Prepake a bath with 5% acerol red, 1% fast red, 1% chrome yellow, and a little sulphuric acid. Work at the boil to shade. Lift, wash, and dry.

WARM BROWN ON WOOLEN CLOTH.

For 100 lb. cloth, Mordant by boiling for 56 hours:

- 4 lb. bichromate of potash,
- 2 lb. tartar,
- 0.5 lb. sulphuric acid,
- 1 lb. sodium carbonate.

Work in a dye-bath with:

- 7 lb. sulphate of copper,
- 1 lb. sodium carbonate,
- 0.5 lb. acetic acid.

In the usual manner with aniline dye-stuff.

BROWN DEARN ON COTTON.

For 100 lb. cotton, Prepare a bath with:

- 7 lb. sodium nitrate,
- 0.5 lb. sodium carbonate,
- 0.5 lb. sodium bicarbonate,
- 0.5 lb. sodium sulphate,
- 1 lb. soap.

Work at the boil for one hour.

DARK GREY ON LINEN.

For 100 lb. goods, Dye a bath for 4 hours:

- 1 lb. Glaser’s salt,
- 1 lb. sodium carbonate,
- 1 lb. sodium acetate,
- 1 lb. sodium sulphate.

Work at the boil for one hour.

DYE AND DYES.

Mr. C. A. Wansitt, in the course of a paper on "Dry Heat Viscosimeter," read before the Glasgow Section of the Society of Chemical Industry, said that the advantage of different dyes and pigments with rubber proofing was little understood as yet. He further said that the operations of the dye and the proofer should be brought into partnership, instead of standing quite distinct as at present. It is to this latter statement that we are about to refer, and we think that this is a very sound plan, considering the great interest of the various manufacturers in the preservation of their business. On this head objection may be felt by the rubber proofing manufacturer in admitting materials of the treatment of each material separately is much to be preferred. The method of finding the weight of the latter class of goods—viz., those in which two distinct materials are employed—is very easy, as the following example shows:

Designing.

THE ANALYSIS OF PATTERN—XIII.

THE WEIGHTS OF CLOTHS.

A large number of fancy dress fabrics, usually included under the heading: "crammed stripes," require distinct treatment under the second heading, since whether they are true crammed stripes or only those in which two distinct patterns are employed, the treatment of each material separately is much to be preferred. The method of finding the weight of the latter class of goods—viz., those in which two distinct materials are employed—is very easy, as the following example shows:

Warp:

- 12 threads 2/50’s of linen worsted.
- 12 threads 2/50’s of cotton.
- 12 threads 2/50’s of worsted.
- 12 threads 2/50’s of worsted.
- 12 threads 2/50’s of green worsted.
- 12 threads 2/50’s of white worsted.
- 12 threads 2/50’s of blue worsted.
- 12 threads 2/50’s of white worsted.

66 threads in pattern.

Weft: 12 threads 4’s.

Same as warp; 48 picks per inch.

Piece to be woven 46 in. wide, in 60 yds. long:

- Then, 48 threads per inch x 66 threads in pattern = 3,168 pattern per inch, or 1 pattern = 22 in.

- Therefore, 48 x 2 = 96 patterns in piece, an 48 x 24 x 60 = 1 lb. 15 oz. of white worsted.

- 35 x 550 = 1 lb. 2 oz. of blue worsted.

- 25 x 550 = 1 lb. 4 oz. of sodium sulfonate.

- 25 x 24 x 60 = 2 lb. 15 oz. of green worsted.

- 15 x 550 = 1 lb. 10 oz. of white worsted.

- 15 x 24 x 60 = 1 lb. 5 oz. of blue silk.

- 10 x 550 = 1 lb. 1 oz. of orange.

The weight of the desired pattern may be exactly the same, unless the take-up in weaving of the warp, true cloth is not a true cram. and since a true cram has more threads in one portion than in another, as instanced above:

<table>
<thead>
<tr>
<th>Threads of Mohair</th>
<th>in a reel</th>
<th>in 100 yds.</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>100</td>
<td>130</td>
</tr>
<tr>
<td>20</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>12</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>9</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>100</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>10</td>
</tr>
</tbody>
</table>

Having the counts of mohair and cotton with the length of the warp, etc., the weight of the cloth may now easily be found as previously shown.

Other Weights and Calculations.

There are many other forms in which warp and weft calculations may occur, but the following formula will probably prove all that is necessary:

Let C = counts, W = width in loom, L = length, N = number of ends or picks per inch, P = weight in lbs. Then

- \[ C \times N \times W = P \]
- \[ C \times N \times W \times L = P \]
- \[ C \times N \times W = P \times C \times N \times W = P \]
- \[ C \times N \times W = \frac{P}{C \times N \times W} \]

Now this is a complete formula; consequently, if one of the terms is missing, the sum worked out will give that term—i.e., the number which will complete the calculation. The following are the values involved:

(1) To find the counts when ends or picks per inch, width, length, and weight are given:

- \[ C = \frac{P}{N \times W} \]

(2) To find the length when ends or picks per inch, width, and weight are given:

- \[ L = \frac{P}{N \times W} \]

(3) To find the weight when ends or picks per inch, width, counts, and weight are given:

- \[ P = \frac{C \times N \times W \times L}{N \times W} \]

(4) To find the ends or picks per inch when width, length, counts, and weight are given:

- \[ C = \frac{P \times C \times N \times W \times L}{P} \]
With these formulas, not only should the analyst be able to work out any calculations which be required to occur, but he should also be able to reason the matter out on reference to the particulars already given. As stated, the above systems, although answering all requirements when dealing with the loom, require certain modifications in application to the cloth in the finished state. These modifications will be considered below.

CHANGING THE WIDTHS OF CLOTHS.

There are three ways in which the widths of cloth may be changed—viz., by change of counts; by changing the number of ends and picks per inch; or by a combination of both of the foregoing. The latter method is undoubtedly the correct one, but since all three methods may be useful to the analyst, for modifying cloths in weight, each shall be briefly considered.

Since counts in reality equal weight, a direct change of counts of yarn in a cloth necessarily implies a direct change of weight, inversely. For example, if a cloth woven with a 20s yarn is 1 lb. per yard, a cloth woven with a 10s yarn will weigh 2 lb. per yard, or as 20 is to 10 inversely. This is exceedingly simple, and at first sight would appear self-evident. Such, however, it is, save that when the number of ends per inch has been made; consequently, if the first cloth is a perfect one, the second cannot be perfect, and reversed.

Again, the required change in weight may be made by the ends per inch, 20 ends giving twice the weight of 40 ends per inch, and so on. But the same objection must be raised to the above method, in which both ends and weights are changed, and the same perfection of structure thus retained.