

ANALYSES OF FABRICS OF FOREIGN ORIGIN COLLECTED AND EXHIBITED BY THE BOARD OF TRADE.

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It will be within the recollection of all present that the Board of Trade made a collection of fabrics of German and Austrian manufacture, which was exhibited in the Manchester Town Hall, and which aroused considerable interest among textile manufacturers in this country. A number of members of the Textile Institute felt, however, that an examination of the exhibits such as could be made on the spot would, in most cases, be inadequate or misleading for the purpose of reproduction.

The authors inspected this exhibition and followed the press comments thereon, but they came to the conclusion that only by careful physical and chemical examination would it be possible to draw definite conclusions regarding the preparation of the threads, the composition, and the structure of the fabrics, and the processes and materials employed in dyeing, printing, and finishing.

The Institute decided to approach the Board of Trade with a view to obtain samples for detailed examination. The Board kindly acceded to this request and afforded the authors every facility for making a suitable and representative collection.

It was found that part of the collection had been dispersed, but a large and varied assortment of fabrics was still available, and from these several hundreds of samples were taken.

The work of selection extended over two and a half days, and the authors desire to take this opportunity of expressing their appreciation of the courtesy extended to them by the officials of the Board, and their thanks to Mr. Frank Warner for his assistance in procuring permission to obtain the samples.

This war has shown the great interdependence of nations for the supply of articles in everyday use, and in no industry has the effect of reducing, or entirely cutting off, the supply been more apparent than in the textile industry. In addition to the dearth of dyestuffs, many of the cheaper kinds of fabrics that have found their way into this country from Germany and Austria are to-day unprocurable and our merchants and consumers are seeking for new sources of supply.

Before the war all the available labour in this country was fully employed in one branch or another of the textile industry. To-day, with greatly reduced labour, there is a demand for a wide variety of fabrics which are, generally speaking, low in quality, but the consumption of which is normally very large.

In producing these articles, Continental manufacturers have shown a thoroughness and an ability to utilise all the available materials. They have abundantly shown that the cheaper kinds of fabrics are not too insignificant to be worthy of being ornamented with good and attractive designs.

They have also thoroughly studied and grasped the limitations of the different materials to be used, and the methods employed have been worked out with a view to economic production on a large scale.

If, as a result of this, they have been able to combine good designs with low cost of production, and still develop a remunerative business, the British manufacturer may find it worth his while to proceed on similar lines. Our textile industry is already very extensive, but it is capable of still further extension in the direction of catering for a class of goods that has hitherto been left largely to German and Austrian effort.

The question as to whether similar fabrics can be produced in this country may be answered in the affirmative, but in order to do this a close study of the conditions of manufacture and a strict adherence to minute details will be essential.

From the structural point of view there is abundant evidence in these fabrics of a constant effort to adapt the means to the end. The building of each fabric appears to begin with the selection of the raw material, and every stage in the treatment of that material contributes its part to the final effect. It is here that Continental manufacturers have displayed an advantage over their British competitors. In many of the Continental establishments the work is carried through from the initial to the final stage, while we, by reason of sub-division of labour and intense specialisation, proceed by relays. The spinner produces the yarn without full knowledge of the uses to which it has to be put. The manufacturer converts the yarn into cloth often without knowing anything of the operations through which such cloth will have to pass after it has left him, and sizing, bleaching, dyeing, printing, and finishing are as often carried out in separate establishments, with the result that it is impossible to correct defects due to unsuitable raw material, unsuitable twist in the yarn, unsuitable sizing, and unsuitable weaves.

It is hardly conceivable that many of the effects in the fabrics examined can have been produced without the closest co-operation of all concerned in their production. In some cases this may possibly be taken as an explanation for the low prices at which the materials can be produced, as the profits from all the different operations are made by one firm.

In advancing this statement the authors are aware that combined efforts such as those obtaining on the Continent do exist in this country, but they are few by comparison.

It should be pointed out that many of the samples obtained are not large enough to permit of a complete analysis. It has therefore, in such cases, not been possible to ascertain with the requisite

degree of accuracy the count of the yarn, the weave, or the nature and the quantity of the finishing and loading materials employed.

The percentage of wool present in some of the union fabrics has been ascertained, in order to enable the manufacturer to calculate the cost of production.

Speaking generally, the examination of the dyed and printed fabrics for the mordants and dyestuffs used does not reveal anything unusual, and the information given below should be sufficient to enable an experienced dyer or printer to imitate the effects successfully.

In carrying out these investigations we have dealt of necessity only with the conditions that obtain in the finished fabrics. For example, the counts of the yarns are given as they have been found in the bleached, dyed, printed, raised, or otherwise finished samples, and the number of warp and weft threads per inch are those in the fabric, and not those required to reproduce a similar effect.

The prices of some of the fabrics are given, but these should be accepted with a certain amount of reserve. Whilst in some instances they no doubt represent the actual sale prices of the material, in others they are possibly dumping prices. Only in a few cases has it been possible to compare the prices charged by Continental manufacturers with those demanded by the retailer in this country. The latter were such that a similar article, of a superior quality, could have been sold at the same price, and still allow a reasonable profit to the retailer. But the inferior quality of the imported article would not be apparent to the purchaser, because of a pleasing pattern or a soft, woolly feel.

Some of the fabrics are so low in quality that it is difficult to understand why they were manufactured. It can hardly be a question of producing something which is needed by the very poor, for one effect of purchasing such articles will be to make the poor still poorer; however low the price, a purchaser cannot obtain value for money.

The collection as a whole may be described as imitative rather than original, and the dyed, printed, and finished effects which are intended to pass for woven ones are often quite remarkable.

The keynote of the collection will be found to consist of cheapness and of an attempt to imitate accurately higher-priced articles. The generally accepted idea that these articles are altogether "cheap and nasty" cannot be upheld. They are certainly cheap and of correspondingly low quality, but many of the effects produced are such as to deceive not only the purchaser but also the expert. Even where the expert is not deceived, he often finds it difficult to determine the exact methods and materials employed in the production of these fabrics.

An analysis of the yarns used to produce the fabrics comprised in the collection show that different fibres have been used to produce one fabric:—(a) By mixing different fibres and spinning them into the same thread. (b) By folding two, or more, threads

together, one of which differs from the other in material. (c) By using separate threads spun from different materials. The admixtures comprise cotton and artificial silk, cotton and wool, cotton and linen, cotton and jute, cotton and kapok, and wool and artificial silk.

In addition to threads which are spun in the usual manner, there are those made from uniformly dyed raw material; from admixtures of differently dyed raw materials; from twisting an undyed roving with a roving produced from mixed colours, and by twisting together an undyed or a dyed thread with a printed thread. The fancy threads are used in different ways and are of different types, namely, in crepe yarns there are those which cause a fabric to crinkle in one direction; those which produce crinkling in both directions, and those which cause a fabric, in crinkling, to assume somewhat of a honeycombed appearance.

Threads are found in all folds from two to six. In some cases equal counts are twisted to produce ordinary two-fold yarns, in others to produce spiral yarns. Unequal counts are also used to produce spiral yarns.

Fancy threads are numerous and varied. These are sometimes used only as warp, sometimes only as weft, and sometimes as both warp and weft. One example of the construction of these yarns will suffice. Thus, a $2/33$'s is twisted with a single 33's and an 8's. But while eight turns will liberate the single 33's, twenty-three turns are required to liberate the $2/33$'s and the 8's. Also, while one inch of $2/33$'s and one inch of the single 33's will make approximately one inch of the four-fold yarn, two inches of the 8's will be required.

The twist in single warp and weft yarns is usually twist way, and in two-fold yarns it is weft way; but in some cases the folding twist is in the same direction as that in the singles. In a few cases the warp is twist way and the weft is weft way, and examples are to be found in which the warp is twisted weft way and the weft is twisted warp way.

The great variety of raised fabrics forms one of the outstanding features of the collection. These include blankets, rugs, shawls, dressing-gown fabrics, flannelettes, men's suitings, imitation cords and velvets.

BLANKETS.

In this group will be found double-weft fabrics made (a) from all cotton, (b) double-weft fabrics made from a cotton warp and one cotton and one woollen weft, (c) single fabrics made from a cotton warp, with stripes made from dyed raw cotton and wool weft and white cotton wefts, an additional pattern having been applied by duplex printing; (d) single fabrics made from a cotton warp and a double roving weft, one roving grey, and the other made from cotton dyed in the loose state and both slightly twisted; (e) fabrics made from three wefts all of mixed fibres.

No. 1 is a typical example of (a). 62 in. by $70\frac{1}{2}$ in., sold at 9s. 3d. It contains 40 ends per inch of 14's, 25 picks per inch of

5's coloured and 24 picks per inch of 6's white, all spun twist way, and picked one colour one white. The ground weave is shown in Fig. 1, the design is produced by a Jacquard, and the shades have

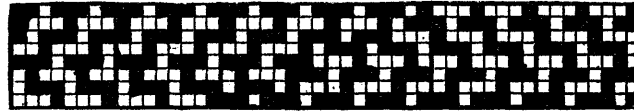


FIG. 1.

been dyed with substantive cotton dyestuffs. The weight per square yard of finished cloth is 5,250 grains.

No. 2 is a typical example of type (b). 59 in. by 78½ in., sold at 6s. 11d. It contains 33 ends per inch of 14's and 24 picks of 5's wool, in cotton count, and 3's white cotton, all spun twist way. The striped portions are woven with two woollen wefts, whilst the

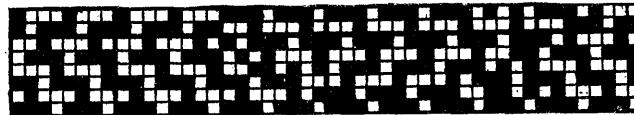


FIG. 2.

white weft is all cotton and picked 1 and 1. The wool has been dyed with acid dyestuffs. The proportion of wool to cotton in this fabric is as 56 to 44. (Fig. 2.)

No. 3 represents type (c). 62 in. by 70¾ in., sold at 4s. 10d. It has 17 ends per inch of 2/24's, folded weft way. The singles are spun twist way and are undyed. There are 14 picks per inch of 1's in cotton count, but spun from wool and cotton. The weave is plain, the fabric is single, and the weight per square yard is 6,394 grains. The stripes are woven from fibres which have been dyed in the loose state with acid dyestuffs. The white portions have been printed on a duplex machine. The fabric contains 60 per cent. of wool and 40 per cent. of cotton.

No. 4 represents type (d). 62 in. by 70¾ in., sold at 1s. 3d. This is a mottled blanket of low quality, of German manufacture. Size 60 in. by 80 in., weight 2 lbs. Price 1s. 3d. per blanket. It has been made with 21 ends per inch of 18's twisted twist way, and with 10 picks per inch of ¾'s red, blue, brown, and yellow wefts, which form stripes, and of 1's grey and blue roving twisted together, the white being heavier than the grey. The weave is a plain one; the shades have been dyed with substantive cotton dyestuffs, and the grey has been produced by employing blue, grey, and white fibres in the manufacture of the yarn.

No. 87. A cotton blanket coloured in stripes, 48 in. and 78 in. wide, sold at 10d. and 13½d. per yard respectively. The piece has 23 ends per inch of 22's spun twist way, and 12 picks of 1.5's spun

weft way. The weave is plain. The warps in all samples of this set are dyed pink with substantive cotton dyestuffs; the weft threads are dyed with substantive dyestuffs, which in some cases have been topped with basic dyestuffs.

No. 90 is a cotton blanket, 59 in. by 79 in., sold at 2s. 1½d. each. The piece contains 43 ends per inch of 16's, 22 picks per inch of 8.5's coloured, and 22 picks per inch of 6.5's white, all spun twist way. The picking is 2 and 2, the ground weave is plain (Fig. 3),

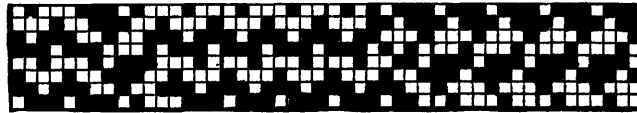


FIG. 3.

the figure is produced by the Jacquard, and the weight per square yard is 3,226 grains. The shades are mostly brilliant and some are dyed with basic dyestuffs, which have not been fixed properly, others with substantive cotton dyestuffs.

No. 99. A striped blanket, 59½ in. by 79 in., sold at 4s. 7½d. each. It is made from 18 ends per inch of 2/25's grey cotton, folded weft way and 14 picks per inch of 0.83's mixed cotton and wool or hair. The fibres have been dyed in the loose state, the wool with acid dyestuffs and the cotton with substantive dyestuffs. The weft contains 28 per cent of cotton. The weave is plain.

No. 101 represents type (e). 62 in. by 70¾ in., sold at 6s. 2d. It is woven with three wefts from cotton and wool mixed. The piece has 30 ends per inch of 12.5's grey cotton, and 20 picks per inch of white, red, and green in the proportions of 10 to 5 to 5.



FIG. 4.

The white equals 3's, the red 3.5's, the green 3's, all spun twist way. The counts are expressed in the cotton system. The picking is 1 white, 1 red, 1 white, 1 green. The wool fibres in the coloured weft have been dyed with acid dyestuffs, those of the cotton with substantive cotton dyestuffs. The weft contains 20 per cent. of cotton (Fig. 4).

RUGS AND SHAWLS.

No. 5. Travelling or sofa rugs of very low quality, woven in a great variety of checks, which have the appearance of woollen goods. They consist of waste cotton and shoddy wool spun together, both in warp and weft. The cotton

and the wool have been dyed in the loose state, the former with substantive, the latter with acid dyestuffs. One of the specimens analysed contains 21 ends per inch of $3\frac{1}{4}$'s green, 3's red, and 3's white, and 17 picks per inch of similar material, all spun twist way. The weave is a 2 and 2 twill, and the piece is raised on both sides. The fabric contains 43.6 per cent of wool, 45 per cent of cotton, and 11.4 per cent of filling materials. Separate analyses of warp and weft showed that the proportion of cotton to wool is practically the same in both sets of threads.

No. 61. A checked shawl, 48 in. by 106 in. It contains 60 ends per inch of 20's, fawn and white, and 18's printed; also 35 picks per inch of 5's, red and fawn, and $4\frac{3}{4}$'s printed. The red

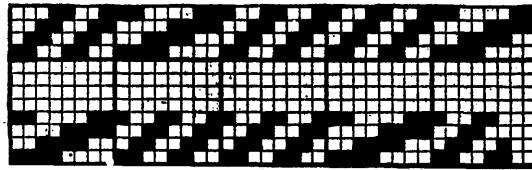


FIG. 5.

and the fawn threads are dyed with substantive dyestuffs, the black effect threads are printed with logwood steam black. The weave is a 2 and 2 twill, drafted to produce stripes (Fig. 5).

No. 105 is representative of a set of shawls in brilliantly coloured

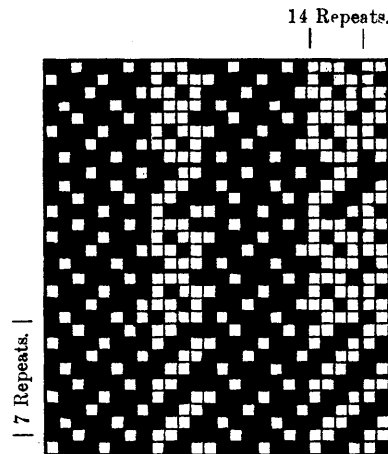


FIG. 6.

checks: One of these contains 32 ends per inch of 10.8's wool, expressed in cotton count, of green, pink, and white, spun twist way, and $2/40$'s mercerised cotton in white, folded weft way, the

singles being spun twist way. Also 32 picks of similar materials to the warp. Warping and wefting patterns:—

8 cotton		
4 green		
8 cotton		
16 green		
2 pink,	}	4 times repeated
4 white,		
2 pink		
16 green		
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78		

Weave as Fig. 6. The shades have all been dyed with acid dyestuffs.

No. 106 is one of a set of shawls in three colours; they are 47 in. by 77 in. and 48 in. by 78 in., with a $3\frac{1}{2}$ in. to 4 in. fringe, sold at 1s. 8d. to 2s. each. This piece has 36 ends per inch of 11.3's cotton and 26 picks per inch of 10.7's woo, in cotton count, all spun twist way. The warping pattern is:—

4 green	
4 sky blue	
30 green	
4 sky	
4 green	
52 black	
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98	

The weft pattern is:—

4 green	
4 sky	
24 green	
4 sky	
4 green	
38 black	
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78	

Weave 2 and 2 twill.

In the warp, the blue threads have been dyed with substantive cotton dyestuffs, the green with a basic dyestuff on tannin mordant, and the black with a sulphur dyestuff. The blue, green, and black threads in the weft have been dyed with acid dyestuffs. The sample contains wool and cotton in equal quantities.

DRESSING-GOWN MATERIALS.

This part of the collection includes some good examples of figuring with two wefts. The pieces are raised on both sides, and the nap is, as a rule, short, close, and evenly felted. This result

has been produced by bestowing special care upon the raising and by giving the fabric a considerable number of passages through the raising machine. A nap of this description reduces the chief complaint made against raised cotton material, namely, its inflammability.

No. 6 is a beautiful specimen of a dressing-gown or ladies' coating fabric; it has heather shade on one side and a mottled Nile blue on the other. It is sold 31 in. wide at 7 $\frac{3}{4}$ d. per yard, and contains 59 ends per inch of 33's, and 64 picks per inch, 32 of heather shade and 32 of blue shade. The count of the heather weft is 6 $\frac{1}{2}$'s, and that of the blue is 7's; all are spun twist way. The wefts are made from fibres dyed in the loose state and then mixed.

The shades have been produced with substantive cotton dyestuffs; one weft is composed of orange, blue, and green fibres, the other of blue and magenta fibres. These mixtures produce pleasing mottled effects on both sides of the fabric. The nap is short and

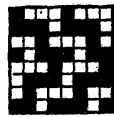


FIG. 7.

close, and evenly felted. The warp is dyed grey with substantive cotton dyestuffs, and the weave is a 3 and 1 twill, picked 1 and 1 (Fig. 7).

No. 7 is another typical example of this class of material. The width is from 30 in. to 31 $\frac{1}{2}$ in., the price 9d. per yard. It is striped on both sides, the stripes being produced by wefts of heather shade and green respectively. It contains 59 ends per inch of 30's grey cotton, also 63 picks of 7's heather, and of 6.5's dark green, all spun twist way, and picked 2 and 2. The warp has been bleached. The lighter-coloured weft threads have

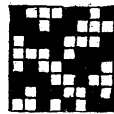


FIG. 8.

been spun from a mixture of yellow, violet, green, and brown fibres, the darker-coloured ones from a mixture of blue, violet, and brown, all dyed with substantive cotton dyestuffs. (Fig. 8.)

No. 8 is 31 in. wide, and sold at 8 $\frac{3}{4}$ d. per yard. It is heather shade, raised on the back and "ripple" finished on the face. The piece contains 45 ends per inch of 28's dyed cotton, and 60 picks per inch of 7's, both spun twist way. Thirty picks go to each side of the fabric, and the picking is 2 and 2. The design is

a four-shaft satin weave on both sides. The brown warp has been dyed with substantive cotton dyestuffs, and the weft has been spun from a mixture of orange, green, and heliotrope fibres also dyed direct. (Fig. 9.)



FIG. 9.

No. 9 is 30 in. to 31½ in. wide, sold at 9½d. per yard. This differs distinctly from the preceding examples in that the face is ornamented with stripes. One stripe is produced by dark blueish-grey threads and by threads printed yellow, blue, red, and green with white intervals. The broad stripes are of a lighter mottled blueish-grey. The light and dark blueish-grey wefts are spun from dyed cotton, the light being a mixture of white and blue fibres, dyed with substantive cotton dyestuffs, while basic

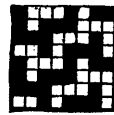


FIG. 10.

colours and tannic acid have been used for printing the effect threads. The fabric contains 58 ends per inch of 30's grey, and 48 picks of 5's dark blue, 6's light blue, and 7's printed, all spun twist way. It is picked 1 and 1. The back is uniformly mottled. The weave is a double four-shaft satin. (Fig. 10.)

No. 60 is a pink and white dressing-gown fabric, 27 in. or 42 in. wide, sold at 6½d. and 9d. per yard respectively. The piece is made from two wefts and one warp. The effect is a striped one,

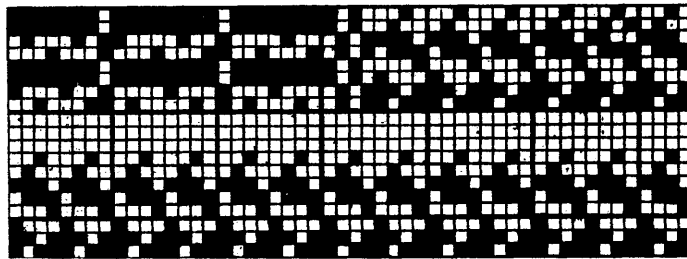


FIG. 11.

which repeats upon 96 ends. There are 42 ends per inch of 17.5's, and 4 picks of 7's, all spun twist way, but the weft is very lightly twisted. The picking is 2 and 2. The warp is heavily sized and the pink has been dyed with Rhodamine. (Fig. 11.)

No. 73. A dressing-gown fabric with a woven design produced in light and dark grey wefts. It is 27 in. and 42 in. wide, and sold at 6 $\frac{3}{4}$ d. and 10 $\frac{3}{4}$ d. per yard respectively. There are 64 ends per inch of 19's, spun twist way, and dyed blueish-grey with a substantive cotton dyestuff, and 54 picks per inch, 27 of each shade, of 5 $\frac{1}{2}$'s. The weave is a 3 and 1 and 1 and 3 satin; the picks alternate.

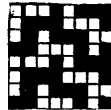


FIG. 12.

and the piece is raised on both sides. The raw cotton for the weft has been dyed light grey with a substantive cotton dyestuff, and dark grey with a sulphur dyestuff. (Fig. 12.)

FLANNELETTES.

The group of flannelettes is an extensive and interesting one. It comprises white, dyed, and printed fabrics. Of these some are printed on one side only; others are printed and pressed to resemble woven cords, while many are strongly printed on the back either with colours or with white and coloured discharges which penetrate to the face, and, when raised, give soft and beautiful effects. In some cases the pieces are raised on one side only, but most of them are raised on both sides; some are raised on the back and "ripple" finished on the face; others are raised to closely resemble velvet.

No. 10 is a plain dyed fabric, 27 $\frac{1}{2}$ in. wide, which is sold at 6 $\frac{3}{4}$ d. per yard. It is made from 51 ends per inch of 23 $\frac{3}{4}$'s, and 41 picks per inch of 8.1's, both spun twist way. The weave is plain, the fabric is raised on one side only, the nap is short and velvety, and it has been dyed with basic dyestuff on a tannin mordant.

No. 11. This fabric is made from a grey warp and pink and white weft. It is 32 inches wide and sold at 5 $\frac{3}{4}$ d. per yard. It contains 49 ends per inch of 20's grey, spun twist way, and 26 picks of pink and white combined. The count of the pink is 7 $\frac{1}{2}$'s, that of the white 8 $\frac{1}{4}$'s, and the average turns per inch are 7 on 12 in. The weave is plain and the pink has been dyed with a substantive cotton dyestuff.

No. 72 is a printed flannelette, 27 in. to 28 in. wide, and sold at 4 $\frac{1}{2}$ d. per yard. This piece has 46 ends per inch of 26's, and 39 picks of 8's, both spun twist way. The weave is plain; the colours are dyed with substantive cotton dyestuffs, with discharges printed on, and the pattern shows faintly through the raising on the face.

No. 12. This is typical of a series of patterns which have been produced by dyeing in the piece, and by afterwards printing either colours, or white, or coloured discharges on the back. The pieces are raised on both sides. This method of producing effects upon

flannelettes is well known, but is worthy of special attention on account of the elaborate, pronounced patterns which are in some cases employed for printing the back in order that a peculiar soft and artistic effect may be produced on the face. The nap is, almost without exception, short and velvety. The specimen analysed contains 46 ends per inch of 26's, spun twist way, and 34 picks of 6's spun weft way. The weave is plain, substantive cotton dyestuffs have been used in dyeing, and the discharged effects have been produced by using a discharge with or without the addition of basic colours and tannic acid.

No. 13 is a fabric with a "ripple" finish; it is dyed with substantive cotton dyestuffs, and lightly raised on the back. It contains 52 ends per inch of 20's, and 32 picks per inch of 7's, both spun twist way. The weave is 1 up and 2 down twill.

No. 89 has a "ripple" finish on one side and is slightly raised on the other. It is 28 in. wide, and sold at 5d. per yard. The piece has 48 ends per inch of 23's and 30 picks of 4's. The weave is 1 up and 2 down twill. It has been dyed with a substantive pink and has been finished with Turkey-red oil.

No. 14. This fabric is sold at 6½d. per yard. It contains 43 ends per inch of 25's, and 43 picks of 8's, both spun twist way. The weave is a plain one, and the fabric is raised on the face only. It has been printed with basic dyestuffs; the colour of the ground does not, however, penetrate to the back. The noteworthy feature of the pattern consists in a remarkably good imitation cord effect which has been produced by embossing the face with deep vertical lines. It will be of interest to compare this pattern with No. 25, which is a real cord. The sample with a white ground contains 42 ends per inch of 26's, and 42 picks per inch of 6's, both spun twist way. The weave is plain.

No. 15. The face of this fabric is similar to No. 14, with the exception that the cord line has not been imposed, but a twill effect has been printed on the back. The construction differs slightly from No. 14, for it contains 44 ends per inch of 20's, and 48 picks per inch of 8's, both spun twist way. The weave is plain. The nap is very short and felted.

No. 15x. A most striking imitation of a velvet effect produced by raising a double 8-shaft satin weave. The piece contains 61

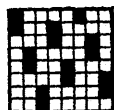


FIG. 13.

ends per inch of 29's, and 50 picks per inch of 11's, both spun twist way. It has been dyed in the piece with fairly fast substantive cotton dyestuffs. The average length of the fibres in the weft is $\frac{7}{16}$ in.; they are harsh to the touch and resemble some of the shorter Indian cottons. (Fig. 13.)

The cottons used in the manufacture of the raised fabrics are necessarily of a varied character, but in nearly all cases the staple is short. In the group of fabrics comprised under the number 15*a*, only the lowest quality of fibre has been used, such as the fly made in willowing, grid fly, licker-in fly, and blowings obtained from openers and scutchers. The maximum length is $\frac{5}{8}$ in., but of such fibres there are very few. The material is so poor that there is reason for supposing that some other treatment than the usual soaping of the fibres was necessary in order to spin them.

The yarns found in the group numbered 15*b* are made of better material than the foregoing, such as waste, or a mixture of waste with short-stapled Indian cotton or the like; the longest fibres do not exceed $\frac{7}{8}$ in., and of these the proportion is very small. The average length is about half an inch.

In the group numbered 15*c* the yarns are made from still better cotton, for, although the maximum length of the fibres is $\frac{7}{8}$ in., such fibres are found in considerable quantities. Probably ordinary American strip, Nasmith-comber waste, Indian cotton, and hard waste have all been employed.

PRINTED FABRICS.

No. 16. This is a furniture fabric. It has a plain ground with a woven spot, and contains 60 ends per inch of $\frac{2}{32}$'s folded weft way, the singles being twisted twist way; and 32 picks of five's jute, expressed in cotton count. The piece is printed with alizarine and basic dyestuffs. The weave repeats upon 48 by 60.

No. 17. This is a good imitation of a woven tapestry; the effect is produced by printing the warp before weaving. It is composed of 44 ends per inch of $\frac{2}{13}$'s cotton, folded weft way, and 22 picks of $8\frac{1}{2}$ lbs. (14,400 yards) jute. The weave is a plain one. The red and pink have been printed with alizarine, the black with logwood, and the green and blue with basic dyestuffs. Price 3s. 6d. per yard.

No. 18. A heavy rep cloth, which contains 45 ends per inch of $\frac{2}{32}$'s cotton folded weft way, the singles are spun twist way, and 12 picks per inch of $\frac{3}{4}$ flax tow, in cotton count. The weave is a plain one, and alizarines have been employed in printing.

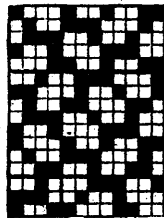


FIG. 14.

No. 19. In this and the following two examples the fabrics are entirely composed of cotton. The designs are floral, but both

ground and figure have been covered with broken stripes to resemble the effect of a stitching warp in a woven tapestry. No. 19 contains 52 ends per inch of $18\frac{1}{2}$'s, and 30 picks per inch of 5.4's, both spun twist way. The weave is an oatmeal, which repeats upon 12 and 16. Alizarine red has been employed in printing the blotch, basic dyestuffs and logwood black for the peg rollers, and aniline black for the cover roller. (Fig. 14.)

Nos. 19a and 19b are similar to No. 19. No. 19d is similar as regards the style, but has been printed on a duplex machine, and contains 42 ends per inch of 26's and 40 picks per inch of 4.5's, both spun twist way.

No. 20. A curtain material. It is made with 43 ends per inch of 24's, and 35 picks of 4's, both spun twist way. The design is an oatmeal, which repeats upon 16 and 12. It is duplex printed with basic dyestuffs, alizarine, and logwood black,

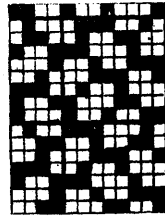


FIG. 15.

and finally covered with a pattern to imitate a woven spot effect. The result is remarkably good. (Fig. 15.)

No. 21. A printed furniture or curtain fabric with a woven spot in the ground. It has 64 ends per inch of 2/29's, folded weft way; the singles are spun twist way, and 32 picks of 6's linen, in cotton count. The design has a plain ground and a spot figure; it repeats upon 30 and 50, and is printed on one side with alizarine colours. The weave repeats upon 50 by 30.

No. 22. A printed furniture or hanging fabric, with woven spots on a plain ground. It contains 72 ends per inch of 2/32's cotton, folded weft way, and 29 picks per inch of 4's half-bleached linen, in cotton count, the singles all spun twist way. Alizarine and basic dyestuffs have been used in printing. The piece contains oleine oil, which has evidently been used in finishing. The weave repeats upon 74 by 40.

No. 23. A printed furniture fabric with a small woven spot on a plain woven ground. The spot is arranged in 8-end satin order. The warp has 60 ends per inch of 2/32's cotton folded weft way. There are 30 picks per inch of 5½'s linen in cotton count; all the singles are spun twist way. In printing, alizarines have been used for the red, basic dyestuffs for the olives, and logwood for the black. The weave repeats upon 48 by 48.

No. 74. A furniture fabric with a printed warp. The piece has 63 ends per inch of 2/29's, folded weft way, the singles being spun twist way, and 32 picks per inch of 6's, spun weft way.

The weave is plain, but the proportions of warp and weft produce a fine rep effect. The red has been printed with alizarine, the black with logwood, and the green and heliotrope with basic dyestuffs.

No. 77. A printed furniture or hanging fabric. The piece contains 41 ends per inch of 26's, and 36 picks of 5.5's, both spun twist way. The weave is an oatmeal which repeats upon 12 by 16. The red has been printed with alizarine,

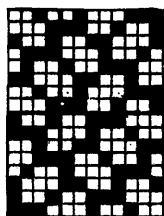


FIG. 16.

the yellow, violet, and green with basic dyestuffs, and the black with logwood. A substantive cotton dyestuff has been employed in slop-padding. (Fig. 16.)

No. 24. This is a printed woollen dress fabric in Bedford cord. It contains 88 ends per inch of 27½'s wool, in cotton count, spun weft way, and 44 picks per inch of 21's wool, in cotton count,



FIG. 17.

spun twist way. The design repeats upon 16 and 8, and the picking is 2 and 2 in each cord. It has been printed with acid dyestuffs. (Fig. 17.)

No. 25. "Velour fourlane" is a cotton cord containing 55 ends per inch of 41.5's; and 144 picks of 25.7's, both spun twist way. The weave has a plain back with two pile picks

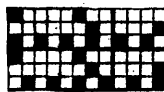


FIG. 18.

to one ground pick. The floats are 4 and 6; the design repeats upon 6 and 12. The piece is printed in six colours. The red and the pink have been printed with Azaphor Red, the green, blue, violet, and brown with basic dyestuffs. (Fig. 18.)

BLOUSE AND DRESS FABRICS.

No. 27. A dress material in cotton rep; it has 92 ends per inch of 35½'s, spun twist way, and 47 picks per inch of 8.5's, spun weft way. The weave is plain; it is dyed with sulphur dyestuffs and has a light starch finish.

No. 28. One of a series of patterns which have been dyed pale shades with substantive cotton dyestuffs. There are 59 ends per inch of $2/96$'s cotton and 23.1's artificial silk, in cotton count. The warping pattern is one end of cotton, two ends of artificial silk, and one end of cotton. There are 51 picks to the inch of two-fold 96's cotton. All the cotton is folded twist on twist, and the artificial silk is twisted twist way. The ground weave is plain; the denting is 2 and 1. The design is produced on a Jacquard.

No. 29 is a cotton and artificial silk dress material; it is 41 in. wide, and sold at $17\frac{1}{4}$ d. per yard. The piece is dyed a yellowish olive shade with vat dyestuffs. It contains 70 ends per inch of



FIG. 19.

22's artificial silk, in cotton count, and 31's cotton, the ratio being 10 of artificial silk to 6 of cotton. There are 60 picks to the inch of 28's cotton. The weave is a 6-shaft Bedford cord with 16 ends and 8 picks to one repeat. (Fig. 19.)

No. 30. One of a series of dress materials with a crepe or sponge effect; it is 40 in. wide, sold at 3s. 11d. per yard, and made from artificial silk and cotton. The series is dyed in various shades with substantive cotton dyestuffs. The piece contains 22 ends per inch of four-fold yarn, which is composed of 40's cotton, 11's artificial silk, in cotton count, and $2/38$'s folded weft way, all the singles being spun twist way. Twelve turns liberates the 40's, 25 turns the 11's and the $2/38$'s, and 28 turns liberates the singles composing the two-fold. Approximately one inch of the fancy yarn equals 1 in. of 40's, $1\frac{1}{2}$ in. of the 11's, and 1 in. of $2/38$'s. The weave is plain.

No. 31. A bleached and figured rep; it is 47 in. wide, and sold at $22\frac{3}{4}$ d. per yard. The piece contains 78 ends per inch of $2/32$'s, and 28 picks of 7's made into four-fold spiral yarn. The four-fold thread equals two threads of $2/32$'s, all are folded weft way, and the singles are spun twist way. Eighteen turns separates the two-fold yarns, and 21.5 turns the single strands. One inch of four-fold thread equals one inch of one of the $2/32$'s and 1.2 in. of the other. The weave has a plain ground with a Jacquard figure. The weft is mercerised.

No. 32. A Bedford cord, 47 in. wide, sold at $18\frac{1}{4}$ d. per yard.



FIG. 20.

The piece is bleached and the warp is mercerised. There are 102 ends per inch of $2/36$'s and of $2/15$'s filling. There are also 75 picks of 36's unmercerised. The folding is weft way, the singles

twist way. Twenty-four ends give the repeat and equal 4 stitching, 4 filling, 16 face threads; a x is a stitching, a o is a filling. (Fig. 20.)

No. 33. A double plain cloth, which is sold at 1s. 9½d. per yard. It is composed of three fine to one coarse threads in the warp and three face picks to one back pick. There are 76 ends per inch, namely, 57 of 2/68's and 19 threads of fancy yarn, and 86 picks of 36's spun twist way. The fancy yarn is made from 20's, 12's and 2/30's. Nine turns releases the 20's, 16 turns the 12's and 2/30's, and 15 turns the two single strands of

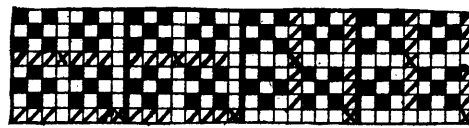


FIG. 21.

30's. The piece is dyed a fawn colour with vat dyestuffs, with a pure finish. The base weave is plain and the figure is produced by the Jacquard. (Fig. 21.)

No. 94. Olive green dress fabric with a heliotrope rep stripe. The piece contains 66 ends per inch of 2/44's wool, expressed in cotton count, which is folded weft way, the singles being spun twist way, and 22's artificial silk, expressed in cotton count; also 53 picks per inch of 32's wool, expressed in cotton count. The weft is folded weft way. The olive warp has 18 twists per inch, and the olive weft 31.5. The warping pattern is 18 heliotrope and 63 olive. The weave is plain and repped, the latter produced by throwing half the picks to the back. The crinkled effect is due



FIG. 22.

to hard twist in the weft. Both the olive warp and weft threads have been dyed with acid dyestuffs, the heliotrope artificial silk threads with vat dyestuffs. (Fig. 22.)

No. 98. Blouse or dress material to imitate woven stripes. The width is not given; it is sold at 9½d. per yard. There are 66 ends per inch of 34's and 65 picks per inch of 48's wool, both expressed in cotton counts, spun twist way. The weave is plain. Acid dyestuffs have been employed with resist or discharge effects.

No. 102. Dress fabric, 39 in. to 40 in. wide, sold white at 11½d. and coloured at 12d. per yard. The effect is oatmeal, produced from 22 ends per inch of fancy yarn and 29 picks per inch of 12's, spun twist way. The fancy yarn is composed of 24.2's, 13.4's, and 2/28's, folded weft way, all the singles being twist way

The threads are held together as follows:—Eight turns twist way releases the 24.2's, 22 turns weft way releases the 13.4's and the 2/28's, and 2.5 turns weft way releases the 28's single. One inch of fancy yarn equals 1.1 in. of 24.2's, 2.3 in. of 13.4's, and 1.05 in. of 2/28's. The weave is plain and the piece has been dyed with substantive cotton dyestuffs.

No. 103. A dress fabric, sold at 12 $\frac{7}{8}$ d. per yard, no width given. Made in stripes of plain and fancy yarns. There are 76 threads per inch of 52's, and of fancy yarn, all folded twist way. The fancy yarn is composed of 56.6's and 13's, and 2/50's folded weft way, all the singles being twist way; 8.5 turns twist way releases the 56.6's; 21.5 turns weft way releases the 13's and the 2/50's; two turns weft way releases the single 50's. One inch of fancy yarn equals 1 in. of 56's, 1.6 in. of 13's, and 1 in. of 2/50's. The warping pattern is:—1 fancy, 2 fine, 1 fancy, 20 fine; total 24. There are 57 picks per inch of 58's, spun twist way. The weave is plain and the piece has been dyed with vat dyestuffs.

No. 96. Ladies' dress fabric, in wool and cotton. There are 33 ends per inch of 11.77's green, 11.42's dark grey, 11.8's peacock blue and light brown, and 22.2's of blueish-black. The last named is spun twist way, the remainder is spun weft way. The threads are either mixtures of wool and cotton or are all wool. There are 25 picks per inch of 3.2's wool and cotton mixed. The counts are expressed on the cotton basis. The warping pattern is as follows:

2 green
6 blueish-black
3 grey
7 blueish-black
2 peacock blue
6 blueish-black
3 grey
7 blueish-black
2 light brown
6 blueish-black
3 grey
7 blueish-black

—
54

The weave is 2 and 2 twill, and the weight per square yard 3,432 grains.

No. 100. Heavy dress fabric or coat lining, dark blue with stripes of green and purple. Twenty-four ends per inch of 25's cotton, spun twist way, dyed blue with a substantive cotton dyestuff. The effect threads are in grandrelle, green, and blue, and purple and blue. The former threads are made from 12.6's green wool, expressed in cotton count, and 23's blue cotton, the latter from 12.6's purple wool, expressed in cotton count, and 23's blue cotton.

There are also 28 picks of 2.5's dark blue, spun from a mixture of cotton and wool, the former dyed with substantive, the latter with acid dyestuffs. The warping pattern equals:—

1	green grandrelle
3	blue
1	purple grandrelle
24	blue
29	

The weft contains 25 per cent of cotton. The green and purple woollen threads in the grandrelle are dyed with acid dyestuffs, the blue threads with substantive cotton dyestuffs. (Fig. 22x.)



FIG. 22x.

No. 52. Crepe fabric, 43 in. wide, sold at 14½d. per yard. This is made from 78 ends per inch of 64's, with 27.66 turns per inch. It also contains 52 picks per inch of 40's, spun twist way, with 51.25 turns per inch, and 40's, spun weft way, with 52.2 turns per inch. The wefting is ten picks twist way and ten weft way. It is half bleached, and the weave is plain.

No. 53. Crepe fabric, 43 in. wide, sold at 12½d. per yard. The piece contains 60 ends per inch, of 44's spun twist way, with 21.6 turns per inch. It also contains 28 picks of 6's, spun twist way, with 21.75 turns per inch, and 6's, spun weft way, with 22.75 turns per inch. The picking is 4 twist way and 4 weft way. The weave is plain, and the fabric is half bleached. The effect resembles that of a honeycomb, but is less distinct than No. 54.

No. 56. Crepe fabric, 43 in. wide, sold at 13¾d. per yard.

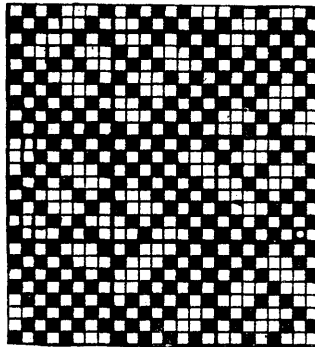


FIG. 23.

The piece contains 41 ends per inch of 18's, half of which is spun twist way, with 30 turns per inch, and half weft way, with 35 turns per inch. Also 41 picks per inch of 18's, half of which is spun

twist way, with 30 turns per inch, and half weft way, with 35 turns per inch. The warp and weft threads are arranged 2 twist way and 2 weft way. The weave repeats upon 24 by 26. (Fig. 23.)

No. 57. Crepe fabric, 43 in. wide, sold at 15 $\frac{3}{4}$ d. per yard. It is made with 50 ends per inch of 17's, spun twist way, with 36 turns per inch, and of 18's, spun weft way, with 28 turns per inch. Also with 46 picks per inch, of 18's, spun twist way, with 37

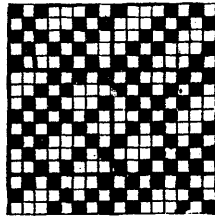


FIG. 24.

turns per inch, and 18's, spun weft way, with 36 turns per inch. In both warp and weft the threads are arranged 2 twist way and 2 weft way. The weave repeats upon 16 by 16. (Fig. 24.)

No. 58. Crepe fabric, 43 in. wide, sold at 14 $\frac{1}{2}$ d. per yard. This contains 50 ends per inch, of 42's, spun twist way, with 48 turns per inch, and weft way with 46.2 turns per inch. Also 50 picks per inch of 42's, spun twist way, with 48 turns per inch, and weft way with 46.2 turns per inch. Both warp and weft threads are arranged 2 twist way 2 weft way. The weave is plain.

No. 54. Crepe fabric, 43 in. wide, sold at 15d. per yard. It contains 66 ends per inch of 42's, spun twist way, with 32.25 turns per inch and 40 picks of 2/20's, consisting of 20 picks, spun weft way, with 42 turns per inch and 20 picks spun twist way, with 38 turns per inch. The singles in both are spun in the same direction as the folding twist. The picks are 4 twist way and 4 weft way throughout, the weave is plain and the crinkled effect closely resembles honeycomb.

No. 55. Crepe fabric, 43 in. wide, sold at 11 $\frac{1}{4}$ d. per yard. It contains 30 ends per inch, half of which are 15.5's, spun twist way, with 32.22 turns per inch, and half of 16's, spun weft way, with 35.5 turns per inch. Also 30 picks per inch, half of which are 16's, spun twist way, with 33.22 turns, and half 16's, spun weft way, with 35.5 turns per inch. The warp and weft threads are arranged 2 twist way 2 weft way. The weave is plain and the fabric is half bleached.

No. 64. Cotton crepe, 43 in. wide, sold at 18d. per yard. The piece has 60 ends per inch of 48's, spun twist way, with 50 turns and 60 picks per inch of 44's, spun weft way, with 30 turns. The weave repeats upon 32 ends and 62 picks.

No. 79. A bleached cotton crepe, 43 in. wide, sold at 11 $\frac{3}{4}$ d. per yard, which contains 48 ends per inch of 42's, with 50 turns

per inch, and 47 picks per inch of 42's with 40 turns per inch, all spun twist way. The weave is plain.

No. 78. A white fabric, 41 in. wide, sold at 10½d. per yard, which possesses a flecked appearance due to the employment of a fancy yarn in conjunction with ordinary yarns. The piece has 55 ends per inch of 32's, and 34 picks, namely, 17 of 31's and 17 of fancy yarn made from 30's all spun twist way, 39.3's spun weft way, and 2/34's folded weft way and spun twist way in the singles. The fancy yarn is united as follows:—8.5 turns twist way liberates the 30's, 39 turns weft way liberates the 39.3's and the 2/34's, six turns weft way liberates the 34's singles. One inch of fancy yarn equals 1.05 in. of 30's, 2.4 in. of 39.3's, and 1.0 in. of 2/34's. The fine and coarse picks are inserted alternately, and the weave is plain.

No. 80. Another fabric in which the effect is due to the use of flecked yarn; 41 in. wide, sold at 20d. per yard. The piece is white and contains 44 ends per inch of 2/40's folded weft way, and 20 picks per inch of flecked yarn made from 29's cotton, 8's artificial silk, in cotton count, and 2/20's folded weft way, with all the singles spun twist way. The flecked yarn is united as follows:—8 turns liberates the 29's, 24½ liberates the 8's, and 15.5 the 2/20's. One inch of the flecked yarn equals 1.1 in. of 29's, 1.6 in. of 8's, and 1.1 in. of 2/20's. The weave is plain.

No. 82. A light brown fabric in which flecked yarn is employed; it is 41 in. wide, and sold at 15½d. per yard. There are 34 ends per inch of 12's, spun twist way, and 22 picks of a five-fold yarn made from 2/20's, 2/32's, and 23.2's. The first is folded weft way and spun twist way, the second is folded twist way and spun weft way, and the third is spun weft way. Six turns weft way liberates the 23.2's, 20 turns twist way liberates the 2/20's and the 2/32's, 2 turns weft way separates the single 32's, and 4 turns weft way separates the single 20's. Also an artificial silk and cotton four-fold thread made with 23.2's cotton, 8's artificial silk, in cotton count, and 2/32's cotton. The first is spun weft way, the second twist way, and the third is folded weft way, the singles being spun twist way. The strands are held together as follows:—8.4 turns twist way liberates the 23.2's, 22.2 turns weft way liberates

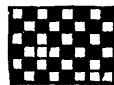


FIG. 25.

the 8's and the 2/32's, and 3.5 turns weft way liberates the single 32's. One inch of the fancy cotton thread equals 1.05 in. of 23.2's, 2.0 in. of 2/20's, and 1.05 of 2/32's. One inch of the fancy mixed yarn equals 1.05 in. of 23.2's, 2.1 in. of 8's, and 1.05 in. of 2/32's. The piece has been dyed with vat dyestuffs. The weave repeats upon 8 and 6. (Fig. 25.)

No. 83. Also a light brown fabric in which flecked yarn is used; 41 in. and 54 in. wide, sold at $11\frac{1}{2}$ d. and $15\frac{1}{4}$ d. per yard respectively. It contains 34 ends per inch of 12's, and 24 picks of 6's, both spun twist way, and flecked yarn. The picks are inserted alternately. The fancy yarn is made from 21's, 9's, and $\frac{2}{48}$'s folded weft way, all the singles being spun twist way. Nine turns liberates the 21's, 26.5 turns liberates the 9's and the $\frac{2}{48}$'s, and 28.6 turns liberates the single 48's. One inch of fancy yarn requires 1.1 in. of 21's, 2.7 in. of 9's, and 1.3 of $\frac{2}{48}$'s. The weave is plain, and it has been dyed in the piece with vat dyestuffs.

No. 84. Another brown fabric in which all the material is flecked yarn; 41 in. and 54 in. wide, and sold at 2s. $3\frac{3}{4}$ d. and 3s. $0\frac{1}{2}$ d. per yard respectively. The piece contains 20 ends and 20 picks per inch of yarn made from 33's, 8's artificial silk, in cotton count, spun weft way, and $\frac{2}{33}$'s folded weft way with the singles spun twist way. Eight turns per inch liberates the 33's, 23 turns liberates the 8's and the $\frac{2}{33}$'s, and 27 turns liberates the single 33's. One inch of fancy yarn requires 1.15 in. of 33's, 1.9 in. of 8's, and 1.2 in. of $\frac{2}{33}$'s. The weave is plain, and it has been dyed in the piece with vat dyestuffs.

No. 85. A crepe figured by the aid of the Jacquard, and dyed in the piece with substantive cotton dyestuffs. It has 124 ends per inch of 70's, with 22.7 turns per inch, and 83 picks per inch of $\frac{2}{106}$'s folded weft way, with 81.5 turns per inch; all the singles are spun twist way. The crepe effect is due to the heavy twist in the weft. The ground weave is plain, and the figure repeats upon 106 ends.

No. 81. A stout dress fabric in light brown rep, 47 in. wide, and sold at 2s. $3\frac{3}{4}$ d. per yard. Both warp and weft contain fine and coarse threads. Of the warp there are 106 ends per inch, which are warped 2 fine 2 coarse. The fine warp is $\frac{2}{80}$'s fold weft way. The coarse threads are $\frac{2}{40}$'s mercerised cotton. There are 38 picks per inch, which are inserted 2 fine 2 coarse. The fine weft is 36's, the coarse is 3.5's fancy, which is made from 31.4's, 14's, and $\frac{2}{32}$'s. All the singles are spun twist way, and the two-fold is twisted weft way. These threads are united as follows:—8.1 turns liberates the 31.4's, 23.0 turns liberates the 14's and 26.75 turns liberates the $\frac{2}{32}$'s. One inch of flecked yarn



FIG. 26.

equals 1 in. of 31.4's, 2.3 in. of 14's, and 1.1 in. of $\frac{2}{32}$'s. The weave repeats upon 4 by 4. The piece has been dyed with vat dyestuffs. (Fig. 26.)

No. 76. A fancy sponge fabric checked with artificial silk. The piece has 40 ends and picks per inch, namely, 10 ends of a

fancy yarn made from 23.5's, 2/40's, and 11's; 10 ends of 2.5's artificial silk, in cotton count, and 20 ends of 2/40's black folded weft way. The fancy threads are united as follows:—10 turns twist way liberates the 23.5's, 22 turns weft way liberates the 11's and the 2/40's, and 3 turns weft way liberates the 40's singles. One inch of fancy yarn equals 1.15 in. of 23.5's, 1.2 in. of 2/40's, and 2.3 in. of 11's. The warping and wefting scheme is:—

2	black
2	artificial silk
2	black
2	fancy
<hr style="width: 10%; margin: 0 auto;"/>	
8	

The weave is plain, and the black has been dyed with a sulphur dyestuff.

No. 65. Fancy canvas fabric, 47 in. wide, sold at 21½d. per yard. The threads are arranged end and end and pick and pick. There are 37 ends per inch of fine and coarse material, and 35 picks per inch of fine and coarse. The fine warp is 2/45's, folded weft way. The coarse yarn is made from 35's, spun twist way, 14's spun weft way, and 2/44's folded weft way, the singles being spun twist way. Ten turns per inch twist way liberates the 35's, 26 turns per inch weft way liberates the 14's, 15 turns per inch liberates the single

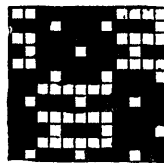


FIG. 27.

44's. One inch of the fancy yarn equals 1 in. of 35's, 1.05 in. of 2/44's, and 2⅓ in. of 14's. The fine weft is 23's single, spun twist way; the fancy weft is similar to the fancy warp yarn. The weave repeats upon 24 by 24. (Fig. 27.)

No. 75. A fancy sponge cloth, sold at 47d. per yard, width not given. It contains 18 ends per inch, and 16 picks per inch of six and four-fold yarns. The coloured fancy yarn is composed of 2/48's white, 2/18's brown, and 2/20's white, combined as follows:—10 turns weft way liberates the 2/48's, 28 turns weft way liberates the 48's singles, 30 turns twist way liberates the 2/20's and the 2/18's, 7 turns weft way liberates the 20's singles, and 2 turns weft way liberates the 18's singles. The white fancy yarn is composed of 37.3's, 10's, and 2/32's, which are combined as follows:—8 turns twist way liberates the 37.3's, 29 turns weft way liberates the 10's and 2/32's, and 1 turn weft way liberates the 32's singles. One inch of the coloured fancy yarn equals 1.2 in. of 2/48's, 1.4 in. of 2/18's, and 3.2 in. of 2/20's. One inch of the white fancy yarn equals 1.15 in. of 37.3's, 1.2 in. of 32's, and 2.4 in. of 10s. The

warping and wefting patterns are 2 white fancy and 2 coloured fancy. The brown threads have been dyed with catechú. The weave is plain.

No. 66. Oatmeal fabric, 47 in. wide, sold at 18d. per yard. The piece contains 20 ends per inch of fancy yarn and 20 picks per inch of the same. The fancy yarn is composed of 23's, 12's, and 2/32's folded weft way, the singles being spun twist way. Eight turns liberates the 23's, 16 turns liberates the 12's, and 13 turns liberates the single 32's. One inch of fancy yarn contains 1.1 in. of 23's, 1.1 in. of 2/32's, and 2.2 in. of 12's. The weave is plain.

No. 67. Oatmeal fabric, 47 in. wide, sold at 14½d. per yard. The piece has 33 ends of 16's, and 21 picks of fancy yarn. The fancy yarn is composed of 35's, 2/20's folded weft way, and 14's, all the singles being spun twist way. Eight turns releases the 35's, 26 turns the 14's, and 16 turns the single 20's. One inch of fancy yarn equals 1.05 in. of 35's, 1.05 in. of 2/20's, and 2½ in. of 14's. The weave is plain.

No. 68. Oatmeal fabric, 47 in. wide, sold at 19d. per yard. The piece has 57 ends per inch of 26's and 10 picks of a four-fold fancy yarn, and 20 picks of 2/64's, folded weft way, the singles being spun twist way. The fancy yarn is composed of 40's, 2/44's folded weft way, and 16's, all the singles being spun twist way. Ten turns releases the 40's, 17 turns the 16's, and 10 turns the single 44's. One inch of fancy yarn equals 1 in. of 40's, 1.05 in. of 2/44's, and 2.38 in. of 16's. The picking is 2 fine, 1 coarse. The sample is not large enough to give a complete repeat of the crepe weave.

No. 26. A cotton dress fabric dyed with aniline black. It has 89 ends per inch of 38's and 64 picks per inch of 27's both spun twist way. The ground weave is a wave with a spot imposed upon it; the latter is arranged in ten end satin order, and the whole repeats upon 400 ends and 360 picks.

MEN'S SUITINGS.

Men's suitings form what is probably one of the most noteworthy features of the collection. Some of the imitations of woollen effects, produced either by printing or weaving, are as remarkable as the prices at which they are offered for sale. They include single and backed fabrics, and great care has been bestowed upon the selection and arrangement of effect threads.

No. 34. This is a single cotton fabric dyed with Diphenyl Black, and is duplex printed with faint interrupted metal lines. It contains 103 ends per inch of 20's, and 55 picks per inch of 12.5's both spun twist way. The weave is a 5-shaft satin.

Nos. 34A and 34B are similarly produced, but the printing is more elaborate. In one of them discharges have been used in place of the metal printing. The pattern is, as a rule, fainter on the back than on the face, and by this means a closer imitation of a woven fabric is produced.

No. 35. A woven black and light blue striped single cloth with raised back; it is 25 in. wide, and is sold at 5d. per yard. The piece has 59 ends per inch of 12.5's black and 14's light blue, and 48 picks per inch of 12's, all spun twist way. The weave is 2 and 2 twill, and the warping pattern is:—

5 threads of light blue	}	three times repeated
4 of black,		
1 of light blue,		
1 of black,		
1 of light blue		
4 of black		

—
30

The blue threads have been dyed with a basic dyestuff, and the black ones with sulphur dyestuffs. The filling consists chiefly of starch, dextrine, and Epsom salt, and totals 23.5 per cent. The counts of the yarn, after the filling has been removed, are:—15's black, 18's light blue, and 13's weft. The weight per square yard is 2,973 grains, and, after removing of the filling, 2,406 grains.

No. 36. A stout single fabric, which is raised on the back, and sold at 7½d. per yard. The piece has 41 ends per inch of 2/10.5's folded weft way, and 44 picks of 4's; all the singles are spun twist way. The warp is grandrelle, composed of a light blue thread printed black with logwood and folded with

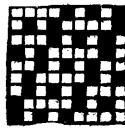


FIG. 28.

a black thread dyed with a sulphur dyestuff. The light blue is 20's, and the black is 8's, both spun twist way. The weave is a fancy twill, 9 and 9. The weight per square yard is 5,883 grains. (Fig. 28.)

No. 37. A khaki Venetian, 28 in. wide, and is sold at 10½d. per yard. A steep twill shows on the face, and the back is heavily raised. It contains 72 ends per inch of 2/36's folded weft



FIG. 29.

way. There are 82 picks per inch of 12's; all the singles are spun twist way. The weave is a 5 and 5 twill, stepped in 4, which repeats on 10 and 5. It is dyed with sulphur dyestuffs; the finish is pure. (Fig. 29.)

No. 38. A twill suiting, 26 in. to 27 in. wide, and sold at 10½d. per yard, brown, with blue effect threads, and slightly raised on

the back. The piece has 76 ends per inch of 2/7.4's grandrelle made from light blue and brown. The former equals 22's, the brown 11's, and 52 picks per inch of 8's; the two-fold is weft way and the singles are spun twist way. A twill weave, 2 and 2 and 5 and 2, is

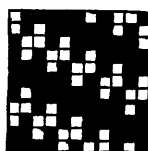


FIG. 30.

stepped in fives. The weight per square yard is 5,412 grains. The yarns have been dyed with substantive cotton dyestuffs. (Fig. 30.)

No. 39. A Bedford cord, 26 in. to 27 in. wide, sold at 8½d. per yard, and raised on the back. There are 45 ends per inch of variously grandrelled threads; in places a dark blue is twisted with black, a light blue twisted with brown, and light blue printed with black and twisted with black. The dark blue and black equals: dark blue 24.8's, and black 11's. The printed and black equals: printed 22.5's, black 11.8's. The light blue and brown equals: light blue 21.5's, and brown 11.8's, all folded weft way, the singles being twist way. The warping pattern equals two dark blue and black, one printed and black, two light blue and brown, and one



FIG. 31.

printed and black. All the shades have been dyed with sulphur dyestuffs; the black has been printed with logwood. (Fig. 31.)

No. 63. Cotton tweed or trouserings, 26 in. to 27 in. wide. Slate and black grandrelle warp and black weft. Sixty-four ends per inch of 2/16's folded weft way, and 51 picks of 9's; the singles are spun twist way. The slate equals 23.25's and the black 12.2's. The weave is a 3 and 2 twill, stepped in two's; the weight per square yard is 4,674 grains. Both the black and the slate have been dyed with substantive cotton dyestuffs.

No. 91. Men's suiting cloth, 26 in. to 27 in. wide, sold at 5½d. per yard. The piece contains 50 ends per inch of 2/24's brown, folded weft way, and 11.5's, black and blue, also 26 picks per inch of 3.6's, all the singles being spun twist way. Two ends work as one, otherwise the weave is plain. The weight per square yard is 3,743 grains. The black warp has been dyed with a sulphur dyestuff, the blue effect thread with a substantive cotton dyestuff and the brown warp threads with a basic dyestuff. The weft has

been dyed with a direct black. The filling consists chiefly of dextrin and amounts to 20 per cent.

No. 69. Men's suitings, 26 in. to 27 in. wide, sold at 11d. per yard. The piece is striped, and backed end and end. The face is partly 2 and 2 twill with two ends and two picks working together, but the binding of the back warp prevents any two picks from being passed through the same shed. The back is bound once on eight picks, and those are alternate. There are

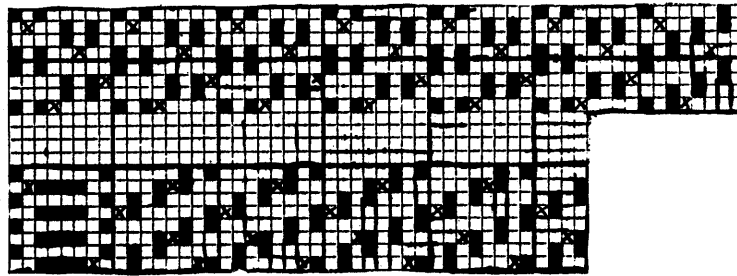


FIG. 32.

66 ends per inch of face of 2/28's black folded weft way, and 66 ends of back of 2/30's grandrelle, the single threads being equal in count. There are 48 picks of 9's; all the singles are spun twist way. Both warp and weft have been dyed with sulphur black, the green and blue effect threads with basic dyestuffs. In Fig. 32 a \times is a back warp thread.

No. 70. Men's suitings. This piece contains 70 ends per inch of 2/30's; also 70 ends per inch of backing in 2/30's count. There

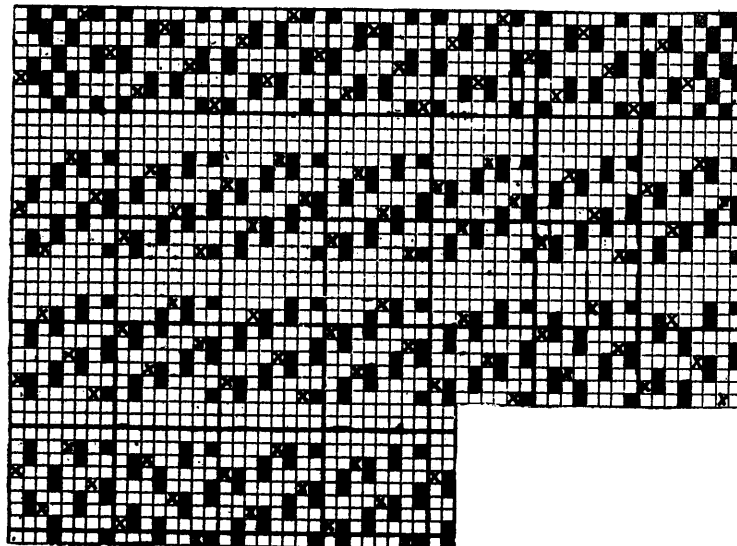


FIG. 33.

are 57 picks per inch of 2/24's, all folded weft way, with the singles spun twist way. The face weave is a 2 and 2 twill broken into stripes; the back warp is bound once upon eight picks, and the binding picks are alternate. The black warp threads have been dyed with sulphur dyestuffs, the green threads with substantive cotton dyestuffs. The bright green and violet in the grandrelle effect threads have been dyed with basic dyestuffs on tannin mordant, the black with sulphur dyestuffs. Both the dark brown and the black weft threads have been dyed with substantive dyestuffs. In Fig. 33 a × is a back warp thread.

No. 88. Men's suitings, 25½ in. wide, sold at 6½d. per yard. The piece contains 62 ends per inch of 2/24's, folded weft way, and 43 picks of 5's black, all the singles being spun twist way. The 2/24's are grey and brown, and black and green grandrelles. The weight per square yard is 4,733 grains. The weave is a 3 and 1 twill, broken into stripes. The warping pattern is:—

42 grandrelle
 2 black
 42 grandrelle
 1 black
 1 grandrelle
 1 green
 1 grandrelle
 1 black

—

91

The shades have all been dyed with substantive cotton dyestuffs. (Fig. 34.)

No. 71. Men's suitings, 26 in. to 27 in. wide, sold at 8d. per yard. The weave is a 2 and 2 twill reversed, and the piece has 50 ends and 38 picks of folded yarns. The warp is composed of



FIG. 34.

2/32's bleached; 2/25's green; red and white made of 2/40's and 7's; black and white of 22's and 8's; grey and grey of 24's and 8's; black and black of 22's and 8's, all folded weft way, the singles being spun twist way. The bleached yarn is entered three in an eye, and the green two in an eye. The weft is 9's black, and grandrelle composed of grey and black of

24's and 8's. The black warp and weft have been dyed with logwood; the black twisted with white, with a direct black developed; the red, claret, and green with substantive cotton dyestuffs; the bright green with a basic dyestuff, and the grey with logwood and iron mordant

No. 104. Men's suitings, 26 in. to 27 in. wide, sold at 6½d. per yard. The piece contains 58 ends per inch of 2/36's dark green, red and black grandrelle, and blue and black grandrelle; all folded weft way and spun twist way. The red is 20's and the black 32.5's. The blue is 60's and the black 24's, and there are 44 picks per inch of 12's, dyed dark olive. The warping pattern is:—

4 blue grandrelle
 12 green
 4 blue grandrelle
 46 green
 1 red grandrelle
 8 green
 1 red grandrelle
 46 green

—
 122

The weave repeats upon 122 ends and 8 picks. The green warp and weft have been dyed with substantive cotton dyestuffs, and

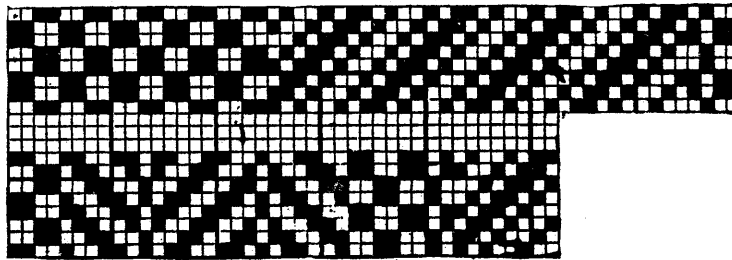


FIG. 35.

the blue and red in the grandrelle with basic dyestuffs on tannin mordant. (Fig. 35.)

No. 92. A men's suiting fabric, 26 in. to 27 in. wide, sold at 5¼d. per yard. The piece has 44 ends per inch of 8's, dyed light and dark grey with a substantive cotton dyestuff, after-treated to increase the fastness to washing, and 2/40's in green, brown, and purple, dyed with basic dyestuffs. There are also 36 picks per inch of 5.57's, dyed a dark grey with a substantive black, after-treated to increase the fastness to

washing. The weave is a 2 and 2 twill, which is broken into stripes, and the weight per square yard is 3,959 grains. The filling (11.3 per cent.) consists chiefly of British gum. (Fig. 36.)

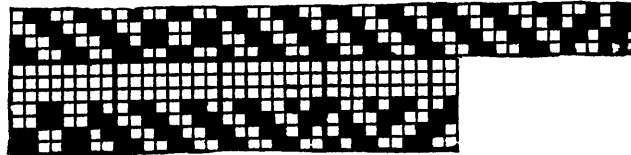


FIG. 36.

No. 93. Men's suiting, 26 in. to 27 in. wide, sold at 6½d. per yard. A black and green check with brown, blue, and black grandrelle effect threads in the warp. The latter are too few in number for determining the count. There are 53 ends per inch of 2/22's, folded weft way, and 44 picks per inch of 9's, all the singles being spun twist way. The weave is 2 by 2 by 1 by 1 reversed, with plain interposed, and the weight per square yard is 3,200 grains. Both the green and black threads in warp

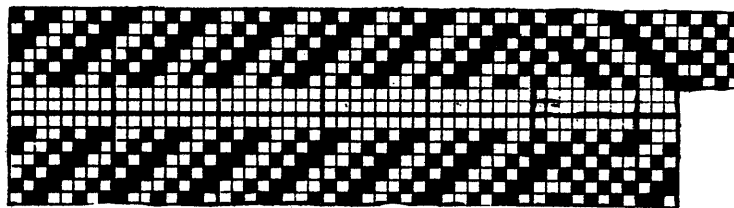


FIG. 37.

and weft have been dyed with sulphur dyestuffs, the blue in the grandrelle with a basic dyestuff and the brown effect threads in the warp with a sulphur dyestuff. The piece is filled with 7.5 per cent of dextrin. (Fig. 37.)

No. 95. Khaki lining, 25 in. wide, sold at 2½d. per yard. There are 49 ends per inch of 26's and 52 picks of 12's, both spun twist way. The weave is a 1 up and 2 down twill. It has been dyed with a sulphur dyestuff and weighted chiefly with dextrin (33 per cent.).

No. 59. A warp backed suiting fabric, 51½ in. wide, sold at 18½d.



FIG. 38.

per yard. It contains 74 ends per inch of 2/36's black and grandrelle. One grandrelle is made from black and blueish-

grey yarns, another from black and a bright blue thread, printed with black. The back consists of 37 ends per inch of 10.5's white, also 70 picks per inch of 6's black. All are folded weft way, and the singles are spun twist way. The warping pattern is as follows:

1 printed grandrelle	1 white
1 white	2 black
2 black	1 white
1 white	2 grandrelle
2 grandrelle	1 white
1 white	1 grandrelle
1 grandrelle	1 black
1 black	1 white
1 white	2 black
2 black	1 white
1 white	2 grandrelle
2 grandrelle	1 white
1 white	1 grandrelle
1 grandrelle	1 black
1 black	1 white
1 white	2 black
2 black	1 white
1 white	2 black
2 black	1 white
1 white	1 black
1 black	1 grandrelle
1 grandrelle	1 white
1 white	2 grandrelle
2 grandrelle	1 white
1 white	2 grandrelle
2 grandrelle	1 white
1 white	1 grandrelle
1 grandrelle	
1 black	
	Total 72 ends

Of these 48 are face and 24 back. The weight per square yard is 6,533 grains; the weave is 36 by 6. The black warp and weft threads have been dyed with sulphur dyestuffs. In the grandrelles the grey has been dyed with substantive cotton dyestuffs, the bright blue with a basic dyestuff partly printed over with a sulphur black. (Fig. 38.)

TABLE LINEN.

No. 40. This fabric is 63 in. wide, sold at 13½d. per yard, and is mercerised and bleached. It has 74 ends per inch of 22's, and 72 picks of 19's, all spun twist way. The base weave is a 5-shaft satin; the figure is produced by the Jacquard.

No. 41. The fabric is 63 in. wide, sold at 15½d. per yard and is mercerised and bleached. It has 91 ends per inch of 23's, spun twist way. The base weave is 5-shaft satin, and the figure is produced by the Jacquard.

No. 42. A pale blue and white damask, 52 in. wide, with 81 ends per inch of $2/32$'s cotton folded weft way, and 44 picks of 16's. All the singles are spun twist way. The warp is dyed a light blue with substantive cotton dyestuffs, and the cloth is filled with starch. The ground weave is a 5-shaft satin, and the figure produced by the Jacquard.

No. 43 is sixty-three inches wide, sold at $15\frac{1}{4}$ d. per yard, has red or blue borders, and is mercerised and bleached. The yarn employed in the production of the red border has been dyed with alizarine, that of the blue border with vat dyestuffs. The pattern analysed contains 75 ends per inch of 20.8's, and 60 picks of 18's, all spun twist way. The base weave is a 5-shaft satin, and the design is produced by the Jacquard.

No. 62. Damask table napkin, 18 in. by 18 in., sold at 2s. $6\frac{1}{2}$ d. per dozen. It contains 78 ends per inch of 23's and 74 picks of 19.4's. The warp and weft are spun twist way, and the fibres are mercerised.

No. 44. A bleached table napkin with red or blue borders; it is $14\frac{1}{2}$ in. by $14\frac{1}{2}$ in., and sold at 1s. 11d. per dozen. The cloth is mercerised, the red is alizarine, and the blue is dyed with a vat dyestuff. It has 72 ends per inch of 19.4's, and 63 picks of 18's, all spun twist way. The base weave is a 5-shaft satin, and the ornament is produced by the Jacquard.

No. 45. A damask with multi-coloured striped border and pale blue and white body, dyed with substantive cotton dyestuffs. The piece contains 73 ends per inch of $2/16$'s folded weft way, and 49 picks per inch of 7's, the singles being spun twist way. The base weave is an eight-shaft satin, and the figure produced by the Jacquard.

It should be pointed out that certain of these effects cannot be produced by finishing unless definite conditions prevail in the materials and processes employed in the manufacture of the article. Thus for example, the employment of mercerised warp and weft in the making of cotton damask cloths will produce effects markedly different from those obtained by mercerising in the piece.

MISCELLANEOUS FABRICS.

No. 46. A druggeting in white and brown. The white is cotton, the brown linen. The piece contains 46 ends of $2/22$'s folded weft way, the singles are spun twist way, and 36 picks of 7.5's linen, in cotton count. The design is a plain ground with a Jacquard figure.



FIG. 39.

No. 47. Heavy blue and white bedspread or table cover, 51 in. wide, sold at $11\frac{1}{4}$ d. per yard. The stripes are similar in warp and weft. The piece contains 74 ends per inch of 22.2's whites

and 20.1's blue, and 36 picks per inch of 10's white and 10.4's blue, all twisted twist way. Alternate squares are formed by Jacquard figuring and by mock-leno. The warp threads are two in an eye. The blue threads have been dyed with a sulphur dyestuff. Other examples contain, in addition, red, green, and black. (Fig. 39.)

No. 48. An Alhambra bedspread, 59 in. by 78.6 in., sold at 48 shillings per dozen. It has 30 ends per inch of 34's white, 30 of 21's red, and 30 of 21's blue, all spun twist way. The white is ground warp, the red and blue are figuring warp. The arrangement of the threads is one white, two red, one white, two blue. The red and blue are drawn two threads in an eye. There are 25 picks of 4's. The ground weave is plain, and the figure is produced by the Jacquard. Ordinary substantive cotton dyestuffs have been used in the dyeing. The warp is heavily sized.

No. 49. A furniture or curtain fabric in which a peculiar but pleasing effect has been produced in the ground by irregularly mixing white and light brown warp threads tinted with a direct brown, and by further interlacing them with a green weft dyed with a basic dyestuff. The piece contains 67 ends per inch of 2/35's white and 2/42's brown, both folded weft way. There are 128 picks per inch, disposed in 32 groups of four, of 25's green; all the singles are spun twist way. The ground weave is plain; the weft is four threads in each shed. The striped ground is produced as follows:—

2 brown
 2 white
 1 brown
 1 white
 1 brown
 3 white
 1 brown
 1 white
 2 brown
 1 white
 2 brown
 1 white
 1 brown
 2 white
 2 brown
 3 white
 3 brown
 1 white
 1 brown
 1 white
 3 brown
 1 white

36, or 17 white and 19 brown threads.

No. 50. A furniture fabric, ornamented with three extra wefts, which, after weaving, are sheared. The ground work is apparently woven from half-bleached linen weft and cotton warp. The effect threads in both warp and weft are cotton, the black having been dyed with a sulphur dyestuff, the red and green with vat dyestuffs, whilst the white is bleached cotton. The piece contains 45 ends per inch $2/36$'s cotton and 39 picks per inch of 20's linen, in cotton count. In each spot figure there are 38 picks of white, 21 of green, and 10 of red, the count of which is probably 10's. The ground weave is plain; the figure is produced by the Jacquard.

No. 51. A woven rep-tapestry in grey, green, and purple. The piece contains one hundred ends per inch of $2/40$'s grey cotton, folded weft way, and 38 picks per inch of green and purple alternately. The green equals 4.4's, in cotton count, of kapok or a similar seed hair. The purple equals 6.7's in cotton count, and is of the same material; all the singles are spun twist way. They are both dyed with basic dyestuffs. The picking is 1 green and 1 purple in each shed. The design is produced by the Jacquard. The fact that the kapok threads have been dyed with basic colours and that tannic acid is present in considerable quantity is of interest, because it suggests that the fibres may have been prepared with this material in order to make them spin better.

No. 97. Furniture or curtain fabric in green and white, figured by aid of the Jacquard. The width is not specified; the price is 1s. 8d. per yard. The piece has 66 ends per inch of $2/32$'s cotton, folded weft way, and 43 picks per inch of 10.5's linen, expressed in cotton count; all the singles are spun twist way. The ground weave is plain, and the green has been dyed with a basic dyestuff. The linen is bleached.

No. 86. A plain double plush in cotton, woven two in the width and with a leno centre selvage; 50 in. wide and sold at 1s. 10½d. per yard. The piece has 76 ends per inch, namely, 38 for ground of 18.5's, 38 for pile of 10's, and 40 picks of 8.5's, all



FIG. 40.

spun twist way. The ground weaves are plain, and, reading from left to right, threads 2 and 5 are pile. (Fig. 40.) It has been dyed with substantive cotton dyestuffs.

No. 107 is a striped furniture fabric, which has been woven as a double plush. It contains 52 ends per inch of cream, dark slate, and black, the counts being $2/2.87$'s, $3/21.5$'s, and 10.1's respectively. The folded yarns are weft way and all the singles twist way. There are 32 picks of 16's black and 16's

brown. The pile is worsted, the counts being approximately 2/20's expressed in cotton count. The warping pattern equals:—

2 dark slate	}	Ground threads
4 black		
2 brown	}	Pile threads
2 dark slate		
4 black	}	Ground threads
1 brown		
1 green	}	Pile threads
2 dark slate		
4 black	}	Ground threads
1 brown		
1 black	}	Pile threads
2 dark slate		
4 black	}	Ground threads
1 brown		
1 green	}	Pile threads
2 dark slate		
4 black	}	Ground threads
2 brown		
2 dark slate	}	Ground threads
4 black		
2 cream		Cord threads

48

The wefting pattern is:—

2 black
2 brown

4

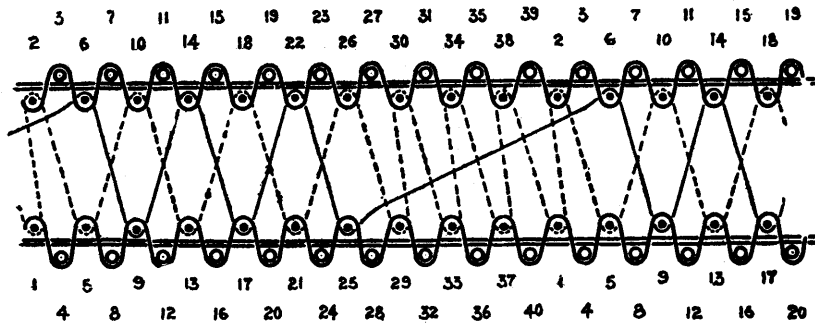


FIG. 41.

The cotton has been dyed with substantive cotton dyestuffs, the worsted with acid dyestuffs. Fig. 41 shows a section of the fabric, and Fig. 42 is the weave.

Whilst it has been found impossible to analyse all the samples

taken, the results given above are representative. One hundred and twenty samples have been examined, but among the fabrics not dealt with in this communication there may be some of interest to one or other of our members. Should this prove to be the case, we shall be happy to furnish further information.

In this paper no attempt has been made to inform manufacturers what they should, or should not, attempt, for the authors realise that each manufacturer fully understands the conditions which decide his actions. Nor have we emphasised the fact that certain of the fabrics will be best made in a particular type of loom. What has been attempted is to place before those interested certain information which they could not obtain from a casual examination of the samples exhibited in the

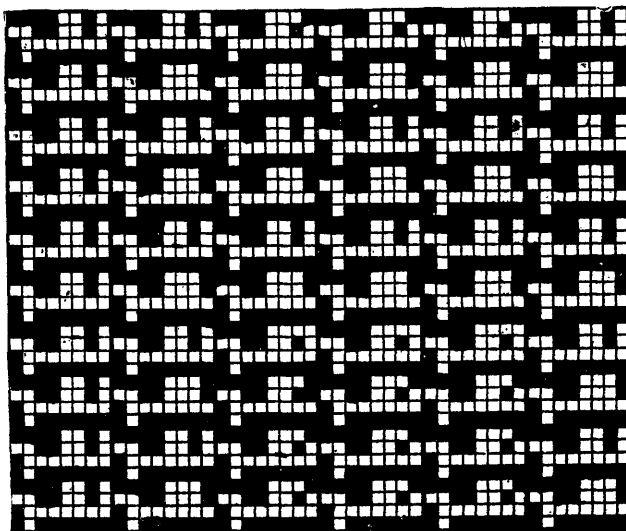


FIG. 42.

Manchester Town Hall, or in the Offices of the Board of Trade. Even here, no claim is advanced that what has been done by us could not have been done quite as well by others. But, through the courtesy of the Board of Trade and the exhibitors, facilities have been afforded to us which were denied to many individual manufacturers, and we trust that the result of our work may be of some service to the textile industry.

A careful examination of the patterns proves that where imitation is most perfect, the quality of the fabric upon which the effect is imposed is often the most inferior, one being in inverse ratio to the other.

If this branch of the textile industry is to be permanently established here, it is absolutely essential that careful investigation must precede the manufacture of many of these articles,

and the spinner, the manufacturer, the designer, the dyer, the printer, and the finisher must closely co-operate.

It should be one of the chief functions of the Textile Institute to promote this co-operation, and if such an object could be achieved, we feel that the existence of the Institute would be fully justified, and that it would deserve the active support of the entire industry.

The authors wish to express their indebtedness to Messrs. W. Bennett, C. Clark, J. Edwards, H. Fairclough, J. E. Hardman, T. Rodway, J. A. Stevenson, and J. Winterbottom for the valuable assistance rendered in connection with this investigation.

Municipal School of Technology,
Victoria University, Manchester.

Invited by the Chairman to address the meeting, Mr. R. W. DALTON, Board of Trade representative, said he was sure the paper was an excellent one, and he thought they would all appreciate the enormous amount of work ungrudgingly given by the authors. When the Board of Trade started these exhibitions, it was hoped that experts might go further into the matter and explain to manufacturers what was necessary if the exhibitions were to be of the fullest service. Therefore, it was pleasing to find that the Textile Institute had gone so far in this connection. The Board of Trade were only too pleased to lend the samples to be analysed and reported upon. The investigations were most valuable, as indicating the possibilities of manufacture of goods of similar character. He had pleasure in moving a vote of thanks to Messrs. Fox and Huebner.

Mr. W. MYERS seconded, and suggested that the samples which had been prepared and mounted at such great trouble should be shown with the whole of the details inscribed on the cards and the prices stated in uniform currency. Under those circumstances, the examination would, he thought, be more valuable.

Mr. E. H. TAYLOR (Manchester) suggested the provision of a printed catalogue. The cards might be left at the Institute, and if the Members got a catalogue and studied it, they could attend and see the samples. The samples might be classified. If the Board of Trade could furnish the values imported into this country in each class it would be of material advantage to the trade. A lot of the patterns might refer to fashions of the moment. But if they could get to know to any extent as to what the annual values of imports amounted to, it would enable them to arrive at a decision as regards the making of these goods.

Mr. HUEBNER said the suggestion of Mr. Myers was excellent, and they would be very pleased to carry it out. As regarded Mr. Taylor's observations, all the details, and in addition the details relating to 70 other samples, would be printed in the Institute Journal and would be available to Members and others.

Mr. DALTON said he did not know whether the statistics of imports into this country alone would satisfy requirements. The matter should be viewed from the point of view of world trade. The Board did try, some time ago, to get out a complete record of the world's trade in cotton blankets. It was realised then, however, that it was not sufficient to encourage men to go for one country's trade alone. They had gone to a lot of trouble in ascertaining the annual consumption of these things, and that information was still available. As regarded certain other classes of samples of textiles which had come from other parts of the world, these were still in existence at 32, Cheapside, and it was intended to try and get them exhibited in the country. If possible, they might add statistics. But any information which the Institute or its Members cared to ask for would be given, in so far as it was humanly possible to provide it.

The vote of thanks was heartily accorded, and the Chairman, in bringing the proceedings to a close, said the whole of the information would be published in the Institute Journal and would be available to Members. They would be glad to have additional Members, who would be entitled to receive the Journal, or non-members could purchase copies of the Journal. But they would, of course, prefer to have every one present a Member of the Institute. He was very pleased they had had such a successful gathering, and hoped it would mark the beginning of a period of largely increased usefulness of the Institute.