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Canadian Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XI. TORONTO, FEBRUARY, 1894 No. 2

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THE VENTILATION OF MILLS.

A very important subject was recently discussed by J. Masinette, in a paper before the Manchester, Eng., Association of Engineers, namely, how to ventilate effectively woolen and cotton mills and other large buildings where there are many employes?

The point which chiefly affects the problem is that the fouling of the air is continuous. If it were possible to completely exhaust a room every ten minutes and recharge it with fresh air, this would represent the needs of the case, but it would be neither practicable nor wise. As the pollution is continuous, so must the provision of the diluting medium be continuous. For it is all that can be looked for in a case of this kind, that the air shall be so diluted that the quantity of carbonic acid will be reduced to a safe limit. Without going into the figures of the subject minutely, it may be said that seven parts of carbonic acid per 10,000 of air is looked upon as the limit which on sanitary grounds is permissible. Now in the case supposed the limit would be reached in twelve minutes, supposing the air to be absolutely pure, so that unless dilution began with the occupation of the room, there would be little chance of the proper standard of purity being maintained. There is, moreover, in addition to this factor, the question of the gas burning in the room to consider. Every burner which consumes 4½ feet of gas per minute eats up 45 cubic feet of air, and the carbonic acid it produces must be at once diluted or removed. Now to do this, and at the same time provide for the sufficient dilution of the acid emitted from the person, requires from 30 to 45 cubic feet for each person per minute, which, on the supposition of the presence of 900 persons, means a supply in the room in question of 27,000 to 45,000 cubic feet per minute. Taking the smaller figure, it would mean that in eight minutes the total cubic contents of the room require changing in order to provide the necessary dilution

How is so large a volume of air to be moved without creating a draft in the apartment? For it must be remembered that any such result would be fatal to the adoption of any system. The most usual method of renewing, or attempting to renew, the air of a room is that of trusting to the natural tendency of heated air to escape by means of any openings which may exist, leaving the fresh air to find its way in as best it may. It need hardly be demonstrated that this system is a failure, even if it be accompanied, as it sometimes is, by the draft induced by the fire. There are days on which the barometrical conditions are such that the air will not move under the gentle compulsion of air heated within a room, as every steam user knows who has had a difficulty with his boiler draft on such occasions. Again, there are times when the temperature without is actually higher than that within, in which case it is impossible to hope for any movement in the air. A better method is that of extraction, but even here there is a need for caution. The so-called automatic extractors are in effect neither automatic nor extractive. The existence of an external current of air is an absolute necessity to their even partially successful working, and it is needless to say that this is not always present. Cases are not rare in which appliances of this nature have utterly failed to remove the air from a room even partially. Reference is not now made to that type of ventilator which, when rotated, does induce a partial current of air, although it may be doubted whether it is of sufficient strength to be of real service in all cases. The partial success of this type of ventilator is an additional proof, if it were needed, that some absolute application of force is required to give even such results. Extraction, to be successful, requires careful application, and care must be taken to see that the force provided is sufficient. It will, therefore, be profitable to set aside at once these cheap but ineffective appliances, and see in what way extraction can be accomplished with a reasonable hope of success.

The methods of extraction usually adopted consist of the employment of an induced current of air within a shaft, or extraction by means of fans. The former is the more common method of the two, and has often been applied with considerable success. As the velocity of a current of air in an extractor shaft is practically the same as the draft of a chimney, it is calculable by the same rules as are used for that purpose, and depends upon the difference of temperatures at the bottom and top. The formula for this is where H = height of chimney in feet, T = temperature of air entering chimney, t = temperature of air at top of chimney, and V = velocity in feet per second. $V = 36.5\sqrt{H\ (T-t)}$. Where the arrangements permit of the creation of a current of sufficient velocity the extraction of foul air can be effectively performed, but it is in all these cases desirable to see that the connecting flues are not too long, as otherwise the loss of suction by friction will be great. Thus in a smooth pipe 24 inches in diameter and 100 feet long, the loss of pressure by friction is, at a velocity of 1,000 feet per minute, 0.046 ounces per square inch. With a rough surface, such as a brick flue presents, the loss is greater. Given a sufficient velocity and proper connections without bends, a large volume of air can be moved. It only requires pointing out that the effective employment of ventilating extractor shafts can only take place when means are taken to insure, under all circumstances of atmospheric pressure, an effective current. It is often the case that an extractor shaft is deprived of its usefulness in the summer time because no means are forthcoming to create a current, which, owing to the balance in the atmosphere within and without the building, cannot be naturally created. The provision of some form of furnace or heater is therefore imperative if the full effect is to be obtained from an appliance of this nature. The same factor materially affects many of the so-called automatic ventilators, which are of no value in still air and equal temperatures. At the same time there is no doubt that the removal of air from a building by the mere power of an extraction shaft can be effectually performed, but it is very rarely that, when means of this character are used, the connections are carefully and thoroughly thought out. It is necessary to insure a connection with each room in such a way that it feels the full power of the extractive mechanism, and it is often the case that this portion of the work is very ineffectively carried out. The course and direction of the flues, the existence of sharp corners where bends should be found, the finish of the flue, and the number and position of the outlets, alike have their influence upon the subject. The most perfect examples of ventilation are those in which the area and position of the openings into the extractive flues are alike ample and well placed, as in this way drafts are avoided, while enabling a perfect extraction to take place.

THE date is announced of the Montreal and Toronto spring millinery openings (wholesale), which will take place on Tuesday, Wednesday and Thursday, Feb. 27th, 28th, and March 1st.

ATTRIBUTES OF A GOOD TURBINE.

BY J. HUMPHREY.

As a safe, desirable and cheap motor, good and properly developed water power is unequalled Its moderate cost, which in many instances is less even than the expense for attendance of a steam plant, has not led to economy usual in other things, but has tended to the neglect of systematic investigation requisite for the general understanding of the best means for its improvement. Yet in most places where power is in demand, its value equals the cost of its equivalent as obtained by other and more expensive methods, and its fullest development becomes a matter worthy of attention. While great advance has been made during the last half century in the improvement of turbines, until they have practically superseded other forms of water-wheels, yet there are certain essential principles pertaining to their construction which should be better understood by users, especially as they are apparently unappreciated, or sadly ignored by many builders. As a first, and by no means unimportant element of a good turbine, the water should be applied to the running wheel with the greatest attainable velocity and force, and with proper direction for its best action upon the floats. This requires chutes or induction channels with sufficient space and correct form for the natural contraction of the vein of water in accordance with the laws of accelerating motion, in which most turbines are manifestly deficient, thereby causing more or less waste of energy of the water before it reaches the wheel.

Another quite as essential and rather more difficult part of turbine designing is in making the floats or pressure vanes of the running wheel of proper form to take the maximum force from the water, and transfer it to the work. This requires length and curvature of floats corresponding to the varying conditions of velocity, as the water is reduced from its highest initial speed to a very low one at its departure from the wheel, as it must be if high efficiency is reached, and as such length and curvature of float is variable under different conditions of use, as for different heights of fall and variable work or water supply, it is hardly reasonable to suppose that one form of float will suit every condition, or that the proper forms are likely to be determined by mere tentative experiment, as by the "cut and try" plan, which has been the system generally pursued by most turbine designers. Although fairly good results may have been attained in that way, with perhaps occasional excellent chance hits, yet the method is far from reliable in general practice, especially with the uncertainties which have attended methods pursued by advertising the efficiency of wheels for which evidently extravagant claims are made, and which are by no means warranted by philosophical examination, or practical use. Very few indeed of the many wheels now in use show either chute or float construction indicative of scientific design, or capable of highest efficiency.

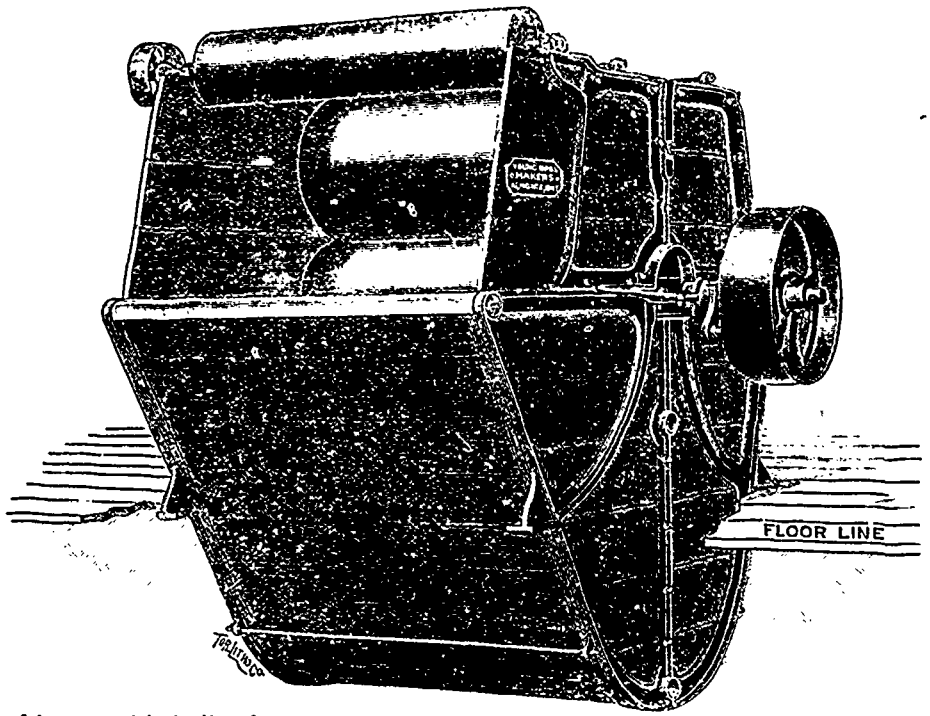
A third, and quite important, feature in the econ-

omy of a wheel is the proportion of its discharge area to the quantity of water applied.

As it is certain that no more power can be obtained from the water than the difference between what it has at its application and that retained at its exit from the wheel, and as it is a well established and immutable law of nature that the energy of motion is as the square of its velocity, it is evident that wheels discharging water at nearly or fully one-half of its entering velocity must waste a large percentage of the power of the water in that way; and this is a prolific source of loss in many of the popular varieties of turbines now in the market, which are readily sold to inconsiderate buyers at somewhat less price perhaps than those of more honest proportions, though their cost to the user, who needs the power they waste, is often many times that of properly proportioned wheels.

AN IMPROVED CLOTH WASHER.

We take pleasure in bringing before our readers an improvement in cloth washers for woolen goods. The illustration represents a cloth washer of improved shape and construction, made by Young Bros., Almonte, Ont., who claim with confidence that it is superior to any cloth washer yet put in the market.



The frame is of iron, and is built of a new pattern, designed to prevent knotting and to give the most easy and natural passage of the goods, with greater capacity. The casings are of hard pine. All bearings are outside of the casing to prevent the dripping of oil on the goods.

All main bearings are babbited and adjustable to take up wear. The main rollers are of hard maple or oak, with heavy flanges on each end, and shafts running clear through the rollers. Below the bottom roller there is a deep box, which catches all the suds and grease squeezed from the goods. In the bottom of this box there is a gate, which, when open, allows the suds to pass down into the washer among the goods, until they are ready to be washed off, when by opening a valve on the side of the washer the gate in the sud box is closed and the soap passes through a spout to the outside and can be saved for further use if desired. There is also a gate at the bottom of the washer which can be used while rinsing, or to drain the washer at any time. All the greasy suds pass off without mixing with the goods while washing, ensuring, with the pressure from the very heavy rollers used, more expeditious washing and cleaner goods. The gates and valves are all controlled by levers conveniently operated from the front of the machine. The power is transmitted by means of a *Friction Clutch Pulley*, operated by a lever conveniently placed, doing away with tight and loose pulleys and shipping of belts, and enabling the operator to start and stop the washer quicker, without damage to the goods, and a greater saving of belts than by the old method. The washer has a capacity of four strings of goods, double width if desired. Prices and further particulars may be obtained of *Young Bros., the manufacturers, Almonte, Ontario.*

THE MANUFACTURE OF CHINCHILLAS.

It is well known to finishers of napped goods how essential it is to have the nap in the proper condition while the goods are yet wet, for it is next to impossible to alter the lay of the nap materially from the position it has while in the process of drying. This holds good on all kinds of goods depending upon a nap for the finish, and on chinchillas more than anywhere else. The nap has been obtained only by the utmost care and attention to detail, and everything that will in any

manner tend to bring the nap in a different position from that required should be just as carefully avoided. The position required on chinchillas is "erect"—nothing short of it will answer our purpose, and it will therefore be readily seen that another whipping just previous to the goods going into the dryer will be of inestimable benefit. Of course it is not always that machinery is so placed as to enable the finisher to run his goods from the whipper directly on to the shear, but if at all possible the whipper should be so arranged that the goods may run directly on to the dryer from the whipper without any further handling or folding of the goods. To any one at all familiar with the peculiarities of this finish, an arrangement of this nature will readily commend itself. The dryer itself should be of a different construction from the ordinary run of dryers, and I have not seen anything yet that will beat the old-fashioned lawn machine such as we find in bleacheries where they finish lawn goods for ladies' dresses. This machine is in the nature of a chain dryer in a horizontal position. The lawn dryer is arranged with a contrivance for racking the goods, which may be taken off and the machine adjusted wide enough, and we have the best dryer for chinchillas imaginable. A hot blast, readily arranged to force hot air through the goods, will quickly dry them before they can come in contact with anything which would interfere with the erectness of the nap. The goods thus dried are in a fit condition for the shear, and in this operation we again note a radical departure from the finishing, or rather shearing, of ordinary woolens. Having frequently called attention to the necessity of keeping the nap in an erect position, we are here compelled, says the *Boston Journal of Commerce*, to resort to something stronger than the common raising brush to accomplish our end, and we therefore put in a wire brush. Also it will be noted that the laying brush is not required, and it is best, therefore, to take it out. As this brush is generally on the main shaft it is found to be quite a job to get this off. The shearing process depends entirely upon the size of the nub wanted, for if a large nub is desired the nap is left longer, and if the web is to be fine and close the goods are sheared closer. Uniform work at this stage is a very desirable item, and great care should be used to obtain it. The wire brush will work into the nap and bring it to the desired position better than any other kind of a brush, and is therefore indispensable. The shearing should be closely watched, to the end that a perfectly smooth and uniform surface may be brought to the chinchilla machine. This machine, although differing sometimes in point of shape, is practically the same as regards the principles of construction. The frame of the machine is somewhat after the pattern of a loom frame, usually about twenty-four inches wide and from sixty to sixty-four inches high. About three feet from the floor is placed an oblong surface of the dimensions given above, and which is securely fastened to the frame. This surface is covered with a good grade of brussels carpet. On each side of this bed, as it is termed, is found a roll covered usually with some card clothing or some stuff to which the goods will adhere, for these rolls are practically the delivery and take-up rolls of the machine. Above this bed is found another of similar shape and proportions, but made of cast-iron, whereas the bed is usually made of a solid piece of plank. This upper surface is called the follower, and on the under side of it a plate of solid rubber is securely cemented. This follower is movable by means of a handle; that is, it can be raised or lowered according to needs. An upright shaft passes through each end of the follower, which shaft is supplied with a mechanism to produce a rotary motion to the same. This can also be changed to a reciprocal motion, either forward or backward, or from side to side, or diagonally, thus securing quite a variety of styles in this particular line of finish. The necessary motion to produce the nubs is obtained from the main shaft, which passes through the lower part of the machinery, and to which the upright shafts are geared, the main shaft of machine in turn receiving power from main or counter-shaft by means of a belt. The mechanism above referred to is capable again of being arranged in different positions, so as to increase or decrease the amount of the motion usually termed the "sweep." To sum up, then, we find the chinchilla machine to consist of a frame containing a bed over which the goods are to pass, a follower which is lowered on the cloth, this follower containing the necessary mechanism that, with the addition of motions, it will twist and twirl the erect nap into the required nubs.

DOES ADVERTISING PAY?

Does advertising pay? asks an exchange. That is no longer a question. Of course it does. That goes without saying. As to the superficial views expressed by some advertisers, to the effect that they had discontinued patronage because they could not observe that they had ever obtained a solitary result from their advertising, I will dismiss the subject by quoting the remarks akin to it made by an old dry goods merchant.—"As I look at it, a man might just as well remark at the end of the year that he could not see that he had received a single order on account of the sign over his door, and consequently that he would take it down and save the wear and tear; or that he could not trace business to his printed letter head and envelope, and consequently would hereafter use blank stationery."

What *is good advertising? I will speak only for the trade* journals. There the story should be short and truthful, pointed and plain, illustrated with cuts, and with prominence given to the trade-mark. Tell it upon a half page or a whole page, *and this continuously:* desultory advertising *does not pay!* Changes now and then renew the interest. Small cards are not stimulants to attention. Pamphlets gotten up by trade journals that understand the ways of their business as to illustrations, cover adornments, and clever reading matter, are good advertising: they are *not* thrown into the waste basket—plain circulars *are*. A last word as to continuous advertising. Most leading houses keep their half pages and pages of advertisements going the year round, yet their repntations were "established" years ago. Our great collar and shirt houses, our big manufacturers of neckwear, the great cotton mills, the wholesale clothing men, the dress goods men—all well known and "established" for a generation—are the most liberal patrons of our trade papers in the way of space and unbroken continuance.

THE GERMAN WOOL MARKET.

The following is Gustav Ebell & Co.'s review of the state of the woolen market during 1893.

BERLIN, JANUARY, 1894.

In spite of a sound statistical position our commodity has for the last four years met with an adverse fate; periodical small rises within this period have always merely been of short duration, with no other effect than an early disappointment. The year under review opened with good prospects; our industry had large orders with small stocks of wool, and not more than a normal quantity of tops on hand from the preceding year. The great activity in all branches absorbed eagerly within the first three months all old stocks and made even a hole in the large importations Germany had made this season direct from the colonies. France having imported very little, began to show a scarcity in wool in the spring, and, with a renewal of demand in general, prices stiffened and gradually rose for wool and tops about 10 per cent, which the opening of the London April sales confirmed. This result of the sales seemed to dissatisfy the more sanguine element, and as there was a lull in the hitherto large buying of tops by spinners, the term market showed its disappointment in turning round a la baisse; confidence was soon shaken, buying became languid and prices dropped, so that before April was out fully half of the 10 per cent. advance was lost and never again recovered! Unforeseen outward influences came to weigh heavily on our trade. In June the Russian-German tariff war broke out, stopping all trade, cancelling orders in tops, yarns and goods for which material had been provided. Later on the heavy crisis in the United States of America prevented export to this our principal customer, so that the home trade had to cope with quantities of goods which it was not equal to absorb, the buying power of the wealthy and poor being alike influenced and weakened by large capital losses and strikes. Many spindles and looms were stopped, but the combs continued to put out the tops of large quantities of wool they had in store, and the market was soon overflooded by them to such an extent that, while wool kept its value, tops at the end of the year had declined to nearly the lowest point ever reached, and quite out of proportion to the cost of producing. In spite of this the new seasons in the colonies have again opened and continue with unabated animation, and prices are being paid which are scarcely in keeping with the industrial conditions of Europe and America. May be the hope of a rise, when "free wool" in America is being legislated, besetting still more sanguine people, may be that the low price of wool in general fosters speculation, still there it is; wool is cheaper in Europe than in the Colonies! We do not think that, after so long a period of preparedness, "free wool" in America will have any appreciable effect on the price, but it is natural to expect that, with the return of confidence and business enterprise in America, especially if coupled with wise legislative and tariff measures, and the expected conclusion of a sensible commercial treaty with our big Eastern neighbors, we may look forward to a revival. The production of fine wool in general promises no further increase; what there may be at the River Plate is counter-balanced by a sensible diminution of the European and North American clips, and we think there need not be any fear that the industry will not, as heretofore, be able to absorb easily what is offered. The import of colonial and foreign wool into Germany during 1893 shows a diminution of 200,000 cwt. against 1892. For the first four months there was a plus of 500,000 cwt. as compared with the same period 1892, while the remaining eight months show a decrease of 700,000 cwt. This illustrates on the one hand the early arrivals of large direct purchases, respectively importations, from the colonies, and finally a curtailed consumption, which, however, may ultimately be counterbalanced by smaller stocks at the end of the year of wool and woolens in manufacturers' hands. The production of German domestic wools has been steadily decreasing; within ten years the shrinkage is 5½ millions sheep, and if we take an average yield of 3 lb. per head (13,800,000) we arrive at a clip of about 413,000 cwt., *i.e.*, not quite one-seventh of the import. It is only natural that under these circumstances the home product loses in significance, not considering the growing tendency of flesh-carrying animals with a coarse fleece. The German wool fairs showed no animation, with prices ruling 9 to 14 per cent. under those a twelve months ago, only the few extra fine Silesian brands escaping this decline. After a somewhat more brisk enquiry, occasioned by the apparent cheapness of the wools in July, business relapsed again towards the end of the year.

The direct import of Cape wool into Germany amounted in 1893 to 103,000 bales, the figures for the previous three years being 85,000, 99,000 and 78,000 bales respectively. If we take it that the whole production for Cape wool averages about 300,000 bales, and accept an amount of about 70,000 bales as bought in the London sales, we find that more than half of the Colonial production is worked up in Germany. Of public sales we only held three this year; the attendance is decreasing, users prefer private dealings, and the small quantities sold form no criterion as to market value. The early arrivals of Cape wools promised fair yield, but the bulk of grease wools yielded disappointingly in weight and color, showing a large quantity of burry and dipped wool. We must consider it satisfactory that with the heavy outfall in our export to Russia and America the total exports for the year show no decrease as compared with 1892.

A COMPANY is being incorporated at Toronto for the purpose of manufacturing appliances and machinery for laundries. It will be known as the Parisian Laundry Company.

PETER WRIGHT'S dry goods store in Montreal was entered by burglars, who got about $500 worth of goods. One of the thieves was caught by the police and the booty was recovered.

SOME of the features of the Government's new Insolvency Bill are, that incompetent debtors may be punished by suspension of discharge for five years, that dishonest debtors may be imprisoned, discharge may be granted merely on consent of a majority of their creditors.

Foreign Textile Centres

MANCHESTER.—The position is unchanged. Demand for Eastern markets is generally suspended, merchants awaiting higher prices in rupees to compensate the low exchange prevailing. A few inquiries for scarves and jacconets and other light fabrics are reported, but prove impracticable. The smaller markets contribute but small orders just now, and these are confined to numerous specialties, some of which command full figures. The trade in printing cloth is limited to purchases for actual requirements. No weight of business is heard of. Heavy goods continue slow. Spinners meet with few buyers, and the demand is almost lifeless. Crop movements have continued to claim a lot of attention, and the disputes as to what the output will be are almost as strongly worded as ever. The large crop men continue to be supported by the best of all arguments—those of facts—whilst the small-crop men have nothing but theories with which to buttress their views The future, of course, is absolutely unknown to both, but it is only fair to attach most credit to the views of those whose forecasts up to the moment have proved most nearly accurate; whilst, on the contrary, those who have failed thus far are hardly entitled to ask for more credence than they have had in the past. They still affirm that the crop cannot be a large one, but offer no facts in support of their affirmation They may eventually prove right, but as far as we can form any opinion it is not probable that they will. We may even see a considerable falling-off in the movement of the crop, yet even that will not necessarily prove exhaustion. Lately there has been a moderate inquiry for Sea Island, and a fair business has been done at unchanged prices. Pernams have also been in fair request, and prices are unchanged. Producers have met with only a very limited inquiry for yarns, and that in the main at most unsatisfactory prices This applies to both the home and export sections of the trade Prices on the week are the turn easier, especially where spinners are finding stocks burdensome. In cloth there is little improvement.

NOTTINGHAM.—The position in the lace trade is unchanged, says the *Warehouseman and Draper*. The colonial demand is quiet, and the increased facilities for producing lace on the Continent have diminished the demand for English goods. Some manufacturers are, however, rather better employed than at the commencement of the year. The Irish Guipure lace is still prominent, and amongst the other varieties selling are Valenciennes, Point de Paris, Point Duchess, Gros Venise, Cluny, &c. Cheap laces are not much wanted, and the demand for embroidery, edgings, and trimmings is without improvement. Silk laces continue to meet with a slow sale, but there is a steady business doing in silk veil nets. In the plain cotton net trade very little change has occurred. Tulle nets are selling a little more freely, and there is a moderate sale for bobbin, mosquito, and point d'esprit nets The curtain department is still quiet Some classes of hosiery are selling tolerably well, but the trade, as a whole, is not healthy

DUNDEE.—The market in all that relates to jute is quieter. Calcutta, indeed, wires firmer prices, but Dundee does not respond, and all sides spinners refuse to go on. For good warps 1s. 9d is the price for 8 lb.; for common warp, 1s. 6½d. to 1s. 7d. Heavies are easier at, say, 1¾d. to 1 7-16d. for the lea. American advices are still unfavorable. The want of confidence regarding the new tariff interferes seriously with buying for future delivery. There is also an unsettled feeling in financial circles in the States. Until these disturbing causes are removed we cannot hope for good trade from America. To-day hessians are depressed. The reduced output seems more than sufficient for the wants of buyers, and on all sides one hears of further curtailment of weaving. Flax is very firm, and tows especially are very dear and difficult to buy. There is decidedly less doing, however, in fibre. To-day flax and tow yarns are of course very strong, spinners refusing to go on selling except at the highest list prices. On the other hand it is difficult indeed to place any large lots of yarn. Manufacturers who are compelled to buy do so, but those who can wait refuse to follow the sharp advance. Linens are held for the highest list prices, and on stocks being exhausted, buyers are now forced at length to pay the rise.—*Textile Mercury*.

ARBROATH.—Full prices for canvas and other heavy linen goods are insisted on, but short-time is still general. The fancy jute trade remains quiet and without change in values Cords and ropes are still in demand, and prices are firm.

LEICESTER.—The wool market is quieter, spinners being careful not to purchase more than is absolutely necessary, in view of the increased uncertainty as regards quotations Skin wools are now of sufficient length in the staple to compete with fleece wools, and the whole of the supplies are cleared off readily. Cross bred colonial wools are in moderate request, but other qualities are not well taken The yarn market is fairly active, and spinners are well under contract, while prices are firm. The hosiery trade is very depressed in the heavy branches, but stocks of light fabrics are much under the average, and larger contracts are being placed The boot and shoe trade improves steadily, and production is being considerably extended. The sales of leather are fairly large, and all English tannages are very firm. Elastic web fabrics sell more freely, while there is a better demand for specialties for home and Continental markets.

LEEDS.—The woolen cloth trade is inactive. Few repeat orders for assortments of winter stock have been placed during the week, but some providers of heavy woolens are engaged upon foreign orders which need not be executed in haste, and prospects as to the next fall trade are considered bright. There are from the country more inquiries about spring and summer coatings and specialties than orders actually placed or positively promised, and still merchants' travellers keep saying they have solid assurances of a good average trade in the near future. Prices of best worsteds are steadier than are those of vicunas, cheviots and new tweeds. In meltons and union cloths there is little or nothing doing. The Canadians are doing fairly well, but they have had for them a mild winter which has left them with too much stock on hand. Orders for ready-made clothing are coming in fairly satisfactorily, and at some factories they are equal in extent to those of twelve months ago.

HUDDERSFIELD.—There has been only a small attendance of buyers in this market lately, and the business done has not been important. There is a slightly better improvement in some departments, particularly in the demand for the best makes of vicunas, the finest fancy worsted trouserings, good serges and tweeds of a cheviot character, which, however, have to be cheap in price The improvement is very slow and gradual, and while some of our leading manufacturers are busy and a few are running their machinery overtime, there is generally a great amount of slackness, so that a large amount of machinery and a considerable number of workpeople are unemployed, and the rest are only working short time, in some cases three, and in others four days per week. Manufacturers and merchants alike are looking forward hopefully to the definite settlement of the alterations in the United States tariff, as the proposed or expected reductions will, it is believed, tell greatly in favor of the district, especially that of the Colne Valley There is a moderate business being done with the Continent. The local wool market is strong.

BRADFORD.—The healthy tone reported in this market is well maintained, although purchasers only buy for immediate requirements. In English wools lustres are not in so good a position as recently, and the inquiry is just now more for strong qualities. Cross-breds are very firm, and the finer qualities fairly steady. Alpaca has undergone no change, but mohair has fallen off somewhat. The yarn trade is still slow. Merchants have no confidence in present values, but they find that spinners are firm, in many cases advances being demanded. The orders placed are for small and miscellaneous qualities only, but producers assert that they cannot accept even the old rates because of the advance in the price of raw material. The inquiry is mostly for twofold wefts. Business in mohair is unsteady just now, because of the fall in the price of raw material, but more orders are expected before long. The piece trade is no better. Both for home and export the condition of affairs is unsatisfactory.

BELFAST.—There is not much change to notice in this market, says the *Irish Textile Journal*, so far at least as concerns the quantity of yarns imported during the past month, and the demand continues to run on the usual numbers. The generally backward state of trade during the past few months has prevented anything like the amount of purchases which the increase in the manufacture of union goods would warrant; but manufacturers, finding it difficult to dispose of their productions, have been limiting their output as much as possible. Now, however, as the prospect of better trade is brightening, there is every likelihood of more soon being done. At the present moment the prices of cotton warps are very low—in fact they have not been lower for some time; and consumers could scarcely be wrong in placing their contracts now, as, with the continued advances demanded for linen yarns and the increased cost of production, cottons cannot remain long at present figures. Coarse union goods of the crashes and roughs descriptions are being produced in fairly large quantities, as there is a constant demand for these articles. Shirting unions have been also selling more freely of late; and although stocks are fairly large, the manufacture is being steadily pushed forward. Union towels, tea and glass cloths, are somewhat sluggish, and their manufacture is being kept within narrow limits. The demand for Irish hand-loom mulls is very feeble, and the production small. The printed cotton handkerchief trade has been extremely quiet for some time past, and the printing and hemming houses having large stocks of finished goods on hand have only been buying cambrics in odd lots, either to more thoroughly assort designs or to keep their hands employed. The heavier makes of cloth are likewise quiet, only limited quantities being disposed of.

CALCUTTA.—In ordinary jute butts, business has been done up to Rs. 17-0 both by mills and speculators, but latterly the demand is quieter and a few sales are reported at Rs. 16-8. There is very little available. Mixings have been quieter but very steady, ordinary marks fetching Rs. 17-8 to 18-0, while good European parcels have been done to mills at Rs. 19 8. The market is fairly firm at the close. For baggings there has been a steady inquiry from mills. There is little change to report in the market for jute fabrics, which remains very steady. Country trade, as well as Bombay and the Straits, are keeping very quiet and hardly any business to report. A good line of cornsacks is reported for the colonies, and trifling lots of woolpacks have also been placed at slightly lower rates. For Great Britain business has been slightly better. Saltsacks and Liverpool twills also commanded some attention. Hessians are quieter. Demand from America for cloth is almost nil. A few hundred bales of wheat bags and bran bags were done for this month at lower rates. In freights the Dundee market has been closed for a week. Jute prices here are again out of proportion to home quotations, and business has, therefore, been at a standstill. Our market, however, remains steady at former quotations.

LYONS.—The Paris market is the only one from which news which is in any sense favorable is being received. The condition of the home trade, however, may be regarded as fair. For export there is not much doing. The New York demand is small. From London a fair volume of transactions is reported, but in goods which may be classified as old stocks and which change hands at low figures, the only good feature in this movement being that if these goods are assisted to pass more quickly into consumption through their low price they will make room for new goods. Otherwise, the London market is so well provided that the demand from that quarter is not likely to be heavy this season. What demand exists is fairly well distributed. Moire is still a great favorite, and is in demand for all markets. Rich damasks find takers in small lots Printed goods and Chine effects promise to have a good season Changeables in plain and figured goods, in small effects, are likely to be as much in favor this season as they have previously been. In velvets business has decreased, and the season will soon be closed. Buyers only re-assort for strict requirements. The favorable feature in the velvet situation is the fact that the season closes with limited stocks. Ribbons are quiet. The demand for velvet ribbons is regular.

CREFELD.—The manufacturing situation does not show much improvement, reports the *Dry Goods Economist*, the demand for export and the reassorting business for spring not being of such proportions as to encourage manufacturers to increase their production. Velvets are quiet and the looms at work are not many, the opening of the order season for fall, which will cause an increased activity in the velvet mills, being still among the possibilities of the future In tie and umbrella silks little activity prevails. Ribbons are also quiet. Moires continue to be good favorites. The good feature in the situation continues to be the demand experienced from the home retailers and also the demand advanced by the cloak trade. Both combined keep up a fair movement of dress and trimming silks, linings and cloakings. This movement is a pleasant contrast to the almost entire absence of export business.

ZURICH.—Business in silk goods is becoming more active and a number of buyers are in the market. The prospects for an improvement are fair and the outlook is a little brighter. Uncertainty, however, still prevails, and, while buyers have a certain amount of faith in the future, they do not want to commit themselves and choose a leader by ordering any given style in large quantity. A good demand exists for novelties. Colored surahs are neglected. In changeables little is being done and their fate is still in doubt, although many have still faith in the changeable as a good seller this season. Black silks are in demand and black satin-faced goods find takers, with peau de soie and satin de Lyons in fairly good demand. Damasses are favorites with buyers and find a good market, in colors, as well as in blacks.

YORK.—The raw silk market has not felt any further effects from the recent failures in Italy, but prices are not strong and buyers still show disinclination to buy.

NEW YORK.—The better feeling now existing will help to improve the manufacturing situation, which has already sufficiently improved to be far better than it was previous to the close of 1893. The only element of doubt that still exists is the uncertainty concerning the new tariff, which, however, will probably be decided one way or another before the time comes for the order season for fall, but which cannot much affect the stock business, as buyers having already adopted the policy of buying for requirements only, are not likely to abandon it until this season closes. The established values of goods this season are in sympathy with the lower raw material, lower than they were last spring, and more in accordance with the lessened purchasing power of consumers This is an item in favor of steady consumption that cannot be overlooked.—*Dry Goods Economist.*

MILAN.—The market is quiet and rather weak, but holders are doing their best to hold up quotations and with a fair amount of negative success, as buyers are operating very sparingly and prices have not the test of actual transactions. Some demand exists for the best grades of greges. Buying from America, which stopped with the announcement of the suspension of the Banca Generale, has not been resumed, and the market is again in the state of abandonment in which it has been so often since the raw silk season opened.

EMPLOYEES IN INDIAN MILLS.

Although a good deal has been written of late about the mill operatives of India, says the *Textile Manufacturer*, their long hours of labor, their low scale of pay and small capacity for effective work, and more recently of their growing taste for strikes, and their sudden outbreak into rioting on a large scale, in spite of a reputation of "mildness," which they have managed somehow to acquire since the mutiny, we have the authority of the *Indian Textile Journal* for asserting that the stay-at-home Englishman has but a vague idea of the personality of the Indian mill hand. Comparisons with the home article will not help him much, for, beyond earning a living by minding similar machines, they have scarcely anything in common. At Bombay the mills are equipped with labor by coolies who belong to the agricultural class, and are drawn to the towns by the attraction of better pay and an easier life than that in the fields under a tropical sun, or under equally tropical rains. These

people have all an interest, more or less, in the property cultivated by their families and relatives, and they send money regularly from their earnings to maintain this interest. Their earnings in the field may amount to two annas (or two pence, roughly) per day, while in the mill a man is worth from six to eight annas. The bond to the land is now becoming weaker. A new generation is growing up, born of mill workers, and earning at the age of 14 years seven rs. per month in the mill. This generation knows nothing of field work, and is physically less fit for it than its parents, so the children will grow up as mill hands without, however, being bound to the work, like the Lancashire operatives, for life. In Ahmedabad and Surat the collector reports that similar conditions now exist, and that there is already a permanant class of factory workers who do not look forward to returning to agriculture.

The Lancashire mill hand lives practically in face of the alternative of "work or starve," while the Indian mill hand frequently and for long periods does neither, and seems little the worse for it. Charity is so universal and food so cheap in India, that death from starvation is one of the rarest things—much rarer than in London. A Bombay coolie with bare head and a simple waistcloth is fully dressed for work in or out of doors; he never needs fire for warmth or shelter, except from the rain. Alms are given daily at mosques, temples, and at hundreds of private houses, and begging is an honored profession that supports many thousands of the people; so a mill hand, if inclined to loaf, may have a fairly easy life without the least interference of the police. Trade unions are unknown in Indian mills, aud are likely to remain so for a long time to come, for the same reason that keeps the lower class of natives from placing their savings in banks. Their savings are usually invested in jewelry or clothing for the sake of effect. Strikes, therefore, although they may be on a large scale, can never last, as the public charity would be overloaded, but the mill hands already understand the way to boycott a mill, or several mills at once, causing serious inconvenience to their owners, while the constitutional aversion of every coolie to routine and punctuality stands constantly in the way of his personal improvement in mill work. Fines of double pay for every day of unauthorized absence do not prevent him taking a holiday when he likes, and expulsion is treated with the gravity of perfect indifference. A man in Bombay will earn on an average rs. 14 per month, a woman from rs. 7 to 8, and children from rs. 6 to 7. A family of a man, a woman, and two children, may earn rs 32 per month. The food of the family will cost rs. 18, and the rent rs. 3; there is thus a surplus of rs. 11 per month for a family that is disposed to work steadily. Food and lodging thus cost 66 per cent. of their income, leaving 33 per cent. for other necessaries and luxuries or economies.

Whatever class of work a man gets used to in a mill he keeps to it for the rest of his mill life. If it is blow-room work, neither ambition nor curiosity would ever attract him to the card room or the subsequent processes. He learns just as little as will insure his pay, and there improvement ends. He is, of course, illiterate, and all machinery deteriorates more rapidly in his hands than in those of the Lancashire operatives. In Bombay mill hands are seldom over 40 years of age, and are never seen over 50 years. Custom and social habit have separated male and female labor in Indian mills, and women only work at reeling and winding, with a forewoman in charge. They are very independent and prompt to take offence, and if their physical appearance and dress on a holiday may be taken as an index of their condition, they cannot be said to suffer from the effects of poverty or overwork. The domestic life of these women is simplicity itself. A short-sleeved jacket is their only garment which requires very little sewing, and they may be completely clothed in a *sari*, which is a piece of cotton cloth, plain or decorated, according to the means and taste of the owner, and which they wind about them with great skill, and wear with a grace that is natural to them. Their children, up to the age of five or six, go stark naked, and the furniture in their houses consists of a box or two to hold spare clothes and valuables, a charpoy or rough bedframe covered with coir yarn netting, and a few cooking utensils of metal or earthenware. They eat very little meat, and feed with their fingers, sitting on the ground.

If the Indian coolie could develop the steady habits and address of the Chinese or the Japanese workmen, it is quite possible that a very large proportion of the Egyptian cotton crops would be spun near Calcutta with the aid of Bengal coal.

TURBINE WATER WHEELS.

Editor CANADIAN JOURNAL OF FABRICS:

Noticing in recent issues of your journal an article on Turbine Water Wheels, by A C McCallum, M. E., Peterboro', I am inclined to comment upon some of the views expressed, and perhaps give some points of benefit to some of your readers.

In regard to wheels in "scroll cases" or helical chutes: The trouble of sideways wear of the step, to which he refers, may be practically obviated by proper proportions of the chute, which should have due allowance made for sufficient increase of the volume of the water which makes nearly or quite the entire circuit of the wheel, so that its force may balance that having less travel, thus equalizing the pressure upon all sides of the wheel. Then it will be no more likely to wear out of centre than ordinary flume wheels, which, if they may have the water "applied to all points in equal volume," frequently have it with quite unequal force, as they are too often set so that the currents at one side are more direct and much stronger than at other points.

Proper care, or good engineering, is as appropriate in the application of water to wheels of this kind as to the construction of the chutes of scroll wheels. Of these I have known instances where long use gave no trouble on the point named.

The chief defect of a scroll wheel, however, is in the loss of force in giving the water a curvilinear direction before it is applied to the moving wheel, while with several chutes applying the water around the entire circumference of the wheel by a series of short straight streams, very little force is lost, provided the chute is of proper form to permit the natural acceleration of velocity of the moving water, and to give it proper direction. In this, however, very many of the turbines now in use are quite faulty and cause serious loss of efficiency.

Of the three types of gates discussed I think there is very little difference in regard to their effect upon the part gate efficiency. As far as my observation extends, there are proportionately more poor part gate wheels with cylinder gates than with the "fly trap" or "register" styles.

The efficiency of a turbine depends more upon other points of construction than upon the form of the gate, and good results at full or part gate may be had with either style of gate by proper construction of chutes and floats, more particularly the latter, as high efficiency at part gate is almost wholly dependent upon the length and curvature of the float, which, to obtain best results, must be proportioned to suit the varying velocity of the water acting upon it as it may be received from a high or low fall to be discharged at the lowest practical or economical velocity.

The proper curvature of the floats is likewise an important element of steadiness of motion, as well as efficiency; and rather more important than exact uniformity of discharge orifices, though that may be desirable. That, however, with ordinarily careful construction, is generally near enough for all practical purposes.

Of the forms of gates referred to, the hinged or fly trap varieties, in addition to their complications, frailty and tendency to leakage, are quite inconsistent with proper chute construction. The cylinder or ring gate is prone to objections, as stated, though it may be made to work easily, as it may be made to have the water pressure counter-balance the weight; in fact, I have seen a gate of that style raised by the pressure of the water passing beneath it.

The register gate, though not without its defects, is, if properly made, as good as either of the others, and has some excellences which they do not possess. In the advantages of horizontal shaft wheels, where there is sufficient head for their use, as well as in the suggestions respecting a comparatively high velocity of wheel as conducive to steadiness of motion, I can fully endorse the views expressed. There is another important consideration in the construction of turbines, however, which should be better under-

stood by those interested in the use of water wheels, as it is causing a loss of much valuable power that might easily be rendered available and useful by more consistent practice.

This, now very common, fault of some even of the most popular turbines is in the excessive application of water to wheels of too small diameter, not unfrequently from two to four times the economical limit, sometimes wasting from 20 to 30% of the initial force of the applied water, in its undue velocity of departure; which with other losses from imperfect action by incorrect forms of chutes and floats, is one of the chief reasons why "there are so many wheels upon the vast number of streams on this continent that are developing only from 40 to 60 per cent. of useful effect when 70 or 80 per cent or more might be obtained" by proper construction

Ample flumes and races are essential requisites for economy of power, but it is just as important to have a moderate or economical velocity of the water at its exit from the wheel, as it is at points remote therefrom, and if the quantity of water at its exit from the wheel is so excessive as to necessitate a velocity of five, ten, or fifteen feet per second at its departure, it must inevitably cause a *loss of power which such velocity represents; and it cannot be* reclaimed by reduction of velocity in its course adown the stream, or after it has ceased to act upon the wheel.

When hundreds, and perhaps thousands, of dollars have been expended in the development of a water power plant by the preparation of canals, flumes and tail races, of dimensions that will allow the water to move at a very low velocity (one and a half feet per second being recommended by various wheel builders), it is certainly unwise to use wheels having five to ten times that velocity of discharge, and as the energy of motion is as the square of the velocity, the loss occasioned by the inordinate application of water increases with rapidly accelerating ratio, so that if, under an ordinary head, a properly proportioned turbine makes a loss of 2 to 3 per cent. of the initial force of the water in its velocity of departure, doubling the quantity applied to a wheel of like area of discharge, involves four times that loss, while a threefold application makes the proportionate loss as the square of three, or *nine* time as great as it should be, and in some of the recent efforts at making turbines of "great power for the diameter," it is not uncommon to find the area of gateage equal to one-half or more of the entire discharge area, or space from which the water drops from the wheel.

By such construction the water must leave the wheel at fully one-half of its entering velocity, and it is certain that at least 25 per cent. of its nominal power must be lost thereby, yet wheels of this class are advertised by various builders as having very high percentages of useful effect, while in point of fact they are quite deficient in that respect. Yet lack of knowlege of philosophical principles, with few chances for exact comparison and determination of the real merits of wheels, affords opportunity for erratic conclusions in this line, and with slight reduction of cost, buyers are easily deceived and readily accept that class of wheels, while builders are striving to outdo one another in a course which is very unprofitable, at least to many of their patrons, and which would not long be tolerated were the true principles of the turbine as well understood as they should be. J. HUMPHREY.

Keene, N H.

SPRING FASHION NOTES.

There are indications from Paris that ribbons will be a great feature in the ornamentation of the bonnets for Easter, also that satin and moire and double-faced satin are *the* coming ribbons. Moire-miroir, Roman and two-toned glace effects are features in the ribbon line, also satin moire reversibles, satin and moire alternated stripes, brocaded and bayadere corded ribbons with moire finish, and rich satins with stripes and edges in lace insertion effect. That the millinery trade will make a large use of ribbons for and throughout the coming spring is now beyond question.

Silks will prove a leading feature in spring dresses, and the many various combinations of brocade, satin, etc., will be highly favored.

One of the prettiest patterns in moire antique is a checked ground in black and white, the stripes of white and black being very narrow. Another, of black, in fancy effect, bears the appearance of a rich and elegant black brocade. Colors and black seem to share almost equally in the favor shown moires; if anything, however, black is in the best position.

The position of satin will be fairly well maintained, black being the leader.

Grenadines, plain and brocaded, crystal grenadines in colors, both plain and fancy, and in stripes; also swivel effects, in all colors, with blacks, crepes in fancy and fluted effects, swivel surah brocades, black brocaded surahs, figured effects on satin, surah, taffeta and merveilleux grounds, and, last but not least, printed silks, which were never more novel nor more attractive, will figure prominently in the silk display of the season. Taffetas, in both black and colored, will also hold their own.

The *American Silk Journal* mentions an entirely new fabric known as chrysanthemum crepe in which narrow rib-like cords wave crosswise of half-inch grooves, made by a faint crimping. The coloring is perfect, presenting all the varied chrysanthemum shades, and many more.

Mohair Travers is a novelty in dress goods described by the *Dry Goods Economist*. It is a diagonal twill with a thick mohair cord running every quarter of an inch from selvedge to selvedge. The fabric is all one color, and it is constructed of fine worsted yarn. The mohair cord, of course, is the product of the mohair goat.

Illuminated Beige is a mixture-colored fabric for the spring trade. It differs from an ordinary mixture in that the shading is varied, or as its name indicates, its colorings are illuminated.

Large buckles will be prominent for hats, collars and belts.

Other points to be noted for spring are:—

Point de Venise laces for millinery and dress garnitures, applied flatly.

Black, brown and navy-blue chip hats trimmed with piece velvet and buckles.

Brown, tan, gray and black kid gloves for general street wear.

Made-up laces of all kinds, though chiefly in white and cream shades.

White muslin, cambric and nainsook petticoats for wearing with summer house toilettes.

Fancy silk waists made up plainly and trimmed with lace.

Shirt waists in the plain shirt and more elaborate waist designs of white and colored cotton goods.

Silk ties of every description, from the simple Windsor up to elaborate Alsatian bow.

Cotton and silk mixed dress goods.

Black velvet ribbon for dress trimmings.

Short capes and jackets that have gained in width what they have lately lost in the length.

Black moire for dress trimmings and combinations.

Changeable taffeta silks in small designs.

Black and white lace parasols and colored sun umbrellas.

Storm serges in black, brown and navy blue.

Ladies' cloth for capes in black, navy, brown and tan shades

White and colored embroideries in both edgings and insertings.

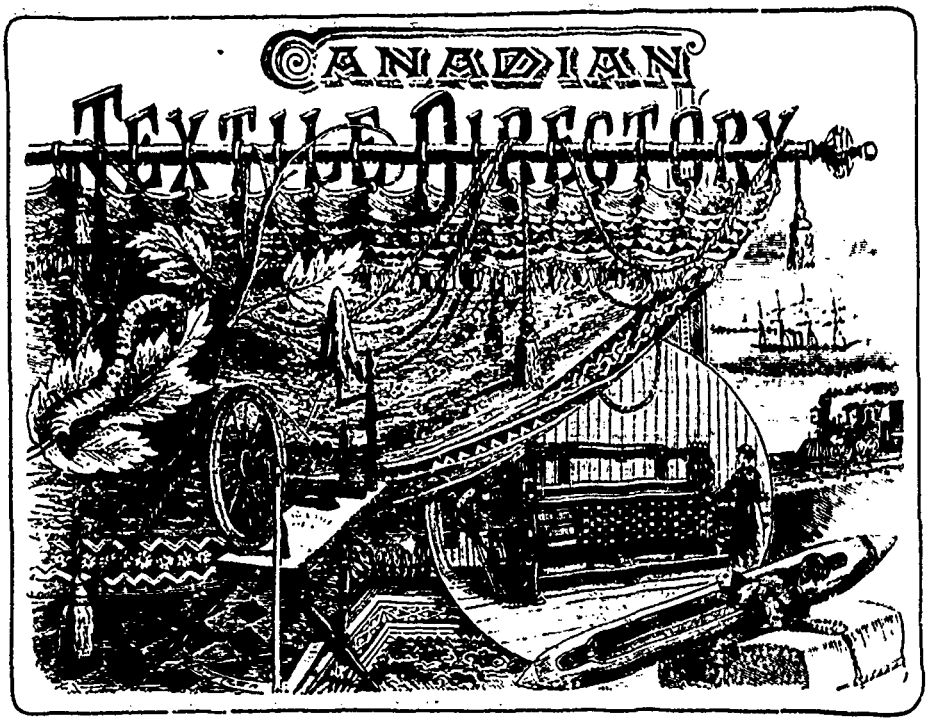
Summer corsets of pongee, etc

Cambric nightgowns having the turnover or Toby neck frilling

Black mohair braids for cape and dress trimmings.

Fancy hairpins and combs of shell and celluloid.

A COMPANY has been incorporated under the title of the Gibbs, Franchot, MacLaren Company (Ltd.), Buckingham, Que. Besides several other industries, the company, whose capital is to be $50,000, propose the erection of woolen and cotton mills.



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It gives lists of all Manufacturers' Agents, Commission Merchants, and Wholesale and Retail Dealers in the Dry Goods and kindred trades of Canada. Also, Statistics, Tables of Imports and Exports, Customs Tariffs of Canada Newfoundland and the United States, the Canadian Boards of Trade and Textile Associations, and other information. The Third Edition includes also the Trade of Newfoundland.

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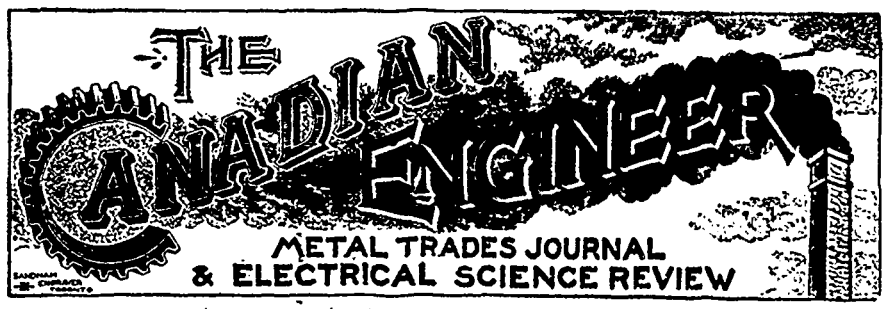

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THIS Journal is devoted to the interests of Mechanical, Electrical and Mining Engineers; Stationary, Marine and Locomotive Engineers, Sanitary Engineers and workers in the metal trades, Machinists and Iron and Brass Founders, and generally to Mill-owners, Manufacturers, Contractors and the Hardware trade.

The *Canadian Engineer* has been received in the most flattering manner by the press and people whose interests it serves. Among the many press notices are the following:—

"There are some suggestive editorial notes, besides descriptive and technical articles and a wealth of short Canadian notes. It fills a distinct place in colonial journalism."—*Electrical Engineer, London, Eng.*

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TEN YEARS OF TRADE WITH BRITAIN.

We give below a summary of ten years of textile exports from Great Britain to Canada, compiled from the British Board of Trade returns. We may explain that the item of haberdashery for 1884 and 1885 is an estimate, and that recent changes in the classification of silks prevent us from giving full and correct returns. We do not give the returns for the individual month of December in this issue; but we may mention that in most items there was a considerable decrease in the value of exports for December, 1893, compared with that month of the previous year.

	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.
	£	£	£	£	£	£	£	£	£	£
Raw wool	15,579	36,958	32,276	18,317	10,153	26,914	24,173	25,035	21,623	22,310
Cotton piece goods	578,172	629,195	634,158	620,378	499,230	494,752	404,417	420,005	453,017	515,711
Jute piece goods	.....	.....	.....	.....	.....	92,278	91,444	106,811	114	137,860
Linen piece goods	157,791	145,287	153,242	178,039	149,116	181,249	138,343	142,527	17[illegible],7	139,406
Silk broad-tuffs	20,564	24,186	287,672	7,501	17,521	6,710	3,433	3,876	.....	.....
" ribbons	10,142	10,485	8,338	7,097	3,893	1,788	496	538	.....	.....
" laces	.....	.....	.....	.....	.....	.....	.....	.....	53,381	41,080
" mixed goods	97,948	63,929	98,540	74,149	70,822	54,974	34,985	44,136	66,438	70,990
Woolen fabrics	727,150	642,347	703,306	656,424	539,691	497,132	336,417	335,792	386,163	343,977
Worsted fabrics	502,868	465,820	599,485	626,710	488,418	640,824	513,354	588,581	637,042	661,949
Carpets	191,926	183,979	216,329	240,910	186,993	221,291	171,860	206,695	201,405	227,607
Apparel and Slops	*280,000	*240,000	260,397	227,080	291,904	331,285	346,568	377,408	395,676	338,091
Haberdashery	696,804	507,217	480,699	535,946	436,683	432,940	373,201	401,684	394,784	252,483
*Estimated	3,278,944	2,959,403	3,222,517	3,212,551	2,694,424	2,982,037	2,443,691	2,653,088	2,900,716	2,751,464

THE RISE AND DROP SHED JACQUARD.

The rise and drop, or rise and fall shed jacquard, as it is sometimes called, is constructed on the closed-shed principles, and like the single-lift machine has one hook for one needle. The filling of the machine is identical with the single lift, and often a raise and drop jacquard is used as a single-lift machine by bolting fast the hook plate.

C. Alford, in the *Manufacturers' Gazette*, describes the machine in detail as follows:

"One needle controls one hook, the two being kept forward, in position to be indicated by the cards, by a spiral spring on the shank of the needle. The hooks are raised by a griffe as in the first-described machine, and rest likewise on a perforated-hook plate. Instead, however, of this hook plate being stationary, it moves at the same time and in the opposite direction from the griffe.

"At the closing of the shed the griffe is down and the hook plate up, thus placing the hooks in their central position, and the relative position of griffe and hook plate is such that the hooks project above the former the correct distance. The advancement of the perforated card forces back those needles and hooks opposite a blank space, and leaves those hooks opposite a hole standing in place to be caught by the rising knives of the griffe; as the griffe rises the hook plate sinks and carries down all those hooks pressed back by the card. The warp threads have been brought together in the centre of the shed, so the griffe rises to form the top shed, while the lowest position of the hook plate gives the bottom-shed line. Thus all the hooks, and consequently all the warp threads, move at each pick of the loom exactly as in a broad, fancy, closed-shed loom, whereas in the single-lift jacquard the threads forming the top-shed line are the only ones to move, and they move through the entire distan

"Rise and drop jacquards are known as single and double-lever machines, and whether single or double lever must be driven from the crank shaft of the loom.

"The so-called single-lever machines really have two levers, for from the first or main lever they operate an auxiliary lever which moves the hook plate. One maker attaches these two levers so that the secondary one passes over the centre when the hook plate is up, thus causing a dwell at that point, the advantage claimed being that the plate reaches its highest point before the griffe deposits its hooks thereon, and the plate being stationary for the period that the lever is passing over the centre and back again, the hooks are deposited easily and quietly, so there is none of that jar and agitation of the lingoes common on rise and drop machines.

"The two-lever machine is driven from a double crank on the crank shaft, and the jacquard has two large levers, one to move the griffe and the other the hook plate. The long reach of harness cord in any jacquard is subject to atmospheric changes, and the cords are often oiled to prevent much alteration in their lengths, but no dressing will prevent the atmosphere from altering the length of the cords so as to change the position of the harness eyes with relation to the breast beam and lay of the loom. In most jacquards this alteration is adjusted, when so great as to affect the correct working of the parts, by shinnying up the loom or the jacquard.

"The makers of the so-called two-lever jacquard claim that they have the best adjustment on any machine, for it is simply necessary to change the screw connection at the double crank the same on each screw in order to raise or lower the harness eyes the correct amount.

"The double lift jacquard is more expensive than either of the other styles, the additional cost coming in by virtue of its construction. There are two sets of

hooks raised by separate griffes, one griffe being up while the other is down, and they move one way each pick. A looped-tail cord is fastened to two corresponding hooks, an end being attached to each hook. At the centre of the tail cord is tied the harness cord, which passes down under a glass rod to the comber board and carries the harness eye as in any other jacquard.

"Sometimes a metal link is attached to the two hooks and the harness cord attached to the link, the maker of which claims certain advantages from the use thereof, which will be described later. When one card cylinder is employed one needle controls two hooks, and these two hooks operate one tail cord as described above. The knives of the griffe are made of sheet steel and the hooks are made long at the end so as to hook well over on the knives.

"While the hooks are down they rest on the hook plate, and a blank space on a card will force both hooks back, but if one hook be on a knife, and consequently up, and the advancing card as a blank space, the hook that is down will be forced back, and the hook that is up must bend between the hook plate and where it is connected with the knife of the griffe. The bending of the hook under these conditions shows the necessity of a long and pronounced hook over the sheet steel knife to prevent its being forced off. The card is subjected to considerable additional pressure in a double-lift jacquard, for it has to bend the hook as described above, and also force back the spiral spring on the shank of the needle, which must be strong enough to keep the two hooks up in place.

"When one needle controls two hooks the single-card cylinder indicates the needles once each pick; but there is another style of double-lift jacquard where there are two sets of needles, one for each set of hooks, and consequently there is a card cylinder for each set of needles. One set of needles is placed above the other, and a cylinder indicates its needles but once every two picks of the loom, thus indicating the hooks when they are down on the hook plate, so there is no occasion for bending the hooks, as in a single-cylinder machine.

"The double-lift jacquard has two levers for running the griffes, operated by a double crank on the bottom shaft of the loom, provided the loom is geared two to one, or from a double crank geared two to one off the crank shaft, and running on a stud fast in the loom frame. The rise and-drop jacquard is often called a double-lift machine, because there are two motions in its operation, but it is incorrect so to name it, for a double-lift machine of any style is always understood to complete its cycle of motion in two picks.

"The general features of the double lift jacquard being understood, it may be interesting to follow a description of the formation of the shed made by the machine. We will start with both hooks down; then one griffe is up and the other griffe down. The card indicates "up" so when the griffe raises it carries one of the two hooks with it, thus moving the warp thread from the bottom shed line, where the weight of the lingo placed it, to the top shed line. When the lift is complete the other griffe reaches its lowest position, and the next card indicates "up" so the second hook is carried up by the rising griffe, but it is only working against its slack end of the tail cord, and as the first griffe descends while the second griffe rises it is evident that the warp thread must descend until the two griffes meet in the centre of their motion, then the rising griffe carries the descending warp thread back to the top shed line again. So it is plain that the lingoes keep the bottom shed line stationary, but that the top shed line moves to the centre of the shed every pick. However, it is an open shed motion, for the shed but half closes and then opens again for the passage of the shuttle.

"When the tail cord is used the change of direction of motion of the top shed line threads is very abrupt; the descending griffe is moving at its quickest point, and the rising griffe is also moving at its quickest. This abrupt stoppage of descent and sudden upward motion causes a jar, and the substitution of the metal link for the tail cord is claimed to greatly ease this jar, for the downward motion of the thread is retarded and the upward movement made more gradual where the griffes pass each other."

THE LOAD AND SPEED OF BELTING.

F. W. Taylor recently read a paper upon this subject before the American Society of Mechanical Engineers, in which he stated that from an experiment made by himself, it seemed that a total load of 111 pounds per inch of width, or 358 pounds per inch of section of belts, was too great for economy, 54 pounds per inch width, or 114 per inch of section being far more economical and satisfactory. Evidently, then, the most economical total load for belting must lie between 174 pounds and 357 pounds per square inch of section of belt. The above experiment did not, however, furnish sufficient data for accurately determining the most economical total load for belting, although it fixes two limits beyond which this load must lie, and demonstrated beyond question that the hitherto assumed "economical total loads" were entirely too high. The writer was, however, obliged, as all previous experimenters on belting have been, to arbitrarily state what he believes this total load to be.

For several years past the writer has used the following rules with satisfaction, and he believes them to represent the most economical practice:

The average total load on belting should be 200 to 225 pounds per square inch section of belt.

Six and seven-ply rubber belts, and all double leather belts except oak-tanned and fulled, will transmit economically a pull of thirty pounds per inch of width to the rim of the pulley.

Oak-tanned and fulled double leather belts will transmit economically a pull of thirty-five pounds per inch of width.

The most economical speed for belting is 4,000 to 4,500 feet per minute.

The writer had recently had a most unfortunate but interesting opportunity of comparing the ordinary rules for belting with the above rules. For three years past he had been engaged as a general manager of a company building and organizing two large sulphite pulp mills, in which about 3,500-horse power is transmitted by belting, this power being transmitted in units varying from 1,000-horse power to a belt down to a few horse power per belt. The shafting ran night and day throughout the week, from Sunday to Sunday, without a shut down. Through a misunderstanding during the absence of the writer at one of the mills, one-half of the other mill, aggregating about 900 horse power, was belted under the following rule, which is believed to be about an average of the ordinary belting practice:

"A double leather belt, or six to seven-ply rubber belt, will transmit 65 pounds pull per inch of width to the rim of the pulley."

The speed of the belting was from 5,000 to 6,000 feet per minute.

About one-third of the belting in the mill was leather, and two-thirds rubber.

On the return of the writer to the mill, the second half of the mill was belted on the basis of 30 pounds pull per inch of width of double belt transmitted to the pulley, and the belt speed of 4,000 to 4,500 feet per minute.

It is safe to say that the belting of the first half of this mill (ordinary rule) gave one hundred times as much trouble as that of the second half. In fact, the belting proved to be the chief source of trouble and expense in running the first half of the mill, owing to the frequent interruptions to manufacture caused by it; while that of the second half ran from the start with almost no trouble.

This had proved to be a most emphatic, though expensive, confirmation of the results of the nine years' experiments above described.

Regarding the speed of belting, it was to be seen that, at moderate speeds, surely the speed of the belting has little or no effect on its durability, since the shifting belts, which lasted so much longer than the cone belts, ran about twice as fast.

When the speed, however, becomes sufficiently high for the centrifugal force in rounding the pulleys to play an important part in increasing the "total load" of the belt, it becomes a most important element affecting the life of the belting.

The writer had adopted a speed of from 4,000 to 4,500 feet per minute as the most economical belt speed for several reasons, one of which is that belting running above this speed has a great tendency to run in waves on the slack side, and flop about and oscillate from side to side of the pulleys, and so cause rapid wear, this tendency being greater and more dangerous as the width of the belt with relation to its thickness increases.

The principal reason for adopting this speed, however, is that, when the centrifugal force is taken into consideration, a total load of from 200 to 225 pounds per square inch gives a maximum of efficiency when the belt runs at 4,000 to 4,500 feet per minute.

In this connection he wished to call attention to the remarkable formula developed by Wilfred Lewis for determining the maximum economical speed of belting corresponding to given total load. The writer regards this as one of the few valuable belting formulæ deduced exclusively from theoretical considerations, and as its value appears to have been rather overlooked, he quoted from Messrs. Lewis & Bancroft's experiments, as follows:

V = velocity of belt in feet per second.

S = working strength of leather in pounds per square inch.

The velocity at which the maximum amount of power can be transmitted by any given belt is independent of its arc of contact and coefficient of friction, and depends only upon the working strength of the material and specific gravity. From equation we obtain for the maximum power of leather belts the condition: $V = \sqrt{28\ S}$; and for any other material whose specific gravity is Y, we find $V = 5\sqrt{\frac{S}{Y}}$. If we insert in the above formula the total load of 200 pounds, which the writer believes to be the most economical load, we have 4,500 feet as the speed of maximum efficiency of the belt.

THE MANUFACTURE OF GINGHAMS.

When the quality, colors, etc., of the proposed ginghams have been decided upon, the order is given to the dyer to dye so many warps, such and such colors and shades.

After passing through the dyer's hands, it is delivered to the dressing room to be prepared for the looms. Up to the dressing room the method of getting the work through is about the same in all mills; it may differ in small details, such as the length and number of ends it is deemed advisable to run in the warps, in order to get the greatest economy both in the dye house and subsequent operations, but substantially the methods of making the warps are identical in mills on this class of goods in different sections of the country.

But in the dressing room there are

TWO DIFFERENT METHODS

of preparing the work for the loom. In brief, by one system, the yarn is run through the slasher on to the loom beams, and in the other system the yarns are sized in the chain, and then they are wound on to the loom beam on a beaming machine.

In the first method the required number of ends of each color to form the desired pattern is wound by a beaming frame on to the slasher section beams, which are then placed behind the slasher; the ends are taken through the size boxes and then taken round the drying cylinders, or on a hot air slasher, through the chambers

heated by coils of steam pipe. After being dried, the yarn passes on to the loom beam upon which it is wound. While passing from the drying cylinders to the beam the yarn passes over the lease bars, which are used to separate the threads, on then through the slasher comb, which guides it on to the beam.

On the regular slasher for gingham work there are usually two separate size boxes, says a writer in the *Textile Manufacturing World.*

The white and very light shades are run through one box, and the dark colors through the other. If both dark and light colors are run through the same size box, the dark colors will tinge the size, and the light colors will show this dark size.

On the coarser kinds of work some manufacturers claim that the hot air slasher is the only kind to use, because when dried by the hot air, the thread retains its roundness, while the method of drying it on cylinders tends to flatten out the portion that comes in contact with the cylinder. But this theory does not seem to be borne out very well in practice, and the style of slasher adopted as a rule is dependent upon the style of machine to which the man has been accustomed.

In the second method of preparing the yarn for the loom, the warps containing the required number of ends are placed back of the beaming machine; they are then passed around drag pins, in order that the drag on each section can be kept alike. This is necessary in order to have them run on evenly; while being wound on, the beamer notices how the cut marks are coming up, and should one warp be running ahead of the others, he puts a little more drag on it, or takes some off, should it be running behind.

From the pins the yarn passes to the drag rolls, which are weighted by drag straps and levers, so that the tension can be regulated to suit the work being run. From the drag rolls the yarn goes to the beam, and the distance that the drag rolls are placed from the beam has quite an influence on the way the yarn opens. Sometimes either from there not being sufficient room, or else to suit some one's idea, this distance is made very short, so that the yarn does not have a fair chance to open before it gets to the rave or reed. I have found sixteen feet a good distance to set them, and on some classes of work would recommend a greater distance, say eighteen feet.

In some mills a coarse rave or reed is used to guide the yarn on to the beam, in others the yarn is drawn through a reed; this last way is adopted where it is especially desirable to open the yarn as thoroughly as possible, and although it makes the cast of the beaming department come a bit higher than the common method, its good effects are shown in the way the warps work in the looms.

I have seen them in some mills where they used a reed to run the yarn from, take a stiff bristle brush and run it back from the reed, so as to open the yarn as well as possible, then run the reed back as far as the warp has been opened by the brush, then the length of warp so treated is run on the beam, the beamer stopped and the same operation repeated. It is rather a slow and expensive way, but the results are good.

A good many of the beamers as now built have a stationary expanding comb, similar to those used on warpers and slashers, and, by using them, better wound beams are turned out on the average than when the yarn is guided solely by the rave in the hand of the beamer. A good man, of course, will do good work by any method, but in the hand of a careless beamer the rave makes a good many poorly wound beams; it is so very easy for him to shift it a little and have the yarn pile up on one side against the beam head, while the other side will be low.

There are, of course, a number of different styles of beamers made, but they may be divided into two kinds; in one, the loom beam is driven by a dog from the driving shaft, and in the other it rests upon a dividing drum. The latter style of beamer is very seldom seen here, but it has one great advantage over the other style, inasmuch as on it the yarn is wound at a constant speed without the adjusting of gears or changing belts from one cone to another on a set of step cones. Whatever style of beamer is adopted, however, the great thing is to have a good system of doing the work and have it followed. When a beamer slights his work, it means extra trouble for the weavers every time. The habit of letting a lost end go sometimes to save the trouble of finding it, and also of twisting the ends instead of tying them, are habits that should be stopped.

TEXTILE MACHINERY DEVELOPMENTS.

The British Board of Trade now makes a separate classification of textile machinery in its returns. The figures for the past year are rather striking, as they show the enormous aggregate of the increase in the production of textile fabrics which is now going on over the world. When one reflects that Great Britain herself is supplying the weapons of competition in this very trade in which she had, till a comparatively recent period, almost a monopoly in the world's markets, one naturally asks where will it end. Is every country in the world to go into textile manufacturing till Great Britain is left with only the making of machinery to fall back on, or will she hold her own by the invention and development of new processes or new lines of fabrics not yet made, or perhaps thought of? These are questions which can be better answered "after the event" than now, but here are the figures of the values in sterling money of the shipment of textile machinery and mill work of Great Britain in 1893:

To countries in Europe	£2,998,648
To United States	488,664
To countries in South America	337,219
To British pssessions in South Africa.	5,759
To British East Indies.....	950,187
To Australasia	5,414
To other countries.....	475,367
Total.....	£5,261,198

The figures for Canada are specified in the report before us. In the case of the United States, it will be borne in mind that the year was one of exceptional dulness in this branch, but it must be remembered that the States produce large quantities of textile machinery for themselves. Allowance being made for these two facts, and a third factor—the production of textile machinery in European countries like Germany, France and Belgium—the advance of the world in this sphere of industry is revolutionary, to say the least.

A novel procession was witnessed one day last month in St. John, N.B. It consisted of ninety-two sleds, all gaily decorated with the Union Jack, and all fully laden with Canadian cottons. This represented the receipts of purely Canadian goods at Manchester, Robertson & Allison's warehouses. A large number of people turned out to witness the great display.

It is stated by a Manitoba journal that numbers of dogs that have run wild in the vast unsettled and wooded territory that lies north of the Lake of the Woods have become crossed with the wolves, and that a new and strange animal has appeared. The beast is peculiar in character, and the fur is much valued by American dealers, who eagerly purchase all the skins that can be procured. The article of fur is called by some high sounding name, and when made up is sold as something rare and odd.

The recent investigations of Mr. Ogilvie, of the Canadian geological survey, show that the musk-ox will soon follow the career of the buffalo. The plain buffalo has been hunted to extinction, and the wood buffalo, of which there never were but a few small herds in the wooded northern regions, will soon be exterminated. The musk-ox, whose robes are highly valued, has escaped chiefly because of the remoteness of his habitat, but adventuring hunters are seeking his gore and hide, and he too will soon be chased off the earth. We heartily endorse the suggestion of Mr. Ogilvie that a close season for hunting this animal should be fixed, and even then it will be hard to preserve him.

Some years ago the Government of Germany prohibited manufacturers from discharging foul water or refuse into the rivers and streams. As a consequence of this manufacturers set about to utilize their wash products, and the value of by products made up from what had hitherto gone to waste is greater in Germany than in any other country in the world. At the Chicago Fair one woolen manufacturing firm showed this by a number of glass cases, in which the wool was shown in all its processes. One showed the wool, another the dirt and refuse from it, and others exhibited the grease, soda, potash, salts, refined alkali, and other products made from this waste, and lastly, the pure water left as the last residue. All these were made at a profit, and it is evident from such an exhibit that the Germans have brought economy down to one of the fine arts.

In conversation with a representative of The Journal of Fabrics, John H. Parks, president of Wm. Parks & Son, Ltd., operating the two large cotton mills in St. John, expressed views on the tariff question which are rather divergent from those known to be held by many others interested in cotton manufacturing in Canada. Mr. Parks takes the broad ground that a duty put sufficient to prevent the Americans from making a common slaughter ground of the Canadian market is ample, and that any duty which does more is excessive. He thinks that an ad valorem duty of 35 per cent. on any line of goods now made in Canada is enough, and is willing to admit that in some lines there is now more duty than is needed in the home manufacturers' own interests. By improved methods the home manufacturers ought to be prepared for a gradual reduction in the tariff, and those manufacturers who could exist on a low scale of duty have a better foundation for future prosperity than if they depended for their existence simply on a high rate of protection.

In speaking recently of the cotton crop estimates we alluded to the discrepancies in the calculations made of the total crop in the United States, and the probability of there being a far larger crop than even official estimates concede. The following extract from the letter of a New York house shows that this underestimating, or to speak more plainly, falsification of the true condition of the crop in hand, is shamelessly general among the cotton growers: "We know from several country accounts that we get ourselves that the farmers are not to be relied upon. We had an instance the other day in which one man telegraphed the stock in Farmersville, Tex., as being only 300 bales, and two days afterwards a fire occurring in that place, 700 bales were burned, and they succeeded in saving 2,000 more in a different warehouse. From another country town in which they reported only 300 bales, a despatch was sent to one of our friends offering 1,900 bales." And yet it is upon such reports that a large part at least of the official statistics are based.

We see it stated by some Ontario papers that the Ontario Government propose, during the coming season, to reduce the price of the binder twine made at the Central Prison to cost. There was a time when the price of binder twine was perhaps higher than the necessities of trade required, and this journal approved of the action of the Provincial Government so far as it went last year, but we cannot follow them in the policy now said to be initiated. The moral right of a Government to put its products of prison labor in competition with the free labor of the country is itself questioned by many thinkers, but without going into that problem, we think few would be found who would justify the Government in putting such a product on the market at cost. To do so under the circumstances would be neither good morals nor legitimate business, and we can only hope that the Ontario Government's plans have been wrongly reported. It is a most unfair method of competition against the outside industries

in this trade that have to live by free labor and a fair profit. By the way, the action of the Dominion Government is still less to be approved of in starting in the binder twine trade at the Kingston penitentiary. The precedent they have set in letting out the work of buying and fitting up the machinery as a job is a most dangerous one. If reports are true, it will prove a very expensive part of machinery, and the whole transaction needs to be very closely looked after in the interests of the people.

WATERED silks—moires—have received marked attention of late. The moire idea pervades everything in broad silks and ribbons, and it is expressed in a far greater variety of effects than was ever known before. It is rather difficult to say just which of the moire styles lead—probably moire antique does. Moire miroir is also a favorite. Black moire antique can boast of the highest approval of Parisian modistes and fashionables. The clouded and changeable moires are also in favor. Satin also is in a good position, and has, it is predicted, a brilliant future before it. Present indications are that all the best weaves of satin-surfaced goods will be favorites in the spring, and also in the autumn of 1894. Satin duchesse and satin rhadames are good. Double-warp surahs, peau de soie, and taffetas are in the list for spring. Some of the new satins are figured with tiny dottings, strewn regular or so as to compose waves, stripes, and zig-zags. Watered silks also are dotted with spots set less closely together. Others of the new moires have a ribbed texture, which does not preclude the introduction of satin spots, or the addition of a pattern printed in chine tones or brocaded upon it.

AMONG the surprises at the late World's Fair was the prominence of the exhibit made in woolens by Spain. We all know that the merino sheep is a native of Spain, or at least attained its highest perfection as a fine wool producer in that country; but most people are under the impression that Spain has gone down hill industrially, as well as politically, since the palmy days of Philip II. It is a fact, however, that the Spanish exhibit of woolen cloths was larger than even that of Great Britain, and was fifty times as large as that of France. On one side of what was called the Woolen Court were displayed the goods made by the members of the corporation of manufacturers of Sabadell, in the Province of Barcelona. It was a collective exhibit, to which 22 manufacturers contributed. They showed 300 kinds of cloth for men's wear, and about 50 varieties of women's shawls, all made from pure Spanish wool. These goods were beautifully arranged in folds some 12 feet in length, each piece being marked with the maker's name, the name of the goods, and the price. The material, workmanship, and coloring of these cloths leave nothing to be desired. The thread in most of them is quite tightly twisted, and they are closely woven. For these reasons they are not so soft as most of the cloth made in other countries, but in delicacy of shade and fine finish they have few equals. This corporation of woolen manufacturers was founded in 1559, and has enjoyed a steady growth, except during some protracted wars, till the present time. The yearly production amounts to 6,500,000 lbs. of finished cloth. The cloth enjoys high reputation in all the countries bordering on the Mediterranean Sea.

A BERLIN report on new ideas in silks says: Entirely new are moire velvets in plain and in changeable, which may, however, not find extended consumption before next winter. In the novelties for the coming spring are many taffetas, light crepes and chevron stripes in merveilleux, these latter being serge-like merveilleux with fine but distinct diagonal stripes. In taffetas many novelties are shown and these promise to give good results. They will be used for dresses, skirts and blouses. Warp-printed taffetas, plain taffeta grounds with swivel effects, changeable taffetas with swivels, and plain taffetas in all modern shades are seen. Fine striped taffetas in blue and white and in blue and red are shown. Many taffetas with small dots have also been made. Crepes are shown principally in changeable grounds with small dots, stripes. blossom or flower designs. The chevron-merveilleux are in one-color and two-color grounds, and in changeable, the fine chevron stripes showing in contrasting color. Satin liberty is a light, soft tissue. It is met with in printed effects in small design, but not in loud combinations. In surahs are found nice small stripe effects in white with red, with blue and with black stripes.

THIS is an age in which art is doing her best to rival nature in supplying the bodily needs of man. In a great many cases experiments have demonstrated that "the thing can be done," but to be able to make this demonstration and to make the process a commercial success are two different things, as the instance of producing artificial, or cellulose, silk will show. We have had during the past few years not only artificial silk, but we have had paper underclothing, paper knitted socks, and even paper waterproof overcoats, while a good many rubber overcoats have been sold in this country that were a great deal less durable than any paper garment could be. Then we have had dresses and curtains made from finely woven glass—exhibited, so far, as curiosities—and even iron has been rolled out into filaments and threads from which fabrics have been made. But now we hear of corsets, and collars, and cuffs being made from aluminum. It is rather chilling to the ardor of a lover to imagine the object of his warm affections being enveloped in a casing of cold aluminum; but a collar of that metal cannot be more frigid than the ones of linen which are now in vogue. It is a wonder that the linen collar has held sway so long as it has, for a more unscientific enclosure for the neck could never have been invented and promulgated by the most malignant foe of the health of mankind. No fabric is so cold as linen, and hence its especial suitability to hot climates, and hence also its adoption for sanitary purposes by the Jews

and Egyptians. But to put a band of material as cold as steel round the neck—the tenderest section of the human frame—in a Canadian winter, would be cruelty of the most wanton kind if it were forced upon us contrary to our will. But inasmuch as we bow like so many slaves to the dictates of fashion we suffer the willing martyrdom. And yet no doubt a vast proportion of cases of catarrh and throat diseases could be traced positively to the cold linen collar. A few Canadians do revolt from the thraldom, but they are in a minority smaller than Gideon's band or the Spartans who stood against the hosts of Persia at Thermopylae.

AN ODE TO CANADA.

Awake, my country, the hour is great with change;
Under this gloom which yet obscures the land,
From ice-blue strait and stern Laurentian range
To where giant peaks our western bounds command
A deep voice stirs, vibrating in men's ears
As if their own hearts throbbed that thunder forth,
A sound wherein who hearkens wisely hears
The voice of the desire of this strong North—
This North whose heart of fire
Yet knows not its desire
Clearly, but dreams, and murmurs in the dream.
The hour of dream is done. Lo, on the hills the gleam!

Awake, my country, the hour of dream is done!
Doubt not, nor dread the greatness of thy fate,
Tho' faint souls fear the keen, confronting sun,
And fain would bid the morn of splendor wait,
Tho' dreamers, rapt in starry visions, cry,
"Lo, yon thy future, yon thy faith, thy fame!"
And stretch vain hands to stars, thy fame is nigh,
Here in Canadian hearth, and home and name;
This name which yet shall glow
Till all the nations know
Us for a patriot people, heart and hand,
Loyal to our native earth,—our own Canadian land!

O, strong hearts, guarding the birthright of our glory,
Worth your best blood this heritage that you guard!
Those mighty streams resplendent with our story,
These iron coasts by rage of seas unjarred,—
What fields of peace these bulwarks will secure!
What vales of plenty those calm floods supply!
Shall not our love this rough, sweet land make sure,
Her bounds preserve inviolate, though we die?
O, strong hearts of the North,
Let flame your loyalty forth,
And put the craven and base to an open shame,
Till earth shall know the Child of Nations by her name!

—CHAS. G. D. ROBERTS.

THE SWISS SILK TRADE.

The silk trade, which is the oldest industry in Switzerland, employs 59,000 persons, and thus ranks second in importance among the trades of the country. Silk spinning and weaving, which have been carried on as a home industry ever since the 13th century, are now fast becoming a branch of factory labor. The number of handlooms still in use is, however, very considerable, and only 27,819, or about 38 per cent of the total number of persons employed, work in factories. Silk is cultivated in the Canton of Ticino, where it occupies some 2,000 hands; the other principal branches of the trade are the manufacture of silk yarn and sewing thread, coarse spinning and weaving. Stuff weaving is carried on chiefly at Zurich and ribbon weaving at Bale. Switzerland produces, in proportion to its population, eleven times as much silk ribbon as France and forty times as much as England. The majority of persons employed in the trade are women, and in the weaving and winding departments the proportion of females reaches 92 per cent. Weavers, both men and women, earn an average wage of 1 fr. 28 c. to 1 fr. 38 c., and throwers 1 fr. 06 c. to 1 fr. 31 c. per week. These figures include home and factory workers, and the average is reduced by the fact that the wages of old persons and children are included in the calculation. In 1882 the average annual wage of silk winders employed in factories was 354 fr., that of throwers 460 fr., and that of weavers 704 fr.

The following details with regard to the wages of silk-workers were given by Dr. Schuler in his report for 1887. He states that the general average of women weavers is 3 fr. a day, that of spoolers 1 fr. 50c. In one large factory, where a public agitation had been made about the low rate of wages, it was found that the fortnightly average for weavers was 32 fr. 80 c., warpers 30 fr. 59 c., assistants on "self-actors," 33 fr. 85 c., carders 25 fr. 64 c., spoolers 30 fr. 9 c., winders 24 fr. 71 c. woofers (mostly children with irregular work) 18 fr. 19 c.

Weaving is generally paid by the piece, and the total earnings therefore vary according to the skill and speed of the weaver, in the other department of the trade timework is the rule.

Silk-workers mostly belong to a comparatively well-to-do class. The women are the daughters of farmers, and when they marry they generally leave the factory. They are seldom obliged to depend on their earnings for a livelihood, and enter the trade chiefly because it is a clean, pleasant occupation, and because their earnings are of great assistance to the agricultural enterprises of their families.

The presence of oxide of lead in the jacquard weaving rooms was formerly injurious to the health of the workers, but this danger was removed by the Federal Circular of 1884.

"The future of the Swiss silk industry is regarded with considerable anxiety. The high rates of the new French tariff practically close the French market to many articles of Swiss manufacture, while the new treaty with Germany imposes a duty of £30 per quintal on silk tissues. The development of the silk industry in the United States will further tend to decrease the exports to that country, while the treaties recently concluded with Austria, Hungary, Italy and Spain are not considered by the trade as likely to advance their business relations with those countries."

COLONIAL WOOL SALES

At the London wool sales this month French buyers made large purchases. American buyers bid fairly, taking about 1,200 bales during the entire series. Prices at the opening of the series were on a par with those prevailing at the close of the December sales. Thereafter they became less firm. The prices of best merinos were unchanged, while the others were ½d. lower. The finer crossbreds were also a ½d. lower. Coarse crossbreds occasionally sold ½d. better. Cape of Good Hope and Natal wools were from ¼ to ½d lower, with the exception of snow whites, which were ½d. higher. There were taken for export 140,000 bales. Home buyers took 89,000 bales, and 40,000 bales were carried forward. About 250,000 bales of Australian wool were offered and 25,000 were left on hand for the next sales, which will commence on the 27th inst. There was a good and large selection of New Zealand crossbreds. The following are some of the quotations for merino combings. Noorong combings, 9½d., W.W.W., 9d. to 10d. Combadell, 8½d., Eunonyharya, 9d., Broughton, 9½d. to 10d.; Elder, 10d.; Russell, 10d. to 10½d.; Gonn 8¼d. to 9d.; Welltown, 8½d. to 9d.; Terrick, 8d. to 8½d.; Lansdowne, 8d. to 8½d., Ellangowan, 8½d. to 9½d., Queensland, L.D., 8½d., Hawker Bungaree (Adelaide), 8d. to 9d. At the Cape and Australian wooled sheep skins sale, values for combings were about steady, with a slight easing off for clothing parcels. The East India tanned sheep skins were generally 1c. down from last sales. The importations from America rather upset the market for tanned skins.

THE JUTE INDUSTRY OF RUSSIA.

Although Russia is the most important flax-growing country in the world, the efforts of the Czar's Government to induce the farmers in the South, and especially in the zone of the famous black lands, to interest themselves in the growth of jute, have not so far proved successful. Prince Massaloki, of the Department of Agriculture at St Petersburg, has made a special study of the question, and has written an interesting pamphlet on the subject, giving the methods of cultivation adopted in other countries, especially in Bengal, together with the requirements of soil and climate Such an act may appear somewhat strange in a country like Russia, but it is quite true that, in a barbarous kind of way, the rulers of the Empire do occasionally devote themselves to other pursuits than the collection of heavy taxes or the baiting of Jews. There is already a jute industry in Russia, and the manufacture of bagging has greatly increased of late years, contemporaneously with a decline in imports of the manufactured article—a change due to the well-known effect of heavy Customs duties.—*Textile Mercury*

THE CARE OF GLOVES.

Gloves are by no means a minor factor as regards expense in a fashionable toilet, and a few hints regarding their care and purchase may not come amiss, remarks the *Dry Goods Economist*. If possible, let purchases be confined to gloves in superior quality, as such gloves fit more perfectly and are more durable in proportion than a number of pairs of equivalent value.

As to fit, the shape of the hand should be clearly defined and not restricted in its natural movements. Too short fingers are also to be avoided.

Devote a time of leisure for the preliminary trial. Have the hands cool and dry. To insure this they may be slightly powdered. See that each seam is *perfectly straight, working the glove on* smoothly and slowly, buttoning the second button first to relieve the strain, which is greatest at the first button.

In removing gloves, turn wrong side out and thus avoid stretching the fingers. Prior to putting them away, smooth out lengthwise.

THE NEW DIAZOTIZING PROCESS.

The importance which the producing of colors by diazotizing and developing on vegetable fibres has lately attained, has induced Wm. J. Matheson & Co. to issue a special sample card with a series of dyeings produced by this method, *which they will be glad to send to those interested.*

In some branches of the dyeing industry the want has been felt to produce in this way not only staple shades, as blues, browns and blacks, but also fancy shades as well as all other colors obtainable by developing on the fibre. Up to three years ago primuline was the only dyestuff suitable for developing on the fibre, and only by the introduction of black, blue and brown diazotizable Diamine Colors has a more general application of this process become possible.

Among the advantages which this process offers may be mentioned the following:

First.—Quick and cheap working, as no mordanting is required.

Second.—Superior fastness to washing of the dyeings produced, a large number of which are even fast to milling.

Third.—Perfect preservation of the cotton fibre, which in some cases even gains in strength.

This last claim has lately been confirmed by repeated tests made with cotton thread dyed in the cop with Diamine Black and developed, the strength of which was found to be by 30 per cent. better than that of the same undyed fibre.

The following is the method for dyeing and developing Diamine colors and Primuline:—

DYEING

(1) Boil for one hour using for each 100 lbs. cotton yarn Diamine colors required for the shade desired, and 30 lbs. common salt; or

(2) Diamine colors required for the shade desired, and 5 lbs. sal soda; 15 lbs. glauber salts.

(For water free from lime we recommend recipe numbered 1, for water containing lime, we recommend recipe numbered 2.)

For standing kettles about one-half the dyestuff used in the first kettle is required, and about one-quarter to one-third the quantity of mordant.

After dyeing wash in cold water, giving the yarn three or four turns, and pass into the

DIAZOTIZING BATH.

Prepare this bath by dissolving 3 lbs. nitric soda in one pail of hot water. Add this to the kettle filled with cold water; then add to the kettle 5 lbs oil vitriol or 10 lbs. muriatic acid diluted in one pail of cold water. Work the yarn 15 minutes, lift, rinse in cold water, giving three or four turns and *pass at once* into the

DEVELOPING BATH.

Prepare this bath by adding to the kettle filled with cold water, the quantity of developer dissolved as per instructions for each. Work the yarn about 15 minutes, or until the depth of the shade increases no more, rinse and finish.

(The diazotizing bath should be kept as cold as possible; the developing bath at 80° to 90° F.)

THE PRINCESS AS A LAUNDRESS.

SHE IRONED A SHIRT FOR A CANADIAN FARMER'S WIFE.

One day Princess Louise was walking without any attendants near her, when she came to a cottage. The only person visible was an old woman busily ironing one of her husband's shirts. The Princess was thirsty after her walk, and, stopping at the cottage door asked the old woman if she would kindly get her a glass of water. The busy old woman somewhat shortly refused to do so. "The spring was a little distance," she said, and she was busy ironing her old man's shirt, for he was going with her to see the Queen's child on the morrow.

The Princess, no doubt with a secret thrill of amusement, said that she would iron the shirt if the old lady would fetch her the water. The compromise was quickly agreed upon. The old woman went to the spring and the Princess did the ironing. When the old woman returned the shirt was handed over to her. Needless to say, it was nicely ironed.

In exchange for the glass of water the recent laundry woman informed the astonished old woman that she was the "Queen's child" The startled old woman took the shirt, declaring that her old man should never wear it, but that she would keep it forever as a memento of the "Queen's child."—*Woman at Home*.

D. SCHWERSENSKI, hatter and furrier, Montreal, has assigned to N. Jacobs. Heavy liabilities.

JAMES ALEXANDER & Co., dry goods merchants, Campbelltown, N B., assigned last month. Liabilities, $27,000. Assets and book debts about $13,000.

T. & W. MURRAY'S dry goods store at Chapleau, Ont., has been destroyed by fire. Loss about $25,000; insured for $11,000.

THE store occupied by John H Phillips, hatter, Halifax, N.S., was completely destroyed by fire last month. Loss (including building) $5,000; insurance, $2,000.

J. H GALARNEAU & Co., men's furnishings, Montreal, are endeavoring to make a settlement with their creditors. Liabilities $5,000.

As will be seen from their advertisement appearing in this issue, Robert W. King & Co., the Montreal firm of practical engineers and experts, are contemplating removing to Toronto. This will necessitate considerable changes in the firm's arrangements, but for further particulars we refer readers to another page.

RAW FUR MARKET REPORT.

MONTREAL, February 16th, 1894.

The continued poor reports from Europe and the United States as to the state of their markets have so demoralized the fur men here that it is quite impossible to give quotations Furs cannot be bought too cheap, and there is a certain prospect of a decline at the March sales.

THE WOOL MARKET.

TORONTO, February 19th, 1894

The wool business is still in a dragging condition. Although there has been considerable quantities of wool sold within the last month, it has been sold at prices that has left no profit to the dealers.

There was a little spirt in the United States some few days ago, but it collapsed, and wool is being offered at still lower prices

There seems to be a lack of confidence in the future. Our wool market is influenced, to a considerable extent, by that of the United States.

	Cts.		Cts.
We quote fleece wool, Canada combing fleece, from	18	to	20
Brashy clothing	22	"	..
Select fine clothing	24	"	..
South Down	26	"	..
Pulled wools, super	18½	"	19½
Extras, from	22	"	23½
B. A. white clothing (according to condition)	27½	"	31
Yellow B. A. clothing	25	"	27
North-West, unwashed	11½	"	12½

Foreign low wools remain steady in price and a fair demand.

CHEMICALS AND DYESTUFFS.

There has been more inquiry lately and the volume of business shows an improvement. Gambier has shown a steady improvement, and is now quoted at 4 7/8d. per lb. ex-store New York. Castor oil to arrive is easier. Bicarb soda on spot is scarce.

The following are present quotations:—

Bleaching powder	$ 2 50	to	$ 2 75
Bicarb soda	2 40	"	2 50
Sal soda	0 90	"	1 00
Carbolic acid, 1 lb. bottles	0 30	"	0 35
Caustic soda, 60°	2 50	"	2 60
Caustic soda, 70°	2 75	"	3 00
Chlorate of potash	0 22	"	0 25
Alum	1 40	"	1 50
Copperas	0 80	"	0 90
Sulphur flour	2 00	"	2 10
Sulphur roll	2 00	"	2 10
Sulphate of copper	4 00	"	5 00
White sugar of lead	0 07½	"	0 08½
Bich potash	0 10	"	0 12
Sumac, Sicily, per ton	75 00	"	80 00
Soda ash, 48° to 58°	1 50	"	2 00
Chip logwood	2 00	"	2 10
Castor oil	0 06¾	"	0 07
Cocoanut oil	0 07	"	0 07½

LITERARY NOTES.

A prominent feature of the February *Century* is its fiction, which has not a little variety of scene and style. In Mark Twain's novel of "Pudd'nhead Wilson" the action is advanced by a dramatic interview between Tom, the reputed white boy, and his mother Roxana, the negress. There is a full page illustration by Loeb. There is the first part of a four-part story by Mary Hallock Foote, entitled "Cour d'Alene," dealing with the labor troubles in the mining regions of Idaho "A Romance of the Faith," by Herbert D. Ward, is a piece of fiction, the scene of which is laid in Ur of the Chaldees, the hero being Abraham, the Father of the Jews. The illustrations by Castaigne show that remarkable draftsman in a new artistic vein, and are carefully studied from archæological history In strong contrast to the seriousness of this tale are two humorous stories, "The Guests of Mrs. Timms" by Sarah O. Jewett, a quiet study of New England rural life; and "Mr. Ebenezer Bull's Investment" by Colonel Richard Malcolm Johnston, a transcript of old-time life in Georgia. The incident embodied is one of the most laughable ever recorded by the author of "The Dukesborough Tales." G. W. Edwards contributes a short sketch—the first of several—entitled "P'tit Matinic' Monotones," relating to life on the northeastern coast of the United States and accompanied by the author's illustrations. In the group of posthumous papers by James Russell Lowell there is a short, pithy, and charming essay on "Criticism and Culture." There are two hitherto unpublished portraits of Washington, and an essay by Rev. J. C. Adams on Lincoln. There is an article by Mrs. Edmund Gosse on the home life and methods of work of Alma-Tadema, accompanied by a frontispiece portrait of the artist. The illustrations include sketches by Alma-Tadema, an engraving by Henry Wolf of his "Hadrian in England," and views of his remarkable house and studio, drawn by Pape and Malcolm Fraser. In personal sketches there are a contribution from the late General D. H. Hill setting forth "The Real Stonewall Jackson," and an interesting article on Nikola Tesla, the Servian-American electrician, by T. Commerford Martin, accompanied by a portrait. Mr. Martin's sketch is probably the first authoritative article on Mr. Tesla which has appeared in the leading magazines, it is the forerunner of an interesting article of a popular character by the inventor himself relating to his remarkable discoveries and inventions. "Hunting with the Chetah" is an out-of-the-way article on sport in India by J. Fortune Nott, to which Mr. Gilbert Gaul has contributed graphic illustrations. It is a substantial addition to *The Century's* papers on sport. A group of "Irish Songs" by Jennie E. T. Dowe presents a number of illustrations by Francis Day, and there are other poems by Henry Tyrrell, Stuart Sterne, Ella Wheeler Wilcox, Edgar Fawcett, and R. W. Gilder.

Among the Mills

An Irishman named McCraken proposes to establish a woolen mill at Mission, B C.

Clark's woolen mills at West Flamboro and Bullocks Corners, Ont., are running full time as usual.

A new 75-horse-power steam engine has been put in at the Richelieu Woolen Mills, Chambly Canton, Que

It is stated that last month over one hundred employees of Gibson's Cotton Mills, near Fredericton, N.B., were laid up with influenza

Joseph Marshall, engineer at the cotton mills, Maryville, N.B., met with an accident the other day, crushing his foot in the machinery.

Young Bros., Almonte, Ont., are building one of their new fulling mills for J. B Ferguson, to be put in at his woolen mill, at Innisville, Ont.

Mr. Hulbert, one of the proprietors of the knitting factory at Toronto Junction, has purchased the shoe and corset factory there and is now starting work.

The knit goods section of the Canadian Manufacturers' Association have been discussing tariff matters, and they will shortly lay their views before the Government.

Owing to the falling off in the demand for grey cottons, the Hochelaga (Montreal) mills have closed down, throwing a large number of hands out of employment.

The following officers have been re-elected by the Dominion Blanket Company: President, Robert McKay; E. A. Small, vice-president; and E. A. Robert, managing director.

Mr. Myles, proprietor of the Woodstock, N.B., Woolen Mills, states that in order to make room for their new departure in horse-blankets, etc., the mills will have extensions built.

The Cornwall Woolen Manufacturing Co.'s taxes will likely be placed at $300 per year, they having been exempted already for twenty years. They are running full time just now.

The twine factory at *Port Hope, Ont., has closed down owing*, it is said, to the action of the Government in establishing a twine industry in Kingston Penitentiary. Ninety men are employed usually.

George S. Plow, representing the Cornwall Mnfg. Company, has established an office in Toronto, his representative there being J. W. Scott. Donald M. Ewan, formerly agent of this company, is now in Manitoba.

The Yarmouth, N.S., knitting factory is at present closed down. Mr. Veits, the surviving partner, is anxious to make some arrangements with a new partner or manager for carrying on the factory to its full capacity.

The new mill in course of erection by the Dominion Blanket and Fibre Co. at Beauharnois, Que., will be 163 x 82 ft., four storeys high. The dye house will be 152 x 50, two storeys high, and the picker house 50 x 70 ft.

A. Sheriff has severed his connection with S. T. Willett, of Chambly, and has assumed the position of superintendent of Lomas & Sons' mills at Sherbrooke. Mr. S. Moore, the late designer, takes the former's place.

The new bleach-house and weave-shed of the Montreal Cotton Co., Valleyfield, Que., which are expected to be completed by the summer, will be three storeys high. The bleach-house will be 370 x 70 ft., and the weave-shed 220 x 70 ft. Nearly 1,000 looms will be added.

John Greenwood, late of the Hochelaga cotton mill, is now in charge of the yarn department of the Halifax mill of the Dominion Cotton Co. Mr. Wyatt, who formerly had this position, has retired from the cotton business and gone to farming. This mill has put in four new ring frames for weft spinning, each having a capacity of 360 spindles.

The affairs of the Merchants' Mnfg Co., St Henri, Montreal are in a prosperous condition. At the annual meeting, which took place the other day, the following were appointed officers President, A. Ayer, vice-president, G. Cheney, secretary-treasurer, W G. Cheney, and superintendent of works, Arnold Lawton

Humphrey's Woolen Mills, near Moncton, N.B., have recently had their capacity increased by the addition of a new twisting machine, a hand loom, and new carding machinery A machine for drying the cloth was also put it, taking in 60 yards of cloth every few minutes It is stated that the mills have averaged 305 working days each year for the last seven years

The Canada Cotton Mills Co are applying to Cornwall, Ont., council for a further remission of taxes for ten years. They also proposed a commutation of taxes on the remainder of their property there to $1,000 for ten years. A by-law was passed exempting their weave-shed from taxation for ten years. With regard to the other buildings it was resolved to tax them up to 40 per cent. of their assessed value.

The Eureka Woolen Mnfg Co of Eureka, near New Glasgow, N.S., have had a prosperous year. At their annual meeting the other day a dividend of 8 per cent was declared, while during the year two new looms and a broad shear had been added. The capacity of the mill is now three sets of cards. The officers for the year are. M. H. Fitzpatrick, of New Glasgow, president; Wm. Cameron vice-president; and J. P. McLennan, secretary. C. A Clark, formerly of the Charlottetown woolen mill, is manager.

A. F. Gault has been re-elected president, Chas. Garth, vice-president; and D. F. Smith, secretary-treasurer of the Montreal Cotton Co. The annual statement shows that the profits for the past year were $174,628.28, being about 15 per cent. on the capital invested A dividend of 8 per cent. was declared; $25,000 was put aside for wear and tear of machinery, and $19,000 devoted to the purpose of building new flumes. During 1893 the company paid $211,616 in wages Their capital stock is being increased to $1,400,000.

James Marshall, 182 Lansdowne avenue, has sent the *News* a sample of a plant which he says he found growing wild, and which may be cultivated to any extent in Canada The fibre has all the appearance of flax except that it is much coarser. A rope has been made from the material which presents an excellent appearance and exhibits great strength. Further experiments with this plant may result in the profitable cultivation of it for all purposes for which hemp is now used. City Surveyor Sankey, who was born in the flax district of Ireland, spoke very highly of the fibre. In his opinion a strong quality of twine or rope can be produced with it. At Rice Lewis & Co 's the young men who handle cordage expressed the opinion that it would answer the same purposes as hemp. Their examination, however, was only superficial, but a piece of the stuff was left with them for more critical examination. —*Toronto News.*

MORE ABOUT THE ST. ETIENNE RIBBON INDUSTRY.

As a supplement to what has already appeared in this journal about the ribbon industry of St. Etienne, we give the following from Francis B. Loomis, the United States consul in the French town:

The most important industry of this town is, perhaps, that of ribbon making, in which marvellous art and skill are displayed, and in which employment is given to about 70,000 people.

The silk industry was introduced into France from Italy at the beginning of the fourteenth century, when the popes established their residence at Avignon. This town, with that of Nimes, was for a considerable time an important centre of manufacture. Toward the beginning of the fourteenth century, by reason of conflicts between the small Italian republics, Italian silk weavers established themselves at Lyons. These emigrants were not well received by the ribbon weavers of that city, and finally were obliged to remove to Tours, where they prospered, and by their means that town became famous for its silk industry. Later on

more Italians left their country and settled in Lyons, and, being real artists in their trade, the population, perceiving the advantages of possessing such a stimulant to their own silk manufactories, treated them with a good deal of consideration. It was from this period that the silk industry became definitely established at Lyons. Later it spread to the neighboring localities, and in the course of a short time St. Etienne became, in its turn, the chief centre of ribbon manufacture, and it is here at the present day firmly established.

St. Etienne was, however, more prosperous fifty years ago than it is to-day. In 1833 the United States was the chief importer from this town; it also alone took a fourth of all that was manufactured, another fourth was used for home consumption, and the remainder was exported to England, Germany, Russia, etc. Consequently three-fourths of the production was exported, for at this period St. Etienne had the monopoly of new articles of ribbon manufacture of any real importance. Fancy ribbons were at that time in great demand, and St Etienne alone could furnish them. Twenty years afterwards Basle, Crefeld and Moscow became serious rivals, and the prestige of St. Etienne was much affected, but the great blow came from the United States when, after the war of secession, numerous ribbon manufactories were established at Paterson, N.J., which speedily developed, and at the present time almost meet the demands of the American market.

However, in spite of foreign competition, St. Etienne's ribbon production is at present four times greater than when it held undisputed possession of the markets of the world; but the manufacturers are obliged to content themselves with much smaller profits. The total production for the year exceeded 92,000,000 francs.

The number of looms in St. Etienne and vicinity is 22,000, of which 18,000 belong to the weavers themselves and are worked in their own homes, the remainder being owned by the large manufacturers. The average value of a loom is 1,500 francs, but there are some which cost from 3,000 to 5,000 francs, consequently the total value of the weaving plant exceeds 39,000,000 francs, of which two-thirds represent the savings and investments of the weavers. The number of persons engaged in ribbon manufacture (men and women) is put down at 70,000, the men for the most part working in their own homes, while a large portion of the young girls are employed in the manufactories or in sale and packing rooms connected with them.

The independent weaver generally possesses two or three looms; one is worked by himself, the other by his wife, and the third by a son or daughter or journeyman. The weaver's house contrasts strongly with that of the miner or gunsmith. It is generally scrupulously clean and might be considered decently furnished, that is to say, the furniture looks bright and clean and is of good quality, although there is of necessity but little of it, as the space is very limited. The apartments consist, in most cases, of two front rooms, serving for kitchen and bedroom (in many instances there is only one room to serve for both), and a large room at the back for the looms, furnished with two or three large windows (a window for each loom). The weaver, from the fact that he works in his own house and leads a domestic life, is in general of a much higher moral and intellectual standing than other artisans here. He is sober and industrious, having but one object in view—the well-being of his family. Although he suffers a great deal at times from enforced idleness by reason of lack of work, and though he has often to be content with small earnings, he never murmurs, but does what he can and hopes for better times. It is not to be wondered at, then, if he is able to economise a little when work is abundant, but it too often happens that the sum laid by in the favorable season has to be drawn upon before the year expires to provide for the necessaries of life during periods of dulness.

What are the daily earnings of a weaver at St. Etienne? The question is difficult to answer, because his occupation is dependent upon fashion, which, as everyone knows, is periodically changing. At one time fancy ribbons are in great demand, at another plain ones. So black, colored, wide, and narrow ribbons are at times preferred The amount he can earn depends, also, on the quality of silk furnished him. If it is of bad quality, it will often break, so that his time is wasted in tying and arranging the threads, consequently he will not be able to do the average day's work, which is 4½ metres. Again, the kind of ribbon he makes affects his earnings, on narrow ribbon he will earn less than on broad, and silk ribbon is less lucrative than velvet ribbon. In any case he is paid on the average at the rate of 1 50 francs for 15 metres on a loom making twelve pieces, and, as he can, under favorable circumstances, do 5 metres per day, his earnings will amount to six francs for the twelve pieces, and if he has two looms at work on the same kind of material, which is rarely the case, he will earn 12 francs per day. But account must be taken of fifty-two Sundays in the year, during which he does not touch his loom, and of eight days every six weeks spent in putting up a new order received, during which he earns nothing, so that his earnings all the year round, if work be regularly given, will not exceed 8.50 francs per day, and this amount is considered a fair average. If he is obliged to call in help from outside, his earnings will be still further reduced, as he will have to divide the profits of one loom with the workman. If the weaver makes velvet ribbon, he earns about 8 francs per day on each loom, at the rate of 3 francs per thousand threads; but velvet is not always in fashion, and the demand for it seldom lasts for more than one season. So it is seen that the average yearly earnings of a weaver in St. Etienne possessing two looms and working two hundred and fifty-five days in the year, do not exceed in any case 3,000 fr., or $600, and in very many instances they do not exceed $500.

The following table shows the actual cost of living for a weaver's family, composed of man and wife and three children:

Expenditure.	Per day. s. d.	Per year. £. s. d.
Rent		10 0 0
Food:		
Wine	10	14 12 0
Bread	7½	10 19 0
Meat	1 3½	18 5 0
Coffee	1	1 9 0
Vegetables	1½	2 3 6
Coal	3	4 7 6
Light	2	2 18 4
Clothes		10 0 0
Taxes		0 10 0
Medical attendance and medicines		2 0 0
Repairs to looms		8 0 0
Other expenses		12 0 0
Total		£97 4 4

It results, therefore, that if the year be favorable a saving of about £23 can be made; but, as I have already said, it too often happens that the man is idle for weeks waiting for orders, and thus the saving, which is always carried to the savings bank, is drawn upon, and before the year is out it may have been all used for the necessaries of life.

Many weavers have three looms at work, but, as one at least must be worked by a journeyman, the owner gets only half the profits of that loom, and, besides, he has to pay a higher tax.

In conclusion, it may be said that at St. Etienne a weaver can live and rear his family, but can do no more—that is to say, he can not to-day lay up money by his trade. The average number of children in a weaver's family is three.

Owing to a fire which broke out on McGill Street, Montreal, the premises occupied by MacLean, Shaw & Co. (hats and straws), W. J. Price (hides), and A. Mendel & Co. (cloth hats and caps) were badly damaged by smoke. Total loss, $10,000.

THE NEW INDIA-RUBBER TREE IN MADAGASCAR.

The trade of the island of Madagascar in 1892 received a decided stimulus by the discovery of a new india-rubber tree. The principal centres where this new product is treated are Farafangana, Vaugaindrano, Manaimbondro, Fort Dauphin, Andrahomby and Cape St. Mary. At first the new product realized from three to six piastres per 100 pounds; aided by competition the purchase price very soon amounted to ten and then to fifteen piastres. More than twenty piastres per 100 pounds is now paid at Fort Dauphin

The discovery of the new india-rubber tree has come very fortunately to relieve the Madagascar market, which was at such a low ebb that the Tamatave houses were closing their agencies on the northeast coast and the Americans suppressed their Majunga houses. It is of very great importance, it almost constitutes a commercial revolution. The trade formerly carried on between Farafangana and Fort Dauphin was confined to a few products which were obtained only in small quantities. Merchants were almost completely disheartened and had abandoned the market to small traders. Several of the latter possessed but a few hundred piastres at the end of from fifteen to twenty years of hard work. At the present day they are all relatively rich, and it has only taken them a year to gain their thousands of piastres. At the time of the india-rubber fever new houses were immediately established at Farafangana, Vaugaindrano, Manaimbondro, Andrahomby and Fort Dauphin, also at Cape St. Mary, bringing goods and money.

The natives, receiving large sums in return for their products, took upon themselves to purchase imported goods to a very large extent. As long as the working of the new rubber tree lasts this state of things will continue. The probable duration of this working is estimated at two years only.

BOURDON & CHARBONNEAU, dry goods merchants, Montreal, have dissolved partnership.

THE work of placing the plant of the binder twine factory, at Kingston, is going on apace.

GEORGE W. CLARKE, fancy goods, Montreal, has assigned to C. E Price, with liabilities at $23,000

N. BROSSRAU'S dry goods store, at Bedford, Que., has been burned. Loss, $25,000: insurance, $11,000.

H W. WILSON & Co., dealers in fancy dry goods, Ottawa, have assigned Liabilities about $15,000

THE Curtain and Upholstering Manufacturing Company (Ltd), Guelph, Ont., has been incorporated

J. M. DURION, London, Ont., manufacturer of woolens, has assigned. Liabilities $15,446, nominal assets $12,400.

L. R. SHORT'S gent's furnishing and tailoring establishment has been damaged by fire Loss covered by insurance.

E. F COOKE & Co, Orillia, Ont, merchant tailors, had their premises completely destroyed last month. Loss heavy.

MRS DURION'S millinery store in Montreal was badly damaged by fire recently, the cause of which is unknown. Loss $2,000

THE Montreal premises of Castle & Richardson, manufacturers of fur ornaments, were considerably damaged by fire a few days ago Loss, $25,000; mostly insured

THE Sykes and Ainley Manufacturing Company (Ltd.), Glenwilliams, Ont., has been incorporated with a capital stock of $100,000 It will manufacture wool, tweeds, etc

SOME Glasgow wholesale houses lose by the recent failure of Mair & Co., calico printers of Glasgow. P. Colquhon, of Mosley street, has called a meeting of his creditors in consequence.

An agitation is being worked up on the part of umbrella manufacturers to have the duty removed from the steel tubes which are used for the handles of umbrellas At present there is a duty of 30 per cent upon these tubes, and the umbrella manufacturers claim that as these tubes cannot be manufactured in Canada, they should be allowed into the country duty free There are some five umbrella manufacturers in Canada, and their complaint is that all the material used in the manufacture of umbrellas is so heavily taxed that they cannot compete with the foreign makers A few days ago a deputation of these manufacturers waited upon Mr. Wallace, the Controller of Customs, at Ottawa, asking that the tariff be amended as indicated. It is just such foolish applications as this that make one become excessively weary. Such steel as is necessary in the manufacture of umbrella handles is already in the free list, as are also other articles necessary in the manufacture of umbrellas These five manufacturers know this, and the Government know it, and if, under the circumstances, they cannot compete with foreign manufacturers, they should retire from the business.—*Canadian Manufacturer.*

Complaints are being made by the wholesale millinery men to the effect that the Customs Department is charging 10 per cent. more duty on bonnet shapes consigned to Toronto than to Montreal houses The Comptroller of Customs will be asked for an explanation.

It is stated that no less than $8,500 worth of Irish woolen goods were sold at the late World's Fair A large part of this fine result was owing to the efforts and the influence of Lady Aberdeen

The Wm J. Matheson Company (Ltd), Montreal, has been incorporated for the purpose of manufacturing and dealing in dyes, drugs, chemicals, etc Capital stock $25,000

A F. Gault, of Gault Bros., has presented $100,000 to the Montreal Theological College for training Church of England clergymen.

Ross Bros' dry goods store in Whitby, Ont. was seriously damaged by fire early this month. Only partially insured.

J. H Richards will establish steam carpet cleaning works in Windsor, Ont.

Established at Georgetown, Ont., in 1877.

ROBT. W. KING & CO.

Practical Engineers and Mechanical Experts

Present Office: 141 BAYLE STREET, MONTREAL

HAVING successfully completed the business for which we moved to Quebec, it is the intention of this firm to return to Ontario for the better convenience of its old customers and locate its head office in the City of Toronto about 1st of May next.

All business arrangements formed when we moved here are now cancelled and dissolved, and we wish it distinctly understood that we have now no connection with or interest in any woolen or knitting mill whatsoever, more than the friendly interest we have ever taken in the welfare of our friends and patrons, whom we have always striven to impartially serve, and of whom Ontario contains the larger number.

Any accounts due this firm will be thankfully received at above address as heretofore, till notice of change in said address is given.

Yours respectfully,

ROBT. W. KING & CO.