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COTTON UNCOMMERCIAL.

There are many ways of looking at cotton. It may be approached with advantage from the statistical side, bringing into view the marvellous developments of its culture, trade, and industry, the millions of money invested in it, the population and interests dependent upon it. It may also be approached, but without so much advantage, from the profit-and-loss direction, upon which Mr. Goschen had something to say not long since, proving that the "cotton lords" enjoy very little more than an empty title. There is the historical standpoint, from which the outlook is unlimited, either in point of time or attraction, connecting the finished spindle, which appears to lose substance in the velocity of its revolutions, with the rude implement that had been used for years untold before invention put more power into it, and tracing all the mighty productive capacity of modern machinery to the first mechanical processes employed in clothing mankind. It would take a long time, or a big book, to completely exhaust even the ordinary inspirations of the chief among textiles, what may be called the commonplaces of cotton. There would still remain for consideration all the wider bearing of cotton in its effect upon the welfare and habits of the people, just as it was noticed long ago that the commoner wearing of printed calicoes, which required washing, led to greater personal cleanliness; and for the purpose we have at present more particularly in view, there would be plenty of room for study of the evidence, here, there, and everywhere, of adaptations of cotton in our language. Cotton-wool is an equivalent for luxury—to be lapped in cotton-wool implies tenderness of treatment. Cotton is still used in a figurative sense in many parts of the country, and if the applications of the word are not always obvious at first sight, there is so much the better opportunity for enquiry or conjecture. For instance, in a volume just issued by Mr. Elliot Stock, on "The Peasant Speech of Devon," we find cotton included as denoting "to beat lustily;" and in a sentence given to illustrate the occurrence of the word in this rugged vulgar tongue, it is written, "I'll cotton thy hide vur thee ef thee dissent come yer dreckly minit." There is the same emphasis given to the word, and no doubt as frequent an administration of domestic justice after it, in Northern as well as in other Western counties, and many a country lad has sore cause to know what cottoning means. There is the other and much more familiar metaphor in which cotton signifies agreement, mutual inclination and liking: as where it was said in Walker's "History of the Independents," that the Parliament "and their Masters of the Army could not cotton together;" and again in Drant's rendering of Horace—

> So feyneth he, things true and false,
> So always mingleth he,
> That first with midst, and midst with last,
> Maye cotton and agree.

As this occurs in a volume issued early in Elizabeth's reign, there are some centuries of justification for the colloquialism by which we "cotton to" any person. Further significance is given to the word in a way indicated by Dyche's "Dictionary" of 1777. There, following an amusingly inaccurate description of cotton as "a woollen kind of flax," brought at that time "from the Levant and both Indies," it is given again as a verb, "to agree, succeed, or hit," which is correct enough, for cotton stood in olden days as a synonym for success in any enterprise. Nares explains this as probably derived "from the finishing of cloth, which when it *cottons*, or rises to a regular nap, is nearly or quite complete. It is often joined with *geer*, which is also a technical and manufacturing term." Corroborative passages are given from Beaumont and Fletcher's *Monsieur Thomas*, 1619—

> Still, mistress Dorothy! This year will cotton.

From Lyly's "Alexander and Campaspe," 1584,

> Now, Hephestion, doth not this matter cotton as I would.

And from the "Family of Love," 1608,

> It cottens well, it cannot choose but beare
> A pretty napp.

This latter instance is explicit enough in its textile expression to contradict Mr. Smythe-Palmer's theory that cotton in this sense "is evidently an old British word still surviving, and has nothing to do with cotton, being identical with Welsh *cydundo, cytuno*, to agree, consent or coincide, from *cydun, cytun*, of one accord, unanimous, coincident, literally 'at one (*un*) together' (*cyd, cyt*). 'To cotton to a person' is then to be at one with him." The fact that cotton was undoubtedly imported and used for candlewicks and in padding garments from the thirteenth century onwards, together with the other fact—both open to conclusive proof—that woollen fabrics were called cottons long before the cotton manufacture was set up in this country, may well raise a qualifying doubt as to whether cotton-wool or animal-wool is referred to whenever "cotton" is mentioned in early days; but there cannot be any question that cotton, as a figure of speech, has a textile bearing in the quotations herewith collated, and in many others like unto them. Cotton may have been a corruption of an old Welsh word, and may have originally implied unity, but when it came to have a nap upon it, the textile trades put in their claim to it. In the States a rabbit is known as a cotton-tuft-tail, and a venomous snake with a white streak along its mouth is called the "cotton-mouth," and we might as well dispute the allusion to cotton in such cases as in the other references which have been given. But while the idea of cottoning to an agreeable person can be easily understood, how can the connection with a lusty thrashing or with the prosperous outcome of some undertaking be acceptably explained?

ARTIFICIAL SILK.

Marius Moyret, in *Le Moniteur de la Teinture*, writing on artificial silk, says that it has been noticed that the silk-worm, eating as it does vegetable tissues, takes in cellulose and nitrogen in some form or another through its fibre-glands, animalises these materials, and converts them into the silk fibre. For a long time the question o how to produce this silk artificially exercised the minds of chemists of all countries, with the result that the problem has been solved to a greater or less extent. On treating cellulose with cold, strong nitric acid, or, better still, with a mixture of strong nitric acid and sulphuric acid, there is obtained a series of products known as the pyroxylins. The most highly nitrated of these products is the hexanitro cellulose, which, under the name of gun-cotton, is used in the manufacture of explosives. The lower, bi- tri- or tetri-nitro celluloses, although somewhat inflammable or explosive, are used in the manufacture of artificial silk. The bi-nitro product is used in the manufacture of collodion by dissolving it in a mixture of ether and alcohol. By so dissolving nitro-cellulose, and forcing the solution through fine tubes, fine threads resembling silk are obtained. These differ from the natural

fibre in being a nitro product; that is, the atoms of nitrogen are combined with oxygen in the form NO_2, while in the natural product they are connected with hydrogen in some form or other. In composition artificial silk is very variable, owing to the fact that the action of the nitric acid forms a variety of nitro products. One essential difference between artificial and natural silk is, that while in the former oxygen is abundant, in the latter it exists only to a small extent, and there is more carbon in its composition. Khulman, of Lille, proposed many years ago to convert cotton into nitro cellulose, in order to increase its dyeing qualities, but at the same time he recognised that its inflammable properties were a great drawback to the adoption of the process. This inflammability is, indeed, the most serious hindrance to the extended use of artificial silk. It has been stated that this defect is overcome by a subsequent process of denitrating, but the author, from his experience, says that all the schemes which have been proposed have been impracticable on the large scale. As a matter of fact the means adopted to denitrate the silk, and so modify its inflammability, also destroy the additional dyeing properties which nitration has imparted to it. There are at present two methods of making artificial silk. The oldest, that of Chardonnet, consists in drawing a thread from a solution of nitro-cellulose in a mixture of alcohol and ether. The second method, invented and patented by Duvivier, in 1886, consists in drawing a thread from a solution of gun-cotton, albumen, and gelatine, in glacial acetic acid. The silk produced by this method resembles more closely natural silk than does that produced by Chardonnet's method; but on the other hand the use of glacial acetic acid as a solvent is rather a disadvantage, owing to its powerful corrosive properties, as it necessitates the use of silver, platinum, or glass vessels for dissolving the materials used in the production of the thread. Artificial silk is white, and has a fine lustre, but it is deficient in tenacity, which is another objection to its use. As to its dyeing properties, unfortunately it will not stand the action of boiling water, thus seriously impeding the work of the dyer. In dyeing the silk, therefore, it has to be dyed cold, and the old wood colours, such as madder, quercitron, logwood, weld, and orchil, give the best results. There seems at present no prospect of artificial supplanting natural silk, although, if better methods were discovered of denitrating it, which should leave it non-inflammable without altering its dyeing properties, it might, in the opinion of the Moyret, have a brilliant future before it.

Calico-Printing on the Continent: the Colourist Chemist.

Some time ago we reproduced some sarcastic remarks made to one of our reporters by a well-known dyer, who spoke of the lack of practical chemists in the silk trade. The reply to this was a vehement championship on the part of a Yorkshire gentleman—or rather a gentleman who spoke in Yorkshire—of the rule of thumb. The rule of thumb, we were told at a dyers' meeting in Bradford, had made England what it was. Rule of thumb was everything—science nothing. The speaker did not ask three cheers for rule of thumb. Probably he intended to do so, but forgot. A little while ago, Lord Masham, (better known as Mr. S. C. Lister), speaking at a Society of Arts meeting, upheld the same view. Somehow or other, he said, Englishmen always thought they could beat the world without troubling to learn. So far as Lord Masham knows there is not a technically-taught person about Manningham Mills. His dyers produce some of the finest colours in the world, but it is all done by rule of thumb. This is well so far as it goes; but if England can do so much without technical education, the inference is that she could do much better with its aid. Lord Masham admits that we should occupy a much more commanding position if we had thought of technical education earlier. The statements made by "rule of thumb" advocates are all very well in their way; but the opinions we have reproduced are not, we are glad to think, universal. The chemist of a well-known firm said to us the other day that the weak point in connection with calico printing here is that the pattern sampler is not a chemist. Our informant has had experience both in this country and on the Continent, and he affirms with all sincerity that English houses, as a rule, are not perfectly equipped. There are very few chemists in our printworks, and many judges think this a mistake. The sampler ought to be a chemist, because he has to know whether certain colours can be printed together. Colours that precipitate he is required to guard against, so that accidents may be avoided. In Alsace all the managers are chemists, and they generally have three or four young chemists under them. The same remark applies in a more limited degree to Rouen. The French managers are trained in the Mulhouse Schools, and many of those in Germany, Russia, Spain, and Italy are trained at the same place. Generally the young Continental chemist spends two years at the Mulhouse Laboratory, and during the last six months of study the theory of calico-printing receives special attention. Some attend the engineering or designing shop before commencing at the Laboratory, which they do not enter before the age of 17. Now that the export print trade calls for better styles, more resembling home-trade styles, the importance of having as printworks' managers men who are practical chemists becomes more apparent. If English calico printers gave attention to the development of the colourist chemist, there would be nothing to prevent them from equalling as a body the productions of Alsace firms, the beauty of whose work is universally recognised. Most of the machinery used on the Continent comes from England, so that our competitors have no advantage over us in this respect. In fact, as far as mechanical arrangements are concerned, English printers appear to be slightly ahead of their rivals. The calico printers of Mulhouse bring most of their designs from Paris instead of keeping *ateliers* (studios) of their own. We do not think that Mulhouse firms care to go to Paris for their designs, and they are making every effort, by encouraging the school, to improve designing in their own locality. In their trade, as in others, however, the best man must of necessity win, and if Parisians, whose artistic ability is assisted by the profusion of beautiful objects to be found in their glorious city, can maintain their lead, England, as well as Alsace, will continue to buy designs from them. Rouen does not turn out such good work as Lancashire or the West of Scotland, many of its works being poorly equipped. In fact Mulhouse may be said to stand alone in its surpassing excellence of design and colour. The works of Mr. Franz Leitenberger at Cosmanos, Bavaria, should perhaps be excepted; the firm produces goods equal to the best Mulhouse productions, and it supplies the principal Austrian centres with fine prints. Italy and the States of the Balkan Peninsula also buy Mr. Leitenberger's goods largely. We described some of his productions a few years ago in *The Textile Mercury*, offering at the time to shew any of our readers samples. The work was so excellent that many affirmed that they were printed by the block method. It is a curious fact that while pointing out the superiority of the Mulhouse methods in many respects, intelligent Frenchmen have been known to admit that English print workmen are superior in other respects to the French, being stronger and better men, with a more perfect training in their special branch. They can be given greater responsibility than those of Alsace, where there are more overlookers and chemists. The view is an interesting one, and may no doubt be correct if applied to the employés of Potter's or Grafton's. We should not like to say, however, that the remark could be applied to the men engaged in the smaller works.

Some Textile Novelties: Flaxen Underwear from Balbriggan, Velvet Skirt Facing from Manchester, etc.

There is always something that is fresh to be found in the dry goods warehouses. Amongst the latest novelties introduced is a class of hosiery, the production of an Irish firm—Smyth and Company, "no less"—consisting largely of flax yarn, and appropriately named "Flaxonia." The makers are, of course, ready to claim all the virtues for the new material. It consists, we are told, of pure linen yarn, so spun as to render the garment beautifully soft, so that the most delicate skin can wear it, whereas both wool and silk are highly irritative to many. This is all very well in its way. Nothing is of course said as to the wonderful process which produces the extraordinary flax yarn referred to; but that is Messrs. Smyth's secret. Reading the circular of the manufacturers further, we learn that linen next the skin is recommended by the highest medical authorities. The objection previously felt to the use of linen underwear has been the cold nature of the garment when first put on, "but after long study and experiment, this difficulty has been overcome by making the garment absolutely porous, giving free ventilation to the skin, so that the article has now the comfort of silk whilst possessing more hygienic qualities, and much greater durability." Another great recommendation is that the goods improve by frequent washing. These claims, if verified by experience, should ensure for the new underwear a large demand. There will, of course, be numerous critics, and these Messrs. Smyth will require to answer. It can, at least, be said in favour of the novelty which the little Dublin town has sent forth, that the wearing of its product is preferable to the linen cure recommended by the Kneipp fanatics, who would have people jump into a cold bath, and then run barefoot for a few miles in order to get dry, after which—horror of horrors!—linen vestments must be donned. The new underwear is made in shirts, pants, combinations, vests, hose, and half-hose, for ladies, gentlemen's and children's wear, in three weights. Seriously, we wish the goods every success. If they succeed in securing for themselves a corner in an already crowded market, it will be by sheer force of attraction. There are two qualities in most trades which draw the notice of buyers. Omitting coal and pig-iron—an article may be said to be worthy of attention because of intrinsic merit, or it may sell on account of its novelty. The new underwear is undoubtedly a novelty, and we hope that, as time goes on, its makers will be able to boast that it possesses the other qualification so necessary to permanent success in all trades and professions—that of simple merit. The material is, no doubt, of a substantial character, and the name of Balbriggan is sufficient to satisfy one that the best machinery has been employed in the manufacture. If the standard objection to linen as an article of underwear can be removed by the experience of the wearers of the new article, then a further addi-

tion may be made to the list of standard articles in the departments of the wholesale warehouses. While we are speaking of novelties, a reference to the extended application of reversible prints may not be out of place. Handkerchiefs and mufflers, both sides alike, fast washing colours, as the travellers say, have been placed on the market in considerable quantities of late. We need not say more about these articles, except that a London house is making a considerable ado about them. The designs are "manufactured"—although the goods are prints!—in a variety of colours. A velvet skirt facing has also been pushed vigorously by a Manchester firm during the past few months. It is superior to the old-fashioned braids, and is made up in continuous lengths of three yards.

The Board of Trade Returns for May.

The Board of Trade returns for the past month have once again proved unsatisfactory, as, with one more working day and no disturbance to trade from public holidays, the total imports are only £558,040, or 1·6 per cent. in excess of the total for May, 1891, the total being £34,935,738. The exports of British and Irish produce are valued at £17,783,969—a decrease of £1,960,504, or 9·9 per cent.; but the exports of foreign and Colonial merchandise were valued at £6,591,447—an increase of £1,144,116, owing chiefly to larger shipments of coffee, cotton, tea, and sheep's wool, and also to the absence of waterside labour disputes. As regards the imports, the receipts of raw cotton, sheep's wool, flax, jute, and silk, are much below last year's level, the decreased value of cotton being £1,043,627, and of sheep's wool £872,411. Of raw cotton the United States sent only 652,365 cwt., compared with 1,015,502 cwt. in May, 1891; Egypt, however, sent 102,266 cwt., as against 49,313 cwt. The receipts of this article during 1892 are so far 500,000 cwt. below the quantity of last year, but, nevertheless, prices are lower. As to sheep's wool, the falling-off is due to the receipts from Australasia being 65,000,000 lb., as compared with 83,000,000 lb. The imports of this article were, however, very heavy in the earlier months of the year. As to the exports of British and Irish produce, the decreased value of £1,960,504 is largely made up of the decreased shipments of coal and iron. The former is less by 612,044 tons in quantity and £421,998 in value; and the latter by 82,484 tons in quantity and £993,149 in value. The balance of the total decrease is found in the lessened value of yarns and textile fabrics and other miscellaneous manufactures. It will be noticed from the annexed tables that the prices of both cotton yarn and piece goods are lower, notwithstanding the fact that the shipments of the latter are 14,393,500 yards more than last year. Of yarn, with the exception of one or two countries, the shipments are generally smaller, but as regards cotton piece-goods there are some important increases, the British East Indies having taken 26,000,000 yards more—the quantity being 169,000,000 yards, compared with 143,000,000. Chili also took 11,429,000 yards, as against 3,548,000; Brazil, 25,475,000, compared with 14,063,000 yards; and the Argentine Republic, 12,115,000 yards, as against 6,313,000. On the other hand, Turkey, China, and Australasia took less. Of jute piece-goods the requirements of the United States were only 9,935,000 yards, compared with 14,788,000 yards; those, however, of the Argentine Republic rose from 456,000 yards to 1,358,000 yards. Of linen piece-goods the United States took 5,963,000 yards, compared with 4,139,000 yards. The shipments of woollen and worsted piece-goods to the United States, Brazil, and the Argentine Republic were also greater than in May of last year. It will scarcely be satisfactory to silk manufacturers to learn that while exports of thrown silk have decreased by £18,827, and those of piece goods by £22,187, the imports of silk manufactures have increased by £153,000. Our imports of raws and knubs have, however, fallen off to the extent of over £84,000. Our purchases of woollen and cotton goods from the Continent for the five months of the year were as follows:—

Cottons £1,270,309
Woollens 3,900,990

More than one-half of our woollen imports consist of the products of French looms. Although our external trade is at the present time far from shewing an expansion, yet the clearances of dutiable goods are heavy, which shews that the wages of the wage-earning classes are at present little affected thereby. In the following tables particulars will be found of the imports and exports of textiles, etc., for the month:—

I.—Imports of Foreign and Colonial Merchandise.

Principal Articles.		Quantities. 1891.	Quantities. 1892.
Cotton, raw	Cwt.	1,184,631	850,100
Flax	,,	307,691	234,497
Hemp	,,	133,463	181,463
Jute	Tons	40,812	18,953
Silk, raw	Lb.	224,639	112,904
Wool, sheep and lambs'	,,	103,669,488	84,934,270
Woollen stuffs	Yds.	4,337,839	4,633,458

Principal Articles.	Value. 1891. £	Value. 1892. £	Increase or Decrease per cent. compared with May, 1891. Quantity.	Value.
Cotton, raw	2,975,649	1,932,022	†28·1	†35·0
,, manufactures	223,607	251,890	—	*12·6
Flax	479,554	357,622	†23·8	†25·4
Hemp	200,060	219,433	*35·9	*9·6
Jute	434,344	358,726	†53·5	†17·4
Silk, raw	150,921	76,972	†49·7	†49·0
Wool, sheep and lambs'	4,088,598	3,216,157	†18·0	†21·3
Woollen stuffs	380,741	401,363	*6·8	*5·5

*Increase. †Decrease.

II.—Exports of British and Irish Produce and Manufactures.

Principal articles.		Quantities. 1891.	Quantities. 1892.
Cotton Yarn and Twist	Lb.	19,457,200	17,383,100
,, Piece Goods	Yards	381,472,800	395,866,300
Jute Yarn	Lb.	2,769,000	1,714,600
,, Piece Goods	Yards	21,765,200	16,832,100
Linen Yarn	Lb.	1,267,500	1,086,900
,, Piece Goods	Yards	9,765,300	12,674,100
Wool, sheep and lambs'	Lb.	1,245,900	1,167,100
Woollen and Worsted Yarn	,,	3,320,800	3,177,600
,, Tissues, heavy and light, broad and narrow	Yards	3,077,500	3,088,700
Worsted Tissues, heavy and light, broad and narrow	,,	8,750,100	7,943,300
Woollen Carpets	,,	653,900	842,700
,, Flannels	,,	534,900	412,700
,, Blankets	Pairs	76,196	56,401

Principal Articles.	Value. 1891. £	Value. 1892. £	Increase or Decrease per cent. compared with May, 1891. Quantity.	Value.
Cotton Yarn and Twist	899,513	734,702	†10·6	†18·3
,, Piece Goods	4,065,655	3,887,363	*3·7	†4·3
,, Other Manufactures	571,768	617,152	—	*7·9
Haberdashery	117,475	109,047	—	*7·1
Jute Yarn	27,885	21,080	†38·0	†24·3
,, Piece Goods	189,743	174,957	†22·6	†7·8
Linen Yarn	80,490	63,936	†14·2	†22·4
,, Piece Goods	237,659	279,033	*39·7	*17·3
Machinery and Millwork	1,367,900	1,355,540	—	†0·9
Silk Manufactures	120,159	97,942	—	†18·4
Wool, sheep and lambs'	58,559	52,840	†6·3	†9·7
Woollen and Worsted Yarn	314,294	336,491	*13·6	*7·0
Woollen Tissues, heavy, light, narrow, broad	308,514	310,476	*0·3	*0·6
Worsted Tissues, heavy, light, narrow, broad	495,083	478,987	†9·2	†3·2
Woollen Carpets	65,651	70,397	*28·8	*20·9
,, Flannels	19,057	13,929	*—	*—
,, Blankets	26,640	17,492	*—	*—

*Increase. †Decrease.

An American View of English Operatives.

A gentleman engaged in trade in Texas, U.S., writing to a friend, has spoken out rather frankly his opinion on the conduct and policy of the operatives engaged in the cotton industry in England. He says: "You complain that the employés ruin your business, stating how many hours you shall run, etc., etc. In one sense I am glad of this, because it will only transfer that much more trade to America, and I shall get a part of it. In another sense I am very sorry, because it is ringing the first knell of the death of England's supremacy in the cotton manufacturing business. I can assure you it is only a matter of a very few years before you will be very glad to play second fiddle in the manufactures of the world. The United States are going to outstrip you in spite of all you can do, and your workpeople are only hastening the time by their foolhardy ways in dictating what shall and what shall not be done. It will be a long time before this country is in the same position you are in to-day as regards labour, because there is such a vast territory to cover, and such a large amount of surplus help willing to learn the cotton trade. It will take many years for our employés to dictate what we must do, but if ever it should come to that point I will quit the business. I will have no sort of men working under me come and tell me what I must do, or dictate as to how I shall run my business. Your employés are a set of fools, cutting their own throats, and they will deservedly suffer for it before many years, mark my words. I will bet you a farthing cake that inside of five years I will be on Manchester Exchange selling cotton yarns—that will be taking coals to Newcastle with a vengeance—and there will be no one to blame for it but your own employés."

Narrow Widths and Double Widths: Short Lengths and Full Lengths.

Machinists, manufacturers, and warehousemen are alike interested in the changes which have taken place during the past few years in connection with the widths of certain classes of dress goods now chiefly in demand. A glance at any representative collection of such fabrics as seen in the establishment of a representative distributor, whether wholesale or retail, will shew that double widths are much more largely stocked than narrow widths. Some ascribe the change which has taken place in this respect to an alteration in public taste. Dressmakers, it is said, prefer double width rather than 27 in. makes. The broad and narrow woollen departments have of late years been amalgamated in our leading home-trade houses as a consequence, no doubt, of the new condition of things. The late Mr. Peacock, well known to Manchester men as an expert buyer of such goods, which he purchased for Messrs. Henry Bannerman and Sons, Ltd., up to the time of his death was fond of saying that there was a prospect of narrow looms "going out" in the woollen trade unless fashion (if the word may be used in this connection) materially altered. This, however, is merely a matter of opinion. There are many judges perfectly ready to say that the change from broad to narrow goods is more due to the action of manufacturers than to any difference in the requirements of consumers. It is not difficult to find dressmakers who refuse to admit that it would be an advantage to have all goods made in wide widths, whether 44 in. or more. However this may be, it is an undoubted fact that narrow makes have receded into the background. If manufacturers have produced this result by their own determination they are to be congratulated; and the circumstance should encourage them to act in unison for the accomplishment of other reforms. The widths in which dress goods are made differ widely. Bradford cashmeres, for instance, range from 42 in. to 46 in., and narrow goods range from 22 in. upwards. Some fancy stripe and check foulettes which we inspected the other day were 22 in. to 23 in., and a collection of Cheviot mixtures were 23 in. to 24 in. Again, as further illustrating the diversity which prevails in the trade, it may be added that fancy striped skirtings may be seen any day in our warehouses in 36 in. to 38 in. widths, the length of the pieces being 20 yards. The matter of length is one which attracts much

more attention amongst retail drapers than that of widths. Manufacturers will readily understand that in the smaller towns it is a matter of some inconvenience to drapers, who have to take pieces of 50 to 60 yards when half the quantity would answer their requirements. Even larger firms have experienced the effects of recent changes in the dry goods trade to such an extent that they are inclined to ask for shorter lengths. Merchants are now expected to display more extensive ranges of colourings and designs, so that they are perforce compelled to curtail their purchases of each individual style to as low an extent as possible. This is not the fault of the merchant or draper any more than of the manufacturer. It is due to the changed condition of the times—to the greater appreciation amongst the masses of novelty and excellence in design and colourings. Merchants can afford to fill their shelves with grey cloths, shirtings, blankets, and other goods of the kind, because, although not the staff of drapery life, their sale is assured, whereas that of the fashionable cloths is not. The demand for shorter lengths is not yet general, because some who suffer are too apathetic to voice their complaints. The most energetic buyers are, however, making their voices heard, and if the cry they have raised be taken up it will be difficult for those to whom the final appeal must of necessity be made to resist the demands of their friends and customers. Manufacturers would of course object to the additional expense involved in setting up so many extra warps; and weavers would not care to run the risk of further waiting while the tacklers performed their extra tasks. Perhaps the day of shorter lengths is yet far off; but it would not be safe to reckon on its being so distant. American buyers of dress goods have taken up the cry of their English brethren, and the demand on the other side of the Atlantic also is for shorter lengths. Already 30 to 40-yard pieces in the commoner cloths are woven largely in Yorkshire for foreign markets, and if buyers knew this they would be all the more pressing in their recently-formulated demands. Lace and embroidery houses have also had to face an agitation of a similar kind on the part of their customers, whose desire is for shorter lengths in such goods. The matter is one which, though broached by us for the first time, is far from being a new one in the trade. So far, however, there has been no thorough exposition of the views of buyers in print, although attempts have been made from time to time to draw attention to minor phases of the subject.

Sewing Machines.

A Continental contemporary reports the substance of a very interesting lecture recently delivered in Germany on the economic significance of sewing machines, from which we extract the following facts and figures as likely to have interest for our readers. The sewing machine has now established itself so firmly as an integral element of Western civilisation that few or none can be wholly indifferent to the story of its gradual diffusion. There are at present, it is asserted, about fifteen millions of sewing machines in use in the civilised world. The annual production amounts to 1,750,000, of which about 500,000 are made in Germany. Although the first experiments in the way of making a sewing machine date from the eighteenth century, the history of the practical use of this invention extends in reality over only about half a century. At the London Exhibition of 1851 only three sewing machines were on view; at the Paris Exhibition of 1856, only 14. In 1861, however, the number of manufacturers exhibiting had risen to 33. In 1853 only 2,300 machines were made in the United States; but by 1859 the number had mounted up to 46,243. In 1854 the first American sewing machine came to Germany, and soon this branch of industry was strongly represented in the Fatherland. The capacity of the sewing machine has developed enormously since its first invention, as was of course to be expected. With treadles, as many as 600 stitches can be made per minute; with steam, as many as 3,500. A family sewing machine requires, if properly worked, about 1-50th of one-horse power, so that the use of it for eight hours does not exceed human capacity. It is alleged that in the sewing machine industry a capital of at least 150 millions of marks is invested. The machines made in America are admitted to work more easily, but the lecturer claimed that those made in Germany are more accurate. In 1890 Germany exported 77,936 quintals of sewing machines, and imported only 29,568 quintals, 87 per cent. of which came from America and England.

The New Fibre Mania: *Enter* Wood—*Exit* Cotton.

Professor Mitscherlich, of Freiburg, has patented a method for the isolation of the fibres of wood so that they can be spun and yield yarns capable of being woven. For this purpose the wood is cut into thin strips, which are repeatedly passed between roughened rollers, so that they are bent and cracked in many places. There is thus produced a mass of material which can easily be divided across, but is with difficulty torn in the direction of its length. The mass is thus wrought until it is finally changed into a completely fibrous substance. This fibrous stuff is dried and treated between the rollers until it is completely disintegrated into its fibres. The fibres are very delicate and soft, and yet very strong. They can be worked up and spun like raw cotton. Since fibres made of wood (as is shewn by paper produced from cellulose) take colours very well, it is only a question of the cost of production, says *Romen's Journal*, as to whether this material will or will not prove a formidable competitor to cotton (!)

The American Elections.

Englishmen cannot help feeling more than ordinary interest in the political doings of their kinsmen across the Atlantic. This interest is partly sentimental, partly one of business. It is the custom on the occasion of each successive presidential election in the United States for various fire-eating politicians on one side or the other to hurl defiance at this country, and to fish for votes by insinuating that the opposition campaign funds have been swollen by the help of English gold. Theatricals of this kind become rather stale when repeated so often, but though observers may be apt to treat them lightly, it should not be forgotten that the passions of the ignorant are apt to be swayed by the stump politicians of the Republic. We have yet to wait for the opening of the oratorical flood-gates, but not for long. In the meantime the National Conventions of the two parties have been actively engaged in choosing candidates. Democratic politicians are already moving towards Chicago in anticipation of the National Democratic Convention, which will open on the 21st. A "wigwam" capable of holding 20,000 persons has been built for the occasion. The convention numbers 898 delegates, and of these a two-thirds majority, or 599, will be required to give a candidate the Presidential nomination. It is estimated that there is a majority in favour of Ex-President Cleveland, a fairly conscientious man, whose example in the years 1884-88 has had a salutary influence on American politics. The Republicans have already nominated President Harrison as their candidate. The present occupant of the White House has shewn himself capable of discharging, with calmness and dignity, the duties of his high office. He does not possess the aggressive ambition of Mr. Blaine, the disappointed candidate for the Republican nomination; but he is all the better for that, both in American and European eyes. Whether right or wrong, there is an opinion in the United States that Mr. Blaine, despite his brilliant abilities, would make a dangerous president; and with such fears in existence, the choice of the Republicans appears worthy of commendation. Manufacturers in this country have repeatedly been informed by the daily press that after the elections a reform of the tariff may be expected. We cannot recommend the adoption of any such belief. Our views on the subject have been expressed fully and frequently, and it is only necessary to add here that the protectionist party in the United States was never so energetic as it has shewn itself during the past few years.

Sir Henry James Again.

A fortnight ago the trades-unionists of the textile industries, which in the main means those of the cotton trade, met at Bury to reward Sir Henry James for the distinguished services they consider he has rendered to them in formulating their demands, throwing them into the shape of a bill, and piloting this through the Legislature. The right honourable gentleman, with the modesty which usually distinguishes him, declined any substantial reward for his services, preferring to accept in lieu thereof what may be described in the euphemistic language of the weaving shed as "a leather medal." So a beautifully illuminated address, in a massive gilt frame, was presented to him. In response he made a speech, which we reported at full length in our last issue, and which, we trust, has received the careful attention of our readers. It is upon this address that we propose to offer a few comments. In doing this we can hardly be said to be going out of our way, as the right honourable gentleman made the criticisms we have previously offered upon his conduct the text of a considerable portion of his speech. Sir Henry James is essentially a modest man, and greatly dislikes to speak of himself; at least so he tells us. It is very unfortunate that the irony of circumstances should be so cruelly hard upon him as to compel him so frequently to do things that are distasteful to him. Last year also in defending himself from the criticisms of *The Textile Mercury* before a similar audience, he had to make himself the burden of his own speech for a couple of hours; and at the end thereof he had not rehabilitated himself as a fair-dealing and honourable politician, or such a one as should be entrusted with the representation of an important constituency like Bury. In his speech of Saturday he descended much lower, and must have destroyed a great deal of the small amount of confidence that continued to be felt in him in Bury.

Sir Henry, at the outset of his speech, placed himself for comparison with the early factory reformers—and we regret to say that to those who know the story of their labours it was greatly to his disadvantage. The band of brave men to whom he referred examined the condition of the factory system, and made themselves acquainted with the evils which had sprung up within it: the long hours, the exhausting labour, the low rooms, the crowded and altogether unfenced machinery, the impure atmospheres, the deleterious illuminants, the imperfect sanitary arrangements, the employment of young children—children of very tender years, and the cruelty exercised upon them by those to whom they were subordinate,

mostly the operatives themselves, and sometimes avaricious employers. Our Peels, Oastlers, Fieldens, Ashleys, and considerable numbers of spinners and manufacturers, carefully investigated the conditions of the system, and found there were evils of a most serious kind that urgently called for the provision of legislative remedies. They therefore vigorously threw themselves into the movement for reform, and never rested until it was secured. This they did when the only reward they could hope to obtain was the gratitude of the oppressed workers, who had neither money nor *votes* to bestow upon their benefactors. Many of the leaders in the movement being employers themselves, had practical knowledge of the matters which they undertook to amend. Others who had not, took care to obtain it under the guidance and instruction of the former, and were not content to hear one side of the question only, and then to take up a partisan position. And they effected the beneficent changes which the situation demanded, and which were provided for and have been maintained by the factory legislation in force before the working-man obtained a vote and professional politicians began to exploit him and use him as a step from which they could easily vault into office. These latter, and we include Sir Henry James amongst them, differ entirely from the early factory reformers, both in motives and methods of action. Their motives we have indicated, and their methods have been to officiously place their services at the disposal of those who have most votes, and to endeavour to give legislative effect to their wishes in return for political support. We have charged Sir Henry James with this sort of conduct before, and we repeat the charge to-day. In both his attempts at self-defence he has utterly failed to repel it or refute it. We have told him that he knows nothing of the working of the factory system, and that he has not taken the trouble to enquire into it; that he has simply adopted the *ex parte* statements of a powerful organisation, whose influence he thinks can secure his re-election. We repeat these charges. It is no defence to say, as he did, that he undertook the conduct of the recent factory legislation as the performance of a duty he owed to the factory operatives amongst his constituency, who, he says, had the right to claim from him such assistance as he could give, and not only to them but to their brethren throughout the country. Nobody has ever denied their right to ask or his right to listen to them, nor his right as a legally elected member of Parliament to legislate for every person subject to the laws of the United Kingdom. But these factory operatives constitute only a section of the constituency of Bury, and those of their brethren in the country only a section of its population. Sir Henry James knows as well as anybody that, on a sound theory of representation, he is the representative in a special sense of the whole constituency of Bury, and in a general and wider sense, of the population of the whole country. The duty in these circumstances of an honourable representative is to listen with every attention to those who approach with grievances, examine their allegations to ascertain if they are true and important, and if they allege the existence of avoidable and unnecessary evils in the industry by which they earn their livelihood, or cast reflections upon the honesty and integrity of their employers, he should ascertain what replies the latter may have to make before he proceeds to condemn and punish them. This Sir Henry James has persistently refused to do. The allegations of the operatives, we maintain, consisted of the grossest misrepresentations of facts, and the most untruthful and unjust accusations; of demands for the increase of penalties upon employers for infractions of the Factory Acts by themselves; of demands for the revelation of particulars that is inconsistent with the preservation of the interests of individual employers from unjust competition; and for reductions of time and the adoption of restraints in working, highly prejudicial to the interests of both employers and employed when regarded from the point of the country's capacity to compete with foreign producers. The employers have persistently demanded that their side of the question should be considered, and this demand for simple justice has been as persistently refused by Sir Henry James. He has barely accorded them the common courtesy of listening to them, whilst he has not only not allowed their statements to influence his views, but he has even gone so far as to distort and misrepresent what they have actually said in both the Commons Committee and the House itself when the recent Act was under discussion. We challenge Sir Henry James to produce any evidence that will justify his statement that the employers were in any sense, either in large or small numbers in a representative capacity, assenting parties to the adoption of the "particulars" clause; whilst we affirm that he knew, because he had been told, "that sooner than give the particulars as required by the clause as first drafted, they would shut up their mills." But he has done even more than this, which an honourable man would shrink from, in the determination to secure the favour and support of the Labour party, whose interests, irrespective of the welfare of the country, he is so assiduously serving. Why does Sir Henry James treat one section of his constituents with such lavish blandishments, and the other with such scant courtesy, is a question that inevitably springs up in the minds of everyone who considers the matter for a moment. Have the employers no right to call upon their representative to consider their interests, and the interests of their brethren throughout the country, and to defend them from injustice? Are the rights of the employers in the textile industries throughout the country of no account, and are these and their property of £100,000,000 or more of capital which they have invested in them to have no consideration shewn them? Are all these interests, and with them the commercial pre-eminence of the country and the prosperity of the industrial classes of every section of the population, to be sacrificed to the demands of a few ignorant agitators, who have not the remotest conception of the immensity and complexity of the interests they are assailing, nor of the disasters their success will inevitably bring upon those they assume to represent?

Evidently so, according to the logic of Sir Henry James's actions, upon which we prefer to place more reliance than we do upon his words. We trust, however, that the constituency of Bury will give a different answer, and shew to the country that it holds the preservation of these as of far more importance than the gratifications of the personal ambition of Sir Henry James. We shall probably have something further to say upon the details of his speech in our next issue.

HUNGARIAN SILK INDUSTRY. — The *Handels Museum*, in its issue of May 12th, says that notwithstanding the small sum allowed by the State in the way of subventions (15,000 florins), the Hungarian silk industry continues to flourish. There were, in 1880, only 71 communes engaged in this industry, as compared with 2,268 in 1891. In the same period the number of silk growers increased from 1,059 to 72,118, and the production of cocoons from 2,507 to 1,108,446. The amount of wages earned by persons engaged in the silk industry in 1879 was 3,700 florins, and in 1891, 1,448,720 florins. The economic value of these wages is enhanced by the fact that they come in just before harvest time, when money is scarce among the earners, and further by the fact that they are chiefly earned by old men and children, whose energies, applied in any other direction, would be unremunerative.

Foreign Correspondence.

TEXTILE MATTERS IN THE UNITED STATES.

BOSTON, JUNE 8TH.

The Protectionists have made every preparation for a vigorous campaign during the Presidential elections. The country will be inundated with the literature of the American Protective Tariff League, the most active organisation of its kind in the world, compared with which the Cobden Club sinks into the shade. This body has issued a series of "Tariff Sermons," and it furnishes zincos and stereos to the country papers favourable to the cause. One of its recent attempts in this direction illustrates a girl's dress, under which are the following remarks:—

Had this dress been imported the duty on it would be $1·79. "The tariff adds that sum to its price to the purchaser," the Free-trader says; but it was bought at retail for $1·80. If the Free-trader is correct all you have to do is to abolish the tariff and you get the complete suit for one cent.

Another example of the League's methods is seen in the published reply to the following query:—

A neighbour of ours, who went to England last summer, says that a suit of clothes which cost $15 in England costs $50 in this country. Of course he is a Free-trader. Can you inform me whether this statement is true?

The following quotation from a report by Mr. Lane, formerly U.S. Consul at Tunstall, Staffs., England, is given as a reply:—

In view of these figures, what becomes of the constantly repeated assertions that the cost of living to the working man in the United States is double what it is in England? The truth is that the only item in which there is any considerable advantage in the working man's cost of living in this country is in the matter of rent. In plain clothing for men, women, and children there is scarcely any advantage, if, indeed, there is any at all. . . As good a suit of clothes can be purchased in that city (Chicago) for $10 as can be obtained in this country for the same money.

J. Schoenhof, Consul at the same place during the administration of Grover Cleveland, and an enthusiastic Free-Trader, says:—

Everything made to order in the way of clothing, except shirts, perhaps, is considerably cheaper here, while machine-made or factory-made goods shew disappearing differences only. . . . . In workmanship and finish I find corresponding articles of the wholesale process of manufacture superior in the United States. This is true of clothing as well as of collars, cuffs, and like articles.

The report of the second quarter's work at the Fall River mills indicates that with the exception of a few corporations, the mills have shewn very satisfactory results, as represented, in part, by dividends amounting to nearly $327,000, or an average of 1·67 per cent. on the capital, as against 1.61 per cent. of the preceding quarter, and this, if continued through the year, would aggregate 6·62 per cent. This is much better than the results in 1891, when the dividends averaged 5·73 per cent. But even this did not fairly represent the earnings of the mills, as the surplus was decreased heavily in order to make anything like a respectable showing, while in the present instance it is stated that a considerable amount has been held back, perhaps to meet similar contingencies in the future or to effect improvements without the necessity of calling for additional capital. New England cotton manufacturers have by no means lost faith in the success of the industry here, as is shewn by the largely increasing "spindleage" following the construction of new mills or the additions to the capacity of old ones. Just now some very noteworthy enterprises in manufacturing are under way: among them entirely new mills of large productive capacity at New Bedford and Fall River, and large additions to well-known plants, an increase in one instance of nearly 40,000 spindles being contemplated. Massachusetts possesses 6,000,000 and more spindles, out of an aggregate of 14,000,000 for the entire country.

One of the latest moves of an English clothing house has been the establishment of a branch office in Montreal, with local canvassers, who tout for custom for suits made to order. The measures are taken in Canada, and the orders forwarded once or twice a week to England, where they are made up to measure, and returned. These goods are brought in dutiable, of course, as ready-made clothing. The firm announce: "Special inducements to clubs and other organisations. Any one who can influence business will be liberally dealt with."

The Watson Linoleum Co., of Akron, O., is about to enlarge its plant. Some of the machinery has been ordered from Scotland.

From a statement by the Treasurer of the Kerr Thread Company in a circular issued to stockholders, it is gathered that the profits of the business of that company for the six months closing on the last day of last year (exclusive of $3,552 .55 interest paid on borrowed capital), were $33,423 .41; that about 22,000 spindles were run, on an average, during that time; that when the company's present building project is completed 60,000 spindles will be operated, and the entire process of manufacture will be carried on entirely in Fall River, in one plant, not partly in East Newark and partly in Fall River, as now, by means of which change a considerable saving will be effected and the prospects of the profits of the business will be enhanced. It is expected that the new mill will be in operation next December. Additional stock ($150,000) is to be issued September 1, 1892, to which shareholders can subscribe *pro rata* until June 1st at par. If more stock is wanted $105 will be asked. With the new plant in operation the profits are estimated at $150,000; interest on the debt of $500,000 will be $25,000, a dividend of 8 per cent. would be $64,000, leaving a large sum available for sinking fund.

THE VELVET AND SILK INDUSTRY OF CREFELD.

The following is an extract from the report of the Crefeld Chamber of Commerce on the local velvet and silk industry:—

The trade in velvet has fallen from £1,998,000 in 1890 to £1,401,000 in 1891; this is the lowest figure in the statistics since distinction has been made between the production of velvet and that of silk. The year 1891 will therefore be the worst that the velvet industry of Crefeld has experienced; it is inferior by £100,000 and £75,000 to the notoriously bad years of 1888 and 1889. The number of looms employed in hand weaving has fallen from 6,920 in 1890 to 3,351 in 1891, while there were 14,438 in 1887. There were 2,907 machine looms working in 1890, and 2,425 in 1891, a fact which indicates an important restriction in production. The velvet factories only paid £202,000 for labour in 1891, against £303,900 in 1890. This explains the great misery in the weavers' districts of the Lower Rhine, for this diminution in wages has been chiefly in respect of home industry. The diminution in the production of velvets is distributed as follows:—£275,000 less for the German market, £150,000 for England, and £150,000 for extra-European countries. This latter result may be partly attributed to the large consignments made to the United States in 1890, in view of the enforcement of the McKinley tariff, and further, to a certain extent by a change of fashion.

The production of silk and half-silk tissues was valued at £2,430,000 last year, against £2,650,000 in 1890 and £2,800,000 in 1889. Beyond the dearness of the raw material, fashion is also responsible for this falling-off. This branch of the weaving industry only employs 11,650 hand-looms, against 14,263 working in 1890. On the other hand the number of power-looms working has increased by about 100. The German markets have absorbed nearly half of the manufactured products. Although production diminished last year by about 8 per cent. as compared with 1890, the quantity of raw silk used has increased, because a greater quantity of tissues composed entirely of silk has been woven than previously.

This is shewn by the fact that there were consumed 439,000 kilos. less in 1891 than in 1890, and that a hand-loom has produced on an average £138 worth of tissues in 1891 against £131 in 1890. Wages aggregated £488,000 in 1890. Home industry received £72,000.

SOME Germans, it would seem, are unpatriotic enough to give an order to England when the same article can be supplied by a native firm for no nobler reason than that the foreigner can supply the article at a far lower rate. A firm in Gladbach, it appears, having decided to procure a fresh instalment of spinning machinery, advertised its needs in the technical papers Hereupon the Barmen representative of a machine factory in Mühlhausen offered to furnish the requirement for 300,000 marks. The tender, however, was not accepted, because a factory in Manchester, with a world-wide reputation in this particular line, offered to supply them for 80,000 marks less.—*Romen's Journal.*

COLD GALVANIZING.—The ordinary method of galvanizing articles of iron and steel consists in steeping them in a bath of molten zinc. There are certain drawbacks incidental to this treatment, which reduces the strength of wire and renders iron and steel of small section brittle. In order to counteract the effect on wire the bath of zinc is kept at a low temperature and the wire is run through it at a high rate of speed, which, however, leads to imperfect coating and a waste of zinc. To overcome these and other difficulties a cold galvanizing process has been introduced by the London Metallurgical Company, of 80, Turnmill-street, London. The new system has several special features, the chief of them being the introduction of electricity into the process. A recent inspection of the plant for carrying out this work, and examination of a number of articles galvanized by it, shewed very satisfactory results. From the reports of public experts who have tested in various ways articles treated by the cold process, it appears that the coating of zinc is more adhesive and affords a better protection to the iron than an equal thickness put on by the hot process. Fine wire gauze is coated on the new system without the meshes being filled up with zinc, and small screws similarly treated do not require re-tapping, the threads being quite clean. The process is also suitable for coating nails and spikes, as it does not impart to them a slippery surface similar to that given by hot galvanizing. It is stated that the cost of the cold system is no greater than that of ordinary hot galvanizing.

Designing.

NEW DESIGNS.

SILK DRESS GOODS, ETC.

Design A is a neat, desirable effect for silk stripe dress materials; it is specially constructed to develop the brilliancy or sheen of weft and warp to the fullest extent. Clear colours, finely harmonised, will be of the utmost importance to make it successful. Clean, clear, finely-marked stripe lines are much sought for in fashionable circles, and, if properly arranged, appeal to the taste of the purchaser whenever or wherever exhibited. A rich and large variety ought to be made, but we deem it inadvisable to crowd too many colours together in one pattern. Every detail ought to be clearly defined; charming effects can easily be obtained by the use of a little judicious selection of shades and tints. The figured portion of the stripe stands upon 72 ends, which ought to be drawn in two threads in a mail, two mails in a dent, 20 dents per inch for the reed; the second stripe is a 9 shaft satin, 72 ends, two in a mail, two mails per dent; but there is no reason why this stripe, along with the 9 shaft satin ground that the weft figure is developed upon, should not be 12 shafts, or, in fact, 18, both being a measure of 72 threads, or 144 in both stripes. For the warp, a two-fold 36's organzine would be suitable, that is really 36's; not as two-fold cotton yarns, in which case this 36's doubled would be considered 18's; the weft 20's tram; picks according to requirements for very heavy or light make. Solid light tints or shades may be used; for instance, weft and warp all very yellow cream, light cinnamon brown, very pale blue, silver grey, etc. We give a pattern as a starting point: 8 very pale green, 8 white, 8 red, 8 white, 8 deep azure, 8 white, 8 yellow, 8 faint straw, 8 white—total, 72 for the satin stripe, 72 salmon for the figured stripe; weft all white tram. If the warp is all grey, white, yellow, cream, or, in fact, any light tint, then the weft may be dark, thus giving a solid stripe of satin, and the figured one thrown up in bold relief on the light satin ground. Should an all-over pattern be found desirable, then the force of contrasts will be found necessary, and it might be advisable to leave out all the round spots, making the figure reversible alternately on some well-defined satin basis. Ground of warp, either light or dark; weft a contrast. The satin stripe might be made an open canvas one, with a basket weave; in any case we consider many very handsome samples can be produced deserving of notice.

GINGHAM PATTERN.

Plain weave, 40 dents, 2 in a dent, 40's cotton twist for warp, 80 picks per inch of 40's weft. Warp and weft pattern: 100 pale China blue, 12 black, 36 white, 8 black, 8 white, 6 pale blue, 6 white, 6 black, 6 white, 6 black, 36 white, 6 black, 6 white, 6 black, 6 white, 6 pale blue, 8 white, 8 black, 36 white, 180 pale blue, 12 white, 12 black, repeat from the 100 pale blue; beetle finish.

WORSTED DRESS FABRIC.

A beautifully toned Tartan check is produced by the following colour arrangement, which consists of only four colours viz., dark blue, dark olive green, olive, and medium brown. The effect is quiet in tone, yet exceedingly rich, the contrast of the brown with the other colour seeming to add to the beauty of the harmony of analogy which forms the body of the pattern.

Warp.

16	thds.	2-50's	Dark olive green.	4	thds.	2-50's	Olive.
4	,,	,,	Medium brown.	4	,,	,,	Dark blue.
48	,,	,,	Dark olive green.	4	,,	,,	Olive.
4	,,	,,	Medium brown	16	,,	,,	Dark blue.
16	,,	,,	Dark olive green.	4	,,	,,	Olive.
8	,,	,,	Dark blue.	8	,,	,,	Dark blue.

16's reed 4's.

Weft.

Same as warp in 40's yarn; 60 picks per inch. Weave to be two-and-two twill.

WOOLLEN AND WORSTED WEAVES.

Another interesting diamond or twill check is given in *Design 1*, this, as in previous examples, being based upon the 8-end sateen throughout. In this case the pure sateen has been converted into twilled hopsack and three-and-one twill, but other conversions are admissible. For the tweed trade the smaller float weaves should of course be used, while for the worsted trade we recommend shaded patterns on an enlarged scale and the longer float weaves.

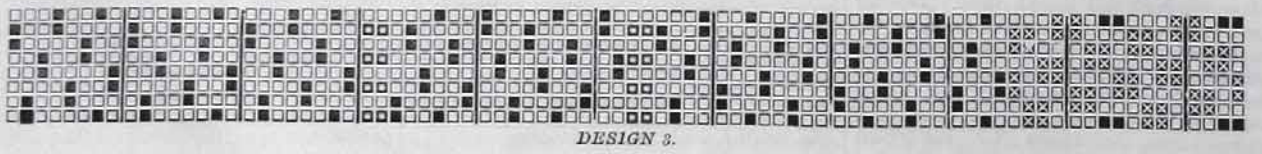
A colouring worthy of trial either for worsted or woollen goods is as follows:—

Warp.

1	thread	Bl'k and white.	16	thread	Dark olive.
8	,,	Dark olive.	4	,,	Slate lavender.
4	,,	Slate lavender.	4	,,	Med'm brown.
4	,,	Med'm brown.	4	,,	Slate lavender.
4	,,	Slate lavender.	7	,,	Dark olive

Weft.

All black or dark colour.



DESIGN 3.

If for a woollen, the sett should be as follows :—

Warp.

All 36 sk. woollen ; 10's reed 4's.

Weft.

All 36 sk. woollen ; 40 picks per inch.

In using this for a worsted it will be found advisable to use a fine yarn for the colouring, and a heavier backing yarn for weight, as follows :—

Warp.

1 thread, 2-40's worsted, for face.
1 ,, 2-30's ,, ,, back.
18's reed 6's.

Weft.

All 20's black or dark colour ; 50 picks per inch. The weave to employ is *Design 2*.

A very effective worsted pattern is given in *Design 3*, which practically consists of an 8-end sateen ground, with two weft rib and twilled hopsack stripe.

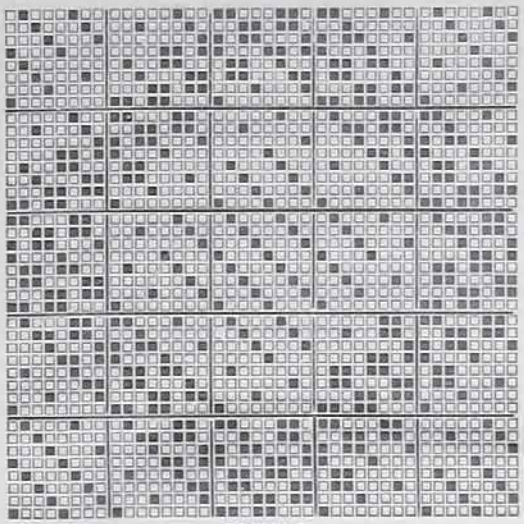
Warp.

All 2-48's dark brown ; 14's reed 6's.

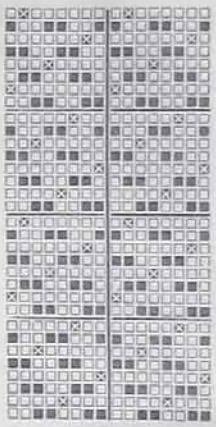
Weft.

All 24's medium brown ; 80 picks per inch.

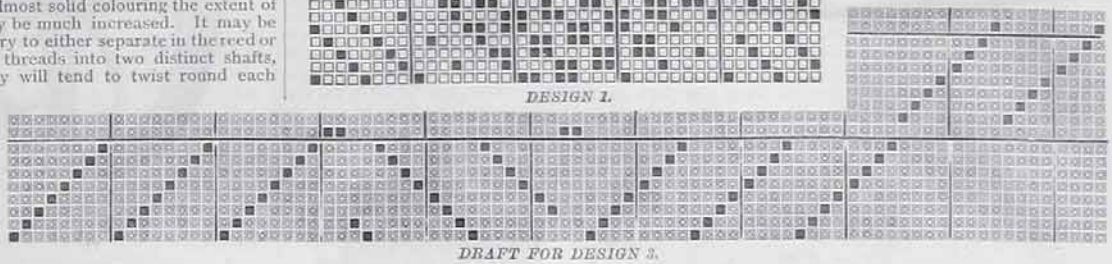
With this almost solid colouring the extent of the stripe may be much increased. It may be found necessary to either separate in the reed or to put the rib threads into two distinct shafts, otherwise they will tend to twist round each other.



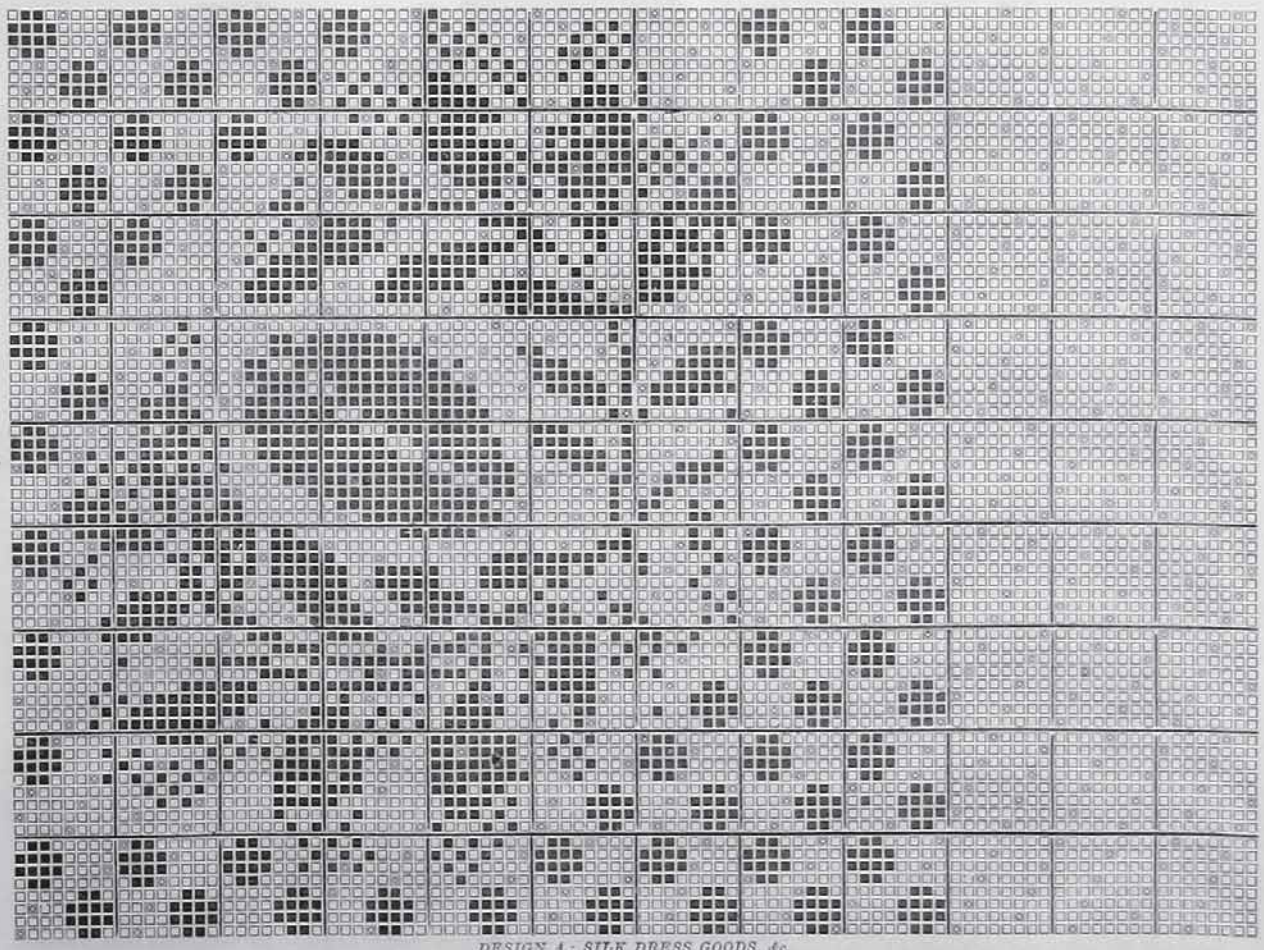
DESIGN 1.



DESIGN 2.



DRAFT FOR DESIGN 3.



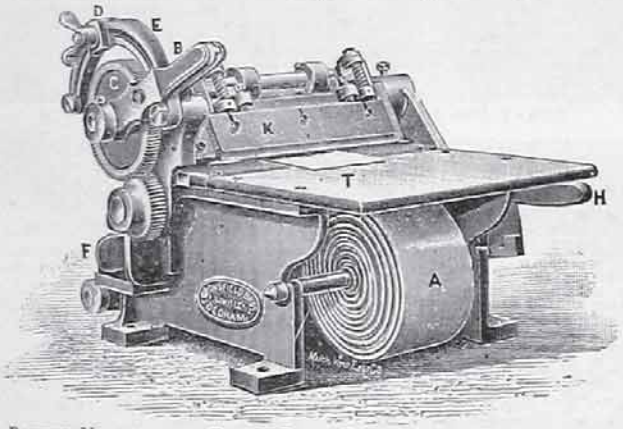
DESIGN A : SILK DRESS GOODS, &c.

Machinery and Appliances.

PATENT MACHINE FOR PASTING, MEASURING, AND CUTTING ROLLER CLOTHS.

MAKERS: MESSRS. DRONSFIELD BROS., ATLAS WORKS, OLDHAM.

The excellence of yarn depends in these days of our elaborated system of cotton spinning almost entirely upon two factors—the quality of the raw material and the perfection of the machinery employed in making it into yarn. The injurious effect that imperfect machinery had in depreciating its quality will be very obvious to any one acquainted with the yarn turned out of our mills in the "fifties," who will take the trouble to contrast that with the productions of the present day. The cotton crops of that time may safely be assumed to have been as good as they are now, and therefore the improvement in yarn may all be safely set down to increased skill in the manupulation, and this mainly to have resulted from the improvements effected in machinery. The theoretical perfection of yarn in its mechanical construction depends therefore upon the identity of the dimensions and the absolute similarity of action in the working parts of the machinery through which the material had to pass. It is only out of these that uniformity of results could be obtained. This cannot be shewn more obviously than in the various series of drawing rollers from the drawing frame to the mule or ring, in which if any variation of diameter exists there will be a corresponding variableness of draught and attenuation of the material, and consequently of the strength of the yarn. It has been the study, therefore, of our machinists to eliminate all these sources of defective results, and to their credit it must be said they have perfectly succeeded.



MACHINE FOR PASTING, MEASURING, AND CUTTING ROLLER CLOTHS.—MESSRS. DRONSFIELD BROS., LTD., OLDHAM.

But drawing rollers have to be covered, and in the cloth and skins employed for that purpose mischief is again liable to be introduced, and more particulary in the manner of covering them. If either skill or care be wanting in this operation the joinings of cloth or leather will form ridges upon the roller, and materially damage the sliver, slub, or rove. In order to remove these contingencies Messrs. Dronsfield Bros., Limited, of Atlas Works, Oldham, have long devoted attention to this matter, and have brought out a series of machines intended to obviate all imperfections of this kind. We have pleasure in drawing attention to the last of the series, which is illustrated herewith.

This is a machine for spreading the paste, measuring the length, and cutting off in lengths the cloth foundation used in roller covering. Our illustration will convey a good idea of its general appearance, whilst the following description will elucidate the details:—The cloth A is placed in a roll on the shaft, and the end is passed through the pasting box at the back of the machine and thence to the feed roller. This roller is covered with card fillet so as to hold the cloth for drawing it through the paste and for measuring. The measuring is performed in the same way as on the firm's patent splicing machine for roller leathers: the handle B is used for measuring; it is made in two parts, passing on each side of the wheel C, so that by pressing the handle together the wheel is held and moved with the handle, giving motion to the feed roller through the gearing, the distance being determined by the stop D. This stop is fitted to slide for adjustment on the arc E, which is figured to scale for measuring. The cloth, after being pasted, is fed under the knife K on the table T, and is cut off by pressing down the knife by the handle H. The knife being fixed at an angle gives an oblique instead of a vertical cut to the cloth, so as to make a slight overlap and thus make a better joint on the roller. The paste is fed in the box at the back of the machine, the top of which is removed by drawing out the taper pins that hold it in position; the edges of the cloth are protected by side plates F, which are placed on each side of the box and are adjustable to any width of cloth; the thickness of paste on the cloth is regulated by a screw on the top of the paste box, and the paste is pressed into the cloth by a presser plate with a weighted lever. The cloth is thus covered with a perfectly even thickness of paste, and the pieces are measured to exactly the same length, so that the rollers when covered have a perfectly even foundation, which cannot be obtained by the usual method of pasting and cutting by hand, A great saving in time is also obtained by using the machine. The firm may be communicated with for any further information.

PATENT CENTRIFUGAL FRICTION PULLEY.

MAKERS: MESSRS. WATSON, LAIDLAW, AND CO., ENGINEERS, GLASGOW.

The use of the friction pulley in driving certain classes of machinery is of considerable advantage, yielding as it does a quick start and a quick stop, both of which are highly desirable in swiftly-running machinery, and in which it is desirable to attain the maximum speed as soon as possible.

We illustrate herewith a patent centrifugal friction clutch made by Messrs. Watson, Laidlaw, and Co., engineers, Glasgow, which may not have come under the notice of our readers. This firm are well known as large and successful makers of hydro-extractors and other high-speed machines, and specially designed this pulley to obviate difficulties and defects experienced in the use of other types of this kind of appliance when used in connection with "hydros." It is peculiarly adapted for all high-speed machines, and where it is used a number of them may be driven direct from the same shaft, and any one can be stopped and started independently of the others. Both stopping and starting are performed easily and gradually without shock, strain, or undue labour being thrown upon the machine, belt, or pulley. In most circumstances it is best to make the friction pulley the driver, and then a common fast pulley only is required on the machine. The belt is never traversed from side to side, and when the friction pulley is, the driver is always at rest when the machine is not in operation. Hence the life of the belt is considerably prolonged. The friction is applied automatically by centrifugal action, an arrangement that precludes damage from by the sudden application of the power, as neither wilfully nor from carelessness in starting it suddenly can it be damaged. The only fractional parts liable to wear are the leather facings on the ends of the arms. These, however, will last for years, and when requiring

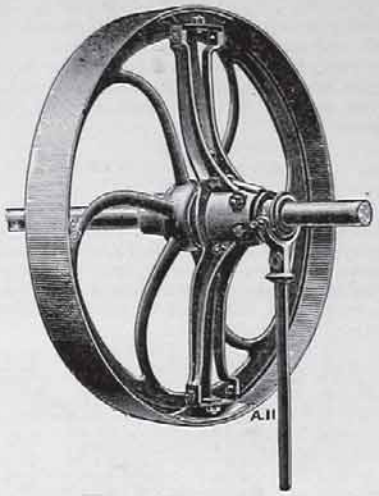


FIG 1.

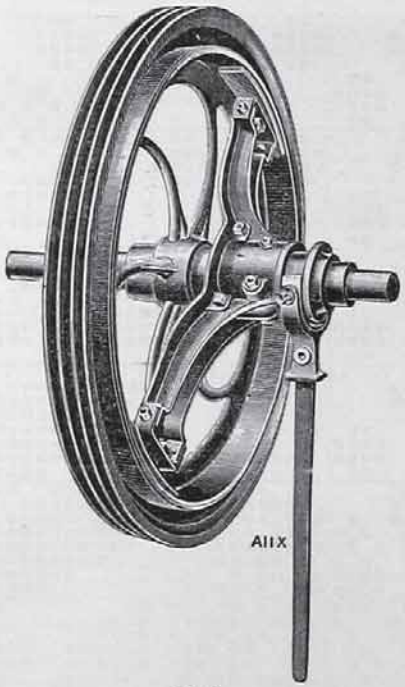


FIG 2.

to be replaced any overlooker or mechanic can perform it in a very brief time, as all that is required is to take out the old leathers and introduce fresh ones. The pulley may be set so as to transmit only the required amount of power. By the use of this pulley the expense of countershafting, fixings, extra belts, etc., may often be avoided. It is usually made of cast iron, but for very high powers or speeds the makers recommend their steel disc pulley. Our illustrations shew it in Fig. 1 as constructed for the belt drive, and in Fig. 2 for the rope drive. The makers will be pleased to afford any other information.

We regret, owing to certain illustrations not having been completed in time for this week's issue, to be compelled to hold over until next week an important article descriptive of the works of Messrs. Brooks & Doxey, machinists, Manchester.—Ed. *T.M.*

New Mills in Oldham and District. — In reference to the list under this heading published in our issue of June 4th, the following amended particulars should be noted:—Moss Mill, Rochdale (90,000 spindles)—furnished by Messrs. Taylor, Lang, and Co., Ltd., and Messrs. Platt Bros., Ltd.; Standard Mill, Rochdale (101,508 spindles), and Castle Mill, Ashton (75,000 spindles)—by Messrs. Taylor, Lang, and Co.

Bleaching, Dyeing, Printing, etc.

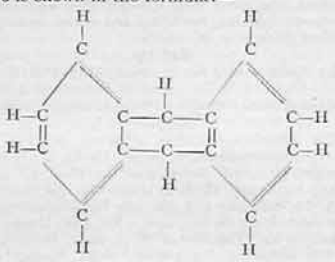
ALIZARIN: A STUDY IN CHEMISTRY FOR DYERS AND CALICO PRINTERS.

It is good occasionally for a technical man to pay a little attention to the more purely scientific side of his trade. Particularly in such industries as dyeing and calico-printing, where so many chemical products are used, it is desirable to study the chemistry of the materials he works with. This course of proceeding cannot fail to be of interest and value, as being likely to increase his knowledge of the tools he is working with, and at the same to throw some light on the general principles that underlie their application in his trade.

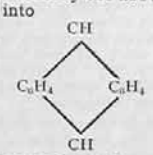
Probably there is no material of greater interest to a dyer and calico-printer than that which it is now proposed to consider in detail from an almost purely scientific aspect, although the practical application will not be altogether lost sight of. Alizarin is unquestionably by far the most important of the dye-stuffs that are obtained from coal-tar; in quantity it forms, with its derivatives, at least one-half of the total quantity made, while in money value they represent about one-third, alizarin being a comparatively cheap material.

In 1826 Colin and Robiquet shewed that madder root—the natural dye-stuff then used for dyeing Turkey-reds—contained a colouring principle to which the colouring power of the madder was due, and which they named alizarin. These researches were followed up by other chemists, notably by Schunck, Rochleder, Higgins, and Persoz, the results being that madder was shewn to contain not only alizarin, its principal colouring matter, but also purpurine, a similar body; and also one or two other colouring principles, which are present, however, in only small amount. To Schunck we owe the first correct account of its chemical composition: he gave it as having the composition shewn by the formula $C_{14}H_8O_4$. Some years later Græbe and Liebermann succeeded in obtaining from alizarin a hydrocarbon body having the formula $C_{14}H_{10}$, which they proved to be identical with a substance known as anthracene, found in large quantity in coal and tar. Previously to this Anderson had prepared anthraquinone from anthracene; and as Græbe and Liebermann had proved alizarin to be a hydroxyquinone, and therefore related to both anthracene and anthraquinone, it thus became a problem to find a process that would prepare alizarin from the coal-tar hydrocarbon anthracene. This they finally succeeded in doing. Perkin also had been working on the same subject, and had independently discovered the same process. To these three chemists, therefore, we are indebted for the foundation of the great alizarin industry.

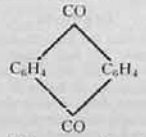
The parent substance from which alizarin is obtained is the coal-tar hydrocarbon anthracene; this has the formula $C_{14}H_{10}$, which is simply the chemical way of shewing the composition of the body. One problem that the chemist is forced to consider is the manner in which the various atoms present in a compound are combined together. This being purely a theoretical question, has led to the promulgation of many theories as to how the atoms of a compound are arranged. Some of these theories have died a natural death, because they failed to explain all the facts connected with any particular compound. In the case of anthracene, while it is not necessary to devote space to the consideration of all the theories that have been proposed to account for its composition and properties, it may be pointed out that the one which is most favoured by chemists, and which so far has proved its right to exist by explaining in the most complete manner all the facts known concerning it, considers that the atoms of carbon and hydrogen in anthracene are arranged in two groups of six carbon atoms with two connecting atoms of carbon, with the hydrogen atoms situated round these. This view of the composition of anthracene is shewn in the formula:—



The two rings of six carbons are known as the benzene rings, because the compound benzene has the composition shewn in the formula C_6H_6; and it has been shewn that Kekule's view that the carbons are arranged in a six-sided ring explains best all the phenomena concerning the changes which benzene will undergo when subjected to chemical reactions. Further than that, anthracene compounds can be formed from benzene compounds, by a process involving condensation, so that on this ground we are forced to consider that anthracene must contain benzene rings. Shortly the above formula may be condensed into



When anthracene is acted upon by means of strong sulphuric acid and bichromate of potash it is converted into a body known as anthraquinone. This reaction is of interest as the first stage in the manufacture of alizarin from anthracene on a large scale. Anthraquinone has the formula $C_{14}H_8O_2$ and its relation to anthracene will be at once seen on inspection of the more extended formula—



from which it will be seen that the two linking carbons have lost their hydrogen and taken up oxygen in its place. Anthraquinone has really a better right to be considered the parent substance of alizarin than has anthracene, because alizarin is obtained from it as a primary derivative, while it is a secondary derivative of anthracene.

The hydrogen atoms of anthraquinone are capable of being replaced by the substitution of hydroxyl, OH, thus giving rise to a large number of what are sometimes called oxy-anthraquinones, but their correct title is hydroxy-anthraquinones. If there be one such replacement then we get monoxy-anthraquinone $C_6H_4(CO)_2C_6H_5OH$; if two such replacements, then the dioxyanthraquinone, $C_6H_4(CO)_2C_6H_3(OH)_2$, is formed; and similarly trioxyanthraquinone $C_6H_4(CO)_2C_6H(OH)_3$, tetraoxyanthraquinone $C_6H_4(CO)_2C(OH)_4$, pentaoxyanthraquinone $OHC_6H_4(CO)_2C(HO)_2$, and hexaoxyanthraquinone $(OH)_2C_6H_2(CO)_2C(OH)_4$, are known. Theory indicates the possibility of hepta- and octa-anthraquinones existing, but so far these have not been discovered.

The oxyanthraquinones are most valuable dye-stuffs, dyeing mordanted fabrics in fast colours, and therefore they will be dealt with somewhat in detail.

(To be continued.)

OXIDATION OF WOOL IN WOOL PRINTING.

It is a well-known fact that the wool fibre readily reduces substances that give off oxygen—a property which has been found of importance in the application of dye-stuffs. Soxhlett has found that if woollen yarns are treated with a 7% solution of potassium permanganate (which is a very strong solution), and then dyed in the indigo vat, the shade is much darker than that ordinarily obtained. This is probably due to the oxidation of the wool by means of the permanganate. Experiment in which a 7% solution of potassium permanganate, to which was added 1% of magnesium chloride, was used in oxidising the wool, which was then dyed in various colouring matters, such as amaranth, ponceau, Victoria blue, etc. The results shewed that the treatment with permanganate was of no advantage. In printing, the application of the permanganate was unsatisfactory. By using sodium chlorate (6·67%) and vanadium dichloride (0·2%) in addition to the dye-stuff, and thickening in printing on unprepared wool, darker shades are obtained than if the dye-stuffs be printed without such additions on chlorine-prepared wool. Some dye-stuffs, such as amaranth, give darker shades on chlorine-prepared wool. This method of treatment possesses the advantage over the chlorine preparation of leaving the wool white and soft. The addition of acetate of tin (4% of 5½° Bé. strength) increases the intensity of the colours produced. The mixtures, if kept for more than 10 or 14 days, begin to decompose, it is advisable therefore to prepare them fresh for use.—*Chemiker Zeit.*

RECIPES FOR DYERS.

The following are mostly translations from foreign sources. We do not guarantee the results from these recipes, but give them for the purpose of shewing our readers what their foreign competitors are doing:—

DARK BROWN ON LINEN YARN.

For 100 lb. of linen yarn, the dye-bath is made with

15 lb. Glauber's salt,
1 lb. soap,
2½ lb. Nyanza black B,
2 lb. Titan brown R,
½ lb. diamine red B.

Work at the boil for one hour; then rinse and dry.

BROWN ON HALF-WOOL CASHMERE.

For 100 lb. of cashmere, prepare a dye-bath with

15 lb. Glauber's salt,
5 lb. salt,
1 lb. Nyanza black B,
1 lb. Tabora black,
2 lb. Titan brown R,
3 oz. Titan red.

Work at the boil for one hour, then lift, wash, and dry.

BRIGHT NAVY BLUE ON WOOL.

For 100 lb. woollen goods, prepare a dye-bath with

15 lb. Glauber's salt,
2 lb. Nyanza black.

Work until the bath is exhausted; then add

⅔ lb. acid violet 6 B,
½ lb. sulphuric acid.

Reënter the goods, work well, lift, wash, and dry.

RUSSIA GREEN ON WOOLLEN YARN.

For 100 lb. yarn, make the dye-bath with
15 lb. Glauber's salt,
1 lb. Nyanza black B,
1 lb. Clayton yellow.
Work well at the boil for one hour, then lift, wash, and dry.

INVISIBLE GREEN ON WOOL.

For 100 lb. of woollen goods, make a dye-bath with
15 lb. Glauber's salt,
2 lb. Nyanza black B.
Work at the boil until the bath is nearly or quite exhausted, then lift and add
2 lb. acid green,
1 lb. sulphuric acid.
Reënter the goods, work well to shade, lift, wash, and dry.

DRAB ON WOOLLEN CLOTH.

For 100 lb. cloth, prepare a dye-bath with
10 lb. Glauber's salt,
2 lb. sulphuric acid,
½ oz. patent blue,
2½ oz. azo yellow,
½ oz. fast acid violet R.
Work at the boil to shade.

SALMON ON CASHMERE.

For 100 lb. cashmere, prepare the dye-bath with
¼ oz fast acid violet R,
½ oz. orange G,
10 lb. Glauber's salt,
1 lb. sulphuric acid.
Work at the boil to shade.

DEEP PURPLE ON SILK.

For 10 lb. Tussah silk, prepare the dye-bath with
1 lb. Glauber's salt,
3 oz. sulphuric acid,
1 oz. fast acid violet R,
⅙ oz. patent blue,
⅙ oz. orange G.
Work at the boil to shade.

EMERALD GREEN ON SILK.

For 10 lb. silk, prepare the dye-bath with
1 lb. Glauber's salt,
3 oz. sulphuric acid,
1½ oz. naphthol yellow,
1 dram patent blue.
Work at the boil to shade.

ELECTRIC GREEN ON SILK.

For 10 lb. Tussah silk, prepare the dye-bath with
3 lb. sulphuric acid,
1 lb. Glauber's salt,
⅓ oz. patent blue,
1½ oz. orange G.
Work at the boil to shade.

A METHOD of using the nitroso-naphthols—which are sold as dye-stuffs under the commercial names of gambine and dioxine—for the dyeing of cotton, is described in a recent patent taken out by the Actiengessellschaft für Anilin Fabrikation of Berlin. This consists of the following process: For 10 lb. of cotton, 1 lb. of the commercial dye-stuff, which is usually in the form of paste, is dissolved in three gallons of water, and then mixed with the usual quantity of water to make the dye-bath. To this is now added 1 lb. hydrochloric acid and ½ lb. bichromate of potash. The cotton is entered into the bath in the cold, and worked for a short time until it is thoroughly impregnated, then the temperature of the bath is raised to the boil, the colour begins to develop, and finally a fine brown is obtained, varying in shade from chestnut up to olive brown, according to the proportions of materials used. These shades are even, and very fast to light and washing. Cotton may also be dyed with nitroso compounds by first treating with tannin and then dyeing in a bath of the dye-stuff containing bichromate of potash, when fast browns are obtained.

THE quarterly report of the Amalgamated Society of Operative Cotton Spinners was issued to the 22,000 comprising the association on Saturday. The general representative meeting is summoned to be held at Manchester on the 25th of June. The total income for the quarter has been £6,788 5s. 1d., and the expenditure £12,266 14s., shewing a loss of £5,478 14s. The largest item of expenditure is that of £10,000 as lock-out pay to Oldham.

News in Brief.

ENGLAND.

Accrington.

At a meeting of the Accrington Town Council held on Monday, it was decided to establish a technical school for Accrington district, and at a meeting in committee subsequently an offer of land in Steiner's Park on a lease was accepted. The decision to build a central institution was unanimously agreed to. It is hoped that surrounding townships will join in the scheme.

Ashton-under Lyne.

Probate has been granted of the will of Mr. Nathaniel Buckley, of Alderdale Lodge, Droylsden, and Ashton, Dukinfield, Bedford Leigh, Hayfield, and other places, a well-known Lancashire cotton spinner and the owner of extensive estates in Ireland. The gross value of the personal estate is £491,100, and the net value £456,282.

The firm of John H. Gartside and Co., Limited, Wellington Mills, are making extensive alterations to their premises in order to make more room for the preparatory department of the weaving section of their trade. New offices are also to be built in front of the mill entrance, and other alterations and extensions are being made in the cotton mixing department of the mill premises.

Barrow.

A fire at the Barrow Flax and Jute Works last week caused damage to the amount of £60,000. The northern wing and a large spinning shed were gutted, and much spinning machinery and a large quantity of finished goods were destroyed.

Batley.

On Friday week a fire occurred at Ings Mill (Messrs. E. B. Cooke and Co., woollen manufacturers), the roof being burnt through. Damage, nearly £1,000.

Belper.

The old-established firm of W. G. and J. Strutt, sewing cotton spinners, of Belper, Derby, has been reconstituted. Lord Belper and the Hon. F. Strutt retire; Mr. George H. Strutt resumes his old connection with the business, and his son, Mr. Herbert Strutt, now enters it for the first time. Mr. John Hunter still remains in it. The firm of W. G. and J. Strutt is one of the oldest in the cotton trade, having been established in 1776, and carried on ever since by members of the same family.

Bolton.

At the General Election the Conservative candidates will be the present members, Mr. H. Shepherd-Cross and the Hon. F. C. Bridgeman. The former is connected with a large bleach-works in the neighbourhood.

Mr. T. Holden, manager of Messrs. Hartley, Gill, and Co.'s mill, at Walkden, has been presented with a purse of gold by the weavers and others in the employment of the firm on the occasion of his retiring and removing to Radcliffe.

With reference to the recent fire at Messrs. James Marsden and Sons' Albion Mill (already reported in these columns), which was checked by the "Grinnell" sprinklers, with which the mill was fitted, Messrs. Marsden write that they "are very much pleased with the way the sprinklers operated, and feel sure they saved the mill from destruction"

The Liberal candidates at the forthcoming General Election will be Mr. John Harwood and Mr. Frank Taylor. Mr. Harwood is a cotton spinner, and owns the Woodside Mills at Great Lever and the Cobden Mill at Farnworth, employing some 600 people. He is the president of the Bolton Liberal Association. Mr. Taylor is a member of the firm of Messrs. Charles Taylor and Brother, Limited, cotton spinners, Brownlow Fold. So long ago as 1875 he became a member of the Bolton School Board, in succession to Mr. Henry Lee, the late president of the Manchester Chamber of Commerce. He is hon. sec. of the Bolton Liberal Association.

Bradford.

It is with regret that we have to record the death of Mr. William Smith, of Ash Croft, Undercliffe, and principal partner in the firm of Messrs. Smith and Hutton, manufacturers, of Tunwell Mills, Eccleshill. The deceased retired from active participation in the business ten years ago, and had devoted a great deal of his time to discharging public duties.

Burnley.

On Thursday the Cliviger shed ceased running. A notice was put up by Mr. Osbaldeston, the tenant, that upon the weavers agreeing to work for 5 per cent. under the Burnley list it would be re-started. A number of the weavers have already obtained employment at Burnley sheds.

Bury.

On Wednesday, at a special meeting of the Bury Town Council, Mr. Councillor John Ashworth, one of the partners in the well-known firm of hat manufacturers, Adam Ashworth and Sons, Fernhill, Bury, was appointed Mayor of Bury, in the stead of Mr. Alderman J. Parks, who resigned with a view to contesting the borough against Sir Henry James at the next Parliamentary election.

Mr. John Pilling's spinning concern in Bridge-street, Freetown, known as the Higher Mills, has been taken over by a limited company, with a capital of £5,000, in shares of £10 each. The number of directors will be not less than three, nor more than five, the first being Messrs. J. Pilling, J. H. Pickup, W. R. Ashworth, and T. Pilling, and the qualification 10 shares. The remuneration will be decided by a general meeting of the company. The registered offices are at the mills.

The Whitsuntide holidays have been taken advantage of by several local cotton firms to carry out some necessary repairs. These include Messrs. W. Rumney and Co., Alexandra Mill; Barn Brook Mill; Messrs. J. A. Openshaw and Sons, Pinhole; and Mr. J. H. Openshaw, Elton, while at Messrs. W. and G. Openshaw's mill, Pinhole, the stoppage will probably extend over a fortnight, owing to a new steel shaft being put in, as well as some repairs being carried out.

Clitheroe.

On Monday night a special meeting was held of the members of the Nelson Weavers' Association. They had previously adopted a resolution to nominate a Labour candidate for the Parliamentary division. Replies were received from ten other trade societies in the division bearing upon the subject. Seven societies declined to entertain the proposal; two approved, and were prepared to bear the proportional cost of the candidate's election expenses and his maintenance in Parliament if elected. Another society suggested a combined meeting of representatives of trade societies to consider the matter. The meeting rescinded the previous resolution, and Sir Ughtred Kay-Shuttleworth, the Liberal member for the division, and Mr. W. E. Briggs, Unionist, will be the only candidates before the constituency.

Farnworth.

Messrs. Thomas Nuttall and Sons have now removed the whole of their weaving plant to the Lakefield Mills, in Worsley-road, recently purchased from Messrs. S. Hurst and Co (in chancery).

Most of the mills here only closed for the usual Whitsuntide holiday of from Thursday to Tuesday. Messrs. Thomas Barnes and Co., however, closed for eight days. No re-arrangement of the management of the latter firm, consequent upon the recent decease of Mr. Wm. Green, has yet been made.

Heckmondwike.

A meeting of the Heckmondwike and Liversedge Branch of the English and Scotch Carpet Weavers' Association was held here on Thursday to hear the delegates' reports of the interview with the masters at their annual meeting in Carlisle at Whitsuntide. Mr J. Farnhill, Dewsbury, complained that the findings of the masters' committee at Easter (which had been by mistake conveyed to the trade Executive) had been upheld at the Whitsuntide meeting, and urged that if this proceeding on the part of the Masters' Association were to be continued it would be a waste of time and expense on the part of the Weavers' Association to send delegates on such a hopeless mission in future. Under the circumstances, the delegates laboured under great disadvantages, but they had tried their best, though unsuccessfully, to get the concessions asked for. A vote of thanks was passed to Mr. Farnhill and Mr. Taylor (trade secretary) for their reports.

Heywood.

The balance sheet of the Heywood, Castleton, and Norden Weavers' Association shews a total income of £219 for the past quarter, while the expenditure has amounted to £263. This includes breakdown and lock-out pay to the extent of £143. There are 1,480 members, being a gain of 220. The committee complain that the "particulars clause" is not being carried out in the district.

The architect having given it as his opinion that the walls of the recently burned down Wham Bar Mill, Heywood, are strong enough to form the nucleus of a two-storeyed ring spinning mill, a proposal is on foot to erect such a mill. An expenditure of about £15,000 would be incurred if the project were carried out, and it has been suggested by Mr. A. Smith, the liquidator of the old company, that a new company should be formed, with a capital of £25,000, to take over the buildings, the present engine, boiler, warehouse, offices, and materials, and construct a ring spinning mill.

The dispute at the Blackpits Spinning and Manufacturing Co.'s mill, near Heywood, *re* the 'fining' question, proceeds apace. The majority of the weavers employed at the mill have struck work. Although the mill recommenced work this week, after the holidays, the weavers whose notices were concluded on the previous Wednesday night failed to turn up, and

their looms are consequently stopped. Other weavers are on notice, and unless a settlement has been arrived at they would leave work this week.

Keighley.

On Wednesday morning, at Temple-street Chapel, the marriage was solemnised of Mr. John Wright, manufacturer, Keighley, with Miss Edith Elizabeth Berry, elder daughter of the late Mr. John Parton Berry, of Northampton, and elder sister of Dr Berry, Keighley.

Leeds.

On Thursday evening, about six o'clock, Mr. Arthur Wildman, manufacturer, of Marlborough Terrace, Bingley, died very suddenly from an epileptic fit. Deceased, who was thirty-five years of age, was the second and only surviving son of Mr. S. Wildman, manufacturer, Bowling Green Mills, Bingley, and was a partner in the firm of S. Wildman and Sons. A doctor was summoned, but death took place almost immediately after his arrival.

Leicester.

On Sunday, a new railway station, for the joint use of the Midland and North-Western Railways, was opened at Leicester. The station is not yet completed, and the Midland Railway Co. are spending over £200,000 in improving the station and widening the lines for traffic. The new station buildings, as far as completed, form a very handsome structure, with a clock tower. They face the main thoroughfare, which has been greatly widened and improved. This is the third station erected for the Midland Railway at Leicester, the first having been built by George Stephenson in 1832.

Liverpool.

A serious fire occurred shortly after noon on Monday at the Huskisson Dock, Liverpool, in a large shed in which cotton and other produce was stored. The flames spread rapidly, and in a short time the roof over three sections of the shed fell in. At this stage, however, the progress of the fire was stopped. There were about 3,000 bales of cotton involved.

London.

A novel and very attractive feature of the Home Arts and Industries Exhibition in the Albert Hall, which was opened on Thursday by Countess Brownlow, is the deft plying of quaint old spinning wheels by ladies picturesquely clad in peasant costumes of England, Scotland, Wales, Ireland, Sweden, and the Black Forest. The association, which began 10 years ago as the Cottage Industries Association, has grown to great dimensions, there being now some 200 schools in connection with it. Some very attractive exhibits came from the Keswick Art School. The Ruskin hand-made linens in their natural tint and in art colours were the chief features at the Keswick Stall.

Manchester.

The Manchester Stipendiary Magistrate on Thursday fined Messrs. A. and S. Henry and Co., Limited, £20, with £50 costs, for infringement of the trade description on a certain kind of sewing cotton sold by Messrs. R. and J. F. Alexander and Co., of Glasgow, for export to Mexico.

Nelson.

On Wednesday morning the winders who struck work on the Thursday previous at Brewery Mill, Brierfield, returned to their employment. On Tuesday the president and the secretary of the local trade-union waited upon Mr. Veevers, the employer at Brewery Mill, and submitted a list of prices the association required to be paid. Mr. Veevers at once consented to adopt this list, which, it is stated, will lead to a reduction in the winders' wages of about 1s. 6d per week compared with the list formerly in operation at the mill.

Nottingham.

On Saturday morning a fire occurred at Arnold, near Nottingham, which resulted in the destruction of a two-storey factory, containing 30 hosiery machines, and a large quantity of stock and manufactured material The outbreak was not discovered until the fire had got a thorough hold of the building, and within half-an-hour the whole place was in ruins. The damage is estimated at £6,000, but the proprietors, Messrs. Moore Brothers, are covered by insurance.

Oldham.

The Pine Mill Co. has about 20 pairs of mules fixed, nearly a dozen of which are working.

Mr. E. Whittaker, mule overlooker at the Summervale Mill Co., has accepted a three years' engagement as spinning master at the Krahnholm Manufactory, Hapba, Marva, Russia.

The employés of the Elm and Beal Spinning Companies, Shaw, to the number of about 600, had an outing to Morecambe on Saturday, the occasion being the "footing" of the starting of the two mills.

The mills were closed Friday and Saturday last week for the Whitsuntide holidays, and the operatives, so far as we learn, have enjoyed their brief cessation from toil in right hearty fashion.

Messrs. Asa Lees and Co., have received an order from the Grimshaw Lane Spinning Co., Limited, to replace eight pairs of mules, which have been working since the company was formed nearly 20 years ago.

Messrs George Saxon and Co., of Openshaw, have been entrusted with an order by Messrs Proctor and Co., of Hollinwood, to speed up and strengthen their steam engines, and also to fix a new fly-spur driving wheel.

The directors of the Werneth Spinning Co. have not yet given out the order for the machinery required for the extension. However, they have finally decided to place in mule spindles, and the mill will hold about 40,000. Competition for the order is said to be very keen.

At the quarterly meeting of the Higginshaw Spinning Co., on Thursday evening, Mr. James Henthorn (the chairman) stated that the directors were doing all they possibly could to place the concern in a good position. They were renewing the machinery in the card-room from Messrs. Asa Lees', and also having the mules squared up, while other improvements had been effected.

The wages question still is an engaging topic of conversation, both in employer and operative circles. The workpeople, however, somewhat indifferently await the pronouncement of the employers on the matter, and speak of being able to resist any encroachment upon their wages. Spinners say they must have relief from somewhere, and that every little will help to lessen the strain upon them. As the general election is close at hand it is thought the wages question will thus be staved off some weeks longer.

The *Oldham Standard* says:—"Arrangements are being made for the erection of a large spinning mill to contain over 200,000 spindles. It is stated that the plan and general arrangement will be on a new and entirely different principle to that of existing mills, enabling a considerable saving to be effected in the cost of erection, and affording other advantages, such as increased light, greater facilities for supervision and management. The site will adjoin a canal, and the boiler-house, cotton store, and warehouse will abut on it. The plans and specifications are being prepared by Mr. T. Sington, architect, of Manchester."

Preston.

Manchester Mill, formerly the property of and run by Messrs. H C. Owtram and Co., having recently changed ownership, has, after a stoppage of some months, resumed operations, and a number of looms are running

Ramsbottom.

Messrs. Stark and Co., of Rose Bank Print-works, Ramsbottom, have acceded to the request of the workpeople to be paid weekly instead of fortnightly as hitherto.

Radcliffe.

The mills here stopped on Thursday night last week for the holidays, and resumed on Tuesday morning.

It is stated that the new list has come into operation in regard to some of the sorts recently put in at the Red Bank Mills of Messrs. Young and Co., and that it has resulted in the weavers making an increased average wage from 6s. 4d. to 7s. 1d.

The men who struck work at the Clough Bleach-works recently have made overtures to the employer, Mr. J. Brierley, with a view to coming to a settlement. They wanted an advance of 4s. per week, but this being declined by the firm, they suggested that they would be content with 2s. per week, but, of course, this also was declined. The men therefore remain on strike.

The Radcliffe Trades Council have taken upon themselves the position of wiseacres to the community at large. They have addressed a series of questions to the two candidates for Parliamentary honours for the Radcliffe-cum-Farnworth Division at the next General Election, viz., Mr. Robert Leake, the sitting member, and Col. Mellor, of Warth Fold Cotton Mills, near Bury. After a minute and prolonged discussion, the Council has unanimously decided to support the candidature of Mr. Robert Leake, whose answers are considered the most satisfactory.

Rossendale.

Out of the 14,000 looms in this district about 1,000 are now stopped, but trade prospects are brightening up, and are much better than they were two months ago.

Rochdale.

Mr. Abraham Whitworth has been elected a director of the Arkwright Spinning Co. in place of Councillor Whitworth, deceased.

Messrs. William Clegg and Sons, woollen manufacturers, Milnrow, have decided to erect another woollen mill. The building will be about as large as the older portion—17 windows long, and three storeys high—and will be placed at the Newbey end of the old mill. Building operations will be commenced at once.

SCOTLAND.

Forfar.

Messrs. W. and J. Don and Co. are about to have an installation of 300 or 400 electrical lamps fitted up in their Station Works

Glasgow.

The following table gives the value and destination of the exports of cotton and linen goods from the Clyde for last week, and also the totals to date for the year. The first line refers to *cotton* goods, and the second to *linen*:—

India and China.	U.S. and Canada.	W. Indies & S. America.	Australasia.	Africa and Egypt.	Continent.	Totals.	Totals for year to date.
£64,177	5,024	1,868	2,105	701	8,339	82,204	1,907,198
111	14,714	105	212	230	122	15,495	415,561

The following are the total values of the exports for the same twenty-four weeks of last year:—Cotton, £1,813,611; linen, £358,379.

IRELAND.

Belfast.

In the linen industry of Ulster there are about 14 millions of capital invested There are 100,000 men employed.

Miscellaneous.

MR. ISAAC HOLDEN'S CAREER.

A correspondent of the *Leeds Mercury* writes as under:—

Yorkshire has known not a few men who have won distinction in the industrial and commercial worlds, and by their genius and enterprise conferred incalculable benefits far beyond their own spheres of action. The position which the county holds in the great field of manufactures might, indeed, be cited as evidence of the fact, were it not possible to name a score of men who, in our broad shire, have played conspicuous parts in the industrial revolution that has touched the very core of the national life. Probably none of them is more entitled to this distinction than Isaac Holden. His claim to be regarded as a great captain of industry rests not simply on his organising power, energy, and enterprise, but also upon his genius as an inventor and a mechanician. Mr. Holden is eighty-five years of age; but it would be a mistake to suppose that he belongs to a past generation. It is a remarkable fact that though half a century has nearly passed since he won his greatest triumphs as an inventor, these have not yet been superseded, but are being applied in manufactures to-day with the same success as when first introduced. Then, though old in years, the member for the Keighley Division is hale and vigorous still, has lost none of his natural buoyancy of spirit, and, in face of the great social problems, regarding which he has never been a pessimist, is as hopeful and eager for the fray as ever. It was Lord Rosebery, I think, who jocularly remarked not long ago that Mr. Holden is the youngest man in the House of Commons. There is a good deal of truth in this humorous allusion to his intellectual vigour and almost youthful enthusiasm in whatever engages his attention.

It is too late to say that Mr. Holden's career has been a remarkable one. That, springing from a comparatively humble rank, he has acquired fame and wealth and high social status, is already known to the world. But few are probably aware that this story of how a young Scotch dominie achieved his honours borders almost upon the romantic. Fewer still have heard it from his own lips Autobiography has an interest which cannot easily be imparted to biography. A few days ago I saw it stated that the venerable Member was at his home at Oakworth receiving the congratulations of his friends on the completion of his four score years and five, and, knowing something of his career, I was tempted by the opportunity to ask him to tell me about his more notable achievements as an inventor. Mr. Holden is one of the most genial of men. Almost before you have felt the grasp of his hand and noticed the sunny smile that never seems to leave his countenance, you feel at your ease in his presence. Mr. Holden had a rather severe attack of influenza some time ago, when the disease was so prevalent, and it left him, as it does younger people, much enfeebled. He assured me that his subsequent sojourn in Algeria has completely restored his health and wonted vigour, and his appearance this sunny afternoon removed the doubt I had been entertaining as to the truth of the news paragraph, which stated that he had been testing his strength by walking from Oakworth to Bradford, a distance of about ten miles.

Mr. Holden was not unwilling to comply with my request, viz., that he should for an hour or so fight his battles o'er again. We were seated in the sumptuously

urnished room in Oakworth House that opens into the winter garden, where the sunlight, pouring through the glass roof, was imparting a brilliance to masses of bloom that would have been dazzling to the eye but for the pleasant contrast afforded by the dark greens of the spreading palms and other non-flowering plants. This vision of beauty was for the time being happily mine, and I confess it was difficult to resist its attractions and give undivided attention to the story told me, interesting though that was.

"What was it, sir, that induced you to come to Yorkshire?"

"I came to Leeds in January, 1828, being then 20 years of age, to be assistant master in Queen's-square Academy, of which Mr. James Sigston was the head master. I was engaged to teach mathematics, in which it was thought I excelled. I am a native of Hurlet, near Glasgow, and my teacher in Paisley was Mr. Kennedy, teacher of mathematics, professor of history in Queen's College, lecturer on physics and chemistry to the Mechanics' Institute of Glasgow, and lecturer on chemistry to the Andersonian Institution. He was a very able man, said by an eminent authority to be capable of filling any professional chair in Glasgow. My parents were Wesleyans, and before I came to Leeds I was a candidate for the ministry in that connexion. Mr. Sigston was one of the leaders of Wesleyanism in Leeds, but before I joined him he wrote saying that differences regarding certain matters had resulted in his being expelled from the society. He invited me to become a minister of an off-shoot of the denomination he had formed, called the Protestant Methodists, but I felt myself obliged to refuse. The state of my health a year later caused me to withdraw my candidature for the Wesleyan ministry. My declining the offer was a disappointment to Mr. Sigston, and I thought he treated me rather unkindly in consequence. He was a man of high principle, however, and I esteemed him very much. After I had been with him some time I decided to leave Queen's-square, and accepted a situation in Slaithwaite Grammar School, of which Mr. Butterfield was the head master. During this time I read Greek with Mr. Butterfield, and when I left at the Christmas holidays it was arranged that I should continue to have a day's reading in the week with him. The day I returned to Slaithwaite for this purpose Mr. Butterfield told me that the clergyman of the village had informed him that if he kept 'that Methodist' any longer in his school he would report him to the patron the Earl of Dartmouth. Mr. Butterfield had replied that he was prepared to incur the displeasure of the patron rather than part with me; but I told him I could not allow him to suffer injury on my account, and so I left Slaithwaite. I did not know where to go, but I was young, and hopeful that another opening would present itself. A classical master was required at Reading, in Berkshire, and I applied for the situation and got it. When I had been there eighteen months my health completely broke down, and no wonder, for I studied hard. I used to get up at four o'clock in the morning to gratify my desire for knowledge. An old friend in Scotland wrote to me, saying that if I would go back to Glasgow and start a school he would provide me with a suitable house and school in the west end of the city, where he was erecting some buildings. I accepted the offer, and after I had recovered somewhat, I opened the school, and soon it was filled with pupils. The next change occurred in this way. The Messrs. Townend, of Cullingworth, near Keighley, were in want of a bookkeeper, and one of them came to Glasgow in search of one, for Glasgow at that time produced the best bookkeepers in the world. The great teacher of bookkeeping, Morrison, was a Glasgow man. Mr. Townend heard of me, and he asked me to take the post. After we had talked the matter over, I accepted an engagement. I did not care so much about bookkeeping as about the opportunity thus presented of getting amongst machinery."

"Then you had a leaning towards mechanics?"

"Yes, I had studied mechanics mathematically, and felt that I should be in my element amongst machinery. The first day I was at Cullingworth Mr. Robert Townend took me over the works, and amongst other things he shewed me was wool-combing by hand, being carried on in a cottage. I asked him, 'Has no attempt been made to do this work by machinery?' He replied that many attempts had been made, but that they had all ended in failure, adding that the fibre of wool was so delicate that it was impossible to deal with it by machinery. I determined there and then that I would make it the business of my life to do it by machinery. I accomplished the task about twenty years afterwards."

"How did you proceed?"

"The first thing I did was to make myself acquainted with all the previous attempts, searching the records of the Patent Office for that purpose. Then I began my own experiments. I remained with the Messrs. Townend for fifteen years. When I had been with them eighteen months they made me manager, and eventually took me into the partnership. Up to my going to them they had been combers and spinners. I partly turned the place into a manufacturing concern, and introduced many improvements in the methods of production. From those inventions I reaped no direct advantage as an inventor, for the reason that they were introduced without being protected. Singularly enough, the Messrs. Townend had a strong objection to have anything to do with a patent. There were four brothers of them, and they were all of the same mind in the matter. For instance, I introduced a new manufacture, viz., that of genappe yarns. They would not have it patented. Had they done so it would have been a fortune for them and also for me. I calculated that it would have been worth a million sterling at least to us. The result was that within twelve months three or four other houses in the trade were applying the invention, and applying it on the most advantageous terms, for they had nothing to pay for it. Another achievement of the kind, of which I was rather proud, was an improvement of Collier's combing machine, which was essential to its successful working. The Messrs. Townend would not patent that either, nor would they allow me. They seemed to think that ruin would overtake them if they had anything to do with a patent. I decided that my next invention should be patented, even if it involved my leaving the concern. That was my process in dealing with genappe yarns."

"What are genappe yarns, Mr. Holden?"

"They were at that time chiefly No. 2 fold 40's worsted yarns, singed by being passed over a red-hot plate, and were chiefly used at first to substitute hand-spun No. 20's as weft for what were called Irish poplins. Genappe yarns have also been extensively used for making braidings. My first invention in 1833 was the method of singeing these fine 2 fold 40's worsted yarns, which could not be done previously by the clumsy machinery which had been used for singeing stronger worsted heald yarns; so that, in fact, my invention of that time created the genappe trade. My invention of 1847 was a reduction of the number of processes the yarn had to go through. As it had to be used in combination with silk, it was, of course, most important that no trace of oil should remain on it, and the last process must therefore be a scouring one. Up to that time this had not been accomplished. My invention was to scour and set the yarn on reels, this to be the last process. Setting means subjecting the yarn to a high temperature, so that when it is taken out of its state of tension it will remain perfectly dead like a piece of wire. The scouring process also rendered it perfectly free from oil, and capable of being blended with the silk, without injury to the latter. I saw that this invention must revolutionise the manufacture, and that there was a fortune in it."

"And I suppose you found it so, Mr. Holden?"

"There was not one in it for me. Why there was not you shall hear. When I found that I had overcome the difficulties, I called the Messrs. Townend together, and told them that I had an invention of great value, and desired them to join me in patenting it. As I had expected, they once more flatly refused to have anything to do with a patent. I informed them that if that were so I should quit the firm. Had they complied, I believe we should have made millions out of the invention, for the process has not yet been superseded; it is carried on still as it was described in my patent. Up to then I had only had a sixteenth share of the profits. They offered to make me equal with themselves if I would remain. I could not do so. I stayed with them twelve months, however, and during that time trained three young men to take my place, so that the firm might not suffer. My old friend, Mr. Sam Lister, of Manningham (now Lord Masham), and I, jointly took out a patent in October, 1847, one section of which was for genappe yarn. That was what brought us together, and we afterwards entered into a partnership which lasted seven years. You are no doubt aware that we had a dispute?"

"Yes; I am aware of that; but tell me, Mr. Holden, how you failed to turn your invention to account?"

"Well, before I left Cullingworth, I had been making experiments in my new process, and had, of course, taken care that no one saw them. When I left I was certain that I alone possessed the secret. But I was mistaken. After the patent had been procured, and some time after I had quitted Cullingworth, I learnt that an attempt was being made there to apply the same process. In fact, the firm asked me to go over and shew them how to overcome a difficulty they had failed to surmount. We had parted on friendly terms, and I went over and shewed them."

"But how had they found out the process?"

"In this way; one of the young men I trained had, unknown to me, seen me making my experiments, and, divining their object, had set about experimenting himself on the same lines, and had partially succeeded. I was, of course, taken aback, but I reflected that I had secured my patent, and, as I have said, I helped them to overcome the difficulty. The Ackroyds of Halifax, through Mr. Robert Midgeley, their commission spinner, and the Sugdens of Dockroyd were engaged in the same manufacture, and each firm offered to pay me a royalty of 1d. per lb. of wool that underwent the process in their works, provided the Townends would do the same. What was I to do? They had been applying the process before I obtained my patent, and it seem to me this would weaken my case if I carried it to a court of law. I decided not to adopt that extreme course, though probably I might have been successful if I had done so. If the Townends would not agree to pay me royalty, the others, of course, would not do so. I lost the value of my patent. It was not long before several firms were using my process; and I should think there are a score now."

"But fortune at length smiled upon you?"

"Yes; it was my good fortune to make the acquaintance of Mr. Lister, and to gain his confidence and friendship. He possessed the patent of Mr. Donisthorpe, for which he paid a large sum, and which embraced the essential parts of a combing machine, to which alone was applicable what I then, and have always, called my square motion. He invited me to be his partner. I am, therefore, so far indebted to Lord Masham for my success; but I presume Mr. Lister will not deny that the debt was a mutual one. Combing was my chief study during the fifteen years I was at Cullingworth; and before I left I had in my mind the elements of the square motion, and I therefore sought the friendship of Mr. Lister, in order to be able to apply it. I have employed it in France some forty-two years, and in England some thirty years, and I have taken out some twenty or thirty patents for improvements in it. The contention between Lord Masham and myself is happily closed, may I hope without the loss of mutual esteem. Our letters were before the public some time ago. I deeply regretted their necessity. Your question as to the smiles of fortune don't apply to late years. I have had formidable competitors in the trade; but I had the advantage of going into it when money was to be made It is a poor business now. Profits are very small, if any."

"I suppose your invention cost you a good deal of thought?"

"That was so; much long and patient study. It has been my practice all my life to take long rambles alone, and many a difficult problem have I worked out in them. In my walk this afternoon I had some quiet thoughts about various social and political difficulties ahead."

This led us into a conversation about some of these said difficulties. For example, we discussed the eight hours question, respecting which Mr. Holden holds liberal views. He pointed out the difficulty, however, of employers in this country conceding eight hours whilst their foreign competitors are working twelve or even more hours, and paying considerably lower wages than are paid here. And the difficulty was all the greater, he said, when competition had reduced the producer's profits to the finest margin. This was a question which affected not merely the interests of the employers, but also those of our workpeople, for how were the workers to be employed if the employers could not compete with their foreign rivals? It was a mistake to think that the employers were making fortunes, and, therefore, not paying their workpeople what was due to them. There were many firms at the present time not making any profits whatever. In this matter, however, Mr. Holden expressed keen sympathy with the working class, remarking that his experience made him thoroughly sensible that their condition is in many respects not an enviable one. Nor is he without hope that reforms will be effected which will materially change the lot of the worker. He is especially prepared to see great changes in our land laws, and other parts of the Newcastle programme have his hearty approval. Like his great political leader, the venerable member for the Keighley division has not become less Liberal as he has grown older. Is this not a proof of his greatness also? Yorkshire, at least, regards Isaac Holden as one of her grand old men.

THE CULTIVATION OF FLAX FOR FIBRE.

Some time ago the Washington Census Bureau gave out preliminary figures shewing the extent of the flax growing industry, and has now issued a completed statement containing interesting information regarding the production of fibre from home-grown flax.

The total area of land devoted to the cultivation of flax in the United States in 1889 was 1,318,698 acres, or 206,047 square miles, the production of flax-seed 10,250,410 bushels, the production of fibre 241,389 pounds, the amount of flax straw sold or so utilised as to have a determinable value 207,757 tons, and the total value of all flax products $10,436,228.

The variations in the relative production of flax-seed and fibre have been remarkable, as shewn by a statement of the ratio that has existed between them at decennial periods from 1849 to the present time. Thus, in 1849 1,371 pounds of fibre were produced to every 100 bushels of flax seed, in 1859 the ratio was 833 pounds to every 100 bushels, and in 1869 it had risen to 1,568 pounds to every 100 bushels. In 1879, however, the ratio was 458 bushels of flax seed to every

100 pounds of fibre, and in 1889, owing to a greatly diminished production of fibre concurrently with a large increase in the area cultivated exclusively for seed, 4,246 bushels of flax seed were produced to every 100 pounds of fibre.

The above figures fail to convey, however, the full nature of the change which has taken place. But little of the so-called fibre produced in the United States within recent years has been fit for spinning, or has really been entitled to the designation that for convenience has been given to it in census and other statistical reports. While flax seed is a well defined product, subject only to the same quantitative and qualitative varieties as agricultural products in general, flax fibre as known to the American farmer and manufacturer has not always had a like uniformity of meaning. Indeed, the utilisation of the fibrous portion of the flax plant has varied so widely at different periods that any comparison of fibre production based solely upon statistical reports is liable to be misleading. The fibre reported at the various censuses up to and including that of 1860 was an excellent grade of scutched flax, fit for spinning, and able to hold its own against all but the finest imported varieties. The fibre reported at the census of 1870, which was raised to meet the enormous demand for bagging, was, on the other hand, only a very common quality of tow, abounding in woody refuse, and so carelessly prepared as doubtless in some measure to have led the way for that adverse legislation which practically put an end to its production. The "fibre" of the present day is likewise, with few exceptions, only a coarse by-product, used mainly as upholstery tow. After a recitation such as the foregoing, it is curious reading to find the report stating: "As a result, however, of the well-directed efforts of the Department of Agriculture there are indications of the revival in the United States of a genuine flax industry that should ultimately render the American people the largest consumers of linen in the world, entirely independent of the foreign manufacturer."—*New York Bulletin.*

TEXTILE PATTERNS AND DESIGNING.*

(*Continued from page 424.*)

The consideration of Textile design subsequent to the decay of Byzantian art, brings us to the art of the Mahommedans. With the spread of Islamism a great revolution of culture took place. Owing to the rapid propagation of Mahomet's doctrines, his adherents, within 100 years after his death, had obtained a footing eastward as far as the banks of the Ganges, and westward over all the northern part of Africa, as well as in Sicily and in sunny Spain. The Arabians transported into their newly conquered dominions not only their creed, but also their culture and science. In Spain splendid palaces arose, all the pomp and luxury of the Orient expanded, and industry and commerce reached a height never before attained.

In the same manner as in Spain, the Arabs exercised their industrial and artistic skill in the sea-girt Etnean island of Sicily. This grand era of textile industry did not commence until after the conquest of Sicily by the Normans. It bears the name at the present day of the "Saracen-Sicilian" epoch of textile art, and a large number of splendid examples of this period are preserved in our churches and museums.

The Normans, in quest of booty and territory, took possession of Sicily in the eleventh century. After settling there, their kings conceived the idea of augmenting their power by developing the resources of the country. This idea was fully carried out by the best of the Norman Regents, Roger II. (1101-1184). He knew how to encourage the rearing of silk-worms and the manufacture of silk, which was carried on in Sicily by Saracenic weavers. He knew how to keep a hold on these men and reap for himself the fruits of their artistic labour. Of great importance to the development of silk manufacture in this country was King Robert's campaign to Albania, the present Greece. He took prisoners several men proficient in the arts of weaving and spinning from Athens, Thebes, and Corinth, in which towns the manufacture of silk flourished, and conveyed them to Palermo, his capital, thus giving a great impulse to the industrial art of the country. In Palermo he built dwellings for these men and compelled them to weave for him and to improve the silk industry (1147.) In order to insure the prosperity of the latter it was declared to be a royal monopoly. Mulberry trees were cultivated in all parts of Sicily and silk-worms were imported and reared with great perseverance to obtain raw silk.

King Roger installed a royal weaving establishment in the royal palace, the so-called Hotel de Tiraz. A writer of the twelfth century, Hugo Falcandus, draws the following picture of it in his description of Palermo: "It is impossible to pass over in silence the celebrated workshop adjoining the Palace, in which silk is spun into different coloured threads combined to form fabrics of several varieties. Here one can see stuffs made of single, double, and three-fold thread, which are less expensive and require less skill than those made of six-fold thread, more raw silk being used for the more substantial materials. Here the fiery red lustre of the 'diarhodon' catches the eye; there the green tint of the 'diapistus' creates an agreeable effect. Other fabrics are ornamented with a circular design, requiring for this reason great skill and a high price. There are also numerous ornamental patterns of various kinds and colours woven in gold and silk threads. In this class of goods the beautiful effect of the design is often illuminated by the brilliant flashing of precious stones."

These measures did not fail to have the desired effect. A silk manufactory soon sprang up from the "Hotel de Tiraz," which not only answered King Roger's expectations with respect to the increased prosperity of his country, but also had its influence upon the whole of Italy, as the industry got a footing there also, and laid the foundation of the opulence and power which was to accrue to the towns of Central and Northern Italy.

Let us now examine the designs upon these fabrics made at Palermo by the Saracenic and Greek weavers. We find that they used the same patterns as in their native countries: symbolical animals enclosed in large or small circles in contact with one another or by polygons, just as in the Byzantian work.

In the Royal collection at Crefeld there is preserved a little fragment of the stola in which the remains of King Roger II. were enveloped in his tomb at Cephal, near Palermo. The design is composed of two colours, a deep violet purple and a lighter reddish violet purple. It is quite possible that this splendid coloured fabric was manufactured at Byzantium and brought home by King Roger II. after his campaign against Emmanuel of Constantinople (1147). At all events the design resembles those of Byzantium so closely, that only Greek weavers could have made it. Other samples of this period, bearing more distinctly the character of Saracenic fabrics, were made on the North Coast of Africa. The designs upon them are composed of stripes in different colours, red, green, blue, and white, with ornaments of gold thread. In the smaller stripes, hares and dogs appear alternately with an object resembling an eye. The object is said to be (according to the opinion of men versed in archæology) a magic formula employed by the Orientals to drive the moths away from the material. The broad stripes, red and blue alternately, contain—one, an ornament similar to the pattern which is characteristic of the woven designs of the 15th century called the pomegranate pattern; the other, on the ground of which appear slender and graceful tendrils in a different binding shews an Arabian inscription, "assulthan alalim" or "el sultan el alim" which means in English "the wise Sultan." This rare fabric came from the Church of Mary at Dantzig. A large number of splendid surplices and fabrics are preserved in the treasury of this Church. At Brunswick also and at Ratisbon similar stuffs are preserved. In the last mentioned town there are two surplices, which the German Emperor Henry VI. presented to the Ratisbon Cathedral. He inherited Sicily by his wife Constance, the heiress of the Norman Crown.

With this Emperor, the vestments of the Norman Kings manufactured in the "Hotel de Tiraz," and bearing Latin and Arabic inscriptions, passed into the possession of the German Imperial family, and until the year 1794 were the official robes of the Emperors of the Holy Roman Empire of the German nation. The designs upon the two surplices at Ratisbon are also striped in the same way as those already described.

The Arabian inscriptions on these fabrics are very important. One of them means "Glory, victory, and long life." The other proves without doubt the origin of and age of these materials; it runs, "This holiday garment was made by Master Abdul Aziz in his factory for William II." This was a Norman King, reigning from 1166 to 1189.

The ornamental use of letters is a characteristic of Islam art. Mahomet in his intense eagerness to suppress the worship and making of idols has repeatedly pronounced in the Koran a strict prohibition against making any images of created beings. He considered such acts to be an encroachment upon God's omnipotence. According to the words of the prophet, the creations of unbelievers in this world will mount upon their backs in the day of judgment with horrible forms and distorted faces, and the unbelievers will be forced to bear this terrible burden for ever.

Talent thus fettered and creation thus suppressed in one quarter, are sure to bear fruit in another. Hence it followed that ornamental designs and the graceful line treatment attained their highest degree of perfection in Arabian art. This very perfection and refinement in the architecture of Mahommedan art captivate and surprise the spectator by their striking effects at the present day.

To compensate for the loss of figured patterns, the skilful Mussulman took a very sensible course in conveying, with the assistance of his letters, so well capable of this treatment, the ideas expressed in other styles by allegories and symbols. Thus we find the walls of Mosques and palaces richly decorated with sentences from the Koran and holy books; their woven goods also shew the employment of letters in their designs. However, the subtle expounders of the Koran soon found a means of evading the strict letter of the law, and admitted a more lenient interpretation of it.

After this, only naturalistic imitations of the living creatures were considered unlawful, whilst a conventional treatment which nearly represented the genus of the creature, as well as fantastic forms, which owed their origin to the inventive minds of the Orientals, were permitted. Similarly, the prohibition against the wearing of silk dresses, which Mahomet considered should only be worn in heaven, was held not to extend to the use of silk fabrics with a linen warp.

In the textile fabrics made by the Moors in Spain, we can see abundant evidence of their strict avoidance of figure subjects. The Arabs, with their peculiar capacity for mathematics, preferred geometrical designs. We find patterns from the end of the 13th century, which, avoiding animal forms, shew floral ornamentation arranged in circles or medallions in the Roman style. These designs might be the precursors of the splendid pomegranate compositions on the velvet, silk, and brocade stuffs which were manufactured in the 15th century in Northern Italy.

Whilst the Arabian style in textile designs had almost disappeared in Italy in the 14th century, the Oriental character of the patterns upon the fabrics made in Southern Spain during the whole of the 14th and part of the 15th century is strongly marked, Islamism having retained its hold there for a longer period. We learn from various writers how important Moorish manufacture in Spain was from the 10th to the 15th century. The towns of Almeria, Granada, Cordova, and Seville were particularly famous for their productions. In Seville, 60,000 looms were said to have been active, whilst in another district nearly 3,000 localities were engaged in the art of weaving. The designs upon these fabrics shew us, as already pointed out, a more regular and often geometrical arrangement. There are many pieces preserved in textile collections, whose patterns remind us of the splendid ornamentation in the Alhambra.

The combined work of the Greek weavers transported to Palermo by Roger, and of the Saracens, introduced a new style of textile design, which by the skilful combination of graceful line and floral ornament with figure drawing, appreciated from the earliest times by Oriental tastes, form the most interesting and attractive textile products of all ages. In accordance with this, we find the fabrics of this time covered with the fantastic animal figures already described when speaking of the earlier centuries. In the arrangement of the designs the regular bordering of the intervals is mostly abandoned: elegantly drawn tendrils from the groundwork over which move slender and lithe-limbed animals, a loving adherence to nature, give great vivacity to all the figures. Human figures are plentifully interspersed; men, and more often maidens, hunting animals, are enclosed in characteristic surroundings such as castles, shells, and nets, like the bewitched princess in the contemporary fairy tales of the Arabian Nights. The leaves and flowers of the fantastic tendrils similarly shew a thorough study of nature, and at the same time incomparable capacity to adapt all forms as plain patterns. The forms are woven in one colour, generally in gold thread upon a mono-chromatic ground.

The gold thread employed is composed of a flaxen thread covered with a gilded membrane cut into strips. The membrane was obtained from the garbages of the cattle killed for market. This gold thread was imported for European weaving up to the fifteenth century. It was called "Cyprus" gold thread, probably because Cyprus was the market for this costly material in the Middle Ages.

It is interesting to learn that these designs often have a symbolical meaning. For instance, a lion seizing a duck pursued by an eagle, which means that the possessor of this garment was valiant enough to snatch the booty from the claws of the eagle; the eagle signifying luck and riches; the lion, power of government. From a pattern upon a piece of silk of the thirteenth century, shewing a lion and a hoopoe, it may be inferred that the fabric belonged to the robe of a strong and wise sovereign, since the hoopoe signifies wisdom. Moreover, the little inscription in the narrow border of the stuff says, "The wise Sultan."

Another design shews a woman catching a hare with a net, and holding by a chain or cord a hound and a spotted cheetah. Beneath this we see a woman with an eagle. From Arabian symbolism we learn that the catching of the hare signifies opulence, marriage, and increase of family. To dream of riding on an eagle's back foretells riches, and if a person should see a woman carried on an eagle's back, he will eventually arrive at Government.

We are thus able to discover a great number of interesting scenes on these fabrics: in one a lion steps from the winged disc of the sun, holding in its claws a little animal. Another design shews a fountain, the

* A lecture by Mr. Paul Schulze, Conservator of the Royal Textile Museum, and Lecturer on Design at the Royal Weaving School, Crefeld.

basin of which is like a shell, the structure being decorated with dragon heads from which hang scoops. Two girls carrying hares suspended from a pole stand at the side of the fountain. Hounds and cheetahs lap the water flowing from the basin. The ground of these designs is filled up with small tendrils, leaves and flowers.

Lastly may be mentioned an interesting design woven in gold thread, in which we see alternate repetitions of stars, and a twisted ribbon bearing an Arabian inscription, above which a pigeon is flying underneath a large crown. It would occupy too much time to describe in detail all the symbolical designs which this period has left to us.

But let us pursue the advancement of weaving in Europe.

Whilst at the "Hotel de Tiraz" at Palermo those splendid silk fabrics with gold thread designs, those magnificent velvets and those embroideries, bearing precious stones in gold settings, were being manufactured, we see that at the end of the 13th century the towns of Italy entered into competition with Palermo, and thus, especially as regards those towns in the North of Italy, rose to great power and affluence.

Let us give our attention to the political situation at that time. I have already shewn how the advancement made in textile production by some countries was due to political causes, and how artistic taste was affected by the same events.

The first town of the Italian peninsula to produce textiles of any importance was Lucca. It is mentioned in this connection in a manuscript so early as 1248. Manufacturing was carried on there to an important extent; they despatched their products to Paris and London.

But commerce and industry were soon interrupted by civil wars of a sanguinary character. Owing to this cause many clever workmen quitted Lucca and settled in the neighbouring towns; Milan, Florence, Bologna, Venice, and Genoa offered refuge to the fugitives and laid claim to their skill. In the year 1309, 30 families of silk weavers thus emigrated to Venice, whilst the other towns of Italy got a similar profitable increase some years later in 1314.

The many difficulties which had to be overcome in the introduction of a complicated industry, such as the obtaining of the raw material and the technicalities of weaving and dyeing, gave no opportunity at the commencement of this industry for the creation of new patterns. The Italian towns will have obtained most of their workmen from Sicilian factories who brought with them their own taste to these towns; hence we again find in the fabrics of the Italian factories of the 14th century at first the same patterns as those made by Saracenic looms in Sicily or by those of the Moors in Spain in the early times; therefore it is difficult to say for certain to which place of manufacture the patterns of this period belong, and it is not until the middle of the 14th century that the differences in style appear more obvious, owing to the advent of the new Italian ornament. It is true that the Italians used the Saracenic designs, but they paid no attention to their symbolical meanings; they thought it sufficient, by copying animal figures and borders bearing inscriptions and floral ornaments, to imitate similar designs upon the Saracenic weavings, which were valued so highly at that time. They would take a group of animals at random, surround it with secondary ornamental work, and add to this examples of their own style of ornament. Thus we see animals and plants mingled together with fantastic forms; cartouches, crowns, castles, fences, fluttering ribbons, and so forth.

We are often able to distinguish by characteristic marks, copies of Saracenic subjects which have not been understood. For instance, an Oriental can easily see whether the Arabian letters were woven by Saracenic weavers, or in the Italian factories by weavers who were ignorant of the language of the Saracens. The symmetrical arrangement of the patterns is often the reason why the Arabian inscriptions on the Italian stuffs are made to run to the edge of the pattern where in the repeat they occur again, but reversed.

The compositions of the patterns of this time are very varied, and it is difficult by description only to give a sufficient idea of those splendid textile designs. In the further development of textile design, the slender and graceful tendrils were converted into knotty branches forming a pointed oval, in the middle of which was placed a group of animals in the Saracenic style.

The pomegranate, the characteristic ornament of the 15th century, is made to sprout from one of the angles formed by the contact of the branches. At first the pomegranate is small and takes a subordinate position, the animal figures being predominant, but later on the size of the pomegranate is increased and that of the animals diminished more and more.

To be continued.

A REPORT on the German worsted yarn spinning industry states that a recent apparent revival of activity has been only of short duration.

Textile Markets.

COTTON.

MANCHESTER, FRIDAY.

The trade has resumed business after the holidays without any alleviation of the discouraging circumstances attendant upon it previous to their advent. The bullish sentiments of jobbers in cotton in Liverpool seem to make the course of the cotton market quite independent of that for yarns and cloth. Evidently when the spindles and looms that consume it are stopped, imagination runs riot with dealers in the raw material. When, however, matters are brought to a position in which intrinsic values can be accurately tested there is a considerable diminution of strength. On any sound theory of business requirements and conditions there has not been the slightest justification for the advance of the raw material beyond from 3½d. to 3¾d., whilst the actual figures attained have been 4¼d. We are now close upon the verge of the new crop, while the supplies remaining over from the last two large ones are totally unprecedented in bulk, and there are no signs of the occurrence of any rapid depletion of these before they will again begin to swell from the heavy receipts of the new crop as it comes into sight. What the amount of this may ultimately be is already a matter of speculation, and those interested in disposing of the balance of the old crop at high prices are writing down very low figures indeed. We have, however, already ventured to publish an estimate of 8,000,000 bales, which, from a careful consideration of facts and future probabilities, we believe is justified. We may here venture to claim credit for the fact that regarding the crop, the finishing portion of which is now being received, we predicted the total outcome would exceed 9,000,000 bales so early as the closing weeks of November last, when all other crop estimates were ranging from 7½ to 8¼ million bales, and belief in which has been most disastrous to the Lancashire cotton trade, as the false estimates so assiduously circulated induced spinners and manufacturers to take over great portions at a price far above that which the facts warranted. These comments are offered with a view to caution the trade against being juggled into repeating the blunder of the last two seasons.

Writing very recently respecting the new crop a private correspondent in Texas says:—"It is a little too early to say anything about the cotton crop, except that the acreage, I think, is less than last year, and that the crop has been damaged considerably by floods, etc. It is also about three weeks late, but I don't think its being late will be detrimental to the output. One very favourable thing I notice is that the 'stand' is very good, and little or no replanting is needed. Everybody is claiming a very materially short acreage. I am not just now in a position to state what the acreage will be, but it will be large enough to produce a good crop, you can depend on it. It is very difficult to find out just what last year's acreage was, some stating ninteen million acres, some twenty and a half million acres. My belief is now—without any authority for stating it—that there will be at least ninteen million acres planted, and if there is you can depend on a crop of from eight and a half to nine million bales."

This is from a correspondent who has no "axe to grind," as he is not engaged in the production, sale, or purchase of cotton, except perhaps the latter to a limited extent, and he is in the centre of a producing district. Once more, therefore, it is necessary that spinners should act with the greatest circumspection if they are to stop the operations of those whose object it is to "take the wool off their backs," and, we may add, the skin also. To have a continuance of such stock-takings as have prevailed lately can only bring ruin upon every portion of the trade.

COTTON.—Last week Liverpool resumed business as Manchester suspended it. The first day opened with considerable spirit, and prices hardened. On the second, through being a little closer in contact with facts, much of this was lost, but within the next two days the relapse was fully recovered from, owing to the joint influences of the Agricultural Bureau's report and that of Messrs. Neill Bros. The first made an estimate of 7,500,000 bales for the coming crop, and the latter one not exceeding 7,000,000, so that those who believe in these two authorities steered their barks accordingly. On Saturday there was only a very small demand for spot, and fully half of it came from speculators and exporters. Of course, the holidays kept the trade out of the market. Prices hardened a little in sympathy with the upward movement of futures, which on the day recorded a gain of 4 to 4½ points. On Monday there was a relapse, owing to poor advices from America, and futures dropped 3 to 3½ points, but subsequently regained a portion, but closed with a loss of 1 to 1½ points. Spots were in moderate request, and prices of good middling and middling fair were "rectified" by being advanced 1/16d. Other growths were unchanged. On Tuesday the market was again slow, and futures on the day lost four to five points. Dull American advices and fairly good crop prospects were reported to be the cause. Holders of spots were easier to deal with, and accepted fractional reductions. On Wednesday the market had lost the impetus derived from Messrs. Neill's and the Bureau's reports, and notwithstanding a fair trade demand, spots were reduced 1/16d., other sorts being quiet. Futures lost four points. Yesterday the spot market was steady with a moderate demand. Futures, however, fluctuated considerably and frequently, and finally closed with a loss of 1 to 1½ points on the day. Other sorts were unchanged.

The following particulars of the business of the week are from the official report issued by the Liverpool Cotton Association:—

	Import.	Forward.	Sales.	Stock.	Actua Export
American..	29,186..	45,887	36,880	1,403,990..	4,150
Brazilian ..	— ..	1,886	1,890	45,220..	—
Egyptian ..	2,421..	3,428	1,590	95,790..	710
West Indian	1,071..	241	440	38,570..	94
East Indian	5,793..	1,690	840	39,990..	1,265
Total ..	38,471..	53,112	41,640	1,623,560..	6,219

The following are the official quotations from the same source:—

	G.O.	L.M.	Md.	G.M.	M.F.
American.....	3 11/16 ..	4 ..	4 1/16 ..	4 3/8 ..	4 5/8
			M.F.	Fair.	G.F.
Pernam.....			3 15/16 ..	4 5/16 ..	4 9/16
Ceara			3 15/16 ..	4 1/4 ..	4 1/2
Paraiba			3 15/16 ..	4 1/4 ..	4 1/2
Maranham			4 1/16 ..	4 1/4 ..	4 1/2
			Fr. G.F.	F.G.	F. Gd.
Egyptian			4 5/16	4 13/16	4 15/16 5 1/8
Ditto white			4 1/2*	4 5/8*	— 5*
	Fr.	F.F.G.	F.	G.F.	Gd. F.G. Fine.
M.G. Broach ..	—	—	—	3 11/16	3 7/8 4 1/16
Dhollerah	3	3 1/8	3 1/4	3 3/8	3 1/2 3 5/8 3 13/16
Oomra	3*	3 1/8	3 1/4	3 3/8	3 1/2 3 5/8 3 13/16*
Bengal	—	—	2 7/8*	3*	3 3/16 3 3/8 3 9/16*
Tinnivelly	3 9/16*	—	3 1/4*	3 5/16*	4 1/16* — —

* Nominal.

The following are the values of futures at mid-day on each day of the week—American deliveries—any port; bases of middling: low middling clause; (the fractions are in 64ths of a penny):—

PRICES OF FUTURES AT 1.30 P.M. EACH DAY.

	Saturday.	Monday.	Tuesday.	Wednesday.	Thursday	Friday
June.....	4-15 v	4-13 14	4-10 11	4-8 9	4-7 8	4-6 b
June-July..	4-15 v	4-13 14	4-10 11	4-8 9	4-7 8	4-6 b
July-Aug..	4-17 18	4-16 s	4-13 b	4-10 11	4-9 10	4-8 b
Aug.-Sept.	4-20 21	4-18 19	4-16 s	4-13 14	4-12 13	4-11 b
September.	4-23 b	4-21 b	4-18 b	4-15 16	4-14 15	4-13 14
Sept.-Oct..	4-23 b	4-21 b	4-18 b	4-15 16	4-14 15	4-13 14
Oct.-Nov..	4-25 b	4-23 24	4-20 21	4-18 b	4-17 s	4-16 s
Nov.-Dec.	4-27 28	4-26 s	4-23 s	4-20 b	4-19 b	4-18 s
Dec.-Jan..	4-30 s	4-28 b	4-25 s	4-22 23	4-21 b	4-20 b
Jan.-Feb..	4-32 b	4-30 31	4-27 28	4-25 v	4-23 24	4-22 23
Feb.-Mar..	—	—	—	—	—	—
Price of Mid American.	4¼	4¼	4¼	4 3-16	4 3-16	4 3-16
Estimated Sales including Spec. and Export.	4,000 2,000	8,000 1,000	8,000 1,000	10,000 1,000	10,000 1,000	7,000 1,000

YARNS.—Spinners have found no improvement since the resumption of business. On Monday not many attempts were made to transact any, as in the main it required the day for merchants to gather up the dropped threads of the position. On Tuesday the market was unsatisfactory on every hand. The slight accumulation of enquiries that had been met with the day previous were mostly unworkable and disappeared. The disappointment resulting distinctly weakened the market. The reports to which Liverpool shewed itself so sensitive had no effect in Manchester; buyers were not stimulated into activity. Though quotations were in general steady, the business put through fell short of the requirements of the day, not carrying off the proportion of the reduction that should fall to a principal market day. The offers current were very little above those made when cotton was ½d. per lb. lower. On Wednesday the demand on both home and foreign account for American yarns was still slow, and prices the turn easier. Some slight increase of business in bundles for India and China took place. Yesterday brought forth no material change in any department. The cop yarn trade remained without the slightest animation. Bundles for the East continued in moderate request. Bolton yarns were firm with a moderate demand.

CLOTH.—Manufacturers have only found a moderate

enquiry for goods, and at the lowest prices current, which are extremely unsatisfactory, some few orders of small dimensions have been put through. Taken all round, however, the feeling at the condition of trade is exceedingly unsatisfactory, as, for all the recent advance, manufacturers cannot obtain more than ½d to 1d. per piece where they ought to have at the very least 2d. and 3d, and even then their margin will be far from satisfactory. It is very probable that were the general election not close upon us some strong steps would be taken in the way of endeavouring to effect some rectification of this unsatisfactory condition. Shirtings are very unsatisfactory, and though a moderate demand is met with, very little business can be brought to book. Lighter fabrics have been rather better. Printing cloths are steady, as are heavier classes of goods.

To day there is no improvement anywhere in any section of the market. Yarns are very slow, and cloth is flat.

WOOLLENS AND WORSTEDS.

BRADFORD.—There is no improvement in the condition of affairs in this market. The wants of spinners are few, and little business is done. Prices are weak and disappointing. Purchasers are waiting to see the result of London sales, which have so far disappointed those who expected values to follow this market. The new Irish wool on the market is being sold at lower rates than last year. The yarn business is much the same. Little new work is secured, though prices are steady. In some quarters there is increased activity, owing to the receipt of particulars for old contracts. The piece trade is still unsatisfactory, and prices are the cause of much complaint.

HUDDERSFIELD.—There have been very few buyers. The cold weather which came on in the middle of last week has checked the retail demand. The tendency of business is towards an improvement, but the progress made is necessarily slow. Some of the manufacturers engaged in the production of the finest qualities of worsteds in novelties are still very well engaged on orders, and are likely to be so for some time to come, and at fairly remunerative prices. Other manufacturers of the same classes of goods are only fairly well off for orders. In the Holmfirth district trade is not as brisk as it might be, but in the Colne Valley it is fairly so. The shipping trade is moderately well sustained for the Continent and South America, but for the United States business is dull.

LEEDS.—Buyers have mustered up exceedingly well. Most firms are only thinly stocked. Pieces are likely to be more remunerative to the manufacturers, as the raw material is easier to purchase.

LONDON.—Messrs. H. Schwartze and Co., in their report dated June 14th, say:—The third series of London sales of Colonial wool commenced to-day with catalogues comprising:—

	Bales.				Bales.
Sydney	2,834	out of an available total of			91,000
Queensland	2,309	,,	,,	,,	33,000
Port Philip	1,446	,,	,,	,,	56,000
Adelaide ..	659	,,	,,	,,	24,000
Tasmania ..	119	,,	,,	,,	12,000
Swan River.	167	,,	,,	,,	13,000
New Zealand	4,385	,,	,,	,,	136,000
Cape	851	,,	,,	,,	17,000
	12,770	out of an available total of			382,000

There was a good attendance of both home and foreign buyers and fair general competition. Australian merino wools, which were not very well represented, ruled for all greasy sorts on a par with the closing rates of last series; the better scoured shewed also no change, but inferior and faulty lots were rather easier. Of cross-breds there was a large selection, and some superior fine brands commanded full prices; the coarse Lincoln sorts, however, sold about 5 per cent. lower. For Capes there was good demand, and May closing prices were very firmly maintained. The fresh arrivals on the 21st ult. when the list was closed amounted to 425,932 bales (386,847 bales Australasian and 39,085 bales Cape). Deducting the quantities forwarded, but adding the old stocks, the total available amounts to 382,000 bales. This is 36,000 bales more than in June last year, but the excess will be fully counterbalanced by a corresponding minus in September. The trade, in fact, has already absorbed this season's increase, and the aggregate supplies for this and next series are not likely to be larger than last year, if indeed they prove as large. As at present arranged, the series will last till the 19th July. Bank rate 2 per cent.

GLASGOW.—Messrs. Ramsey and Company, wool brokers, in their report dated 14th June, say:—*Wool:* There is no new feature in the market this week. A fair amount of business has been doing, chiefly in black-faced. The new clip of hogs of all kinds is coming in freely now, and we anticipate a large show and a good sale on the 22nd. *Sheep-skins:* The supply is well kept up, and competition is fairly active, without buoyancy, for all sorts.

FLAX AND JUTE.

DUNDEE, WEDNESDAY.—The market is firmer for all jute products. There has been a large business done for South America, and the continued restriction of production does begin to tell. *Jute* indeed is no dearer: on the contrary, there are now eager sellers, who are naturally anxious to get out of stock before the new jute comes. There are, therefore, irregular quotations for jute, with a downward tendency. The quotations for new do not as yet induce business. *Yarns* are quite ½d. per lb. dearer all round. For 8lb. cop, done at 1s. 4d. ten days ago, 1s. 5d. is refused to-day. For yarns of fine quality the price is firm at, say, 1s 8d. for 7lb. Heavies, however, are being freely offered at 1½d. for 1 lea. Hessians are dearer, and little wonder. At recent prices the loss was so great that further stoppages of machinery were imminent. Since last week one other factory is silent. Unless, therefore, a slight rise is paid, hessian-makers refuse to enter forward. *Flax* is rather dearer, and fine tows especially are very firm at the recent advance. Flax yarns in the best warp qualities are firmly held, and a large business has been done this week. For the lower qualities, and especially in common tow yarns, prices are not firm—are indeed irregular. Linens are in fair request. Fife is busy in fancy linens, and Forfarshire, while glad to see new business, is fairly well employed at list prices. Arbroath in heavy canvas remains very dull. Dundee fancy jute goods are quiet, and except for new designs of the best makers' goods the prices are irregular. Twines and cords are in demand. Jute harvest twine especially, which is now found in every way suitable, is in active request.

BELFAST.—Yarns have sold fairly well, but transactions are restricted by the unwillingness of spinners to book ahead with any freedom. Prices are without quotable alteration, though where foreign flax is largely used spinners have withdrawn their lists. At present the market is strong, and business up to an average. Brown power looms have met with rather more enquiry, and producers have some pretty good orders on hand for crashes, canvas, etc. Diapers and damasks have gone off in regular lots, but the demand is not particularly brisk. Ballymenas and county Downs are bought up as offered, the production being extremely low and weavers scarce, owing to poor rate of wages. Linen and cambric handkerchiefs have been taken in much the same way as of late, the demand being extremely restricted. Union goods sell quietly, and are scarcely so active as recently. Cotton handkerchiefs are at present a large sale. Hand-loom damasks are moving regularly into consumption at late rates. Home trade in bleached and finished linens has not shewn the smallest development, being altogether retail in character.

LACE AND HOSIERY.

NOTTINGHAM.—Orders for lace goods are coming to hand rather slowly, and manufacturers are not fully employed. The home demand does not appreciably increase, and the export department is rather quiet, although up to the present the shipments compare favourably with those of last year. A fair amount of business is being done in the Irish guipure and purl laces, and a few firms are still busily employed in producing these goods. There is no great run upon any other description of fancy lace, and the production of some varieties has been considerably curtailed. Silk goods are only in moderate demand, and it is noticeable that the exports of these fabrics to France during the last few years have undergone a very rapid decline. The sales of Chantilly laces during the season have been disappointing, and are still small. A moderate enquiry prevails for veiling nets. Orders for silk Brussels and Mechlin nets continue to be placed slowly. There is very little alteration in the lace curtain trade. Buyers operate with caution, and many machines are only partially employed.

LEICESTER.—Accounts of the hosiery trade are favourable, and prospects are regarded as encouraging. Already some good orders for winter goods have been placed, and the sale of various specialities, such as Cardigan jackets, jerseys, gloves, etc., promises to be large.

SILK.

LONDON.—Messrs. Durant and Company, in their circular dated 8th June, say:—Since the public sales our market has been extremely quiet. All attention is now turned to the production of the new crops, of which so far the reports are fairly satisfactory; although the quantity of seed laid down in Italy is said to be considerably less than last year. The export of white silk from Shanghai is generally estimated at 60,000 bales, and the Japan crop is expected to be about the same as last year. But seldom has a campaign opened with stocks of the raw material on the Continent so much reduced, and considering the present extremely low range of prices, coupled with the very large Continental and American consumption, it seems as though the new season should be profitable both to the importer and consumer.

Arrivals in May.

Bengal	49	Bales.
China	428	,,
Japan	150	,,
Canton	32	,,
Tussah	10	,,

Joint Stock and Financial News.

NEW COMPANIES.

THOMAS SEWING MACHINE CO., LIMITED.

Registered by Gard, Hall and Rook, 2, Gresham-buildings, E.C., with a capital of £20,000 in £10 shares. Object, to acquire the undertaking of the Thomas Sewing Machine Company, hitherto carried on at 30, Aldersgate-street, E.C., and elsewhere, and to develop and extend the same. Most of the regulations contained in Table A apply.

PILLING AND CO., LIMITED, BURY.

Capital £5,000 in £10 shares. Object, to acquire the undertaking of cotton spinners hitherto carried on by J. Pilling, at Bury, in accordance with an agreement made between J. Pilling and this Company; and to carry on and extend the said business. The first directors are J. Pilling, J. H. Pickup, W. R. Ashworth, and T. Pilling. Qualification, 10 shares. Remuneration to be fixed. Registered office, Higher Mills, Freetown, Bury.

JAMES WALTON, LIMITED, BURNLEY.

Capital £25,000, in £10 shares. Object: to purchase and carry on the business of a manufacturer and merchant carried on by J. Walton, at Bishop House Mill and New Hall Mill, Burnley, and to adopt an agreement between J. Walton and J. Pickles of the other part. Subscribers:—

	Shares.
*James Walton, Burnley, cotton manufacturer	1
Mrs. S. Walton, Thornleigh, Burnley	1
*Wm. Walton, Thornleigh, manufacturer.....	1
R. Walton, Willow Bank, Burnley, manufacturer.....	1
*Walter Walton, 4, Elm-st., Burnley, manufacturer	1
*H. Walton, 55, Colne-rd., Burnley, manufacturer	1
*Jno. Walton, 169, Colne-rd., manufacturer...	1

The first directors are the signatories denoted by an asterisk; qualification £100; remuneration to be fixed by the company. Registered office, New Hall Shed, Elm-st., Burnley.

EDWARD ELSEY AND CO., LTD., NOTTINGHAM.

Capital £70,000 in £10 shares. Object, to acquire the undertaking of a lace manufacturer, hitherto carried on by E. Elsey at Russell-street, Nottingham, generally to carry on business as lace manufacturers, finishers, and merchants, bleachers, dyers, and dressers of lace fabrics, etc. Subscribers:—

	Shares.
E. Elsey, Wellington House, Nottingham	1
J. Sulley, Park-road, Lenton.....	1
J. Snook, Houndsgate, Nottingham.....	1
J. Renals, Pelham-crescent, Nottingham.....	1
G. Hoffman, Magdala-road, Nottingham.....	1
R. Steele, Cavendish-crescent, Nottingham.....	1
J. Bright, 1, Pepper-street, Nottingham	1

The first directors to be elected by the signatories to the memorandum of association. Qualification, 100 shares. Remuneration, £150 per annum each.

Patents.

SPECIFICATIONS PUBLISHED.

Each of the following Specifications may be purchased at the Sale Branch, 38, Currtior-street, London, for the price of 8d., or may be ordered on the Postal Request, price 8d., which is now on sale at all the principal Post Offices in the United Kingdom.

1891.

7,884 HINDLE AND OTHERS. Looms.

8,661 BRIERLEY. Looms.
8,946 EVES. Spinning yarn from flax.
10,189 WELDON AND HOLLAND. Lace and curtains.
10,633 BROOKES (*Draper*). Looms.
10,678 SUTCLIFFE, E. AND G. E. Dyeing and treating cotton, etc.
11,391 MITSCHERLICH. Textile fibres from wood.
11,649 ASHWORTH, G. AND E. Carding engines.
11,778 HATTERSLEY AND JACKSON. Looms.
11,882 POIZOT. Spinning spindles.
12,227 SCOTT. Carding machinery.
12,267 PICKFORD AND OTHERS. Spinning mule stop motion.
12,658 NETTLEFOLD. Binding bales of cotton.
13,039 HOLGATE. Looms.
13,844 BIRTWISTLE. Looms.
15,510 SUTTON, T. A. AND W. H. Label cloth.
15,770 BANHAM AND CO., LTD., AND BANHAM. Woven belting.
20,737 NEVILL. Designs upon calico.

1892.

2,355 RUSHTON AND BLADES. Looms.
2,373 BAILEY. Combing wool, etc.
5,784 CLEGG. Self-acting mules and twiners.
5,904 MORLEY, T. AND T. Hosiery.
7,030 DAILEY AND OTHERS. Horse blankets.
7,035 IMRAY (*Preston*). Stockings, etc.
7,184 KNOWLES, S. AND J. Printing sarees, scarves, etc.
7,457 DON. Banding hanks of yarn.

AMENDED SPECIFICATIONS.

8,886 (1891) NOTON. Opening and preparing cotton, etc.

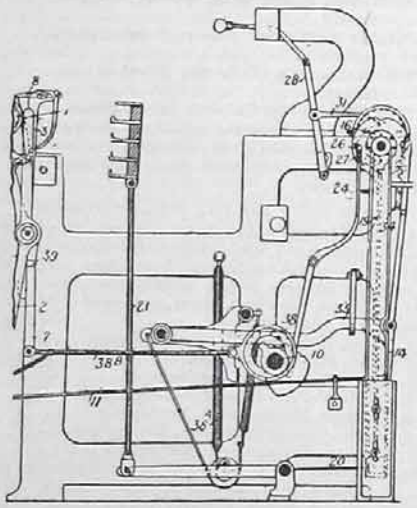
SECOND EDITIONS.

1891.

11,046 JOHNSON (*Badische Anilin and Soda Fabrik*). Basic dye-stuffs.
11,275 JOHNSON (*Badische Anilin and Soda Fabrik*). Rosaniline dyes.
11,629 JOHNSON (*Badische Anilin and Soda Fabrik*). Basic naphthaline colouring matters.

ABSTRACTS OF SPECIFICATIONS.

287. January 7, 1891. **Looms.** C. HAHLO, C. E. LIEBRICH, and T. HANSON, all of Mill-street, Bradford.



Change-box motions.—The box-rod 21 is operated through a lever 20 and rod 19, from a double eccentric mounted between two studded discs 16. The latter are turned, as required, by rack-rods or levers 14, which are moved up and down by a cam-worked broken-backed lever 35, and set by rods 11 from feeler-levers 2, 3, acted on by a card cylinder 1. The latter is turned by a pawl 8, on a lever 7 operated from an eccentric on the tappet shaft 10. An arm 39 on the lever 7 operates the levers 2, 3, in one direction, these levers having a spring connection with the eccentric rod 38B. A cam-worked forked lever 24 engages with pins, 26, to lock the discs 27 after each movement. The eccentrics may be reversed by pawls 31 operated from hand-worked levers 28, and engaging with ratchet wheels. The rods 14 are guided by pins thereon, which pass one side or other of guides 34. The discs may be further steadied by runners which rest in hollows in their peripheries. A spring 38A serves to balance the boxes.

348. January 8, 1891. **Spinning.** G. and E. ASHWORTH, Moss Brook Works, Collyhurst, and R. ASHWORTH, 26, Perth-street, Cheetham, both in Manchester.

Card-setting machines.—Relates principally to mechanism for feeding forward the wire and cutting off the required length thereof, and to mechanism for stopping the machine automatically when the supply of wire fails, or the staple is otherwise defective. The parts of the stop motion are so arranged as to be applicable to sheet card-setting machines, but a modification is described applicable to card-fillet setting machines. *Drawings.*

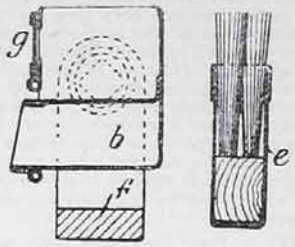
822. January 16, 1891. **Dyeing.** G. HOOLEY, 9, Sovereign-street, J. B. and J. E. GILHAM, Trafalgar Engine Works, Meadow-lane, both of Leeds.

Relates to stopping down or push ng down apparatus. Consists in a rectangular wooden frame or scray vertically reciprocated by oscillating levers, and moved horizontally by pins working in cam slots, and guided by weighted swivel cams. To prevent damage of the cloth by the scray the latter is allowed to overrun the winch in the first part of its downward course before pressing upon the cloth. *Drawings.*

857. January 16, 1891. **Dyes.** S. PITT, Sutton, Surrey.—(*L. Cassella & Co., Frankfort-on-Main*.)

Rosaniline series.—Relates to the production of violet or blue dye-stuffs of the triphenyl-methane group. Consists in the simultaneous oxidation of derivatives of diamido-diphenyl-methane and aromatic monamines. Dimethyl, or diethyl-dibenzyl-diamido-diphenyl-methane disulphonic acid, is first prepared by condensing ethyl-benzyl-aniline-sulphonic acid with a concentrated aqueous solution of formic aldehyde. The corresponding monosulphonic acid is obtained either by sulphonating the product of the condensation of formic aldehyde and methyl-benzyl-aniline, or by condensing together ethyl-benzyl-aniline-sulphonic acid, dimethyl-aniline, and formic aldehyde. The colouring matters are produced by oxidising a mixture of one of the above sulphonic acids, or of tetramethyl or ethyl-diamido-triphenyl-methane, with an aromatic monamine, such as dimethyl-aniline, benzyl-ethyl-aniline-sulphonic acid, diphenylamine, *m*-oxydiphenylamine, etc., by means of bichromate of potash or peroxide of copper salts. The formation of the diphenyl-methane derivatives and the oxidation with aromatic amines may be effected at one operation.

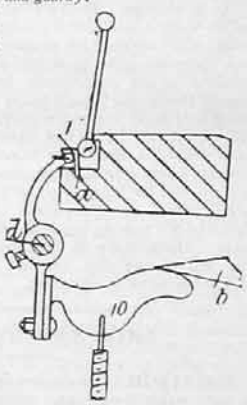
876. January 17, 1891. **Spinning.** A. TAYLOR, 19, Bold-street, Lower Rockliffe, Bacup, Lancashire.



Pasting cop bottoms.—The lower edge of the chamber *b* in the paste box, which receives the paste brush, is made to project further than the upper edge, and a casing *e* encloses the stock of the brush and a portion of the length of the bristles, thereby preventing the paste from running into the stock and the bristles from spreading more than is required. The box is provided with the usual sliding feed door *g* and guard *f*.

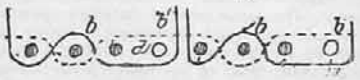
918. January 19, 1891. **Looms.** P. BRIMELOW, 54, Shepherd-street, Bury, Lancashire.

Loose-reed motions.—The reed case 1 is formed with a projection hinging in a groove *a* which runs the length of the lay, and is held up to the reed by spring duck-bills 10 on the stop-rod *d*, when such duck-bills pass beneath the heaters *b*. When the reed is pushed out the duck-bills pass above the heaters. The arrangements may be modified.



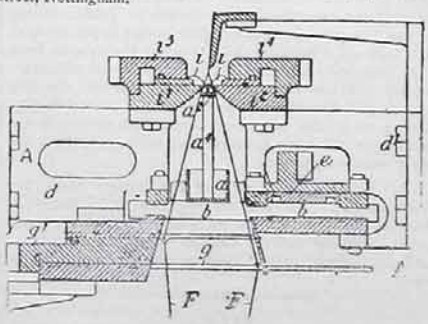
922. January 19, 1891. **Pile fabrics.** G. A. J. SCHOTT, West End Mills, Bradford.

Warp pile fabrics, produced either by the pile warp *b* being passed over wires and then cut, or by the double method, are



woven with extra weft picks *d*, above and below which pass all the binding warp and all the pile warp respectively. The threads *d* are afterwards pulled or drawn out by hand, the cut pile ends *b*1 being thus drawn through the ground to the back of the cloth, to form there a cut pile surface.

888. January 17, 1891. **Looms.** R. WEISS, 139, Noel-street, Nottingham.

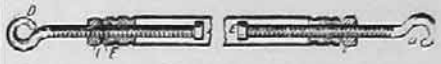


Circular.—The framing is formed by outer and inner supports A, A1 connected by radial and segmental stays and rings. Two or more pairs of curved shuttles *a* may be employed, carried and operated by radial jacks *b*, which slide in recesses in fixed rings carried by brackets *d*, *d*1. The jacks are formed with projections adapted to close against and press on the inclined ends of the shuttles to propel and guide the latter. The shedding is effected by radial guides *g* through which the warp is threaded. The necessary motion is imparted to the jacks *b* and guides *g* by grooved cam-rings *e*, *g*1, driven through certain gearing and shafting from a horizontal main driving shaft beneath. For beating-up curved-ended slides *i* are provided, reciprocating radially in rings *i*1, *i*2, under the action of suitably driven grooved cam-rings *i*3, *i*4. The warp threads are guided by teeth on the rings *i*1, *i*2, being divided and held between the same, whilst the slides are open, by the pointed end of a plate *a*2 carried by springs *a*4 on the shuttle. This plate has a guide-hole for the weft, and extensions, which run in notches in the slides *i*, to ensure the correct laying of the weft. The warp beams are supported in bearing on the supports A. The take-up consists of two rollers, preferably covered with roughening material to grip the fabric between them; one roller is driven by worm gearing, etc. The material is wound on a beam after leaving the rollers. In a modification, the jacks *b* may be formed to effect the shedding and beating-up, as well as the picking. The Provisional Specification states that the warp guides may be constructed so as to be controlled by jacquard action for pattern effects, and that they may be operated by levers or by wheels mounted on a central wheel or on arms; also that the shuttles may carry anti-friction rollers, and that they may be removed or inserted by making parts of the cams removable; also that the warp-beams may be connected by gearing to equalize the take-up, and that supplementary cam-worked guides may control the warp tension; also that the fabric as it is produced may pass over a fixed circular facing; also that the weft may be raised to assist the beat-up, by pivoted radial points or jacks. (*Patent not yet due for sealing.*)

945. January 19, 1891. **Knitting.** S. LOWE, 24, Bath Terrace, Robin Hood-street, Nottingham.

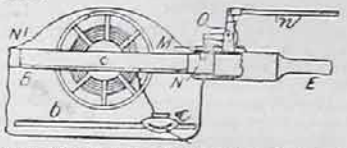
Straight-bar machines.—To increase the speed, two or more slur-cocks are employed in each division to indent the threads of a corresponding number of thread-layers. To obtain an even piece of work, the nebs of the jack sinker and dividing sinkers near the joining needles, are bevelled at the lower and upper edge respectively. *Drawings.*

968. January 20, 1891. **Looms.** G. D. SYKES, Upperhead Row, Huddersfield.



Healds, adjusting.—Relates to a connection between the healds and the cords, straps, etc., by which they are operated. The device consists of screw-threaded hooks D working in nuts F which are fixed in the tube E, lock nuts being provided at I. The parts are adjusted by turning the tube. The arrangements may be modified.

1,005. January 20, 1891. **Looms.** L. LETALLE, Beauvais, Oise, France.



In weaving chenille carpets the chenille is carried by a disc or bobbin in the shuttle B and passes through a guide *c* sliding in the groove of the plate *b*. The shuttle is moved through the shed by two slide-bars such as E, each of which carries a bolt M on an angle piece O, the latter being operated by bars *n* and fixed strikers so as to enter or leave the holes N, N1 in the shuttle at certain times, whereby the said shuttle is pushed part of the way by one rod and pulled the remainder by the other. The parts weaving the chenille are quite independent of the lay and of the usual shuttle-boxes, the latter being fixed. The chenille is beaten up a certain distance and brushed as described in the next paragraph, and is then beaten up fully, the lay being acted on respectively, through rods and levers from a cam and the crank shaft to effect the required beats up. The crank shaft is automatically disconnected to allow of the insertion of the chenille as well as of the ground weft, and the lay may be stopped by cam-worked bolts.

Pile raising in chenille carpet looms.—A rotating and reciprocating brush acts on the chenille when it is partly beaten up, and combs at each side of the brush shake the warp threads and make them sink into the chenille.

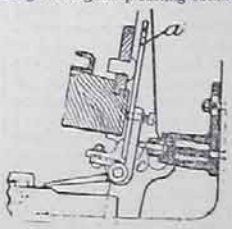
1,075. January 21, 1891. **Knitting.** W. HARRISON, 48, Upper Brook-street, Manchester.

Circular machines.—The needle cylinder is made of less depth than usual, so that needles of the same length can be used in the cylinder and dial. The latter is adjusted vertically by a screw near the socket end of the ribbing arm, the cam-shell and toothed ring being firmly held down by an annular lip at the lower edge of the needle cylinder.

The Provisional Specification states also that all latch needles may be provided with rollers at their butt ends, and latch-openers may be made to yield in order to avoid damage to the needles. *Drawings.*

1,102. January 21, 1891. **Perforated fabrics.** C. O. SCHNAUDER, Chemnitz, and E. B. SCHLEGEL, Borna, near Chemnitz, Saxony, Germany.

Relates to the manufacture of perforated stuffs which may replace curtains, coverlets, and the like. Caoutchouc is dissolved in carbon bisulphide and zinc white, or any white or coloured dye-stuff is added. The solution is then solidified and rolled into smooth flexible plates or sheets. Paper parchment may be employed in place of caoutchouc, glycerine being added in this case. For increased pliability glycerine may be added when caoutchouc is employed. The sheets are perforated and figured by passage between rollers, of which one is plain and of wrought iron, whilst the other is formed with an engraved or embossed design having sharp cutting outlines, and is of phosphor bronze. *Drawings.*



1,111. January 21, 1891. **Looms.** H. OTTO, Reichenbach a Fils, near Plochingen, Wurtemburg, Germany.

Stop-motions, shuttle.—The usual stop-rod spring of fast-reed looms is dispensed with, the tongue *a*1 being acted on by a spring buffer *c* until it is required to be free to swing by the entrance of the shuttle into the box. The shuttle has thus merely to overcome the weight of the tongue.