The

Textile Mercury:

A Representative Weekly Journal for

Spinners, Manufacturers, Machinists, Bleachers, Colourists, and Merchants,

In all Branches of the Textile Industries.

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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 ineligible MSS., if accompanied by the requisite postage stamps, but will not guarantee their safe return.

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Current Topics.

ARE MANUFACTURERS RESPONSIBLE TO WEAVERS FOR KEEPING THEIR LOOMS SUPPLIED WITH BEAMS?

This question was raised at the Blackburn County Court on Monday, in the claim of a weaver against Messrs. Eli Heyworth and Son, manufacturers, Blackburn. It appears that the weaver gave in a fortnight's notice to leave the employment of the firm. He was a four-loom weaver, and after weaving for about seven days he finished one of his warps. It was shewn that, orders being slack—no uncommon thing—he did not get another, and had to finish the remainder of his notice weaving upon three looms. For the loss resulting he claimed 7s. 6d. As Mr. Riley, solicitor for the Weavers' Association, appeared in the case, it is fair to assume that the claim was put forward by the Association, and it need not entail a great stretch of imagination to believe that the Association in this case have been making a tentative experiment, in the hope of incidentally getting a judicial opinion that manufacturers are responsible for providing full employment for every loom of every weaver all the year round. With the way in which justice is being administered now-a-days in many of our courts it would not be surprising to find such an opinion expressed. In this case, however, the claim put forward was based upon the statement that the weaver was in some sort of way victimized because he was leaving, an allegation abundantly disproved. Really, to avoid annoyance and groundless actions, would it not be better for Mr. Barker, the secretary of the Weavers' Society, to test the veracity of persons who come to him with such cock-and-bull stories, before he adopts their claims? We think it would, and that the care thus exercised would increase the reputation of the society for fair dealing, and further its influence when there was a legitimate call for its exercise. For some time past we are afraid these qualities have been a diminishing quantity. Of course it is only fair to assume that having lost their case they will recoup Messrs. Heyworth and Son for court and solicitor's costs. If not, it would be desirable to ask and ascertain whether the Society does not render itself amenable to prosecution under the Maintenance Acts.

GERMAN *versus* ENGLISH VELVETEENS.

For some years past the velveteen industry has been in a depressed condition, and manufacturers when questioned on the subject have generally ascribed the wretched condition of the business to the fact that fashion is against the use of the article they produce. Most people have for a long time entertained the belief that Manchester is the leading centre for the production of the pretty cotton-pile fabric in question, and that English dyers and finishers could turn out the best work in the world. The unfavourable attitude of fashion's votaries towards the material of late has always been blamed as the cause of the depression that prevailed for a considerable period, and which has not yet disappeared. Foreign superiority at any rate has not often been adduced as a cause for the inability of our own producers to transact a satisfactory business, although some statistics which have reached us concerning the imports by France of cotton velvets, cords, and moles, clearly shew that Germany in that market is a formidable competitor. The figures given below are for the first seven months of each year:—

	1890.	1889.	1888.
VELVETEENS:—			
England ....francs	61,500	60,900	52,515
Other countries ,,	32,700	28,500	44,514
CORDS, MOLES, ETC.:—			
England ....francs	31,400	40,400	89,401
Germany.... ,,	107,000	140,300	175,708
Other countries ,,	4,000	7,800	7,667

The shewing made by this country, as far as velveteens are concerned, while indicating no advance of moment, is at any rate better than that of other nations. In the other pile fabrics named, however, Germany, it will be seen, far surpasses us in its trade with France, although both competitors have suffered a serious decline in their shipments since 1888. An effort is being made by the French manufacturers to obtain increased protection in 1892, and this danger looming in the not remote distance should be noted in advance by those interested.

NEW ZEALAND FLAX: A CHANCE FOR INVENTORS.

Not long since we had some remarks upon the injury being done to the *Phormium Tenax* by the reckless manner in which the plants were being cut, and by the disregard shewn to extending its growth. The matter was so urgent and pressing that it engaged the attention of the New Zealand Legislature, which appointed a committee to examine the subject in all its aspects. The committee has just presented its report, in which it is recommended that a bonus of £10,000 should be offered by the Government for the encouragement of the flax industry, to be devoted to the following purposes: (1) for a process of flax dressing which will reduce the cost of production; (2) for a process which will improve the quality of the dressed fibre, making it suitable for textile purposes; (3) for a mode of utilising the waste products of the industry. There is a reasonable probability that the Government will adopt the report, and such a bonus as £10,000 should stimulate the inventive genius of men outside the colony. We may recommend the matter to the numerous persons who are now devoting so much attention to kindred subjects.

PREHISTORIC TEXTILE MANUFACTURERS.

A very interesting volume on *The Story of Early Man*, by Mr. D'Anvers, which has just been published, gives several curious facts regarding the existence of textile industries in different countries in very early times. The remains of the Neolithic period found in the pits or hut-circles at Fisherton, near Salisbury, included a clay spindle-whorl, with two well-made weaving combs, used to comb up the threads of weft. The strange people who tenanted the pile dwellings on the lakes of Switzerland were also able to produce rude textile fabrics, matting and cloth having been discovered amongst their relics, as well as several clay spindle-whorls, resembling those of our own island. Passing to the age of bronze, indubitable proofs are encountered of acquaintance with the art of weaving. The articles found in many of the barrows, intended probably for the use of the dead, include woven materials. The American continent also has supplied ancient examples of textiles. A rock-shelter in Kentucky contained pieces of coarse tissue rudely mended, and the tombs near Pachacamac, 25 miles south of Lima, which are supposed to have been constructed by a monotheistic people, are full of mummies, embalmed and wrapped in very finely-woven cotton cloth. One thing these prehistoric spinners and manufacturers lacked, that is a *Textile Mercury* to record their various achievements, which would also thereby have saved them and their works from being now labelled "prehistoric."

THE DEPRECIATION OF MACHINERY.

At the meeting of the Oldham Chamber of Commerce on Monday, Mr. S. R. Platt presiding, the important question of depreciation on machinery and buildings came up for consideration. A letter on the subject was received from the Olive Spinning Company, who stated that they drew the attention of the Chamber "to the question of the allowance made by the commissioners for income tax in this district as a deduction from profits for the depreciation of a spinner's machinery—that is, 7½ per cent. on the value of machinery shewn in the very last statement of accounts a firm may issue, instead of on the original cost." In the discussion that ensued opinion differed as to whether depreciation should be allowed on the original cost of plant or on the reduced value, the latter being the plan generally adopted in the Oldham district. Mr. J. Dodd, of Messrs. Platt Bros. and Co., said he was strongly of opinion that the depreciation should be taken on the original cost, and the renewals should be added to the cost of plant. It was decided to communicate with other Lancashire towns with the object of obtaining further information. The question raised is certainly a very important one, and is not new to the trade, having been discussed at various times and in many places. For ourselves, we are inclined to agree with those who adopt the plan generally in vogue in the Oldham district. It is certainly the only theoretically accurate plan. When a person commences business and invests a certain amount of capital in buildings and plant, it is obvious that at the end of, say, twelve months' use, the wear and tear must have reduced the value of his machinery. Say the sum thus invested and used is £50,000, the depreciation on this at 7½ per cent. is £3,750. This leaves the capital sum at £46,250. With this sum business begins anew. On what ground, therefore, can it be held that the capital is £50,000, when it has clearly been shewn to be and accepted as the smaller sum? The actual rate of depreciation of machinery may vary, but for practical purposes an average is taken, and this average is supposed to be accurately represented by 7½ per cent. This being the case the sum of the last valuation, which is that remaining after the deduction of the amount of the depreciation, is that which ought to be taken. How it can be assumed that the larger sum (which is now to a considerable extent an imaginary one), is available for depreciation we cannot conceive, and it will not be easy for anyone else to do so after a close examination of the matter. The cost of renewals and repairs of each year ought to be added to the sum then standing in the books. This process, we maintain, is the scientifically accurate method. If the result does not come out correctly on the average the fault is not with the method, but simply with the percentage of depreciation being fixed at too low a point—a detail that could easily be rectified. The matter is one that might very properly engage the attention of one of the leading organisations of the trade—say the United Cotton Spinners' Association, which, by making exhaustive inquiries amongst its members, would easily gather data from which some sound reliable conclusions could be derived. In the interest of the trade this should be done.

THE CARD AND BLOWING ROOM OPERATIVES' ASSOCIATION.

The eleventh quarterly report of the Oldham Provincial Card and Blowing Room Operatives' Association has been issued. The secretary (Mr. G. Silk), after alluding to the differences which existed in the Association at the commencement of the quarter, states that a new Wages Committee will shortly be appointed to resume negotiations with the employers with a view to completing the list to regulate the wages of this class of factory labour, and that hopes are entertained that the work may be completed by the quarter's end. They regret to have to record the withdrawal from the proposed new Factory Bill of the clause making the fencing of takers-in compulsory. That was not allowed to be done, however, without an effort to retain it, but in consequence of what was stated to be the opinion of those who would have to steer it through Parliament, those representing the card-room interest were compelled to allow it, and content themselves with registering a protest against the withdrawal of a clause which would undoubtedly have secured complete immunity from accidents, the nature of which, when they do occur, made it impossible for the person affected to again follow his employment. The eight hours question is also dealt with, and the report states that so far as it affects the general trade of the country, it seems to have subsided into a passing shout, as most of such ill-considered matters generally do. Mr. William Mullin is the secretary of this Association, and we presume is the author of the report, from one point of view of which we have made this summary.

THE YEAR'S COCOON HARVEST IN FRANCE.

Official statistics just issued by the French Government shew that the chief silk-producing districts of France are the four Departments of Gard, Ardèche, Drôme, and Vaucleuse, but there are twenty other Departments in which silk-worms are reared, and their collective produce considerably exceeds that of Vaucluse. The most important of these Departments are Bouches du Rhône, Var, Isère, Basses-Alpes, Lozère, and Hérault. The eggs used for 1890 are estimated at 253,915 oz., or 250 oz. less than 1889. The cocoons, on the other hand, are reckoned at 7,799,423 kilos., or 389,593 kilos. more than 1889. As there are 142,556 sericulturists, each is represented by 1·65 oz. in weight of eggs, and 55 kilos. of cocoons. These figures shew that the rearing of silk-worms is distributed amongst a large number of persons and of establishments, which is one of the best conditions of success. It was in large establishments that the silk-worm malady broke out thirty years ago, to spread over the world. Another fact clearly shewn by the Governmental statistics is the revolution which has taken place in the production of silk-worm eggs. For a long period France was dependent for its supply on foreign countries, Italy, the Levant, and, lastly, Japan. Now the opposite is the case. The southern Departments sell silk-worm eggs to all the countries of Europe and the Levant. Italy, Spain, and Turkey have become the regular customers of the egg-rearers of the Var, the Pyrenees, and Corsica, where the production of eggs has become a branch of the export trade. Of the 877,000 ounces produced in France in 1890, not more than 230,000 to 250,000 ounces will be hatched at home. The financial results of this new Department are by no means inconsiderable. In 1889 silk-worms were exported to the value of 6,860,800 francs. The quantity of raw silk produced is estimated at 650,000 kilos.

WHERE OUGHT THE RESPONSIBILITY FOR PIECERS' INFRACTIONS OF THE FACTORY LAWS TO REST?

Our Oldham correspondent writes:—"I wrote you last week respecting a case that had been before the Oldham bench of magistrates, illustrative of the anomalous position occupied by cotton mill piecers. In the case in question it was laid down that a piecer was under the full control of the minder in whose employ he was. The point here raised has been much commented upon in this district, and it has been pointed out that in breaches of the Factory Acts by piecers the mill owner is held responsible by the factory inspectors, except he proves to the satisfaction of these custodians of the law that he has exercised due diligence to prevent a breach. Now it is asked—if it be good law in one case that the piecer is responsible to the minder, who in turn is responsible to the employer, why should it not be equally good in the other? To hold employers responsible for every infraction of the law by persons in the employ of subcontractors on his premises—as minder-spinners are held to be—is simply ridiculous. The points raised require dealing with and simplifying, in order that the responsibility may be placed upon the right shoulders. Either the employer ought to have full control or the minder full reponsibility."

CANADA'S FUTURE.

The United States having by its McKinley Bill thrown down the gauntlet before Europe in general, and, as we think, its northern neighbour in particular, the question naturally occurs: What must Canada's next move be? Her chief market has now been closed by an almost impassable tariff barrier, and the *faineants* of the Dominion are clamouring for commercial union—which in the opinion of competent judges is only another name for annexation. Stouter hearts, however, naturally view such cowardly weakness with contempt, and the recent utterance of Sir John Macdonald may be taken as an expression of the ideas which fill many minds just now in our premier colony. This section of the Canadian public would compensate the Dominion for the injury caused by the McKinley Bill by opening out foreign markets, and with this object the Government is being urged to furnish merchants and manu-

facturers with encouragement and assistance for the furtherance of the wise project that is entertained by the more enterprising spirits of the country. Mr. Adam Brown, a Canadian M.P., has accordingly been selected by the Dominion Government to work up an interest in the forthcoming Jamaica Exhibition, at which Canada is to be officially represented. Mr. Brown is giving all his energies to the present undertaking with the practical object of extending Canada's trade with the West Indies. Besides agricultural produce he recommends the display of cotton and woollen goods, and we are pleased to learn that Messrs. D. Morrice, Sons, and Co., of Montreal, who are largely interested in the manufactures of Canada, have consented to send a fine exhibit of cotton and woollen fabrics made by the leading mills they represent. The Chinese trade of the Dominion will also be helped by the establishment of the new line of trans-Pacific steamers, and we note that the British Government has just given its sanction to the appointment of a Canadian consul in a South American port. This is as it should be. The Dominion is too big to be treated any longer as an infant unable to take care of itself, and as its foreign trade must be developed to free it from the sinister influences now working towards annexation, the result of the new policy will be of considerable importance, as the question at issue, if not solved satisfactorily, may possibly lead to a disruption of the Empire.

THE TEXTILE INDUSTRIES OF SWITZERLAND.

Switzerland has long been known for its devotion to the textile industries. The chief centres of these are in the Cantons of Zürich, Basle, Glarus, and St. Gallen. The number of textile factories subject to the Factory Acts in 1888 were 3,767, with a complement of 159,106 workmen, being distributed as follows among the different industries :—

Industries.	Factories.	Workmen.
Cotton.....	432	36,238
Embroidery	1,139	17,920
Silk.....	227	27,819
Woollen.....	47	3,538
Various	133	5,583
Textile Industry	1,978	91,098

Raw silk is chiefly imported from Italy, France, Japan, and China. England and the United States are her best customers for ribbons, and the same countries, with Germany, for woven goods. The export of whole-silk goods to the United States has recently declined considerably, union silks having taken their place. France also has taken more of these goods of late. The Swiss cotton industry has since the year 1876 been passing through a period of great depression, but the report for the past year is satisfactory, and indicates improvement. It is a great sufferer from the high protective duties in force in the neighbouring countries, and it is also sorely pressed by English competition. Raw cotton is imported chiefly from the United States and Egypt, and cotton goods from Great Britain. The greater portion of Swiss yarns go to Germany, Austria-Hungary, and Italy. The white cotton textures are largely purchased by the Alsatian printers, while the coloured and printed textures find the best markets in the East, especially in the Straits Settlements and India. The exports to the Danube States of both white and coloured textures have assumed considerable importance during the last three years, but a greater demand for cheap English and Belgian goods is now said to be manifesting itself in those countries. There was some improvement in the woollen industry during last year, especially in the manufacture of cloth. It has, however, lost much of its importance ; and the manufacturers are reduced to agitating for higher protective duties in order to keep the supply of the home market, at any rate, in their hands. The linen industry has also ceased to be of any real importance. The value of the exports for the year increased by £27,208, amounting in all to £104,763 ; while the value of the imports, chiefly from Germany, Belgium, France, and Great Britain, was £482,065, an increase of £14,509. Embroidery, which is generally included in the cotton industry, is carried on chiefly in the Cantons of St. Gallen and Appenzell. Handwork has now been replaced by machinery for all except the finest embroidery ; but in both branches of the trade the reports of last year are satisfactory. The export to France shewed a considerable increase, but England and the United States were the largest purchasers of this class of goods.

THE CALAIS STRIKE.

The position at Calais is one of waiting on both sides. The masters made a move the other day by offering to open the factories, but this evidence of good will was not reciprocated, the men remaining out. At a general meeting of operatives held on Tuesday, at which 2,000 strikers attended, it was decided to authorise the delegates of the men to open negotiations with the employers on the basis of an increase of wages on a sliding scale. Later, however, the negotiations between the delegates of the men and the employers were broken off, the masters declaring their inability to accept the men's proposals. The position was put as follows by M. Salembier, speaking on Sunday, who said that "the strike of employers having concluded, that of the workmen would now commence. The masters were the aggressors by adopting the policy of a lock-out. They now desire to retrace their steps, but the men say that they shall not be allowed to do so except on their terms." A formal resolution has been passed by the strikers, in which it is declared that no *employé* without work shall take the place left vacant by a striker. The following is a copy of the proposals which were made by the men :—

Four francs per day for changing without prejudice to prices per rack, whatever may be the number made during the week.

"All passing of warps to be paid for as piece work.

"Where a whole week is occupied in changing, the wages to be 30 francs."

Articles.

FACTORY INSPECTORSHIPS.

The administration of the Factory and Workshops Acts is an important matter to those who are subject thereto. The Legislature has thought fit to institute a special constabulary to see that these laws are obeyed and to take cognisance of their infraction. This, we presume, is done because it was inferred that the persons liable to break these particular enactments were men of comparatively good social standing, of whom the ordinary policeman might be expected to stand in awe, and might therefore too often be winking when the circumstances demanded that he should have his eyes very wide open. It thus required that the new officers should be drawn from people of a social position and standing equal to those over whom they were entrusted with supervision, in order to be uninfluenced either by fear or favour. It cannot be denied that this was a fairly sufficient reason for instituting the new class of officers. On the whole they may be said to have performed their duties very well and with satisfaction to both employers and workers. During the past twenty years, however, the circumstances have changed considerably. These changes are mainly represented by the admission of the working classes to the suffrage by the legislation of 1868, and the subsequent development of trades-unionism. The working-man having become the wielder of a vote, very suddenly found himself the object of the most assiduous attention on the part of professional politicians, and he therefore naturally soon became conscious of his growing importance. The development of this sentiment, however, did not cease when it had attained dimensions equal to the fact. Unscrupulous politicians have ever been ready to flatter, the result being that to-day the working-man entertains the most grossly exaggerated notions of his importance to the community. There is no necessity to adduce evidence of the truth of this statement : it has been obvious enough on every hand during the past year or two. The trades-unionists have not been slow to utilise the advantages placed within their reach, and have raised a cry for the appointment of "Working-men Inspectors," a cry eagerly taken by politicians of both parties, and working-men have accordingly been appointed by both the ruling parties of the State. Working-men, we have said, but this statement ought to be qualified ; they are working-men and something more—namely, trades-unionists, and it is really as the latter that these Inspectors have been put into their present position, and because their appointment has been thought to secure support or placate opposition at an election time, as neither party has liked to encounter the risk of arraying against itself the important and influential trade organisations of our working classes. We have not the slighest objection to *bonâ fide* and intelligent working-men being appointed to these posts, but we have a very decided objection, and a just and well-grounded one, to trades-unionists as such being pitchforked into the position in order that either one candidate or another, a supporter or an opponent of an existing Government, should thereby help to win his election. The motive is certainly an improper one, and ought never to operate. It is a piece of political patronage that should at once be removed from the hands of the Home Secretary, as its exercise in the changed conditions that have arisen since these imperial policemen were first instituted is not and cannot be continued without the greatest detriment to the interests subject to their supervision, whilst on the other hand no countervailing advantage accrues to the community. It is quite time these aspects of the question were seriously considered by the various associations affected by these laws, and that united protests were made against the continuance of a system so liable to abuse. Whilst this reform is being attempted from its basis advantage might be derived from making a united protest against the appointment to these offices of trades-union officials, or such persons who are likely to become tools in the hands of such organizations. The textile trades have a sufficient number of difficulties to fight against, such as, for instance, the McKinley Tariff Bill, which is now in operation, without having obstacles and worries thrown in their path by those who ought to carefully cherish their interests, because of the intimate manner in which their own are bound up with them. If it be essential that working-men should

be appointed factory inspectors, there is abundance of intelligent and capable men who have not compromised their suitability for the post by allying themselves with the foolish if not worse schemes and views that trades-unions have recently put forth. It is on behalf of present and future applicants of this class that we offer these words of protest against the existing system, with a sincere wish that it may soon be abolished, and a better one be instituted in its place.

There is a somewhat wide belief entertained that we may soon witness a considerable accession to the number of the present staff of inspectors, and as an outcome of this opinion we have received several applications for information as to the character of the examination candidates are required to pass, and the conditions with which they have to comply. In order to comply with these requests in the fullest and most perfect manner, we print below the official list of subjects, in which candidates have to pass an examination, in order to be eligible for the appointment. It is as follows :—

INSPECTORS OF FACTORIES.

Subjects of Examination.

1. Handwriting.
2. Spelling.
3. Arithmetic, including Vulgar and Decimal Fractions.
4. English Composition.
5. Theoretical and practical acquaintance with factories and workshops, including a knowledge of their sanitary requirements.
6. Applied Mechanics, including Elementary Mechanical Drawing.
7. (*a.*) The Factory and Workshop Acts, administered by H.M. Inspectors of Factories, viz :—
   The Factory and Workshop Act, 1878, 41 Vict. c. 16.
   The Factory and Workshop Act, 1883, 46 and 47 Vict. c. 53.
   The Factory and Workshop (Scotland) Act, 1888, 51 and 52 Vict. c. 22.
   The Cotton Cloth Factories Act, 1889, 52 and 53 Vict. c. 62.
   The Truck Acts (1 and 2 William IV. c. 37, and 50 and 51 Vict. c. 46).
   And the following Acts partially administered by H. M. Inspectors of Factories : viz. :
   The elementary Education Acts, 1876 and 1880 (39 and 40 Vict. c. 79, and 43 and 44 Vict. c. 23).
   The Education (Scotland) Acts, 1883, 46 and 47 Vict. c. 56.
   The Protection of Children Act, 1889, 52 and 53 Vict. c. 44.
   (*b.*) An acquaintance with the history of Factory Legislation in the United Kingdom.

Candidates must pass to the satisfaction of the Civil Service Commissioners in all these subjects. When two or more Candidates are nominated to compete for one vacancy, the competition will be in the subjects 5, 6, and 7.

Limits of age, 21—30, with an extension up to 38 in the case of a Candidate who has been occupied as Master, Manager, Foreman, or Workman in a Factory or Workshop for at least seven years, and has acquired practical acquaintance with the working of Factories and Workshops.

An official nomination by the Home Secretary is required for this situation.

To this we may add that the recommendation and support of as many M.P.'s as can be obtained, who are supporters of the Government, will be exceedingly useful, and we are afraid indispensable to success, although there is no reason whatever why these inspectorships should not be placed upon the same footing as other ordinary Civil Service appointments, thrown open to competition, and candidates appointed on their merits.

CAUDRY: A DESCRIPTIVE SKETCH.

The disturbances at Calais, however much they may be regretted in other respects, have at least thrown a flood of light upon the condition and extent of the lace trade in France, and manufacturers in this country have only themselves to blame if they miss the opportunity now presented of peering beneath the veil that has hitherto shrouded the movements of the most dreaded of their foreign rivals from the gaze of the inquiring outsider. Of Caudry we have already spoken at some length ; but we are now able to give additional facts about this interesting little town. One of the least known of the industrial centres of the department of the Nord, Caudry is at the same time among the most curious. At Calais, Roubaix, Tourcoing, Armentiéres, Halluin, and elsewhere, the town has been transformed and improved as the special industry of the place has progressed, the one, in fact, keeping pace with the other, and the streets being laid out regularly, as is the case in American cities. But the good people of Caudry would have none of your baneful regularity about their thoroughfares. What it was twenty years ago it is to-day—a village full of tortuous windings, with gardens and fields thrown in "permiskis like," with the addition to-day in the narrow paths which pass muster for streets of immense factories of three to five storeys. A sign in one of the squares of this hamlet (it is little more) bears the inscription," Banque de France." Elsewhere appear houses of a single storey with pointed gables, the thatched roofs of which have only recently been replaced by those of tile or slate, and possessing at their angles plates of copper or marble bearing the names of business firms, such as are seen in the Parisian thoroughfare of Le Sentier. Many of these places bear English names, the offices being branches of houses established at Nottingham and Calais. Others are German, for here, as at Calais, *die Söhne des Vaterlands* are quietly working with a view to securing a preponderating influence in the market.

At the railway station, where one might naturally expect to find some activity, the only sign of life is a pettifogging little omnibus, that scarcely possesses seating accommodation for four persons. All this seems odd in a country like France, where the smallest inns of the smallest of villages are in the habit of despatching conveyances to the station with *Soleil d'Or* or *Grand-Turc*, or some other name equally imposing, shining in all the glory of gilt letters on the sides of the vehicle; but Caudry possesses only two of these local institutions. The town wil preserve for a long time its character for tranquility and *bizarrerie*. Already, it is true, one begins to see large plate-glass windows in some of the shops, but these are found in the old village. The only expenses of a sumptuary character that have been incurred locally are shewn by a pretty church in the Gothic style, the paving of the foot-walks, and the installation of gas, which, in the larger establishments, has already been succeeded by electricity.

It is towards its periphery that the aspect of Caudry becomes, so to speak, transformed. Here, in the midst of fields of beet-root, are long rows of dwellings bordering the narrow streets. These buildings are intended for the housing of the workpeople. Erected on a uniform plan by private enterprise, they lack perhaps both ventilation and space, those responsible for them having evidently aimed first at absolute economy, leaving other and (to the public) more important questions to take care of themselves.

To-day Caudry possesses a population of 8,000 souls. Inchy and Beaumont, which from an industrial standpoint are dependent upon it, bring the number up to 10,400. Sixty years ago the three communes scarcely contained 1,500. The manner in which the present staple trade of the district was commenced was rather curious. The whole of this part of Cambrésis is peopled by weavers, with whom the earnings of the loom are complementary to those derived from agriculture. In almost all the villages the inhabitants own a small plot of ground which they cultivate during the summer. In winter, they remain in their homes, and work for the manufacturers of Cambrai, Cateau and Solesmes. Those who do not own land lock up their houses in the spring and journey to Flanders or Picardy or the Isle de France, where they weed the beet-root crops, make hay, dig potatoes or beet-roots, and after these operations have been accomplished, return home to resume work at the loom. This collection of weavers, whose cellars are lighted by large semi-circular bay windows, imparts to the villages of Cambrésis a curious aspect.

About 1829 M. Toffin, a workman belonging to St. Pierre, but who originally came from Caudry, managed by means of rigid economy to save enough money for the purchase of an old lace machine, and became possessed with the idea of installing himself in his native village, where labour was cheap, for the purpose of commencing the manufacture of the cheaper descriptions of St. Pierre lace by the aid of old designs. Toffin's house, originally of very modest proportions, has developed to-day, under the direction of his grandchildren, into a large factory where great quantities of curtains, bedcovers, as well as various descriptions of tulle are produced. The example set by the industrious *Caudrisien* was only followed slowly, the lace machines, however, displacing little by little the weaver's loom. The gentleman to whom we are indebted for this interesting account has seen one of these old machines, dating back to 1830. It is a miserable-looking affair, very small, and scarcely covering more than a couple of square metres. By means of careful watching—shall we say nursing?—it has been preserved to posterity like Jeannot's knife, its worn-out parts having been replaced one by one, so tha it will still turn out work, and is found very serviceable when there is a rush of orders and the powers of production are taxed to the utmost.

Towards 1837 other firms commenced business The English had previously made unsuccessful attempts to establish themselves in the neighbourhood at Beauvois, but it was not until 1870 that Caudry, taking unto itself heart of grace, transformed itself—or allowed itself to be transformed—by the erection of large factories driven by steam, and supplying power to smaller manufacturers. Since that period the growth of the industry has been steady, and at the present time the number of manufacturers is 180, and of machines 450—in number a quarter of those at Calais. A score of factories with steam power supply the motive force for this machinery, each requiring two workmen, with an additional couple for the accessory duties. *Decoupage* and preparatory processes of the lace business employ from four to five thousands hands, half of whom are resident in the suburbs. Inchy and Beaumont have five factories with thirty machines. In all there are, including the lace hands, the dyers and finishers, between seven and eight thousand persons employed in this busy little hive.

Caudry is not a competitor of Calais. She has left to her elder sister the production of all

articles de luxe and fashion, and simply pays attention herself to goods for the use of the million. But for all that Caudry has exerted a powerful influence on the industrial situation of the other town, where formerly cheaper goods were produced by apprentices or old men who had not the assurance or the manual skill necessary in making articles of the higher qualities. In proportion as Caudry has developed, these workers have found the avenues of occupation gradually closed against them, and they have frequently therefore been without employment. On the other hand, it scarcely seems probable that Caudry will ever compete with Calais in richer makes, the trade in which will for a long time to come be monopolised by the older town. The causes for this are not far to seek. Calais operatives possess an artistic taste which cannot, of course, be taken from them. The weaver of Cambrésis, *au contraire*, is only gifted with ideas of the commonplace. Moreover, such an industry as that conducted at Calais requires collaborators designers, and card cutters, of a highly-skilled order. These are to be found at Calais, and they get highly paid. Their ideas receive inspiration from the illusions of the great town, from the sea, and from the beautiful landscapes of the *Boulonnais*. Caudry offers no such advantages The place bears the impress of "village" on every side, and the scenery is of a gloomy character. The clever artists referred to can only be retained by means of heavy salaries, and in the present state of the industry at Caudry, these cannot be paid. The town, therefore, for its models, its designs, must perforce be dependent upon Calais and Paris.

Commoner goods, however, which are entering more and more into the toilettes of the operative and agricultural populations, require to be made at the lowest prices possible. Hence Caudry with its cheap labour, possesses distinct advantages for such a trade. Wages vary from 32s. to 40s. a week, whereas at Calais they reach £6, and frequently exceed that figure. Besides, the Caudry folk, while living well and being fond of excursions to Cambrai, le Cateau, Solesmes, or other neighbouring towns, which to them are centres possessing many attractions, have economical tastes. As soon as they have saved sufficient money they hasten to Calais for the purpose of buying old machines to enable them to commence on their own account These habits amongst the workers of the town will secure for it a continuance of its present position as a centre for the production of the commoner lace.

Foreign Correspondence.

TEXTILE MATTERS IN THE STATES.

AN EX-PRESIDENT ON THE M'KINLEY BILL.—THE SILK TRADE.—A NEW LOOM.—COTTON MANUFACTURING IN QUEBEC.—A NEW HOSIERY MACHINE.

NEW YORK, OCT. 11TH.

Mr. Rutherford B. Hayes, former occupant of the presidential chair and a Republican to boot, says that he cannot find words to express his regret at the passage of the McKinley Bill. "It is ruinous," he remarks, "to all our best interests, and it will do an infinite amount of harm." Asked as to his opinion on the letter written by Mr. Blaine against the Bill, Mr. Hayes said he could not understand how public men could be so blind to the interests of the country at large as to pass such a measure, which he considers annihilation to the Republican party, and the most terrific blow struck at it during its existence. He hopes that such a policy will die out surely and soon, but cannot shut his eyes to the evil that will be done before such protection finds a grave. Of course such adverse views as these are to be found always when a measure exciting strong feeling for or against is brought forward, and I am not inclined to regard Mr. Hayes's remarks in the light of a prophecy. The "Grand Old Party" has shewn such a wonderful amount of vitality during its long career, that he would be a rash man who ventured to lay plans in the expectation of its downfall. The Force Bill will probably be discussed at a special session of Congress to be called next month. The very fact that the Republicans contemplate such action, notwithstanding the fierce opposition they encountered before the Bill was dropped (temporarily, as it now seems) recently, shews that the unscrupulous politicians composing the party will at all costs strengthen their position at the polls by such corrupt legislation as this Bill undoubtedly is.

The manufacturing districts are busier, and labour is much better employed at the present time than was the case a few months ago. The condition of the silk industry is, however, still unsatisfactory. The business for legitimate manufacturers is spoilt by the horde of irresponsible adventurers, *sans* brains, *sans* technical skill, *sans* every qualification necessary for the successful prosecution of such a business, who have been called into existence by the tariff, and whose affairs are mortgaged up to the hilt, thus leading to sales of goods (many of which are in favour both in quality and design) at prices that cannot be remunerative. At Paterson one concern reduced wages by 10 per cent. almost simultaneously with the taking effect of the McKinley Bill—a rather peculiar coincidence.

Schaum and Uhlinger are manufacturing a new loom for weaving dress goods, which possesses several important novelties over any other looms in operation.

The first annual meeting of the Montmorency Cotton Manufacturing Company took place a few days ago at Montmorency, Quebec. The factory only started in January last, and great satisfaction was expressed at the result of the first six months' working. The goods are becoming favourably known in China, and the demand for the same is in excess of the mill's production. The shareholders are satisfied, and are already increasing the capacity of the mill.

The Kingston Hosiery Co., Kingston, Ont. have bought the exclusive right in Canada to build and operate a new machine for making a full fashioned seamless sock or stocking that conforms to every curve of the foot and leg, including the instep. It is claimed that this is the only machine that has been able to accomplish it. The machine, for the right of which the company have paid $50,000, is a very complicated affair, but turns out its work without any attention other than the supply of bobbins of yarn. One boy or girl could attend thirty of the machines. The company are making the machines themselves, and are having a limited amount of goods ready for the fall trade.

MESSRS. SAMUEL LAWSON AND SONS, of Leeds, have furnished figures and estimates for complete sets of machinery for the manufacture of coarse linen, and two sets of machinery for ramie, for parties who propose to establish these manufactures in the United States immediately.

BROOKLYN is looming up as the centre of a very strong jute industry. In addition to the Chelsea Jute Mills already located in that city, which is the largest concern of the kind in the world, the American Manufacturing Co. is establishing a plant which marks a new departure in its line. The buildings are to be specially constructed on a new plan to give the maximum of light and of economy of space. The main building will be five storeys high, and the mills altogether will occupy between twelve and thirteen acres of floor surface. The architects are Drew, Baldwin, and Co.

A CORRESPONDENT writes:—"The American manufacturers of hosiery who have put the price of their goods up about 30 per cent. since the passing of the McKinley Bill, are alarmed at a report that certain British manufacturers are about to transfer their plant and operatives to this country. Foreigners think that with their superior machinery, backed by the more skilful workpeople and the prohibitive tariff, they will establish a profitable business here, and the alarm prevailing among the American manufacturers would seem to indicate that the belief has ample justification. There is talk of invoking the contract labour law against the threatened competition, but that is all moonshine. The McKinley duty upon imported hosiery is nearly 150 per cent."

A TELEGRAM, dated New York, Thursday, says:—"It is believed that fatal defects have been discovered in the new Tariff Act, and a protest against the operation of the Act is being prepared by the leading constitutional lawyers acting on behalf of a large number of prominent importers. Senator M'Pherson first discovered the alleged defects, one of which is said to be fatal, and is contained in section 30. This section was passed by the House, and was struck out by the Senate, but was finally restored by the Conference Committee. In the engrossed Bill is printed a note, reading:—'Section 30 restored,' but in the Bill passed by both Houses and signed by the president most of this section is omitted. Senators M'Pherson and Carlisle believe that the omission vitiates the whole Bill, and the best legal talent of the country will be engaged in the contest." The section referred to relates to tobacco and snuff, and by itself is not important.

THE Association of Woollen Manufacturers in Brunn, the Central Association of Silesian Woollen Manufacturers, and the Central Association of North Bohemian Woollen Manufacturers have forwarded a common petition to the Austrian Minister of Commerce, calling his attention to the damage which is being done to their interests by the tariff war with Roumania, and urging him to take steps for the renewal of the treaty relations with that State, in order that the lost markets for their fabrics may be recovered as speedily as possible.

U.S. TARIFFS FOR 100 YEARS.—The following are given as about the average tariff charges of the United States for the past hundred years:—

	Per cent.
From 1791 to 1812	19·58
From 1812 to 1817	32·73
From 1817 to 1825	26·52
From 1825 to 1829	47·17
From 1829 to 1832	47·81
From 1832 to 1834	28·99
From 1834 to 1843	19·25
From 1843 to 1847	26·92
From 1847 to 1858	23·20
From 1858 to 1862	15·66
From 1862 to 1884	34·16
From 1884 to 1890	45·50
From 1890 to ——	about 60·00

PARIS AS A WOOL CENTRE.—The projector of a scheme for the creation or wool sales at Paris has been expounding his views at some length to his supporters. He states that the object is to make Paris the centre for French, Spanish, Italian, and Swiss wools, but he does not indicate what special advantages the French metropolis has for such a purpose. He estimates the number of sheep in France at from 22,000,000 to 25,000,000, yielding wool worth about £4,500,000. An attempt is being made to modify the French law on public sales, so as to admit of sales being made by sample, after the English fashion. This is about all the information the promoter gives, though it is plentifully padded with rhetoric calculated to appeal to national prejudice. There is no indication that any of the leading woollen or worsted manufacturers are supporting the scheme, and its future seems to be very doubtful.

THE DECLINE OF THE SILK TRADE OF BENGAL.—A report by Mr. Mukerji, who was appointed to investigate the causes of the decline of the silk trade of Bengal and to suggest remedies, has lately been issued by the Bengal Government. Between 1812 and 1870 the average annual export of raw silk from Bengal rose from 972,108lb. to 1,518,592lb. Between 1856 and 1870 waste silk began to be exported to the average amount of 520,750lb. per annum, making a total export of raw and waste silk, of 2,039,342lb. in that period. The average annual export of both between 1874 and 1887 fell to 1,581,860lb. The decline is attributed by Mr. Mukerji to the increased production of cocoons in Europe owing to the introduction of Pasteur's system of grainage; and he thinks if the same system were adopted in Bengal, and healthy seed brought within reach of the peasantry, there would be an increase in production if Bengal silk should continue to be in demand. But it is doubtful whether it will continue in demand except for certain special purposes. It is the best silk for gloss, elasticity, and for taking black dye, but it is, on the whole, the worst silk in the market. When European, Japan and China silks sell for 45f. per kilo., that of Bengal will fetch only 32f. The reason is that it is the worst reeled silk in the world, and Bengal cocoons cannot be reeled to produce silk

like that of other countries. Other cocoons of a good class contain thread four times longer than that of a Bengal cocoon; the thread, too, is the weakest of all, and very liable to break. The consequence is great unevenness, which is increased by the character of the chrysalid. Hence it is more expensive to handle Bengal silk; it breaks so continually that a girl can handle no more than six to 30 skeins while she can work 100 skeins of Japanese silk. Hence the introduction of Pasteur's system alone will not effect the necessary improvement. Mr. Mukerji thinks the first important step is to introduce the superior Bombay and Mori cocoons, which are employed in every other silk-producing country; this should be followed by improvements in reeling. He elaborates also a scheme for the establishment of a sericultural laboratory, of which the Government has already generally approved. Here experiments will be made, investigations conducted, and men trained who will distribute amongst the peasants a knowledge of the practical results of the laboratory work.

Obituary.

MR. JOSEPH CHESHIRE, ST. PETERSBURG.

It is with much regret that we have to record the death of Mr. Joseph Cheshire, cotton spinner and manufacturer, of St. Petersburg, which occurred at his residence in that city, on Friday, the 17th inst., at the age of 64 years. Only a few weeks ago Mr. Cheshire was over on a visit to England, and called at *The Textile Mercury* Office, when, although not in robust health, he appeared far from the end of his active and prosperous career.

When about 21 years of age Mr. Cheshire, who was then assistant overlooker at Mr. Samuel Barlow's mill, in Mill-street, Ancoats, resigned that post and proceeeded to St. Petersburg, to take up the position of assistant manager in Mr. Thomas Wright's cotton mill there, of which concern his uncle, Mr. Robert Anderson, was managing partner. Three years later he returned to England, but after staying a short time he again went back to Russia, where he became managing partner in Count Lamsdroff's spinning and manufacturing establishment in the Great Octor, St. Petersburg. This position Mr. Cheshire held until about twenty years ago, when he started manufacturing solely on his own account in St. Petersburg. Soon after commencing, a misfortune that might have daunted less persevering men overtook him in the shape of a fire, which completely burnt out his premises. Undismayed, however, he immediately commenced afresh, and has ever since maintained a successful career as a cotton spinner and manufacturer. His products in the latter department range from plain calicoes to jacquard goods, and also include elastic webbing and knitted fabrics.

Mr. Cheshire contrived, amidst the many duties of an active business life, to devote an unusual amount of time to intellectual culture, and possessed perhaps one of the largest private libraries in St. Petersburg, which he was continually enlarging. In private life he was highly esteemed by a large circle of friends, both in England and Russia. He is survived by a family of one daughter and six sons. Four of the latter have been associated with him in the management of the business, and will, of course, carry it on.

Letters from our Readers.

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

FLAX AND LINEN FACTORIES IN THE UNITED STATES.

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

Sir,—I have previously called the attention of the canny Scots people to the fact that the people of America are about establishing the flax and linen industry, and that there is room here for all the idle flax and linen machinery and appliances of the old country. I again wish to suggest to you that the second-hand breaks and scutching machinery, cards and drawings, frames and spinning machinery, are now being inquired for here, and there is a market for it already in a small way, and it will steadily increase. The weaving machinery is more likely to be supplied from American makers. I may also add that there is employment here for experts in flax preparation, and there will during the coming year be a good demand for operatives in linen manufacture. There is a law in this country against making contracts beforehand, but there is no law against an expert flax dealer or a spinner and weaver coming here to find employment.—I am, etc.,

S. S. Boyce.

280, Broadway, New York.

Designing.

THE McKINLEY TARIFF.

It is not our duty in these articles to deal with such a measure as the above further than to note its probable effects on design in textiles, and if possible to offer suggestions which may prove of service to manufacturers who have been more or less engaged in the American trade and who, consequently, at the present time are deprived of a greater or less proportion of their business. We would, therefore, call attention to certain classes of materials which in our opinion may prove very marketable and which, whether the McKinley tariff be repealed or not, manufacturers will do well to note.

In the first place then let us direct our attention to the more costly fabrics which English manufacturers of to-day should find no difficulty in making and in competing therewith successfully with our foreign rivals.

Of the better-class fabrics in which silk is largely used, such as all-silk goods, silk and cotton, silk and worsted, and many of the best worsted fabrics, a very large quantity is imported from France, while at the same time the yarn of which these cloths are composed is often spun in England and shipped to France.

A tremendous amount of copying from French designs is done, very often to be utilised in lower fabrics. There is not the slightest need for this if our art and technical schools are properly utilised, which they are not, though a considerable advance has been made of late years. Why not make a determined effort to get the artistic cloths we require made by the hands of our own countrymen? Here is undoubtedly a means of extending our trade, and that in a direction which always pays the best.

In the woollen trade there has of late been developed a remarkable amount of artistic ingenuity, particularly in the better-class mantle and dress fabrics; and of more recent growth still are the class of fabrics termed "figured worsted serges." The popularity so readily obtained by these cloths should induce manufacturers of other classes of goods to attempt the production of more artistic fabrics for the home-trade, and also for foreign markets still open to British produce.

In thinking over the difficulties of the Bradford manufacturers, who are feeling very severely the effects of the American tariff, it has occurred to us that in the fancy worsted dress and mantle trade there is great scope for extension both at home and abroad. Great variety in figuring has been successful in creating a trade in the woollen districts, and even greater variety and novelties may be obtained in worsteds, which properly conducted cannot fail to obtain a market, and thus find employment for firms whose present machinery is in every way adapted for carrying on such work. It shall be our duty then to indicate, to the best of our ability, in future numbers suggestions both with regard to design and construction, which we hope will prove of service to manufacturers in the position indicated

NEW DESIGNS.

PLAIN AND CASSIMERE CHECK IN LINEN.

Reed 72, two in a dent, or 72 ends per inch, and 72 picks per inch. Weft and warp: 56's linen, or if made all cotton, 24's warp and weft; 8 shafts, pattern and draft: 216 dark sage, 20 dark cream, 4 dark sage, 18 dark cream, 6 dark sage, 16 dark cream, 8 dark sage, 14 dark cream, 10 dark sage, 12 dark cream, 12 dark sage, 10 dark cream, 14 dark sage, 8 dark cream, 16 dark sage, 6 dark cream, 18 dark sage, 4 dark cream, 20 dark sage=216 ends. The whole of the dark sage ends to be on 5, 6, 7, 8 shafts, and the dark cream on 1, 2, 3, 4 shafts. The checking pattern the same number of picks and colours as the warp. The whole of the dark sage weft to be on 5, 6, 7, 8 treads, and the dark cream weft on 1, 2, 3, 4 treads shewn by the figures at the bottom of pegging plan, the draft figures being at the left-hand side. This will make a very fashionable and stylish dress cloth. These large checks well broken up in any material either wool, worsted, silk or cotton, are sure to become popular at this period of the year. Blue may take the place of dark sage, while drab, fawn, and lilac may also be used with decided advantage in conjunction with light cream. We consider these patterns would be very effective in plain weaves for fine ginghams.

FIGURED MANTLE CLOTH.

Figure 27 is a suggestion for a figured mantle cloth or dress panelling. One method of development is indicated in *Design 192*, for which the following sett is suitable:—

Warp.
All 2/40's dark worsted.
12's reed 6's.

Weft.
1 pick 20's dark worsted,
1 ,, 36's mohair or silk.
72 ground picks per inch.

The ground of the pattern, it should be observed, is the 3 and 3 twill, the inside a crape effect, and the figure itself is developed as weft flush. As a cheaper cloth the extra weft may be dispensed with, when even then a very good effect may be obtained. The design as developed here is for production on 3 and 4 wires, *i.e.*, four times 96. Other suggestions shall be given in our next.

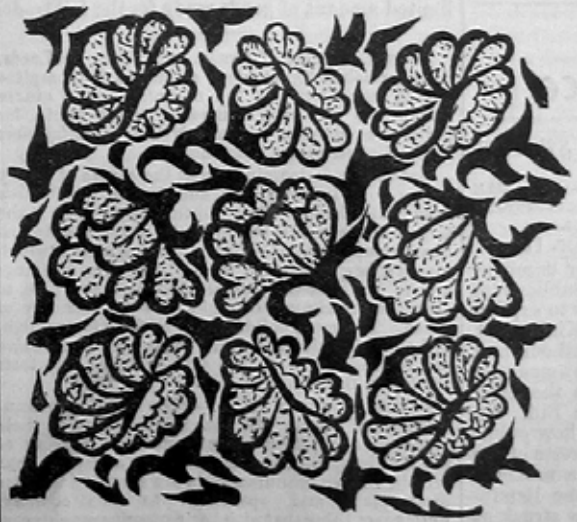
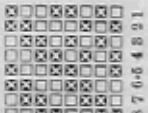
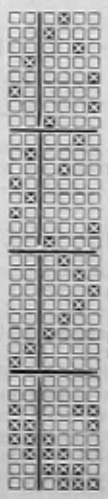


FIGURE 27.



PEGGING PLAN AND DRAFT. NEW CASSIMERE CHECK.



DESIGN AND DRAFT.

FANCY TARTAN CHECKS.

The newest colours for autumn and early winter wear are brown, tan, grey, a clear dark blue, deep rich red, a purple heliotrope, very deep in colour, and deep old rose. Black will also be a great favourite upon all occasions and in all fabrics. We give this week particulars for the make of a durable cloth, which will stand plenty of hard wear, and will look equally bright and pretty in dark red, navy blue, brown, olive green, and a deep tint of terra cotta. Floral and intricate designs are for the present in reserve for spring patterns.

No. 1 design and draft is for a checked tartan, which, as we have said, will stand a great amount of wear if made from 16's cotton twist for warp in a 60 reed, or really 60 ends per inch, the weft 16's cotton, 60 picks per inch, on six shafts, 24 end draft, three in a dent. Warp pattern : 24 dark brown, 120 very light olive green, 24 clear dark blue ; weft pattern : 2 light brown, 2 cream, 2 light brown, 2 cream, 2 light brown, 2 cream, 12 light brown, 120 cream, 2 deep old rose, 2 opal blue, 2 deep old rose, 2 opal blue, 2 deep old rose, 2 opal blue, 12 deep tint of terra cotta.

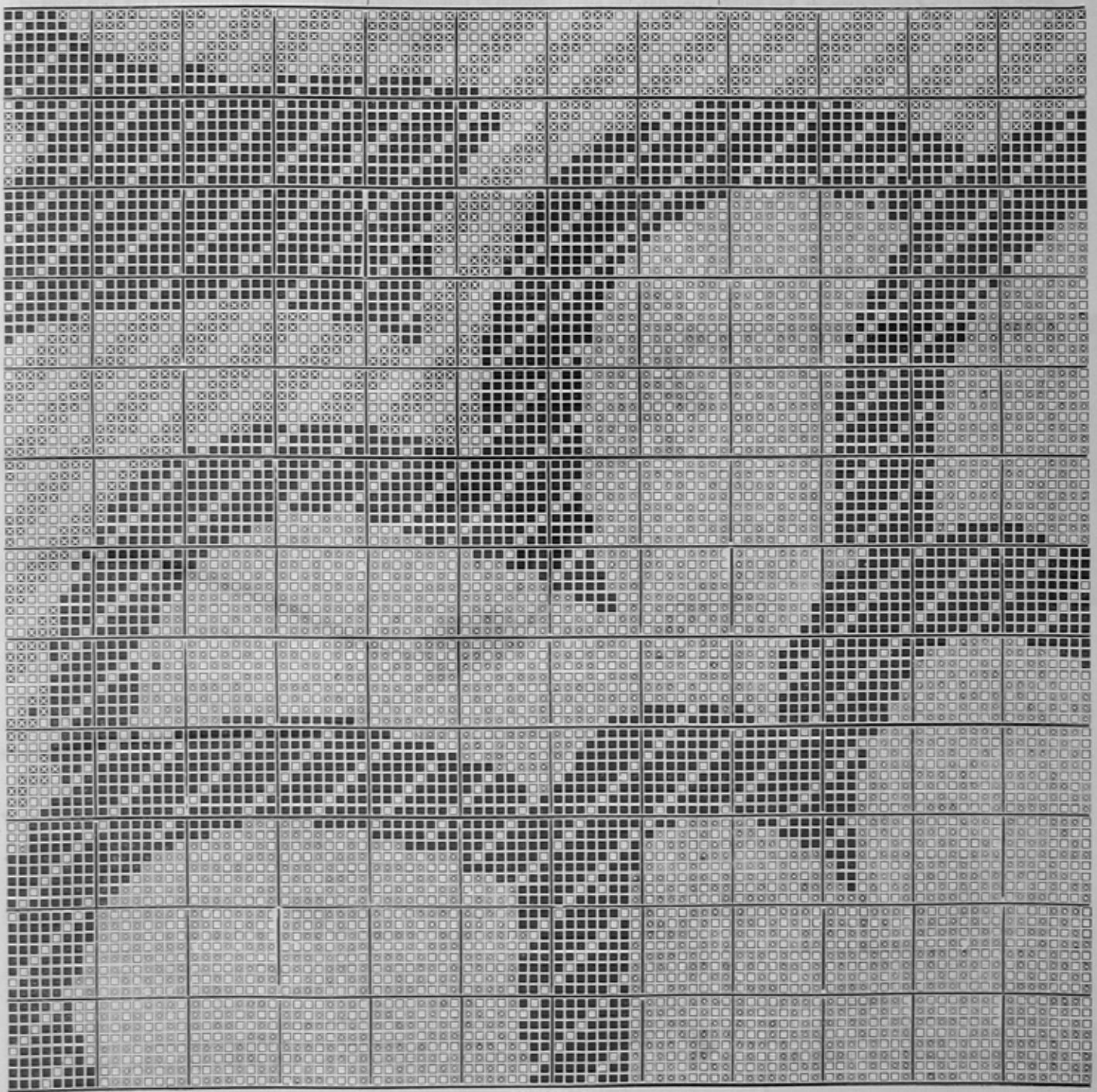
No. 2.—Straight over draft with same reed, counts of warp and weft as *No. 1*. Warp pattern : 18 of deep rich red, 18 of grey, 6 of deep rich red, 18 grey, 6 deep rich red, 2 grey, 2 red, 2 grey, 12 red, 90 of grey, 12 red, 2 grey, 2 red, 2 grey, 6 deep rich red, 18 grey, 6 deep rich red, 18 grey, 18 of very deep green. Weft pattern the same as the warp.

No. 3.—*No. 1* draft, and the particulars of warp, weft, counts and reed as *Nos. 1* and *2*. Patterns—warp : "The Macduff or Fife Tartan," 24 red, 4 black, 24 red, 4 black, 24 red, 24 light or yellowish green, 12 black, 12 royal blue, 24 red, 12 royal blue, 12 black, 24 yellowish green, and repeat from the commencement. The weft pattern is the same in every respect.

No. 4.—On 6 shafts, straight over draft, in a 72 reed, three in a dent, 18's warp and weft, all cotton ; 72 picks per inch. Warp pattern : 6 deep purple heliotrope, 6 dark buff, 24 deep purple heliotrope, 6 dark buff, 6 deep purple heliotrope, 60 of mid coral, 6 deep purple heliotrope, 6 dark buff, 24 deep purple heliotrope, 6 dark buff, 6 deep purple heliotrope. Weft pattern the same.

No. 5, in Linen.—*No. 1* draft, 6 shafts, 80 ends per inch, and 80 picks per inch of linen weft and warp ; 40's count, or warp 40's two-fold cotton, and weft 50's linen. Warp pattern : 12 cardinal red, 12 white, 12 peacock blue, 12 white, 12 peacock blue, 12 white, 12 straw, 12 white, 12 straw, 12 white. Weft pattern same as warp. The white of warp and weft in this case might be linen and the colours cotton.

Patterns *Nos. 1, 2, 4,* and *5* are not reproductions, but original checks, specially designed for early winter, and no doubt would become deservedly popular if made in silk, woollen, or worsted materials with a plain or ordinary twill weave, and we give them with every confidence that they will be found of value to manufacturers who wish to be abreast of the times. The colours ought to be fast, as they are meant for a washing material.



DESIGN 192.

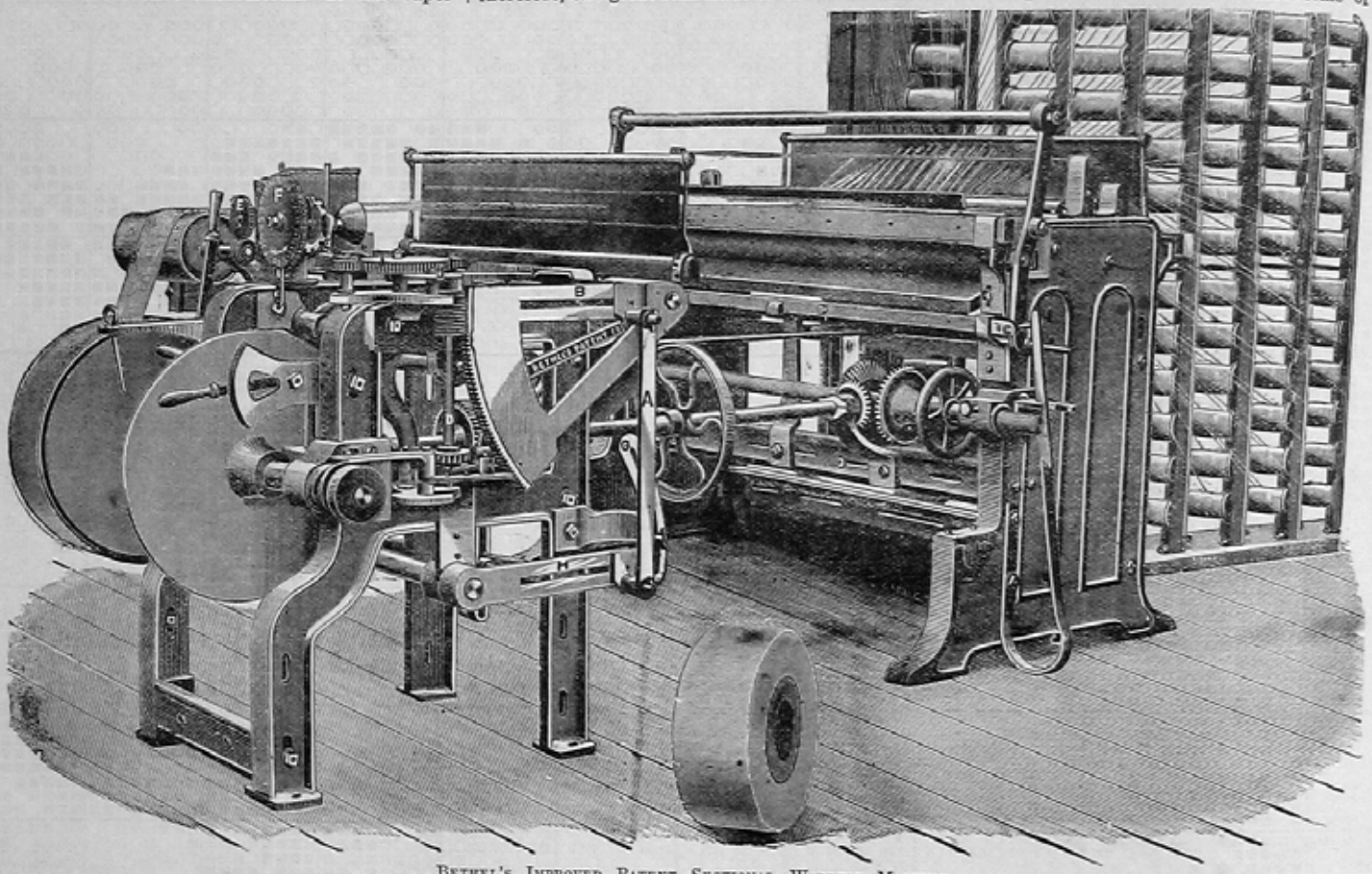
Machinery and Appliances.

IMPROVED PATENT SECTIONAL WARPING MACHINE.

MR. J. BETHEL, MOSLEY MILL, PENDLETON, MANCHESTER.

Warping is the process of arranging in parallel order the longitudinal threads that enter into the construction of woven fabrics. Like every other process of manufacturing it has passed through several stages of development before the present degree of perfection was attained. There was the old system of peg warping, hardly yet extinct amongst the natives of India, and which existed even in this country to the close of the last century. This came down from time immemorial. It was superseded by the old reel warping mill, which in places with antiquated plant is yet to be found. From many causes that need not be dwelt upon here, it retained its position most firmly in the woven coloured goods branch of the trade. This is found mainly in Manchester and its suburbs; in Rochdale, Radcliffe, Farnworth, Swinton, and other districts. In the plain calico trade it disappeared mainly between twenty and forty years ago, superseded by the beam-warping machine, the adjunct of the new system of sizing in the tape and slasher-sizing machines, invented by the late Mr. William Kenworthy and Mr. James Bullough, of Blackburn, which displaced the ball warp system. The latter necessitated the employment of men, owing to the strength required in the process of doffing the large reel and forming the warp into a ball. As a comparatively small number of men in the warping department were needed to supply the wants of a large mill in the weaving department, any misunderstanding or disturbance among the warpers could easily bring an establishment to a standstill. The men, of course, at an early date discovered that they had this power in their hands, and were not slow to let their employers know and feel it. They often made the most extravagant demands, with which their employers generally preferred to comply rather than have their establishment stopped, because being few in number the aggregate of advances in wages that they might extort was only very small compared with what a similar grant to weavers would have been. The men, too, made their occupation a very close one, forming themselves into clubs, and refusing to teach anyone not the son or very near relative of those members who wanted to introduce the candidate. Thus it was very difficult to increase the supply of this class of operatives. The costliness of the labour became, therefore, one great stimulant to manufacturers and inventors to devise a means of ridding themselves of this class of labourers and substituting one less costly and more tractable. There were other reasons also which impelled them to this course, in the fact that the system of ball-warping had its inherent defects, such as being liable to make wrong lengths through the mistakes of the warpers, to mark the warps falsely, and very often to make entangled and slack "half beers," which were a great impediment to the weaver, deteriorating the quality of the cloth, and reducing the production. The urgent demand for an improvement led to the invention of the section warping machine some years ago, which at one stroke obviated most of the difficulties that the manufacturer experienced. There are several machines of this type, but the particular one to which we wish to draw the attention of our readers is the invention of Mr. J. Bethel, Mosley Mill, Pendleton, Manchester, a well-known manufacturer of woven coloured goods. His extensive practical experience rendered him perfectly familiar with the defects of the machines then in use, and of the requirements of the trade, and peculiarly qualified him for undertaking the task which he set himself.

In the sectional warping machine the warp is made in several sections, each coming out of the machine in the form of a cheese with a hole in the centre. Several of these are mounted on a spindle, the whole containing a sufficient number of threads to make the required warp. It will be obvious to the practical reader that to avoid waste and make good work, it is necessary that the various sections should contain exactly the same length of yarn and be of exactly the same diameter; otherwise in the first instance waste will be made from the unequal length, and in the second the yarn in the warp would be of unequal tension, a very serious fault. These were conspicuous defects in the first forms of section warping machines. Mr. Bethel, however by combining several inventions in his improved machine, has obviated these and several other faulty points. One of these improvements is the introduction of a patented regulator, consisting of a presser positively worked according to the increasing diameters, by means of which all sections can at the finish be made of exactly the same size. It is so constructed that the heck of the old warping frame can be utilised with it, thus diminishing the first cost when the purchaser happens to have these in his possession. It can also be adapted to or connected with any self-stopping warping frame. Another feature of this frame is an improved reversing motion, by which the pattern can be reversed and run on the section-block in an opposite direction. This operation, necessary in the case of large patterns, is effected with great facility by means of two sets of driving pulleys, one for each



BETHEL'S IMPROVED PATENT SECTIONAL WARPING MACHINE.

friction bowl. With one set the section spindle is made to revolve in one direction, with the other in the opposite way. The use of two bowls has another advantage, obviating the torsion of the spindle, or the tendency to displace it experienced where only one bowl is used. With two, pressure of this kind is neutralised and easy driving secured—this frame, in fact, taking scarcely more than half the power of those with one bowl. Continuous attention on the part of the minder to regulate the tension is not required, as the tension arrangement is self-acting. By means of an automatic differential motion the section moves with a uniform surface velocity from the commencement upon the bare block to the finish of the section. By this means the frame can be run throughout at the highest rate of speed of which the quality of the yarn will admit, thus diminishing the number of breakages and increasing the production, the strain and friction on the yarn being diminished.

A further important improvement is one that by a simple and effective arrangement the use of change wheels has been dispensed with, and all calculations previously necessary in changing the details of warp has been done away with, the warper now being able to adjust the machine for the reception of a new warp without the aid of overlooker or mechanic. This advantage will be appreciated, as it obviates the necessity of keeping a man to work calculations and put in change wheels, and the small manufacturer, who does not keep a regular overseer in the warping room, can now introduce the use of the Sectional Warper without let or hindrance of any kind.

These machines will warp yarn, whether cotton, linen, silk, woollen, or worsted, sized or unsized, and will turn out completed warps as fast as the best constructed round mill, with a reduction in wage expenditure of at least 50 per cent., for female labour alone is required to work them. Ball warps can be made from the cheeses turned out by them, with all the before-mentioned advantages of even tension and equal length of thread, and totally free from twisted half beers, while as many warps are made as can be done by round mills; it is now, in fact, being made and supplied to spinners to make ball warps of grey and unsized yarn. Experience has demonstrated that it increases production, diminishes waste, improves the quality of the cloth, and reduces the expenditure upon wages.

In spite of the improvements that have taken place in all classes of machinery there are always a number of people who continue to trail far in the rear of all progress. In many cases manufacturers are to be found who are yet using the old reel mill, much to their disadvantage, and it is to these especially that we would appeal to investigate the merits of this machine. They will be supplied with any further information they may desire, and can see the machine at work on application to the inventor as above.

MESSRS. POZANSKI, owners of some of the largest woollen mills in Lodz (Poland), have just purchased two of Messrs. Merryweather's "Greenwich" pattern fire engines, capable of pumping 750 and 400 gallons per minute respectively, and a similar engine has been ordered for the mills of Messrs. Schriebler, of the same town. Owners of mills would do well to consider whether the adoption of suitable appliances would not be a good investment. It reduces their annual account for insurance, besides securing them from the losses that inevitably follow a large fire.

THE Rev. J. Page Hopps, who has been giving a course of lectures in Leicester on 'Town and Toil,' being a study of Ruskin's 'Crown of Wild Olive,' remarked in one of the lectures that, "Of all the ghastly and silly delusions the British workmen had, the ghastliest and silliest was that anything which stirred money was good for trade.'

Bleaching, Dyeing, Printing, etc.

THE COAL-TAR COLOURING MATTERS.

II.

THE AZO-COLOURING MATTERS.—(*Continued.*)

It is impossible in the limits of these articles to describe the azo-colouring matters in detail. There are, however, a few general points worthy of notice; in the first place, aniline $C_6H_5NH_2$, toluidine $C_6H_4CH_3NH_2$, xylidine $C_6H_3(CH_3)_2NH_2$, and cumidine $C_6H_2(CH_3)_3NH_2$, form what is called a homologous series of compounds possessing similar properties, differing, however, in a few minor details. They are capable of being acted upon in the same way by the same means, and therefore form a regular series of compounds. Thus each of them is capable of being diazotised and combined with a sulphonic acid of naphthol forming colouring matters. Now, in such a series it is found that the colour or shade of the dye-stuffs varies in a regular way with the increase in the molecular weight of the dye-stuff; thus from aniline can be got benzene-azo-naphthol-disulphonic acid $C_6H_5N:NC_{10}H_4(HSO_3)_2OH$, which is orange in colour; toluidine similarly gives toluene-azo-napthol-disulphonic acid $C_6H_4CH_3N:NC_{10}H_4HSO_3)_2OH$, which gives reddish orange; xylidine gives xylene-azo-naphthol-disulphonic acid $C_6H_3(CH_3)_2N:NC_{10}H_4(HSO_3)_2OH$, which is a bright scarlet, while cumidine similarly gives cumene-azo-naphthol-disulphonic acid $C_6H_2(CH_3)_3N:NC_{10}H_4(HSO_3)_2OH$, which is a deep crimson. Other examples might be quoted. Not only is the colour shade altered, but the fastness of the colour to light and acids is considerably increased, the last-named colouring matter being very fast.

Then, again, the colour shade is altered by the isomerism of the naphthol-sulphonic acids used. This opens out a complex question rather too extensive to be dealt with here. Briefly, it will suffice to mention that there are two naphthols—*alpha* and *beta*—both identical in composition; *alpha*-naphthol gives more brownish shades than *beta*-naphthol, while the latter gives far brighter shades and is technically more useful. Then, again, each of these forms several sulphonic acids isomeric—that is, of the same composition, but which yield colouring matters of slightly different shades, one acid giving yellow shades of scarlet, while an isomeric acid will give red shades of scarlet. For instance the Benzopurpurines 4 B, 4 B and 6 B are identical in composition, but owing to isomerism in the sulphonic acid used, they are of different shades. The azo-colours are mostly yellows, oranges, scarlets, and browns of various shades. Generally they are soluble in water, especially when they contain one or more sulphonic (HSO_3) groups.

The azo-colours are more generally applied in wool and silk dyeing than on cotton, for which fibre they are practically useless.

On *wool* they are dyed by boiling in a bath containing Glauber's salt, about 10 per cent, sulphuric acid, 2 per cent., and the colouring matter.

On *silk* they are applied in a bath containing Glauber's salt and acid as in wool, or in a bath of old boiled-off liquor broken with sulphuric acid, generally at the boil.

The azo-colouring matters will not dye on wool or silk without the addition of acid, the colour must be as it were precipitated out on the fibre.

On *cotton* these can be applied by preparing the cotton with soap and acetate of alumina, or by stannate of soda and alum, but generally speaking, the results are not good, the shades having mostly a washed-out appearance and not fast to washing.

In *calico printing* they can be applied by printing with acetate of alumina and a suitable thickener and then steaming, but here again, as a rule, the colours are wanting in fastness to washing.

2ND DIAZO-COLOURING MATTERS.

This group is characterised by containing the azo group—N:N—twice. The first of this class that was made is the Biebrich scarlet, benzene-sulphonic acid-azo-benzene-sulphonic acid-azo B naphthol.

$C_6H_4HSO_3N:NC_6H_3SO_3NaN:NC_{10}H_6OH$

which, as will be seen, contains two azo groups —N:N—connected with a benzene nucleus. The croceine colours likewise belong to this group, as also do naphthol black and several others. These differ but little in their methods of preparation and properties from the azo colours. On *wool* and *silk* they are dyed in precisely the same way; and are characterised by the brilliancy and solidity of their colours as well as by their fastness to light, etc. A few of them, Biebrich scarlet, the croceines, have some affinity for the cotton fibre, and can be dyed on that by simply boiling them in a bath containing a little alum. The other colours are not applicable to cotton.

(*To be continued.*)

DYEING AND PRINTING WITH THE ALIZARINE COLOURS.

The usual method of dyeing with these colours is to mordant the wool or other fibre with the mordant to be used, chrome, alumina, or iron, then to dye in a separate bath. The colouring matter being insoluble in water, the formation of the colour lake is very slow, necessitating a considerable expenditure of time and increasing the cost of production. Further, there is always some tendency for some of the colouring matter to be thrown down to the bottom of the dye-bath as an insoluble lake, and this is necessarily lost. A German patentee proposes to take advantage of the fact that these colouring matters, alizarin, purpurine, gallein, cœrulein, alizarin blue—yellow—black, anthracene brown, etc., etc., while insoluble in water are soluble in alkaline solutions, ammonia, ammonium carbonate, caustic soda or potash, carbonates of soda or potash, and alkaline salts. The first-named is preferred because of its volatile character, and can be driven off by the application of heat in a drying apparatus. The goods are passed through this alkaline solution of the dye-stuff, then through a bath of the acetate of alumina, chrome or iron, according to the shades required, then they are dried in a drying apparatus, steamed, and finally cleared by washing in soap; or the operations may be reversed. For *printing*, the dye-stuff solution may be thickened and the mordant directly added and printed. The goods are steamed and cleared as usual, or the mordant may be thickened and printed, and the goods padded in the alkaline solution of the dye-stuff, washed and treated as before to fix the colour lake on the fibre.

COLOURLESS TANNINS.

M. A. Villon describes in the *Bulletin de la Société Chimique* his method for obtaining colourless tannins from tannin drugs such as chestnut wood, quebracho, sumac, valonia, divi-divi, oak wood, etc.

It comprises three principal operations: 1st, lixiviation of the raw tannin materials; 2nd, precipitation of the tannin as an insoluble tannate; 3rd, separation of the tannin.

For the lixiviation of the tannin matters, six becks are used, in which the materials, along with water, are placed, and heated to from 80° to 90° C. a current of carbonic acid gas being passed through. By this means liquors of a gravity of from 5½° to 11° Tw. according to the nature of materials used are obtained. The liquor passes into a settling and cooling tank; when cold it is then passed into a refrigerating apparatus, where it is cooled to 2° C., and is kept at this temperature for about half an hour. The tannin and extractive matters are precipitated out and are separated by filtering through a filter press; addition of 0·5 per cent. of zinc sulphate renders the clarification more complete. The amount of tannin in the liquid is then determined, and the total weight in the mass to be treated is calculated.

For every kilo. of tannin thus found M. Villon adds to the liquor 2½ kilos. of pure crystallized sulphate of zinc, which has been previously dissolved in five times its weight of hot water.

The mixed liquids are transferred to a closed vat fitted with an agitator. Into this is passed a current of gaseous ammonia, obtained by decomposing 2½ kilos. of ammonium sulphate for each kilo. of tannin in the liquid. Any excess of ammoniacal gas is passed into another vat of liquid.

The ammonia displaces the oxide of zinc in the sulphate, which then combines with the tannin to form a zinc tannate, which is insoluble in a neutral or ammoniacal solution. The liquid in the vat is heated to boiling by means of a steam coil during the time the current of the ammonia gas is passing. Zinc tannate is precipitated and separated from the liquor by means of a filter press; it is washed first with hot ammonia liquor, then with cold ammonia liquor, and, finally, with cold water. The liquor is passed into cast-iron pans, where it is treated with lime to recover the ammonia, which is used over again in a subsequent operation. The zinc tannate is stirred up in five times its volume of water and decomposed with dilute sulphuric acid, when zinc sulphate is formed and tannin is set free. Then to separate out the zinc sulphate from the liquid, a solution of barium sulphide is gradually added, until no further precipitation occurs. There is formed zinc sulphide and barium sulphate, and both being insoluble are precipitated; they are then filtered off and the tannin solution is obtained in a condition ready for use.

In this manner extracts of tannin can be obtained of from 14°—22° Tw. in gravity and containing from 20 to 30 per cent. of tannin free from extractive matter and almost colourless. These will be found useful in dyeing light tints.

Monsieur August Foelsing proposes to utilise electricity for decolourising tannin extracts. These are made as usual of a specific gravity of 40° Be., from the various kinds of tannin matters—myrabolams, quebracho, mimosa, divi-divi, chestnut, etc. To every 1,000 litres of such extract 500 grams of oxalic acid are added and 2 kilograms of salt, each previously dissolved in water; the mass is heated to 60° C. and a current of electricity is passed through; this decomposes the salt and oxalic acid, which (although it is not so stated) will have a decolourising effect, and at the same time it causes the precipitation of resinous, albumenous and any colouring matter in the extract in the form of a flocculent precipitate. When the separation is complete the liquid is filtered to separate out the precipitate leaving the liquid, which contains the tannin perfectly clear and ready for immediate use.

RECIPES FOR DYERS.

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

DARK BROWN ON COTTON.

For 100 lb. yarn. Prepare a dye-bath with 2 oz. Glauber's salt per gallon of water used,

2½ lb. soap,
1½ lb. diamine black R O,
2 lb. cotton brown N.

Enter the yarn at 180° F., give three turns, raise temperature to boil and work to shade. Lift, rince, and wash.

DARK PLUM ON COTTON.

For 100 lb. of yarn. Prepare a dye-bath with 2 oz. of Glauber's salt per gallon of water used,

2½ lb. soap,
1½ lb. diamine black R O,
2 lb. diamine red N.

Enter at 180° F., work a few minutes, then raise to boil and dye to shade. Lift, wash, and dry.

FAST BROWN ON COTTON.

For 10 kilos. The cotton is heated in a boiling bath containing

3 kilos. catechu,
200 grms. copper sulphate,

for one hour; it is then treated in a bath containing

300 grms. bichromate of potash,

for half-hour; then dyed in a bath containing

50 grms. benzoblack blue,
150 ,, benzobrown N B,
200 ,, soap,
800 ,, salt.

for one hour at the boil, washed, and dried.

A NEW red dye-stuff has been patented in France. It is obtained by combining diazoamidoazo benzene with dioxynapthalene sulphonic acid S. This dye-stuff gives very fine and pure shades, resembling those of magenta.

A CHARACTERISTIC reaction for peroxide of hydrogen is stated to be as follows: 1 c.c. of a 10 per cent. solution of ammonium molybdate is mixed with 1 c.c. of strong sulphuric acid and a little of the liquid to be tested. If hydrogen peroxide is present a deep yellow-coloured solution will be obtained.

SOME of the alizarine colours are supplied in two forms—powder and paster, the former being the strongest: 1 lb. alizarine blue, SN or SRW, in powder, has the same colouring power as 3 lb. of the same dye-stuff in paste form; 1 lb. of cœruleine SN powder is equal to 3 lb. cœruleine blue paste, and 1 lb. of alizarine red S powder is equal to 3 lb. alizarine red S paste, and gives a rather more brilliant tone.

THE celebrated coal-tar works, founded by Poirrier, at St. Denis, employ 52 chemists and assistants in their chemical laboratories, of which there are five: One for theoretical research, which is under the direction of A. Rosenstehl; a second for superintending and controlling the manufacturing operations, under the direction of F. Chapius; a third for testing the raw materials; a fourth for testing the manufactured products; and a fifth for dyeing and testing dyed fibres.

News in Brief,

FROM LOCAL CORRESPONDENTS AND CONTEMPORARIES.

ENGLAND.

Accrington.

During the dinner-hour on Monday a fire was observed in the machine-room of the Broad Oak Printing Works, but, thanks to the ready use of hand fire extinguishers, the damage was confined to a few printers' blankets, and a small portion of the roof.

Ashton-under-Lyne.

Messrs. Asa Lees and Co., Limited, have delivered the first consignment of machinery to the Ryecroft Mills this week.

Blackburn.

At the Blackburn Bankruptcy Court, on Tuesday, James Cook, cotton manufacturer, of Newby Mill, Rimington (Yorkshire), who formerly carried on business under the style of "James Cook and Co.," came up for his first public examination. His statement of affairs shewed gross liabilities £1,574 16s. 0d., of which £1,546 18s. 6d. was expected to rank, whilst the deficiency amounted to £1,149 15s. 7d. The debtor commenced business on the 1st January, 1889, with £50 of his own, and according to his own statement first became aware that he had not enough property to pay his debts in full about two months ago. He stated that he had lost all his capital two months after starting business, and he did not subsequently make any profits. In August he paid £300 to his father-in-law, which he had borrowed, raising the money by collecting accounts and selling some of his goods. He then did not know that he was insolvent. The examination was adjourned until the 26th November.

Bradford.

Mr. S. C. Lister will distribute the prizes to the successful students at the Bradford Technical College on Wednesday, November 26th.

The alarming discovery has just been made that a collapse is threatened of the mill of Messrs. Mitchell Bros., mohair manufacturers, Bradford. The premises, which are situated off Manchester-road, have been built twenty-five years, and suspicions as to the stability of some of the outer walls, which are surrounded by a small stream, led to the discovery that the whole of one side of the building was in one part 16 inches out of plumb. On the advice of their architects, Messrs. Mitchell Bros. have decided to pull down and entirely rebuild the structure, which is five storeys in height. Operations have already commenced, and in the meantime five hundred workpeople have been thrown out of employment. It is supposed that the stream which flows by the mill had loosened the foundations.

At a meeting of the Finance and General Purposes Committee of the Bradford Town Council, held yesterday week, a deputation from the Bradford Technical College, consisting of Sir Henry Mitchell, Mr. Moser, and the secretary, attended, with the view of inducing the committee, and through them the Council, to hand to the college the money which will be made over to the Corporation under the Local Taxation (Customs and Excise) Act of last session, as part of the fund that was intended to be appropriated to the purchase of public-house licences. Alderman W. W. Wood, who presided, in the absence of Alderman John Hill, the chairman of the committee, informed the deputation that the subject would receive the best attention; but, inasmuch as the committee would not be holding any more meetings during the present municipal year, it must stand over until the new Council had been elected. The deputation then withdrew. During the discussion it transpired that the money coming under the Act of last session may be dealt with as the local authority may determine, without in any way interfering with their power, and, if they think fit, they may make a further grant out of the rates not exceeding a penny in the pound.

Brighouse.

Mr. Herbert Edward Sugden, worsted spinner, was married on Wednesday to Miss Ada Scarth, daughter of Mr. Benjamin Scarth, of Stanley.

Bury.

The Bury Cotton Spinning Co., Limited, have decided to renew the entire machinery in their card-room department. This will include 60 cards and their complement of frames. The order for the whole has been placed with Messrs. John Hetherington and Sons, Limited.

By an oversight in our last issue it was omitted to be stated that the new plant, consisting of 10,000 ring spindles and the requisite complement of preparatory machinery, to which extent Messrs. Kenyon and Co. have been refitting their mills, is from the establishment of Messrs. John Hetherington and Sons, Limited. It is giving the highest satisfaction.

Calverley.

The death is announced of Mr. Joseph Atkinson, a partner in the firm of Messrs. Atkinson Bros., woollen manufacturers, of Holly Park Mills.

Church.

Messrs. William Blythe and Co., of Holland Bank Chemical Works, have just erected a set of wash-houses for their employés, replete with all the latest conveniences.

Messrs. F. Steiner and Co., of Church Works, have handed over to the Blackburn Infirmary the sum of £133 14s. 8d., being their workpeople's collection for twelve months, and the firm's donation, £10. The workpeople's amount is realised by collecting at the rate of one penny per fortnight from adults, and one halfpenny per fortnight from the juveniles. The collection in 1889 realised £124 9s. 9d., and in 1888 £114 8s.

Darwen.

Lecturing to a large meeting of Liberals here on Wednesday evening on the Eight Hours Question, Mr. Bradlaugh, M.P., said that he held the same views upon the subject as he expressed 30 years ago. There were 1,084,631 persons engaged in the textile trades of the country, and he suggested that it was no light matter to propose to enact some measure which would affect upwards of one million workers without their consent. A very strong case would have to be made out before it could be considered. It was said there was exceptional legislation in the case of miners because of danger to life and limb. He was quite prepared, if it could be shewn that a case was made out of danger to life or limb, to allow that there was responsibility; but he was not prepared to recognise the want of legislation in such a case if it was not made out in a clear and formal way. He admitted people's right to experiment with their own property and prospects, but he denied them the right to compel other people to take part in the experiments against their will.

Derby.

On Sunday evening a fire broke out at the silk mill of Mr. Wm. Rickard, in Chandos Pole-street, Ashbourne-road. It originated in some cotton waste, but was got under before much damage had been done.

Dewsbury.

Fire broke out on Wednesday night in the boiler-house of the extensive works of Messrs. Wormald and Walker, blanket manufacturers, Thornhill road. Two brigades attended and prevented the flames from spreading to the adjoining buildings, which contained manufactured goods and raw material to the value of thousands of pounds. The building in which the fire originated was gutted. The loss, which amounts to over 2,000, is fully insured.

Dukinfield.

The meeting of the Astley Spinning Company has taken place during the week, and a dividend of 8 per cent. has been declared. Everything passed off satisfactorily, the only change in the directorate being that Mr. Jno. Crossley, of the firm of Buckley and Crossley, spindle makers, was elected

after a contest to a position on the directorate, vacant by the death of his father, the late Mr. Edwin Crossley.

Eccles.

Mr. H. J. Roby, of the firm of Ermen and Roby, sewing cotton manufacturers, bleachers, and dyers, Nassau Mills, Patricroft, was on Wednesday elected M.P. for the Eccles division. He is a Gladstonian Liberal.

Farnworth.

Several Oldham gentlemen are assisting in the promotion of a limited company to build a mill at Farnworth. The mill contemplated to be erected is to be capable of holding some 80,000 spindles, and will be set out for the spinning of Egyptian cotton.

Haslingden.

Mr. Abraham Hindle, of the firm of Messrs. A. and J. Hindle, of Carr Mill Shoddy Works, Musbury, died last week at his residence in Haslingden. On the 1st inst. a disastrous fire took place at the Musbury Mill belonging to the firm, and the deceased gentleman, being present when it broke out, was very active in the attempt to save the property. He inhaled much dense smoke, which afterwards affected his lungs, and the place being also uninsured, he was much shocked by the financial loss. Two days afterwards he took to his bed, and, notwithstanding the best of medical skill, death ensued. He was about 60 years of age.

Hyde.

At the Hyde Police Court on Monday, before Colonel Sidebottom, M.P., and Mr. H. Rhodes, Messrs. Horsfield and Co., Limited, Greenfield Mills, were summoned for employing five young women during a part of the time allowed for meals (dinner-hour) on the 28th August. Mr. Stokes, Factory Inspector, said he found the five women working at the looms, although the machinery was not running. The defendants were fined 10s. and costs in one case, and ordered to pay the costs in the remaining four cases. Messrs. Francis W. Ashton and Co., calico printers, Newton Bank, Hyde, and Manchester, were summoned for employing a lad, named Roscoe, after six o'clock in the evening. Mr. Stokes stated that when he visited the works after six o'clock, the usual time for leaving, he found Roscoe working in the dye-house. The lad told him that he would have worked on till eight o'clock at night. A fine of £3 and costs was inflicted.

Kidderminster.

During the last two or three weeks there has been quite an exodus of carpet men from Kidderminster for Canada and the United States. Mr. Bernard Eck (of T. Bond, Worth, and Son, Stourport), and Mr. R. Ransome (of W. Green and Sons) set out a fortnight ago. Last week Mr. Albert Cowell, a director of the Carpet Manufacturing Co., Limited, departed with his son for a short tour. The object of Mr. Cowell's visit is believed to be of an important character, apart from the sale of his firm's carpets, and has caused a little speculation. Mr. James Humphries (Humphries and Sons) has also gone to the other side.

Leigh.

A number of new looms are being erected in the Pennington Mill weaving shed, near Leigh.

A change has been made in the management of the weaving department of Astley Mills, Mr. W. Grundy, the late manager, having been succeeded by Mr. Napoleon Hopwood, of Bury.

At a special meeting of the shareholders of the Mather Lane Spinning Company, Leigh, held on Saturday, it was decided to erect a new mill. The company have already two mills, and employ upwards of 500 hands.

Liverpool.

A fire broke out on Sunday morning in a large cotton warehouse in Queen-street. Several floors were gutted, and about 3,000 bales of cotton were destroyed. The damage is estimated at £6,000.

Manchester and Salford.

Sir William Ewart, of Belfast, was in town on Thursday.

A Mill Girls' Institute is about to be built in Ancoats. The building will be Italian renaissance in style, and will have a frontage three storeys in height, faced with Ruabon red bricks and terra-cotta. The building will cover an area of 75 feet by 128 feet, and will cost about £5,000.

The committee appointed by the Salford Corporation to report on the methods of technical education visited the Stockport Technical School on Monday. There were present the Mayor, Mr. Alderman I. Bowes, Mr. Alderman W. H. Bailey, Messrs. J. Corbett, and W. F. Cottrell. At the school they were received by the President (Mr. Councillor Robinson, and other gentlemen. The building was inspected, and the visitors seemed satisfied with the arrangements. Their object was to glean information with regard to the establishment of a technical school for Salford.

Many in Manchester will learn with regret that the venerable John Napier—"the father of Manchester Methodism"—died suddenly on Monday morning. He had attended service twice on Sunday at his place of worship in Plymouth Grove, and seemed in his usual health, but at eleven o'clock on Monday morning, without a moment's warning, he died. Mr. Napier was one of the oldest members of the Wesleyan body in England. He was born of humble parentage on September 19th, 1801, and entered as a mere boy the employment of Messrs. Samuel and Thomas Knight, cotton spinners and manufacturers, of Church-street, with whom he continued for several years, passing by degrees from the position of warehouse boy to that of counting-house clerk, bookkeeper, cashier, and salesman. By habits of prudence he was able, about 1839, to commence business on his own account in partnership with Mr. Richard Goodair, a fine spinner and muslin manufacturer, of Preston. The concern, trading under the firm of Messrs. Napier and Goodair—first in Fountain-street, afterwards in Chapel-square and Birchin-lane, Manchester, with extensive mills in Preston—was carried on for many years with considerable success. Mr. Napier belonged to that quiet, steady-going class of commercial men who have so largely contributed to the prosperity of Lancashire. Few men who have attended the Manchester Exchange during the past half-century were more thoroughly just in their transactions or pleasanter in their manner than the quiet, gentlemanly head of the firm of Napier and Goodair. Some years ago, having acquired a comfortable competency, he retired from business, which was subsequently carried on for a time by his son, the late Mr. George W. Napier.

Middleton.

The directors of the Middleton and Tonge Spinning Co. Limited are exhibiting a very praiseworthy amount of energy, shewing their determination to place the establishment over the fortunes of which they preside in the very front rank of dividend paying concerns. It has been there before, and they mean it to go there again. With this object in view they are making extensive alterations, turning out their old carding machinery, and preparation and refurnishing with new, which, while occupying less space, will do more work. One card-room will be done away with, and the room thus gained will receive three pairs of new weft mules, containing 8,000 spindles. Messrs. John Hetherington and Sons are executing the work, and furnishing all the new machinery. Mr. J. Bethel, of Mosley Mill, Pendleton, is chairman of the company, and under his guidance a heavy adverse balance has been cleared off.

Milnrow.

It is reported that action is being taken to form a new spinning company at Milnrow, which is likely to secure the aid of Oldham men.

Oldham.

Messrs. Tetlow Bros., Hollinwood, have obtained the order for the new boilers required by the Yew Mill Company, Heywood.

It is stated that Mr. J. S. Twyfold, of Liverpool, has been appointed the sole cotton broker to the Summervale Mill Company.

Several Oldham spinning companies are involved in the failure of a yarn agent, and others in that of a manufacturer.

Messrs. Green and Co. have obtained the orders for the economisers required by the Irk Mill Company, and Messrs. Lowcock for the Eagle Mill Company.

Machinery is expected to be delivered at the Stamford Mill before Christmas. The work at the mill is being pushed on with to allow of this being done.

The overlookers of Albany Shed, Watersheddings, sat down to an excellent supper at the Carrion Crow Inn, Huddersfield-road, on Saturday evening last. Mr. J. Jackson Shiers, their employer, defrayed the cost.

Mr. George Lees, the new manager at the Lime Mill Company, has been the recipient of several presentations from the operatives in the employ of Messrs. Tunstill, at Brierfield, where he was engaged as head spinning and weaving manager.

We understand that several promotions have been made at the firm of Messrs. A. and A. Crompton, Limited, of Crompton, in consequence of Mr. J. H. Lees Milne having partially resigned his position as managing director.

Particulars of the registration of the Holly Mill Company, Limited, Royton, are to hand, which is established with the object "to carry on the trade or trades—one, more, or all—of spinning, doubling, weaving, bleaching, dyeing, and printing, and further to carry on business as brick and tile makers." The subscribers' names will be found under our "Joint-Stock News." The salary of the directors, who are to be not less than five nor more than seven in number, is fixed at £170 divisable—we presume per annum.

The Pearl Mill Company, Limited, which is erecting premises at Glodwick, is registered to "carry on business as cotton spinners and manufacturers, and also as brick and tile manufacturers." The subscribers are:—Messrs. E. Hall, T. Cottam, C. C. Spencer, A. Lord, J. Parker, J. Cottam, and S. Stott, architect. The contracts for the building, we understand, have not yet been given out. The Company is making a new departure in this district in the setting out of the mill premises. These are to be, as it were, two mills, which will be joined by the engine-house, there being sheds at each end for a portion of the preparatory machinery. One-half of the mill will be devoted to the spinning of fine American yarns, and the other half to coarse yarns, which, it is expected, will be worked jointly. The promoters have confidence that this new arrangement will work satisfactorily, and be the means of securing good returns for the shareholders.

Preston.

On Monday William Birley brought an action against Messrs. Swainson, Birley, and Co., cotton manufacturers, of Preston, for £1 13s. 6d., in lieu of a fortnight's notice. Plaintiff was a grinder in the firm's employ, and on the 31st July last he was requested to do some work other than his regular work. He refused, and was served with a fortnight's notice. On the expiration of the notice he returned to his work as usual, and told the overlooker to give him a written notice, as a verbal notice would not do. A man had been engaged in plaintiff's place, and plaintiff was obliged to leave his work. He then brought the action. His Honour considered that he had been legally discharged, and found for the defendants.

Shaw.

Mr. James Henry Lees-Milne, J.P., chairman of the Hard Twist Cotton Spinners' Association, has partially resigned his position as managing director at Messrs. A. and A. Crompton and Company, Limited, Park and Woodend Mills, the largest firm of hard twist manufacturers in the world. The firm have promoted Mr. Levi Fitton to the position of general manager of the concern, and in addition to his technical duties of cotton sorter and grader, Mr. Wm. Blackwell has been entrusted with the position of inside manager.

Shipley.

A meeting of past and present students and friends of the Shipley Technical Schools was held yesterday week to consider the formation of a Textile Society. Mr. J. Cryer, chairman of the Technical Schools Committee, presided, and called upon Mr. A. F. Barker, who had been hon. secretary of the Yorkshire College Textile Society since its formation, to give a brief outline of the objects of that society. These Mr. Barker stated to be: the reading of essays, followed by discussions, on all matters relating to textile processes, fabrics, etc.; the promotion of social intercourse between past and present students; and the obtaining of journals and books of reference for the members. Upon the motion of Mr. Dobson, seconded by Mr. Anderson, a "Shipley Textile Society" was accordingly formed. The subsequent proceedings, which were taken part in by Messrs. Renard, Simpson, Wyrill, and Shackleton, included a resolution that Messrs. Pullen, Rawnsley, C. F. Stead, Miles Sowden, and Gordon Salt be asked to become vice-presidents of the society, and that the president be elected from the vice-presidents. The following committee also was elected:—Secretary, Mr. F. Bradbury; Treasurer, Mr. Dobson; Messrs. Wyrill, Clough, Dewhirst, Dawson, and L. A. Page (students), and Messrs. Renard, Barker, Brocksbank, and Clough (non-students). We cordially wish the society every success, and hope it is entering upon a very prosperous career.

Stockport.

The marriage of Mr. Matthew Dickie, jun., of the Albion Towel Mills, to Miss Margaret Jane Symonds, took place on Wednesday.

Yeadon.

The Yeadon and Guiseley Chamber of Commerce, Mr. J. Peate in the chair, on Monday evening discussed the question of renewing certain tariff treaties which are about to expire. The chairman referred to two resolutions which were to be brought before the Leeds Chamber of Commerce preparatory to being submitted, if agreed upon, to the Associated Chambers of the West Riding, who met at Leeds

on Wednesday. The first of these resolutions expressed an opinion favourable to the present treaty, and the second suggested that whatever action might be taken by the other contracting parties, England should not enter upon any retaliatory policy. He considered the latter resolution a most foolish one, as declaring that the French might do exactly what they pleased, and England would under no circumstances retaliate. He was in favour of Free-trade, but to tell a rival country that however high they raised their tariffs no retaliation would be offered seemed to him absurd. They must not, at any rate, shew the weakness of their own hand. The existing treaty was by no means what it should be. It had inflicted a great injury upon the trade of that district. Since the treaty of 1882 was negotiated very little trade had been done with France in that district. He trusted that the Government would be able to negotitate a far more favourable treaty with France than that now in operation; and one which would give the manufacturers of the district access to the French markets once more. Mr. Thomas Brown argued that if retaliation were threatened it would bring the French to their senses, and it would not be necessary really to resort to retaliatory measures. It was necessary to do something, however, if a better treaty was to be secured. Mr. I. Moon suggested that a return should be made to the treaty of 1860. The secretary (Mr. Laycock) pointed out that the manufacturers were worst off in the countries which were most protected. If they entered upon Protection they would have to protect all trades. Mr. Barraclough also urged that retaliation was a violation of the Free-trade principle. Mr. Brown would not retaliate, but he would tell the French that he would. It was explained that the tariff on the goods of that district had been increased by the treaty of 1882 from about 10 to 25 per cent. After a good deal of discussion, it was resolved unanimously, on the motion of Mr. Slater, seconded by Mr. Pratt, that a resolution be presented to the Associated Chambers in the following terms: —"Seeing that the increase of the French Tariff Treaty of 1882 almost totally destroyed a large trade in this district, this Chamber would urge the Associated Chambers of Commerce to make strong recommendations to the Government not to enter into any treaty with France less favourable than the Cobden treaty of 1860." The president and Messrs. Barraclough and Brown were deputed to place the views of the Chamber before the Associated Chambers.

SCOTLAND.

Brechin.

Last week the whole of the workers in the employment of the East Mill Company, Limited, when getting their weekly pay received a bonus of one week's wages in recognition of their services during the past year. This gift has been entirely spontaneous on the part of the Directors of the Company, and is highly appreciated by the workers.

Dundee.

Dundee merchants have received intimation that their goods entering Brazil will henceforth be charged an additional 15 per cent. duty. What with prohibitive tariffs and keen competition Dundee traders are having a hard time of it.

The first portion of the spinning and weaving machinery which has been given to the Technical Institute, has now been erected. It consists of a spinning frame, made in Monifieth Foundry, the erection of which was completed by Mr. Low's workmen on Saturday. A photograph of the frame was taken on Saturday afternoon. The machine is of the most substantial description, and finished in the superior style which characterises all the work turned out of Monifieth Foundry. Messrs. Urquhart and Lindsay, Blackness Foundry, have also finished the machines which they are to present to the Institute, but their erection is delayed until the shafting for driving the various machines has been put up. Messrs. Urquart and Lindsay have secured the contract for the shafting. The machinery which is to be forwarded by two English firms has not been received yet.

Galashiels.

The firm of Adam L. Cochrane and Brothers, woollen manufacturers, Netherdale, has been converted into a limited liability company. The shares will not be offered to the public, but be held by the present partners and relatives. The business will be carried on under the same management as hitherto, the directors being Messrs. Adam L. Cochrane, Archibald Cochrane, Walter Cochrane, and William Rodger.

Paisley.

The fund raised for the Sir Peter Coats statue amounts to about £2,200, and the total expenditure will be £4,000. Both statues are being erected by public subscription in recognition of the brothers Coats's public andprivate benefactions to their native town.

Stanley.

A presentation ceremony took place on Saturday, in a portion of the old cotton factory, on the occasion of the marriage of Miss Daisy Sandeman, daughter of Colonel Frank Stewart Sandeman, owner of the mill, to the Rev. J. E. Somerville, of Mentone. The presents, which consisted of a bracelet set with 12 diamonds and 26 pearls, and a brooch set with five brilliants, were given by Mr. Fenton, on behalf of the employés of Col. Sandeman. In the course of an interesting address, Colonel Sandeman said "That day they stood in the old mill associated with cotton spinning from the days of its introduction into this country, and built by Arkwright 110 years ago. When Mr. Bright asked him what he was to do with it now that it was empty he (the Colonel) said he would pull it down. Mr. Bright said—'No; don't pull down the old institutions and landmarks of our country. Leave it alone. It may be of some use one day.' He (Colonel Sandeman) only wished his friend with his silvery voice and loving heart were there that day to see that unique meeting and to hear Mr. Fenton's brief but pithy and heartfelt words. No one would have spoken more strongly than Mr. Bright would have done about this Socialistic movement, which was being brought insidiously in this country to separate those who were associated in business. If those wedges which separated the employed from the employer were driven in they would more and more drive business from the country."

IRELAND.

County Mayo.

According to a special correspondent of the (London) *Times*, who is now making inquiries into the condition of the population in the West of Ireland, there are no cottage industries in the district of Swineford, County Mayo, and the people have given up spinning their own yarn and weaving their own cloth. Attempts have been made to introduce knitting, but they have not hitherto been successful, and some English ladies are now endeavouring to establish home industries. There are some very fair cattle and some good sheep. The people are well dressed and shew no appearance of poverty. Some of the elderly men wear the old-fashioned, blue swallow-tailed coat and some wear frieze, but among the younger men the ordinary tweeds have quite supplanted the old homespuns, which were so much more serviceable.

Belfast.

The McKinley Tariff Act is responsible for 27 prosecutions at Belfast, on Monday, under the Factory and Workshops' Act. Five local linen manufacturers were summoned for employing a number of females and boys after the specified hour on 13th September last, contrary to statute. They admitted the offence, and pleaded in mitigation anxiety to get certain goods for the United States finished before the McKinley Act came into operation. The magistrates, admitting the pleas as reasonable, imposed nominal fines only in all the cases.

The *Dublin Gazette* of Tuesday night contained an order of the Secretary of State, extending special exception in the employment of young persons and women, whereby they may be employed for an additional two hours in the event of press of work at recurring seasons of the year, or from a sudden press of orders from unforeseen events, providing always that the other sections of the Factory and Workshops Act, 1878, are fully complied with. This order appears to be framed to meet such cases as referred to in the preceding paragraph.

The Silk-worm Disease in China.—The total production of silk in China this year has exceeded that of the previous year by from 25 to 30 per cent. This fact proves to demonstration that the silk-worm disease in the North of China does not spread, and that it will not be necessary to take the measures of extirpation which were spoken of last year. There is no doubt, however, that the disease exists; but according to the last consular report from Shanghai experiments have shewn that the Chinese silk-worms are more robust than their European congeners, and that they can produce eggs even when diseased, which is impossible in the case of European worms. Still experts are afraid lest the production of silk should presently cease in the districts where the malady prevails, and those who wish to see preventive measures adopted similar to those of Japan, positively assert that the

Miscellaneous.

A VISIT TO THE ONLY AXMINSTER FACTORY IN ENGLAND.

Mr. Harold Cox, writing in the monthly magazine *Time*, has something to say this month on a subject which, to the historical student and even to the modern manufacturer, will not be without interest. The production of carpets by the processes described below is similar to that of Asia Minor, an account of which appeared in *The Textile Mercury* recently. Taken in conjunction with the article on the origin of "Axminster Manufacturing in England," which appeared in our columns, the following completes the available information on a subject that possesses many unusual attractions:

Just on the outskirts of the small town of Wilton (not long ago a parliamentary and still a municipal borough, three miles from the city of Salisbury), is an unimposing building eminently suggestive of a factory. In this building is carried on one of the most interesting of the hand industries that are still left in England. But before attempting to form an idea of this industry, it is necessary to dismiss from the mind the external aspect of the building in which it is housed. This is as bleak and forbidding as any of the hideous barracks that disfigure our northern towns. But go inside the gates and a very different spectacle presents itself. Instead of seeing a dirty yard deep in black mud, or covered with dull paving-stones, the visitor will find himself in a pretty little garden, surrounded by well-kept paths. Round three sides of the garden run the workrooms, built at different dates, and unrestrained by any fixed plan of architecture. On the fourth side is the house of the principal proprietor and manageress of the factory. It is a simple, two-storied, low-roomed building, that has outlived more than one generation. The dining-room opens with a glass door into the garden, so that the mistress is living literally within her factory. For the garden communicates directly with the workrooms, and indeed forms the main thoroughfare for the workpeople on their way from one part of the factory to another.

My visit is luckily made under the conduct of this lady-president of the factory. Stepping from her dining-room into the garden, and giving a brief glance at the flowers in the little greenhouse, we mount a few wooden steps and enter a long, low workroom filled with carpet frames, where scores of girls and women are busily at work, building up the deep-piled carpets.

This room which we first entered is the most typical room of the factory, and therefore it is worth while, before passing onwards, to give some description of the nature of the work by which the famous Axminster pile is produced. Let me take for my text the first frame I inspected, on which was being completed a carpet specially designed for a billiard room. The "frame" consists essentially of a large wooden roller or winch, about two feet six inches in diameter, and some twenty feet long, pinned at the ends to two uprights. The two uprights are joined together by a beam some four or five feet above the roller, and, of course, parallel to it. It is over this beam that pass long warp threads or strands of the carpet separated from one another by little pins or studs in the beam.

In order to set up the frame, these warp strands, which are made of the strongest linen thread, are fixed to the roller at one end, the other end being also secured. The girls then take their places in front of the frame, sitting beside one another on a long bench, each girl having her own width of work to attend to. She has two duties to perform: first, to fix the pile to the warp strands; secondly, to weave these strands into a solid backing.

First with regard to the pile:—Beside her, conveniently placed for her left hand to reach, hang a number of short lengths of different coloured wools; in front of her is pinned the coloured paper pattern by which she is working. Watching her pattern, she takes the appropriate wool, and with a few quick motions of her fingers ties it tightly on to the warp strand; then with a pair of scissors snips off the two ends within about an inch of the strand. In this way the two woollen tufts are left standing out from the warp, and by placing a succession of them side by side, the tuck pile of the carpet is gradually built up. So far, however, we have only got a number of separate threads with tufts of wool attached to them. The next process weaves them into a carpet. As soon as the girl has completed her row of tufts, she passes a shuttle carrying

tuft. Then comes another row of tufts, and then another row of weaving, and so on.

The process no doubt is a slow one, but the product is permanent. Each tuft of the pile goes through to the very back of the carpet, so that real Axminster cannot become threadbare until it has been worn right through. With that machine-made article, on the other hand, known as patent Axminster, the backing and the pile are woven separately and then fastened together. Unfortunately, the two elements having thus distinct existences, are easily induced to part company.

So much for the nature of the work; now for the people who do it. In this little factory at Wilton were some two hundred girls and women, and, in all the factories I have visited at one time or another, I have seldom seen a higher general average of tidiness and good looks. Many of the girls were quite young—twelve or thirteen years old—and were learning their craft from elder girls sitting beside them. In these cases the firm pays the elder girl for teaching the junior, and the learner is paid something by her teacher for the work she does. Nearly all the wages are on the piece-work system, so that the weekly takings of the girls vary considerably. The highest amount taken seemed to be about 13s. a week, and the average perhaps 9s. or 10s. This does not sound very high in a Londoner's ears. But all wages have a habit of being low in Wiltshire, and probably many a London factory girl who makes 15s. or 16s. a week in the noise and dirt of the East End or the Borough, would find that she was a good deal better off on 10s. a week in Wilton.

But I must not omit to mention the male part of the factory. Comparatively, only a few men are required, perhaps forty or fifty, and their work is merely supplementary to that of the women—for example, shifting the carpets, which are too heavy for the women to move. Men, too, are wanted for the engine-room, and there is a male machine department for making Brussels carpet and Wilton "velvet," where men and boys are employed. Also, the dyeing department is entirely given over to the male sex. The dyeing rooms, I think, delighted me more than almost any part of the factory. Nearly all the dyes employed are made from vegetable products, and great heaps of bright-coloured bark and chips were piled up in different bins waiting to be steeped. But my hostess and guide would not let me linger to examine these brilliant masses of colour, but led the way through the further door of the dye-room towards the next department. We were again in the open-air, and, to my intense surprise and delight, standing on a little promontory of land, separated by two running streams from a wood, whose tall trees almost overhung the factory.

Of course, the streams were inky black, and vile to touch or smell, from the waste products of the dye-house! No, we are in Wilts, not in the West Riding of Yorkshire. The water was as pure and clear as any mountain stream, and, as it hurried by, murmuring against the stones, seemed to invite one to stoop down and drink.

From this open spot, a flight of wooden steps led to an upstairs room, where the girls, as they sat at their work, could look out through the open door on this fairy scene of wood and water.

Looking at this almost ideal, but quiet unpretentious factory, with its garden in the centre and the woodland scenery at the back, the reflection arises: Why should not all factories be thus pleasantly situated, instead of being pent up amid dirty streets? The answer is, Because of the difficulty of getting a sufficient supply of labour in the country. At Wilton this single factory has used up all the available female labour in the district, and the proprietors have been obliged, reluctantly, to open a branch factory in Salisbury to meet the growing demand for their manufactures. And why cannot more labour be attracted to Wilton? For two reasons. First, because all the houses and cottages in the place are already full, and the nobleman who owns practically the whole of the district either will not, or, at any rate, does not allow more to be built. Secondly, because women will not go to live in a place where there is no work for their fathers and husbands.

The first of these causes is prevalent all over the country, but is obviously removable by the power of Parliament. The second is more serious. The tendency of machinery throughout Western Europe and America is to supplant male by female labour, at any rate in all textile industries. This tendency will certainly continue until women acquire the habit of insisting on wages at least as high as those of men engaged in similar work. And the effect will be, as is reported to be the case in the Eastern States of America, that the men will be driven abroad to new fields, while the women are left behind in "She-towns."

However, this is wandering a long way from

there, even if economic and political causes prevent its further extension. The demand for real Axminster comes from quarters where more is attached to quality than to price—large London hotels, the City guilds, members of the Royal family, and the great land and money lords. It is by executing orders from these dignified personages and bodies corporate that the little factory at Wilton lives and thrives, and affords a healthful, happy livelihood to some twelve score persons.

THE RELAY SYSTEM IN JUTE MANUFACTURING.

The following observations in reference to this subject, which appeared in the *Dundee Advertiser* of Wednesday, are from the pen of an esteemed occasional correspondent of *The Textile Mercury*, whose opinions merit the most careful consideration:

The difficulty of the eight hours system, as far as textile industries are concerned, is the cost of plant. The cost of spinning 100 tons of jute into ordinary Dundee yarn is about £600. Of this sum from £3 2s. 6d. to £3 10s. per ton is paid in weekly wages. The balance is largely made up of charges which fall upon the production, whether the production is great or small. The coal and gas account would be less under an eight hours system, but the rent, interest on capital, depreciation of machinery, horses, management, and insurance, and a multitude of petty charges would be practically the same whether the works ran eight hours or fourteen hours. Regarding the important item of depreciation, it would appear at first sight as if the shorter time of running would lessen these charges, but experience has shewn that most of the machines are superseded rather than worn out. Practically, therefore, the item of depreciation might be nearly as much whether the machines ran eight hours or fourteen hours. In point of fact, then, the sum which has charges other than wages falls upon a spinning mill which is fitted to turn out 100 tons of yarn per week in 56 hours, and which charges on 56 hours are, say, £275, would probably not fall under £200 were the hours of working shortened by one-half. It accordingly follows that the charge upon the eight hours' production increases enormously the cost of production as against a ten hours day. For this reason, no doubt, the representatives of the textile industries at the Trades Union Congress protested against further limitation of the hours of labour by Act of Parliament as being perilous to the textile industries of Lancashire, while it is well known to the leaders of the labour movement there that the margin is already dangerously narrow.

The direction in which the limitation of the hours of labour would be possible without increasing the cost of production is manifestly by running machines longer, and so diminishing the charge for costly and expensive plant. This is done in shipping. A large and costly ship does not drop her anchor when she has sailed eight hours; on the contrary, she is wrought by relays of seamen. In the same way the railways, which are very costly and upon which indeed the charge for plant is often more than 50 per cent. of the total earning, are all wrought by relays or by long and irregular hours of labour, and that for the purpose of taking as much out of the fixed charges of plant as possible. With this view also the expensive machinery of paper mills is run night and day, and is attended to and the work carried on by relays. The more expensive portion of the woollen mill plant is also frequently wrought by adult male labour in relays. The same cause operates to further the habit of overtime in foundries and engineer shops. It is clear that a turning-lathe which, with its whole appliances, costs £1,000 will cause a heavy charge against the work done. Indeed the cost of the plant is much higher than the cost of the wages. Therefore an expensive turning-lathe is run on for twelve hours, and the workmen are tempted by a little extra wages per hour to the evil custom of almost constant overtime.

There is a great difficulty no doubt in working many industries by relays. When a first-rate iron-turner has a job on hand, such as a crank or cylinder, he is reluctant to allow another man to begin work on it, as the divided responsibility, and indeed the difference of touch of a new artisan might lead to grave difficulties. But there are many industries on which the relay system is, as already noticed, successfully carried on. In Dundee the relay system, as far as half-timers are concerned, has been wrought with the greatest possible success. Thousands of children attend school one day or one portion of the day, and thousands more children go to the same work, take it up, and carry it on successfully.

Earnest men wishful to get more leisure for the working people, and desirous of enabling them to enjoy the advantages of the extra production of mechanical invention, have for some time been directing their attention to the possibility of still further extending the relay system, and making it applicable to all the textile industries. No doubt there will be difficulties in carrying this into practical effect. The management is one of this class. No manager feels happy unless he is present when the work starts and when it closes, and the difficulties of having a relay of supervision over complicated and costly processes of manufacture are no doubt very considerable. However, in Calcutta, where the whole of the jute industry is carried on by relays, this difficulty seems to have been successfully overcome. It is interesting to know that in Calcutta the whole jute industry is carried on by operatives who never work more than 6½ hours to 7½ hours per day. The works there run from sunrise to sunset, and, of course, the hours vary with the length of the day. The management seem to arrange so that a siesta or rest can be had in the middle of the day for the heads of the departments.

Another difficulty connected with the adoption of the relay system in textile industries is the obvious result of a vastly increased output from the plant at present laid down and the difficulty of finding a market for the production of the mills running twelve to fourteen hours, while at present there seems a difficulty of securing markets for the output of ten hours' labour. Still, the economic law will assert itself, and the cheapening of production by diminishing the charges for plant would in the end greatly aid this country in its competition with foreign rivals. The cost of producing its manufactures would be greatly diminished by using the plant for thirteen or fourteen hours instead of ten as at present. The following table shews the financial result of the relay system. Note well that the jute trade especially is not uniform in its profit and loss. There are seasons when there is not more than the bare wages. There are seasons when there is much more than the charges. Assuming that the wages and charges on spinning a ton of jute amount to £6, the result of working a 56-hour week by a single set of hands, and an 84-hour week by relays would be as follows:—

Cr.	
The owner gets for spinning 100 tons—in 56 hours at £6 a ton	£600
Dr.	
He pays in wages	£325
He pays in charges	275
	£600
Cr.	
On an 84-hour week the production is 150 tons, say at £6	£900
Wages (double) £325	£650
Charges as before	275
	£925

These figures are, no doubt, slightly inaccurate, as the charges on an 84-hour week would be more than on a 56-hour week. But practically the wage fund working 84 hours at the same rate per ton as 56 hours would be nearly as much and afford as much wages for each set working 42 hours as they now receive for working 56 hours. The present mills would produce one-half more, and if the change were not made very gradually the market would be glutted with goods. But the effect of this system would be to give employment to double the number of operatives, and to shorten the hours of labour from 56 per week to 42. The production per hour by such a plan would not be diminished. On the contrary, the work being for only a short day, the operatives would be able to do rather more than less per hour. The theory which is in the heart of many of the "new Unionists," however, is directly opposed to this system. They think that by reducing the day to eight working hours the production of goods would be diminished, the price would rise, and, above all, many more workers would be required. They expect to get more wages for working eight hours than they now get for working ten. Nor in practice are they far wrong. The mason does this successfully, so does the miner. The rest of the workpeople, however, have more to pay for their house rents and coal. The effect of this is not fully felt in those trades which do not directly encounter foreign competition. But every working man knows that the chief gainers outside the building trades, by the masons working as they do now, less than eight hours a day the year round, are the rich men who own house property. The other working people, of course, have the greatly increased cost of building to pay in house rent. The idea which is at the bottom of the eight hours legislation for miners is, of course, to restrict output. Eight hours is too long to work every day in a coal mine. But were members of Parliament to be pledged by people who buy coals—and that

means every household—to vote for a compulsory working of all the costly plant of coal mines fourteen hours a day by a double shift, there would be more sense in that than in trying to raise the value of labour by restriction on output of costly plant. Every poor woman who buys coal would benefit, and the commerce on which our people depend would be greatly stimulated by cheap and abundant coal, while the miners would earn more also. It is to be hoped, therefore, that the legislation which would limit the miners working day to eight hours would not in the slightest degree interfere with the working hours of the costly plant of the mine. But the operative cotton spinners see clearly that if they push the eight hours into practice, they destroy their chance of getting any work whatever under the present conditions. Look at the result of working *half*-time in a jute mill, and the effect of the reduction of hours is clearly seen.

56 hours produce	£600
Of which fixed charges absorb	275
Leaving as a wage fund	£325
But 28 hours produce only	£300
Charges amount to	200
Wage fund	£100

The charges for coal, gas, oil, and several other items would be less; but even when charges are reduced to £200, only £100 is left over as a possible wage fund instead of £325. The price of the manufactured article would require to rise, as far as the wages are concerned, from £100 to £150 before there was in existence a fund to pay the operatives 10s. a week for half-time instead of £1 for full time. But it is objected that the rise of £50 upon the £100 is not fairly stated, and that it would be a rise of only £1 on the value of each of the 50 tons of yarn, or say £1 on £20. But to reason so is to deceive ourselves. The British spinner in competition with his rival pays for his material, and it is only the amount of the item of cost of production upon which the whole continuance of the trade depends. There are great difficulties, no doubt, in making so radical a change as to increase the production of expensive plant by a system of relays. The machine makers would object because far fewer mills would do the work, and fewer machines would be required. But there is no valid reason why the Factory Acts should not be altered so as to enable any firm to bring the subject to the test of actual experience. At present this cannot be done. It is clear as day that a further reduction of the hours of working costly plant would be as fatal to the interests of the operatives as if steam ships were by law restricted to make fewer voyages in the interest of sailors and shipwrights. To restrict output may work wonders for a small class whose labour has not directly to face the keen competition of the world, but the operative cotton spinners, who know so well the instant increase of cost of short time on joint stock mills, are well aware that an Eight Hour Factory Act in the present condition of the world means the destruction of their industry. Short time may sometimes be the medicine to cure an exceptional state of trade, but it is not, cannot be economically sound to endeavour to destroy the productive power of costly plant for the purpose of increasing the value of labour. To do this is to grasp at the shadow and lose the substance; it is to fling away the foreign trade of the country to eager rivals who, as it is, press us very hard.

The new historical political economy of Oxford ignores all this, or at least does not think these considerations of prime importance. The theory of that school is that the moral condition of the people—leisure—opportunity for developing qualities other than mere money-making—all this is of higher consequence than the mere money result. Better that the people should emigrate, that trade should cease, than that the conditions of employment, the home life, and the environments of the industrial system should destroy their health and possibility of living lives worthy of educated men and women. Say they, "Let us risk the loss of the money, the loss of the trade, anything would be better than the miserable lives led by the dumb masses." In asking me to write on this subject, you did not desire me to enter on this argument. All I can say from experience is that, from a money point of view, to limit production to eight hours by law in the textile industries would certainly and quickly hand over our trade to our rivals, and the philosophers like Arnold Toynbee would quickly find themselves, to begin with, face to face with a starving population. Better, perhaps, that the people should starve than work 56 hours a week. This, however, is a question for the philosophers, which must be left in the meantime to them.

LARGE checks are always fashionable in lawyers' suits.—*American.*

THE JUTE INDUSTRY AND THE McKINLEY TARIFF.

"BURLAPS" writes from New York to the editor of the *Dundee Advertiser*, as under:—

SIR,—In a letter to you, dated New York, 10th June, 1889, I advocated the formation of a Dundee Spinners' and Manufacturers' Association; also, instead of extending, I stated it would be wise of Dundee spinners and manufacturers to earn as much as possible without making further extensions, as it was predicted that the new Tariff Bill would remove the duty off raw jute, and place a protective duty on jute yarns and cloth, to develop the production of such goods here—which would be a serious matter for Dundee. The new Tariff Bill, which went into force yesterday, is in accordance with the prediction made last year, and there are numerous reports current here of large extensions and new jute mills to be erected now. It is generally believed that, with 35 per cent. duty on yarn, and 1⅛ cents per pound to 40 per cent. *ad valorem* duty on hessians and free jute (landed here from Calcutta as quickly and cheaply as to Dundee), jute spinning and manufacturing will develop here on an extensive scale, to supply the large consumption of such goods in this country. Attempts were made to get the duty on jute goods reduced, but without success. The Bill was evidently made to foster domestic production, and eventually to shut out foreign manufactured jute goods.

As it is a menace to Dundee, I believe Dundee spinners and manufacturers ought not to remain quiet and indifferent, but should be alive and alert to the threatened danger. The first thing that should be done is to stop selling at the ruinously low rates current of late. By-and-bye, if mills are started here, Dundee may be forced to fight for the trade; therefore Dundee spinners and manufacturers should be making money now so as to be able to fight for their trade later on. To stop the present ruinously low prices production must be curtailed. Reduction of workers' wages would be of very little benefit, as that would not remedy the evil of over-production. The true and only remedy is to reduce production to basis of demand. It was clearly demonstrated two years ago that short time (reduced production) benefited the trade exceedingly. If Dundee should promptly decide to curtail production by going on short time prices would at once improve. A rumour in this market a few days ago of a short time movement in Dundee helped to check the downward tendency of prices (that shews the recognised power of curtailment on prices), and in the interest of the Dundee jute industry I hope the rumour will prove true. I know how difficult it is to get united action by Dundee spinners and manufacturers, but I think the present gloomy state of the trade ought to make them all join together in a united movement for the mutual benefit and protection of their trade.

THE NEW UNIFORM LIST PRICES FOR WEAVING.

The two lists which regulate the prices paid to weavers in Lancashire are the Blackburn standard list, which was established in 1853, and the Burnley list, established in 1880. There have been lists at Preston, Stockport, Hyde, and other towns regulating the prices paid in these localities, but in course of time, owing to a variety of circumstances, these lists gradually became superseded by the Blackburn and Burnley lists. For a long time the desirability of having only one uniform list has been apparent to both employers and operatives, and the subject has from time to time been under consideration for many years. Ultimately arrangements were made for entrusting to Mr. Joshua Rawlinson, of Burnley, representing the employers, and Mr. T. Birtwistle, of Accrington, representing the operatives, the work of formulating the new list. These two gentlemen proceeded steadily for some time, and collected a vast amount of information. The two experts soon found that though they could agree on many points of the new list they could not agree on a complete list to recommend to their various bodies of employers and operatives. At this stage Mr. Rawlinson attended meetings of the local committees of employers at Blackburn, Preston, and Burnley, for the purpose of consulting upon the list he was prepared to recommend, and he obtained a number of valuable suggestions from them. Mr. Birtwistle also took into consultation the Executive Committee of the Operatives' Association. At the suggestion of Mr. Rawlinson, three representative employers and the same number of operatives were appointed to assist the two experts in the final adjustment of the list. The employers appointed were Mr. T. Thornber (Mayor of Burnley), Mr. W. Taylor (Blackburn), and Mr. J. Willing (Preston), and the operatives were represented by Mr. Barker (Blackburn), Mr. L. Park (Preston), and Mr. Wilkinson (Haslingden). After numerous conferences between this Joint Consultative Committee a list was produced which received the sanction of the General Council of the Operatives, and which will now be submitted to the Central Committee of the North-East Lancashire Employers' Association and the local associations of employers and operatives at Blackburn, Preston, and Burnley. After receiving their sanction the list will come into force on the dates specified. It is anticipated that the new list will regulate the wages for over 300,000 looms, representing an aggregate sum of £100,000 weekly. The list just issued is as follows:—

1. THE STANDARD.

The standard upon which this list is based is an ordinarily made loom, 45 inches in the reed space, measured from the fork grate on one side to the back board on the other, weaving cloth as follows:—Width: 39, 40, or 41 inches. Reed: 60 reed, 2 ends in one dent, or 60 ends per inch. Picks: 15 picks per quarter inch, as ascertained by arithmetical calculation, with 1½ per cent. added for contractton. Length: 100 yards of 36 inches measured on the counter. Any length of lap other than 36 inches to be paid in proportion. Twist: 28's or any finer numbers. Weft: 31's to 100's, both inclusive. Price: 30d. or 2d. per pick.

2. WIDTH OF LOOMS.

A 45-inch reed space loom being taken as the standard, 1½ per cent. shall be added for each inch up to and including 51 inches; 3 per cent. from 51 to 56 inches; 2½ per cent. from 56 to 64 inches; and 1 per cent. from 64 to 72 inches. 1½ per cent. shall be deducted for each inch from 40 to 39 inches inclusive; and one per cent. from 39 to 24 inches, below which no further deduction shall be made. For any fraction of an inch up to the half no addition or deduction shall be made, but if over the half the same shall be paid as if it were a full inch. All additions or deductions under this clause to be added to or taken from the price of the standard loom, 45 inches.

3. BROADER CLOTH THAN ADMITTED BY RULE.

All looms shall be allowed to weave within four inches of the reed space, but whenever the difference between the width of cloth and the reed space is less than 4 inches, it shall be paid as if the loom were 1 inch broader, and if less than 3 inches, as if it were 2½ inches broader.

4. ALLOWANCES FOR CLOTH 7 TO 15 INCHES NARROWER THAN THE REED SPACE.

When the cloth is from 7 to 15 inches inclusive narrower than the reed space of the loom in which it is being woven, a deduction in accordance with the following tables shall be made. No further deduction shall be made when cloth is more than 15 inches narrower than the reed space, or when cloth is narrower than 18 inches. Fractions of an inch are not to be recognised ander this clause.

(Here follows a series of tables shewing the deduction for each width of cloth in every loom from 72 inches to 25 inches.)

5. REEDS.

A 60 reed being taken as the standard, ½ per cent. shall be deducted for every two ends or counts of reed from 60 to 50, but no deduction shall be made below 50; ½ per cent. shall be added for every two ends or counts of reed from 60 to 68, 1 per cent. from 68 to 100, 1½ per cent.) from 100 to 110, and 2 per cent. from 110 to 132. All additions or deductions under this clause to be added to or taken from the price of the standard, 60 reed.

6. PICKS.

Low: An addition of 1 per cent. shall be made for each pick or fraction of a pick below 11, thus—Below 11 down to and including 10, 1 per cent.; below 10 down to and including 9, 2 per cent.; below 9 down to and including 8, 3 per cent.; below 8 down to and including 7, 4 per cent.; and so on, adding 1 per cent. for each pick or fraction thereof. High: An addition of 1 per cent. per pick shall be made whenever they exceed the following: If using weft below 20's when picks exceed 16; weft 26's to 39's inclusive when picks exceed 18; weft 40's and above when picks exceed 20. In making additions for high picks any fraction of a pick less than the half shall not have any allowance; exactly the half shall have ½ per cent. added; any fraction over the half shall have the full 1 per cent. added.

7. TWIST.

The standard being 28's or finer, the following additions shall be made when coarser twist is woven in the following reeds:—Below 28's to 20's in 64 to 67 reed inclusive, 1 per cent.; 68 to 71 reed inclusive, 2 per cent.; 72 to 75 reed inclusive, 3 per cent.; below 20's to 14's in 56 to 59 reed inclusive, 1 per cent.; 60 to 63 reed inclusive, 2 per cent.; 64 to 68 reed inclusive, 3 per cent.; and so on at the same rate. When twist is woven in coarser reeds no addition shall be made.

8. WEFT.

Ordinary pin cops: The standard being 31's to 100's, both inclusive, shall be reckoned equal. Above 100's 1 per cent. shall be added for every 10 hanks or fraction thereof. In lower numbers than 31's the following

additions shall be made:—For 30's, add 1 per cent.; for 29's, 28's, add 2 per cent.; for 27's, 26's, add 3 per cent.; for 25's, 24's, 23's, add 4½ per cent.; for 22's, 21's, 20's, add 6½ per cent.; for 19's, 18's, add 9 per cent.; 17's, 16's, add 11½ per cent.; 15's, 14's add 14 per cent. Large cops: When weft of the following counts is spun into large cops so that there are not more than 19 in 1lb. the following additions shall be made in place of the allowance provided for pin cops in preceding table:—For 29's, 28's, add 1 per cent.; for 27's, 26's, add 2 per cent.; 25's, 24's, 23's, add 3 per cent.; for 22's, 21's, 20's, add 4½ per cent.; for 19's, 18's, add 6 per cent.; for 17's, 16's, add 8 per cent.; for 15's, 14's, add 10 per cent.

9. Four-staved Twills.

Low picks: in four-staved twills an addition of one per cent. for each pick or fraction thereof below the picks mentioned in the following table shall be made when using weft as follows: Below 26's the addition shall begin at 13; 26's to 39's inclusive, the addition shall begin at 14; 40's and above, the addition shall begin at 16. High picks: When using weft below 26's the addition for high picks shall begin at 21; 26's to 39's inclusive ditto, at 22; 40's and above ditto, at 23. In making additions for high picks any fraction of a pick less than the half shall not have any allowance; exactly the half shall have ½ per cent. added; any fraction over the half shall have the full 1 per cent. added.

10. Throstle Twist.

When warps composed entirely of throstle or ring twist are used in reeds 67 to 70 inclusive, they shall be calculated as if woven in a 66 reed, and if woven in reeds above 70, 2 per cent. shall be deducted.

11. Splits.

The following additions shall be made for splits: One split, uncut, add 5 per cent.; two splits, uncut, add 7½ per cent. Empty dents only shall not be considered splits.

12. Additions and Deductions.

All the foregoing additions and deductions shall be made separately.

Price for 60-reed, 10 picks, 100 yards of 36 inches:—

Deducted from Standard.			Added to Standard.		
Width of Loom.	Per Centage Deducted.	Price.	Width of Loom.	Per Centage. Added.	Price.
Inches.			Inches.		
24	24	15·2	46	1½	20·3
25	23	15·4	47	3	20·6
26	22	15·6	48	4½	24·9
27	21	15·8	49	6	21·2
28	20	16·0	50	7½	21·5
29	19	16·2	51	9	21·9
30	18	16·4	52	11	22·2
31	17	16·6	53	13	22·6
32	16	16·8	54	15	23·0
33	15	17·0	55	17	23·4
34	14	17·2	56	19	23·8
35	13	17·4	57	21½	24·3
36	12	17·6	58	24	24·8
37	11	17·8	59	26½	25·3
38	10	18·0	60	29	25·8
39	9	18·2	61	31½	26·3
40	7½	18·5	62	34	26·8
41	6	18·8	63	36½	27·3
42	4½	19·1	64	39	27·8
43	3	19·4	65	42	28·4
44	1½	19·7	66	45	29·0
45	Standard	20·0	67	48	29·6
			68	51	30·2
			69	54	30·8
			70	57	31·4
			71	60	32·9
			72	63	32·6

It is proposed that the list shall come into force after the first making-up day in December for new classes of cloth, and on the first making-up day in March next for all classes of cloth.

CUPID'S WEAVING.

At her loom the sad-browed maiden
Weaving day by day,
Tired eyes and aching fingers,
Stuff of sombre grey.

Enter Cupid arch and smiling
Into that dull room;
And, the maiden all unwitting,
Stood beside her loom.

Straightway in the stuff's dark texture
Flashed a golden thread,
While as if it wrought with gladness
Swift the shuttle sped.

See, a web of magic beauty
'Neath his hand unfold;
All the maiden's sombre weaving
Turned to cloth of gold!

Isabella T. Postgate, in *Time*.

Ruined by the McKinley Tariff. — The proprietor of the Einsiedels wool mills in Lichtenberg, near Hof, regarding himself as ruined by the effects of the passing of the McKinley Tariff Act, committed suicide on Friday by shooting himself. The unfortunate man leaves behind him a large family.

Smuggling in Russia.—The Berlin correspondent of the *Daily Chronicle* telegraphed on Monday: "A sensational trial began at Warsaw to-day, when three merchants were brought up on a charge of having carried on an extensive system of smuggling silk for many years from Germany to Russia. One charge alone shews that during the past five years they bought in Leipzig silk ribbons to the value of 530,764 marks, which they smuggled over the border. The case promises to be a long one, as 214 witnesses have been subpœned. Defendants have been admitted to bail, this being placed at 400,000 roubles."

A Good Story from St. Kilda.—A rather good story (for the truth of which, however, we cannot vouch) is told about one of the native women of St. Kilda, who had occasion to visit the late minister. A handsome variegated rug adorned the minister's parlour, and the visitor was so much taken up with it that she could talk of nothing else. The minister, thinking she might probably want to try to weave something like it, allowed her to take the rug away. Next day, Sunday, the islanders were assembled in their little church for worship, when, last of all, who should walk in but the lady with the variegated rug about her shoulders! All eyes were turned towards her, and the general verdict was that she was the "brawest" lady in the island.

Trade-Unionist Intimidation. — At the Plymouth Petty Sessions, on Monday, Peter Curran and J. W. Matthews, secretaries of the Bristol and West of England Gas Workers' and General Labourers' Union, and George Shepheard, district secretary of the Dockers' Union, were charged, under the Conspiracies and Protection of Property Act, 1875, with using intimidation towards George F. Treleaven, coal merchant, of Plymouth. The intimidation consisted in a threat that they would stop Treleaven's business if he continued to employ non-union men, and was followed up by their calling off the labourers from complainant's vessels, two out of four now lying idle, and the others being worked by the crews. An account of an interview published in a daily paper, in the course of which the threats were emphasized, was also accepted in evidence. The Bench found the charge of intimidation clearly proved, and fined each of the defendants £20; in default six weeks' imprisonment with hard labour. Notice of appeal was given.

Factory Regulations in India.—With reference to the Factory Act in India a Simla correspondent writes:—"It is proposed to proceed with the consideration of the Indian Factories Act Amendment Bill during the approaching session. The Viceroy appoints a commission to determine the conditions required by the Indian operatives themselves as to restrictions on their labour. The commissioners are:—Surgeon-Major Lethbridge, Raja Piyari Mohan Mukharji, Mr. Sorabji Shapurji Bengali, and Mr. Mir Mohammed Hussen, and the Director of Agriculture, North-west Provinces. These commissioners will be assisted in Bombay by Mr. Narayan Meghaji Lakhanday; in Bengal by Babu Rasik Lal Ghose; in the North-west Provinces by Mr. Framji Manakji, of the Cawnpore Woollen Mills. The points for determination are—1. Limitation of hours of work for women to be eleven hours each day proper, and if women desire it. 2. Should any distinction be drawn between young persons and adults? If so, define young persons, and state the proper hours of labour to nine hours each day proper. 3. Does the proposed Bill, clause 5, provide sufficiently for holidays? 4. Do the operatives deserve, or the conditions of labour demand, fixed working day? 5. Do male operatives desire a compulsory stoppage of work at any fixed time of the day? The report of the Commissions is required to be submitted by the middle of November. The inquiry commenced in Bombay at the beginning of October."

Trials of Sheep-Shearing Machines.—The first competition among makers of sheep-shearing machines took place on the 4th July last, at Sydney, for a prize of £50 offered by the New South Wales Government. The eight machines entered were:—The Australian Compressed Air machine, Sydney; the Invicta machine, Sydney; the Wolseley machine, Sydney; Bariquand's machine (Messrs. Harrold Bros., Adelaide); Silver's patent machine, Sydney; the Howard-Geddes machine, Sydney; Burgon's patent machine, Sheffield; the Brewarrina machine, Sydney—but the Burgon, the Invicta, and the Howard-Geddes did not put in an appearance, while the Silver machine broke down after about three sheep had been shorn, owing to an error in the construction of the spindle of the leather friction wheel of the driving gear. The Brewarrina machine was withdrawn from the contest at the call of time, so that only the Wolseley, the Australian, and the Bariquand machines completed the trial. This commenced at 11 a.m. and continued till 4 p.m., with an hour's interval. The judges were—Professor Warren (Professor of Engineering at the Sydney University), and Messrs. N. Hargreaves and Neale, for the mechanical portions, and the Hon. W. H. Suttor, the Hon. John Smith, and Mr. Richard Rouse, jun., of Birangambil, as pastoralists. In their report, the judges, Mr. W. H. Warren, professor of engineering, and Mr. D. H. Neale, engineer on the Government railways, express the opinion that the Suckling and Wolseley shearing machines "are much superior to the others competing, and each possesses exceptional merits. As far as the trials show, Suckling's compressed-air system is slightly the better. These trials, however, did not give sufficient data as to the relative amount of power required. It is, therefore, recommended that further trials be made to determine this point, failing which they would suggest to the council the advisability of dividing the prize." Mr. W. H. Suttor and Mr. John Smith, who watched the shearing, agreed with the suggestion made by the judges of the mechanical working of the machines. They observe:—"We are much struck by the excellent work done by these machines. If the Wolseley shearers had shown more care and less haste, then the work done would have been more equal in character." The Howard-Geddes machine was withdrawn from exhibition on account of negotiations having been concluded for amalgamation with the Wolseley Co. Messrs. Blanks, Lefebure, and Co., Invicta Foundry, Glebe, did not exhibit the Invicta machine, although it was entered for competition. The Brewarrina machine was worked by a "Champion" engine made in Canada. The Bariquand machine was worked by an engine of Messrs. W. Sisson and Co., Gloucester.—*British Trade Journal.*

Textile Markets.

COTTON.

Manchester, Friday.

The cotton industry in its general aspects presents little change during the week. The Blackburn Operatives' Association have two strikes upon their hands, brought about by their assertion of a perfectly novel principle, viz., that employés engaged in mills containing machinery which is relatively old and upon which as large an amount of weekly earnings cannot be made as from that of the newest construction shall have the difference made up by the employer. It might have been thought that those who were dissatisfied with such earnings as can be made would have found a remedy in seeking employment at other establishments where newer machinery is in use. But no, this is not according to the policy adopted. When told they were at liberty to leave without serving the usual fortnight's notice they declined, stating that somebody would have to work the machinery, and as long as that was the case they preferred it should be themselves, with the allowance they asked for. This naive admission shews that these gentry prefer to have their wages supplemented by a gift from their employers rather than earn it even on the best machinery. At neither establishment did the employers comply with the request, and the trades-unions have therefore drawn out the workpeople. These are samples of what is being done in the cotton trade by the workmen's unions, which are looked upon as being composed of comparatively intelligent workers and very intelligent and reasonable leaders. People outside, if brought into circumstances in which they would have dealings with them, would probably come to a different conclusion. It is proposed that the uniform weaving list to which reference has several times been made shall come into operation, for new fabrics the first week in December, and for existing classes of cloth, the first week in March next. The latter is a somewhat distant date. It might have been better had the first week in January been fixed upon.

Cotton.—There has only been an insignificant demand for the raw material throughout the week, either in spots or futures. It is clear that the section of the trade, which may be denominated as somewhat gregarious—following leaders—and which was thus influenced to place its season's contracts for cotton, has exhausted its energy. The present course of prices, and the point to which they have descended shew, already, as we predicted in these columns would be the case, that they have made a mistake, and might have done better by deferring their purchases until the weight of the crop had brought its pressure upon the market. On Friday

Saturday, Monday, and Tuesday, the spot market was very dull, prices tending towards ease. On Wednesday, a better spot business was put through, and yesterday the sales aggregated a fair amount. The changes in prices consist of a reduction of $\frac{1}{16}$d. in spots, whilst futures, which have exhibited only a small range of fluctuation, are lower by about 1 to 1½ points. The new crop cotton now in the market is not of a very satisfactory quality, there being a rather heavy proportion of damp, sandy, and stained cotton. In Brazilian there has been a reduction of $\frac{1}{16}$d. to $\frac{1}{8}$d. In Peruvian rough a decline of like amount is recorded, and of $\frac{1}{16}$d. in smooths. Egyptians have moved moderately under a fair demand, but sellers have been pressing, and prices have declined from $\frac{1}{16}$d. to $\frac{1}{8}$d. East Indian cottons have met with a fair inquiry, though not quite sufficient to sustain prices, which have declined $\frac{1}{16}$d., West Madras being marked down $\frac{1}{8}$d. Spinners have shewn much more reluctance to buy freely during the week than in the previous two or three like periods.

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

	Import.	Forw'ded.	Sales.	Stock.	Actual Export
American	107,519	53,145	35,450	245,780	3,561
Brazilian	4,417	1,326	1,480	13,600	30
Egyptian	13,319	7,594	3,640	38,850	219
W. Indian	21	1,003	1,530	14,430	344
E. Indian	50	4,236	4,860	200,730	2,831
Total	125,362	67,304	46,960	513,390	6,985

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

	G.O.	L.M.	Mid.	G.M.	M.F.
American	5 7/16*	5 5/16*	5 11/16	5 15/16	6 1/16
	M.F.	Fair.	G.F.		
Pernam	—	6 1/16	6 7/16		
Ceara	—	6 1/16	6 3/8		
Paraiba	—	6 1/16	6 3/8		
Maranham	—*	—*	—*		
	Fair.	G.F.	Gd.		
Egyptian	6 9/16	6 9/16	7 15/16		
Ditto, white	—*	—*	—*		
	Fr.	F.F.	G.F.	F.G.	Gd.	F.G.	Fine
M.G. Broach	—	—	—	—	4 15/16	5 3/16	5 1/2
Dhollerah	3 11/16	3 13/16	3 15/16	4 1/16	4 5/16	4 9/16	5
Oomra	4 1/16*	4 3/16	4 5/16	4 7/16	4 11/16	4 15/16	5 1/8*
Bengal	—	—	3 3/8	3 1/2	3 11/16	4 3/16	4 1/2*
Tinnivelly	4 1/2*	—	4 13/16	5 1/16	5 1/4	—	—

* Nominal.

YARNS.—Spinners this week have been decidedly easier to deal with, and have found the strength of their position diminishing. Manufacturers have been able to buy both twist and weft generally at a reduction of $\frac{1}{16}$d., but this decline has not been nearly sufficient to induce them to operate with freedom. Their position is still unsatisfactory, and the price of cloth must advance or yarn come down before there will be much activity. Bolton spinnings on the whole maintain their rates, though perhaps perceptibly easier. The scarcity that has existed is not quite so strongly marked as it has been of late. Manufacturers continue their policy of buying only for urgent requirements.

CLOTH.—In the cloth section of the market appearances are not quite uniform. There is a very slow demand from India and China, though that from the former is on the increase, and has resulted in a rather distinct addition to the amount of business passing. Printing cloths are steady, though producers would be glad of more business in the ordinary qualities at least ; there are looms here and there wanting employment. In heavy goods, mainly for the home trade, there is not much activity, though sufficient business is passing to keep the production from running into stock. Taking the market on the whole, there is a considerable amount of irregularity therein.

WOOLLENS AND WORSTEDS.

BRADFORD.

The wool market has not changed for the better, purchases only being made in small quantities, and winter prospects being accordingly less cheerful. Staplers find that they cannot favour buyers to take their goods at prices satisfactory to themselves, and for that reason there is a partial deadlock. Mohair is slow, and alpaca, though firm, is next in demand. Stocks of botany tops are low, and this helps to keep prices up. Spinners cannot dispose of all the yarns they are turning out, and there is a tendency therefore to curtail production. For shipments there is a small inquiry at previous rates and for prompt delivery. Weft on tube sorts for local consumption are in moderate request. Mohair yarns slow. In botanies the best spins only move freely. The piece trade is slow. Home demands moderate

HUDDERSFIELD.

Trade has been rather dull during the past few days, buyers not having been in the market in any considerable number, high-class worsteds, serges, and certain descriptions of tweeds being chiefly in demand or on contract. Spring repeats have not come forward so freely as was hoped. The Continental spring trade is delayed, and the rush for the United States market to anticipate the tariff has left a lull, both of which causes are operating on our trade. There is a very good business doing with Canada, Australia, and the Cape, and especially with ready-made clothiers for the two latter Colonies. Wools are selling slowly, but prices are well maintained.

LEEDS.

The changed weather has brought about a revival in the demand for winter goods, and sales being of late much more satisfactory. The position of sellers is strengthened by the fact that stocks are rather low. Even for the warmer kinds of serges prices are not quite so high as they were, and this also applies to low mixtures, worsteds, and plain suitings, in general. Makers in the outlying districts of ulsterings, mantlings, and woollen dress goods are using very considerable exertion to get out their orders. At present the greatest variety is in serges, and because there are good Continental markets for them they only sell at quotations which are higher comparatively than in past seasons. In tweeds improvements have also been apparent for some short time past, but they are not so conspicuous as in the case of serges. Blanket and rug makers are fairly well engaged.

ROCHDALE.

The flannel trade is dull, and quotations are not firm. A large Government order has been placed of late, but the effects of this are only limited to a few firms. Yorkshire goods are firm, and the demand is fair.

GLASGOW.

Messrs. Robert Ramsey and Co., hide and wool brokers, Glasgow, in their report, dated 21st Oct. 1890, say :—

WOOL.—The business in the Scotch Wool Market has remained without change during the past week. There has been a fair amount of business passing, mostly for export, but prices remain at former quotations.

SHEEP SKINS.—The supplies were fuller than previous week, and of good qualities. Competition was well maintained and full prices obtained.

FLAX AND JUTE.

DUNDEE TRADE REPORT.

WEDNESDAY, 22nd Oct., 1890.

The advices from America do not encourage shippers, and the accounts of the crop from Calcutta still indicate an abundant supply of jute at prices much under the rates paid here for jute still afloat to Dundee. To-day, therefore, jute is quiet, and the lower qualities especially can find buyers only at a further reduction in price.

The latest wire from Berlin reports Russian exchange as lower, and this makes the sterling price of the flax easier here. About £18 10s. to £19 is the quotation for K, and sellers over.

Jute yarns are weak, especially the commoner qualities. The only yarns selling at list prices are heavies, for which there is still an excellent demand.

Hessians are dull ; common 10½ 40in. Dundee goods are especially so. For wide goods, and especially for the choice goods, there is still a fair demand, and all the makers of such Hessians are busy.

Flax yarns are in fair request, without change in price.

Tow yarns, especially heavy sizes, are weaker. Linens are in fair demand, and while it is true that all orders are competed for keenly, still Fife, Forfar, and Brechin are all busy, and orders come in to take off the whole production.

Arbroath is still well engaged. The cheap material, combined with the prosperity of the shipping trade, has made this an excellent year for the Arbroath canvas trade.

Dundee fancy goods, carpets, rugs, and mattings are all wanted, and for pretty new patterns there is an excellent demand.

Twines and cords also are wanted, all the makers being well engaged.

MANCHESTER.

The linen trade displays no specially interesting feature just now. Prices are firm for most classes

for home and Continental spins. The feeling of strength shewn abroad has, in fact, helped native producers greatly. In the lower end linen quotations are unfortunately still unsatisfactory.

HOSIERY AND LACE.

NOTTINGHAM.

There is no improvement in the condition of trade here. Yarns, both for hosiery and lace, are quiet, cashmere and merino varieties having been in as much request as any. Brown cotton nets are in moderate request, but millinery lace is slow, while production is limited. The American buyers who have recently visited the town have operated to a very small extent. The imposition of increased Customs duties has naturally rendered them cautious, and they are for the most part awaiting instructions from their respective firms before placing orders of importance. There has as yet been no such change of fashion as to encourage home buyers to operate with more freedom, and orders from the Continent are disappointing. There is consequently much machinery still unemployed. The more popular sets of Valenciennes laces continue to sell pretty well, and a moderate demand prevails for Maltese and torchon laces. Guipure and macramé laces are inquired for to some extent, and laces in the Vandyke style are still in moderate request. The demand for laces of the edelweiss description is quiet. Some varieties of Swiss embroideries are selling fairly well. Chantilly laces and flouncings are attracting a little attention, and some Russian flouncings are also being disposed of. Manufacturers of curtains are kept pretty well employed, but the bulk of the goods wanted are of common quality, and the profits realised are small. A steady business is being done in plain cotton nets, and prices are unchanged. Some varieties of silk nets continue to be asked for. Various specialities, such as Shetland and other shawls, lamp-shades, etc., are in fair demand. In hosiery there is a steady business doing.

DRY GOODS.

MANCHESTER.

There is a steady movement noticeable this week, and the feeling is cheerful. The chief drawback has been caused by the wet and gloomy nature of the weather we have had, which has caused even eager buyers to hold off. The memorial signed by the principal houses engaged in the home trade, requesting that a sectional committee of the Chamber of Commerce be formed to protect their interests has excited attention. It has long been an anomalous fact that such a powerful body of merchants should be unrepresented in the local chamber, which cannot be considered a representative body until the present deficiency is rectified. Furs have moved off well this week, and silk velvets have come in for a good share of attention. Fancy makes are not looked upon as being safe stock, and for that reason there is not much disposition to purchase noticeable amongst buyers in the wholesale houses. There is now a nice selection of new designs in fancy cottons to choose from, but the season has not yet fairly commenced. A large number of buyers from the United States and Canada are at present in the city.

SILK.

LONDON.

THURSDAY.—London Produce Clearing House quotations of 5½ Tsatlee October 11s. 11d., November 11s. 11d., December 12s., January 12s. 1d., February 12s. 2d., March 12s. 3d., April 12s. 4d., May 12s. 5d., per lb. Sales registered, nil.

THE KIDDERMINSTER CARPET TRADE.

The volume of business does not increase in the Brussels department of this trade by leaps and by bounds, or as quickly as some manufacturers would wish; still there is not much cause for complaint as, on the whole, orders are coming in steadily, and every week brings additions to the order books. As is usually the case the orders arriving are mostly of a trial nature, and as such do not enable manufacturers to so fully employ all their machinery as could be desired, and the consequence is that at most of the mills work is somewhat irregular just yet. Reports from travellers continue promising, and there is every indication that in the winter manufacturers will have more than they can well do, as in many quarters retail buyers are evincing a disposition to defer giving the bulk of their orders

The passing of the new American tariff has not caused much excitement or anxiety in Kidderminster, as, to the great bulk of the manufacturers, the markets of the United States have been practically closed for some years. It is true that one or two makers may feel the effect of the new measure, but not to any important extent; indeed, there are rumours that these manufacturers will cease sending their goods, which are usually the finest in quality—such as the Americans do not manufacture—to the States altogether, as it is a market they can very well do without. Several of the firms' representatives are now running through the Canadian markets; consignments to these markets have rapidly increased during the last five years. There is little change to report as regards the condition of the raw material markets. Wools are in fair request and prices keep steady, but there is not much disposition shewn by spinners to anticipate requirements, and the market is free from speculation.

Joint Stock and Financial News.

COTTON COMPANIES' REPORTS.

CROMPTON (SHAW).—Profit, three months, £631 12s. 2d. In order to pay a dividend of 2s. 6d. per share (10½ per cent., £1,250), £618 7s. 10d. will be taken from the reserve fund. Share capital, £46,250. Loans, £7,622. Spindles, 63,600 (18,900 T and 44,700 W). Plant, three months ago, £48,446. Company formed 1874.

BELGIAN (ROYTON).—Profit, three months, £862. Dividend, 1s. per share of £3 10s., which will absorb £700. Amount carried forward, £340. Share capital, £53,411. Shares, 36,667. Spindles, 56,556 (34,764 T and 21,792 W). Plant, three months ago, £70,050. Mill fireproof. Company formed 1873.

PRESTON COTTON SPINNING AND MANUFACTURING CO.—The accounts for the quarter ending October 1st, 1890, shew a net gain of £324 14s. 3d. This, with the small amount brought forward, leaves a disposable balance of £337 9s. 2d. The directors recommend a dividend of sixpence per share, and carry a balance forward. There have been several stoppages during the past quarter, caused by the breakage of a pair of large wheels which drive the whole of the weaving department.

NEW COMPANIES.

FOULRIDGE BOOM AND POWER CO., LIMITED, NEAR COLNE.

This company was registered on the 13th inst. with a capital of £3,000, in £5 shares, to acquire the Foulridge Mills at Foulridge, with all appurtenances thereof. The subscribers are:—

	Shares.
*Henry Hewitt, Colne, draper	1
James Carr, Colne, solicitor	1
*Edward Carr, Colne, articled clerk	1
R. Procter, Nelson, solicitor	1
J. Rawlinson, Burnley, accountant	1
*Henry Fort, Colne, tobacconist	1
J. H. Bracewell, 145, Lloyd-street, Manchester, clerk	1

The first directors are the subscribers denoted by an asterisk, and J. Thompson, Peter Robinson, and Henry Holgate; qualification, six shares. Solicitors, Messrs. Backhouse and Procter, Burnley.

HOLLY MILL COMPANY, LIMITED.

Registered by R. Jordan, 120, Chancery-lane, W.C., with a capital of £70,000 in £5 shares. Object, to carry on the trade or trades—one, more, or all—of spinning, doubling, weaving, bleaching, dyeing and printing, and, further, to carry on business as brick and tile makers. The first subscribers are:—

	Shares.
G. Holden, 19, Royton-lane, Royton	20
A. Baron, 25, Queen-street, Royton	20
R. Leach, 16, Market-street, Royton	20
T. Seville, 101, Park-road, Royton	20
T. E. Gartside, 11, St. Paul's-street, Royton	20
E. Longbottom, 96, Park-road, Royton	20
C. Coates, 44, Church-street, Royton	20
K. Chadwick, 89, Oldham-road, Royton	20
J. Cooper, 52, Sandy-lane, Royton	20
J. Platt, 22, Queen-street, Royton	20

There shall not be less than five nor more than seven directors. Remuneration, £170, divisible.

PEARL MILL COMPANY, LIMITED.

Registered by James Dawson, 125, Union-street, Oldham, with a capital of £120,000 in £10 shares. Objects, the businesses of spinners, doublers, weavers, bleachers, etc. The first subscribers are:

	Shares.
E. Hall, 98, Greengate-street, Oldham	100
T. Cottam, 415, Park-road, Oldham	100
C. C. Spencer, 3, Barley Croft, Oldham	100
A. Lord, 417, Park-road, Oldham	100
J. Parker, 30, Swinton-grove, Chorlton-upon-Medlock	100
J. Cottam, 1, Oak-street, Shaw	100
S. Stott, 90, Waterloo-street, Oldham	100

There shall not be less than five nor more than seven directors. The subscribers to the memorandum of association, with the exception of S. Stott are the first. Qualification, 100 shares. Remuneration, £50.

Patents.

APPLICATIONS FOR PATENTS.

The names in italics within parentheses are those of Communicators of Inventions.

Where Complete Specification accompanies Application an asterisk is suffixed.

13TH to 18TH OCTOBER.

16,228. T. PILKINGTON, 8, Quality Court, London. Mules for spinning.

16,242. W. M. PORTER, 175, Agnes-street, Belfast. Locking apparatus for testing machines for yarn, thread, etc.

16,259. H. S. CROPPER, 23, Southampton Buildings, London. Bobbin carriages of twist lace machines.

16,313. W. HAYTHORNTHWAITE, W. TEMPEST, and M. SMITH, 17, St. Ann's-square, Manchester. Self-acting mules and twiners.

16,336. J. M. SIMONEAU and E. P. MORSE, 45, Southampton Buildings, London. Leasing mechanism for warp dressers.*

16,359. E. EDWARDS, 35, Southampton Buildings, London. Self-acting spinning mules. (*A. Heipt* and *W. Streit*, Germany.)

16,360. H. E. KUHN, Temple Chambers, London. Wire heald.

16,376. J. BRIDGE and L. BRIDGE, Accrington. Openers for textile fabrics.

16,382. W. I. JAMES, 8, Brunswick-terrace, Stafford. Circular knitting-machines.

16,450. E. HOLLINGWORTH, Market-place, Huddersfield. Sectional warping machines.

16,464. H. DOBBS, 45, Southampton Buildings, London. Apparatus applicable to twist lace machines.

16,514. J. T. AINSWORTH, 17, St. Ann's-square, Manchester. Belt shifting and backing-off motions of self-acting mules and twiners.

16,573. J. ARCHER, 8, Quality Court, London. 'Doctors' employed in printing fabrics.

16,578. J. FARMER, 17, St. Ann's-square, Manchester. Calendering machines.

16,587. E. SMITH, Sunbridge Chambers, Bradford. Method of and apparatus for automatically stopping looms, beaming, sizing, and other machines.

16,595. J. CASEY and J WHEATER, 20, Charles-street, Bradford. Spinning fibrous material.

16,602. F. W. BARBER, 6, Bream's Buildings, London. Means for packing narrow piece goods for the market.

ABSTRACTS OF SPECIFICATIONS.

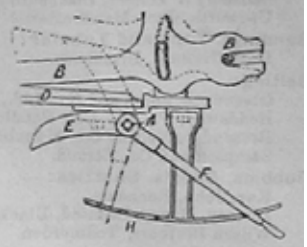
7,802. May 9, 1889. **Amines; dyes.** B. WILCOX, 47, Lincoln's Inn Fields, Middlesex.—(*Farbenfabriken vormals F. Bayer and Co.; Elberfeld.*)

Relates to the manufacture of diamidodiphenylene oxide, and diamidoditolylene-oxide, and of direct-acting colouring matters therefrom.

Amines.—The diamido compounds are prepared by melting ortho-benzidine disulpho acid or ortho-tolidine disulpho acid with soda lye in either closed or open vessels. At the same time, especially at low pressures, an intermediate product is obtained which is converted into the corresponding diamido oxide when heated.

Azo dyes.—The colouring matters are obtained by tetrazotising the diamido compounds, and allowing the tetrazo compounds to flow into a solution of two molecular proportions of an amine, a phenol, or the sulpho or carbo acid thereof, the amines being employed in an acetic acid solution, and the phenols in an alkaline solution; for example, diamidodiphenylene oxide is tetrazotised and run into a solution of alpha-naphthylamine, sodium acetate is added, and after standing some hours the mixture is heated to 80° C. In a similar manner a combination is effected with alpha-naphthol in alkaline solution. The dye-stuffs produced from amines and phenols are soluble in spirit, and may be rendered soluble in water by heating with sulphuric acid containing 20 per cent. of anhydride at 15°-30° C. Dyes soluble in water are obtained when the tetrazo compounds are combined with the sulpho or carbo acids of amines or phenols; for example, with alpha-naphthylamine monosulpho acid a blue-red dye is obtained, and with alpha-naphthol sulpho acid a Bordeaux dyeing colouring matter. Mixed azo dyes soluble in spirit are obtained when the tetrazo compound is combined with two molecular proportions successively of different amines or phenols; for instance, with alpha-naphthylamine and meta-phenylene diamine, or alpha-naphthylamine and alpha-naphthol. These dyes are rendered soluble in water by sulphurising as above. When sulpho or carbo acids are employed, mixed azo dyes soluble in water are obtained; for example, with alpha-naphthylamine-sulpho acid and alpha-naphthol-monosulpho acid successively. [8½d.]

7,821. May 10, 1889. **Looms.** H. CROSLAND, 9, Milton Terrace, Halifax.

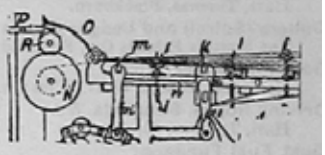


Healds, lifting (not for shedding).—A shaft A beneath the dobby gantree D carries an adjustable finger E and a hand lever F. Any heald may be lifted by bringing the finger beneath the corresponding jack lever B and operating the hand lever, the latter being held in position by a notched bracket H. [6½d.]

7,857. May 10, 1889. **Dyes.** O. IMRAY, 28, Southampton Buildings, London.—(*The Farbwerke vormals Meister, Lucius and Brüning; Hoechst-am-Main.*)

Indulines.—Relates to the production of a new blue violet colouring matter, the hydrochlorate of which is soluble in hot water, and has the composition $C_{24}H_{18}N_4HCl$. Consists in heating a mixture of 5 parts of aniline, 3·9 parts of hydrochlorate of aniline, and 2 parts of amidoazobenzol. The product is boiled with water several times, and from the mixed filtrates the hydrochlorates of the mixed indulines are precipitated by addition of hydrochloric acid, and then pressed and dried. The new colouring matter is separated by forming its acetate, either by first precipitating the free bases and treating them with dilute acetic acid, or by boiling the hydrochlorates with acetate of sodium. The new colouring matter alone forms a stable acetate, and this crystallises from the solution on cooling. Other organic acids may be employed, such as tartaric, citric, or levulic acid, or the salts of these acids. [4½d.]

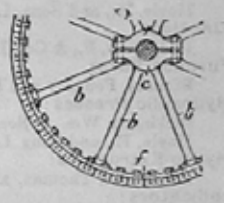
7,865. May 11, 1889. **Yarn dressing frames.**—J. GARSTANG, Fulledge Mill, Burnley.



Brushing.—The warp threads pass in sections from a series of guide bars over brushes I adjustable by screw bolts, J, J¹, and thence to the beam H¹.

Stop motion.—The reed K and comb m are mounted on frames K¹, m¹, connected by a link n. In the event of entanglement of the threads the reed and comb are moved forwards, the latter acting on a blade spring O and depressing a catch P into engagement with a ratchet or cog-wheel R on the driving shaft, by which the driving strap is caused to slip or skid, and the machine is stopped. [6½d.]

7,888. May 11, 1889. **Spinning.** R. TATHAM, Mos Lane Iron Works, Rochdale.



Carding-engine cylinders, taker-in rollers, doffers, breasts, and fancies, etc., are formed of tubes of steel or wrought iron, or by bending sheets of steel, etc., and uniting the ends by brazing or other suitable means. The cylinder is connected to the axle or shaft by arms *b* of steel, etc., secured to split bosses *c*, which are secured to the shaft by bolts, clips, or other suitable means, and it is covered with a lagging *f* of wood, leather, etc., to which the card clothing is secured. The axles are formed of steel tubing. [8½d.]

TEXTILE MACHINERY, APPLIANCES, &c.—DIRECTORY OF MAKERS.

Auctioneers:
Rushton, Edward, and Son, Blackburn, and Manchester.
Salisbury & Hamer, Blackburn and Manchester.
Unsworth, Geo., Manchester.

Bandings, Tape and Tubular:
Hart, Thomas, Blackburn.

Belting:
Greenwood, John, and Co., Ltd., Todmorden.
Reddaway, F., and Co., Pendleton.
Rossendale Belting Co., Manchester.
Sampson and Co., Stroud.

Bobbins, Spools, Shuttles:
Kay, John, Rochdale.
Livesey, Henry, Limited, Blackburn.
Wilson Brothers, Todmorden.

Boilers:
Galloways, Limited, Manchester.

Calenders:
Hoyle, E., and Sons, Limited, Halifax.
Riley, J. H., and Co., Bury.

Card Clothing:
Whiteley, John, & Sons, Halifax.

Cement, Mineral Fusible:
Fox and Williams, Manchester.

Chemicals:
Grimshaw Bros, Clayton, Manchester.

Cop-Tubes:
Jagger & Co., Oldham.

Cop-Tubing Apparatus:
Jagger and Co., Oldham.

Cotton Driving Ropes:
Hart, Thomas, Blackburn.

Cutters (Spiral) and Ledger Blades:
The Smith's Patents Co., Sheffield.

Gold and Silver Wire:
Makinson, E. and W. G., Preston.

Driving Ropes, Bandings, &c.:
Hart, Thomas, Blackburn.

Dust Fuel Furnace:
Donkin, B. and Co., London.

Emery Filleting:
Dronsfield Brothers, Oldham.

Engines:
Goodfellow, Ben., Hyde.
Musgrave and Sons, Ltd., Bolton.

Engineering Work:
Bransby Foundry and Engineering Co., London.
Hoyle, E., and Sons, Limited, Halifax.

Fire Hose:
Reddaway, F., & Co., Pendleton.

Furnace Bars:
Bransby Foundry and Engineering Co., London.

Hydraulic Presses:
Dickinson, Wm., & Sons, Blackburn.
Hoyle, E., and Sons Limited, Halifax.

Hydro-Extractors:
Broadbent, Thomas, and Sons, Huddersfield.

Indicators:
Orme, G., and Co., Oldham.

Jacquard and Card Cutting Machinery:
Devoge & Co., Manchester.
McMurdo, James, Manchester.

Knitting Machinery:
Harrison, W., Manchester.
Rothwell, W. & Co., Limited, Bolton.

Lattices, Pegs, Jacquard Slips, &c.:
Livesey, Henry, Limited, Blackburn.
Stone and Burnett, Preston.

Looms etc.:
Butterworth and Dickinson, Burnley.
Dickinson, Wm., & Sons, Blackburn.
Dugdale, John, and Sons, Blackburn.
Hacking and Co., Bury.
Hall, Robert, and Sons, Bury.
Hutchinson, Hollingworth, and Co., Doboross, Oldham.
Livesey, Henry, Limited, Blackburn.
Pemberton and Co., Burnley.
Platt Brothers and Co., Limited, Oldham.
Schofield and Kirk, Huddersfield.
Shaw, Wright, Stockport.

Machinery (Cotton):
Bethel, J., Manchester.
Curtis, Sons and Co., Manchester.
Dobson & Barlow, Bolton.
Guest and Brookes, Manchester.
Hetherington, John, and Sons, Manchester.
Holden, G. H., and Co., Manchester.
Horrocks, John, and Son, Manchester.
Howard and Bullough, Accrington.
Hurst, W., Rochdale.
Lees, Asa, and Co., Limited, Oldham.
Lord Brothers, Todmorden.
Platt Brothers and Co., Limited, Oldham.
Stubbs, Joseph, Manchester.
Tatham, John, and Sons, Limited, Rochdale.
Taylor, Lang and Co., Stalybridge.

Machinery (Dyeing, &c.):
Dickinson, Wm., & Sons, Blackburn.
Heppenstall, E., Huddersfield.
Riley, J. H., and Co., Bury.

Machinery (Silk):
Curtis, Sons and Co., Manchester.
Dobson & Barlow, Bolton.
Guest and Brookes, Manchester.
Holden, G. H. and Co., Manchester.
Horrocks, John, and Son, Manchester.
Platt, Brothers and Co., Limited, Oldham.
Stubbs, Joseph, Manchester.
Sykes, John, and Sons, Huddersfield.
Taylor, Lang and Co., Limited, Stalybridge.

Machinery (Sizing, Filling, &c.)
Dickinson, Wm., & Sons, Blackburn.
Riley, J. H., and Co., Bury.

Machinery (Woollen and Worsted):
Curtis, Sons, and Co., Manchester.
Dobson & Barlow, Bolton.
Guest and Brookes, Manchester.
Hetherington, John, and Sons, Manchester.
Holden, G. H. and Co., Manchester.
Horrocks, Jno., and Son, Manchester.
Lees, Asa, and Co., Limited, Oldham.
Platt Brothers and Co., Limited, Oldham.
Stubbs, Joseph, Manchester.
Sykes, John, and Sons, Huddersfield.
Tatham, John, and Sons, Limited, Rochdale.
Taylor, Lang and Co., Stalybridge.

Oil:
Wells, M. & Co., Manchester.

Oil Cans and Oilers:
Jagger & Co., Oldham.
Royle, W., Atherton.

Patent Agents:
Bosshardt, F. & Co., Manchester, Oldham, and Stockport.
Thompson, W. P., & Co., Manchester, Liverpool and London.

Pickers, Picking Bands, &c.:
Greenwood, John, Todmorden.

Picker Steepers:
Green, James, Blackburn.

Pistons:
Lancaster and Tonge, Pendleton.

Roller Leather:
Meredith-Jones, J., and Sons, Wrexham.

Shuttles:
Kay, John, Rochdale.
Livesey, Henry, Limited, Blackburn.
Pickles, Robert, Burnley.
Walton and Halstead, Hebden Bridge.
Wilson Brothers, Todmorden.
Greenwood, John, Todmorden.

Sizing and Filling Preparations:
Adley, Tolkien, and Co., Blackburn.
Eastwood, James, Manchester.
"Gloy" Manufacturing Co., London.
Grimshaw Brothers, Clayton, Manchester.

Smoke Consumers:
Greaves, W. McG., Manchester.

Steam Traps:
Lancaster and Tonge, Pendleton.

Tambouring Threads, Braids, &c.
Makinson, E. and W. G., Preston.

Technological Handbooks:
Bell, George, and Sons, London.
Naismith, J., Manchester.

Temples, etc.:
Blezard, James, and Sons, Padiham.
Lupton Brothers, Accrington.

Tools (Machine):
Hetherington, John, and Sons, Manchester.

Type Writers:
Type Writer Co., Ltd., London and Manchester.

Ventilation:
Blackman Ventilating Co., London.
Matthews and Yates, Manchester.
Renshaw and Co., Manchester.
Rothwell, John, Farnworth.

Warping Machinery (Sectional):
Bethel, J., Manchester.

Wire, Gold and Silver:
Makinson, E. and W. G., Preston.

Wire Healds:
Barlow, H. B., and Co., Cornbrook, Manchester

Yarn Assorting Balance:
Thomas, G. and Co., Manchester.

Yarns, Coloured:
Makinson, E. and W. G., Preston.

Yarn Testing, &c., Machine:
Wallwork, Henry, and Co., Manchester

INDEX TO ADVERTISERS' NAMES.

When the number of the page is not given the Advertisement does not appear this week.