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## The Textile Mercury.

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Articles, Correspondence, Reports, Items of News, on all matters of novelty and interest bearing upon the Textile Industries, home or foreign, are solicited. Correspondents should write as briefly as possible, on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication, but as a guarantee of good faith. When payment is expected, an intimation to that effect should be sent with the contribution. The Editor will do his best to return intelligible MSS., if accompanied by the requisite postage stamps, but will not guarantee their safe return.

\* \* \* Readers at home and abroad are invited to avail themselves (gratis) of our columns, for the purpose of entering into communication with machine makers or others able to supply their wants, and for obtaining any other information on textile matters which they may desire. Their names will not be published unless requested.

All communications to the Editorial Department should reach the offices, 23, Strutt-street, Manchester, early in the week in order to receive attention in the next issue.

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### AMERICAN COTTON FOR BOMBAY.

We have several times drawn attention to the fact that Bombay is as favourably situated as this country for supplementing its native supplies of short-stapled cotton by the finer and better article grown in Egypt; and that, as a fact, experiments on a considerable scale are being made to spin fine yarns and manufacture jaconets and mulls, and the same classes of dhooties, with cotton from this source. We have also called upon manufacturers to make a note of the fact that the American trade had begun to draw supplies from the same source. But we have not until now had to report that the Bombay trade was coming to Liverpool for

American descriptions. Yet this is the case. Writing on Saturday last, the Liverpool market reporter of the *Manchester Examiner* gives the following:—"One peculiar feature of to-day's market has been the sale of 100 bales American cotton for shipment to Bombay, and at a slight further fall in values it is said some large orders will be put through for the same quarter. This gives some idea of the relative cheapness of American compared with other growths. About 18 months ago 1,000 bales of East Indian were shipped from this port to New York; now the operation is being reversed, and American shipped to India instead." This is a remarkable event, and a very suggestive one. It is also in the natural order of things. Those persons who have purchased and are shipping this cotton can doubtless see their advantage in the transaction, or they would not do it. It means one of two things—either that they can see their way to use it profitably on the yarns they are spinning or the goods they are engaged in manufacturing; or they mean to experiment with it to see if they cannot make those upon which the Lancashire mills are mainly engaged. Whichever it be, it ought to yield an important lesson both to Lancashire employers and operatives, and especially to the latter. They have ample means of knowing that the course of trade during the last few years has been anything but profitable; and yet, with the full knowledge of that fact, they have conspired to place upon it the onerous obligations of the new law which has just come into force, and which is, as it was meant to be, most harassing. It is useless to reply that this law has been procured to defend themselves against fraud on the part of employers, for the Act contains many clauses that are simply aggressive and harassing, besides those that are protective; whilst they had and have ample power in their hands for punishing employers who do not treat them justly. However, they have the consolation of knowing that they have imposed burdens upon their employers from which their rivals in India are free, and to that extent have incapacitated their employers from competing with English and other capital in India. The diminished trade that will be the consequence will chiefly be their loss, as they will, at an early date, find out. The money paid in wages in the cotton trade of this country far transcends in amount the sums allocated to the employers for profit, wear and tear, and interest upon capital. If a policy of this kind be wise it is based on a wisdom that far transcends the comprehension of ordinary mortals.

### CONGLETON: A RETROSPECT.

Our Special Commissioner, who has written the numerous articles on various silk manufacturing towns that have appeared at intervals in these columns, sends us the following notes on Congleton:—"There is much that is pleasant, but a good deal more that is sad, to be seen in connection with the history of the small cluster of quaintly built old towns lying to the east of the Cheshire Midlands. Of many of these I have already spoken, but a good deal remains to be said before the subject can fairly be regarded as thoroughly exhausted. As I write, the heavy tramp of a jaded hand-loom weaver returning from his daily task, commenced at daybreak, sounds, two hours before midnight, in the narrow passage which leads from the front of a little cluster of cottages facing one of the numerous streams whose waters eventually mingle with those of the Mersey. The tread of this toiler has served to awaken in my mind memories which carried me back to a period in the '70's, when the silk trade flourished in the valleys of the Bollin and the Dane. Old-fashioned Buglawton—the name is not a pretty

one I grant—then bore a much more consequential air than it does now; while amongst the wood and plaster of Congleton, a short distance away, the merry laugh of a well-employed populace bore testimony to the presence of an abundance of good cheer, which is said to be absent to-day from the board of our Cheshire silk workers. A brute of a French author wrote not long ago, after traversing some of the silk districts to the south of Manchester, that 'la vieille Angleterre est le seul lieu du monde ou les maris achètent leur femmes.' His remarks are supposed to have been made because of the poverty which he noticed in certain towns, which shall be nameless, which poverty was due to the decadence of a trade unable longer to hold its own in the face of Lyons competition. The statements embodied in the quotation must be taken with the contents of a full salt-cellar; but the hint they are supposed to convey is obvious. Matters are not so bad in Cheshire as M. D'Aubigny would have us believe. New industries have risen up in the county as others have declined, and the productive capacity of the factories, works, and 'soaperies' of the district are probably in excess of what was seen at any previous period of its history. There have, however, been many changes in connection with the textile history of Cheshire. Knutsford, for instance, could once boast of a thread factory; and woollen goods were formerly produced extensively in the county. Gloves, too, were important items in the sum total of its output. Of the silk centres, one must of course admit that the trade survives; but, taking Congleton as an instance, who would care to speak, as men once spoke, of the 'handsome mansions of the opulent manufacturers, surrounded with shrubberies and ornamental gardens?' There are shrubberies and gardens enough, even yet; but somehow one does not hear of 'opulence' in the old place now. O'ld Ormerod tells us that Congleton once had twenty-eight manufacturers of ribbons and other silks. Black silks, twenty years after the time of which Ormerod wrote, were the principal feature of the trade of the town; while its output of throws exceeded that of Macclesfield, although the total turnover was then, as now, inferior. At its best the Congleton trade did not employ much more than 5,000 hands, a number far below that of Macclesfield in the prosperous days of 1841—51. The number now is not much, if any, above 1,500 operatives, who are engaged in throwing and spinning, as well as in the manufacturing of ribbons, trimmings, crapes, bindings, galloons, and gauzes. There are, in addition, three towel manufacturers, one of whom has about 60 looms; and at Buglawton, close by, the employers include a couple of towel firms, one throwster, and one trimming manufacturer. The Beeches of the district have disappeared entirely from the ranks of the trade, as far as we have been able to ascertain, and the Johnstons, Brooks's, and Hunters have also gone. Of names still known in connection with the silk trade of Congleton, the following carried on business half a century ago as manufacturers of ribbons:—

|                         | Power Looms. |
|-------------------------|--------------|
| Messrs. Pearson .. .. . | 100          |
| " Read .. .. .          | 30           |
| " Barton .. .. .        | 9            |

Just previous to the period of which I have spoken, the trade was in a depressed condition, speculation being at a standstill, and new works not being erected with noticeable frequency. There are something less than a dozen throwsters in the district now, as against forty previous to the French Treaty. Cottage weaving can scarcely be said to exist, and there is no dyeing worthy of the name to be found in the town. Between 100 and 200

power looms are running on sarcenets, trimmings, and other smallwares at the present time—a small number compared with those at work in 1840, when 254 power looms ran on plain ribbons alone. Engine weaving by hand was, in addition, carried on by means of 100 looms, which was about the number of the broad silk looms remaining in those days, the trade having gone to Macclesfield. Bandannas and twills for pocket handkerchiefs were chiefly manufactured; and there were altogether about 200 hand-loom weavers to 250 power-loom operatives. The abolition of the 12½ per cent. duty on foreign ribbons proved disastrous to the Congleton ribbon trade, and the throwing trade, as has been shewn, declined also with much rapidity. A few firms now manipulate *schafpe* yarns, but the ribbon trade, once the great staple of the place, has fallen off to a shadow of what it once was. Mills formerly used as silk factories have in many cases been taken over for the purposes of the fustian trade; but the depression in the latter industry has again set the town back.

#### CONGLETON TO-DAY.

"There is really little to add in connection with the position of Congleton to-day as a manufacturing centre. The population of the town has been almost stationary for half a century—ever since the period, in fact, when its manufacturers were furious at the plunder of their bales of silk *en route* by canal from London. It is not intended to suggest that this plunder (which took place chiefly at Stoke-upon-Trent) had anything to do with the decline of the trade. The condition of the Congleton operatives has seldom been spoken of favourably in comparison with other centres. Many Irish formerly came into the trade, until the decline of the Dublin industry, when the supply of skilled workers from across the St. George's Channel naturally fell off. Sarcastic critics like Mr. John Newman, once an undertaker in the town, said that the men kept sober overnight in the old days, because they had to commence work at 6 a.m. in order to effect a livelihood—a remark which might be applied to the workers in the mills to-day. Many of the best workmen in the earlier days took pride in the wasteful spending of their extra earnings, which they regarded as proof of their superiority. Strikes, which have taken place frequently since 1860, have as a rule resulted in favour of the employers. The condition of the operatives has perhaps altered slightly for the better during the last few years; but altogether the improvement is extremely small. There seems to be no cohesion amongst either employers or employed, and a lamentable lack of public spirit characterises the town. Congleton cannot now claim to attract notice because of the absence of uniforms amongst its policemen; for even the privilege of dispensing with these has during the past few years been taken away."

#### THE LOW PRICE OF COTTON.

Considering the low range of value now ruling for cotton, it may be worth while to put upon record for easy reference by those interested the result of investigations by a well-informed writer in the columns of the *Manchester Guardian*: "The low range of prices now reached in the cotton market has naturally drawn attention to former occasions when quotations have been similarly depressed. Frequent references have been made during the week to the year 1848, when American cotton was even cheaper than it is now. In that year the average price of middling upland in Liverpool was 393d. per lb. The lowest point, 34d. per lb., was touched in October, but the price remained there for only a fortnight. A reaction set in at the beginning of November,

and at the close of the year 4d. per lb. was reached. The next stage of the recovery began at the end of January, 1849, and on February 16 the quotation was 4½d., but in April a relapse to 4d. occurred on the outbreak of war between Germany and Denmark. Shortly afterwards, however, there was a rally which carried the price to 5d. on August 10. Thenceforward the upward movement was almost continuous, and at the end of the year the quotation, after reaching 6½d. in November, was 6¾d. In 1850 the rise went on with little interruption until the close, when middling upland stood at 7½d., middling Orleans being at the same time 7½d. per lb. For the latter quality the lowest price—that of October, 1848—was 3½d. per lb. The causes of the great depression of that year were not excessive supply or large accumulations of stock. It arose from the prostration of credit occasioned by the great 'railway panic' of 1847 and the outbreak of the French Revolution. The only other instances on record of a fall in the cotton market to the present low level occurred in 1843 and 1844. At the end of June in the former year middling upland dropped from 4½d. per lb. in January to 3½d. at the end of June. In the same interval middling Orleans declined from 5d. to 4d. per lb. A recovery began, however, in the third week of July, which carried the prices at the end of the year to 5d. and 5½d. for the two qualities respectively. In 1844, however, however, a renewed decline set in, which brought down prices again towards the close of the year to the lowest point of 1843, from which there was no substantial recovery during 1845, the quotations being once, indeed, during that year ½d. per lb. below those of June, 1843. In 1846, however, a permanent advance occurred, middling American having reached 7d. per lb. at the close of December. The low prices of 1843-5 appear to have been mainly occasioned by large crops of American cotton and accumulations in Liverpool. The maximum stocks at that port during this period were 997,414 bales in 1843, 998,500 bales in 1844, and 1,067,000 bales in 1845. The average prices of middling upland and middling Orleans during these three years were:—in 1843, 4'37d. and 4'5d.; in 1844, 4'71d. and 4'91d.; and in 1845, 3'92d. and 4'31d. per lb."

#### CHANGES IN THE CARPET TRADE.

A short time ago the *Kidderminster Shuttle* referred to some remarks in *Bentley's Gazetteer, Directory, and Statistics for Worcestershire*, of about 50 years ago, in which it was stated that there were at that date "twenty-five highly respectable houses" engaged in the manufacture of carpets in the town. The total number of hand-loom weavers at their disposal was 1,975, of which number 1,726 were Brussels looms, while 209 were employed in the manufacture of Scotch and forty of Venetian carpets. These afforded altogether employment for 5,925 men, women, and children. "The population of the town in 1801 was 6,810. In 1821 it was 10,709, and in the suburbs called the 'Foreign,' 2,043; and in the chapelry of Lower Mitton, 2,044; making 15,296 in those parts of the parish. In 1831 the population of the town and parish was 20,865," and was estimated by the compiler at about 23,000 at the time the directory was published. The twenty-five "highly respectable carpet houses" were as follows:—

Barber and Cole, Church-street; Bough, T. and J., Pitt's-lane; Brinton, Henry, Vicar-street; Butcher, Worth, and Holmes, Mill-street; Dixon, H. J. and John, Mill-street; Dobson and Sons, Church-street; Gough, J. and Sons, Church-street; Hiles, Joseph, Mill-street; Hopkins, Thomas, Wharf-hill; Humphries and Barratt, Vicar-street; Humphries, T. and J., Vicar-street; Kiteley and Fawcett, Mill-street; Lea, G. and Co., Callows-lane; Een and Co., Mill-street; Morton and Co., Vicar-street; Newcomb and Son,

Church-street; Parlee, Hoomans, and Co., Worcester-street; Robinson, G. and H., Church-street; Stoddard and Boycott, Church-street; Talbot, G. and H. and Sons, Mill-street; Watson and Son, Church-street; Woodward, Henry, Church-street; Woodward, B. H. and Co., Church-street; Woodward, Gandell, and Co., Church-street—warehouse, 17, Skinner-street, London; Wright and Crump, Vicar-street.

Of the firms in this list only four—Dixon's, Brinton's, Morton's, and Humphries—can trace a continuous existence to the present time. The firms named employed about 4,000 hands in 1840, of whom about one-half were men. The period referred to was not altogether satisfactory to the workers of the town. Many of the operatives, in fact, turned to field work, while others left their native town to seek employment in the North, some being engaged at Messrs. Henderson's factory at Durham. The Royal Pile was then the dearest fabric produced in Kidderminster, both material and labour being above the average, although in proportion the goods were only a one-eighth to the rest of the Brussels trade. It is an interesting fact to remember, seeing that the North is now such a powerful centre, that even in those early days the Kidderminster weavers generally migrated in this direction during times of trouble; although, according to local evidence at the time, there was no place in which better wages could be obtained. The changes that resulted after the power-loom had become the ruling factor in the carpet trade are in few cases illustrated so strikingly as in connection with the loss of the American market to English manufacturers. Statistics shew that in the carpet industry the foreign trade has not held its own. Since 1866 we have, it is true, increased the quantity of our shipments largely, but the value has decreased. Taking the exports to all countries for the purposes of comparison, we find that for 10,513,000 yards shipped last year, a less price was paid than for 6,673,000 sent abroad in 1866. Of the last-named quantity more than half, or say 3,350,000 yards at least, went to the United States. Last year we only forwarded 769,000 yards to the Republic, and even these figures shew a decline on those for the two preceding years, which were 1,066,100 and 996,700 respectively. What proportion Kidderminster contributes to this total cannot exactly be stated; but according to U.S. Consul Jarrett's last return, the exports from the Kidderminster Consular Agency during the December quarter of 1891 amounted only to \$7,861. This, of course, cannot represent the total, as many carpets are shipped through Manchester and London houses. Considering that the shipping trade has declined so much of recent years, it is a matter for surprise that it is maintained at its present level. The only manner in which this can be accounted for is by suggesting that the home trade has grown. One certainly sees more carpets now in the homes of the people than was the case a few decades ago.

#### COTTON SPECULATORS LOOK OUT.

There exists in the minds of many people a strong conviction that speculators, as they are known in our various markets, are an unmitigated evil, and there are persons who would be glad to see them suppressed. Senator Washburn, of Indiana, is evidently one of these. That gentleman has introduced into Congress a bill prohibiting dealings in "futures" in regard to agricultural products, which is interesting for its attempt to define "futures." This is done by section 2, which provides "That for the purpose of this Act the word 'futures' shall be understood to mean any contract or agreement whereby a party agrees to buy, or agrees to sell and deliver at a future time to another, any of the articles mentioned in section 3 of this Act, when at the time of making such con-

tract or agreement the party so agreeing to make such delivery, or the party for whom he acts as agent, broker, or *employé* in making such contract or agreement, is not at the time of making the same the owner of the articles so contracted and agreed to be delivered, or unless the articles so contracted to be sold and delivered shall subsequently be actually delivered to the purchaser for manufacture or consumption; provided, however, that this Act shall not apply to any contracts or agreements for the future delivery of any of the said articles made with the United States, or any state, county, or municipality, or with the duly authorised officers or agents thereof, nor to the contracts or agreements made by farmers for the sale and delivery of any of the articles aforesaid, which are in actual course of production by such farmers at the time of making such contract or agreement." The other sections relate to penalty, licence, tax, etc., and practically prohibit dealing in "futures" of wheat, corn, oats, rye, barley, cotton, and all other farm products; also pork, lard, and all other hog products. In view of this projected enactment, it will be desirable that that portion of the fraternity which devotes its attention particularly to cotton should be setting their houses in order and making their wills.

#### THE WOOL PRODUCTION OF THE WORLD AND ITS CONSUMPTION.

It is fair to infer from obvious facts that the world is better clothed to-day than ever it was in its history before. When we consider the two great raw materials of clothing, cotton and wool, and the amount produced of each of these, even if we leave out of the reckoning the remaining fibres, hairs, and downs, vegetable and animal, that are used for this purpose, the fact becomes incontestable. In cotton alone the enumerated and unenumerated growths cannot possibly be less at the present day than the equivalent of 12,000,000 bales per annum, which, in the shape, mostly, of clothing, are mainly divided between the warm and the temperate regions of the world. But the increase in the production of wool demonstrates our statement perhaps more powerfully still, and this, in the main, is consumed for clothing purposes in the temperate and colder countries of the earth. A recent report by the French Chamber of Commerce at Constantinople states that the wool production of the world amounted in 1890 to 882,576,000 kilogrammes (kilo. = 2.204 lb.), of which 62,652,000 kilogrammes were produced by England, 204,300,000 kilogrammes by the European continent, 146,188,000 kilogrammes by North America, and 469,436,000 kilogrammes by Australia, the Cape, and La Plata. The world's wool production was greater in 1889 than in 1890, the amount for the former year being over 926,000,000 kilogrammes. In thirty years, from 1860 to 1890, the Australian production rose from 27,000,000 to 232,000,000 kilogrammes; that of the Cape from 8,000,000 to 41,000,000; and of La Plata and Uruguay from 15,000,000 to 123,000,000. France, in 1890, consumed about 64,000,000 kilogrammes of Australian wool, representing 425,000 bales—that is to say, more than a quarter of the total production of Australia and New Zealand. The United Kingdom alone consumes a larger quantity of these wools. In 1890 the total production of La Plata and Uruguay was estimated at 130,000,000 kilogrammes, not including the wool and skins of slaughtered sheep. Of this wool France takes 64 per cent., represented by a quantity of 205,000 bales. France, therefore, imported in 1890 168,000,000 kilogrammes of wool in the grease or washed, of which 64,000,000 was Australian and 82,000,000 kilogrammes La Plata wool. The remainder, 82,000,000 kilogrammes, represents wool of

European origin and common wool from Africa and Asia Minor. These 168,000,000 kilogrammes, with an approximate value of £14,000,000 sterling, do not, however, represent the whole quantity consumed in the country, as no account has been taken of the French clip and the wool of imported sheep. Taking all these into consideration, it may be stated that France consumed in 1890 for her industries over 240,000,000 kilogrammes of wool—more than a quarter of the entire wool production of the world. With this evidence of her competency to manufacture and hold her own against all competition, surely our neighbours might have got along fairly well without their last appeal to their political rulers to protect their home market from the aggressions of their neighbours.

#### GERMAN COLONIAL COTTON.

The principal market for cotton on the Continent is at Bremen, and the 980,000 bales which Germany obtains annually from abroad mostly pass through that town. The extent of this German cotton trade may be estimated from the circumstance that the United States alone sell yearly to the amount of £5,300,000. It would, therefore, be an enormous advantage for the German Empire if her manufacturers could get their cotton from the German Colonies. As already indicated in these columns, a few faint efforts are being made in that direction, and on these some Germans are beginning to build castles of hope. For several years bales of cotton from the German Colonies have been arriving in ever increasing quantities, and of a quality which is highly esteemed by the dealers of Bremen. The first cargoes came from Kaiser Wilhelm's Land in New Guinea. The chief cotton place in that district is Stephansort, where the South Sea explorer, Kubary, has in hand the management of a cotton plantation. By the side of these goods can be placed specimens from Togo and the Cameroons, which are very satisfactory. The principal station in the Cameroons is Barombi Station. In consequence, the Imperial Government have commissioned the gardener Goldberg, who has been occupied with cotton planting for many years on the Samoa Islands, to help the colonists in Togo and the Cameroons with his experience.

#### SERICULTURE IN GERMANY: PROFESSOR HARZ'S EXPERIMENTS.

The experiments of Professor Harz, of Munich, in the rearing of silk-worms by other means than the leaf of the mulberry, have already been noted in these columns, but the subject is sufficiently curious and important to justify further reference. The Professor has recently published a pamphlet on the question, from which the following details are extracted. The plant employed is that called in German *Schwarz-wurz*, or comfrey. The results of feeding with this plant for 1889 were as follows:—About 9,000 eggs had been obtained, which were hatched in the incubator at 25° C., and the 2,700 worms which emerged in the first three days were taken for rearing purposes. Although cold and damp weather and want of food exerted an unfavourable influence, yet Harz obtained, after an interval approximate to that usually observed when the worms have been fed by mulberry leaves (33 days), 755 cocoons, the threads of which could be easily reeled, and which, in length and durability, were equal to those obtained by ordinary means in an average harvest. Thus, after four years of uninterrupted breeding, he succeeded in accustoming the genuine silk-worm to the exclusive use of comfrey, so that the worm has increased thereon, and supplied the cocoon filament in a condition which equals that

obtained when mulberry leaves are employed. The cocoons obtained in the fifth breeding year, 1889, in most instances left little to be desired as to magnitude and weight. The largest weighed 1.39 grammes, and the thread attained a length of almost 300 metres, while its diameter coincided exactly with that of the original Milan thread, and it possessed almost the same tenacity, breaking with a weight of from five to six grammes; also the gloss of the silk fibres was exactly that of the normal thread yielded by worms fed on mulberry leaves. The last breed, that for the present year, exhibits fresh progress, Professor Harz reporting that 34.2 per cent. of the worms, which, as before, had been exclusively fed with comfrey leaves, yielded normal cocoons. While the heaviest for previous years weighed 1.39 grammes, those of the present year have a weight of 1.83 grammes, and their thread harmonises completely as to gloss and tenacity with the usual product obtained by means of the use of mulberry leaves. The period of incubation amounted to from 39 to 47 days. These interesting experiments thus appear to promise very important results.

#### SERVIAN CARPETS.

The principal seat of the Servian carpet industry is Pirot, well-known from the Servian-Bulgarian war. In the time of the Turkish rule, almost the whole female population of the city, which numbered about 10,000 souls, was occupied with the manufacture of carpets. Now, however, as the well-to-do nobility and the Mohammedans, who were the chief customers, have left the place, and Customs arrangements have shut off the land from Bulgaria and Turkey, there are only about 900 persons who are engaged in this branch of industry. An interesting circumstance in the preparation of the Servian carpets is the fact that there exists a certain code of patterns, a traditional nomenclature of design, which is transmitted orally from the mother to the daughter and the granddaughters. Usually five females workers have to work hard at a carpet of moderate size for 18 to 20 days; and on the average each worker earns 40 to 60 centimes per day. These low wages are only explicable by the great contentedness of the Servians, who live mainly on bread and cheese. The mother of the present King founded the Pirot carpet-industry fund about six years ago—an institution which has proved very beneficial to the country.

#### THE SEWING THREAD TRADE.

Of late disquieting rumours have been current concerning the position of the cotton thread industry, several leading members of which combined a few years ago for the purpose of uniting their various selling agencies, and economising, in other ways, by reducing the number of travellers, curtailing office expenses, and so forth. The title of the combination at first was "The Sewing Cotton Agency," afterwards changed to The Central Agency, and its members included Messrs. J. and P. Coats, Limited, Clarke and Co., Limited, Jonas Brook and Bro., and Lister and Co.—the latter firm placing its sewing silks with the home trade through the machinery for distribution thus created. The arrangement was a most sensible one in its way, economies of great importance being obviously rendered possible. It is plain, however, that any concern becoming dissatisfied with their turnover would find it difficult to adopt special measures for the purpose of extending their connection without falling foul of the others. Rumour has it that one concern has actually found this out at last, and that a reduction in quotations, with the object of increasing the turnover, has created a split in a hitherto happy family. This report, we

may as well say, has been flatly contradicted, the assertion being put forward that nothing had been done without the consent of the others. The fall in the quotations of Coats's shares was at the same time explained by the assertion that the directors had decided not to pay interim dividends—a step which has met with the general approval of experienced men. There is strong reason for believing that Messrs. Coats's have decided upon a substantial reduction in quotations. This can be done without difficulty, owing to the cheapness of cotton. It is not known, however, whether other firms will make similar reductions. If they do not, the great Paisley house will be able to seize all the trade—a proceeding which will not be permitted, of course, by their competitors. At the same time, if other members of the Agency disapprove of the reduction, the organisation will be broken up, and competition of a more serious nature than ever will set in.

#### THE TEXTILE INDUSTRIES OF SPAIN.

When we consider the reputation that Spain anciently attained for her textile manufactures during the time that the Moors ruled the country and the religion of Islam was its creed, it cannot be said that the existing condition of such manufactures shews much progress. Like everything else in Spain, manufacturing as then pursued went down in decay, owing to the diversion of men's thoughts to the fortunes to be attained in the lands beyond the horizon of the Western seas which Spain had discovered and annexed. These discoveries formed the climax of her power and the beginning of her decay. Her downward course was rapid, and in the early years of the present century she reached a point where it looked as if early extinction was her destined fate. With the destruction of the power of Napoleon she began to have rest, until dynastic quarrels within her boundaries again threw her back. Through all this troubled period the mechanical industries originated and developed in this country, though introduced into the Spanish provinces, had small chance of taking strong root and flourishing. All the surroundings were to a large degree uncongenial. Still they got a slight position, and the domestic peace of the past few years has done something to aid their development. Nearly all the textile industries are represented, though one or two are only so on the minutest scale. The manufacture of cotton goods, which is almost confined to Catalonia, is constantly growing. The principal factories are located in Barcelona, Mataro, Esparraguera, Sans, Granollers de Valls and Villanueva y la Geltru. There are others of less importance out of Catalonia, such as those of Valladolid, Saragossa, Cavada, Malaga, and Guipuzcoa. The manufacture of knitted goods is confined to Barcelona, Mataro, Esparraguera, and Reus. The manufacture of woollen goods has six principal centres—Catalonia, Alcoy, Bejar, Ezcaray, Antequera, and Palencia. In Caceres, Toledo, and a few other cities, there are also factories of some importance. The principal silk factories are in Valencia and its province, and in Murcia, Seville, and Almagro. Hats are made in all parts of Spain. Most of the hemp of Spain is exported, but some of it is used in the manufacture of matting, among which that of Crevillente is well known. The canvas made of this hemp is used in the manufacture of shoes, and is an industry of some importance in Southern Spain. The country has just adopted a rôle of high protection, and it is possible that this may stimulate the growth of the textile trades, at the expense of some of those of much more intrinsic importance to the welfare of the country. This course has been mostly adopted out of a spirit of retaliation to France, which by the steps it has recently

taken has not only commercially isolated herself, but has evoked a feeling of dislike amongst all its Continental neighbours that will not be soon nor easily allayed, and which may prove of serious disadvantage in the struggle with her great rival, which it is well known she has determined to provoke. It is always better to make friends than enemies, but this is a truism France seems not to know, or at least to heed. Already she is at commercial war with Germany, Switzerland, Italy, and Spain, whilst the same condition with this country is latent, and could easily be rendered active. It is not improbable that Spain will accede to the commercial union of the Triple Alliance, and, if so, this will soon be followed by her adherence to its political engagements. When will nations insist upon their rulers seeking to advance the welfare of the community rather than the gratification of party and personal ambitions? The time for this ought to be nearly due.

#### LORD SALISBURY AND OUR FOREIGN COMMERCIAL INTERESTS.

Lord Salisbury has not attained his present distinguished position in the world of English politics without the display of signal ability. As Lord Robert Cecil he attracted attention in the House of Commons, when sitting for the family borough of Stamford, by the incisiveness of his logical power, and the biting nature of his sarcasm. Mr. Disraeli, his leader and model in many respects, characterised him as a master of "flouts and gibes." In his capacity of Secretary of State for India, as the colleague of Mr. Disraeli at the Berlin Congress, and as Secretary of State for Foreign Affairs in 1878-80, he displayed great ability, such indeed as even to win the confidence of opponents in the conduct of his department. So conspicuous were his qualities that his accession to the leadership of the Conservative party was perfectly assured. Since then, the party to which he belongs, as is admitted on all hands, has been led with distinguished skill and success. With increasing years and the responsibilities of office Lord Salisbury has developed a degree of circumspection, carefulness, and skill of fence and defence, that make him a most dangerous opponent in both verbal debate and political negotiations. In the latter field, which is the most serious and important of all, there are few living politicians either on the Continent or in America who have ventured into the arena of contention with him that have not gone down before him. And critics at home fare little or no better when they challenge his course of action, or try a fall with him.

An instance illustrating the latter statement has just been made public. The African Trade Section of the Liverpool Chamber of Commerce, feeling that the commercial interests of this country were being greatly endangered by French aggression on the West Coast of Africa, sent a deputation to Lord Knutsford, secretary for the Colonies, shewing how, both already and prospectively, English trade had been and would be further injured by the cession to France of the Northern rivers of Sierra Leone and the island of Matabong, and desiring that steps should be taken for its effectual protection. This was a sentiment deserving of every respect, and one in which all the commercial interests and manufacturing industries of the country will coincide. Lord Knutsford, however, soon put the saddle on the right horse by informing them that as to the loss of trade resulting from the cession to France of the northern rivers, the Government in coming into office found that a convention had been made in 1882 by their predecessors, by which that territory, including Matabong,

had been ceded to France, and that England had since 1882 recognised that island as a French possession. The arrangement, though not ratified, had been considered as binding. Very naturally the deputation was quite taken aback at these statements, regarding them as profoundly disappointing, since they practically conveyed the intelligence that nearly the whole of the interior of Africa westward of the districts of the lower Niger had been abandoned to foreign influence.

The above was bad enough, but worse was to follow. In reply to the resolutions adopted by the Chamber, and forwarded to Lord Salisbury, the Premier went into the matter most thoroughly. And the subject not being in the domain of party, we have pleasure in reproducing it as a specimen of his lordship's trenchant style. The following is a copy of his communication:—

Foreign Office, December 30, 1891.

Sir,—I am directed by the Marquis of Salisbury to acknowledge the receipt of your letter of the 18th inst., including a copy of the resolution passed at a special meeting of the council of the Chamber. I am to observe that his lordship, while recognising that the council in adopting this resolution had in view the interests of British trade, finds that in its anxiety for those interests it has failed to give due weight to historical facts, and to the universally admitted rules as to the rights of nations. In the keen competition for acquisitions in Africa Great Britain has taken a leading part. She has successfully established her claims over vast and important territories in East, South, and West Africa. But other countries have also shewn exceptional activity. She has not had the monopoly of treaty-making and of declarations of protectorates. This fact is apparently unwelcome to the Chamber, for the resolution seems to claim that wherever on the African Continent British enterprise has established trade connections, direct or indirect, there the British flag should fly, or, at least, foreign flags should be excluded. The resolution speaks of the consent of her Majesty's Government to the placing of certain countries under the influence of France. This phrase implies that independent countries in Africa cannot pass under the influence of a European Power without the assent of Great Britain. Such a doctrine is unknown to the law of nations, the practice of which is correctly interpreted in the 34th Article of the Act of Berlin, wherein it is recorded that any Power taking possession of territory on the coast of Africa shall notify the acquisition to other Powers, "in order to enable them, if need be, to make good any claims of their own." The Chamber will observe that assent is not necessary to the acquisition of territorial rights; that its absence does not invalidate them; and that the only ground of protest is a claim to a prior title. Having dwelt on these important considerations, I am to reply to the special questions with which the resolution deals. (1) It is objected that her Majesty's Government has confirmed the cession to France of the northern rivers of Sierra Leone, including the island of Matabong. To this I am to answer that in doing so her Majesty's Government were only acknowledging an unquestionable title. In order to remind the Chamber of the facts a copy is annexed of the convention of June 28, 1882, in the form in which it was published in the *Journal Officiel*, of the 28th of March, 1882. It was in 1882 that the arrangement was made to which the Chamber demurs. It is true that the convention was not formally ratified by the French Chambers, but it is equally true that from the date of its signature it has been accepted by both Powers as a binding arrangement. The desire of the Chamber properly interpreted is that her Majesty's Government should have obtained a revocation of the arrangement. The reply to this is that the assent of both Powers would have been necessary to the revocation, and that there was no hope of obtaining it. It is evident that if the conditions of the convention had not been formally confirmed in 1889 they would, nevertheless, have lost none of their force. In this respect, therefore, her Majesty's Government are in no way responsible. (2) That the resolution complains that her Majesty's Government are "practically consenting" to the placing under French influence of territory behind Sierra Leone and Liberia. I have shewn that the assent of Great Britain is not necessary to France. She has no prior title. The question at issue is whether the territory has actually been placed under the influence of France. The Chamber has, it is stated, good ground for believing that the African chiefs who have signed treaties with France regard them merely as trade treaties. It is to be feared that this belief, if well grounded, does not affect the treaties if the colouring given to them by the natives is correct. Her Majesty's Government have not let the treaty between Colonel

Gallieni and the Almany Samado of March 23, 1887, pass without careful examination. The following is its principal article:—"L'Almany Samony, Emir-el-Moummenin, se place, lui, ses héritiers qui sont dans l'ordre de primogeniture et ses états, présents et à venir, sous le protectorat de la France." Another article stipulates for reciprocal freedom of trade. There is no provision for monopoly nor for exclusion of foreign trade. The treaty speaks for itself. It is not invalidated by the fact that its terms may now be unpalatable to the chief. It is not the fact that her Majesty's Government have neglected this territory. The Chamber must be aware of the mission of Major Festing to Samadoo in 1888, which, unfortunately, resulted in the death of that able officer; but it will observe that at the date of that expedition the bargain with France had been struck by the chief. The resolution complains of the extension of the influence of France over the Kroo coast lying between Liberia and Grand Lahou. My previous observations meet in the main this grievance. Great Britain had no prior rights and, consequently, no ground for protest. The territory adjoins the French possessions, and is isolated from those of Great Britain. It is presumed that the Chamber would hardly say that this country should in the past have assumed the responsibility and expense of erecting a savage, harbourless country, under the geographical conditions of this coast, into a British colony. Not having done so it has no preferential title to advance. In the preceding observations his lordship has endeavoured to place the questions raised by the Chamber on their true ground. Having done so, he is able cordially to assure the Chamber that, though he cannot undertake the impossible task of interfering where he has no international ground for interference, nor of negotiating commercial treaties with chiefs who have voluntarily placed themselves under the protection of a foreign Power, he will never swerve from efforts to protect British trade and to secure its sources. This was the object of the arrangement recently concluded with France, and his lordship trusts that the Chamber will, on reconsideration, recognise that, though it did not realise the hopes of those who object to any interference with British trade, it secured as many advantages as it was possible to obtain under existing conditions.—Yours, etc., T. V. LISTER."

Whilst admitting the unanswerable nature of this communication upon the basis his lordship lays down, we venture to affirm there is still room for something to be said in reply to, and in protest against, what has taken place. In relation to the historical facts to which his lordship refers, namely, the cession of the Northern rivers of Sierra Leone and the island of Matagong to France by the Gladstonian Government, we admit that though a serious blunder was made by so doing, it would be difficult if not impossible to retrace our steps in the matter. This, however, only demonstrates the absolute necessity devolving upon our statesmen of taking the greatest care in matters from which a retreat cannot be made. Both the Liverpool Chamber and the public generally are fully aware of the great scramble there has been amongst the nations of Europe for African territory, and that this country has got a fair share. They are also aware that we have no monopoly of treaty making and the declarations of protectorates. This "unwelcome fact" may be admitted, but the inference Lord Salisbury deduces and imputes to the commercial public, namely, that where the English have developed trade either the English flag should fly, or at least foreign flags be excluded, is debatable. His lordship will no doubt readily admit that trade is a very tangible interest, and a necessity of our national existence, and that whenever and wherever we have established such an interest very good grounds should be adduced before we permit interference with it by any foreign nation, whether by the protection or the annexation of the country with which it is conducted. Very possibly "the law of nations" takes no cognisance of such interests, but international law, as it exists to-day, is the outcome of the requirements of the community of nations at a time antecedent to the development of modern commerce, of which therefore it could take no cognisance. We affirm, however, that the time has arrived when the reality of these interests must be admitted and their importance recognised.

The law of nations must be amended in this direction in order that these interests may be conserved for those to whom they belong. If other countries followed the policy of Great Britain, and when they annexed or protected any country left all the commercial doors wide open for the traders of every land to enter upon the same terms as themselves, the call for this reformation would not be very urgent compared to what it is in present circumstances. But such is very far from being the case, and no nation contravenes the principle of this policy nearly so much as France. Wherever and whenever she has annexed a county or territory, she has at once established differential duties against the commerce of all other nations in order that she might monopolise the trade herself. Madagascar, Cochin China, and other places might be adduced as illustrations, but it is unnecessary to multiply instances, as the policy is adopted wherever the French flag is hoisted. By this policy a great and growing English trade has been destroyed in Madagascar and other places, whilst in other cases we are precluded from all attempts to develop it, though our necessities are daily growing more imperative. At a limited distance, Germany follows the same course as France.

As to the remedy. Owing to the earlier development of the manufacturing industries of this country, and the consequent growth of foreign trade, we have established trading connection with every people under the sun, and other nations bent on a like errand cannot find a field in which we have not arrived before them. Wherever they go they find us there with an established trade, which constitutes, or ought to constitute, a stronger or prior claim to anything they can advance, and one that "the law of nations" ought to recognise. We propose that Lord Salisbury should put forth all his great power in order to secure the recognition of these interests by "the law of nations." This would be an achievement worthy of his reputation and the commanding power he wields in the councils of the community of nations. The principle to be sought should be that of the admission to all annexed or protected countries of the commerce of all nations on a common basis with that of the governing country. Unless this be done, we venture to predict that the wars of the future will be greater and more costly in treasure and life than they have ever been in the past, and that they will not be fought to realise the dreams of politicians or princes, but to attain and maintain commercial pre-eminence. The political movements of the past dozen years shew this conclusively. Failing the incorporation of this principle in "the law of nations," the imperative duty of English statesmen will be to annex or protect all unannexed or unprotected countries in which we have commercial interests liable to fall into the hands of the political filibusterers of the Continent. It is only by either one or the other of these courses that Lord Salisbury can fulfil the promise with which he concludes the above communication.

## Letters from our Readers.

The Editor does not necessarily endorse the opinions of his correspondents.

### THE MILL-HANDS OF BOMBAY.

(To the Editor of *The Textile Mercury*.)

Sir,—In my letter, which appeared in the *Manchester Guardian* of September 23, 1891, I referred to a statement made by Dr. Bahadurji in a letter which appeared in its issue of September 10, where he said that: "I know Mr. Lokhanday, and in a conference we

had with some friends a few days before I left Bombay he agreed there should be no change in the working-hours." In my letter, I pointed out that:—

Mr. Lokhanday has for many years been the chairman of the Bombay Millhands' Association. His views, which express those of the Bombay operatives, are well known to include the fixing of the working-hours of the mills between 6 a.m. and 5.30 p.m.; the granting of a recess of half an hour for meals and rest at 9 a.m., and another half-hour at noon; women to work from 7 a.m. to 5 p.m.; children to be employed for half time; wages to be paid by the week; a dispensary to be attached to every mill for the use of injured and sick persons; a school to educate children; and the grant of one complete day's rest every Sunday. It will be little short of miraculous, after agitating for many years for these boons, and so strongly expressing his opinion in their favour only last November, if, to please Dr. Bahadurji and his friends the manufacturers, he now intends to throw up his agitation and dance to their piping.

I am glad to see, by your issues of Nov. 28 and Jan. 16, that you are calling attention to the scathing exposure by Mr. Lokhanday, in his paper the *Din Bandhu*, of the misstatements made by Dr. Bahadurji at the Hygiene Congress and in the columns of *The Times* and the *Manchester Guardian*. Your readers will remember that Mr. Lokhanday was appointed by the Government of India, Local Member of the India Factory Commission of 1890 for the Presidency of Bombay. Having served for nine years in the Bombay cotton mills as operative and assistant manager, no better authority can be met with as to the condition of the operatives and the legal regulations that are required for their health and general welfare.

Mr. Lokhanday has pointed out in the article in your issue of the 16th inst. that operatives prefer using their native drugs and strongly object to being treated in a hospital in case of sickness. His statement is strongly emphasized by the report in 1887 of Mr. Factory-Inspector Jones on "Bombay Factories," where he says:—"It is often impossible, owing to the superstition of the relatives, to keep an injured person in the hospital, and several have been removed, who were rapidly recovering from their injuries, by a mob who have hurried the patient to the magic man. He, having waved a few peacock feathers over him, and plastered the wound with dung, saying at the time a few prayers, often leaves him to die."—I am, sir, your obedient servant, HOLT S. HALLETT.

## Foreign Correspondence.

### TEXTILE MATTERS IN THE UNITED STATES.

BOSTON, Jan. 11th.

The crusade against "shoddy" foreign goods, commenced by the *Wool and Cotton Reporter* of this city, is still continued. Your contemporary, albeit justly regarded as an authority, would probably be amongst the first to admit that the series of articles it has recently been giving owe their origin to the feeling of animosity which the editor, in the interests presumably of his clients, displays in the pages of his journal whenever European encroachments in the American market are being discussed. Some tennis cloths from a London shop form the latest text, upon which a sermon on shoddy is preached by a correspondent of your contemporary. The warp and weft is 40 by 40 of Vigogne yarns, 95 per cent. cotton, five per cent. combed wool, of a low quality warp about 13,440 yards to the pound; weft finer, 18,000 yards to the pound, or at the outside 20,000.

The Western States are now making elegant white bed and coloured horse blankets. Finest blanket made at present comes from Minneapolis from the North Star Woollen Mills—it is known as the "Royal Rose," 90 by 100 inches, and sells at \$38.25, regular. Ohio now sends out fine horse blankets.

The exports of domestic cottons from New York to foreign ports for the week ending December 28th, were as follows:—

|  | Packages. | Value.     |
|--|-----------|------------|
| Total for the week .....                         | 10,500    | \$474,054  |
| Previously reported.....                         | 208,130   | 10,574,893 |
| Total since Jan. 1st, 1891. 218,690 \$11,048,947 |           |            |
| Same time in 1890 ..... 184,137 9,905,023        |           |            |

A proof that Chinese wool is rapidly superseding wool from other parts of Asia is given in the fact that our imports from Asia for the fiscal year 1889 were 18,397,486 pounds; for 1890, 15,709,098 pounds; and for 1891, 16,564,110 pounds. The total imports from Asia, as these figures shew, did not increase, although those from China nearly trebled. The wool from the northern parts of China and Russia is being much sought after for its fine quality and length, and, as railway systems are extending, is likely to be a still larger competitor than at present with wool from other countries.

According to a Galveston exchange, a lace curtain and mosquito net factory is shortly to be established in that city. The project was started by R. Behrens, a German. The plant, it is said, will cost \$120,000, as it requires a three-storey brick structure 250 feet long by 85 feet wide, besides detached engine and boiler rooms. The eight looms required will cost in England about \$60,000, to which 33 1/2 per cent. import duty must be added. The company will be incorporated with \$200,000 capital stock. The citizens of Galveston will be asked to subscribe for \$50,000 of the \$150,000 stock which it is designed to place the first year.

Shortly after the sale of the stock of the Alexander Smith Carpet Company, referred to at length in these columns at the time, an anonymous circular was issued to the trade denouncing the firm for having flooded the market with such a vast supply of goods. The suggestion was made that the Smith Company should be boycotted; but as no name was appended, the result has not been such as was hoped for. There can be no doubt that the effect of such action as that of Messrs. Smith disorganises the trade, but as long as the firm chooses to produce in excess of the supposed requirements of the market there appears to be no way of preventing them.

Referring to the offerings of autumn worsteds, importers of Bradford goods are said to be quoting figures below those of domestic makes, the standard price ranging from 7s. 11d. to 8s. 4d. The importations of English worsteds for the month of December, 1891, aggregated 11,940 pieces, as against 7,940 pieces in the same month 1890, and 14,650 pieces in 1889. The importations consist almost wholly of spring weights.

A NEW waste-silk spinning mill was opened in Yokohama last month. The company has been formed with a capital of 120,000 dol. to improve waste-silk spinning in Japan.

ROUBAIX AND THE CHICAGO EXHIBITION.—Efforts are being made to induce Roubaix manufacturers to exhibit at the World's Fair, but in many quarters there is a decided inclination not to do so. It is urged with some force that to spend money and trouble in sending goods to a country which has established a prohibitive tariff is labour thrown away. On the other side, an appeal is made to French vanity by the contention that the surest way of getting the duties reduced or abolished is to let the Americans see what valuable things they lose by the present policy. Probably Roubaix manufacturers are too shrewd to swallow such a bait.

THE AUSTRALIAN WOOL RACE.—On Tuesday the Associated Shipping Press reported that the *Crimba*, Captain Femister, an iron ship of 1,117 tons, owned by Messrs. A. Nicol and Co., of Aberdeen, had arrived off Gravesend, bringing the first consignment of the season of the Australian wool clip to the Thames. The *Crimba* left Sydney on October 24th with 5,416 bales of New South Wales wool, and she has made the passage in eighty-five days. The *Salamis*, Captain Philip, an iron ship of 1,079 tons, owned by Messrs. George Thompson and Co., of London and Aberdeen, which left Melbourne on October 30th, was signalled off the Isle of Wight at 9 a.m. on Monday. She brings 5,356 bales of wool, and has made the passage in seventy-nine days. There has been a good deal of speculation as to the arrival of the first consignment of wool—as much as was ever experienced with respect to the arrival of the first cargo of the season of new China teas—and some heavy sums of money in wagers changed hands on Monday.

## Designing.

### NEW DESIGNS.

#### COTTON STRIPES, PLAIDS, ETC.

*Design A* is arranged for fancy stripes, suitable as shirtings, dress goods, or suitings. The warp 24's cotton, 3 in a dent, 30 dents per inch, 60 picks per inch of 20's cotton weft; these particulars will give a dress fabric. For suitings, 16's cotton warp, 3 in a dent, in 25 dents per inch, 14's cotton weft, 56 picks per inch. For shirtings, 21's cotton warp, 3 in a dent, 25 dents per inch; weft 12's, all cop, 48 picks per inch.

*Pattern No. 1:* Warp, 24 dark cream on 1, 2, 3, 4, 5, 6 shafts; 24 very light cream on 5, 2, 1, 6, 5, 4, 3, 2, 1 up to 24; 3 of scarlet, all in one heald, on No. 1 shaft; 3 of green in one heald, on 4th shaft; 3 light brown on 1, 2, 3 shafts; 3 light blue on 6, 5, 3 shafts; 3 light brown on 1, 2, 3 shafts; 3 light blue, on 6, 5, 3 shafts; 3 light brown on 1, 2, 3 shafts, and repeat from 24 dark cream; weft all dark cream.

*Pattern No. 2:* Warp, 22 dark blue, on 1, 2, 3, 4, 5, 6 shafts; 2 light blue, on 5, 6 shafts; 24 dark blue, on 3, 2, 1, etc., shafts; 3 white in one heald on 1 shaft; 3 white in one heald on 4th shaft; 3 red, 3 deep fawn, 3 red, 3 deep fawn, 3 red on 1, 2, 3, 6, 5, 3, 1, 2, 3, 6, 5, 3, 1, 2, 3 shafts. This completes the pattern, which is repeated from

the "22 dark blue." Weft all dark blue. From these two patterns, with the draft clearly indicated, it will be obvious that any number of stripes can be formed with ease, while colour arrangements may be formed to suit the different classes of goods required.

For PLAIDS, the warp 24's cotton, in 26 dents per inch, three in a dent; weft, 76 picks per inch of 24's cotton; the pegging plan of *A* to be used with a straight-over draft all through on the 6 shafts.

*First Pattern:* Warp and weft crossings alike; 24 very light green, 12 dark maroon, 24 white, 12 light blue, 24 lilac, 12 cardinal, and repeat from light green. This arrangement will give a very handsome plaid pattern, well worthy of attention. The weft and warp must be good, both in materials, such as cotton, and in colours.

*Second Pattern:* 36 dark fawn, 6 black, 6 fawn, 6 black, 6 fawn, 6 black, 6 fawn, 6 black, 36 dark fawn, 6 white, 72 dark fawn, 6 white, and repeat from the first "36 dark fawn." Weft pattern the same. One of the two fawns is a shade lighter. A variation of this plaid pattern divides the 72 dark fawn into 34 dark fawn, 2 scarlet, 34 dark fawn, but the scarlet is not used in the weft pattern,



A: PEGGING PLAN.

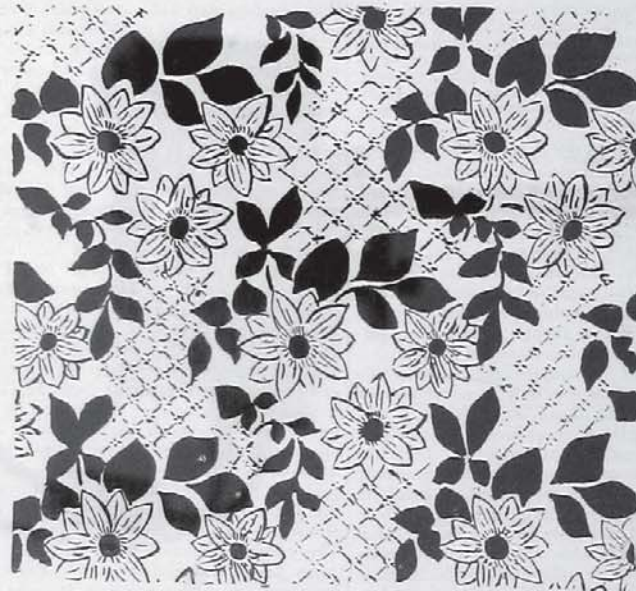
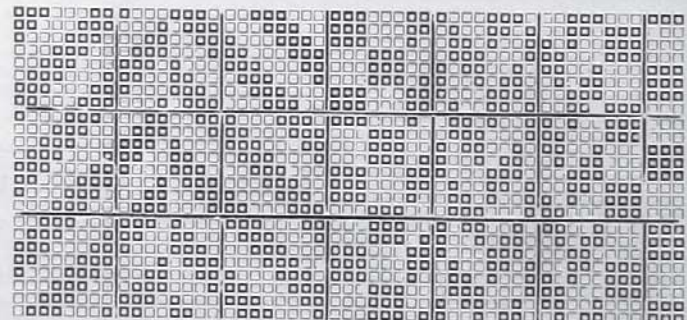


FIGURE A.



DESIGN A NEW STRIPES, PLAIDS, &c., IN COTTON DRESS GOODS, &c.



DESIGN A: DRAFT.

although if it is convenient it would add to the beauty of the checking.

*Third Pattern:* 72 of dark green, 6 red, 72 dark green, 12 white; weft pattern the same.

*Fourth Pattern:* 144 dark purple, 12 red, 144 dark purple, 12 white, 36 dark purple, 12 white, and repeat from the first "144 dark purple." Weft pattern the same. A yellow might be used for the red.

*Fifth Pattern:* 96 light cream, 12 marine blue, 96 light cream, 12 shrimp or coral. Weft pattern the same.

*Sixth Pattern:* 36 light silver, 6 drab, 6 light silver, 6 drab, 6 light silver, 6 drab, 6 light silver, 6 drab, 6 light silver, 6 drab, 6 light silver, 6 drab, 36 light silver, 12 rose, and repeat from first "36 light silver." Weft pattern the same.

*Seventh Pattern:* 96 dark blue, 6 white, 96 dark blue, 6 white, 96 dark blue, 6 orange, 96 dark blue, 6 orange, 96 dark blue, 6 green, 96 dark blue, 6 green, and repeat from first "96 dark blue." The weft pattern the same.

These seven plaid patterns on six shafts will

give some idea of the particular class of crossings which will be favourably received by the public for spring fabrics in cotton. All would require a good clear beetle finish, and may be made 45 inches wide out of the loom, or after the finishing process.

FIGURED DRESS FABRIC.

Figure A is a suggestion for figuring a worsted or silk dress fabric. One method of development is shown in Design 7, which to the following particulars will yield a very effective cloth:—

Warp.

All 2/100's light tan cotton,  
24's reed 4's.

Weft.

All 40's darker tan silk,  
96 picks per inch.

Mohair may be substituted for the silk and worsted for the cotton warp, under which circumstances it will be found advisable to use a considerably coarser warp, sett opener, say,

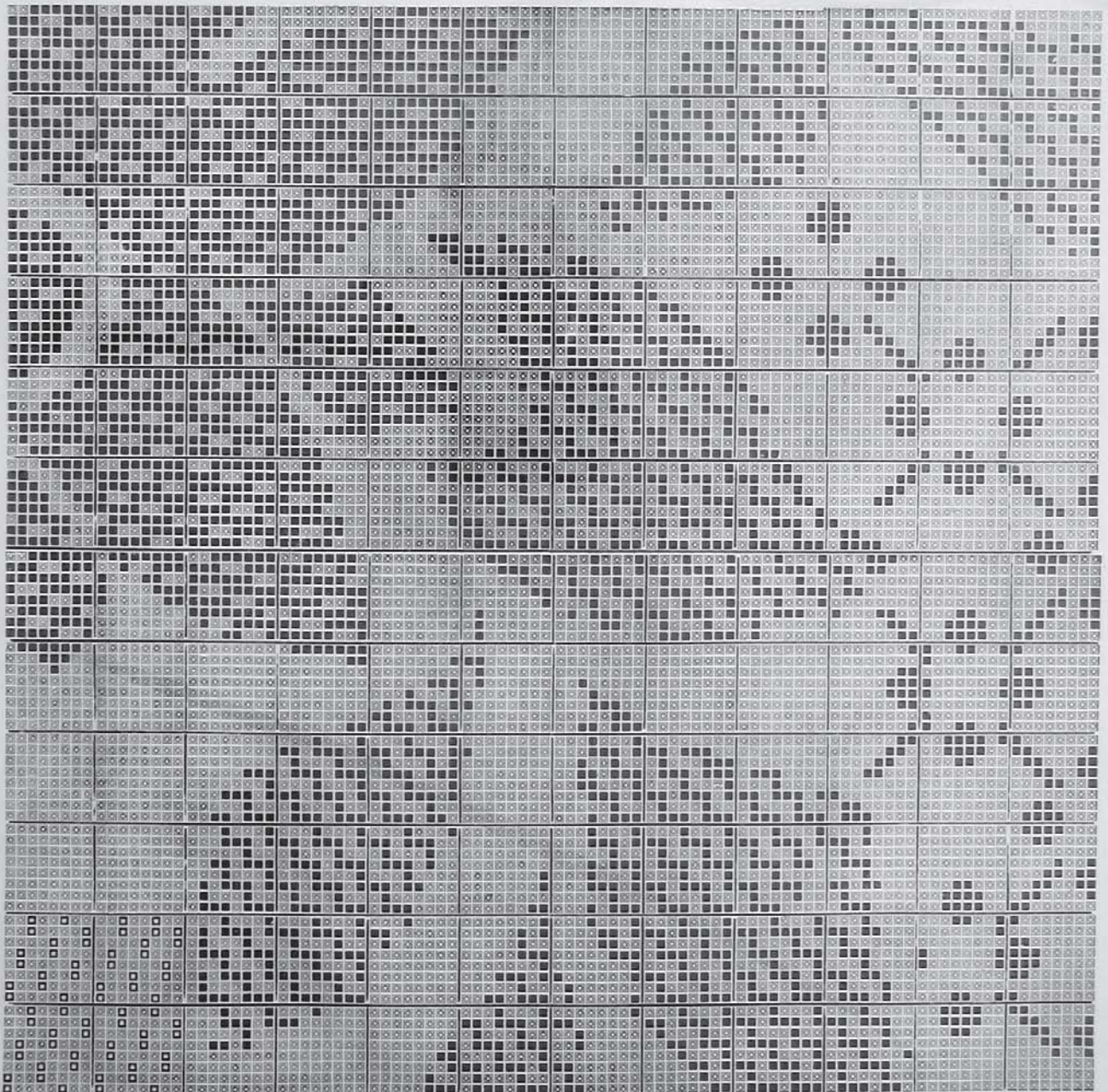
Warp.

All 2/80's worsted; 20's reed 4's.

Weft.

All 36's mohair; 70-80 picks per inch.

It should be noted that in the design the double plain weave is used to obtain the solid black broad leaves. If it be desirable to introduce two colours in the weft we should advise a closer sett, say, 120 to 140 ends per inch of a finer cotton or silk yarn, and an extension of the design to double the number of ends and picks, that is for a 600 instead of a 300 machine, for which Design 7 is worked out. There will be no need for an extra weft under these circumstances, while we should advise as one of the wefts a tinsel yarn to form the fine dot and check effect which forms the groundwork upon which the flowers and leaves are thrown. An additional value will be added to the design by foreshortening some of the flowers, since the flat view here presented indicates too clearly the limitations of application.



DESIGN 7.

## Machinery and Appliances.

THE ENGINES OF THE ASH SPINNING  
COMPANY, LIMITED.

MAKERS: MESSRS. JOHN MUSGRAVE AND SONS,  
LIMITED, BOLTON.

One of the corner stones of success in all our mechanical industries, and especially in the textile trades, where competition is keen and the margin of profit is small, is the equipment of a mill with the most perfect motor that science and skill can produce. Excellence of material, a perfect adjustment of every part to its fellow, and the observance of correct proportions in magnitude, strength, and weight in the working parts, having regard to the duty they have to perform, are all conducive to

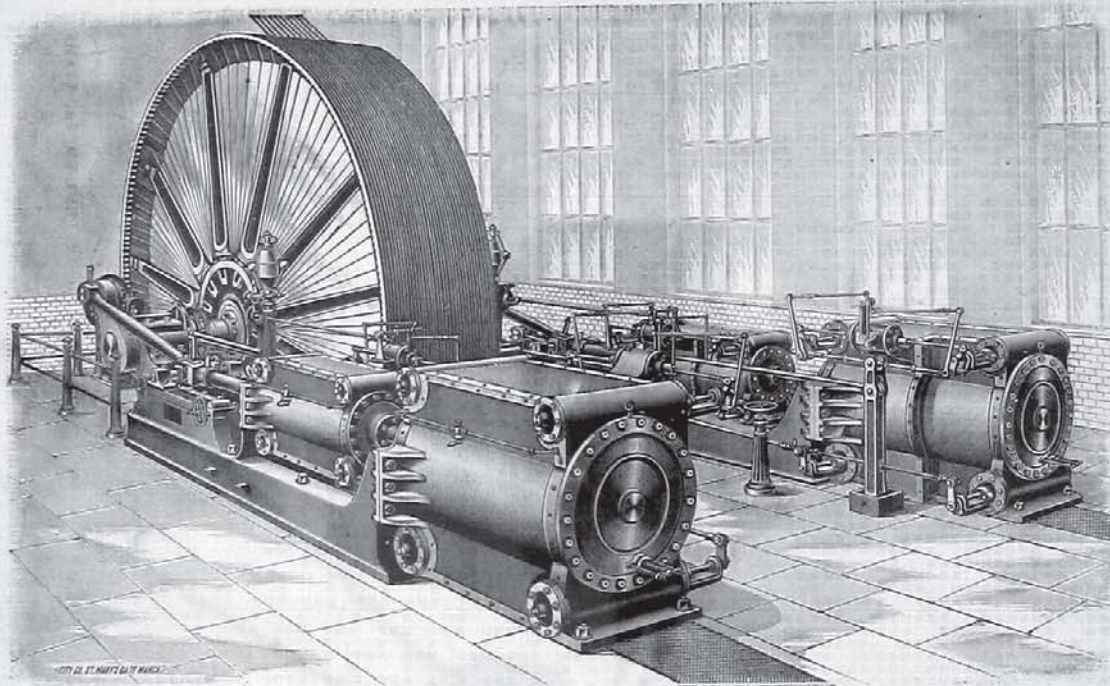
placed below the floor, and are actuated by means of rods and levers from the cross-head of each engine. The drum is 32 feet diameter, weighs complete 68½ tons, and is grooved to receive 35 ropes of 1¼ in. diameter. The crank-shaft necks or journals are 16 in. diameter, and 32 in. long. The crank pins are 8 in. diameter, and 10½ in. long. The high-pressure cylinder is furnished with Corliss valves, and the trip mechanism of the admission valves is connected with the governor, the arrangement admitting of a variation in the point of the cut-off from nothing to ¾ stroke. The low pressure cylinder is also fitted with Corliss valves, but in this case the trip motion is arranged for adjustment by hand in varying the point of cut-off. A water catcher has been provided and arranged on the steam pipe close to the engine, and to this a steam trap is connected by which it is kept constantly drained.

### RECENT IMPROVEMENTS IN TEXTILE MACHINERY, ETC.

In connection with the Weaving and Designing Department of the Huddersfield Technical School, Mr. Edward Armitage, the teacher of the department, delivered a lecture on Saturday on "Recent Improvements in the Textile Trades." The attendance was not large. Mr. W. H. Wolstenholme presided, in the absence of Alderman J. F. Brigg, who wrote stating that he was indisposed.

#### CONDITIONING WOOL.

The first improvement noticed was the establishment of a conditioning-house in Bradford, with the object of providing official tests of the condition of wool, tops, noils, and yarn, and it was expected that, as the system grew, every buyer of wool or other fibre in various forms would demand an official certificate furnished by the conditioning-house as to the selling weight of any particular lot. In other words,



PAIR OF TANDEM COMPOUND ENGINES, MADE BY MESSRS. JOHN MUSGRAVE AND SONS, LIMITED, FOR THE ASH SPINNING CO., LTD., SHAW.

economical working, freedom from breakdowns, and durability. These things assured in a mill engine, the management will be relieved of an onerous contingency that often resolves itself into a burdensome tax. It is satisfactory to think that our engineers, during the past ten or fifteen years, have kept pace in the march of improvement in which all other branches of machine makers have joined, and that now we rarely hear of the disastrous breakdowns that used to be so common.

We have pleasure in placing before our readers an illustration of a fine pair of tandem compound engines, furnished to the Ash Spinning Company, Limited, by the eminent engineering firm of Messrs. John Musgrave and Sons, Limited, Bolton. These engines may be regarded as a type of the manner in which our joint-stock spinning companies equip their mills. The cylinders of these engines are 24 in. and 46 in. diameter, with a piston stroke of 6 ft., the working speed being 52 revolutions per minute. There are two air pumps, each 35 in. diameter and 30 in. stroke. These are

The results obtained in the working of these engines shew an average indicated horsepower of 1,400 on a total consumption of coal for all purposes, including mill warming, of 76 tons per week, of which it is estimated the engines take 71 tons. The quality of coal used is about 9s. per ton. The ordinary boiler pressure is 100 lb., and the coal consumed per indicated horse power per hour is 2.02 lb. These items are sufficient to indicate the quality of the work being performed.

The Ash Mill, it will be known to many of our readers, is one of the most recent of the modern additions to our Lancashire mills, and is a fine specimen of mill architecture. It contains 90,000 spindles and preparation, furnished by Messrs. Platt, Bros. and Company, Limited, Oldham. An extension is now being made in the form of a shed. The order for furnishing the required machinery has been placed with Messrs. Asa Lees and Co., Limited.

The firm of Schmitz Varnhagen and Co. are erecting a factory in Lodz for the manufacture of fine silk lace, etc.

the conditioning-house weight would be the only recognised invoice weight. The lecturer, by means of photographs exhibited by the oxy-hydrogen lantern, explained the process adopted in order to ascertain the precise proportion of moisture in the materials which pass through the conditioning-house, and the normal dry weight, together with other tests. Conditioning-houses of this kind were largely in vogue on the Continent in the worsted and woollen centres.

#### PILE WEAVING.

Having described several improvements in the Knowles or Dobercross looms, which had been in the direction of rendering them still more automatic, the lecturer said a very important invention in pile weaving had just been brought to perfection by a Bradford firm. The pile was obtained by the use of an extra weft or pile weft, which might be of wool, worsted, cotton, silk, or other fibre as required. The peculiarity of the pile was that it was raised on each side of the cloth, and cut in the loom at the same time that the pick was beaten up. For curtains, mantle goods, and furniture cloths there was undoubtedly a future for this material, and it would be interesting to note



the method of its manufacture. The lecturer, with the aid of diagrams, then entered into a lucid explanation of the process, and in concluding that part of his subject said the invention unquestionably opened up a very promising field of enterprise. There would probably be difficulties, as in every new departure, but there was nothing intrinsically defective in the process of manufacture of the fabric. It had all the advantages of a welt pile fabric over a warp-pile fabric, whilst retaining the highest possible power of figuring. Material which could not be used for a warp pile might be used for this cloth. The most important advantage, however, was the production of double-sided pile fabrics. This was the first machine made to produce such cloths, and the inventors were to be congratulated on the efficacy and simplicity of the machine. By it a double-pile woollen cloth could be produced. Whether or not that cloth would be taken up and be successful was a matter which must be left to the merchants and the public.

#### FUSTIAN CUTTING.

Mr. William Netherwood and Messrs. Lockwood and Keighley, the well-known woollen and cotton cord manufacturers, had recently brought to perfection a fustian and cotton cord cutting machine. In the Manchester Exhibition of 1887 a machine having the same object was exhibited, but it did not succeed in supplanting manual labour, because it was not sufficiently sensitive. It had been long supposed that fustian cutting could only be done by hand, but he ventured to predict that this machine would supplant hand cutting. Its chief feature was its extreme sensitiveness and instant and complete stoppage at any fault or failure to act. In fact, the machine was bound to do its work correctly or stop. The lecturer concluded by noticing several minor improvements in textile machinery. The proceedings closed with a vote of thanks to the lecturer and the chairman, which was adopted on the motion of Mr. Bentley, seconded by Mr. Dyson.

## Bleaching, Dyeing, Printing, etc.

### VALUATION OF ALBUMEN.

Albumen is prepared from the white of eggs or from blood serum, essentially by a process of drying, so as to obtain the albumen in a dry condition. On the care with which this drying is conducted depends very largely the value of the albumen when it is used in calico printing. It should be completely soluble in cold water, but if the drying has been done at too high a temperature, then some, if not all, of the albumen is altered into the insoluble variety, and according to the amount of this which is formed so the value of the albumen is decreased, in perhaps rather more than direct ratio to the amount which is actually present. The high price of albumen also tends to induce adulteration with such bodies as dextrine, gum arabic, gum tragacanth, or glue. The best albumen is in the form of large, colourless, transparent flakes or leaves, which have a high gloss or lustre.

The fixing quality of the albumen may be ascertained by a practical printing test, which is carried out in the following manner: A small quantity of albumen is weighed off and dissolved in water, and then a small quantity of dye-stuff or pigment is mixed with this solution, and two swatches are printed with this mixture. One of these is steamed and washed in the usual manner, while the other is not treated. Both are dried and the shades compared; the less the difference the greater the fixing quality of the albumen. This is a good practical test, and if a comparison trial be made with a sample of known quality a very fair idea of the relative value of the sample may be obtained.

Cordillot's method consists in taking 2 to 3 grms. of albumen, and dissolving in 80 to 120 c.c.'s of water, whereupon any insoluble matter is filtered off, and its quantity is ascertained in

the usual way. This insoluble matter may consist of changed albumen, starch, gum tragacanth, sand, and dirt. Then 15 grms. of the filtered solution is placed in a test tube with a thermometer and heated in a beaker of water: at 50° C. the solution should become turbid, and at 75° C. it ought to be completely coagulated. The mass is now filtered off, and the solution examined for gelatine by adding a little tannic acid, or for gum by adding strong alcohol.

The proper valuation of albumen is a matter of some difficulty, and no thoroughly satisfactory process has yet been devised. One of the best is Monnier's, which is based on the formation of a compound of albumen, copper, and potash, which is stated to have a constant composition, and to contain 12.64 parts of copper oxide for every 87.36 parts of albumen. This process is carried out as follows: 4 to 5 grms. of the albumen are dissolved in 100 c.c. of water; after standing for 24 hours the solution is filtered through a weighed and dry filter, and the residue upon the filter is washed, dried, and weighed. Its composition may be ascertained by a few tests: 20 c.c.'s of the filtrate are now made alkaline with a solution of caustic potash, and a solution of sulphate of copper is added until the precipitate which forms ceases to be re-dissolved. It is best to add a little more, and to filter off from any precipitate of copper hydroxide which forms. To the filtrate sulphuric acid is added to distinct acid reaction, whereby all the albumen is precipitated out. Iodide of potash and starch solution is now added, and the iodine which is liberated is estimated by means of sodium hyposulphite. The albumen may contain bodies which affect the solubility of the copper, and so a second sample of the albumen is taken; the albumen is coagulated and filtered off.

The sample is now treated to the same process as before. If it be pure then the addition of copper sulphate to the alkaline solution produces at once a permanent precipitate, while if it contains any substances which will dissolve oxide of copper it will not give a permanent precipitate until all these bodies have been acted on. The amount of dissolved oxide of copper is determined as before, and this, subtracted from that obtained in the first sample, represents the amount which is combined with the albumen, and from the amount so found the quantity of albumen may be calculated.

### "DRY" PROCESS OF DYEING SILK.

The so-called "dry" process of cleaning silk really consists in treating the goods with benzene, which removes the grease and dirt very much better than water will do, while it also has the further advantages of not causing any deterioration of the colours of dyed fabrics, and of not affecting the quality of the fibre—two things which are likely to occur with the ordinary processes of wet cleaning. There has been recently devised a process of so-called "dry" dyeing, which consists in applying the dyes in the form of solutions in alcohol or benzene.

As is well-known, silk tissues shrink when treated with water, and the better the quality of the silk the more does it shrink. To avoid this shrinking, which causes a loss of lustre, many contrivances have been devised, which usually depend upon keeping the fabrics stretched until they are dry. To attain the same end, experiments—which have been more or less successful—have been tried in the direction of dyeing with solutions of dye-stuffs made with other media than water: as, for instance, alcohol, using the coal-tar colours, which alone are available for this dry method of dyeing; but alcohol is an expensive article, and its use adds much to the cost of the dyeing. The shades obtained with it are not very satisfactory.

The only solvent practically available is benzene, which, however, suffers from the fact that it does not readily dissolve the dyes themselves; but it is capable of dissolving the compounds of the dyes with fatty acids, and solutions so made may be used for dyeing silk.

The solutions are made in the following manner:—The dye-stuffs are dissolved in a solution of soap, using one part of dye-stuff to

four parts of good soap; when the solution has been made hydrochloric acid is gradually added, whereupon the soap is decomposed, and the fatty acid which is liberated rises to the top, carrying with it the colouring matter. The mass is allowed to cool and is skimmed off, and is then dissolved in benzene, using about 800 parts of the solvent. In this solution the silk may be dyed in the usual way, after which it is drained in the hydro-extractor and dried. This process is applicable only to the basic dye-stuffs, such as magenta, violet, green and auramine; but it cannot be used with benzidine and alizarine dye-stuffs. The colours obtained are bright but not fast.

Instead of using a soap made from oil or tallow, good results may be obtained by using a soap made from resin by boiling 50 parts of rosin with 150 parts of soda crystals and 50 of caustic soda. This solution is used in place of the solution of soap in the above process. The colours obtained are rather faster.

The dye-baths are not exhausted, and may be kept for further use. The manipulation is the same as in the ordinary process of dyeing. It is scarcely necessary to point out that owing to the inflammable character of the solvent great care is needed to prevent any risk of fire.

### METHODS OF WOOL-DYEING: THEIR PRINCIPLES AND PRACTICE.—I.

The various methods which are used in dyeing wool have, of course, underlying them certain principles on which they are based, and on the observance of which much of the success of the process depends. Sometimes these principles are overlooked by dyers, with the result that they do not get good results from their work. It must be obvious to any person with any technical knowledge that all processes of dyeing, either wool, or silk, or cotton, or any other fibre, must take into consideration the properties of the fibre on the one hand and that of the dye-stuff which is being used on the other. Wool can be treated differently from cotton: a process of dyeing which gives good results with the latter fibre would lead to nothing but disastrous effects with wool or silk; and on the other hand processes are used in the dyeing of wool which could not possibly be used for cotton on account of the very different properties of the fibres. Of cotton-dyeing something has been said in former issues of this journal; at present the treatment of wool will be dealt with.

A few words as to the properties of wool, so far as they relate to the methods of dyeing, may be of use, and will form a fitting introduction to the main body of our remarks. Wool has the property of resisting the action of acids in a great degree, so that it may be treated with even strong acids with impunity. On the other hand, alkalis and alkaline solutions have strong action on it: the caustic alkalis rapidly dissolve wool, and their use must be avoided in all cases of dyeing this fibre; the carbonates have not so strong an action, and therefore may be used in moderation; nevertheless, too strong solutions of these should not be used. Soap has no disintegrating action on wool, and soap solutions may be used whenever necessary for cleansing or dyeing wool. Ammonia has no action on wool, and it may be used in place of soap if desired. There is one feature of wool that must be alluded to here, and that is its felting property. When wool is boiled with water and is handled a good deal, the fibres clot or felt together into a firm coherent mass. This should be obviated as much as possible, and when wool is cleansed and dyed in the loose condition it is absolutely necessary that every care be taken to avoid felting. This condition is much influenced by the temperature and the condition of the bath in which the wool is being treated: too high a temperature or too prolonged a treatment tends to increase the felting; therefore in dyeing wool, prolonged treatment at the boil must be avoided.

Further, the condition of the bath has some influence on this point: it is found that an alkaline bath tends to considerably increase the felting properties of the wool, and on this account dyers invariably avoid the use of both

the caustic and the carbonated alkalis. Strong soap liquors also have some influence in the direction of increasing the felting; therefore soap should not be used if it can possibly be done without. Ammonia has not so strong a felting action as the other alkalis. Acids, on the other hand, exert a retarding action on the felting of the wool, and this is a matter of some interest and importance in the dyeing of wool, as an acid condition of the bath is necessary for dyeing by far the great majority of colouring matters on this fibre. Alkaline salts, such as Glauber's salt and common salt, exert little or no influence on this felting property, and can be added to dye-baths with impunity, and in many cases with good effect so far as the quality of the dyeing is concerned.

So far as the properties of the wool are concerned, it is seen that an acid condition of the dye-bath will work better than an alkaline condition, and wherever it is possible to use acids such should be added.

What has been said in regard to wool is equally true of all fibres derived from animals in the same way as wool is, such as horse hair, fur of rabbits, hares, and other animals; although, of course, there are some minor differences between different furs in their resistance to the action of acids and alkalis.

The next feature that influences the methods of dyeing wool is the varying properties of the dye-stuffs or colouring matters. It is obvious that those which, like magenta or saffranine, have a strong affinity for the wool fibre, must be dyed differently from those which, like alizarine and gambine, have no direct affinity for the wool fibre, and, further, which require the aid of mordants before they can be dyed, and on the character of which mordants the colour that is fixed on the fibre depends. Into the consideration of these processes for the application of dyes to wool we shall enter in the next article.

(To be continued.)

#### ALIZARINE BORDEAUX AND ALIZARINE CYANINE.

When anthraquinone is acted on by strongly fuming sulphuric acid, which is sulphuric acid containing a large quantity of sulphur trioxide in solution, it is changed and forms a new class of dye-stuffs known as the "Alizarine Bordeauxs," which dye chrome-mordanted wool fine Bordeaux red shades. Its chemical composition shews it to be tetrahydroxyanthraquinone. It is capable of yielding a nitro and an amido derivative, from the latter of which a dihydroxyalizarine blue can be prepared by the action of sulphuric acid. This new product is a very insoluble body, its only solvent being nitrobenzene. When alizarine blue is heated with strong sulphuric acid it is converted in trihydroxyalizarine blue. These two blues are sold commercially under the name alizarine cyanine. Colours of a very similar nature have been sold under the name of alizarine blue green, alizarine green, and alizarine indigo blue. Hitherto little has been done towards ascertaining the composition and nature of these dye-stuffs, but recent work shews that the former is a sulphonic acid of monohydroxyalizarine blue, from which the monohydroxyalizarine blue may be obtained by the action of hydrochloric acid. Alizarine green has the same composition, and only differs from alizarine blue green in its method of manufacture, and in an intermolecular difference. The last of the three dye-stuffs is a mixture of trihydroxyalizarine blues. These dye-stuffs are very valuable bodies, and dye wool which has been mordanted with chrome very fine blueshades, differing from one another in tone. The shades obtained are very fast.

INDIGO may be valued by the following process: 10 cubic centimetres of a solution of tin chloride, containing 88 grammes of tin crystals per litre, are mixed with caustic soda solution, until the precipitate which is first formed is dissolved. To this alkaline solution is now added 0.8 gramme of the indigo in a very finely-powdered condition. The mixture is heated for an hour on a water bath, by which time the

indigo will have been dissolved, and a yellow green solution will be obtained. To this is now added 15 cubic centimetres of freshly-prepared peroxide of hydrogen, when the indigo blue will be precipitated; to ensure the complete precipitation, the liquor is generally heated to the boiling point. The precipitate is now collected on a weighed filter and washed well, first with warm water, then with dilute caustic soda solution, then with warm water, and then with alcohol, after which the precipitate is dried at 100°C. and weighed, when the amount of indigotin in the sample of indigo will be obtained. Examined in this way some samples of indigo gave the following results: Prepared indigo, 97.85 per cent.; ordinary indigo, 44.19; Bengal indigo, 75.01; Tirhoot indigo, 57.92; Benares indigo, 54.39; and ammonia indigo, 30.05 per cent. of indigotin.

COLOURED DESIGNS may be produced on indigo-dyed cloth by first padding them in a caustic soda solution of *o*-naphthol; then, after drying, printing on a thickened solution of a diazotised amido body, such as aniline or naphthylamine, which has been mixed with potassium ferrocyanide. After printing, the goods are passed through an alkaline bath.

THERE is reason to believe that the prohibition of the use of alizarine dyes in the dyeing of military cloth, which has for some time been in force in various states, is likely to be withdrawn, as it is now possible to manufacture colours of this class of a durable kind. As Prussia alone needs about a million metres of military cloth, the expense of indigo and logwood, which have both to be procured from abroad, is very considerable; and if alizarine can be used it will mean a great saving and the use of domestic instead of foreign materials.

TETRAHYDRO-*o*-METHYLOUINOLINE-P-AZOBENZENESULPHONIC acid is a dye-stuff which dyers will not care to ask for very often under its scientific name, lest they might forget one-half of it. However, they may console themselves with the thought that this is the chemical name, and that when the dye-stuff is placed on the market it will be under some such name as Fast Orange 2Y, as it imparts an orange yellow to wool and silk, which, however, is not very good. One of the most curious features of chemistry is illustrated by this body: a dye-stuff giving Bordeaux red shades from an acid bath upon silk and wool is identical in chemical composition, and has a similar chemical name, the only alteration being an *o* for the *p*. This is an example of what chemists know as isomerism, and often it is wonderful to observe the great difference there is between two bodies of identically the same chemical composition, and probably prepared from the same compound, but with some slight difference in the manner.

## News in Brief.

### ENGLAND.

#### Bradford.

The annual conversation of the Bradford Chamber of Commerce was held on Monday night at the Technical College. The President (Mr. G. Hoffmann) reviewed the course of local trade in 1891, and said that Bradford manufacturers and merchants were now giving better value for money than ever before, and increased trade, notwithstanding the McKinley Tariff, would come surely, if slowly.

The annual meeting of the shareholders of Lister and Co., Limited, was held on Wednesday at the Mechanics' Institute, Mr. José Reixach presiding. The annual report and balance-sheet, which recommended a dividend to ordinary shareholders at the rate of 5 per cent. per annum, was adopted unanimously. It was stated, in answer to a question, that the directors had, if anything, a larger interest in the concern than they had when the company was formed. Lord Masham was re-elected a director.

The annual meeting of members of the Chamber of Commerce was held on Monday afternoon, the president (Mr. G. Hoffmann) in the chair. There were also present Messrs. R. Cohen, Heilborn, and E. P. Arnold-Forster. The business was of a purely formal nature, and it was speedily transacted. Messrs. James Drummond and Arthur Priestman were elected members of the Council, and the following gentlemen,

retiring members of that body, were re-elected:—Mr. J. R. Armitage, Mr. F. Behrens, Mr. V. Edelstein, Mr. E. P. Arnold-Forster, Mr. Herbert A. Foster, Mr. W. B. Gordon, Mr. J. M. McLaren, and Mr. H. Muir.

#### Cleckheaton.

A meeting of the Chamber of Commerce was held on Wednesday, Mr. B. H. Goldthorp presiding. The following letter, in reply to a communication from the Chamber, was read from the Foreign Office:—"Sir,—I am directed by the Marquis of Salisbury to acknowledge the receipt of your letter of the 17th December asking whether the most-favoured-nation clause will be applied to British goods by each country in the projected commercial alliance between Germany, Austria, and Italy, and, if so, whether it is likely that future negotiations on trade matters will be dealt with by each country separately or by some collective body for the whole three countries. In reply, I am to inform you that British trade enjoys most-favoured-nation treatment in the countries afore-named, and that it is at present not possible to say in what way future commercial negotiations will be conducted with them.—I am, sir, your obedient, humble servant, JAMES W. LOWTHER."—A letter was read from the secretary to the Dewsbury and District Trades and Labour Council suggesting the formation of a Board of Conciliation for the Heavy Woollen District, which the secretary was instructed to acknowledge.

#### Darwon.

On Friday of last week the spinning mill of Mr. James Watson, Sunnybank, Darwon, was destroyed by fire. The damage is estimated at £1,500, covered by insurance.

#### Huddersfield.

At a meeting of the Council of the Chamber of Commerce, held on Tuesday afternoon, to consider a proposal to send a collection of local exhibits to the Chicago Exhibition, Mr. George Thomson, who presided, stated that English exhibitors would be allowed to state the prices of their productions in England and the prices in America, with duties and other expenses added. The question was whether the exhibits from that district should be sent individually by manufacturers or collectively. It was thought that a collective exhibition of representative manufacturers from the Huddersfield district would be better than isolated exhibits.—As there was only a small attendance the meeting was adjourned for a week, and meantime circulars will be sent round to manufacturers.

The action of the McKinley Tariff and the heavy fall in the silk market have resulted in considerable losses being sustained by Messrs. Henry Lister and Son, Limited, silk plush and worsted manufacturers, of Ashbrow Mills, Bradford Road, Huddersfield, and the effect has been to seriously cripple their business. Proceedings having been threatened and taken by several creditors, the company have, on the advice of Messrs. Ramsden, Sykes and Ramsden, their solicitors, decided to suspend payment, in order that no preference or priority shall be obtained by any creditor. A petition for the winding-up of the company was presented in the High Court of Justice on the 16th inst., and will be heard on the 30th inst. In the circular issued by the solicitors giving the above information to the creditors, it is further stated that—"It is hoped that arrangements can ultimately be made for the business to be resumed, and for the reconstruction of the company upon a sounder basis."

#### Leigh.

The 35th half-yearly balance-sheet and report of the Mather-lane Spinning Co., Limited, which, for the past ten years or more, has regularly paid a 12½ per cent. dividend, states that the net profit, after allowing for depreciation, is £5,585 4s. 7d. With the balance brought forward there is available for dividend a sum of £6,607 7s. 9d. The directors again recommend a dividend of 12½ per cent. free of income tax, that £1,000 be added to the reservefund, and a balance of £358 be carried forward.

#### Liverpool.

The death is announced of Mr. R. N. Hobart, the chief official in the clearing-house of the Liverpool Cotton Association. Mr. Hobart was well known on 'Change, and his genial qualities endeared him to all his friends and colleagues. He had been ailing for some time from a complication of maladies. Mr. Hobart took a great interest in the boys who attended the clearing from the numerous firms in Liverpool, organising classes and himself giving prizes for efficiency among his pupils, by whom he will be sadly missed.

#### Liversedge.

On Thursday the mediation of Mr. B. H. Goldthorp, of Cleckheaton, in the matter of the dispute at Rawfolds Dyeworks, proved entirely successful, an arrangement being made by mutual concessions whereby the men will now return to work as fast as Messrs. Briggs can prepare for running their machinery. The only difficulty was with regard to two of the men whose return to work was objected to, but during the day an

arrangement was made which, though not precisely stated, is satisfactory to both sides. The strike affected nearly 150 men and boys, and has been of about thirty weeks' duration, mainly in consequence of the firm determination of Messrs. Briggs not to recognise the Gasworkers' and General Labourers' Union, with which the men are associated, and by which they have been liberally supported throughout the period of dispute.

**Macclesfield.**

A meeting of the Macclesfield Chamber of Commerce was held on Thursday, Mr. Edwin Crew (president) in the chair, when a resolution was passed confirming the decision of the Technical School Committee to hand over the present Technical School, which was founded six years ago by the Chamber, to the Town Council, on condition that in appointing a committee of management the Council include representatives from the Chamber. The President, who is a member of the Town Council, mentioned that a sub-committee of the Council had been appointed to select a site for a school worthy of the town.—Mr. R. Snow, secretary of the Silk Trade Protection Association, attended and explained how injuriously the silk trade would be affected by the new French tariff; that pure silk goods, which had hitherto been introduced into France free, would now have a duty upon them tantamount to 5 per cent., and that duties on other goods were increased in proportion. A discussion ensued, in which the action of the French Senate was condemned, and eventually a resolution was passed protesting against the new duties which the French are placing upon English silks entering France, and condemning these duties as unfair, ungenerous, and unworthy of a great nation.

**Nottingham.**

Mr. John Jardine, of this town, has just received another large order from the United States for lace curtain machinery. The whole of the apparatus and machinery necessary to convert the cotton into finished curtains is included in the order, which amounts to about £20,000.

**Oldham.**

Mr. Honsley, of the Harper Twist Co., Ashton-under-Lyne, has been appointed engineer at the Boundary Spinning Co.

The Pearl Mill Co. has commenced spinning operations, and other machinery is being got to work as rapidly as possible.

The directors of the Oak Spinning Co have placed an order for new steel boilers with Messrs. Tetlow Bros., of Hollinwood.

Mr. Thomas Taylor, of the Windsor Mill, Hollinwood, has been appointed carder at the Broadway Spinning Co.

The Oldham Under-engineers' and Stokers' Union has become affiliated with the Oldham Operative Cotton Spinners' and Twiners' Association, which also includes the roller coverers.

Mr. Bertie Whittaker, the assistant secretary of the Crompton Spinning Co., has been appointed to the position of secretary and salesman, vacated by Mr. W. Hartley.

The Elm Spinning Co has now got to work with the whole of its machinery, supplied by Messrs. John Hetherington and Sons, Limited, of Manchester, and indications are not wanting which point to the concern being a great success.

Mr. Robert Radcliffe, of the Glasgow Spinning Co., has been appointed mule overlooker at the Woodstock Spinning Co., Limited, Oldham; and Mr. James Alexander, of the Bankside New Mill, Oldham, is transferring his services to the Glasgow Co.

It is reported that the operatives at the cotton mills in both the spinning and carding departments are making complaints to the officials of their respective trade-unions in regard to the nature of their work. Several disputes are pending, and at one concern the employes have given notice to strike work.

On Wednesday morning a fire broke out in the Higher Clough Mill, Crompton, belonging to Mr. J. M. Cheetham, which resulted in the destruction of the premises, and doing damage to the extent of several thousand pounds. The conflagration originated through a skip of waste, which an operative was carrying, coming into contact with a gas jet, and thus becoming ignited.

The West End Mill Co. are about to have the steam engines of their No. 1 mill triple expanded. At the shareholders' meeting last week the Chairman said they did not expect to effect the same economy they had in the engines which they had had similarly treated, but at the same time they anticipated obtaining more regularity in turning and also some amount of economy.

The directors of the Prince of Wales Spinning Co. have for some time had under contemplation the carrying out of alterations in connection with the steam engines, and have now decided to have them converted to triple expansion, the carrying out of which has been placed in the hands of Messrs. Polliitt and Wigzel, engineers, of Sowerby Bridge. They have also ordered new boilers with Messrs. Tetlow Bros., Hollinwood.

The death is announced, at his London residence, Lancaster-gate, Hyde Park, in his 78th year, of Mr. Eli Lees, of Werneth Park, Oldham. Mr. Lees was well known in Manchester and Liverpool commercial circles as founder of the very extensive firm of cotton spinners and velvet manufacturers, Eli Lees and Co., Limited, of the Hope and Bedford Mills, Oldham, and of Spring-gardens, Manchester. He was an ardent Liberal and a member of the Reform Club in London. He had been for several years magistrate for the Salford Hundred of the County Palatine of Lancaster. Mr. Lees was an exceedingly generous and benevolent man, especially in connection with the town and neighbourhood of Oldham.

At the spindle works of Messrs Platt Bros. and Co., textile machine makers, Oldham, one of the steam engines "ran away" on Wednesday afternoon, with the result that it was seriously damaged, and the flying debris penetrated a wall into an adjoining engine house, doing damage also to a pair of horizontal engines. The engineer sustained fractures to several of his ribs, besides receiving other injuries. The mishap will throw a few hundreds of workpeople temporarily out of employment. Every effort is being made to repair the damage as quickly as possible. The runaway engine was an immense structure of the marine type.

At the ninth annual meeting of the Oldham Chamber of Commerce, on Monday evening, Mr. S. R. Platt (of Messrs. Platt Bros. and Co.), in his address as president, reviewed the questions which had received the attention of the Council during the past year. In regard to factory legislation, he said many regulations had been made to improve the sanitary arrangements: workshops of all sorts were now under the Act, and the children were also looked after by the School Board. The new regulations relating to the fencing of dangerous machinery were very loosely worded, and, unless inspectors acted very judiciously, would lead to much friction. It almost seemed that machinery must be so fenced round that they could not get at it. Referring to technical education, he stated that the Corporation had appointed a committee, of which he was chairman, who had been engaged during the past few weeks in visiting some of the leading technical schools in the country. They had amassed a large amount of information, which would be put in a report and printed, and then the committee would consider as to the best scheme to adopt for the best interests of the borough. In alluding to the new tariffs of France and Spain, he remarked that they were of a very protective character indeed. That of France was particularly so, and that country seemed inclined to do the best it could for itself. He was surprised at the character of the Spanish tariff because he would have thought that that country, not being overburdened with superfluous cash, would have preferred to purchase in the cheapest market. He also stated that the number of members of the Chamber was 196, and in his opinion in a town like Oldham this number ought to be considerably augmented.

**Pool.**

A fire occurred yesterday week at Balston's twine factory, Poole, Dorset, doing damage which is estimated at £10,000.

**Preston.**

The first cargo of pig-iron that has come up the Ribble arrived this week at Preston Quay from Ardrossan in the *Moss Rose* steamship. The consignments were to foundries in Accrington, Burnley, Blackburn, and Preston.

On Saturday afternoon, at the Kent-street Cotton Mills, worked by Messrs. Liver and Co., the interesting ceremony of christening a new type of beam engine, on the triple expansion principle, was performed by Mr. E. Rushton, one of the owners of the mill buildings. The new engine—manufactured by Messrs. Joseph Foster and Sons, engineers and boiler makers, Soho Foundry, Preston, and designed by Mr. J. H. Tattersall, consulting engineer—is the only triple expansion beam engine in this part of the county. It is on a new beam principle, the high and low pressure cylinders being applied to the beam, after the McNaught principle, and the intermediate and low-pressure cylinder after the Woolf principle. The h.p. cylinder is 16 in. diameter by 2 ft 6 in. stroke, the i.p. cylinder being 22 in. by 3 ft. 4 in., and the l.p. cylinder 30 in. by 5 ft. The steam pressure is 165 lb absolute, and the horse-power about 230 indicated. The engine beam is 17 ft centres, 2 ft 10 in. deep, with flanges 13 in wide by 2½ in. thick. The connecting rod is 14 ft centres, made of the best forged iron, polished all over. The crank is also polished. The flywheel is 17 ft. 6 in. diameter, with eight arms receiving a ring of toothed segments, 14 ft. diameter. Amongst those present at the ceremony were Messrs. E. Kushion (Blackburn), J. W. Liver (Preston), R. Pendlebury (Preston), E. Mossley (Manchester), J. Jones (Preston), W. Baxter (Preston), Oliver (Preston), J. Bradshaw, T. Maymon, J. Aspin (Blackburn), T. Whitehead (Burnley), K. Shaw, J. Kenyon, J. Fell. Pateson, J. Sellers, J.P. (Preston), T. Vane, J. Whitehead, Hindle (of the firm of Messrs. Foster and Sons), Lomas (Leyland), Taylor, Hodson (Feyland), Hibbert (Preston), S. Nicholson

(Blackburn), A. Anderson (Blackburn), J. Ormerod, W. Isherwood, W. Cheetham (Blackburn), J. W. Bamford (Bolton), H. E. Sowerbutts, J.P., and others. The engine was started by Mr. Tattersall for a run of fifteen minutes, at the expiration of which time wine glasses were filled, and success to the engine, "The Majestic," was drunk.

**Rosendale.**

The election literature issued by the rival candidates, Sir Thos. Brooks and Mr. Maden, in this constituency, includes a leaflet by the Rev. John Donald, Wesleyan minister, Belfast. Dr. Donald was a follower of Mr. Gladstone until the latter espoused the Home Rule cause. Narrowing that question down to its relation to Lancashire, Dr. Donald says:—"The cotton trade would in all likelihood suffer largely from Home Rule. The Home Rulers would be very apt to follow the United States of America and our colonies in taxing imported goods. Cotton cloth is woven in Lancashire, and manipulated in Belfast and Londonderry and surrounding counties, giving employment to tens of thousands of hands in making same into handkerchiefs, aprons, collars, cuffs, sheets, and other smaller goods. Under Home Rule, it is believed, protective duties would be imposed to the disadvantage of Lancashire, and a scheme would be framed for the establishment of spinning and weaving cotton in Ulster as in the United States, and probably not to the advantage of the large numbers employed in Ulster as to the work of manipulation. Many commodities under these protective duties would become dearer for the working classes in Ireland, while Lancashire would suffer from the loss of trade; thus rendering the position a losing game for both the North of Ireland and the North of England."

**SCOTLAND.**

**Dundee.**

It is of interest to note in view of the partial famine in jute that the stock in the Dundee warehouses is 500,000 bales, and the quantity afloat 300,000 bales, while it is computed that of the jute yet remaining to be shipped, 300,000 bales will be sent to Dundee.

The many friends of Mr. Oliver Gourlay Miller, so long a leading spinner in Dundee, and one of the most enterprising merchants of his time, will be glad to learn that in his new home in Manitoba he is displaying the same energy and vitality which characterised him of old. Although an octogenarian, he is evidently as active as ever, and has been lately mainly instrumental in promoting and starting at Winnipeg the Manitoba Binder Twine and Cordage Co., of which he has been appointed Consulting Director.

An adjourned meeting of importers of jute in Dundee was held on Monday to consider further the question of what action should be taken to protect themselves against damaged cargoes. Some discussion took place as to the rate at which the various importers should be assessed if the association were formed, and it was ultimately recommended that the rates should be based on a three years' average of their respective importations. The meeting thereafter adjourned, but it is expected that the importers will be called together in the course of a week or ten days to take definite action with the view of forming a Protection Association.

**Forfar.**

The weavers in the employment of Messrs. Don and Co., Forfar, have received an addition of from 1d. to 2d. per cut.

**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 of the previous week. 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. | Continent. | Totals. | Totals for year to date. |
|------------------|------------------|-------------------------|--------------|---------|------------|---------|--------------------------|
| £89,468          | 20,747           | 3,144                   | 1,012        | 136     | 153        | 114,940 | 292,727                  |
| 251              | 22,253           | 40                      | 200          | —       | —          | 22,754  | 74,603                   |

A complete installation of electric light has just been fixed up in the Clydesdale Silk Factory, Larkhall (Messrs. Caldwell, Young, and Co.), by Mr. John Bennie and Co., Star Engine Works, Glasgow. A special feature is that, in the event of the factory engine breaking down or requiring repair, the electric motive power will be available to work the factory.

Yesterday week a fire broke out in the finished goods store in connection with the bleaching, dyeing, and finishing work of Messrs. William Adam and Sons, Mill-bank, Townmill-road. The works cover an extensive area of ground, and employ between 300 and 400 hands. The building in which the fire originated is two storeys in height, and was stored with finished goods. The firemen succeeded in confining the fire to the building in which it originated. The damage, however, owing to the valuable nature of the goods destroyed, is heavy, being roughly estimated at £6,000.

Mr. Peter Colquhoun, grey goods-merchant, Glasgow, died yesterday week at the age of 87. He was the oldest member of the Royal Exchange, having joined in 1834. He was known on 'Change and in commercial circles generally for more than half a century by the familiar and honourable appellation of "Honest Peter," and the name was thoroughly well deserved. He was a severe sufferer in 1878 by the failure of the City of Glasgow Bank, of which he was a shareholder, and much public and private sympathy was shown to him at the time on account of his losses. He is survived by two sons and two daughters.

#### Haddington.

Mr. Roger Robson, woollen manufacturer, Wauk Mill, was accidentally drowned on Sunday night. Mr. Robson, who was over 80 years of age, left his house in the evening to take a look at the mill premises, one of the boundaries of which is a deep mill lade. It is supposed that while the deceased was walking in the darkness near the lade he had slipped on the ice-bound ground, and thus fallen into the water. When found life was extinct. Mr. Robson had been in business over half a century, and was highly respected.

to a reasonable rate of remuneration.—The Chairman held that the rate of wages was higher and the hours of labour shorter here than in Scotland. As to the future, linnenlappers was decreasing, and if the strike was to terminate to-morrow a large number of those now on strike could not be employed. This he said with extreme regret.—Mr. Reade added that an enormous quantity of linen for shirt-making purposes was being produced unappled.—Mr. Taylor thought it singular that these facts had not been discovered before by the linen merchants. At all events, so long as any men were being employed they had a right to be fairly remunerated.—The lappers having retired, the following resolution was passed:—"That, having heard the views expressed by the representatives of the Linenlappers' Union, which was received to-day, at the instance of the United Trades' Council, the Council of the Linen Merchants' Association regret that since the resolution of the 6th November was passed there is no change in the condition of the mercantile department of the trade to enable the linen merchants to adopt any changes in the lapping trade that would increase the cost, and they came to this resolution after hearing the views of the representatives as expressed to-day in sup-

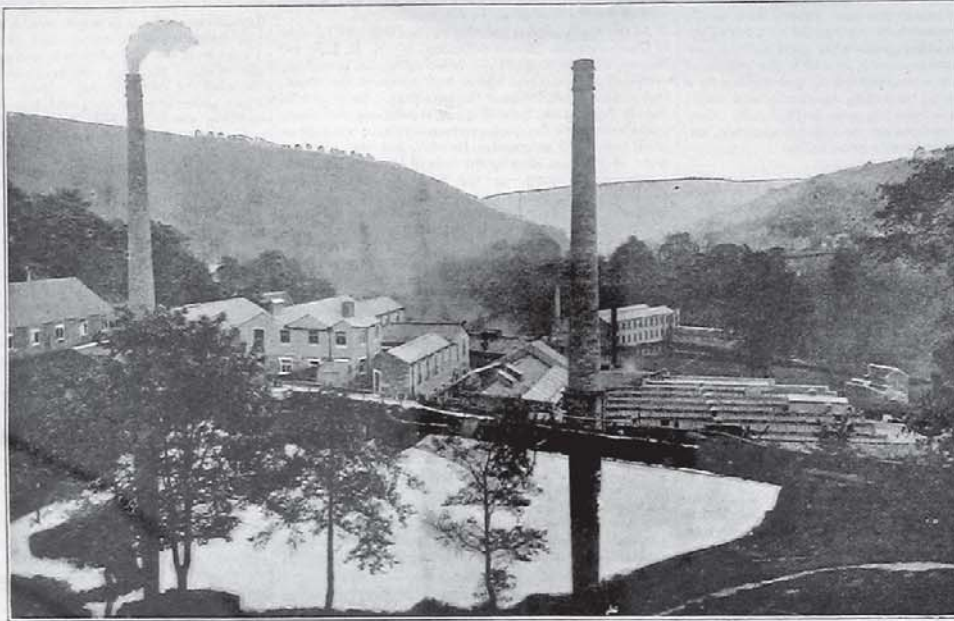
## Miscellaneous.

### CONCERNING VELVETEEN.

(Extracted from "The Diary and Buyers' Guide" for 1892, issued by Messrs. Henry Bannerman and Sons, Limited, Manchester, by kind permission.)

(Continued from page 55.)

When our cloth has passed through the hands of the cutter it has to go into those of the dresser and dyer. One of the earliest attentions devoted to it here will be that of examining it for the purpose of discovering and repairing any damage it may have sustained in the operation of cutting. Those who perform this work are known as "Enders and Menders," and, if you watch one of them, you will see, when she has discovered a torn place, how deftly she can not only insert bits of warp thread, but raise a pile upon them, the latter



A COUNTRY DYE WORKS.—MESSRS. WORRALL'S.

### IRELAND.

#### Belfast.

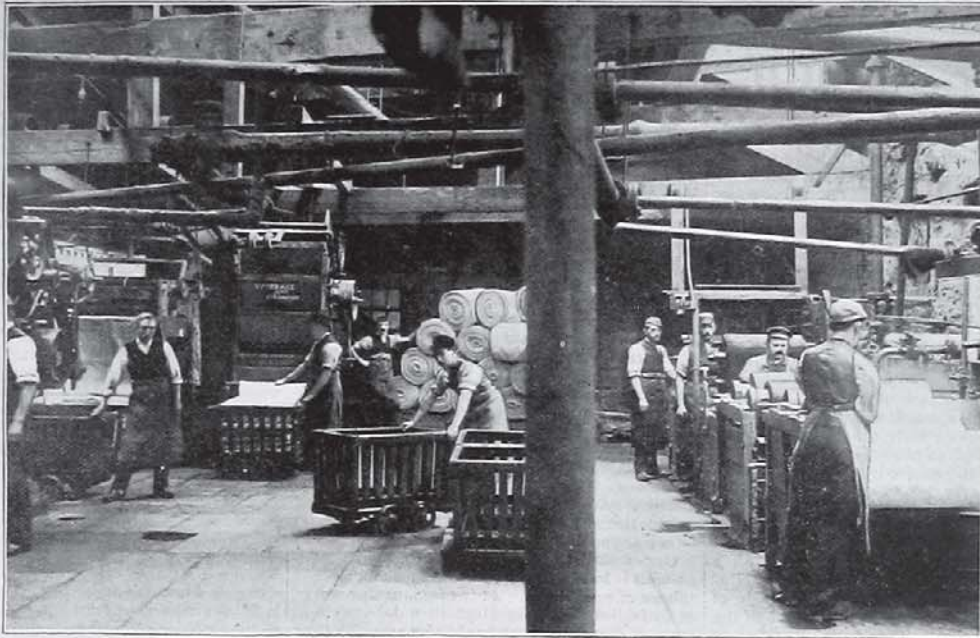
On Monday the Council of the Belfast Linen Merchants' Association received a deputation from the United Trades' Council, when it was arranged that the Association should receive a deputation from the Linen Lappers' Union on the following day. Accordingly, on Tuesday, a conference took place in the Linen Hall Library between the representatives of the Linen Lappers' Trade Union and Council of the Linen Merchants' Association. Mr. W. K. Patterson (Northern Linen Company) presided, and the other members of the Merchants' Association were—Messrs. Samuel Bryson (John Adams and Co.), Max Veitel (Geo. Betzold and Co.), John Rogers (Brookfield Linen Co.), Wm. Moreland (County Down Flax Spinning Co.), Sir Wm. Q. Ewart (Messrs. William Ewart and Son), Frazer and Houghton, R. G. Glendinning (Glendinning, McLeish, and Company), H. J. Nicholson (Greenmount Spinning Co.), F. P. Gunning (John Gunning and Son, Ltd.), Wm. Russell (A. and S. Henry and Co.), Thompson Kelly (Thompson Kelly and Co.), H. McClelland (F. B. Leckey and Co.), George M. Shaw (Henry Matier and Co., Ltd.), Wesley Watson (M'Crum, Watson, and Mercer), R. F. Scott (Richardson, Sons, and Owen, Ltd.), and R. H. Reade, J.P. (York-street Spinning Co., Ltd.) The linen lappers' trades-union was represented by the following:—Messrs. John Millar (president), Alex. Taylor (vice-president), Thomas M'Kendry (secretary), William Wilson, Thos. Hunter, and Wm. Morrison.—Mr. Alex. Taylor opened for the lappers, explaining the circular in which the claims of the men had been set forth. They held that they were entitled to uniform conditions of labour, and after serving six years

part of the propositions in the circular issued by the Linenlappers Union on the 27th October.—This resolution was communicated to the linenlappers' representatives, and Messrs. Millar and Taylor having expressed thanks for the manner in which they had been received, the deputation withdrew.

AMONG the latest instances of *fin de siècle* fastidiousness is an accepted Code of Fashion in relation to the garments worn by ladies' pet dogs, according to the Paris correspondent of the *Daily Telegraph*. Time is no longer when a plain coat of blue cloth with a yellow border was considered the acme of luxury for the domestic toy terrier, pug, or Italian greyhound. Doggy must now have a complete wardrobe, containing a costume for each event of the day. The following is given by a society paper as the very latest thing in "canine outfits." At breakfast only a simple garment of blue or white flannel should be worn, and at this period a collar of any kind is considered vulgar. For the morning "constitutional" a close-fitting coat of striped or spotted English chevot, with a mantle well covering the chest, is essential, and the leading chain and collar must be of antique silver. The costume for the afternoon drive, to be fashionable, must be of fine cloth or plush, and the collar either blue, mouse, or fawn. With this a collar of velvet hung with tiny medallions is *de rigueur*, unless one of far be considered more becoming. Finally, for evening dress the pet is arrayed in a wadded gown of cashmere or velvet, ornamented richly with beads and emblazoned with the arms of the happy owner on the collar.

process being accomplished by looping weft threads over a needle, binding them to the warp, and then cutting the loops by means of scissors, and finally clipping the divided threads until they blend with the rest of the pile. Upon the treatment it receives in the hands of the dresser and dyer the value of our cloth to the wearer will very largely depend, and how much is comprised within those terms, dressing and dyeing, we shall presently see. Now, every purchaser of what is known as the "County" Velvetene is informed, as a guarantee of its excellence, that it has been dressed and dyed by Messrs. J. and J. M. Worrall, a firm whose reputation, built up on the experience of a century, is of the highest, and whose fame is world-wide in extent. Some idea of the magnitude of the operations conducted by this firm may be gathered from the fact that it employs as many as two thousand persons. These cannot be accommodated within one area, but are departmented off according to the various processes through which the fabric has to pass; so that we find we must go to one place to see the cloth scoured and otherwise treated in a preliminary way, to another to see it singed and bleached, and to a third for the dyeing and finishing operations.

Following our cloth to the first of these works we find it stored in a receiving room, and in the condition in which it came from the cutter. Manufacturers' marks are pointed out to us on each piece by which it may be traced from its source to its ultimate destination. It will be

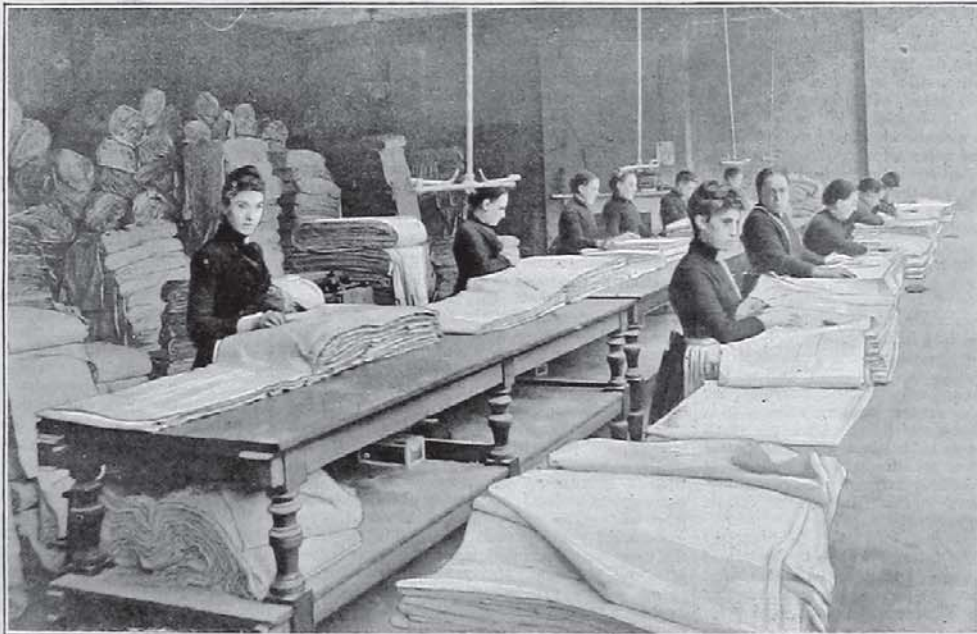


INTERIOR OF DYE SHED.

remembered that our cloth both in the weaver's and the cutter's hands had received a certain amount of stiffening matter. These temporarily introduced substances will have to be removed so that the fabric shall be rendered as pure and soft as possible. To accomplish this it will first have to be soaked, and to see it so

among these machines, we are introduced first, and are told that it contains boiling water only, to which, as we see, the cloth is introduced and made to pass under and over rollers until it has become thoroughly saturated or soaked, after which it is dropped into a tub of cold water to get cooled, and is thence delivered in

only dimly perceptible. Nothing has been added to the hot water in this operation, and when the cloth has gone through it, it is effectively washed. It has now to be taken to have the moisture extracted from it, and following it as it is taken away on the barrow we are introduced to what is technically called a



"ENDERS AND MENDERS."

treated we are introduced to a large open shed lighted from the top, filled with a humid steamy atmosphere, and with surroundings that are decidedly sloppy. All about us on the wet stone floor of this great wash-house, with its interlacement of steam pipes among the whitened rafters overhead, there are mysterious chambers of wood and iron in which heated water is being splashed and dashed about in a vigorous and turbulent fashion. To the soaker,

a folded form. From the soaker, in its softened condition, it is taken to the washing machine or winch standing close by, a long chamber-like structure with sliding panels or shutters in it. When one of these shutters is opened and the steaming interior is exposed, you get a confused impression of dripping cloth working along over a fly wince, and are told that it is being helped on its way by a "rudder" arrangement," the nature and movement of which are

hydro-extractor, but which among the workmen is familiarly known as a "whizzer." It should here be remarked that in all these washing and dressing operations the cloth is in a sense handled tenderly, great care being exercised to prevent the pile being crushed. Squeezing the cloth to get rid of the moisture would be out of the question, so we find that in the "whizzer" a turning process is adopted like that used to take water out of a mop. This "whizzer" is

a hooded machine, and when the hood is raised we see a drum round which the wet cloth has to be wound. When this winding has been done, and the cloth fastened by bands so as to retain its position, the hood is drawn over and the revolving process begins. The result is that by centrifugal force the water is discharged from the cloth in such a way that if the hood of the machine is lifted, the effect is like that of a shower of rain. Care has to be taken that the cloth shall not remain in the machine too long. When it is sufficiently cleared of moisture, it is taken to a drying chamber, the inner portion of which is hidden from our view, but we see it delivered into the interior, and know that it is dried by passing over steam-heated cylinders. We next get sight of it in the room above, where it is seen rising from the drying machine and being delivered in plaited folds upon the floor. Here the cloth is weighed and marked. It has now to be well brushed, and to this end we see it travelling through a machine where the pile is brought into contact with a series of brushes fitted upon the curves of rollers. The effect of this brushing is to remove loose filaments, take any twist there may be out of threads, and fill the pile up into a compact, even form. It is now taken to have the face of it shorn, and in this process we see it passed between a series of knives placed in a diagonal fashion on a roller and a steel plate, the effect of this clipping being like that produced by a pair of scissors. This is done to make the face of the pile smooth and level. It is now subjected to the brushing machine again, and the last of these preparatory processes has been accomplished.

We have now to follow it to the scene of a new series of operations. Here our cloth, after being subjected to many ordeals, the knife among the rest, has now to pass through that of fire. Two forms there are to select from, each of which may serve the purpose. The cloth has to be singed, which means that all loose fluff on the face of the threads is to be burnt off, and the pile made still more solid and even. This may be done by means of passing it over gas flames, or a red-hot copper roller. Watching the first of these processes, we see the cloth made to travel rapidly between the lower sides of three rollers and three rows of gas flames, after which it is carried aloft, in a suspended fashion, over and under a series of rollers for cooling purposes, and then deposited again in plaited form. In connection with this machine there is a ventilator worked by a fan, which removes all noxious effects of gas combustion. The singeing by means of a red-hot copper cylinder looks a much more formidable business than that by gas. Here we see a cylinder made red hot by having the flame of a furnace passed through it, and in contact with this revolving cylinder the cloth is travelling in a fashion which makes one wonder how it escapes complete destruction. The speed saves it, however, and we see it emerging looking only a little browner, as, having passed over the cooling rollers, it is deposited again on the floor. After the cloth has been singed it is brushed again, and after being examined to see that the desired result has been obtained, it is ready for bleaching. The cloth is now in the "dressed-off" state. A pattern is shown in the book.

To what extent the cloth shall be bleached depends upon the colour it has to be dyed, and other circumstances; but described generally, the bleaching process goes on somewhat in this way. The cloth is first boiled in a weak solution of soda ash, and afterwards washed, then soured by being run through a weak solution of sulphuric acid, and afterwards washed again; then it is subjected to a weak solution of chloride of lime, and another washing takes place, after which it is subjected to a weak solution of sulphuric acid, and then a final washing brings the process to an end. It will be understood, of course, that in dealing with these processes the description is limited to what is roughly presented to the view of an outsider, and that accuracy of detail is nowise affected. Indeed, as the uninitiated observer wanders about a bleach works of this kind, with its many sheds and outbuildings, its elevated

reservoirs and tanks, its steaming boilers, its dark, sloppy alleys, filled with washing and bleaching machines, with wet cloth being trundled about on innumerable barrows, and busy workers everywhere, the effect is, to say the least of it, confusing, and the effort to get at any distinct sequence or order of things is difficult. Knowledge seems to come only in glances and glimpses, though the courteous guide in this case is by no means to blame for that. One clear notion of bleaching, however, is got as a pause is made before a machine into which the cloth is being delivered in its brown and singed state. As it is dipped into a greenish-looking liquid, to be lifted up and dipped again, the process being frequently repeated, you can see the cloth gradually losing its brown hue, and getting whitened, until the last dipped portion presents a striking contrast to the one which has not yet entered the bath. What strikes you also, is the inventive genius which has been brought to bear upon the various processes that come under your observation here and elsewhere in these works. As the various machines are passed in review, you find that for washing, brushing, singeing, bleaching, dyeing, and finishing, there are inventions and adaptations conceived and worked out on the spot, and which are not to be found in use anywhere else.

Our cloth being now ready for dyeing we must go with it to a much larger and more important sphere of operations. At the famous dye-works at Ordsall we find ourselves in a labyrinthine maze of dye-sheds scattered about among loftier buildings, and covering ten acres of ground, where the unguided stranger might wander helplessly and soon lose all clue as to the tendency of his footsteps. As you pass through it you find that this great industrial warren is filled with a multitude of workers, and with machinery whose ramifications seem so endless that you are scarcely surprised to learn that it requires six main besides numerous subsidiary engines to supply the power.

There are the same steamy and dripping conditions as in the works we have previously inspected, and in the "whizzers" and washing winces we seem to recognise old acquaintances. But it is the dye beds of all fashions, "jig" and other, that preponderate here, and the distinguishing feature of the place is the presence of colour. It is in evidence in all conditions of development, presenting itself to you in the fabrics going through the beds and in the pieces of cloth lying about everywhere. As you look upon the operations that are being carried out here, though your impressions may only be vague and general, you cannot help having the consciousness that you are surrounded by conditions the outcome of which is the production of colour in the most delicate and varied forms. You are conscious, too, that behind these material evidences there is a vast storehouse of scientific knowledge, the result of patient and watchful investigation, combined with the experience of a century of practical work. You will be aware, too, that there are secrets and mysteries in this art of dyeing, which, as an outside observer, it would be useless to try to fathom, and you will be wisely content in such matters to remain an impressionist. From such a standpoint you may go to look, and not without interest, upon some of the materials from whence these dyes are produced; the red woods and yellow woods, logwood or fustic, as the case may be, piled up in the storehouses attached to them, and may also see logs of these woods pressed remorselessly end-on against a rapidly revolving circular disc, fitted on the face of it with saw-edged teeth, that bite with a gritty, grinding sound, and rapidly reduce the hard wood to sawdust, small particles of which float out into the air and deposit themselves upon you as you watch the operation. From here you may go to see this ground wood put into great iron receptacles familiarly known as "teapots," which are in reality stills, and where under the influence of steam and boiling water the dye-liquor is extracted. Many other dye-stuffs, vegetable and mineral, you may see and handle, to the enlargement of your knowledge in this direction; but perhaps it is time now to apply ourselves more closely to the object we have immediately in view, which is to

see our velveteen cloth dyed. Brown, as we have previously indicated, is the colour selected, and to see how this is imparted to it we make our way along the sloppy alleys to a shed where stands a continuous dyeing machine, at one end of which we see our cloth lying in the partly bleached condition that it presented when it left the bleach works. Into this machine, in that part of it to which our cloth is introduced, there has been poured a hot solution of cutch or catechu, which you are told is a vegetable colouring matter derived from shrubs grown in the Indian provinces. It possesses strong tanning qualities, and fishermen use it to tan their nets. You are shown this cutch as it is received compressed in slab-like form, and may also inspect a reservoir of it in the liquid state, located in a chamber over the dye-beck, into which it is conducted in carefully regulated quantities. Into this beck of cutch-dye the cloth is passed, and is conducted through the hot bath, being dipped and lifted under and over guide-rollers in such a manner as to give it a thorough steeping. From this cutch bath it is taken continuously forward to be introduced to a new receptacle, where by the same mechanical arrangement as before, it is passed through a solution of bichromate of soda. This has the effect of precipitating the colouring matter into the fibres of the cloth. When this operation is finished you see it delivered at the other end of the machine wearing a brown appearance, though the shade is lighter than it will ultimately shew. There is in the cloth at this stage a quantity of colouring matter beyond what has been precipitated, and as the latter only is required to remain, this surplus colour must be washed out. To effect this the cloth is passed on to a washing machine containing cold water, and here it is carried along under and over guide-rollers, with much splashing, and eventually delivered free from all superfluities. When this wet cloth has been subjected to the "whizzer" it is taken to what is known as a "dye-jig." These dye-jigs, which have rollers round which the cloth is raised and lowered in the beck, are worked by hand or otherwise, and are arranged in pairs. Into these in turn our cloth will be put and receive treatment which we need not follow in detail, but which may be briefly summed up in this way. In one of these jigs it will be passed through a solution of logwood, red wood, fustic, and sumac, according to the weight of the piece and quality of the cloth. The effect of this is called "saddening." Then it will be taken to another dye-jig, and in order to fix the colours it will be passed through a solution of muriate of tin, sulphate of iron, and sulphate of aluminium. Between these processes, which, of course, are regulated or repeated according to the objects to be gained, the "whizzer" will be brought into use to take out superfluous moisture. After the fixing of the colour the cloth will be washed, and then, in a dye-jig, it will be "topped" with aniline dye to get the exact shade required. Then there will be another washing, another twirl in the "whizzer," and finally the cloth will be dried over heated cylinders. The gradual development of the colour on the cloth as it goes through these processes is shown in the patterns, where it will be found in its "catechued," "saddened," and "dyed-out" states respectively.

We have now to follow the cloth to the finishing operations, which are not commenced until it has been ascertained that the correct shade of colour has been obtained. The first process of finishing is the waxing of the pile side of the cloth, which is done by causing it to travel through a machine containing four rollers made of beeswax, into contact with which, as they revolve, it is brought. This, you are told, is done to prevent the colour being stripped, and for other reasons. After this slight waxing the cloth is subjected to a number of brushes in a brushing machine, the object being to raise the pile, work the wax into the fibre, and give it polish. Then it is waxed again, and afterwards taken to the peg finishing machine, where you see the pile as it passes through, being subjected to measured and nicely adjusted strokes from the edge of a strip of hard wood working across the width of the cloth. The effect of this "stroking"

operation is to give lustre to the pile, but to counteract any flattening result of it the cloth is afterwards brushed again. Finally, in these finishing operations, you will be shewn how our piece of velveteen is subjected to hand treatment. In another room, set apart for this purpose, you see the cloth laid upon stone tables, there to have the "hand peg" and the brush applied to it, and the last touches given in the development of the lustrous beauty of the pile. Afterwards it will be put through the plaiting and folding machine, and then it will have to pass—as every piece must—the careful scrutiny of one of the principals of the firm. Our cloth then presents the appearance shewn in the last of our patterns.

Before, however, it is ready to be placed upon the counter of the draper, it will elsewhere be measured and made up into graceful and attractive folds; a fitting receptacle in the form of a box will be provided for it; and, as a last delicate attention, there will be laid on it a distinguishing trade ticket, a work of art in its way, the reproduction, it may be, of some well-known picture or representation of female beauty, such as you find displayed in the labels by which the "County" velveteen is identified.

We have now come to the conclusion of our subject, and if the narrative may not lay claim to being a "fairy tale of science," it may perhaps not be found entirely devoid of interest. We have endeavoured to trace the development of this special form of textile fabric, from the yarn of which it is composed to the embellishment of it by the aid of the finctorial arts. In watching all these processes the observer cannot have failed to recognise the infinite care that is taken to produce good and honest results. At no stage could he say that efforts were not being made to give practical effect to a maxim which the present writer saw freely displayed in the workshops of a firm of machinists, whose business, among other things, it is to construct the looms upon which velveteen is made, a maxim which conveyed to the workers the unquestionable truth, that "Whatever is worth doing is worth doing well."

#### CARPET AND MAT-MAKING IN THE PUNJAB.

The Calcutta *Englishman* gives the following summary of a monograph on fibrous manufactures in the Punjab, which has been written by Mr. H. W. Gee, of the Indian Civil Service:—

The scope of the enquiry has been confined chiefly to "classes of fibres which are actually utilised in local manufactures, and no attempt has been made in the district reports to deal with those classes of potential products which are as yet little known or unused among the people." A description of fibrous plants, their localities and uses, is the introduction to the more serious part of the work, but even this portion has been most minutely treated, and the results shew that Mr. Gee has spared no pains in getting up his subject. The chief imports of manufactured articles into the Punjab consist of tāt and gunny bags from Bengal and Karachi, and paper from Calcutta. The munj fibre is used largely, and from it is made the bān munj so much sought after on account of its capital wearing qualities.

Carpets and mats are made from bān munj in Gurgaon after a peculiar fashion, which Mr. Gee describes. To use his own words:—"The skeins of beaten-up fibre (lachchhās) are stretched round two rollers on the ground to form the warp; the woof consists of a piece of bamboo about a yard long with niches at each end. A lachchha is wound on to the teri, and this is crossed and re-crossed between the parallel strings of the warp, and these parallel sets of strings are crossed behind each strand of the woof (bhāi bharna). This is done by means of two bamboos, which are hung horizontally over the web on a frame; from each of these bamboos a number of strings are suspended, which are fastened to the upper and lower layers of the woof respectively. By elevating and depressing these bamboos alternately, the upper and lower strings of the

warp are made to cross after each strand of the woof has been inserted. The strings are then made compact by means of a comb with iron teeth. One man can make a square yard in a day. The Delhi Jail is famous for these carpets, and they have also been made in the Lahore Jail. They have been from there exported to England, and the trade could be made a profitable one if more labour was employed. They can be worked on a loom to any pattern, and the fibres are easily dyed. Munj and san string can also be made into door mats of any pattern, and most jails can supply them to order. When san sutri is employed instead of munj, the matting is known as tāt patti. In Hoshiarpur Rs.3,200 worth of munj matting is made annually, and sold at five annas per square yard. Sān and sankra are used in Ferozpur, tufts of coloured fibres being sometimes left on the mats in imitation of Persian carpets. A mat called 'mandri' is made in Kulu of rice straw or grass, plaited on a framework of string. In Hazara, too, a round mat, 18 inches across, called 'phindi,' is made of the same material and sold for two to four annas. In many districts the dib (bulrush) is a good deal used. These mats are also made something like a darri. A long pole of the required width is perforated with holes about an inch apart, through which strings of munj are passed and stretched tight to form the web. The rushes, which have been moistened and beaten first to make them pliable and flat, are then twined over and under the strings of the web, and beaten into their places with wooden pegs. As the work progresses the beam is moved further on. The sides are finished off by collecting the long ends into bunches and twining one under the other to form a sort of plait work; the ends of the mat are secured by sewing these with long stitches of double munj string. The matting is firm, durable, and elastic, but is not equal to that made of dwarf palm. Pachai, the crushed stalk of the sugar cane, the dihla rush, and the dab (*Poa cynosuroides*) are used in a few places, but not to any great extent. In Dera Ghazi Khan the coarse flat shoots of the *Saccharum sara* are made into a thick matting called 'truha.' These mats are generally used as a substitute for thatch; their thickness renders them unsuitable for use in bungalows.'

#### MR. HOLT HALLETT, DR. BAHADURJI, AND INDIAN MILL OPERATIVES.

The following article, copied from the *Din Bandhu*, a native newspaper published in Bombay, and "devoted to the interests of the working classes," is in continuation of articles on the above subject which appeared in previous numbers of that journal, and were reprinted in *The Textile Mercury* of November 28th, 1891, and January 16th, 1892:—

The *London Times* of the 14th ultimo has taken a very judicious and deliberate view of the subject, and has acquitted itself very admirably, an act certainly to be lauded. It says "Dr. Bahadurji intimates that the factory operatives of Bombay, whether males, females, or children, are engaged in an easy and healthy occupation in which the shifts of work are so divided among members of a family, or similar groups that no one is unduly taxed by continuous labour." We are at a loss to know in what light we are to interpret what the Professor of Medicine means by the shifts of work being so divided among members of a family or similar groups, etc., etc. We fail to see, *in toto*, what the members of a family or similar groups have to do with such shifts of work; because we doubt very much the very existence of such mode of work in any of our Bombay mills. As far as we know very few mills in Bombay can boast of such shift modes of work with regard to children, but we are sure that there is none that provides such ways of working with respect to males and females. We know well that in many instances the poor operatives do not get leave, however important and urgent may be their business, unless they produce their substitutes, and in some cases they are flatly refused substitutes at all! We should like very much to know in what mills such shift modes of work are in vogue in our little island, and until we know such mills we deem it proper to be sceptic about Dr. Bahadurji's above statement.

Fortunately for Dr. Bahadurji and his supporters Mr. Holt Hallett is not yet in possession of all the par-

ticulars of the life of our Indian mill operatives, otherwise we doubt not he would have proved very hot for them. We heartily wish he knew them all long ago. It seems his contention chiefly rests on the reports of factory commissions and hence they cannot be but credible. It has been shewn plainly by the *London Times* that the assertions made by Mr. Holt Hallett are in no way incredible as Dr. Bahadurji thinks, but on the other hand they are as credible as anything, since they are confirmed by the reports of the Bombay Factory Commissions. We pass by quietly until we arrive at Dr. Bahadurji's beautiful description of "the present well-fed, well-clad, and healthy women of the Indian mills with bright ornaments on their persons!" Here we must pause awhile and pass a remark or two by-the-bye. But before doing so we should like to quote what our contemporary *The Bombay Gazette* has to say in one of its recent issues in respect to Dr. Bahadurji's description of our Indian reeler. It says "the picture corresponds closely to one that was given in our own columns as an accurate description of one of the commonest sights in an average Bombay mill, and features in it are as familiar to us as anything in Bombay street scene." Unfortunately we do not view at things exactly in the same way as Dr. Bahadurji and our contemporary do, otherwise we would give vent to similar expressions. Everybody knows that the same thing is not seen in the same light by two observers. And we fear perhaps we may be wrong. Let it be as it may, but it is a fact that we differ vastly from Dr. Bahadurji and *The Bombay Gazette* in our observations of the so-called picture. A picture! What a beautiful expression! And who will take back to call the description in its present form more than of a picture and a scene. We wish that it were so.

IMPORTANT TO SILK MANUFACTURERS.—Owing to enquiries which are now being frequently made of the Silk Association of Great Britain and Ireland for the names of British Dress Silk Manufacturers, the Secretary of the Association would be glad if manufacturers of dress goods would send him their names, with any particulars and patterns (if practicable numbered) of their productions, so that he may be in a position to supply information to enquirers. Address communications to A. E. Piggott, Secretary, 15, High Street, Manchester.

## Textile Markets.

### COTTON.

MANCHESTER, FRIDAY.

The market has exhibited a changed aspect from that of last week. The heavy depression of prices and the losses this was inflicting upon holders both in spot and futures was so unendurable that a general and determined rally was made in the middle of the week to start prices upward. This movement was touched upon in our last week's report. Many people began to waver in their convictions that cotton was not for some time to see any material advance in prices. Circumstances also led the more cautious and those of more strength of mind to stand off so decisively from supporting the movement that on Friday it was evidently collapsing. Half of the advance both in spot and futures was lost, and on the following day nearly all the remainder disappeared. These successive breakdowns ought to teach the trade the folly of lending these attempts the slightest support, because in the present condition of the facts relating to supply of the raw material, the impossibility of securing any considerable permanent advance ought to be obvious to everybody. If so, there is absolutely no necessity for making provision for the future by purchasing supplies in advance of requirement. On Friday morning Messrs. Neill again issued a report increasing their estimate of the ultimate out-turn very largely, giving as their "minimum figure 8,650,000 bales, and probably more, and possibly much more." Practically, therefore, these, the best statistical authorities in the trade, are closely approaching the figure laid down weeks ago in this report as the probable total of this year's crop. It should be borne in mind that the propounders of nearly all the estimates made regarding the crop are people interested, and deeply so, in the result being a small one. It is strange, therefore, that the trade does not adequately discount these prognostications on account of their necessarily being biased. Very reliable news has been received from the cotton States shewing that the comparatively slight falling-off that has taken place in the receipts at the ports is owing to unfavourable weather, and that they will soon resume their full dimensions. But presuming that they do not again swell, let careful note be made of what will be required to wipe off the present excess. This will need a loss, roughly speaking, of 20,000 bales per week for the next 20 weeks of the season, and 10,000 for the remaining 10 weeks. This diminution can hardly be

deemed probable; and it would require to double these figures to get down to the estimates that are professedly held so strongly in some quarters. The intrinsic value of such estimates must be left to the judgment of our readers. We only repeat that spinners should keep their eyes on Liverpool stocks.

**COTTON.**—On Saturday it became evident that the last grand effort of the "bulls" to scare the trade into wild buying had failed as disastrously as all its predecessors. A sharp fall in values in America, and increased crop estimates from a source that had been expected to do something to counteract that of Messrs. Neill, took all the diminishing vigour out of the market at once. Americans were reduced all round  $\frac{1}{8}$ d., thus bringing the official figure again to the lowest point. Brazilian and Sarats were slow, whilst Egyptian was in good demand at firmer rates. Futures opened very weak at a decline of 4 to 5 points, and after some little fluctuation closed at the same. Only a small demand was met with from the trade on Monday, with prices steady. Other growths unchanged in values. Futures fluctuated within a range of 3 to 4 points, and finally closed about 1 point dearer on the day. On Tuesday the "bull" party made another effort to start prices, ostensibly based on the small movements of the crop, and the stronger reports from New York and southern centres. As a consequence futures opened 4 points dearer, and hesitatingly moved upwards 1 to  $1\frac{1}{2}$  points further, at which they closed for the day. Spinners bought fairly well for a Tuesday, both of spot and for gradual delivery, and with this double support spot prices advanced  $\frac{1}{8}$ d. Egyptian was in good request at steady prices. Other growths dull. Business was interrupted on Wednesday by the funeral of the Prince, the Exchange closing at noon until after the obsequies at Windsor. The steady feeling of the day preceding continued, with a hardening tendency in American, other growths exhibiting no particular change. Yesterday there was a fair demand for spot cotton, and an advance in the official rates of  $\frac{1}{8}$ d. was made, representing the improvement of that and the previous day. Futures opened at 2 to 3 points advance, but on the appearance of Messrs. Neill's circular, substantially confirming their previous views of the probable out-turn of the crop, and opening the vista of possibilities much further, they declined again, and substantially closed at the prices of the night before.

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

|             | Import. | Forward Sales. | Stock. | Actual Export. |
|-------------|---------|----------------|--------|----------------|
| American    | 136,649 | 69,853         | 46,280 | 1,371,470      |
| Brazilian   | 136     | 696            | 510    | 39,810         |
| Egyptian    | 11,932  | 8,693          | 5,700  | 125,690        |
| West Indian | 4,105   | 434            | 690    | 26,840         |
| East Indian | 466     | 1,235          | 1,050  | 50,030         |

Total .. 153,288 .. 80,911 .. 54,230 1,613,840 .. 4,129

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.

|   | Satur-day.     | Mon-day.       | Tues-day.       | Wednes-day.    | Thurs-day.      | Friday.        |
|---|----------------|----------------|-----------------|----------------|-----------------|----------------|
| January                                     | 3-6s 6r        | 3-6s 6r        | 4-2 v           | 4-8 b          | 4-6 1           | 4-8 b          |
| Jan.-Feb.                                   | 3-6s 6r        | 3-6s 6r        | 4-2 v           | 4-8 b          | 4-6 1           | 4-8 b          |
| Feb.-Mar.                                   | 3-6r b         | 3-6r b         | 4-2 b           | 4-8 b          | 4-6 7           | 4-8 9          |
| Mar.-April                                  | 4-0 b          | 4-1 s          | 4-5 6           | 4-8 9          | 4-9 10          | 4-11 12        |
| April-May                                   | 4-3 4          | 4-4 s          | 4-8 9           | 4-12 s         | 4-12 13         | 4-14 15        |
| May-June                                    | 4-5 7          | 4-7 s          | 4-14 15         | 4-15 s         | 4-16 s          | 4-18 s         |
| June-July                                   | 4-9 10         | 4-10 s         | 4-14 15         | 4-18 19        | 4-19 b          | 4-21 s         |
| July-Aug.                                   | 4-12 13        | 4-13 s         | 4-17 18         | 4-21 22        | 4-22 b          | 4-24 b         |
| Aug.-Sept.                                  | 4-15 v         | 4-15 16        | 4-20 21         | 4-24 s         | 4-24 25         | 4-26 27        |
| Sept.-Oct.                                  | —              | —              | —               | —              | —               | —              |
| Oct.-Nov.                                   | —              | 4-18           | —               | —              | —               | —              |
| Price of Mid-American.                      | 4              | 4              | 4 1-16          | 4 1-16         | 4 1/2           | 4 1/2          |
| Estimated Sales including Spec. and Export. | 7,000<br>1,000 | 8,000<br>1,000 | 10,000<br>1,000 | 8,000<br>1,500 | 10,000<br>1,000 | 8,000<br>1,000 |

\*These are the closing prices of Wednesday, business being suspended in the middle of the day on account of the funeral of Prince Edward.

The following are the official quotations:—

|             | G.O.  | L.M.  | Md.   | G.M.  | M.F.   |
|-------------|-------|-------|-------|-------|--------|
| American    | 3 1/8 | 3 1/8 | 4 1/8 | 4 1/8 | 4 1/8  |
|             |       |       | M.F.  | Fair. | G.F.   |
| Pernam      | 4 1/8 | 4 1/8 | 4 1/8 | 5 1/8 | 5 1/8  |
| Ceara       | 4 1/8 | 4 1/8 | 4 1/8 | 4 1/8 | 4 1/8  |
| Paraba      | 4 1/8 | 4 1/8 | 4 1/8 | 5     | 5      |
| Maranhm     | 4 1/8 | 4 1/8 | 4 1/8 | 5     | 5      |
|             |       |       | Fr.   | G.F.  | F.G.F. |
| Egyptian    | 4 1/8 | 4 1/8 | 4 1/8 | 4 1/8 | 5 1/8  |
| Ditto white | 4 1/8 | 4 1/8 | 4 1/8 | 5     | 5 1/8  |

|             | Fr.   | F.F.G.F. | F.G.F. | Gd.   | F.G.  | Fine. |
|-------------|-------|----------|--------|-------|-------|-------|
| M.G. Broach | —     | —        | —      | —     | 3 1/8 | 4     |
| Dholerah    | 3 1/8 | 3 1/8    | 3 1/8  | 3 1/8 | 3 1/8 | 3 1/8 |
| Oomra       | 3 1/8 | 3 1/8    | 3 1/8  | 3 1/8 | 3 1/8 | 3 1/8 |
| Bengal      | —     | —        | 2 1/8  | 3 1/8 | 3 1/8 | 3 1/8 |
| Tinnivelly  | 3 1/8 | —        | 3 1/8  | 3 1/8 | 4 1/8 | —     |

\*Nominal.

**YARNS.**—A little spurt was felt in the yarn market as a feeble reflection of that in Liverpool, which resulted in a few transactions over what might have been taken place. On Saturday, however, the last of the bitter feeling had disappeared, the market closing with a very quiet feeling. On Monday there was no improvement in any of the yarn departments, and only a slow business, with a small aggregate on the day. On Tuesday the hardening tendency slightly disturbed a few manufacturers, and induced them to operate a little more freely than they might otherwise have done, mostly on the basis of Friday's prices. On export account business was very slow, both for the Continent and the East. Bolton yarns were steady, with a small business. There was little change in the yarn department on Wednesday, buying being on the same cautious scale as of late, both amongst exporters and users, whilst spinners were steadier and less pressing for business, in view of the firmness in Liverpool. For yarns there was a moderate enquiry yesterday all round, but as spinners had in many instances advanced their prices, the conclusion of business was difficult, and the aggregate put through did not exceed an average for an "off" day. Many producers complained of sparseness of practicable offers.

**CLOTH.**—On summing up and comparing notes on Saturday, few cloth sellers could report any important increase in the week's business over late ones. The effects of the spurt in Liverpool did not pass beyond yarns. The feeling on Monday was very quiet, and the sales in cloth few and of small amount. What demand there was discoverable was held in check by the state of the Liverpool market. On Tuesday cloth developed very little change in either value or volume of demand, which continued on a small scale for the great outlets; whilst no improvement took place in the printing or miscellaneous sections of the market. Still, there was an under-current of demand, which proves that a fair business will be done as soon as assurances are satisfactory that it can be done on a stable foundation. Buyers, however, seem determined to hold aloof from operations of magnitude as long as there is any risk of a further decline. There was no perceptible increase of activity in the cloth market on Wednesday, though perhaps the steadiness in the other departments tended to inspire buyers with rather more confidence. As we have often said before, steadiness is the element requisite to secure a good trade. In view of the improved feeling in cotton and yarns, cloth producers shewed a firm front to the attacks of buyers; but though offers were more numerous than many large transactions were concluded. Continued steadiness in the market would soon lead to the completion of a considerable amount of business, whilst either an advance or a decline would prevent it.

The market to-day is steady in both departments, mainly based upon the strength of Liverpool. Prices in many cases have been slightly advanced, but this is found to stop business.

WOOLLENS AND WORSTEDS.

**BRADFORD.**—The worsted trade keeps quiet. Consumption of wool is steady, although prices do not seem to give satisfaction. English wools are firmer, country growers having adopted a much more independent tone. Colonial wools are bought on spinners' account, but the trade does not display any features of importance. Mohairs and alpacas are unchanged. For yarns the enquiry is small but constant, although quotations do not give satisfaction to sellers. Botany spins move off quietly. Hosiery and braid yarns are steady. Piece goods are being bought more largely; blacks having, of course, a large share of attention. The Eastern and American trades are active, all things considered.

**HUDDERSFIELD.**—Damp and generally changeable weather has been adverse to the trade of the district, and, as the failure of Messrs. Henry Lister and Co. distinctly shews, the plush trade is still in a depressed state. Fine and medium goods will, it is feared, be in poor request, as the demand cannot but suffer owing to the death of the Prince of Wales's eldest son, which will set the fashion in favour of blacks amongst that large section of the community following the decrees of the Society. There is still much machinery running on short time.

**LEEDS.**—From London large orders have come for black superfine woollens, worsteds, and for very fine black serges. All this business had to be got through in a great hurry. Ordinary goods for the present season were slow of sale, and scarcely any repeat spring or summer orders were heard of. No change from former prices was suggested. Most likely business will be slower than it has been until the wool sales begin at the end of the month. Opinions differ as to whether

any important change will take place in prices. Amongst large manufacturers the expectation is that they will advance a little. Even the department of ladies' dress and mantle cloths was quiet to-day, and the producers have resolved to work only regular hours without overtime. Blanket and flannel manufacturers are busy, but merchants are resting after a couple of weeks' run of business unusually brisk.

**LEICESTER.**—Wools are not bought extensively, although quotations remain steady. At this period business is not usually large, and the present is no exception to the general rule. Yarns are strongly held, sellers being unwilling to meet the views of buyers where lower figures are offered. For hosiery the demand is active. Stocks, however, are not so low as they might be, probably because of a diminution in the demand on shipping account, rather than a decline in the home branches. The fancy trade is active, and the production of samples has been delayed for the approaching season.

**ROCHDALE.**—The market remains very quiet, and the repeat orders are both small and few. There will no doubt be a change in the course of the next week or two, but in the meantime the business is, if anything, in smaller compass than usual. Yorkshire goods are in poor demand. Makers are firm. Wool staplers complain of the scarcity of orders, manufacturers being very careful.

**GLASGOW.**—Messrs. R. Ramsay and Co., wool brokers, in their report dated 19th January, say:—Wool: The wool market continues quiet, but with rather a better feeling. Business is still under the average, but there is more doing, without change in prices, which are well maintained.

FLAX AND JUTE.

**DUNDEE, WEDNESDAY.**—The excitement in the jute market has increased rather than abated. Jute has risen from £12 to £22, and there are buyers over. During the fortnight the rise is £3 a ton. At length buyers have taken alarm, and jute goods of all kinds are dearer, with few sellers. Jute yarn has advanced in ten days from, say, for 8 lb. cup done at 1s. 6d. before the New Year to 1s. 10d., which price is refused to-day, and 2s. is asked. For the better qualities of jute yarn still higher prices relatively are asked. Jute cloth has risen quite in proportion to the rise in yarn, and there are now no important sellers under 2 1/2 for 10 1/2 oz. Dundee hessian, while for wide goods of superior quality the price is nominal. Sellers in some cases absolutely refuse to quote. In these circumstances one hears of short time by the firms who are out of stock. The trade is greatly puzzled, and some of the shrewdest men still think the rise is largely owing to a corner in jute rather than a real scarcity. Time will tell. Flax remains quiet, with a fair business passing at about £18 for really good Riga K. Other sorts in proportion. A large business has been done in flax yarns at an advance of quite 1d. from the lowest point. Tows also are more enquired for; the excitement in jute is at last affecting the values of tows. Linens are also in better request, Arbroath with its heavy canvas remaining exceptionally dull. Dundee fancy jute goods having been advanced in price, large offers come at old rates, but with jute advanced 50 to 75%, a further sharp advance must be insisted on in all jute manufactures. Even at the advance, twines, ropes, and cords by the best makers are easily sold, and this important industry extends.

HOSIERY AND LACE.

**NOTTINGHAM.**—Cotton yarns have not been bought much this week, which has been a very quiet one on the whole, the funeral obsequies in connection with the Duke of Clarence being gladly seized upon as an excuse for the stoppage of some of the mills. Prices are very uncertain. Bobbin nets are steady, but fancy millinery lace has been for some time quiet.

DRY GOODS.

**MANCHESTER.**—The year has opened somewhat quietly. Travellers have been able to send home a few orders of importance, but, as a rule, the business coming forward has been of an unimportant character. The heavy departments, including fustians, greys, whites, and woollens of various kinds have been steady, but there is nothing in connection with the business at present passing that can be regarded as specially worthy of mention. The linen trade in the coarse branches is not marked by any feature of special interest. Silks are quiet, and the outlook for buyers has not been improved by the recent death of a member of the Royal Family, whose *fancés*, it may be remembered, was to wear at the intended wedding a dress composed of British silks. Some expense has already been incurred in connection with the preparation of designs and the purchasing of cards, but the loss has been incurred chiefly in the Spitalfields



district. The insignificance of London as a textile manufacturing centre prevents all possibility of the loss being serious. For the silk trade at large, however, the results of recent events will prove much more serious, as it was hoped that fashion, which has been adverse to silks for some time, would be favourably influenced by the preference shewn on the part of a member of the Royal Family. Carpets are moving off more freely, and the home trade promises to improve. The South American market is quiet, but orders are coming forward with greater frequency. Chilean business is said to be more satisfactory to British firms. There is some activity in the French trade, owing, of course, to the approaching enforcement of the new tariff.

## Joint Stock and Financial News.

### NEW COMPANIES.

**JAREZ JOHNSON, HODGKINSON AND PEARSON, LTD.**  
Capital, £160,000, divided into 16,000 shares (8,000 preference and 8,000 ordinary) of £10 each. Object, to acquire all or any of the businesses at present carried on by J. Johnson and Co., at the Moor Mills, Bolton, and at 44, Spring-gardens, Manchester; by G. Hodgkinson and Sons, at the Hilton Mills, Bolton, and 105, Portland-street, Manchester; and by Thomas Pearson and Son, at Bradshaw-field, Victoria, and Phoenix Mills, Bolton, and 54, Church-street, Manchester; and, with a view to the above objects, to carry into effect certain agreements, generally to carry on the businesses of manufacturers of cotton, woollen, and linen quilts, sheets, blankets, toilet covers, towels, quiltings, vestings, and dress goods; also as cotton spinners and doublers, twisters, winders, printers' combers, dyers, bleachers, finishers, etc. Subscribers:

- J. Parlane, Rusholme, Manchester . . . . . 1
- J. J. Holden, 23, Duke-street, Southport . . . . . 1
- J. E. J. Ferguson, 44, Spring-gardens, Manchester . . . . . 1
- J. B. Hodgkinson, 105, Portland-street, Manchester . . . . . 1
- T. Pearson, 54, Church-street, Manchester . . . . . 1
- G. H. Gaddum, 7, South-street, Manchester . . . . . 1
- T. Wood, 105, Portland-street, Manchester . . . . . 1
- W. Reynolds, 44, Spring-gardens, Manchester . . . . . 1

The first directors are J. E. Johnson-Ferguson, J. B. Hodgkinson, T. Pearson, and G. H. Gaddum. Qualification, £1,000. Remuneration to be determined.  
**WINDSOR AND COMPANY, LIMITED, MANCHESTER.**  
Registered by Cooper and Co., 5, Shoe-lane, with a capital of £10,000 in £5 shares. The objects of the company are to carry on the business of merchants, manufacturers, and commission agents, in Manchester or elsewhere. The first directors, to be nominated by the signatories to the memorandum of association. Qualification, 10 shares. Remuneration to be determined in general meeting.

**JOHN GILL AND SON, LIMITED, CLECKHEATON.**  
Capital, £10,000 in £10 shares. Object, to acquire the undertaking hitherto carried on by John Gill and Son, at Cleckheaton, and generally to carry on the business of flannel and blanket manufacturers in all its branches. The first directors are J. Gill (chairman), P. Gill, and Thomas Haley. Qualification, not specified. Remuneration to be determined.

**JOHN LONGBOTTOM AND COMPANY, LIMITED.**  
Registered by Jordan and Sons, 120, Chancery-lane, W.C., with a capital of £2,000 in £10 shares. Object, to adopt and carry into effect two agreements, the first made between J. Neatby and S. M. Neatby of the one part, and W. Dunk, on behalf of this company, of the other part; the second, made between John Longbottom of the one part, and this company of the other part; and generally to carry on business as machine and engineers' tool makers, makers of power-looms and other machinery, millwrights, etc. The first directors are J. Longbottom, C. H. Charlesworth, T. Ward, and J. E. McLintock. Qualification and remuneration to be fixed.

## Gazette News.

**PARTNERSHIPS DISSOLVED.**  
P. M'Gregor, T. Aitken, and E. H. Oylar, Major-street, Manchester, general commission agents and general merchants; as regards E. H. Oylar.  
H. S. Hirst and H. F. and E. S. Anderton, Bradford, worsted spinners and soap manufacturers; as regards H. S. Hirst.  
J. Nutter and T. S. Edmondson, Barnoldswick, manufacturers; as regards J. Nutter.  
G. Gibbins and W. Smith, Keighley, basket and skip makers; as regards G. Gibbins.

R. and J. and C. Webster, Pudsey, top makers and wool merchants.  
Mortimer and Greenwood, worsted-coating menders, Albert Buildings, Great Horton-road, Bradford.  
Robinson and Smith, yarn spinners and merchants, Bradford.  
Grainger, Smith, and Walter, woollen merchants, Carr's Lane, Birmingham; as regards Joseph Walter.

## Patents.

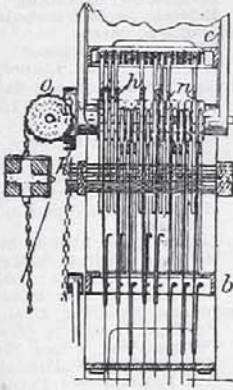
**PATENT OFFICE.**  
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### ABSTRACTS OF SPECIFICATIONS.

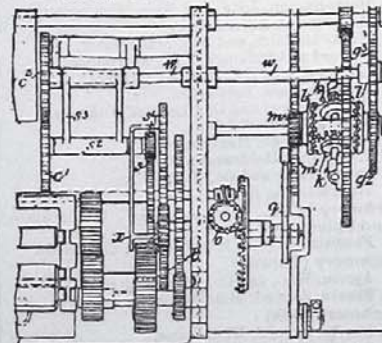
**11,498.** July 23, 1890. **Looms.** J. WORMALD, Dewsbury, and G. WASHINGTON, Yorkshire College, Leeds.

**Jacquards.**—Relates to means for reducing the number of cards employed in weaving carriage rugs, etc. The cards act as usual on cross-wires *k*, through which pass one or more of the double lifting hooks *h*. The upper and lower grippers *c*, *b* are operated in the usual way. To each row of hooks there are two lifting-bars *n*, one for the figure weaving, and one for the ground. The up and down motions of the lifting-bars are determined by a spirally constructed "weave barrel" acting on horizontal slides, which are made to engage as required with the upper gripper, and, by means of pins, to catch in hooks extending up from the lifting-bars, and thus to raise the latter at times. The "weave barrel" is driven by star and peg-wheel mechanism *s*. 21d.



**11,585.** July 24, 1890. **Spinning.** J. WILKINSON, 24, Acre-lane, Oldham, and W. N. WILKINSON, 10, St. John's-road, Longsight, Manchester.

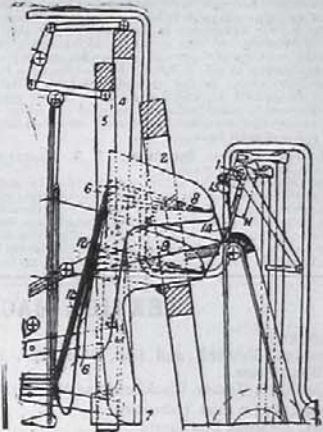
**Ring frames.**—Relates to means for operating the ring rail and for driving the rollers so that the yarn shall be delivered at a rate corresponding to that at which it is being wound. The ring rail is raised and lowered by means of a cam, and the rollers are driven from a toothed wheel *s* of a form corresponding to that of the cam and driven through a jack-box arrangement *k*, *l*, *l*, *l*, and the gearing *g*, *g*, *g*, *g*, *g*, *g*, *g*, the last two wheels being mounted



on a shaft *z* which is carried by swinging arms *z* from the shaft *o*. The pinion *z* is kept in gear with *z* by means of a cam ring *x* carried by the wheel *z*. The speed of the rollers is further modified during the formation of the cop-bottom by means of a rack and pinion arrangement *m*, *m* in which the pinion is fast to the bevel wheel *l* and the movement of the rack is governed by a rotary cam *q* driven through worm, etc., gearing, and a segmental wheel from the shaft of the wheel *z*. When the cop-bottom is completed the bevel pinion *z* takes into one of the spaces of the segmental wheel and the speed of the rollers is regulated only from the wheel *z*. The rack *m* is placed into and out of gear by hand. 15.

**11,614.** July 24, 1890. **Looms.** W. BRITAIN, junior, 28, Lambton-road, Hornsey Rise, and H. GOODRICK, Ceylon Mills, Queen's-road, Victoria Dock, both in London.  
Relates to looms for weaving coil yarn mats and similar fabrics. The reeds *2* are made longer than usual. Within two frames *4* and *5*, movable backwards and forwards and laterally are placed frames *6* and *7* which slide up and down. The frames carry hollow arms *8*, *9*, passing between the reed blades, the pile warps *12* being led over and under rollers therein to near the fell. A bar *H* on a rocking bar *I* carries a row of hooks *14*, which are made to catch the lifted pile threads into loops and to move forward and carry them with them. By the motion of the frames *4*, *5*, the pile threads descend, cross certain ground warps, and

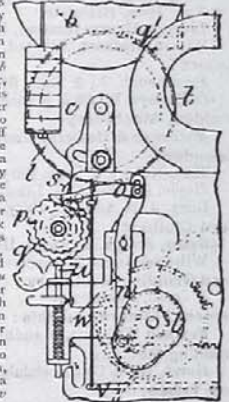
again rise, a weft shot being then inserted and the whole beaten up. A knife *13* then slides across the hooks, cutting the pile and releasing the hooks, which rise and take up the next row. The material is taken up by a ratchet-driven endless spiked belt. The length of the mat woven is governed by special groove-dam and lever mechanism, which stops the action of the hooks *14* and the arms *8*, *9* at the required times. Plain fabric is then woven till



the mat is finished. The feed then takes a long stroke of several inches, and more plain fabric, for the next mat, is woven, and then the pile forming apparatus is set in action again. A stop surface in connection with this mechanism regulates the stroke of one of the take-up levers. The details of the apparatus for operating the various parts are described, and the invention may be modified. 21d.

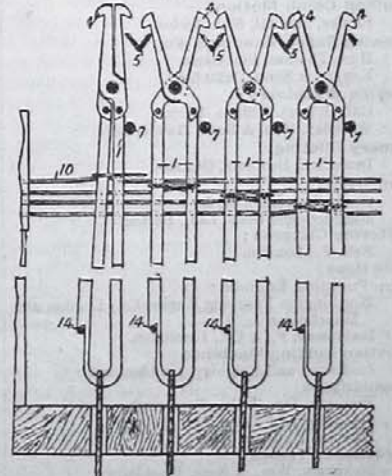
**11,700.** July 26, 1890. **Looms.** W. WARRINGTON, Fairfield Mills, Droylsden, Lancashire.

**Let-off motions.**—Relates to means for letting off terry warp in weaving Turkish towels, etc. The invention is applicable to cases in which the terry beam *b* rests on the let-off roller *c*, or in which the warp is drawn between the latter and another roller, and to other cases. The let-off roller is driven by change gearing *g*, *z*, *l*, from a ratchet wheel *h* operated by a catch *s* on a lever *n*, the latter being worked by a cam *l* and gearing, or other means, from the crank shaft. Terry warp is thus let off at every three picks, for example. A notched wheel *g* and spring bolt *z* lock the ratchet wheel after each movement. The catch *s* may be put out of action by hand when a heading or cross-stripe is to be woven without terry; it may also be lifted out of action, when the weft falls, by a rod *w* and weighted lever *v* connected with the brake lever, etc. Reversing or letting-back gear, operated by a treadle, may be provided. Guide plates *g* serve to keep the warp from running over the edges of the let-off roller. 21d.



**11,716.** July 26, 1890. **Looms.** G. H. HODGSON and W. TETLEY, both of Bee Hive Works, Bradford.

**Jacquards; dobbies.**—The uprights *1* are formed U-shaped and carry jointed hooks *4*. When a needle *10* is pressed on by a card



the corresponding upright is pressed against the grate *7*, and the hooks *4* close and escape the V knives *x*. The hooks which are unacted on remain open and engage with a knife, the pull of the harness serving to close the hooks and hold them clear of the

adjoining knives. Bends in the hooks catch on a grate 14 for supporting the harness as long as required. The needles 10 may enclose the aprichts, or be formed with projections for acting hereon. Invention may be applied to dobbies. *Sgd.*

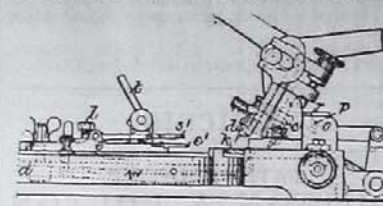
11,511. July 27, 1890. **Dyes.** J. IMRAY, 28, Southampton Buildings, Chancery-lane, London.—(*La Société Anonyme des Matières Colorantes de St. Denis; 106, Rue Lafayette, Paris.*)

*Azo dyes*—Relates to colouring matters which are derived from azoxyamines and dye mordanted wool, various shades of yellow fast to light, air, and fading. Consists in diazotising nitranilines or their homologues in the usual manner, then running the diazo compound into a solution of the sodium salt of salicylic acid, or of one of the cresotic acids, adding soda lye and glucose, and heating to 40° or 60° C. for 6–8 hours, or longer until the mixture ceases to dye unmordanted wool. The new product is precipitated by addition of an acid, filtered, washed, dried, re dissolved in caustic soda, and prepared as a paste. The colouring master dyes wool mordanted with chromium oxide a greenish yellow of great fastness. *Sgd.*

11,567. July 24, 1890. **Spinning.** J. S. DROSFIELD, Atlas Works, Oldham, Lancashire.

*Covering spinning machine rollers*—A machine for pasting the roller cloth and cutting the same into prescribed lengths for fixing on to the rollers. The cloth in passing over the table forms the bottom of a paste box, the sides of which are formed by adjustable guides *a*, the forward end by an adjustable doctor *c*, the rear end by a weighted slide or piston *b*, and the top by a plate *r*. The cloth, after passing beneath the doctor, takes over

the cutting bed *d* and is gripped by jaws *e*, *e'* operated by a cam lever *f* and mounted on a slide *g*, whose extent of movement can be regulated by means of a screwed rod. When the slide has been drawn outwards to the extent of its traverse a knife *k* of mounted in suitable slides *i* is forced downwards by the handle *h* on to the cutting bed *d*, the movement of the handle *h* being



regulated by an adjustable stop *l* in order to prevent the cutter from penetrating too deeply into the bed. To enable the jaws *e*, *e'* to seize the end of the cloth the latter is pushed upwards from the bed by means of a bar operated by a weighted lever *m*, the movement of which is limited by an adjustable stop. *Sgd.*

11,595. July 24, 1890. **Sacks.** J. MEND, 19, Nightingale-road, Horsaam, Sussex.

Sacks are made by folding a piece of fabric at the middle of its length, overlapping the edges at the sides and sewing both edges at each side to the body of the fabric. *Sgd.*

11,717. July 26, 1892. **Knitting.** W. BAKERWELL, 19, Broad Marsh, and C. COTTON, Brookfield place, Derwent-street, both in Nottingham.

*Straight-bar machines*—For inserting elastic or other threads into fabrics for surgical and other purposes, special carriers are secured to the carriage. Details are given. *Sgd. Drawings.*

11,770. July 28, 1890. **Embroidery.** R. WILSON, 139, Noclair-street, Nottingham.

*Embroidery machines* groups of designs on cloth moved by a pantograph, and having guides for laying cords or braids under the stitches, are provided with mechanism for communicating a small reciprocating rotary motion to the cord guides, and with means by which the pantograph attendant can keep them always in front of the needles. *Sgd. Drawings.*

**PATENTS.**  
**W. P. THOMPSON & CO.**  
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Reddaway, F., and Co., Pendleton.  
Rosendale Belting Co., Manchester.  
Sampson and Co., Stroud.
- Bobbins, Spools, Shuttles:**  
Dixon, John, & Son, Steeton, near Keighley.  
Hall, Robert, & Sons, Bury.  
Kay, John, Rochdale.  
Livesey, Henry, Limited, Blackburn.  
Wilson Brothers, Limited, Todmorden.
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Galloways, Limited, Manchester.
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McGowan & Hadwen, Manchester.
- Calenders:**  
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Hoyle, E., and Sons, Limited, Halifax.  
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Wilson & Ingham, Liversedge.
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J. Jones, Dukinfield.
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Fox and Williams, Manchester.
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Jagger & Co., Oldham.
- Cop-Tubing Apparatus:**  
Jagger and Co., Oldham.
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- Crystoleine:**  
Wells, M., & Co., Manchester.
- Doffing Comb Motion:**  
Brooks, Samuel, Manchester.
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Musgrave and Sons, Ltd., Bolton.
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Nell, F., London.
- Fire Hose:**  
Fire Pumping Engines:  
Worthington Pumping Engine Co., London and Manchester.  
Reddaway, F., & Co., Pendleton.
- Fustian Cutting Machines:**  
Lockwood and Keighley, Huddersfield.
- Humidifiers:**  
Howorth, Jas., & Co., Farnworth.  
Mathews and Yates, Manchester.  
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Broadbent, Thomas, and Sons, Huddersfield.  
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- Looms, etc.:**  
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Hacking and Co., Bury.  
Hall, Robert, and Sons, Bury.  
Hutchinson, Hollingworth, and Co., Dobcross, Oldham.  
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Hall, Robert, & Sons, Bury.  
Mather and Platt, Manchester.  
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Brooks, Samuel, Manchester.  
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Hetherington, John, and Sons, Manchester.  
Hall, Robert, & Sons, Bury.  
Horrocks, John, and Son, Manchester.  
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Lees, Asa, and Co., Limited, Oldham.  
Lord Brothers, Todmorden.  
Platt Brothers and Co., Limited, Oldham.  
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- Horrocks, Jno., and Son, Manchester.  
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Green, James, Blackburn.
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- Sizing and Filling Preparations:**  
Adley, Tolkein, and Co., Blackburn.  
Eastwood, James, Manchester.
- Smoke Consumers:**  
Automatic Smoke Prevention Syndicate, Ltd. Manchester.  
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- Sprinklers, Automatic:**  
Downson, Taylor & Co., Ltd., Manchester and London.  
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Whiteley, Wm., & Sons, Huddersfield.  
Crowley and Co., Ltd., Sheffield.
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Livesey, Henry, Limited, Blackburn.  
Stott, J. H., Rochdale.  
Whiteley, Wm., & Sons, Huddersfield.
- Waste (Cotton) Picking Machinery:**  
Brooks, Samuel, Manchester.
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Jarman & Son, Huddersfield.
- Yarn Testing, &c. Machine:**  
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