It has been proposed to convert the indigo into the sulfonlic acid, and to make dye trials against pure indigo, but it is obvious that this method is not practicable, owing to the imperfect or over-saponification; some indigo takes longer to dissolve than others, and it is not possible to know precisely how much the indigo is placed on the sulfonation, nor when to stop it, and either under or over-saponification would lead to bad results.

Perhaps the best method of valuing indigo consists in obtaining indigo laevorotatory in the pure form and weighing it. A solution of stannous chloride is prepared by dissolving 48 grams of SnCl2.H2O in one litre of water, which is mixed with a strong solution of caustic soda until the precipitate which is at first formed has just re-dissolved; so on of this solution of sodium stannate is then mixed with 8 grams of strongly powdered indigo. The mixture is well shaken up and allowed to stand for an hour, when the reduction will be complete, a yellowish green solution being obtained. The solution is promoted by shaking at intervals. There is now added 15 c.c. of a fresh re-precipitated solution of hydrogen peroxide, the mixture being well shaken and then allowed to stand for one hour, after which it is filtered, washed with distilled sulphuric acid, and then boiled and filtered. The precipitate of indigo is washed with water, then with dilute caustic potash, and finally with warm alcohol, after which it is dried and weighed. It is carefully incised and weighed, and the amount of indigo in the precipitate gives the amount of indigo in the indigo.

Any attempt to obtain indigo from indigo by alternate treatments with acid, alcoholic potash, water, and alcohol will not give satisfactory results.

The following mixture is recommended by a French contemporary—Four litres hydrochloric acid of 20 or 25 Be. and one litre liquid sulphuric acid of 48 Be. are dissolved in two litres of water; the solution will stand at about 18° C. After being secured, the wool is laid down in this solution for a few minutes and then dried.

Stiff may be dyed and printed with allarice Bordeaux and allarice cyanine with good results. The dyeing of the wool is done in one bath by using fluocine of chrome as a mordant, entering the dye in the cold bath, and then slowly raising the temperature, the silk may be mordanted with chromium chloride as in cotton dyeing, and then printed to separate bath of the dye stuff. For printing, the colour is made with a thickening gum tragacanth, starch, and a little oil, containing a mixture of acid, sulphate of alumina, acetic of chrome, and the dye stuff, printing and steaming in the usual manner.

Designing.

THE ANALYSIS OF PATTERN—II.

WEAVE ANALYSIS.

Since any further calculations than those already dealt with will relate definitely to the cartoon of the cloth that happens to be under consideration, the next step will be to obtain the weave, or order of interlacing of the warp and weft threads. Since, however, it is not possible to examine one piece of cloth and get a piece of ordinary piece glass on the face of the cloth, when probably the make or make (should it be a fancy one) will be recognized, the ordinary piece, the threads may even be followed throughout the repeat. In analysing woollen and worsted fabrics, therefore, the maker can usually judge from the face of the cloth, whether there be both backing warp and weft, then the fabric will usually be a double cloth, in which case three points must be decided: firstly, the face weave; secondly, the back weave; and thirdly, the system of tying the back cloth to the face. Since backed and double cloths will be treated at length later, we proceed at once to consider the analysis of single cloths.

SINGLE CLOTHES.

In the case of single cloths, as already pointed out, it is necessary to pull the pattern in pieces, a very effective way of obtaining the weave of such a cloth is to apply an ordinary piece glass on the face of the cloth, which, when probably the make or make (should it be a fancy one) will be recognized, the ordinary piece, the threads may even be followed throughout the repeat. In analysing woollen and worsted fabrics, therefore, the maker can usually judge from the face of the cloth, whether there be both backing warp and weft, then the fabric will usually be a double cloth, in which case three points must be decided: firstly, the face weave; secondly, the back weave; and thirdly, the system of tying the back cloth to the face. Since backed and double cloths will be treated at length later, we proceed at once to consider the analysis of single cloths.

CLASS 1—Ordinary Woven Flax, hemp, etc., which are usually woven on the square, i.e., an equal number of threads and picks per inch.

CLASS 2—Warp and Weft: Usually woven with a finer than warp, and consequently some picks per inch.

CLASS 3—Warp and Weft not too fine; with slightly finer warp than weft, with a greater number of threads per inch.

ORDINARY MAKES, ETC.

Since in this class warp and weft interwoven in the same, or nearly the same, manner, the number of picks and the number of threads are usually the same, or nearly the same, in a high count thread, we see that in the ordinary make we may be pulling out a twilled cloth, as shown in Diagram 1. Notice first that the curves are equal, this being a necessary condition where a thread is as up and down an equal number of times; and, secondly, that the
THE TEXTILE MERCURY.

115

Diagram 4 shows this clearly, (1) being the warp thread and (2) the weft pick. Design 4 is a typical warp rib, but Design 5 was employed in the cloth from which this thread and pick were taken, this being practically a 15 and end twill weave, (3) indicating the thread for 2 wefts, and (b) showing for 5 picks. In this case the structure is more easily arrived at by carefully pulling out the threads. Should the weft be single yarn, however, it may be impossible to decide how many individual picks the warp floats over or under, each pick becoming merged with its neighbour. Under these circumstances it may be necessary to extract a few well-pick; in fact it is always advisable to do so, for it must be remembered that it is not upon one circumstance alone that the structure of any cloth will be decided, but by the combination of circumstances, which practice alone will enable the analyst to combine in one harmonious whole.

The satin and satin derivatives are a type of design which have representatives in all three classes, but the satin will be recognised at once by its appearance and upright or horizontal angle, while the derivatives may usually be recognised by noting the principal weave feature along with its repeat; for example—the twilled hopack is remarkably like ordinary hopack, but when the relative positions of each pair of two by two are noticed the satin distribution is at once apparent.

COTTON SUITINGS.

Design A, B, and C are on 12 shafts, straight-over draft, 24 to the round, and are constructed as to form a back without extra material, making them specially suitable for outdoor wear. If made from the following particulars a good useful cloth for many purposes can be fabricated. Warp, 2/20’s cotton, 60 ends per inch or 15 dens, four in a dent, 30 picks per inch of 8’s soft spun cotton weft; woven all grey, and piece-dyed in drabs, buffs, stones, or any shade. These designs will be found of advantage to the makers of heavy cotton cloths.

Design D is a cotton cloth, having one face pick alternated with a back pick, which will give a fabric of any weight required. The back may be carded, thus providing a lining for cotton garments and giving the leaf of a woollen material; 8 shafts, straight draft, 32 to the round. Where it is not convenient to have drop boxes on each side of the loom, one complete set of weft will suffice for both face and back, therefore one shuttle will effect this object. On the other hand, with the shuttle boxes, it is possible to make the back with a coarser count, or any material that may be deemed advisable. Let the warp be 2/30’s, in 20 dents per inch, 4 in a dent, 60 picks per inch of 12’s soft cotton.

Design E: Nearly similar particulars, warp 2/30’s, in 20 dents per inch, 4 in a dent, 8’s weft, 60 picks per inch. As will be seen by the design, there are two picks of weft for the face to one on the back. We need scarcely draw attention to the fact that end-and-end colour arrangements can be produced in these goods with the greatest freedom, either in warp, weft, or both combined; but they are generally woven grey and piece-dyed.

Design F is in cotton for ladies’ jackets, vests, etc., 20 shafts, 16-end draft, 16 to the round. Warp, 2/30’s cotton, 28 ends per inch, 4 in a dent; weft 8’s cotton, 60 picks per inch. This cloth, woven in the grey, may be dyed in all the fancy shades, or well bleached.

Design G is also a cotton fabric for suitings, on 10 shafts, straight draft, 20 to the round, one pick face, and one for a backing strip. If a heavier cloth be desired the warp or weft, or both may be increased in the number of ends or picks, by the use of coarse counts; also in the weft the same result may be obtained.

The following particulars will furnish the idea of how to obtain a good cloth:—Warp 2/30’s, with 20 picks per inch, 4 in a dent; 12’s weft, 70 picks per inch; when woven it will be well bleached and piece-dyed. We have by these designs shown how this class of cotton goods may be backed in a simple manner as possible.