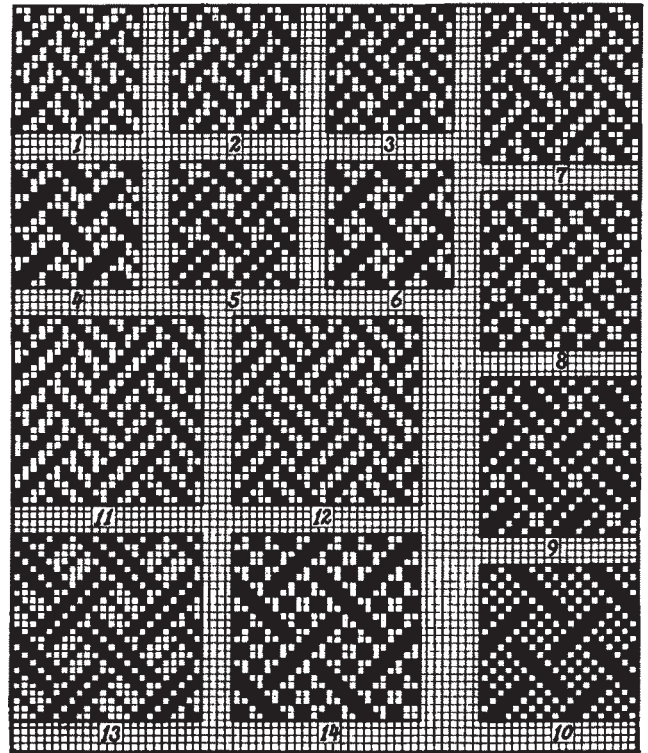


- SULTANABAD:**—A standard make of a Persian rug made partly of wool and partly of cotton.
- SULTANE:**—Twilled cloth of silk and wool; finished in the rough, not singed or sheared.
- SULTANI:**—One of the best varieties of Egyptian cotton, grown in lower Egypt. It is of a very long and silky variety and has some of the characteristics of the Sea Island cotton. The plant requires much attention and is easily affected by climatic conditions. Very little of this variety is grown, and it is probable that its production will remain small.
- SUMAC, SUMACH OR SHUMAC:**—Leaves and smaller branches of a shrub. That which comes from Sicily is the most esteemed, and brings the highest price, but several other countries produce a usable article. Has a smell reminding of tea, or sometimes of new hay. The chief consumption of sumac is probably in cotton-dyeing, where it is the preliminary treatment for the fancy shades to steep the cotton for some hours in decoction of sumac. The astringent matter of the sumac is thus firmly combined with the cotton, which can now be easily mordanted with either tin or alumina, which forms the basis of the colors. Sumac liquors have a strong tendency to become acid, which must be guarded against in those cases where an iron-alumina mordant is concerned, since the acidity is sometimes strong enough to dissolve out weak iron mordants.
- SUNN HEMP, INDIA OR JUBBULPORE HEMP:**—The plant is a native of India, the Malay Islands and Australia, and belongs to the Natural Order Leguminosæ. It is a cordage fibre plant.
- SUN-WHEEL:**—The gear of the differential motion in fly-frames, which according to the direction of its rotation imparts to other gears of the same motion, either an increased or decreased speed. See differential motion.
- SUPER:**—The fourth grade made in sorting a fleece for woolen spinning; next to choice.  
A two-ply ingrain carpet, constructed with 960 warp-threads (36 inch. wide fabric) exclusive of selvage.
- SUPER COMBING:**—The finest quality wool of the clip.
- SUPER QUALITY:**—A quality of any quality number, but of a type superior to that quality number. Super qualities of tops will yield a yarn much nearer in count to the quality count than will the unqualified quality number.
- SURAH:**—A soft, twilled silk fabric, usually of plain color and without pattern; used for women's garments.
- SURAH-DE-LAINE:**—A fine woolen and silk fabric for ladies' summer wear.
- SURAH ECOSSAIS QUADRILLÉ:**—A surah in design and coloring of Scotch squares, or shepherd checks.
- SURAH SILK:**—A variety of silk, woven with a fine, flat twill; similar to serge in woolen goods.
- SURTOUT:**—An upper coat; an overcoat; a riding coat; a great coat.
- SWANS-DOWN:**—The down of a swan, often used for a dress-trimming, as on opera-cloaks.  
A thick cotton cloth with a soft pile or nap on one side, more often called Canton or cotton flannel.

The simplest form of a regular twill.

### ENTWINING TWILLS.

The same refer to a system of weaves finding extensive use in the manufacture of dress goods, in connection with cotton, wool, worsted and silk fabrics. The smaller effects are used with worsted men's wear, either by itself, or in combination with other weaves. They are also used for interlacing the ground in connection with Jacquard work, and considered all around, form one of the most interesting system of weaves for the designer.



Entwining twills are obtainable from any one of our regular twills by using one or more pieces of the twill selected, running in one direction, against one or more pieces of the same twill running in the opposite direction, the one twill-set meeting its mate twill-set balanced, in turn imparting the characteristic entwining effect to the weave and thus to the face of the fabric. This, in connection with some of the weaves, will result in open spaces, which then have to be interlaced either with broken twills, baskets, or other fancy weave effects, whereas in some instances, more particularly when using two or more twill-lines running against each other, none of these open spaces will appear in the final weave.

Entwining twills are always designed with an even number of harness for their repeat, the smallest repeat practically to use being 8, after which they can be made for any higher number of harnesses, 10, 12, 16, etc. No reduction of harnesses by means of a fancy drawing-in draft is permissible with entwining twills, on account of the double direction of the foundation twill-lines, forming the basis of the weave.

#### Rule for Constructing these Weaves.

Indicate the repeat of the weave wanted on your point paper, after which run one, or as many twill-lines as desired of your foundation weave for a certain number of threads from left to right on your point paper, after which paint three joining repeats of these twill-lines (one to the right, one above, and

one in oblique direction) in the proper places on your point paper. Next run a similar twill-line, or twill-lines, as the case may be, in opposite directions to the ones planned, being careful to properly connect these two sets of a twill-line, or twill-lines, where they meet their mate lines. You may have to extend the length or both sets of twill-lines, or you may have to shorten them, in order that a properly balanced effect is produced; this however, refers more particularly to fancy combinations.

When planning for the repeat of the new weave, knowing what foundation twill to use, the following details will assist:

To ascertain the lowest repeat possible for a certain entwining twill, provided the foundation weave, as well as the number of its twill-lines to be used are given, multiply the two together, the result being the lowest possible repeat for the entwining twill. If then less pieces of twills are used, the result will be the two open spaces in the repeat of the weave plan, a feature previously alluded to, and which spaces have to be filled up with a suitable interlacing.

In this manner, taking the 4-harness even sided twill in connection with two pieces of twill-lines to be used in consideration, we then will find that  $4 \times 2 = 8$ , *i. e.* 8-harness and 8 picks are the lowest repeat for its entwining twill. Weave Fig. 2 illustrates the subject.

If we would use only one twill-line in place of the two used, the two open spaces previously referred to would occur if planting for an 8-harness entwining twill, since  $4 \times 1 = 4$  and not 8. Weave Fig. 1 illustrates the subject, showing the two open spaces referred to filled up with broken twill effects, using two ends twill running from left to right, to fill up one of the spaces, and two ends twill running in the reverse direction, to fill up the other space.

To quote another example: Plan for an entwining twill, using a 4-harness even sided twill for foundation weave, in connection with six pieces of twill-lines used. This will call for  $(4 \times 6 =)$  24 warp-threads and 24 picks for the repeat of the entwining twill. No open spaces will be met with, since we use the result of the multiplication complete for the repeat of the weave.

The explanations thus far given will indicate to the designer the chance to calculate for the number of twill-lines of the given foundation twill he can use in connection with a given repeat of the new entwining twill.

Provided the repeat of the weave and the number of twill-lines to be used are given, the designer then can also obtain the repeat of the foundation weave he can use.

*Example:* Ascertain number of twill-lines possible to be used in connection with the 6-harness even sided twill for foundation, the repeat of the entwining twill to be 24-harness.

$24 \div 6 = 4$  lines of a twill must be used for each set of twill-lines, no open spaces resulting. Weave Fig. 22 explains the subject.

*Example:* Repeat of weave 16-harness and 16 picks. Number of twill-lines to use for each set of twills to be 4; ascertain repeat of foundation twill permissible to use.

$16 \div 4 = 4$ -harness and 4 picks, permissible repeat of foundation twill to be used. Weave Fig. 19 illustrates the subject.

Having given a thorough explanation of the construction of these entwining twills, we will now briefly refer to the construction of the various 22 specimens of weaves of this system, accompanying this article.

Weave Fig. 1: Foundation weave  $2-\frac{2}{8}$  8-harness twill; one twill-line used in each set; repeat of weave 8 by 8. The open spaces resulting on account of the 6 end filling-float, have been interlaced with the  $2-\frac{2}{2}$  4-harness broken twill.

Fig. 2: Foundation weave  $2-\frac{2}{2}$  4-harness twill, using two twill-lines in each set; a perfect connection, no open space where sets of twills meet; repeat of weave 8 by 8.

Fig. 3: Foundation weave  $2-\frac{2}{1-\frac{2}{3}}$  8-harness twill; one twill-line in each set; repeat of weave 8 by 8. No open space where twill-lines join.

Fig. 4: Foundation weave  $2-\frac{2}{3}$  8-harness twill; one twill-line in each set; open spaces produced on account of prominence of the filling-float (over 5 warp-threads) in the foundation twill are interlaced with broken twill effects  $2-\frac{1}{2}$ ; repeat of weave 8 by 8.

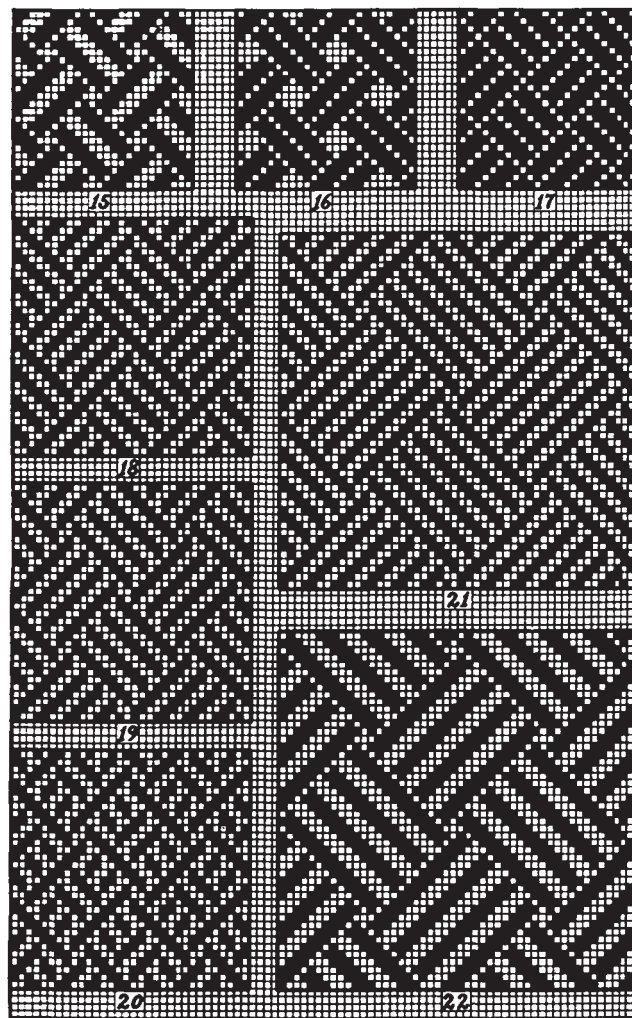


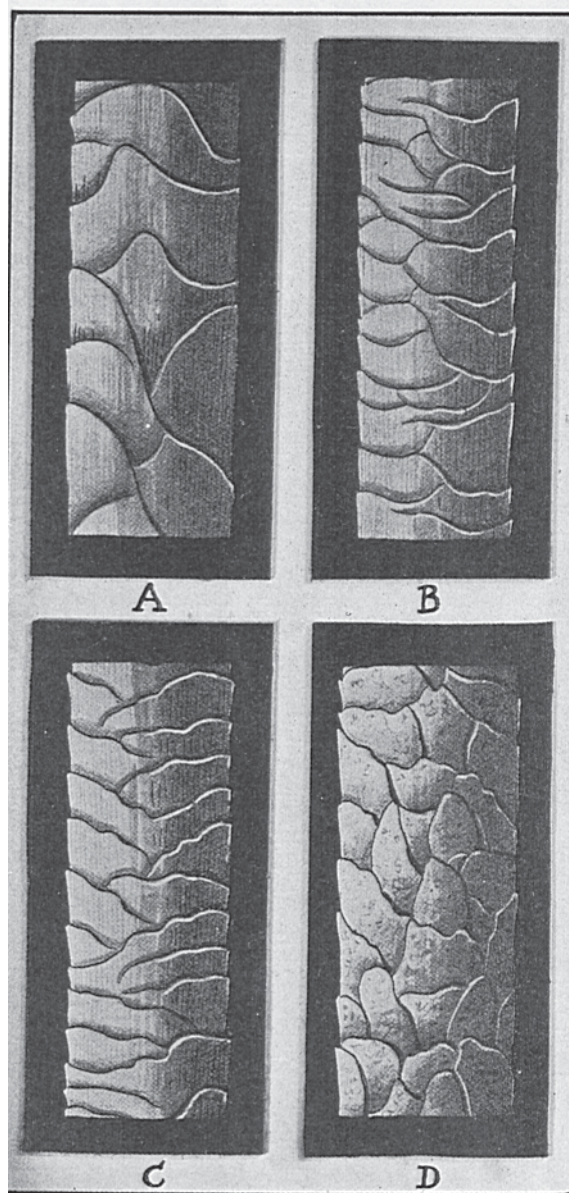
Fig. 5: Foundation weave and its arrangement is the same as for weave Fig. 3, showing however a different joining of the two sets of twill-lines. The same refers also to weaves Figs. 6 and 4 compared respectively.

Fig. 7: Foundation weave  $2-\frac{2}{2}$  4-harness twill; 2 twills to each set; repeat 10 by 10; open spaces of  $(10 - (4 \times 2 =) 8 =) 2$  ends are suitably interlaced.

- Fig. 8: Foundation weave in this instance is a fancy twill with a basket effect; repeat 10 by 10.
- Fig. 9: Foundation weave  $\frac{2}{1}\frac{3}{1}\frac{2}{1}$  10-harness twill; one twill-line in each set; repeat of weave 10 by 10.
- Fig. 10: Foundation weave  $\frac{3}{1}\frac{2}{1}$  10-harness twill; one twill-line in each set, the open space caused by the 7 end filling-float of the foundation twill being interlaced with the plain weave; repeat of weave 10 by 10.
- Fig. 11: Foundation weave  $\frac{2}{1}\frac{2}{1}$  4-harness twill; two twill-lines in each set, the open spaces of  $(12 - (4 \times 2 = ) 8 = ) 4$  being interlaced with broken twill; repeat of weave 12 by 12.
- Fig. 12: Foundation weave same as for weave Fig. 11, using however in this instance 3 twill-lines in each set, *i. e.*, the complete combination of  $(4 \times 3 = ) 12$  in the repeat of the weave which is 12 by 12.
- Fig. 13: Foundation weave  $\frac{2}{1}\frac{2}{1}\frac{2}{1}$  12-harness twill, one twill being used for each set, the open spaces caused by the filling, floating over 7 ends, being interlaced by  $\frac{1}{3}\frac{1}{3}$  broken twill effect; repeat of weave 12 by 12.
- Fig. 14: Foundation weave  $\frac{3}{1}\frac{2}{1}$  12-harness twill; one twill is used for each set, the open spaces caused by the filling, floating over 9 ends, being interlaced with  $\frac{2}{1}\frac{2}{1}$  basket; repeat of weave 12 by 12.
- Fig. 15: Foundation weave  $\frac{3}{1}\frac{2}{1}$  6-harness twill; two repeats of the same are used, leaving no open spaces where the two sets of twills join since  $6 \times 2 = 12$ , the latter being the repeat of the entwining twill.
- Fig. 16: Foundation weave  $\frac{3}{1}\frac{3}{1}$  12-harness twill; one twill-line only is used for each set; the open spaces formed on account of the filling-float (over 5 warp-threads) are not interlaced, forming a neat spotting effect, distributed after the plain setting; repeat of weave 12 by 12.
- Fig. 17: Foundation weave  $\frac{3}{1}$  4-harness twill; 3 twill-lines to each set; no open spaces since  $4 \times 3 = 12$ , which is the repeat of the entwining twill warp and filling ways.
- Fig. 18: Foundation weave  $\frac{2}{1}\frac{2}{1}$  16-harness twill; one twill-line to each set, the large open spaces resulting being interlaced, with  $\frac{2}{1}\frac{2}{1}$  entwining twill effect; repeat 16 by 16.
- Fig. 19: Foundation weave  $\frac{2}{1}\frac{2}{1}$  4-harness twill; four twill-lines to each set, furnishing no open spaces since  $4 \times 4 = 16 =$  the repeat of the entwining twill warp and filling ways.
- Fig. 20 shows a fancy arrangement of an entwining twill, having the  $\frac{2}{1}\frac{2}{1}$  4-harness twill for its foundation; repeat 16 by 16.
- Figs. 21 and 22 show two entwining twills, repeating on 24 warp-threads and 24 picks, having respectively the 4 and 6-harness even sided twill for their foundation weave. No open spaces result in either case, since in the first example  $4$  (foundation)  $\times 6$  (pieces of twills used)  $= 24$ , the same as in the latter weave  $6$  (foundation)  $\times 4$  (pieces of twills used)  $= 24$ .

### THE IMPORTANCE OF WOOL-SORTING.

The early stages in which manufacturing materials are dealt with are always of vital importance, not only to those immediately concerned, but also to those who handle them afterwards. Every operation is influenced by the one which has preceded it, and also affects the one which follows, consequently, sorting, though not actually the first handling which the wool receives, is well worth special consideration with a view to finding out why it is done, the best way to do it, and noting any important matters which may crop up in relation thereto.



TYPICAL WOOL FIBRES.

A, Port Philip, cross-bred, scales very bold; B, New Zealand, half-bred, scales of various widths; C, Var-Tasmaria, cross-bred, clear and well scaled; D, Cheviot, scales numerous and mosaic-like, surface rough.

It may be said at the outset that though classing and sorting are similar in many respects, and have one ultimate object in view, they are not identical. The work of classing, when done at the right time and place, is complete before the clip leaves the growers' premises.