can be given because of the various weights of yarn available and because of the varied number of ends to the inch that may be set. Following is the rule for estimating the amount needed, and is figured after the yarns, ends to the inch and other details are determined.

$$\frac{\text{Ends to the inch} \times \text{width of the material (inches)} \times \text{length of the material (yards)}}{\text{yardage per pound of yarn}}$$

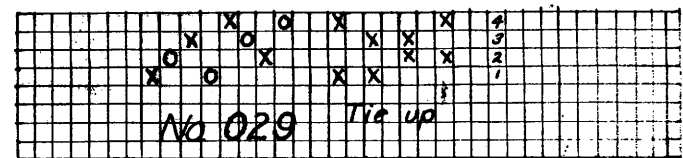
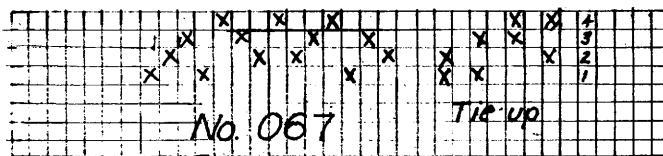
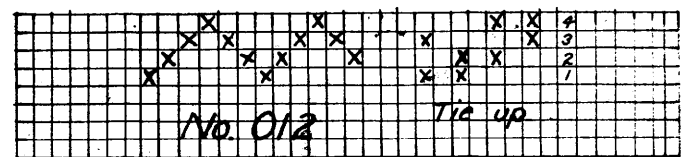
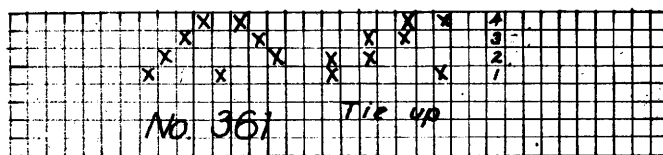
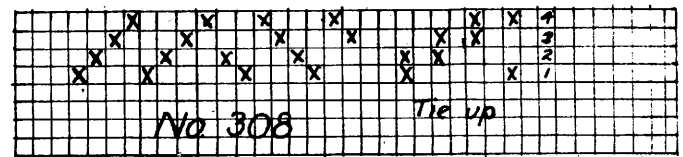
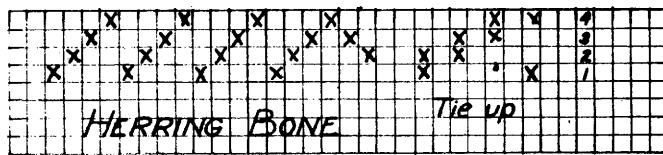
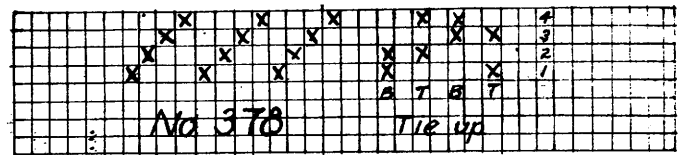
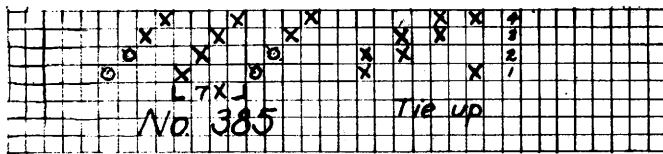
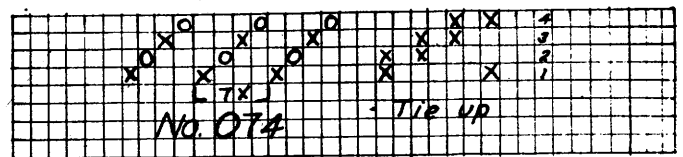
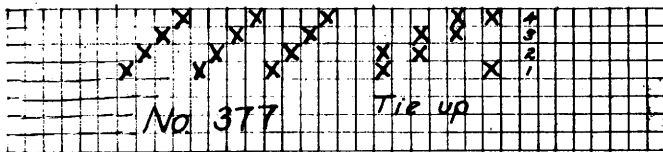
The result of the above formula will be the number of pounds required for the length of fabric. This number doubled will be the amount needed for the complete piece. When several weights of yarn are used in a single piece, the several weights should be figured separately. From these figures the cost of the yarn for the piece and by the yard may also be determined.

Take-up, shrinkage, and loss of yarn must be allowed for in estimating amounts. "Take-up" is the amount of take-up of the warp ends in working around the weft in weaving. This figure varies with the tension of the warp in weaving. If the warp is set very tight the take-up may be less in weav-

ing, but the shrinkage in finishing may be greater, so that one practically offsets the other. When the tension is released the fabric immediately shrinks some and, in handling, "sets" or shrinks a little more, but most of the shrinkage is in the finishing process. In the mills, in commercially finishing the fabric and where yardage is an important item, the goods are stretched in the finishing process. Beyond small limits this is undesirable and may result in injury to the fabric and lessening of its wearing qualities. Loss of yarn that must be considered is the amount that is lost in tying on the warp and the amount that is lost on the end that cannot be woven through the heddles because of the knots. This amount of waste depends upon the individual weaver. For short lengths (under 10 yards) the allowance should be about 1½ yards for take-up shrinkage and loss in weaving; for longer lengths the proportion may be reduced. The exact figures each weaver will have to work up as the tension of the warp, beating up of the weft and handling changes the

figures. The shrinkage in the width must also be allowed for, and is a matter for each weaver to determine; 3 to 4 inches shrinkage from width drawn in the reed to the finished width is average.

In inquiring about yardages necessary for making up different items of apparel, a more or less varying rule is accepted for the amounts required. The standard for men's wear is the size 36 for coats and suits, and size 18 is the standard for women's wear for both suits and coats. The amount of yardage for a size 36 coat or suit, or size 18 coat or suit, is the same in all cases, the standard amount being 3¼ yards double width and 6½ yards single width per garment; the width of the material being 27 inches single width and 54 inches for double width. A more generous width allowance is 29 inches single width and 58 inches double width, as a better cutting can be made with this width without skimping and may be more economical in the long run.



DRAFTS AND TIEUPS FOR TEN SCOTCH FABRIC DESIGNS