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# CANADIAN JOURNAL OF Fabrics

THE JOURNAL OF THE  
Textile Trades of Canada.

Vol. XV.

TORONTO AND MONTREAL, SEPTEMBER 1898.

No. 9.

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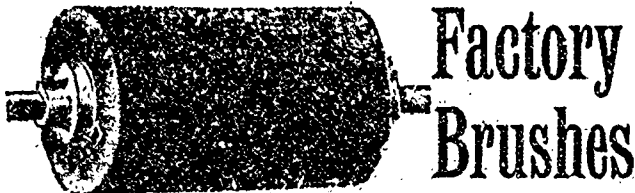
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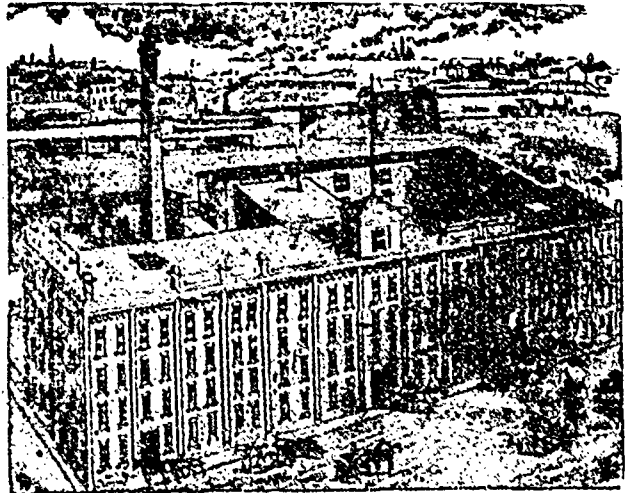
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# Canadian Journal of Fabrics

THE JOURNAL OF THE  
Textile Trades of Canada.

Vol. XV.

TORONTO AND MONTREAL, SEPTEMBER, 1898

No. 9.

## Canadian Journal of Fabrics

A Journal devoted to Textile manufactures and the Dry Goods and kindred trades.

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## Editorial.

### THE COTTON CROP OF THE UNITED STATES.

Secretary Hester of the New Orleans Cotton Exchange has just issued his report for the year ending August 31, in which he claims that the crop will aggregate 11,000,000 bales, which shows an increase over the crop of 1896-97 of 2,442,030 bales and of 4,042,648 over that of 1895-96. The average commercial value of the crop has been \$28.62 per bale, against \$30.76 last year, \$41.09 the year before, and \$30 in 1894-95, and the total value of the crop compares with the previous two years as follows.

	Bales	Value
1897-98.....	11,199,994	\$320,552,606
1896-97. ....	8,757,964	321,924,834
1895-96 .....	7,157,346	294,095,347

It is claimed that many of the northern mills were running at a loss. The south, on the contrary, has done well. It has added more spindles, and its increase in number of bales consumed is greater than has ever yet been recorded in any one year. The increase of spindles in the south since 1890 has been 2,443,964, while those in New England have increased 2,207,918, showing a gain for the south over New England of 236,046 spindles. Of the gain for New England, Massachusetts contributes 1,904,718 spindles, or a little less than an average of 240,000 spindles a year for the past eight years.

### THE CANADIAN WOOLEN MANUFACTURER.

The Canadian trade is in a more favorable position than for some time past. The yield of the crop just gathered is very large, and the fact that it has been housed without any serious damage has imparted a brisker tone to a market already in a healthy state. The competition from Great Britain is not going to be so serious a thing as many woolen manufacturers anticipated, and where it might otherwise have been felt by them new machinery and improved processes will render it harmless. Many of our woolen and knitting mills have been running day and night since May last.

### TRADE IN THE UNITED STATES

The trade conditions in the United States are far from satisfactory, though there are signs of improvement, the war caused a feverish activity in many lines, but now that it is all over except the paying of money and health, there has been a decided reaction. The following is a statement of the case from the columns of a prominent contemporary. "A great deal of machinery is lying idle to-day, a great many mills are practically out of commission. The situation among woolen manufacturers is in a sense somewhat critical. The market is suffering very largely from the sins committed a year ago and six months ago. Had there been less speculation in goods, had there been a nearer approach to legitimate demands of consumption, to day there would not be the distress which is apparent in the manufacturing situation."

Among the more favorable features of the situation are the heavy imports of raw silk and the indication of

firmness in the wool market shown by the recent sale of five hundred thousand dollars worth of wool in 8,000 bales and bags, at auction at Boston, by a salvage company. This was the largest transaction of this nature in the wool business ever made in New England. Buyers were present from all parts of the United States, and dealers who offered a low price for a private sale were compelled to bid much higher at the auction. The greater portion of the consignment was bought by manufacturers.

#### THE ARGENTINE WOOL INDUSTRY.

A report of interest to the woolen trade, "Sur les Laines de la Republique Argentine," has been prepared by M. Gourgas for the French Ministry of Agriculture, by whom it has been issued as an official paper. Rather more than 40 years have elapsed since, in 1855, the sheep-breeding industry began to assume importance in Argentina, as a result of the importation from Europe of improved stock for crossing purposes. The pastures and climate of Argentina are better suited than those of Australia to the development of the pastoral industry. Up to the year 1889 the Rambouillet sheep—which, we may remark, is a well-known type of the French merino breed—reigned supreme in Argentina, and constituted the basis of extensive business transactions between France and the South American Republic. This development was closely watched by English breeders, who meanwhile were engaged in perfecting the Lincoln, and eventually succeeded in making the latter a heavier wool producer than the Rambouillet. Consequently the Argentine breeders transferred their preference to the Lincoln, the Rambouillet being relegated to an inferior position. Another circumstance telling in favor of the Lincoln was the rapidly-growing export trade in live sheep from Argentina, the exports having been 512,016 head in 1896, and 504,128 head in 1897; and the Lincoln, as is admitted by M. Gourgas, affords better and more tender mutton than the Rambouillet. The Germans, desirous of extending their commerce, have also entered the lists, and for this purpose have developed a type of sheep which is referred to as "Rambouillet precoce," and may be regarded as an early-maturing type of Rambouillet; it is admittedly superior to the French type both in size and in quality of flesh. To maintain the pre-eminence of the Lincoln the English have (says M. Gourgas) brought into fashion such fabrics as necessitate the use of long wool in their manufacture. Importations have been made into Argentina of Vermont sheep, which combine in themselves the qualities of the Rambouillet and the Negretti—the latter another type of merino—as shown in the fineness of their wool and the quantity and quality of their mutton. This type of animal suits the Argentine, and, crossed with the Rambouillet, it produces sheep of strong constitution and admirably adapted to serve the export trade in wool and mutton. The crossing of Argentine Rambouillets with Australian sheep has likewise yielded good results.

It is evident that the Argentine Republic has made great efforts to improve the quality of its sheep, of which it possesses about 100,000,000 head. These efforts, more-

over, have resulted successfully, as is shown by the extensive export trade in wool, of which product 205,571 tons were shipped last year. To meet the increasing requirements of this trade a new market has been built at Barracas, Buenos Ayres, and is very thoroughly equipped. It includes a huge and well-appointed warehouse, to which stock-breeders and farmers may consign their produce and obtain for the latter receipts for warrants which are negotiable at the banks, and thus enable the producer to obtain money on account at a time when it might be disadvantageous to sell. The panic which might arise from a severe, though perhaps temporary, fall in prices is thus avoided, and it is stated that the Government contemplates taking over and extending the privileges in question.

The production of crossbred Lincoln wool in Argentina at the expense of the fine Rambouillet wool has been on an enormous scale. Should, however, European fashion revert to finely-woven fabrics, the demand for pure Rambouillet wool must revive. This, apparently, is what is actually taking place. At the close of last year there were in store at Barracas about 15,000,000 kilos. of wool, mostly crossed Lincoln; but while this has declined in value, the pure-bred Rambouillet wool is rising. Argentine sheep-breeders are much concerned at this, and are awakening to the necessity of returning to the Rambouillet strain. Should this step be taken there would be a demand for pure-bred Rambouillet sheep, which would prove advantageous to breeders in France, though the latter would have to encounter serious competitors in Argentina and Germany.

The trade in wool has undergone a complete transformation. The recent tendency has been to suppress the middleman, the French manufacturers buying their wool direct from Buenos Ayres and shipping their purchases to Dunkirk for the North of France, to Havre for Elbeuf, and to Bordeaux and Marseilles in the case of sheepskins. The chief ports of shipment of Argentine wool are Buenos Ayres, Rosario, Bahia Blanca, and San Nicolas. The last three, which are very important, are not visited by French steamships, though the English and Germans are well represented. As France is the largest importer of Argentine wool it is naturally a matter to be deplored (says M. Gourgas) that most of the transport should be effected in English and German bottoms. The "Chargeurs Reunis" is the French company which carries the largest quantity of Argentine wool, but it is surpassed by the Allan Line, of Great Britain, and by some German companies.

It is to its representation at the Universal Exhibition at Paris in 1889 that Argentine mainly owes its success. There was much that was noteworthy in the Argentine section, but the wools, above all, commanded admiration. A complete collection, classified both technically and scientifically, had been prepared by Carlos L. Klett, and was awarded a gold medal and two silver medals, while it led to a great increase in the shipment of the wools of the Plate to the ports of Dunkirk and Havre. The operation of the Dingley Tariff has seriously affected the Argentine

wool-growers, who used to send annually to the United States from 20,000,000 to 25,000,000 kilos. of wool, principally crossed Lincoln. M. Klett was sent to Washington to protest against the measure, but without avail, and he has since advised his Government to adopt a retaliatory policy. M. Gourgas, in concluding, expresses the opinion that Argentina will always be a principal centre of the wool industry, and that in Europe the confederation will find a constant and certain market. Its production, he maintains, defies competition, and the country as a whole cannot fail to have a great future.

#### WORSTED SPINNING.\*

BY M. M. BUCKLEY.

(Lecturer in Wool and Worsted Spinning at Halifax, Wakefield, and Elland Technical Schools.)

(Continued.)

Tops should be examined to see that they are free from neps and notes, since these always detract from the appearance of the yarn by riding on the surface. Burrs and vegetable impurities likewise occasion trouble when present, although it is almost impossible to obtain a fine Botany top absolutely free from them. Still, where they persistently occur in any quantity, it is a bad indication. The character of the wool from which the top has been made is of primary importance to the spinner, because unless the blend is made from brands possessing similar features and properties, it is not likely that the yarn will produce satisfactory fabrics. The best tops are produced from the greasy colonial wools; but when prices are low there is a general tendency, where it is possible, to introduce some of the cheaper varieties—such, for instance, as the Buenos Ayres and Monte Vidian wools—in order to meet the market. Assuming, therefore, that a spinner who previously had only used greasy colonial tops obtained some made from the mixed wools, the difference would soon be detected by the user of his yarns. When a particular top or mixture of tops has been once adopted, it should be repeated in order to secure uniform results.

Strength of fibers and softness are features which largely determine the spinning powers of the wool. A soft, flexible top possesses much more drawing power than one which is horny and stiff. A longer draft may be adopted, which produces a more level thread and straightens out the fibers better, giving a clearer surface, while in addition it is possible to spin it into finer counts without having to get it hard twisted.

Drawing.—After being combed and converted into tops, the next process through which the wool passes is the drawing, and this may be said to be the most important operation in the series preparatory to the formation of the thread. It consists in passing the combed slivers through a series of machines or "boxes," the number varying according to the character of the material and the result it is desired to obtain. The object of drawing is to gradually reduce the thickness of the sliver, so that we get a smaller number of fibers in cross

section, and also to perpetuate the parallel arrangement obtained in the combing in order to produce a sound, regular roving from which the yarn can be made. This is done by a systematic doubling of a number of ends and then drafting them into one smaller than any of those which have been combined. Low kinds of boxes are adopted—first, gill boxes, which constitute the early part of the process, their duty being to separate and straighten the fibers so as to make them work more freely. This is more necessary when the tops have been in stock for some time, as they "set"—i.e., the fibers adhere closely together and become somewhat stiff, wiry, and sticky, owing in a great measure to the evaporation and decomposition of the oil used in combing, which seems to leave a resinous residue on the fibers. The second type of machines are the drawing boxes, designed especially for drafting or drawing the wool.

The drawing boxes consist practically of two pairs of rollers, with two or more sets of smaller rollers, termed carriers, working between them. Three kinds of drawings are in general use, each being most suitable for a specific purpose. First, we have the open method, used very largely for the production of ordinary worsted yarns for coatings and dress goods made both from Botany and long wools. Second, the cone drawing, adapted for dealing with short, loose open wools, and where it is desirable to produce a soft, regular roving without submitting it to much tension during the winding on to the bobbin. Its chief drawback, however, is the cost of repairing breakages which are constantly occurring with this system. Thirdly, we have the French method, specially designed for the production of a soft, round, fluffy roving for spinning upon the mule. The number of operations comprising the set depend entirely upon the class of work to be done. For long wools six or seven operations are usually considered sufficient, while for short Botany wools eight or nine, and in some cases ten, are given. Where mixtures of colored tops are made in the drawing, two or three more operations are often given in order to ensure a better blending of the different colors.

Seeing that the object of the drawing is to produce a roving suitable for spinning, it is essential that each stage should be carefully watched, because imperfections made here are certain to be reproduced in the yarn. Several features require attention, viz., the amount of gilling, the number of doublings, length of drafts and ratches, the amount of twist, and nature of the drag to regulate the speed of the bobbins. All these are variable factors which depend upon the judgment of those in charge, and probably few would adopt the same treatment for any particular class of wool, though each to a great extent depends upon the other. The primary axiom to be borne in mind is to produce a sound roving which will spin well. Great difference of opinion exists as to the amount of gilling necessary. Formerly it used to be considered necessary to pass it through three or four gill boxes before it reached the drawers. This is apparently becoming obsolete, and rightly so, because it only tends to break and damage the surface of the fibers. The function of the gill boxes is

\*Republished from the *Textile Manufacturer*.

only to open the slivers so as to render the work of the rollers easier in the drawing boxes, because the fibers have all been placed parallel in the comb and succeeding operations. Further, since by drawing the fibers through the faller pins several times we are removing the very features upon which we are dependent for good spinning. That this is to a certain extent realized is shown by the fact that many spinners are now reducing both the number of fallers per box as well as the number of pins.

It is quite right and necessary in the case of comb circles to adopt the finest setting possible in order to ensure that each fiber will be dealt with separately, and all arranged in their proper relation; but when this has been attained, what advantages can accrue from pursuing this still further? If we can obtain the desired result by simple treatment and few operations, of what use is it to adopt a more elaborate method? It only tends to weaken the yarn, in addition to incurring more expense. Upon this question, then, we may say that the slivers should just be gilled sufficient to enable the drawing rollers to control the fibers.

The arrangement of the ratch is another vital point upon which writers disagree; one author stating that it is best to break the longest fibers and work to the average length, so as to secure a better yarn. From experience, however, we must decline to accept this statement, and affirm that if we break the wool we neither get as strong a yarn nor one as level, whilst, in addition, we throw much strain on the rollers, which causes leathers to wear out much sooner. Taking the facts of the case, it is both theoretically and practically wrong. This is essentially a drafting arrangement, *i.e.*, one in which a reduction in thickness is obtained by drawing the fibers over each other. Before we can do this, however, at least one end of the fibers under the influence of the front rollers must be free to enable it to slide over its neighbors. To assume that in order to control the short fibers we must break the longest by lowering the ratch, is contrary to the fundamental principles of spinning, for are not the ends twisted and carriers employed in order to enable us to preserve the length of the staple? The strength of the yarn and the spinning capacity of the wool depend largely upon the length.

Very few appear to be thoroughly acquainted with the functions of the carriers and twist. To illustrate their influence let us take an example. Suppose, for instance, we are dealing with some wool, the bulk of which is about 4 inches long, while most of the remainder is 7 inches. Now, if we attempt to work this with a 6 or 5-inch ratch, we shall in the first instance break the long fibers; but this throws great strain upon the top front roller, which soon becomes grooved owing to its slipping, caused by the fact that the long fibers are held in the nip of both sets of rollers, and, especially in the case of strong wools, refuse to respond to their action. With the short ratch, however much we may open out the carriers, the twist cannot get out, the consequence being that the ends become "ropy" and run into the front rollers or force the back rollers, thus making bad ends and increasing the amount of waste.

Assuming, now, that we fix the ratch rather higher than the longest fibers, the drafting is rendered much easier owing to one end of the fibers being free when seized by the front rollers, and we still preserve their length. To prevent the short fibers being pulled down, the carriers require setting so as to keep in the twist to about the length of the shortest fibers; after this point is passed the sliver gradually begins to unroll and ease the fibers.

(To be continued.)

#### ENGLISH OPINION.

We take pleasure in quoting the following from the *Textile Mercury*, which is one of the leading textile publications of the world:—

"It seems clear that the boom in Canadian interests is to be large and long continued. The *Dominion* has successfully struggled against the diseases which afflict the childhood of nations as corresponding ones do the childhood of the human creature. They are both in alternating periods of growth and consolidation. Present appearances strongly justify the belief that our kindred community in the great North-West is entering upon a stage of development which promises a strong, vigorous, and healthy manhood. As a consequence, industrial and trade prospects are brighter than ever before in its history. Its liberal policy and its determination not to be seduced from its connection with the mother country are manifestations of a robustness of wisdom and prudence which will not be lost upon the Motherland. It is the old country which can be of the greatest benefit to the young one. The great need of the latter is abundant capital, and the capitalists of the old country want an enterprising field of investment under the old flag. This the *Dominion* can give, and the result will be to the benefit of both."

#### HARRIS TWEED-MAKING.

As an article of commerce, says the *Dundee Courier*, the cloth known as Harris tweed has, during the past twenty years, been regularly advancing in public favor, especially among the fashionable folk who wish to encourage genuine home industries, but more especially among cyclists and tourists, who believe in an all woolen dress which is practically wind and water proof. And truly a good thing this is for many a crofter fisherman's family in the conjoint island of Lewis and Harris. In this island, of the land of which an agricultural authority has said: "It would take thirty acres of the Island of Lewis to graze one snipe," there were, when last census was taken, thirty-two thousand six hundred souls, though at the opening of the century there were only one-third of that number. This immensely increased and still increasing population cling to their rocky, barren island like limpets, though to anyone accustomed to the conditions of life elsewhere in Britain those which obtain here must appear terribly hard. The natives are, however, a hardy, healthy, happy-go-lucky lot, contented with little of this world's gear and hospitable to a degree with the little they have. The demand for their home-spuns, of which for generations they have been making just enough for their

own use, has surprised them into earnest home industry just for that period of the year when there used to be little doing, and the spinning wheel now whirrs by hundreds of fires during the long winter evenings, and the handloom weavers have had to furbish up their old looms and work with more than redoubled energy, and now throw their shuttles with monotonous regularity for about 72 hours a week during half the year. Indeed, the whole story of the processes through which the wool passes before it is fit to be shaped into any garment must be rather a strange one to those who have been long accustomed to the large woolen factories of the South, with their time and labor-saving apparatus which turn out their finely-finished fabrics.

Of course the first consideration is to get the wool, and for this purpose crofters and squatters all keep sheep, and small, hardy creatures these grey and black-faced crossbreds are. Their coats are plucked off instead of shorn, as is sometimes done, for it is believed that shearing makes each succeeding fleece coarser, while plucking is said to have the reverse effect. And fine, long wool is essential for home-spuns, as the Highland spinning wheel can only work with the longer fibered, or best, wool, and that of itself really forms a guarantee of durability and quality. For a long time the island produced no more than enough for its own needs, but now it has to be imported, and many boats' crews at the summer herring fishing on the East Coast are on the lookout for suitable wool as an investment for their earnings, and this they bring home. But usually the Harris tweed-maker is not even so much of a capitalist as to do this, and the much more common thing is to go to some town shopkeeper who deals in such tweeds and get him to furnish enough wool to make a web of about forty yards, and wait for payment until it is made into cloth. When the wool gets under the crofter's roof, generally some time soon after the harvest is gathered in, it is carefully teased and sorted, and then it is well washed in a hot liquid to get quit of the remains of any "sheep dipping" material which may cling to it. After being dried in the sun some of the black oil, which housewives have been regularly making from the livers of any of the large fish which the men have been bringing in for household use, is sprinkled over and worked into it so that it may be all the easier carded or combed.

This carding consists in getting all the fiber of the wool to lie in the same direction. The "cards" for this purpose are really flat, oblong brushes measuring about 12 inches by 6, having thickly set teeth of wire, with a wooden handle placed in the middle of one of the longer sides. A handful of wool is placed on the one held in the left hand, and the right hand card is dragged over it two or three times. The wool is then dexterously picked up out of the teeth and rolled lightly beneath the smooth backs of the cards, and is then a "ribbon" ready to be spun on spindle and distaff, or spinning-wheel. However expert a housewife may be, the sitting by the fireside alone carding would be a slow, wearisome and hard task, and the heap of wool piled up near one side of the fire, placed on the middle of the floor that the oil may get well soaked

into it, would almost be enough to make the lively Celtic maker despair of getting through it all, and therefore carding parties, or *ceilidhs*, have grown up to be quite a recognized institution in the tweed-making districts. To these the older women of the township are usually invited, and gladly come bringing with them their cards. After little parley they form a ring round the fire, and from the early gloaming of a winter evening right on till half past midnight they card away, discussing in kindly fashion all the news which constitute their world. Younger visitors drop in uninvited, and may sing a song; one of the older women may croon some old Gaelic tragic legend, or the old man mending his nets in the corner may tell some of his old-world tales. Strong tea, with oatcake and butter, is served once or twice, but the formidable heap of wool has been very much reduced, and that of "ribbons" has arisen, and the housewife's heart rejoices and is very glad when one after another of her visitors in return invite her to their carding parties. The spinning is done at every available odd moment there is to spare between bringing home the peats or the black sea-weed for cattle beds, but a part of this heavy work the men now do when they can, though it is usually reckoned women's work.

Next comes the dyeing, and in their *ceilidhs* the workers have got to know from those who have lately visited the stores what colors and patterns are most in demand, and they apportion their yarn accordingly. If a part of the pattern is to be black, *shillister* (Irish root), or the root of the common dock, is used, and it is surprising to what a size these grow in Lewis. Brown is a favorite color, and to get it the *crottles* (*Parmelia parietina*, *P. saxatilis* and *P. cerato phylla*), which are abundant and easily prepared, are used. The peat soot scraped from the chain suspended over the fire gives a soft sepia color, and the roots of the water lily yield a very dark brown. Dark green, another favorite color, is got from heather, and a much brighter green from the common broom. For all the shades of blue nothing can be got so effective and cheap as indigo, although the blackberry with copperas, and the elder with alum, is sometimes used. To produce a red, the rock lichen (*Ramalina scopulorum*) or the white crottle is used, while the crottle corkir (*Leconara taitarea*) gives a bright crimson when properly treated.

Before being ready for the dye-pot the wool is washed in lye, mixed in pure cold water, and then put into the large dye-pot, which is kept hard boiling over the peat fire. On dyeing days the crofter's house and all that it contains is extremely warm, and the air is thick with smoke, but that is merely an incident which a native gets over with a smile, and any visiting stranger with dripping eyes. The thread is now and then lifted out of the pot on the point of a stick to see how the color is progressing. The great drawback to this method is that when the succeeding lots of thread come out—for the pot can only hold a few hanks at a time—the shades differ slightly, as the amount of lye put in has been measured only approximately "by the handful." When every part of the yarn has been put through its own dye-pot, the whole is hung outside until dry and then wound up into balls which it is the house-



wife's privilege to carry to the weaver, who usually charges from sevenpence to ninepence per yard of the usual single width, but even at that, and with his old-fashioned loom, he is able to earn from twenty to thirty shillings per week.

Every maiden in a township well knows who has thread at the weavers, as well as the date on which he is expected to complete it, and not to be invited to the party on the night set apart for "felting" or thickening, or, as it is called in the north, the "waulking," from the old style of working it with their feet, plainly shows that the person whose "waulking" is to be done does not estimate the uninvited one's company at much. For this night's work a strong door is taken off its hinges and laid on rests, and three young women, proud at being those chosen for the work, sit comfortably on each side. The matron then unrolls from six to ten yards, measures its exact width in several places, and sprinkles it with soapy water. The "waulkers" then take hold of the cloth and the fun begins. One sings a verse of a Gaelic song while all joyfully take up the chorus, and as this song rolls along its wondrous length the cloth is beaten and tossed on the board from side to side while a score or two of the neighbors, chiefly young men and women, look on and join in the laugh which song or joke inspires. When the cloth has shrunk about an inch another length is taken in hand, and so on, until after five hours' work the "mill" makes the texture rather hard, stiff, and heavy, but this hand or foot waulking leaves it soft and supple, and besides it is a function which affords much social enjoyment in townships where there is little to disturb the "even tenor of their way." A dance sometimes follows. After this the cloth is well washed, dried in the open air, and then carefully rolled tightly up, put in its canvas cover, and is ready for the merchant. Selling it is the matron's prerogative, and to do this she accompanies it to town, calls at a "general merchant's" store, and strikes a bargain. No money is paid, as it is understood the seller must take payment in such goods as will be useful in the household, and she returns in triumph to show her neighbors how much she managed to make out of her tweed.

But it would almost be unjust to tell of Harris tweed and not of her who was the first to show those who now benefit by it how this industry could be a help, and who nursed it at its weak beginnings. As long ago as 1844 the late Earl of Dunmore, proprietor of the whole of Harris, sent a pattern of Murray tartan to be copied in tweed, and webs of it were very successfully made. When the late Countess of Dunmore saw this she taught the people how to dispose of it, and this she did so successfully that they were encouraged, and gradually learned how to improve the texture and pattern and how to use the natural dyes. She worked up a market for it, so that before her death in 1886 Harris tweed was an important article of commerce, and its manufacture spread over the whole of the outer Hebrides, to the no small gain of the natives

D. Shepherd has severed his connection with the woolen mill at Chambly, Que., in which he has been working for some time, and has returned to his home in Almonte.

#### FLAX CULTURE AND THE MANUFACTURE OF LINENS TO TAKE THE PLACE OF COARSER COTTONS IN NEW ENGLAND.\*

(Concluded from last issue.)

This last leads, naturally, to certain considerations in manufacturing in our country that favor flax culture and the linen and lace industries. Southern competition in the coarser cottons has already been hinted at. It seems inevitable that the manufacture of coarse cottons will be gradually transferred to the South. Indeed, if this movement towards the South continues at the increased pace of the last ten years, the South will be making the larger part of the coarser cottons manufactured in this country. The New England cotton manufacturers must face this fact squarely, and with the same indomitable courage and enterprise with which they have faced the many obstacles of the past.

Attention has been called earlier in this paper to the very large consumption of linen goods in the United States, amounting at the present time to nearly \$50,000,000 annually. The fact has been pointed out also that although cotton can never wholly take the place of linen goods, the consumption of linen goods in proportion to cotton goods in civilized countries is steadily increasing. With these facts before them, the New England manufacturers will not long delay making a thorough experiment in the manufacture of linen fabrics. Many of the conditions favoring the agricultural side of this industry also favor the manufacturing phases. Abandoned farms have been referred to. Many of you know to your sorrow also of abandoned and partially abandoned mills and manufacturing plants. One of your problems is how to utilize this abandoned property with the valuable water power so often connected with it. Certainly any enterprise that promises within the range of probability to occupy this abandoned property and make it productive to the fullest limit is worthy of your earnest consideration, especially since the amount of this property will be more rather than less in the future, if some industry to take the place of the coarser cottons is not developed. Another favorable condition is that native Yankee enterprise referred to in connection with the agricultural features. You are aware of course that the cotton industry of the world owes more to the inventive genius and mechanical skill of Americans than to all other causes contributing to its progress. It is not necessary to enumerate to you the revolutionary inventions and methods introduced into this industry by Americans. Such an enumeration would be practically a catalogue of all the machinery of modern cotton manufacturing. The manufacture of linens has not had the benefit of this inventive genius because the industry has never flourished in this country to a large extent outside the homes. As a consequence, the mechanical processes are admittedly crude and clumsy. To be sure the machinery has come to be

\*Extract paper read before the New England Manufacturers' Association, at Boston, April 27th, 1893.

comparatively elaborate, but it is not nearly so well adapted to the ends for which it is used as our cotton machinery. Without doubt, if the manufacture of linen should be introduced into this country on a large scale, we should ere long outstrip the countries now engaged in the industry in the development of machinery. There is such large room for improvement in the mechanical processes that our manufacturers would thereby secure a very great advantage over all competitors. A third favorable condition remains to be noted.

The manufacture of the linen fabrics requires a higher degree of skill than the handling of cotton fiber. Wherever highly skilled labor enters into any industry, the United States has an advantage over foreign competitors. You have found in this matter that the best is the cheapest, and that no labor is so dear as the so-called cheap labor of foreign countries. Having at your doors an adequate supply of skilled labor is an important consideration in your favor. A final condition worthy of note which would be established by the introduction of this industry into New England is the building up of a home market for all kinds of manufactured goods. If the abandoned farms of New England by this intense form of farming could support a rural population many times as great as she has ever supported. We have become too easily reconciled to the movement of our rural population into the cities and into the more fertile plains of the middle West. We have come to regard this as an unavoidable necessity. We have reasoned about it a great deal, and have concluded that New England is destined to become more and more a manufacturing centre and less and less devoted to large agricultural activity. But we shall one day have to face the problem of the older civilized countries of the world—the problem of how to make every foot of our territory productive in some way. No greater folly is possible than that the good acres of New England soil must remain untilled, with our population increasing more rapidly by birth and immigration than ever before within its history. It is impossible for New England farmers to compete with the middle West in growing cereals or with California in growing fruits. It is easily possible, however, for her to return to her early agricultural activities, if she can introduce this flax industry or some other specialty for which her climate and soil are adapted, and especially which might be directly related to her manufacturing industries, as is the raising of flax for fiber.

After a careful examination of all that has been written upon the subject, and as a result of personal investigations covering the period from my visit to Ireland and the Continent, for special investigation in 1851 to the present time, I venture the following practical suggestions about how to proceed in the establishment of the flax and linen industries of this country. The United States has been very generous for nearly forty years in appropriations for gathering information and

for the purposes of extended scientific experimentation in this industry, and especially so during the last decade of this period. Mr Charles Richard Dodge has been a special agent in fiber investigations of the United States Department of Agriculture during this latter period. He has covered the ground of flax culture and linen manufacturing in this country very thoroughly. His reports, nine in number, contain all the general information necessary for the making of a beginning of the industry in this country and also recommendations of the highest value. What is needed first is a capable and progressive committee from such a representative body of manufacturers as this to co operate with Mr. Dodge and the United States Department of Agriculture in carrying their recommendations into effect. Abundant information of the most detailed and reliable kind is at hand, illustrating every phase of the industry from the selection and preparation of soils up through every step of the agricultural features as well as of the processes of manufacturing to the finding of the consumers for the finished manufactured product.

A committee, representing a body of capitalists of adequate resources, such, for example, as our New England Association, is an absolute prerequisite as a preliminary step. Such a committee, with a paid secretary, who should devote his whole time to the business, should address itself at once to the following tasks. *First, they should acquire by lease or otherwise a plant sufficiently commodious for adequate experimentation, in a locality where a score or two of farmers are willing to grow a definite number of acres of flax each. The committee should have power to import the very latest and best machinery, both for scutch mills and for the manufacture of linen goods—in short, should be empowered to do in New England what has already been so successfully done in Canada and in Michigan. When such a committee is ready to proceed, backed by such an organization and by the representatives in Congress of such a constituency as New England boasts, there is no doubt that adequate protection in the form of a tariff on importations could be secured. Even without protection a beginning can be made, in the opinion of all experts on the question. But with protection, by making use of the abundant information at hand, there is not the slightest risk. Indeed, there is every reason to believe that financial success is certain from the beginning. It is equally certain that the growth of the industry will be steady and substantial from the first, since every possibility of failure has been anticipated by previous experiment. Once sure of their ground, through such an initial step, the committee should be authorized to acquire large tracts of suitable lands in the vicinity of present plants and water privileges, to which the industry may be extended as rapidly as is expedient, the distinct aim all the time being to supersede the making of the coarser cottons by the making of linen fabrics. As fast as the space now occupied by coarser cotton machinery can be utilized by linen machinery,*

the cotton machinery should be transferred to the South, where mills should be established or acquired by the association. This double plan will secure to New England the great and remunerative linen industry to take the place of the coarser cotton manufacturing that you are bound to lose in the end, any way, and will enable New England capital and brains to compete on equal terms on its own ground with the South, that is, taking the coarser cottons from us on account, chiefly, of certain distinct local advantages, as we believe.

The industry is as certain to become one of the chief industries of the United States as that our country is certain to continue to lead the world in manufacturing enterprise and progress. It must be a matter of constant wonder to every serious investigator that such an enormous industry, for the lack of which we are paying an annual tribute of \$50,000,000 to European countries, an industry demonstrated by the United States Government and other experts over and over again during nearly half a century to be easily within our reach, should still remain simply a possibility, when all that is needed to secure it is that Yankee spirit of enterprise and eagerness for accomplishing great things that have made our country what it is.

The introduction of this industry cannot be long delayed. If New England is first in the field, as she has been so often in the past, she will reap the chief advantages and benefits. Will not this association choose a capable committee at this time to give this question the earnest consideration it deserves?—a committee empowered to employ a secretary and to seek governmental and other assistance in taking the initial steps in the enterprise.

#### BRITISH CARPET STYLES.

A writer in The London Cabinet Maker says: "The question of the hour with manufacturers will soon be what to produce in the shape of novelties for the coming spring. I think a change of styles might with advantage be introduced; but so far I have heard of no departure from the standard designs of last year. Some of my friends think a few good Persian and Indian colorings would go well in place of the usual floral patterns which this year have been well brought to the front—I had almost said 'done to death.' On one point most manufacturers are agreed—that Axminsters and Wilton piles must be considered, especially those of the lower makes. The general houses, who always seem somehow to possess the art of 'making things hum,' even when upholsterers are complaining of quiet times, find that these showy goods boom the trade and considerably help to tot up the returns. In face of this fact it is hoped that the British manufacturers will emulate the ingenuity and taste displayed in the colorings of some German squares I have seen on the market. In my opinion the effect of colorings in this cheap class of goods has not been equalled on this side. The question naturally occurs: What are the carpet manufacturers doing? It is true that only a small amount of business in this particular direction is being done, but why should the Germans and French secure what ought to go to our own makers? I do not think that sufficient effort is made by the workers in textile districts to take advantage of those technical institutions which already exist in this country. While we are still a long way behind our rivals in providing

these establishments for affording the workers every facility for improvement in their particular departments.

"Business in the wholesale trade is not so bright as usual and, except it be for the everlasting squares, repeats are slow in coming to hand. Rumor has it that stock takings will not come up to the average. One class of goods, however, continues to find much favor in the market, as indeed it has done all through the season—I refer to the cheap machine printed floor cloths and linoleums; some difficulty is experienced in getting orders for these executed.

"The repeats for the best body Brussels continue extremely sluggish, and, in the face of the new patterns and colorings I have seen in the local Axminsters that will be on show for the spring range of samples, the orders for best Brussels will still be small unless the same effect can be given as in these goods. At present I must not state the line of coloring for these grand carpets. We shall show a few startling lily-leaf green grounds—quite new for the English market, and other changes in the art hues of green, fawn and blue, and the colors raised to such a high level that it will be admitted that some charming results have been obtained, extremely artistic and out of the common"

## Foreign Textile Centres

MANCHESTER.—Cotton continues weak. This decline is regarded as proof by many that we are to approach the "four lbs. for a shilling" limit, although the view does not obtain general acceptance. The cotton yarn market has been affected by the fall in raw material. Buyers are much firmer, but spinners are assisted by the important orders under contract, which in many cases will suffice to keep them going for some time ahead. Bradford houses are taking much larger quantities of cotton warps, a fact which may quite safely enough be held to indicate an improvement in the demand from New York. Belfast is also buying cotton at a satisfactory rate. The imports last quarter were 1,520 tons, or, say, 3,404,000 lbs., a quantity quite up to the average of recent years. There has been very little doing in the lace departments of late. The agitation against short lengths in connection with Plauen goods will accomplish a useful purpose. At the same time, it is to be noticed that the difficulty would never have arisen had the metric system been adopted by this country. There has been a much more active movement of late in the New York business, consignments from the Mersey having increased considerably. The prospects for the remainder of the season have, in fact, considerably improved, and much larger orders have of late been placed by the large houses on the other side. In quite a multitude of ways the effect of this revival in the States has made itself felt. The raw silk markets of Milan, Yokohama, Canton, and Shanghai have experienced the beneficial effects of increased American buying, and the demand for hatters' fur has also been augmented, with a corresponding influence upon prices. There has been a strengthening of many branches of the raw material trade owing to the altered commercial conditions across the Atlantic. There is not much doing in the carpet sections. Orders from Canada have increased in importance, and there is now quite an accumulation of stocks in Montreal, Quebec and Toronto. There is not much inquiry in the home trade for floor-coverings. Local interest in the subject has been greatly lessened since the principal manufacturers commenced to distribute goods on their own account. The tendency is more marked in the carpet than in any other branch of the textile business.

OLDHAM.—The cotton mills, weaving sheds, and iron works in this district were closed for the Wakes holidays.

During the stoppage repairs and alterations have been carried out at several mills. The Wakes clubs distributed their funds, but the reports to hand are to the effect that the sums distributed were below those of last year; especially was this the case at the ironworks, owing to the engineers' lock-out.

**LEEDS.**—There was some improvement in the demand for worsted and woolen cloth recently, and the attendance was larger than for some time past. Considering the large stocks of last winter's goods the orders were of fair extent, and both London and provincial requirements were larger than had been expected, and Scotch and Irish business was fairly good. For the time of the year there are unusually large quantities of specialties being made to order in worsteds, serges, and strong fabrics. For black beavers, presidents, pilots, and reversibles the demand was hardly so good, but it is slowly improving. Prices were quite equal to makers' expectations, which is owing to the good demand for Canada. Some inquiries for indigos, twills, black and grey vicunas, and for fancy meltons took makers by surprise, stocks in warehouse being low and new production immediately necessary, but rates were unchanged. New spring patterns did not receive much attention, but quotations were asked from makers of fancy and Scotch tweeds and of all-wool suitings, but no orders were placed. The costume cloth trade was quiet. A large order for indigo army cloths was placed at former prices.

**HUDDERSFIELD.**—In Huddersfield business is, on the whole, fairly healthy, as, in addition to the makers of the best kinds of fancy goods being busy, there is also more doing amongst the makers of medium plain woolens.

**BRADFORD.**—Although lace is very largely worn, there is much grumbling at the unsatisfactory condition of trade, particularly as regards the home demand. No doubt the unsettlement of trade, caused by the constantly-recurring labor disputes in different parts of the country, is largely responsible for this, and it is difficult to see how an alteration can be effected in this particular. Perhaps when the holiday season has run its course, we may witness a revived demand for lace goods; meanwhile, manufacturers are busily engaged in the preparation of novelties, with which they hope to stimulate the demand. Although business in fancy millinery laces is, on the whole, slack, animation is observable in some particular lines. Valenciennes laces, edgings, and insertions are still much in favor, notwithstanding the strong competition they have to meet in foreign-made goods. More attention is being paid to home-produced Oriental laces, and attempts will be made to push cotton and linen torchons. The inquiry for silk laces is still very restricted. There is not quite so much doing in fine bobbin nets and light tulle. Mosquito and corset nets meet with a strong demand, and the highest quotations are firmly adhered to. Stiff foundation nets are moving in moderate quantities, and there is a fairly good demand for spotted nets and Mechlin tulle. Only a moderate business is being done in the fancy apron, cap, and ruching branches, and many hands are unemployed. Plain, fancy, and chenille veilings are selling in good quantities, and manufacturers are busy in the preparation of new samples. In hosiery, natural wool vests, combinations and smaller goods are steady in value, but the demand is not equal to former averages. A good demand is experienced for certain specialties in cycling hose. The market is less favorable to sellers of cotton stockings and socks of the ordinary type, and the demand is languid. A steady trade is being done in merino and cashmere vests, and prices keep firm. White, cream, and tan hose for girls and children are selling in cotton, merino, and cashmere. The Bradford wool market continues to be extremely firm for all classes of raw material, and the position of holders appears to be strengthening, as it is quite un-

derstood that should the promised improvement in the American trade come about, the manufacturers on the Continent will also at once become buyers, as well as those in this district. The demand for fine colonial merino wools and tops continues very good, but this is undoubtedly more the result of a shortage of the supply from the Australian producing districts than from any increase in the consumption of these wools, as the combers of these wools have not been well employed for many months past. In the crossbred colonial wools, especially in the coarser qualities, business continues quiet, but there is an absence of that extreme depression which characterized this department of the wool market for the greater part of the present year, and all the extremely cheap lots of both wool and tops now seem to have been taken off the market. This class of wool is so largely used in the production of two-fold weft and warp yarns, which are exported to the Continent of Europe (principally to Germany), that the long depression there has had the effect of causing spinners to take almost any price to keep their machinery running, and as the continental users have kept finding that the longer they put off ordering the cheaper they could buy, they have run their stocks down to the lowest possible point. When, however, these consumers are convinced that the real bottom level of prices has been reached, they will begin to come into the market to replace their attenuated stocks, and the increased quantity of offers from abroad at prices just under spinners' present quotations would seem to indicate that the condition of the market above referred to has very nearly arrived. In English wools there is little change to report in connection with any of the heavy stapled non-lustrous kinds or in cross-breeds, but the quiet buying of pure lustre wools, which has been noted in previous letters, is at last beginning to have an effect, and holders of the best class of lustre hog wools are trying to establish slightly advanced quotations. Raw alpaca is very firm, and at both the Cape and in Turkey there has in the last few days been very considerable activity, and some large purchases of raw material have been made at prices quite equal to the recently-advanced quotations. Mohair spinners continue to be very well employed, but almost wholly for the home and continental dress goods trade, as the demand for mohair braids is rather quiet. All classes of worsted yarns are in better demand on home account, and for yarns made from fine merino wools spinners are able to gradually advance their quotations.

**ROCHDALE.**—The flannel market was thinly attended by merchants recently on account of the holiday season. Most of the mills have been closed for a week. The business transacted was on a small scale, but there were signs of an improvement in the trade. Manufacturers find great difficulty in getting an advance in the prices, and this can only be done for the finer class of goods. There is every prospect of the manufacturers' profit this year being considerably less than late years.

**KIDDERMINSTER.**—Machinery is kept moderately well employed on small orders and repeats, and in the trial of new patterns. A few of the travelers are visiting their customers with the object of looking up repeats, but they will not go on the road with the new season's patterns till the end of September. Those travelers who visit Canada are now getting away, and with the favorable fiscal arrangements they ought to send home some good orders. The impression grows in all quarters that the next season will show a considerable improvement on the one now closing. So far as the prices of wools and yarns are concerned there are clear indications that a little more money will have to be asked, unless people are content to lose money on their transactions. The consumption of wool and the production of yarns will be for some weeks of a restricted character.

**NOTTINGHAM**—Inquiries for lace and hosiery yarns have been languid, and there has been no disposition to place orders to any extent. The market has been decidedly less favorable to sellers of all classes of cotton yarns than recently, and quotations are unsteady. There is no change in the brown net trade; prices of all plain goods are firm. The fancy lace departments are dull, and there are few buyers in the market.

**LEICESTER**—The hosiery industry is still very partial, and several of the plain branches are very flat, but there is more business offering and prices show an upward tendency. The Indian and Colonial trade is improving. The improvement in the yarn market is well maintained, and spinners now occupy a much stronger position and decline to entertain offers of new contracts unless higher prices are conceded. The export trade is still partial, but the production is kept low, and the business done is very sound and regular in character. Lambs' wool, natural cashmeres, and fancy yarns are firmer, with an increasing consumption.

**SOUTH OF SCOTLAND**—Business in the South of Scotland woollen trade has not undergone much change recently. A good many of the makers have a fair amount of work before them, but there is still considerable room for improvement. The demand for worsted goods continues surprisingly steady. There are also good enquiries for cheviot cloths. Very few transactions in wool are reported, but merinos continue firm in price, and a further advance is expected. Home wools are in poor request, and rates are going down.

**KIRKCALDY**—There is no indication of a falling off in the production of floor-cloth and linoleum at the Kirkcaldy factories. All the establishments have large orders on hand, there being a strong demand for all qualities. The linen factories are moderately busy, although the spurt has not yet commenced.

**DUNDEE**—The linen branches of Dundee trade showed more signs of life recently. Some good lines have come to hand from the United States markets, and there are indications of the home demand improving. Drapers in Dundee at the moment are extremely quiet. The summer trade is now over, and the winter business has scarcely started. In the course of a week or two it is expected that a briskness will set in.

**BELFAST**—The improved tendency in the linen market is well maintained, and further recovery has been made in several quarters. Yarns are moving steadily into consumption, the briskness being still more or less restricted to wet tows. Line welts, however, are gradually selling in larger quantity, and prices of both are very firm at the late advance. Trade in brown linens is steady, it not quotably larger. Green yarn power-looms are changing hands in fairly substantial parcels. Boiled yarn goods are quiet, and damasks, napkins, and towellings in moderate request. Wide unions are satisfactory, and elastics sell freely. American trade is expanding steadily, orders being larger and more frequent.

**LYONS**—The Lyons market remains very quiet. The mills have received but few orders for Spring, and there are but few buyers in the market. Manufacturers are still without positive information regarding the fabrics which will be favored by fashion, and all that is known is that taffeta will continue to be the leading weave. Taffetas glace have been ordered, and there is also some indications that embroidered and broche taffetas will be fashionable. White damas in medium grades, satin duchesse and merveilleux are in better demand than they have been for a long time, and further orders were placed for mousseline. Some orders were received from the United States for warp prints and ombres, for delivery during September and October, from which it is concluded that the outlook for the Fall season is favorable. Velvets continue to sell very freely in cheap and in fine all-silk qualities. The desir-

able shades are marine, bleuët, ruby and maroon. Fancy velvets in black and colors are much sought. The latest novelty in these fabrics are small velvet figures or dots on a taffeta ground, which are being produced in good qualities, mostly in colors, the shade of the taffeta and of the velvet being different. Purchases in plaid and striped velvets are quite satisfactory. The ribbon trade has improved, fairly large transactions taking place in cheap goods. Novelties are sought in better grades, stripes being in particularly good demand. The demand for satin ribbons has also improved.

**CREVELD**—This market is very quiet, there being scarcely any demand either from retailers or wholesalers. Fall orders have been delivered, but there is no signs of a beginning of the season. The cloak trade has started well and supplies a fairly regular demand for lining silks. Bold ribbed diagonals continue to lead, and aside from black are sought in brown, mode and green, but it is observed that the use of colored linings is made much lighter than during the last few seasons. Black merveilleux also sell very well, but for outer materials the demand is not as active as had been anticipated, and the demand for matelasse has not developed to the expected volume. On the other hand, the demand for velours du Nord is much stronger than had been anticipated, and the heavy stocks of six weeks ago have almost disappeared, while the mills are filled with orders for a considerable time ahead. Pile fabrics, generally, are in a much healthier position. The demand for plain black and colored velvets from stock has become much heavier, and the orders for later delivery in the hands of the mills are more numerous; in fact, all the mills are now working full time. Fancy velvets are much sought in brocade styles, as well as in stripes and checks.

**CHEMNITZ**—Business is very satisfactory, but prices should be better, is what most manufacturers reply when questioned as to the present state of trade. All indications point toward a good season, and manufacturers will soon have booked orders enough to keep their plants running on full time. Even if the buyers in town do not seem anxious to buy heavily, they are placing good-sized orders, and some few have placed very large orders. As to the style of goods, there is no change, and it is only on fancy styles that the opinions of the buyers vary. Narrow stripes, ombres and similar styles, however, are generally preferred. Woven vertical stripes are, also, in good demand. In gloves, trade is very active, and in low-grade cotton gloves a considerable advance in prices has been made, and another rise will doubtless take place shortly if the present volume of trade is maintained. In underwear, trade is also very satisfactory, and in fine lises, silk plaited all-silk qualities liberal orders have already been placed. Buyers placing orders early will most likely not only secure the goods cheaper than those who come later, but also have the goods in stock when the others will be spending their time and money writing and wiring for delivery of orders long overdue.

#### DEPRECIATION.

In times now past, never to return, remarks London Engineering, men went into business to make an income or a fortune. Now they are content with a dividend on their capital, which is quite a different thing. Of course there was always some relation between the capital in a concern and the profits; the large undertaking was expected to make more than the small one, and a business grew, so the gains were anticipated to increase, although not always in direct ratio. At the end of the year the manufacturer reckoned up his profits, comparing them with those of previous years, but it was only those with actuarial minds who stated them as percentages. It was customary to deduct what the capital might have earned if invested

in stocks or shares, without the exercise of trouble on the part of the owner, and this naturally was arrived at by assuming five, or some greater percentage, as the legitimate reward of capital. There were other deductions also to be made by those who strove for business exactitude, notably one for depreciation; but it mattered little what was the amount thus written off, for well-managed manufacturing businesses paid so well that the greater part of the profit was spent in extensions. It is a tradition on the Manchester Exchange that there once was a time when the owner of a small cotton mill could confidently begin to build a large one beside it, certain of being able to pay for it out of profits, with the temporary assistance that his banker was only too ready to furnish.

In those days the average man could hardly spend his profits, for they grew more rapidly than his ideals of what was necessary for his comfort. He naturally put the greater part of them into his business, because there they brought him in more gain than if invested in other ways; hence he kept the concern in a very sound condition, for some part, at least, of it was always modern. Indeed, machinery grew old in a very leisurely fashion in those days, for the pace was easy, and there was little influx of capital into any industry from the outside. There was no Limited Liability Act to protect those who desired to enjoy the profits of manufacturing without sharing the worst of its risks. When profits are large it is of comparatively little importance what is the condition of the machinery—of course 25 per cent. is always preferable to 20 per cent., but it does not offer the same relative advantage as 5 per cent. does over an even balance. When there is money to spend in a concern, it is far better to apply it in extensions than in replacing machines that are still giving a good return, provided a market can be found for the enhanced output. This is really "writing off," although it scarcely conforms to the accountant's definition of such an operation, since the books of the concern give an incorrect view of its capital value. But, what is of greater importance, it feeds the undertaking with new plant and fresh capital, and in that way maintains its vitality, and its ability to keep its position in the world.

The times, however, when bookkeeping could be neglected without great risk are very far remote, and the practice of making deductions for wear and tear of buildings and machinery has long been established. For a long time it was customary, and, indeed, it is so still, to write off annually a given percentage of the value of machinery, as shown by the last year's balance sheet. This has the aspect of being a logical proceeding, and further, it prevents the accountant finding himself in an awkward position of having to assign a negative value to a plant which is still doing good work. In the early years of the life of the machine its value gets rapidly written down, but very soon the rate falls off, and eventually the annual deduction grows very small indeed. It is an inversion of the well-known increasing effect of compound interest. Under this system a machine has always some value, and there comes a period when years seem to have scarcely any effect upon it. It enjoys a lusty old age—from the actuarial point of view—and it seems sacrilegious to scrap it and replace it by another tool which will suffer a very severe annual decline in value. Not only will the machine involve a large initial outlay; but it must also earn far more than the old one before it can show a profit; hence its advent is often delayed. The manufacturer thinks that in carrying out the system of writing off the annual percentage he had done all that can be required of him, and he treats what is left as income to be spent without regard to the requirements of his business. The old-fashioned kind of manufacturer does not now make so much profit that he has plenty of money to spend on extensions, and hence he awakes one day to find that he must get a large increase of capital from outside, or must close

his business. His books show that he has a valuable plant, but unfortunately its earning power is nil.

Our accountants will have to revise their ideas of depreciation if industrial undertakings are to have the long careers they have enjoyed in the past. Otherwise, their histories will be confined to a short period of good profits, and a longer period of struggle, to be followed by extinction. When the Institution of Naval Architects visited Germany a year or two ago the question was constantly heard: "How are we to compete with all this new plant?" The answer rose glibly to the lips of the casual observer, "By putting down similar or better plant," but it had a mocking sound to those who knew the facts. In many cases there was no fund from which the necessary money could be drawn. The gains of past years had been credited too freely to profits, and depreciation had not been provided for on a sufficiently liberal scale. No doubt the temptation to be satisfied with a moderate sum for this purpose is almost irresistible in times of competition. The yard must be kept going, and the owner must live; these are two essentials, and they must be satisfied before the future can be thought of. Further, it needs very great strength of mind to scrap a machine which is still as capable of doing work as when first set down years ago. Nevertheless, if that machine cannot make a profit in competition with those of to-day, it ought to go. To keep it is like a vine grower storing his wine in a leaky cellar; the loss goes on steadily all the year around, and although an occasional good harvest may enable a part of the vacant space to be replenished, yet that does not reduce the wastage, and some day the cask will be empty.

The ordinary methods of reckoning depreciation take no account of the important fact that machines grow yearly more specialized and more expensive. The lathe costing £200 has to be replaced by one costing £400 or more, and no system of percentage on last year's book value will provide for this. It is only by writing off a fixed annual sum that the case can be met. The so-called absurdity of a machine being credited with a negative value is not an absurdity at all, when it is remembered that its successor will probably cost twice as much as it did. A manufacturing business cannot be run on the principle of gradually writing off all the capital and then allowing it to drop. Much money has to be expended in directions from which it cannot be drawn. Reputation has to be created, and the confidence of customers to be obtained, and both these cost money. Any attempt to trade upon them by turning out inferior goods deteriorates them most rapidly, and even when unimpaired they are scarcely ever saleable to another person for what they have cost. Business is like a race, the entrance money is only returned in the form of prizes. The man who drops out gets nothing back. Once a man has embarked his fortune in manufacturing, he can only regain it by being successful. He must constantly find more and more capital, and spend increasing sums on machinery; every year this necessity becomes more urgent.

The man in the parable had a reasonable certainty when he wrapped up his talent that it would suffer no deterioration by time; the depreciation of silver had not been heard of in those days. But the same cannot be said of machinery. It may be carefully greased and well looked after, but it loses value almost as rapidly when standing as running. Unlike a man, it has no power to keep up with the times, and adapt itself to the altered condition of things. It cannot imitate the ways of its younger rivals nor put its experience against their strength. It is the restless mental activity of the age that causes depreciation to be now such an important factor in a balance sheet. Thousands of people in this country devote their lives to improvement of machinery, that is, to render existing machinery obsolete, and so long as capital is crying for employment

they will find plenty of assistance in exploiting their ideas. It is by no means likely that we have seen the worst—or the best—of this process. The pace has perceptibly quickened during even the past ten years, and it is certain to get still faster in the next decade. America leads the way in a fashion which is absolutely staggering. In her iron and steel works, money is poured out like water on new machines. Old plant is thrown out as a matter of course, and the manufacturer who cannot find the money to purchase new gets squeezed out of the trade, although his works may be perfectly equipped for every purpose, except that of making a profit.

Private manufacturers, as a rule, are awakening to the importance of making proper provision for depreciation, if the state of their business will allow of it. But it is very difficult to make the average shareholder in a limited company understand the necessity of the deduction. Quite recently we heard of a shareholder at an annual meeting protesting that the whole amount set aside for depreciation should be distributed as a dividend and that in a concern standing in urgent need of a very liberal expenditure on plant. Directors are apt to purchase peace and quietness at the expense of the ultimate success of the concern, and to pay a dividend when a call on the shares would be the proper course to adopt. Such a proceeding operates disastrously in other ways than those we have noted above. It encourages trades unions to make demands for increases of wages, and renders it very difficult to refuse acquiescence, not only by the company in question, but also by the rest of the trade. The manager cannot go behind the acts of the directors and declare the place is making a loss when a profit has just been distributed. Further, bad finance of this kind increases competition. Other people seeking an outlet for their capital argue that if a more or less antiquated plant can earn a dividend, then a newly designed works must yield a splendid return, and they rush into an overcrowded industry, depressing prices still further. Large numbers of our limited concerns have been distributing for years as dividends the money that ought to have been spent on renewals, and they must assuredly go down when the present rush of good trade has spent itself, and has been followed by the inevitable reaction.

We are not going to attempt to say by what proportion or amount the value of a machine decreases annually, because to do such a thing is quite impossible. The figure varies in every trade, and for every class of machine in each trade, and even if settled authoritatively to-day, it would not be correct five years hence. Our object is rather to urge upon the attention of manufacturing engineers the fact that the business methods of twenty years ago are not applicable to the present day. Of course, they all know that, but there is a vast difference between assent to a general proposition of this kind and its rigorous application in daily life. When profits are small, and the expenses of living are great, owing to the luxury and ostentation of the age, it needs a deep conviction of the necessity of the case to enable a man to write his gains down to a small amount for the sake of providing a reserve fund for the future. We wish to emphasize the point that a business to be successful must receive a constant accession of capital, and that much of this must be created by the business itself. The days of enormous profits are past, and for that reason every part of a plant must be worked at its highest efficiency. The machine that does not earn a profit is merely a useless incumbrance, however satisfactory it may be to look at, and it is actual economy to break it up with a sledge hammer rather than keep it filling up valuable space. This is a condition to which every machine comes in time—often in a short time—and unless the owner has accumulated money to replace it by a better and more expensive one, he has been living on his capital while deluding himself with the idea that he was only spending his profits.

#### A CORRESPONDENCE TEXTILE SCHOOL.

The announcement is made that a new textile school will shortly be established in Lowell, Mass., on the correspondence system, and that Christopher P. Brooks, the present director of the Lowell Textile School, will have charge of it as director. Mr. Brooks, who had charge of the Lowell Textile School since it was first organized, and who has brought it to its present high state of efficiency, resigned his position a few days ago and will enter upon his new duties immediately. There are undoubtedly many men who would like to take advantage of a textile school education, but who are unwilling to leave their positions to do so, or who are prevented from financial or other reasons. This has been noticed by several textile men, and with Mr. Brooks as principal, the American Correspondence School of Textiles has been established. Mr. Brooks' resignation will be a loss to the Lowell Textile School, which he has given almost an international reputation in less than two years. The new arrangement will leave Mr. Brooks free to supervise other textile schools, and he has already accepted an appointment as consulting engineer to the Georgia School of Technology, Atlanta, Ga., and will design and supervise the construction of the new school at Atlanta and organize its staff. He is also being consulted regarding the establishment of a similar institution in Canada. The headquarters of the new correspondence school, it is understood, will be in Lowell. Mr. Brooks states that it will not in any way conflict with the work of the Philadelphia or Lowell textile schools.

#### RECENT TEXTILE PATENTS.

No. 60,633.—Improved knitting machine; Chas. James Appleton, Long Island City, and Edwin H. Browne, New York City.

No. 60,705.—Artificial silk; Dr. Max Fremery and Johann Urban, Oberbuch, Germany.

#### LINENS IN THE UNITED STATES.

We have received from the Albany Linen Mills, Albany, Wis., some samples of linen towellings which speak well for the future of the linen industry in the United States, says the Dry Goods Economist, New York, in a recent issue. The goods are made from flax produced and prepared in the United States, and the proprietors of the Albany Mills express the opinion that it is only a matter of time before finer goods will be produced. Considerable difficulty is still experienced in the preparation of the fiber. One of the obstacles is the present inability to thoroughly decompose the stronger straws, which unless removed, render the yarn, and consequently the fabric, uneven. One or two methods of retting have been employed, but there is a tendency to return to the method known as dew retting. A strong effort is being made in Oregon to build up a flax industry in that State, and an organization known as the Flax Fiber Association has been formed for this purpose. Much difficulty is experienced in inducing the farmers to plant flax, but the advocates of the industry are being ably supported by a linseed oil company, which gives to the Flax Fiber Association all the straw it has on hand, after removing the seed. The association also plants several acres on its own account, from which a very fine straw is obtained. We are informed that the linseed oil company is planting more flax this year and planting it thicker so as to produce better straw. A competent superintendent, who comes from Belgium and uses the Courtrai system of retting, is employed by the association. In addition, M. Leppens, who invented the tank system of retting successfully used in Belgium and Ireland, is now in Oregon. Charles Richards Dodge, of the Agricultural Department at Washington, was desirous of having M. Loppens employed to demon-

state the merits of his system in America, but Congress failed to make the necessary appropriation. Failing this, Mr. Dodge endeavored to have the Flax Fiber Association employ M. Loppens, but this, for lack of funds, could not be done. When M. Loppens saw the Oregon straw, however, he decided to go there at his own expense and demonstrate his system. It is understood that M. Loppens will remain with the Flax Fiber Association until his method of retting is fully understood. He is convinced that the Oregon water is of the best quality, and says the State will astonish America with its flax.

### WEIGHTING WOOLEN BLANKETS.

At a meeting of the Manchester, Eng., Chamber of Commerce, recently, attention was called to the "weighting" of woolen blankets with moisture attracting substances, which practice is believed to be growing in the trade. A manufacturer stated: "We have the same evil to contend with in the blanket trade that you hit on the lead in the waste twill sheet trade, and blankets will soon be as dangerous to sleep under as sheets if certain practices in filling are allowed to go unchecked. I have protested for some years, but in vain, and certain people are compelling others to follow suit or lose all the trade." Another said he would not sleep under a pair of his own sheets for £100. The mixtures of zinc and epsom salts used for weighting purposes were very deleterious in the effects they produced. The following resolution was adopted: "That the president be requested to call the attention of the Home Trade Sectional Committee to the practice of weighting textile fabrics used for clothing purposes with moisture attracting materials, with a view to devising the best method of dealing with the evil."

### A GERMAN PROCESS FOR INCREASING THE WEIGHT OF WOOLEN GOODS.

The formula for the best and relatively heaviest weighing process for finishing dyed woolen fabrics, which are to be treated with glue or starch decoction, so that the several agents do not enter into a chemical combination, i.e., that the former must dissolve readily, not come out of the dry fabric in dust afterwards, nor influence the color of the goods in any manner, states a contemporary, is as follows: One hundred parts of potash alum, 100 parts of glue (animal is best), 5 parts of nut-gall tannic acid, and 2 parts of silicate of soda (water glass). The potash is dissolved in 100 parts of boiling water. The glue is steeped in cold water until it has absorbed double its weight, after which the superfluous water is decanted, and the swelled glue heated to boiling point. During the boiling, the tannic acid and the silicate of soda are stirred into the glue solution. The potash solution and the glue solution are then poured together, and, with constant stirring are boiled until thoroughly incorporated, after which the mixture is placed aside for cooling. The gelatinous mass obtained in this manner is employed as follows: One pound of the substance is boiled for three hours with 10 or 12 pounds of water. The loss of water occasioned by evaporation is replaced by pouring in fresh, so that the solution is always sustained at the same degree of concentration, which is to be ascertained by the hydrometer. When the bath has cooled to 17° F., the fabric is entered for one-half hour. The latter, having been impregnated in this manner, is then, for six hours, spread horizontally upon a table, whereby the uniform distribution of the fluid through the whole piece is effected. The escaping fluid may be collected and used again. After six hours, the fabric is dried upon a horizontal frame, either in a drying-room, at a temperature of 133° F., at the most, or in the open air. The fabric, impregnated in this manner, has largely increased in weight, is stronger and water-proof, without preventing exhalation from the body when used for clothing. The

fabric is made ready, at 122° F., in the calendar. By treating dyed fabric with this mixture, the colors are thoroughly fixed. For pale colors, both glue and potash alum must be as nearly colorless as possible. The latter must also be perfectly free from iron or other coloring ingredients.

### FIRE SERVICE IN FACTORIES, WORKS, ETC.\*

BY HAROLD SUMNER.

It is difficult to generalize on a subject of this description. No two factories have the same requirements in the matter of fire service. And yet most factories have so much in common that I will attempt to show what is necessary for an establishment worked under normal conditions and of an average extent. For the purpose of this paper I assume that the factory or works under consideration covers several acres, that the water supply is ample, either from reservoirs, river, or canal; that there is no fire brigade within reasonable distance, that there is no public water supply, and that the buildings are of fairly substantial type, mostly only one storey in height, but not constructed with particular regard to avoiding damage by fire or with any special attempt to separate the various hazards. Now, the first consideration is the description of the plant to be adopted, and before entering further into this matter it is desirable to point out that quite as much care should be taken in choosing the best apparatus as if the selection of some additional machinery for the process of manufacture were in question. Only apparatus by first-class and reliable makers should be chosen.

The principal part of the fire-extinguishing apparatus is the pump, be it a stationary one or a portable steam fire engine. This pump we will call the fire pump, and remark that it should be, preferably a stationary one. Its position should be carefully chosen, both as regards the distance from the main water supply and the boilers which are to supply it with steam. It is advisable that the fire pump be exclusively bought and used as such, and beyond occasional employment as an auxiliary or stand-by to the general pumping plant of the works, it should not be brought into daily and regular use, but be solely retained for its specific purpose. It must not be understood by this that it is to have no attention paid to it, and stand idle month after month; on the contrary, it should be worked regularly at stated intervals, tried for lengthy and short spells under the conditions it would be required for, and occasionally be thoroughly overhauled. The reasons for having a pump stationed for fire purposes only are, firstly, that it would probably be found to be an uneconomical pump for general purposes; and, secondly, that, provided it has proper attention bestowed on it, it is always ready for immediate use without time being lost in changing from some other work it may be performing. The type of pump I consider best adapted for this work is one of the duplex type, i.e., having two steam cylinders and two water cylinders, steam and water cylinders being on the same rods. This type has the advantage of starting immediately and dispensing with a fly-wheel. The water-way should be large and so arranged that the water, when passing through the pump, has no devious paths to follow. It should be brass-lined throughout the water end, and of strong construction. Large suction and delivery air vessels should be provided, and also a bye-pass between the delivery and suction chambers, so as to enable the pump to work with small or large jets. For deep lifts the suction pipes should be provided with a foot valve, and where possible with a charging pipe and valve. Hose valves can also be conveniently provided so as to permit of two or more jets being directly obtained from the pump.

In ordering such a pump it should be carefully specified that

\*Reprinted from the transactions of the British Fire Prevention Committee.



the pump shall be able to work efficiently and well with a low, as well as a high, steam pressure. This is essential, since the steam pressure is often low at night time or during any stoppage of the works. It must also be taken into consideration that the quantity of water stated to be delivered by the makers is generally the maximum possible under the most favorable conditions. The fire pump should be housed in a building of its own, preferably detached from any other, but as near its steam supply as possible. In factories, where steam is not kept up during the night, or during holidays, it is advisable to have an auxiliary boiler placed near the fire pump. This boiler should then be of a quick steaming type, similar to those used with steam fire engines, and it should be possible to raise steam to 100 lbs. pressure in eight minutes. In such cases, of course, the fire pump should be connected with the main boilers as well as with the auxiliary boiler, so that the steam supply from the former, if available, can be primarily utilized. The fire pump should be directly connected with the principal system of fire mains. Where it is possible the delivery into the mains should be effected through a T-piece delivering into two mains, each running in different directions from the fire pump, but joining at the most distant point, thereby forming a complete circuit round the premises. Each main should have a controlling shut-off valve in the pump house, so that it can be used independently of the other. Valves should be placed at various convenient points on the mains to permit the speedy cutting off of any section that may be rendered inoperative through a burst, without the whole system of mains being necessarily thereby affected. The mains should be large, and should be laid at least two feet six inches below the surface. Cast iron spigot and socket pipes, coated internally and externally with Angus-Smith's solution, should be used in preference to flanged pipes, though the latter are useful when any alteration to the mains may be expected to frequently occur. Easy bends in the directions of the flow of the water should be provided, and every precaution taken to minimize loss of pressure through friction in the pipes. Branch circuits can be taken off the principal system for special sections of the works or for circuits of secondary mains, such as the internal ones, and dead-ends should be avoided. A flush-out pipe controlled by a valve should be provided for flushing out the mains periodically, or for emptying them in cases of severe frost. The latter valve, of course, would be placed at the lowest point of the mains, so that the mains could be quickly and efficiently emptied.

An automatic water-relief valve should be placed on the main close by the fire pump, and, further, one or more valves of this description should be placed on the mains. This precaution will obviate any damage to the mains or fire pump from shocks occasioned by the simultaneous or sudden shutting down of the hydrants in use.

The course of the mains should not be laid too close to the buildings, but some few feet away, without being so placed as to be liable to be damaged by heavy traffic passing over the hydrant boxes. The position of each hydrant or standpost off the main system should be clearly indicated by a plate on the wall immediately over the hydrant. The hydrants should be placed in neat proximity to or opposite the entrances to different parts of the works and should be so arranged that at least four jets are easily capable of being brought to bear on any given point. The hydrant boxes should be lined with cement and drained. Special precautions should be taken against frost either by the adoption of "frost-proof" hydrants, by keeping the fire mains empty during the cold weather, as indicated above, or by ensuring in some way a gentle and constant flow of water throughout the system. It should be strictly prohibited to deposit anything on or in close proximity to a hydrant. In connection with the main system generally, simply known as the external fire main, a series of internal mains, each forming

its own circuit, can be arranged. A shut-down valve should be placed at the points of connection between the external and internal mains, so that the latter can be easily cut off from the external mains should they be damaged or rendered useless during the progress of a fire. The position of these valves should also be clearly indicated. This system of inside mains should run through every part of the factory. Each room or section of the works should have one or two fire valves off these internal mains, the hydrants being situated near the entrance to the room or section.

Quite apart from the water supply and pressure obtainable through the fire pump, it is advisable that the whole of the mains (internal and external) be connected either with an overhead tank, situated on a roof and holding at least 6,000 gallons, or to a public supply main. This tank, or public supply, will always keep the mains, external and internal, charged with water under a slight head, and be found useful for a rapid first attack on any outbreak discovered in its early stages. This slight head may suffice to extinguish a small fire or keep the flames in check till the main pump can be got to work. A valve should be placed in a convenient position on the rising pipe to the tank; this valve is to be closed when the fire pump is at work, so as to avoid any loss of pressure or water on the system of mains.

It is important that a large-sized tank should be employed when a constant steam supply is not available, and this tank should be of sufficient capacity to ensure a plentiful water supply till steam is raised in the quick-steaming boiler mentioned before. Automatic starting valves can be placed on the steam supply pipe of the pump, in order to start the pump directly any water is drawn from the mains, but this device, of course, can only be adopted when a constant steam pressure is obtainable. Where the reservoir or other source of water supply furnishes sufficient head to keep all the mains under a moderate pressure at the highest point of the system, the tank can be dispensed with. Neither the external or internal fire mains should be used for the ordinary supply purposes of the factory, if it can be avoided; and, where it is necessary, all connections must be securely made, so as to stand the pressure necessary for an efficient fire service.

As to the hydrants and valves, these should be of the best make, of gun metal throughout, and of such construction that they are not liable to leak and are easily and quickly opened. Near each fire valve or cock a cupboard or box, containing sufficient hose to reach to any point of the protective area of the fire valve, a branch pipe, and a proper sized nozzle should be provided. This cupboard should be damp-proof, and provided with glass doors, so that it can at once be seen if the proper appliances are in good condition. Instead of the cupboard, the hose and branch pipe can be flaked on a swivel bracket, or attached to the wall, but in damp places the cupboard is preferable. If the hose is kept directly attached to the valve, a small tap or cock should be placed between the seating of the valve and the hose coupling. This tap should be kept partially open, so that any water leaking past the valve will be drained away, preventing any deterioration of the hose and calling attention to the faulty state of the valve. A tap can be placed on the main itself for the purpose of filling the fire buckets, etc. It is advisable to provide an air vessel of large size, or a water-relief valve, to each circuit of internal mains, and also a few cut-off valves in a similar way and for reasons similar to those mentioned when speaking of the external mains. As the internal mains are of undoubted utility in preventing the spread of a fire or checking it in its inception, it is advisable that the fire valves and mains should be as numerous as possible. The size of the internal mains generally depends on the size of the room or part to be protected, but the greater proportion of the internal mains should not be less than four inches in

diameter. But with all due regard to the value of the internal main or circuit, the external main should always have precedence, owing to possibility of working from it in more than one direction, or, in other words, owing to its greater elasticity. It should also not be forgotten that internal mains are liable to damage during a fire, and may thus cause the outside mains to be inefficient until the necessary stoppages have been effected.

For this reason, too, should the question ever arise of protecting a factory by external or internal mains solely, and not by a combination of the two, then the external main should be chosen without hesitation, and any internal protection must be supplied by means of hand-pumps, and so forth. Roof hydrants are of undoubted utility where access to the roof is easy. These hydrants can be furnished either by the prolongation of an internal rising main or by an exterior rising pipe in connection with the external main. Where iron fire escape landings are provided for the escape of employees in two or more storied buildings, fire valves can also be placed off such roof mains at different levels in proximity to these landings. In choosing positions for the roof hydrants, their accessibility and range of working utility should be carefully considered. Shut-off valves and drain taps should be placed in convenient positions so as to prevent damage by frost. Where it is necessary or desirable to have two fire pumps, each with a separate system of mains, a connection between the two systems of mains should be made, in case either of the fire pumps break down or be otherwise out of service. All underground valves should be placed in cement-lined, well-drained, brick chambers, with easily removable covers, and have a specially lettered plate fixed to a wall in close proximity. It is also advisable so to arrange the piping that one or more of the pumps in the factory can, if required, pump into the fire mains to afford auxiliary aid

(To be continued).

#### W. J. MATHESON & CO., LTD.

Wm. J. Matheson & Co., Limited, of New York, have become well and favorably known in textile trade, and no better record of this can be cited than the growth of the business of this house. This progressive firm is now located in the magnificent new building at 182 and 184 Front street, New York. There are ten stories, which make the building unusually high in proportion, and the elegance of the outward appearance is well matched by that of the interior finish and the completeness of all possible modern improvements, and the convenience and comfort secured to the occupants, and the facilities offered for rapid despatch of business. The shipping and receiving offices, as well as the shipping rooms, are located on the first floor; the basement, second, third, fourth, fifth, sixth and seventh floors are being used for the storage of dyestuffs and chemicals, etc.; the eighth floor is being rented as offices. On the ninth floor are situated the general offices, the counting room, private offices of the president, treasurer and secretary, the book-keeping department and correspondence offices. The tenth floor is taken up by the laboratory, sample room and committee rooms, and the private offices of the salesmen and chemists. There are toilet rooms and lavatories on the eighth, ninth and tenth floors, and on the second floor is the warehousing department. The building is fitted with electric passenger and freight elevators, and with pneumatic tubes for transmission of packages, connecting all departments; likewise an interior telephone system with nineteen stations, besides a long distance telephone service connecting the several departments. In the book-keeping department an innovation has been introduced, by which each book-keeper has his own individual safe. The laboratory on the tenth floor is one of the most complete of its kind, and has many features especially designed by the technical men connected with the company

It is exceedingly well lighted both from the sides and from the roof. In fact, the building in all parts has little use for artificial light. This building is considered to be one of the best and most complete in all its details ever built by any dye-stuff concern on the continent.

#### RAW SILK IMPORTS TO THE UNITED STATES.

The figures issued by the American Silk Association in regard to importations of raw silk and silk goods during the fiscal year of 1897-98, which closed June 30th last, show a great increase in the importation of raw silk, although it is not accompanied by any material decrease in the importation of manufactured silk goods. In spite of the remarkable decline of the silk industry in the United States during recent years, and more especially since the enactment of the Dingley tariff, it may be doubted whether the consumption of silk goods in that country and the consequent use of raw silk have increased to such an extent as to justify the introduction of such large quantities of raw material.

#### TESTING THE FASTNESS OF THE DYE.

The demands made on the permanence or "fastness" of dyes are manifold. Since, however, absolute permanence is unattainable, the term has to be somewhat limited and qualified with the designation of the influence to be withstood, such as light, air, wear, washing, etc. *Dyes for military cloths, which when in wear are exposed during the greater part of each day to the influence of light and air and frequently rain, must stand different tests as regards fastness, to such as are applied to goods like valuable silks, which are rarely exposed to the sun's rays, are but seldom worn, and then only in an artificial light. In curtains and carpets the capacity to withstand the action of light is the chief essential, whereas in underwear the colors must stand the effect of soap in washing, and in the case of stockings it is necessary that the colors should not come off whilst in wear. No special fastness towards light is demanded of colored linings, but on the other hand they should not stain in wear, and must be able to resist the action of perspiration, and the same applies to mattress and corset fabrics, etc. One requirement frequently made in respect of dress materials, is that the color shall not fly under the influence of street mud. In requiring fastness of color, regard should be had to the material of which the fabric is composed. In the case of shoddy or inferior woolen goods, that are only intended to wear for a short time, expensive, permanent colors that would last longer than the cloth itself, will not be needed. On the other hand, a correspondingly high quality of material and capacity of resistance to light and air are rightly demanded in the case of military cloth, which is exposed to a great deal of rough wear. So far as the dyes themselves are concerned, they can be determined on the fabric with a greater or smaller degree of facility, the examination necessitating, however, some acquaintance with dyestuffs and methods of dyeing.*

Reference is here necessary to a very common error, viz. that the same dye is equally permanent on all fibres. A consideration of the different chemical constitution of the fibres will explain why indigo carmine, for example, is very fast on silk, but not at all so on cotton. Another circumstance of frequent occurrence should also be mentioned, viz. that a fast color when used in a diluted condition for dyeing light shades, a good example of which is afforded by the alizarine colors, which are faster on wool than any other dyes, but which are less permanent when used for the production of mode colors than for dyeing darker and richer shades. The tests for permanence in dyes are applied as follows:

(a) Washing Fastness.—Colors to be proof against wash

ing must be able to stand both the mechanical friction as well as the action of the alkaline liquid and high temperature of the operation. If, under these conditions, the color remains almost or quite unaltered, and does not stain other colored or white fabrics washed in contact with it, it is said to be fast under washing. For the purpose of testing this quality, colored yarn is plaited with white yarn, or a cutting of the fabric under examination is taken, and immersed in a solution of 5 grams of soap in 1 litre (0.8 oz. per gallon) of distilled water, and pressed therein for two or three minutes at 40°C. (hand temperature), then left for twenty minutes in the solution, rinsed and left for another twenty minutes in the rinsing water, to be finally wrung and dried. If the color ought to be particularly fast the soap solution is heated to 55°C., and the treatment repeated several times over. This test is applicable to fabrics, whether composed of wool, cotton, or a mixture of both.

(b) *Fastness Under Friction.*—Colors on stockings, hosiery yarns, corset stuffs and other fabrics intended to be worn next the skin, must be permanent under friction, and must not rub off, stain or run, i. e., the dyed materials must not give up their color when worn or in rubbing contact with white or light colored articles of clothing or the human epidermis. The test consists in rubbing the material by hand on white—not too smooth—paper, or, better still, on a white, unstarched cotton fabric. In order to obtain reliable, comparable results, the rubbing must be equal in all cases and friction surfaces of as near same as possible the constitution should be employed.

(c) *Resistance to Perspiration.*—In addition to fastness under friction, power to withstand the action of perspiration is also required, more particularly in stuffs coming in contact with the human skin, and having to absorb the excretions therefrom. This action is intensified by the warmth of the body, by friction, and above all by the fact that the perspiration in the absence of air is obliged to dry with all its constituent matters on the absorbent fibres, and that by the frequent repetition of this process the acids of perspiration (acetic, formic and butyric) become so concentrated that they act destructively on the fibre. The effect of perspiration on stockings which are repeatedly worn during prolonged journeys on foot can be estimated. For testing a color it has been recommended to place a piece of the dyed material on the back of a horse beneath the saddle and examine the effect of a brisk ride, or the test may be performed as follows. A bath of dilute acetic acid—containing about 6 cc. of 30 per cent. acetic acid in 1 litre of distilled water—is prepared and warmed to a temperature (37°C.) corresponding to that of the body. In this the sample is dipped and rubbed vigorously with the hand, being then dried, without rinsing, at 20° to 25°C. between parchment paper. This operation is several times repeated, and the more frequently this is done, the nearer will the test approximate to actual conditions of wear.

(d) *Fastness Against Rain.*—This quality is more particularly required in silk materials for umbrella making. The skeins of silk intended for the manufacture of such fabrics are tested by plaiting them with undyed yarns, and left to stand all night in cold, distilled water. The water should not be more than slightly discolored, whereas the white yarn should not be stained in the least. For woolen yarns this test is occasionally made more stringent; the yarn is plaited with undyed yarn to a queue, and then boiled for ten minutes in water. When wrung and dried the color should not have deteriorated, nor should the white yarn be stained.

(e) *Resistance to Street Mud and Dust.*—This quality is specially exacted for ladies' dress goods, and is tested as follows:

1. Sprinkling the moistened sample with lime and water, drying and brushing.

2. Sprinkling with 10 per cent. solution of soda, drying, brushing and noting any change of color.

3. *Ammonia Test.*—Immersing the fabric in concentrated ammonia for three minutes and observing the color both in the damp and in the dry state.

4. Ten grams of soda are dissolved in 1 litre of water and mixed with 10 grams of lime—previously slaked and reduced to milk of lime by the addition of water—and 12 cc. of ammonia. After stirring well up together, the mixture is left to settle, the supernatant liquid poured off, and the residue employed for steeping the sample for five to ten minutes, after which the latter is dried without rinsing and is finally brushed, any alteration in color being noted.

(f) *Fastness to Weather, Light and Air.*—Every shade of color succumbs to the influence of the sun, light and air, although in some cases it is only after prolonged exposure that fading becomes noticeable. The degree of permanence can only be determined by exposure to light, to which end one-half of the sample is covered with a closely surrounding, but readily movable paper wrapper, and the whole suspended in the open air in such a position that it is fully exposed to the sun's rays, but sheltered from rain. The object of the paper wrapper is to enable (by removing it at any time) the degree of alteration affected by the exposure to be ascertained. In order to establish a time standard of the fastness to be expected from any dyestuff under these conditions, normal check tests are made with one or two colors of known permanence, e.g., Turkey red or a medium indigo blue on cottons. The samples should be examined daily in order to ascertain the exact time when alteration begins. In the case of Turkey red this will be on the twenty-fifth or thirtieth day, and between the twelfth and fifteenth days for indigo, in summer, or double these periods in winter time. The fastness of other colors can then be estimated in comparison with these. Attempts have been made to set up standard degrees of fastness, according to which colors that remain without appreciable alteration after an exposure to direct summer sunlight for about a month are classified as "fast," and those undergoing appreciable change under the same conditions as "fairly fast." "Moderately fast" colors are those altering considerably in fourteen days; and, finally, those more or less completely faded in this latter term are designated as "fleeting." A "light-test" apparatus for quick determinations has been devised by Ferd. Victor Kallab, of Offenbach, Germany. The samples to be tested are suspended vertically in the apparatus and continuously exposed to the sun's rays, the position of the apparatus being changed in conformity with the apparent movement of the solar orb. The action of the rays is strengthened by concentration on a small surface by the aid of a lens 200 m. m. (8 in.) in diameter, and with a focal length of 420 m. m. (16½ in.).

Professor von Perger, of Vienna, Austria, proposes a testing apparatus consisting of a plano convex and a bi-convex lens, the former with its flat surface turned towards the light, serving to parallelize the rays of an arc lamp, situated at the focal lengths of the lens, which rays encounter the second lens placed in their path at a suitable distance away. A metal disc placed at a point between the second lens and its focus receives the sample to be tested. In estimating the capacity of a dye to withstand weather, the country where the material is to be worn must be taken into consideration, since the climate and seasons of various latitudes exert a considerable influence on the rate of which a dye will fade from one and the same material. Thus it is certain that, for example, the color will be more strongly affected in a given time on the sea coast than in inland districts, and that dark colors are not so durable in southern countries as in northern climes. Permanence is, furthermore, influenced by the material on which the color is dyed; on poor material.

e.g., shoddy, the same degree of fastness cannot, by reason of the price, be expected as in stuff of better quality. Finally, it will be noticed that deep, full colors do not fade so rapidly as light shades.

(g) Resistance to Ironing and Steaming.—Stuffs, especially for men's wear, which are to come under the hands of the tailor, and corset materials, should not lose their color when ironed, or, at any rate, the color should recover its original appearance after a short exposure to the air. This is tested by hot ironing a sample or by drying it on a hot metal plate. In the same manner, capacity to withstand steaming is demanded of many cloths, the latter property being determined by steaming a sample laid between the folds of a larger piece of steamed cloth, during which operation the color should remain unaltered.—Ex.

### SPOTS ON KNITTED GOODS.

One of the most troublesome things connected with the knitting mill, are the oil and other spots which occur on almost all kinds of knitted goods. No sooner are these noticed, than an instant search should be made to find the cause, for certainly the best remedy of removing this evil is to remove the cause; this once away, and the effect ceases. Spots may occur in many ways and from many unthought of causes. It may be of interest, says a writer in the Knitter's Circular and Monthly Record, to point out one or two cases that have come under notice.

Not long ago, serious complaints occurred about certain spots appearing on a special line of hose that were dyed black. One of the most curious points of the case was that though many other goods were made in the same factory, and some from the same yarn, that none of these had the fault complained of, it being only noticed on this special quality. Of course, when the goods were dyed and finished, and put on the counter, these spots were soon noticed, and complaints made, and the question arose as to how, when, and where, such spots occurred. The knitter of course was not the cause, it must be in the finishing and dyeing, it could not possibly be any where else (?), and so the dyer was brought to task, and several lots of these goods, and others, too, were carefully watched, but the same strange result occurred, that still this particular quality had the defect. A perfect examination of the goods was now made after each process, and these spots were found to gradually develop themselves as the process of dyeing proceeded; this, of course, instituted a perfect examination of every process, as regarded material used, machinery employed, and every other detail, yet no trace of the cause could be found. The goods were now examined before any of the finishing processes were commenced, and here a key to the problem was discovered. Some slight stains were seen, and these being marked were found to develop into the mysterious spots that were so much trouble. Nothing now remained but to find the cause of these stains, which were conclusively caused during the knitting processes of the goods, as they appeared in the finished goods before dressing. Each machine was examined, but still no cause could be found. A suggestion was made to test the element of the stain; this done, it was found to be none other than iron, and was caused by a defective joint in a steam pipe, which, in running round the top of the warehouse, passed through the hole where this particular class of goods was put, and in this hole was a leaky joint; the spots of iron water, as they fell from the pipe, dropped on to the goods, and as additional goods were put into the hole, and no doubt moved at intervals, so the spots became as it were distributed over a numerous quantity of the goods.

Another and a strange trouble on a similar line was caused the writer some little time ago. Here a defect occurred across a certain portion of the stocking, in a somewhat horizontal line,

this assuming the form of a discoloration. One would at first sight have judged the use of a different yarn, especially as the defect was across the courses of the fabric, but on closer examination, it was found only across a portion of the hose on which this defect happened to occur, and therefore this theory had to be abolished as soon as this was noticed. Without entering into long details, the trouble of finding out the cause of such stains will be well understood when the cause is made known, and which arose from the knitter, who was in the country hanging the stocking as they left the frame in a damp state over the iron garden rail to dry. Hence the stain being only across a portion of the stocking and that horizontally.

Another striking example is given in one of our exchanges, the writer saying: A short time ago I was called to a large knitting mill which had been in operation for nine years, to show them how to wash a very fine quality and grade of underwear, in both white and fancy colors, also cotton, silk, and woolen mixtures. When I had been there a few days, I discovered some spots on two or three of the garments which to me appeared like oil spots. I asked the washerman where they came from. He replied, "I don't know, for it has been always so, more or less, and there is not near as many since you came," for I had him see that all shafting and drip pans around the fulling or washing mill, extractor, etc., were properly cleaned daily. So, one or two days after, when the goods were brought from the drying room, to the trimmer, I discovered on some fine white, all wool garments, a spot which, after testing, I satisfied myself came from oil. Showing the spots to the washerman, I asked him again where they came from. His reply was the same as before, adding he had been very careful ever since I told him. So I told him it was my duty here to find out, and if he could not, I would, if possible. So I had each garment carefully examined before washing, for a few days, to satisfy myself whether they were all right thus far, for they might have come from the knitting frames, ribbers or seamers, and if the oil was not stainless, it would show.

The following day one or more spots occurred again. I saw at once that all things were properly cleaned, and started on a search to find out where the spots came from which had caused all this trouble. I had not long to wait before I discovered whence it came. I will give a simple illustration how it occurred and escaped discovery, for there may be others who may be troubled in like manner. The extractor was driven from a counter shaft in close proximity to the wash mills, being placed there for convenience and saving of labor. As there were no self lubricators on the counter shaft, and few on the main, the shaft had to be oiled daily with an oil cup attached to the end of a stick, which is poor practice, because of the great waste of oil, if nothing more.

After the shaft was oiled, I observed the oil working out of the hanger box, making its way gently along the shaft, until a heavy drop formed and fell. Instead of dropping into the drip box or pan, the oil was drawn, by suction, so to speak, into the rapidly moving belt that operated the extractor, and thus carried to this machine and deposited on the goods therein. As soon as I discovered this, I had the carpenter make a light frame of wood covered with tin, and suspended it by a light rod of iron at each corner within a few inches of the shaft, so that when the drop would fall the current of suction from the belt could in no way affect it.

Oil spots from shafting bearings are very difficult to remove, and when a dull or heavy yellow spot is seen on underwear after it has been washed, you may rest assured that it is from dirty oil, and hard to remove.

Many examples could be given of spots caused by impure oils getting upon the goods during some process or other to which they are subjected in knitting or finishing. But sufficient

has been shown to impress the importance of at once finding the cause of any defect that may occur, as this being removed is the key to a successful remedy and no other. Many of our readers will no doubt have had some such difficulties, and others may have them, and are having them, as this article has been suggested by the many enquiries submitted, often with samples for our explanation, which we are always pleased to give when possible

### FINISHING.

In many places there seems to be a preference to use large and small teasels in conjunction. By this we mean that they use a 2 or 2½-inch teasel for the body of the slat and use what is termed "buttons" to fill out with and keep the others in place. This practice shows plainly that the subject has not received the thought and consideration of which its importance is worthy. Buttons for the purpose of gigging are of no value whatever and their use amounts to nothing more or less than throwing away good money for very poor material. A slat perfectly set should call every teasel point into action, says a writer in *The Boston Journal of Commerce*, and make it do its share of the work, and this can only be done if the teasels are carefully selected with this object in view. If a teasel is got from 1½ to 1¾ inches in size the chances are that better slats will be obtained with less trouble. Every teasel of this kind will be of value, and if properly mounted such a slat will last longer and give better results than can be had if large teasels are used with buttons to fill out with. The price of these buttons is usually so low that it seems to be a fair investment to buy them, but it should be remembered that these small teasels are not as well matured as the larger and full-grown ones. They are open and soft and their usefulness in the actual process of gigging is nothing; they simply fill one purpose, the holding in place of the teasels which do the work. Now, if this purpose can be just as well attained by a teasel which is effective in the process, and it surely can be done, we certainly have so much less useless material to handle and the effective surface of the slat will be so much greater. To be sure, buttons will have to be got rid of by the teasel grower, for they are of no earthly use to him, but that is no reason why the gigger should be bothered with this useless stuff. If the proper size teasel is got, it is not only easier for the man who sets the slats to produce a good slat, but also more of them, and as every teasel in such a slat will be of decided usefulness, it stands to reason that this will eventually also reduce the cost for teasels as well as the cost for mounting them.

Another practice must come in for a few words here, and that is the moistening of the teasels before setting them. Of course this practice makes it easier to set them in the slats, for they will handle a good deal better, but their vitality is thereby sadly impaired; in fact it is simply planting the seeds of destruction before there is any need of it. Moisture is, of course, the most effective foe to the teasel, and once the heart of the teasel gets wet it does not take long before it is gone. Then again, why should the teasel be wet when they have to be dried again before they can be used? for a wet slat is of no use in the gigging, as every one should know. When teasels are thus wet, they, in common with other dry vegetable bodies, begin to swell only to assume their normal size when they become dry again, so that a slat which is mounted with the teasels in a moist or wet state can never be as solid as one which is mounted in the dry state. Therefore we advocate at all times the mounting of the teasels in a perfectly dry state. At first this is usually found to be a hard job and more protection for the hand is needed, but after it has been once mastered it is not any harder than to mount them moist, and the slats are ready for use as soon as finished and the gigger will not have

to wait till they are dry. This latter may not be considered much of an item, but in the actual work of the gig room we have often found it of immense advantage.

Having thus disposed of the teasel part of the process, we will turn our attention to the machine upon which the actual work of gigging has to be performed. When we come to look around we find quite an array of different kinds of machines, all of which are made with a special view of facilitating or perfecting the process. Each finisher has a preference for one or the other of these machines, and claims his preference to be the best machine for the work in hand; but after all, when this matter is closely looked into, it will be found that it amounts to nothing more than that the finisher has had more experience on the machine of his preference, is therefore better acquainted with all its points, and considers it in consequence the best machine for the purpose. There is no doubt but what it is so far as he is concerned, but this does not detract anything from the value of the other machines. We favor most decidedly the double-cylinder rotary gig on almost all classes of goods, except, perhaps, chincillas, and on this class the old-fashioned up-and-down gig will be found the safest and most valuable to use. In favoring the double-cylinder gig above all others, we wish to state, however, that this applies only to gigs, for we are most decidedly in favor of the use of napping machines for the gigging process altogether as giving the most uniform and best results obtainable, but will not touch that subject now, but consider the teasel gigs first. So far as preferences go this is all very well, but for the purpose of illustrating the process of gigging we have always found that the old up-and-down gig lends itself better to the purpose than any other kind, and the illustrations will be more readily understood. We therefore purpose using this type for illustrating purposes in these articles, unless otherwise noted. As the fundamental principles underlying the process are of the first importance, we will confine ourselves to them as we go along and will endeavor to show what a system for gigging may be, but not what it should be, for that is quite another thing. While the systems which will thus appear may be all right on the goods used for illustration, we would not advise any one to copy them literally on similar goods and expect good results; the results may be good and they may not, for there are a great many things which are apt to change conditions, that it will never do to copy any system literally, not even the best, without taking due notice of all conditions. The goods, as well as the facilities, will have to be carefully studied, and from these a system must be evolved which is to fit each individual case.

### DYEING OF LINEN YARN.

Linen is more frequently dyed in the yarn state than in any other form, partly because it is readily handled in that state, and partly because it is in as open a form as can be conveniently dealt with and will take the dye liquors up more readily. Linen cloth is rather more difficult to dye, for, being stiff and hard, the dye liquors do not penetrate very well, and hence full shades are not as readily obtained on cloth as on yarn. The dyes most commonly applied to linen are the basic and direct dyes, says *The Textile Mercury*. With these good shades are not difficult of attainment, while the operations are comparatively simple, the only points requiring attention being, to see that the yarn is properly handled while it is in the various baths and to have the dyestuffs properly dissolved. Basic dyes require the linen to be first mordanted with tannin matters, which are fixed by using tartar emetic or some other suitable agent. Here we may point out that if pale, bright tints are required, fully bleached yarn must be used, whereas dark shades may be dyed on half-bleached yarn, or even when no great brilliancy is needed, on well-scoured yarn. The yarn is first treated with

tannic acid or some other tannin matter. For bright shades of violets, pinks, greens, blue, yellows, etc., it is as well to use the best quality of tannic acid; for medium to dark shades, sumac may be employed, while for the deepest shades myrabolams or divi-divi may be used. The quantity of tannin should be regulated according to the depth of shade or quantity of dyestuff used. For very pale shades, 6 to 10 ounces tannic acid is sufficient; for medium shades, 1 to 1½ pounds; for moderate shades, 2 pounds; and for deep shades, 3 pounds; or the equivalent in sumac, myrabolams, etc. It is always well to err on the side of having too much tannic acid rather than too little, as then the dyebaths are likely to be better exhausted, and the colors fixed faster on the linen. In making the tannin liquor, allow 100 to 150 gallons for each 100 pounds of yarn. Heat the liquor to about 170° or 180° F. Enter the yarn and work well, so that the yarn is thoroughly impregnated with the liquor; then allow to steep—six hours for pale shades and over night for deep shades. This is, on the whole, the best plan of mordanting linen with tannin matters. After the tanning comes the fixing. This is best done by using a cold bath of tartar emetic, taking half the weight of tannic acid used in the first bath; the yarn is allowed to steep in this for thirty to forty minutes, and requires turning over at intervals to insure levelness of treatment. Instead of tartar emetic any other antimony compound may be used. For special shades of deep greens, maroons, dark blues, browns, etc., iron liquor or copperas may be used, in which case a gray bottom is formed on the linen yarn, which materially influences the nature of the shade that is ultimately dyed on it.

Too much attention cannot be paid to these preliminary operations, as upon the proper carrying out of them depends in a great measure the levelness or uniformity of the color as it comes from the dye bath. There are many dyers who sadly neglect these preparatory operations, but yet take some care in the dyeing. They are rather at a loss to understand why they do not get even shades, forgetting that it is not a question of affinity between dyestuff and fiber on which dyeing with the basic colors depends, but rather on affinity between the dye and the tannin deposited on the fiber; if this tannin be not deposited uniformly, then a uniform shade cannot possibly be obtained. So we recommend them to give some attention to the preliminary operations of tanning and fixing by turning over the yarn and keeping it open, so that the liquors may thoroughly penetrate into the substance of the linen fiber.

Next comes the question of the dyeing. The dye bath is made with the required amount of dyestuff, using 200 to 300 gallons water for each 100 pounds of yarn. While not absolutely essential, the addition of 2 to 3 pounds of acetic acid is advantageous, particularly when working with calcareous waters. The yarn is entered into a cold bath. After turning over for one-fourth hour, the temperature of the bath is raised slowly up to 170° to 180° F., at which it is maintained until the bath is exhausted of color, when the goods are taken out, rinsed and dried. To insure greater uniformity of shade it is a good plan to add the dyestuff, previously dissolved in water, to the bath—not all at once at the commencement of operations, but in small quantities as the dyeing proceeds. Having discussed the method of operating, the next proceeding will be to detail the dyestuffs which may be used and the character of the shades which can be got from them.

**Violets.**—The range of methyl violets may be used with good results in the production of a wide range of tints—from a reddish violet to a pure violet—by using one or other of the various brands—R, B, 2B, 3B, etc. Using ¼ per cent. (or ¼ lb.) to 100 lb. linen a good tint is developed; with ¾ to 1 per cent., a bright shade; and with 1½ to 2 per cent., very deep shades. No great difficulty need be experienced in dyeing with

the violets. Although the tints obtained are bright, yet they are wanting in fastness.

**Rose Lilac.**—For 100 lb. linen yarn, use in the dye bath ¾ oz. methylene violet 3 RA. By using a similar quantity of the 2RA. brand, a tint is obtained which is not quite so red in tone.

**Crimson.**—Use 1¼ lb. methylene violet 2RA. The two brands of methylene violets used in the above recipes dye rose lilac to crimson shades of a somewhat dull tone. They work fairly well. The 3RA violet gives the brightest shades, particularly light ones, when from ¼ to 1 per cent. of dyestuff is used.

**Lavender.**—Use ¾ ounces methylene violet BN.

**Dark Violet.**—Use 1¼ lbs. methylene violet BN. The shades dyed with this violet are not so bright as those got with the methyl violet B, although there is a similarity in tint.

**Pinks.**—For pinks the rhodamines and safranines among the basic dyes can hardly be excelled. Rhodamine B gives bluish pinks, when from 3 to 4 ounces per 100 lbs. of linen is used, while the same quantities of safranin produce bright rose pinks; 3 to 4 ounces of magenta produce pinks not so bright as those given by the rhodamines or safranines.

**Lilac Red.**—A brilliant lilac red is got with from 12 to 14 ounces rhodamine B.

**Bright Crimson.**—Use 2 lbs. rhodamine B. Magenta, 1½ lbs., produces crimsons which are much duller than those got from the rhodamine B.

**Deep Scarlet.**—Use 2 lbs. safranin. By toning with a little auramine the scarlet is made much brighter and less blue in tint.

**Brown.**—A warm nut brown shade is got by using 1¼ lbs. Binarc brown GG.

**Drab.**—Use ¾ ounces vesuvine 4BG.

**Pale Canary.**—Use ¾ ounces auramine or canary yellow. Thioflavine T may also be used, and gives slightly greener shades of yellow than auramine.

**Bright Yellow.**—Use 1 lb. thioflavine T. This gives a fine shade of yellow of a greenish tone. If a yellow which is not so greenish is wanted use auramine. No better basic yellows than the two just named can be used for dyeing yellows on linen. They give bright shades of a good degree of fastness to light and washing. They are very useful for mixing with safranin greens, etc., to produce new tints.

**Cream.**—Fine cream tints can be got on bleached linen by using 2 to 3 ounces of phosphine, azo-phosphine or new phosphine G.

**Gold Yellow.**—Use 1½ lbs. new phosphine G. Azo-phosphine GO gives similar shades.

**Greens.**—There are but few basic greens. The old malachite, methyl and brilliant greens produce bright greens of a bluish tone, brilliant green giving the yellowest tints; while being bright they are not remarkable for fastness. Three to four ounces per 100 lbs. linen gives good shades; 1½ to 2 lbs. fine full shades. Toning with thioflavine T or auramine gives rise to the production of fine yellow greens, and with such mixtures almost any tint of green, from the yellowest to the bluest, can be produced. Methylene green dyes very blue shades of green, commonly known as Russian green, if 1½ to 2 per cent. of dyestuff be used, while if from 3 to 4 ounces per 100 lbs. linen be used sea greens are got. The greens got with this dye are rather faster to light, etc., than are those obtained from the green dyes named above.

**Blues.**—For the production of blues on linen the dyer has a very large number of basic dyes at his disposal, by means of which he is able to dye tints ranging from the faintest sky to the darkest navy blues—from blues of considerable brilliance and purity to dull blues. Of all the basic blues, the cotton blues yield the brightest, but at the same time the most fugitive,

blues. With these blues the best results are obtained when a little alum is added to the dyebath. The marine or water blues also dye bright blues which are rather faster than the cotton blues. The cotton or soluble blues and the marine or water blues are made in various brands; they dye from pure to reddish blues in tint. Using from  $1\frac{1}{2}$  to 2 ounces per 100 lbs. of any of these two classes of blues, pale sky-blue tints are produced; with from  $\frac{1}{2}$  to  $\frac{3}{4}$  per cent., very bright and good shades; and with from  $1\frac{1}{2}$  to 2 per cent., very full shades are the result.

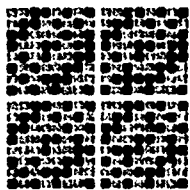
The methylene blues and new methylene blues dye linen very well, and with them a very wide range of tints and shades of blue can be got—from very greenish to reddish blues, according to the brand used. The blues dyed with these coloring matters are much faster to light, washing, etc., than are those from the cotton and marine blues. Methylene blue BB dyes greenish blue tints, methylene blue R bright blues of a pure tone, while methylene blue RR dyes reddish blues. New methylene blue GG dyes very bright greenish-tint blues, new methylene blue N very bright tints, new methylene blue R violet tints, while new methylene blue 3R dyes violet shades.

—Russia in 1843 had only 350,000 spindles, now she has about 5,000,000, and has not only been able to eliminate foreign competition in her own interior, but is exporting. One-fourth of the quantity of cotton worked comes from Central Asia and Caucasia. That grown from American seed equals the imported American both in staple and strength of the same. This country uses one-tenth of the European consumption.

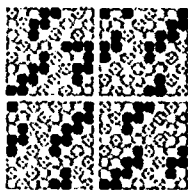
## Textile Design

### TWILL AND PLAIN COMBINATIONS.

Small effects, consisting of plain and cassimere twill, develop satisfactorily in fancy woolen yarns for suitings, and in the finer counts and open setting for dress materials, writes Roberts Beaumont in the Textile Recorder. Two examples in the kind of weave intended are supplied in Designs 1 and 2.



Design 1.



Design 2.

The former is a little check of twill and plain, which may be colored 4 and 4, 2 and 2 and 1 and 1. Strong contrasts of color may be allowed. In black and white, for example, the special effects due to the twill and plain are neatly brought out. Some of the best methods of working this weave are as follows:

#### I. Warp.

4 threads of 2-24s cut, dark shade,  
4 threads of 2-23s cut, light shade.  
8s reed, 3s.  
Weft. Same as warp; 22 picks per inch.

#### II. Warp.

2 threads of 18 skeins, medium shade,  
2 threads of 18 skeins, light shade.  
10s reed, 3s.  
Weft: Same as warp; 30 picks per inch.

#### III. Warp.

1 thread of 18 cut, dark or medium shade,  
1 thread of 18 cut, light shade.  
8s reed, 4s.  
Weft: Same as warp; 30 picks per inch.

The 24 and 18 cut yarns to be chevot and the 18 skeins saxony. The first method of weaving makes a chevot, and the second a saxony

suiting, while the third is for a woolen dress fabric. Each order of coloring may be produced in the different textures.

Plan 2 is also a compound of plain and twill, but makes a small diagonal or fancy twill pattern. It should not only be developed in the thread and thread, and in similar counts of yarn to the previous design, but in compound colorings, of which the following are suggestions:

- (I.) For 24 threads,  $\begin{cases} 1 \text{ dark,} \\ 1 \text{ light.} \end{cases}$   
For 8 threads,  $\begin{cases} 2 \text{ dark,} \\ 2 \text{ light.} \end{cases}$   
(II.) For 12 threads,  $\begin{cases} 1 \text{ light,} \\ 1 \text{ dark,} \\ 1 \text{ light.} \end{cases}$   
For 12 threads,  $\begin{cases} 1 \text{ dark,} \\ 1 \text{ light,} \\ 1 \text{ dark.} \end{cases}$   
(III.) For 32 threads,  $\begin{cases} 2 \text{ dark,} \\ 2 \text{ light.} \end{cases}$   
(IV.) For 40 threads,  $\begin{cases} 1 \text{ dark,} \\ 1 \text{ light.} \end{cases}$   
For 8 threads,  $\begin{cases} 3 \text{ dark,} \\ 1 \text{ light.} \end{cases}$

The degree of contrast between the colors used must be modified according to the size of the pattern and its application. As a rule, the larger the pattern the more subdued the contrasts of color; especially is this desirable in styles made for suitings. It is a law which does not obtain always, however, in patterns made for dress and mantle cloths, where more pronounced effects are required.

### TEXTILE IMPORTS FROM GREAT BRITAIN.

The following are the sterling values of the textile imports into Canada from Great Britain for July and the seven months to July 1897-1898:

	Month of July.		Seven months ending July.	
	1897.	1898.	1897.	1898.
Wool .....	£4,814	£ 1,321	£16,805	£24,274
Cotton piece-goods .....	30,661	55,001	231,381	293,566
Jute piece-goods .....	11,530	11,834	65,617	79,811
Linen piece-goods .....	11,912	19,166	69,989	86,843
Silk, lace .....	255	826	3,177	5,007
" articles partly of .....	2,456	6,688	10,758	17,769
Woolen fabrics .....	32,929	55,605	135,358	165,031
Worsted fabrics .....	70,562	89,187	345,979	372,011
Carpets .....	8,630	11,226	90,262	110,514
Apparel and slops .....	27,681	32,304	159,791	187,196
Haberdashery .....	10,320	17,170	86,221	94,153

### LITERARY NOTES.

The Corticelli Silk Co., St. Johns, Que., is about to commence the publication of a quarterly illustrated magazine, which will be devoted to silk needle work, the culture and manufacture of silk, etc., the title of which will be "Corticelli Home Needle Work." The first number will appear in October next. Subscription is placed at the moderate price of 25 cents per annum.

The Canadian Magazine for September has for leading features two distinctively national articles, viz., Canada's International Status, by Sir C. H. Tupper, and the St. Lawrence Route and the Grain Trade, by Edmund Farrer. The number has also a great many other articles and stories, which are of great interest, as well as the usual book criticisms, etc.

The Philadelphia Commercial Museum has published a 44-page pamphlet entitled "American Trade with India," which includes not only varied and full statistics of the various trades affected, but also a commercial directory, which contains some of the leading firms in each line in each of the leading cities.

**FABRIC ITEMS.**

It has been reported, denied and reasserted, that W. H. Scroggie, Montreal, was about to open up a large departmental store in the Queen's block, St. Catherine street, Montreal.

A big Anglo-American thread combine has been formed with a capitalization of \$18,000,000. It includes all the plants of importance, and the result will be a decrease in the price of thread.

The clothing and gents' furnishing business conducted in Amherst, N. S., by Fraser, Fraser & Co., of St. John, N. B., has been sold to W. A. Cookson, for years with Manchester, Robertson & Allison, St. John, and lately with Finley Smith & Co., Montreal.

H. Pedder, for some years manager of M. B. Perine & Co.'s store at Doon, Ont., has purchased a store in Goderich, Ont., and will take possession immediately. Mr. Bowman, of Berlin, will succeed him at Doon.

Northway & Anderson having purchased the Ham dry goods stock at Chatham, Ont., are continuing the business under the firm name of John Northway & Co. This firm now conducts large dry goods stores in St. Thomas, Simcoe, Tilsonburg, Chatham and Orillia.

The contract for the Toronto firemen's winter clothing has been awarded to Malcolm McBain, 31 Queen street east, at the following prices: Coats, \$8.10; vests, \$1.60; trousers, \$3.80; a total of \$13.50 per suit, as against \$15.30 per suit, the price paid last year. The contract for Persian lamb caps was awarded to J. E. Perry of Queen street east.

The stock of Reid, Taylor & Bayne, wholesale milliners, Toronto, was sold at auction recently. The stock (valued at \$77,000) brought 58c., which was an unusually high price. The purchasers were Chas. Reid & Co. Mr Reid was one of the partners of Reid, Taylor & Bayne. The new firm consists of Charles Reid and Hugo Block, the latter having been a special partner in the firm of Reid, Taylor & Bayne. Mr. Block will be the manager of Reid & Co.

Many of those familiar with the Toronto dry goods trade in the early days will learn with regret of the death of Conyngham Crawford Taylor, which occurred Aug. 5th at his late residence, Toronto. Deceased, who was in his 75th year, had been in failing health lately. He was a native of Leitrim, Ireland, and came to Canada in 1847. Up to its dissolution in 1858, he was at the head of the wholesale dry goods firm of Taylor & Stevenson, Toronto. In 1883 he was appointed to Her Majesty's Customs. While in business he was largely instrumental in having the bonding system established in connection with British goods passing through the United States into Canada. He was also the first to place a "commercial traveler" on the road in this country. Deceased was best known as the author of "Toronto, 1886 to 1850," and of three supplements thereto: "The Queen's Jubilee and Toronto Called Back, from 1887 to 1847"; "Toronto Called Back and Emigration, with Reminiscences of a Trip to Great Britain and Ireland," and "Toronto Called Back from 1897 to 1847: Its Wonderful Growth and Progress," all of which have been distributed in the Mother Country, and have been the means of supplying much information touching the rise and progress of Toronto.

**THE WOOL MARKET.**

TORONTO.—There is little or nothing doing on the Toronto market at present. Plenty of wool is offering but the ideas of holders and dealers are so far apart that very little business is recorded. There is little doubt that holders will be compelled to meet the views of the large dealers more fully before any further business is done. In pulled and foreign wools the

demand from the mills is very weak at present, though most are reported well engaged.

MONTREAL.—Prices continue unchanged and buyers are very sparing in their takings. The next London wool sales open on the 20th, and an advance of 7½ to 10 per cent. over prices prevailing at the last series is expected. Good foreign wools are very scarce and prices are well maintained, but faulty wools are plentiful and neglected. Canadian fleece is quoted at 16c to 17 cents.

**Among the Mills**

Co-operation is one of the guiding principles of industry to-day. It applies to newspapers as to everything else. Take a share in "The Canadian Journal of Fabrics" by contributing occasionally such items as may come to your knowledge, and receive as dividend an improved paper.

Toronto Cotton Batting Co. has been incorporated.

W. Cairnes has recently installed a new electric motor in his glove factory, Berlin, Ont.

The St. Croix Woolen Mills Co. will be reorganized, and the mill probably be running in a short time.

The flax crop of Manitoba this year is a good one. The acreage is much larger than it was last year.

Hugh McCulloch, woolen manufacturer, Hawksville, Ont., is putting in a steam plant as an auxiliary power.

Trenton, Ont., is negotiating with the Dominion Carpet Co., Elora, Ont., for the removal of the business to that town.

Geo. W. Ward, Alton, Ont., has enjoyed improved health since moving to Alton, and he has not been ill as has been reported.

Geo. Pattinson & Co.'s mill at Preston, Ont., was closed for a week last month owing to the breaking of the engine cylinder.

It is a good sign industrially when the mills run full time on Civic Holiday, as did the numerous factories in Almonte, Ont., recently.

The Penman Mfg. Co., the Auburn Woolen Mills and the Trent Valley Mills have been working 24 hours a day from May to September.

Frank Duffy, for many years boss dyer for the Kingston Hosiery Co., has gone to take a like position in the Chambly, Que., woolen mills.

The R. Tanner Co., Ltd., capital \$15,000, has been incorporated to manufacture rubber shoes and rubber goods generally in Picton, N.S.

The shoddy mill, a warehouse and stables of A. W. Brodie's woolen mill at Hespeler, Ont., were destroyed by fire early on the morning of the 14th inst.

The Amend Process Co., 205 Third avenue, New York, is bringing a new mordant before the trade which is attracting a good deal of favorable notice.

**FOR SALE**

THE

**Machinery of the Blyth Woolen Mill, Peterborough, Ont.**

has been placed in the hands of the

**GEO. REID CO., 118 Duke St., Toronto**

for immediate sale.

**Catalogues will be forwarded on application.**



Fire communicated from an adjoining house burned down the Roberval, Que., Woolen Mfg. Co.'s mill, Sept. 6th. Loss, \$7,000, and insurance about \$3,500.

The Barnston Woolen Mill Co. has completed the new dam near the mill at Ways Mills, Que. It is 180 feet long and 20 feet high and will give all the power desired.

United Garment Workers' Union recently held its International Convention in Cincinnati, U. S., where Louis Gurofsky was a delegate representing the Toronto union.

The Blyth woolen mill, Peterborough, Ont., has been closed down, and the plant has been placed with the Geo. Reid Co., 118 Duke street, Toronto, for immediate sale.

Jno. Devlin, aged 17, a weaver in the Hawthorne Woolen Mills, Carleton Place, Ont., was run over by a C. P. R. train at Almonte, Ont., last month, and was instantly killed.

Mary Byron, St. Catharines, Ont., whose arm was caught between the cylinders of a spinning frame, in the cotton mill, a short time ago, was quite severely injured by the accident.

The woolen manufacturing business of Ferguson & Pattinson, Preston, Ont., is being continued under the style of Geo. Pattinson & Co., Mr. Pattinson being now sole proprietor.

Among the Canadian woolen manufacturers who have gone into the manufacture of clothing as a side line are the Brock Woolen Co., Simeoe, Ont., and Samuel Rife, Walkerton, Ont.

The Chicoutim Pulp Company is urging the Dominion Government to dredge out a channel from Point a la Roche to Chicoutim, to enable ocean steamers to go up and load at its mills.

The ratepayers of Port Dalhousie, Ont., have obtained an order from Chief Justice Meredith, quashing the by-law by which the town granted a bonus to the Toronto Rubber Company.

An Anglo-American trust to control the output and sale of sewing machine, knitting machine and all other kinds of needles is said to be in process of formation. The capital, it is announced, will be £1,500,000.

The worsted spinning branch of the Paton Manufacturing Co., Sherbrooke, is at present closed down, owing to the effect of the discrimination made against Canadian made worsted yarns under the present tariff.

David Manchester, clothing dealer, Ottawa, has recently started a carding and woolen mill in connection with his store. It is a one set mill, and manufactures flannels, kerseys, etc. James McGill operates the mill.

The contrast between the exports of Canadian wool into the United States this year and last is very great. In 1897 Canada exported \$1,487,153 in wool to the United States, and in 1898 we have only exported \$179,262.

Geo. Imeson, late of the Hawthorne Woolen Mills, Carleton Place, Ont., has taken charge of J. W. Wylie's Golden Fleece Mills, Almonte, Ont., which are now running full time. The dam and flume were recently rebuilt.

The Rathbun Company's sash and door factory, Deseronto, Ont., has recently filled an order for four carloads of large window frames, sash, door frames and doors for the Dominion Cotton Company's mills at Magog, Que.

Wm. Parks & Sons, St. John, N.B., are making extensive repairs and improvements in their cotton mills; amongst others a new boiler-house is being built.

H. D. Martin has resigned his position with the Dominion Cotton Co., Windsor, N.S., and has accepted a position to superintend a cotton mill in the United States, beginning his new duties some time before October 1st.

One night last month burglars entered the office of the Coaticook, Que., Woolen Mills Co., and blew open the safe. They secured about \$18 in cash. The clock in the room was stopped at 2.10 a. m., presumably by the concussion.

The Cobourg, Ont., Matting Works have been running full time ever since Wm. Mitchell took control of the plant. Recently Mr. Mitchell received a new loom from Dundee, which enables the mill to turn out some especially fine rugs.

A new napping machine has been placed in position in the cotton mills at Merriton. A picker and lapper, twenty cards and eight spinning frames of the latest make, ordered some time ago, will arrive in a few days and will be speedily set in motion.

Robert Harkness has recently started a glove and moccasin factory at Renfrew, Ont. Mr. Harkness appears to be doing a good moccasin trade, having a special process of oil tanning which renders the moccasins not only waterproof, but odorless.

William Kelley, one of the oldest section hands in the St. Croix cotton mill, Milltown, N. B., who recently resigned to accept a position in a mill at Waterville, Me., was presented with a handsome clock on behalf of the overseers and section hands of the mill.

A financial statement of the Berlin Brush Co.'s affairs was presented, showing a nominal deficit of \$1,650. The stock saved from the fire was purchased by A. Rudy, a retired farmer of Waterloo. If the company can secure a loan from the town as a bonus business will be resumed.

The pressers of the R. Greene Manufacturing Company, clothing manufacturers, London, Ont., were out on strike recently for a brief period, but an agreement was arrived at in the afternoon in regard to the half-holiday, concerning which the men went back to work pending a satisfactory settlement.

Last month Miss Edith M. Argue, second daughter of George Argue, of the "Maple Corners," Solina, Ont., and Edwin Harris, son of John R. Harris, the well-known woolen manufacturer and mill owner, of Rockwood, Ont., were married at the bride's home, surrounded by a large gathering of friends.

The real estate, plant, machinery and tools of the Bowmanville Rubber Company, in liquidation for some time, have been sold by the Master-in-Ordinary at Osgoode Hall for \$6,200. The purchaser was Joseph J. Wesley, of Montreal, who also purchased the stock of merchandise and supplies for 12½ cents on the dollar.

An accident occurred at the Penman Mfg. Co.'s mills, Paris, Ont., last month. A steam press in No. 3 mill exploded, and two young men were scalded by the escaping steam. Their names are W. Winder, scalded about the face, and E. Strickland, scalded about the back; the men were operating the press at the time of the explosion.

**Wool Washers**  
Dryers and Carbonizers

**KITSON** - - -  
**MACHINE CO.**  
LOWELL, MASS.

The Brandon, Man., felt factory was burned down Sept. 10th. The plant was valued at \$15,000, the shops at \$5,000, and building \$2,000; insurance \$11,000.

Geo. Everett, Elora, Ont., sued the Dominion Brussels Carpet Co., some time ago, for damages for injuries, and received judgment for \$1,500. The carpet company then instituted a suit against the London Guarantee and Accident Company, claiming that as they were insured in that concern, it should pay the damages. This suit has just been dismissed.

D. Breckenridge, superintendent of the Gillies woolen mill, Carleton Place, Ont., which position he has held for the past fourteen years, before leaving for his new position in Cornwall was presented with a complimentary address and a handsome gold watch by the employees of the mill. Mr. Breckenridge goes to Cornwall to superintend the Cornwall Mfg. Co.'s large mills.

Benjamin Williams, formerly of Glen Williams, Ont., and brother of Joseph Williams, till recently a hosiery manufacturer of that village, died last month at his home in Chicago. The deceased was the son of the late Mr. Williams who founded the woolen mill now owned and operated by Sykes & Ainley, at Glen Williams, Ont., and was widely known as the inventor of a patent newspaper wrapper, now largely in use in the United States.

The agreement entered into by the leading knitting mills in December last is working satisfactorily, and gives promise of permanency. By it no goods are shown in advance of the season, and all sales are at four months from the first of September and March. Any goods bought after these dates are at four months from the first of the following month. This applies to job lots and small orders. Casing and freight charges are paid by the buyer as formerly.

The Dominion Dyewood & Chemical Co., Toronto, has been appointed sole agent in Canada for the British Dyewood & Chemical Co., English branch, comprising the well-known firms of Mucklow & Co., and E. D. Milnes & Bro., of Bury, Lancashire. The new company is a strong one and the products, principally dyewoods and dyewood and tanning extracts of the above firms, are already familiar to the principal consumers of dyestuffs throughout the world.

Henry Grey, the watchman employed at the Almonte Knitting Co.'s mills, was murdered on the night of June 29 last by some person who was attempting to commit a burglary, and the efforts of the detectives to discover the perpetrators of the crime have been unsuccessful. In the hope of bringing the murderers to justice the Ottawa Government have decided to offer a pardon to anyone other than the actual murderer who furnishes such information as will lead to a conviction.

The Toronto Carpet Company has broken ground on a new site at the corner of King street west and Fraser avenue, the

frontage on King street being 158 feet, and on Fraser avenue 325 feet. It is understood that the building will be erected at a cost of between \$40,000 and \$60,000. The Assessment Commissioner has agreed that the factory shall be rated at \$10,000 for general purposes, dating for ten years from January 1st, 1899; the machinery being placed at \$35,000, for school taxing purposes. Not fewer than 150 hands are to be employed.

The carpet factory of Thomas Gemmell, Peterboro, Ont., has been closed for several months past, owing to Mr. Gemmell's illness. Recently, however, he had an operation performed, and is now recovering so as to be about again. It is probable that the factory will be re-opened soon. C. G. Gemmell, son of the above named gentleman, recently started on his own account as a manufacturer of corsets, ladies' blouses, collars and cuffs, in Charlotte street, Peterboro, and has worked up a very good business, selling to the retail trade. The factory is operated by electrical power.

The majority of the striking spool room hands returned to work at the Stormont cotton mill, Cornwall, Ont., early this month, and the establishment is again in full operation. The dissatisfied operatives received the same assurance that was given when they stopped work, viz., that if, after a fair trial, the change was found to reduce their wages, a new arrangement would be made. Had this most reasonable proposition been accepted at first by the twenty-five or thirty that were affected, it would have saved them and about five hundred other employees loss of time and wages.

**POSITION WANTED**—Young man of good education, at present employed as superintendent in a large woolen mill in the south of Scotland, would like similar position in Canada. Can assist in designing. Address "SUPERINTENDENT," care of Canadian Journal of Fabrics, Montreal, Que.

**W**ill shortly open Manufacturers' Agency in Montreal. Have you any specialty you want me to handle? Thirteen years' experience in a general store in Canada, fourteen in the general dry goods trade in the U. S. Speak English and French. Am a pusher. EXPERIENCE, ENERGY, care Canadian Journal of Fabrics.

**BOSS CARDER** or second hand in card room woolen mill; has had ten years' experience on all classes of goods and cards and feeds. Will go anywhere for a permanent position. Address W. R., care Canadian Journal of Fabrics.

#### SITUATION WANTED

Wanted situation as manager or superintendent of woolen mill by a man who has had a large and most successful experience on shoddy goods. Married, 39 yrs. of age. Address J. E. C. I., care Canadian Journal of Fabrics.

#### SITUATION WANTED

Experienced long chain dyer and yarn printer desires situation. Fast colors. Economical. Nine years with leading gingham, shirting, and fancy cotton, woolen and silk goods mill in New England. Age 39. Married. Address "M," care of Canadian Journal of Fabrics.

#### Wanted

By experienced Cotton Bleacher and Finisher, situation in Canadian mill. Best of references covering a long period of years. Age forty. Married. Apply "WEST POINT," Care Canadian Journal of Fabrics.

# The Royal Electric Co. MONTREAL TORONTO

CANADIAN MANUFACTURERS OF THE

## S. K. C. TWO-PHASE APPARATUS

Alternating Current Generators

Alternating Current Motors

Alternating Current Arc Lamps

Served from the same circuit

## S. K. C. TRANSFORMERS

Correspondence solicited for all kinds of Electric Installations.

Joseph Simpson, of the Toronto Knitting Factory, died at his residence, 140 St. George street, this month. He had been suffering for some time from an affection of the stomach, and complications set in which rendered his recovery impossible. The deceased gentleman was 74 years of age, and leaves a widow, two sons, R. M. Simpson, of Glen road, and E. A. Simpson, of Admiral road; and a daughter, Mrs. Geo. W. Coates, of San Francisco. He had retired for some years from the active management of the knitting factory which he had established, leaving the business to his sons.

William J. Matheson & Company of New York and Montreal appear to be forever springing some new surprises upon their customers in bringing their new dyestuffs before the notice of textile manufacturers. An unusual form of sending out color samples exists in a paper cabinet containing fifteen different samples of fast chrome colors, each sample being enclosed in a square compartment having a circular opening through which the sample may be seen and taken out for inspection. Upon one of the covers enclosing this cabinet are the dyeing directions for each sample printed in squares of the same size as the cabinet itself. The whole series when done up has the appearance of a book in cloth binding.

By an arrangement between the Montmorenci and the Riverside cotton factories at Quebec, which recently amalgamated, and the Dominion Cotton Company, Montreal, the latter company will not meet with any competition in future in grey cotton from the former in the home market. Practically the same individuals own the controlling interest in all of the factories. The Montmorenci and Riverside will in future be under one management. The capacity of the latter will be greatly enlarged and improved. Both will manufacture exclusively for the China export trade. C. R. Whitehead will continue to direct the Dominion Co., while L. G. Craig will manage the Quebec factories. The election of directors of the new Mont-

morency Cotton Mills Company resulted as follows: Mr. C. L. Whitehead, president; Mr. H. M. Price, vice-president; Messrs. Thomas Pringle, John T. Ross, L. G. Craig, Alex. Pringle and J. N. Greenshields, directors. The capital of the company will be increased to \$500,000. The Dominion Cotton Mills Co. has decided to close down the woolen mills, and enlarge those which are at present on a profitable basis. The Coaticook, Que., mill has been closed.

The trial upon the proceedings for the liquidation of the Granite Mills commenced before the 24th ult., and adjourned to the 8th inst. is now in progress. F. H. Markey of Smith, Markey & Montgomery, appeared for the creditors, who are contesting the transfer of the mills to the new company; and L. F. Morrison of St. Hyacinthe, and J. N. Greenshields, Q. C., of Montreal, appeared for the company. Some time ago a new company was formed as the Boas Manufacturing Company, with a capital of \$1,000,000, and an agreement was entered into by which the new company took over the property of the Granite Mills and issued mortgage debentures to the extent of \$750,000, which were offered to the creditors of the old concern in settlement of their claims. A large number of the creditors accepted the debentures in settlement of their claims, but several of the English creditors refused to do so, and instituted proceedings for the compulsory liquidation of the Granite Mills by a liquidator to be appointed by the court.

**CHEMICALS AND DYESTUFFS.**

The market continues firm without any changes. Orders from the mills are coming in more freely, as already this season buyers anticipate their winter requirements. The following are current quotations in Montreal:—

Bleaching powder .....	\$ 1 95	to \$ 2 00
Bicarb. soda .....	2 00	" 2 05
Sal soda .....	0 70	" 0 75
Carbolic acid, 1 lb. bottles .....	0 35	" 0 37
Caustic soda, 60° .....	1 75	" 1 80
Caustic soda, 70° .....	2 00	" 2 10
Chlorate of potash .....	0 13	" 0 15
Alum .....	1 35	" 1 50
Copperas .....	0 70	" 0 75
Sulphur flour .....	2 00	" 2 50
Sulphur roll .....	3 00	" 3 50
Sulphate of copper .....	4 50	" 5 00
White sugar of lead .....	0 07	" 0 08
Bich. potash .....	0 09	" 0 10
Sumac, Sicily, per ton .....	55 00	" 60 00
Soda ash, 45° to 53° .....	1 25	" 1 50
Chip logwood .....	1 90	" 2 00
Castor oil .....	0 09½	" 0 10
Cocoonut oil .....	0 06½	" 0 07

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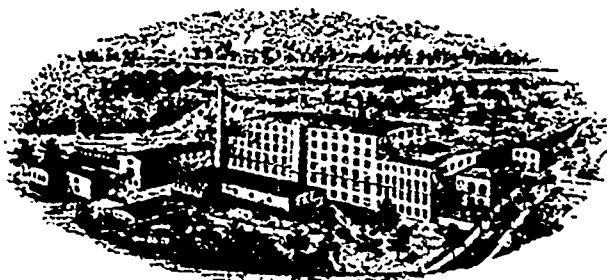
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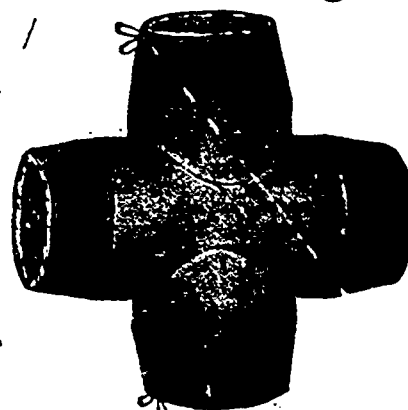
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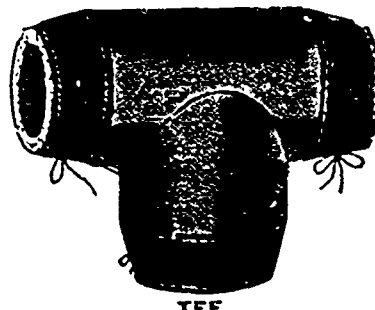
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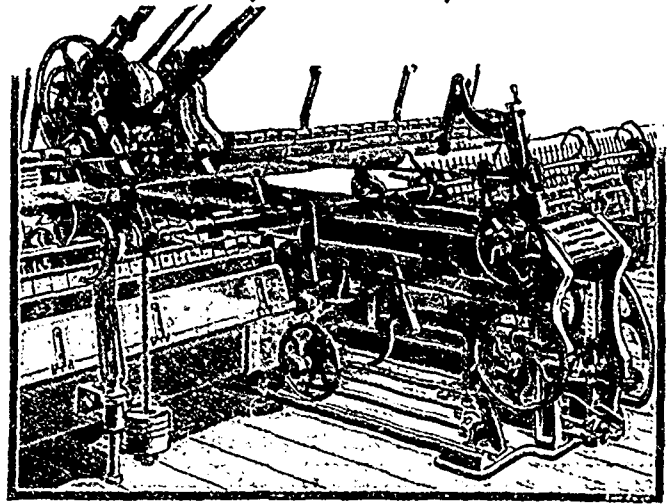
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spindles (in the case of knitting mills,  
the number of knitting machines, and whether  
hand or power machines), when estab-  
lished, whether water, steam or electric  
power; description of goods manufac-  
tured, whether the mill has a dye house;  
and names of selling agents, if any. When  
situated in cities, the street address is  
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capacity, date established, and whether  
steam, water or electric power.**Cordage and Twine, Jute and Flax Mills:**  
Name, address, date established, capa-  
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of goods made and material used (whether  
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Suspender and other Factories in Men's  
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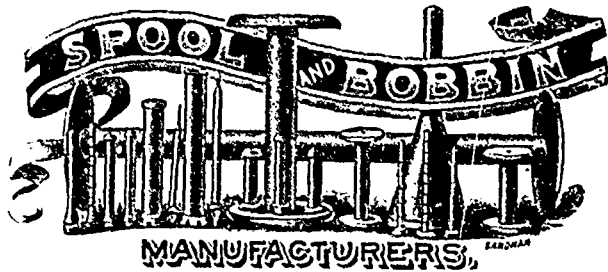
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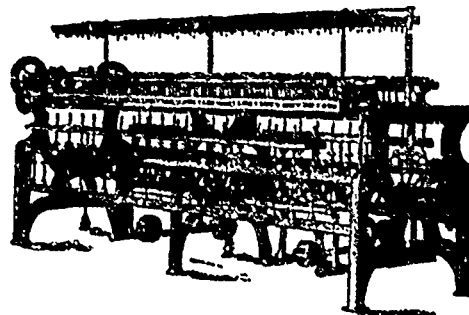
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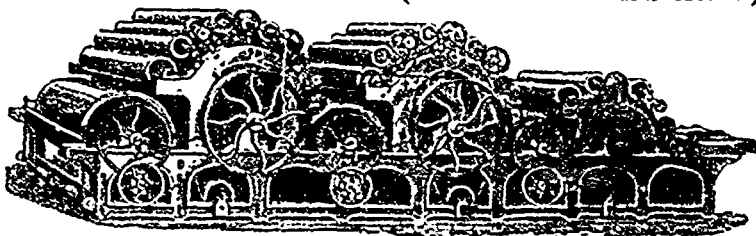
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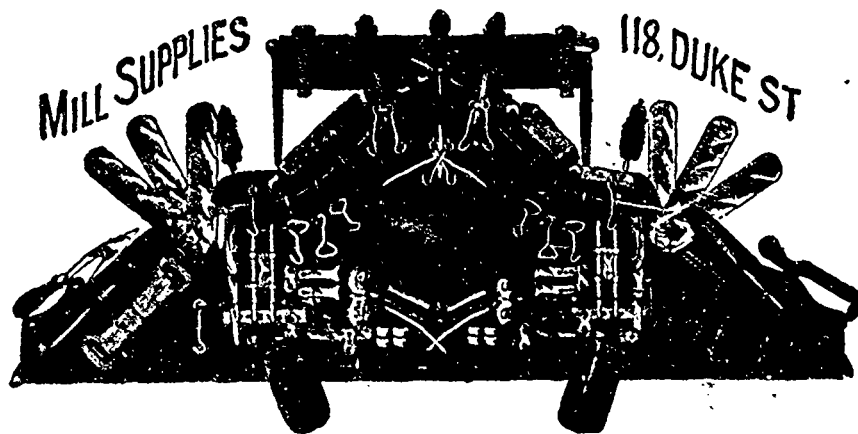
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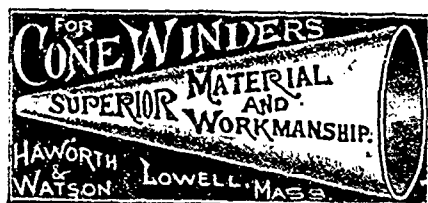
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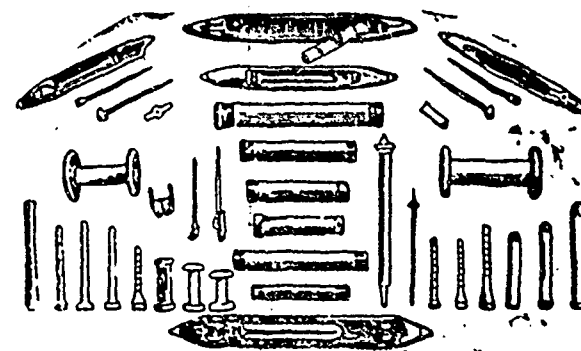
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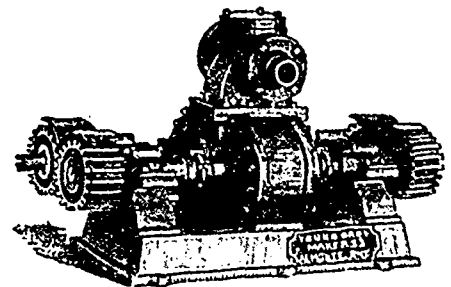
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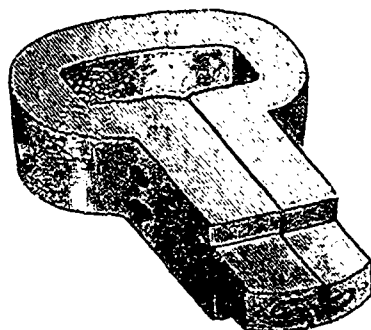
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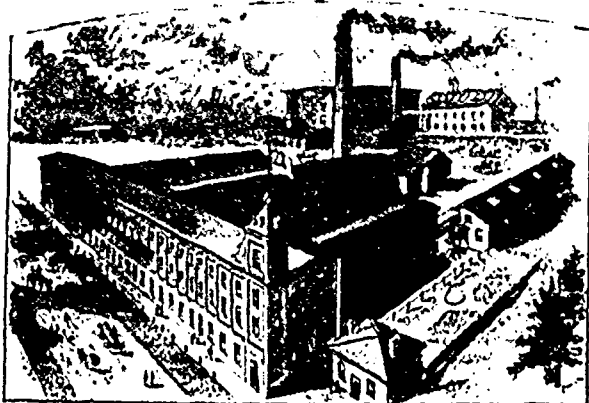
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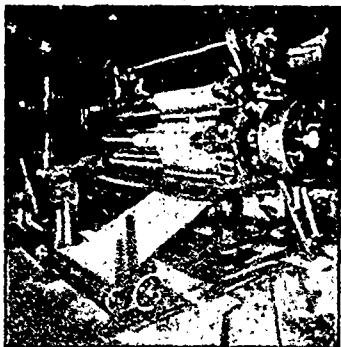
## DEROCHIE BROTHERS, Cornwall Ont.

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### NAPPING MACHINES

up to 80 inches wide, to nap one or two pieces in width. The machine naps cotton or woolen goods; can either furnish folders or winding attachments; this machine is so geared that the changing of small gears changes the nap on cloth that is needed. The main shaft is 3 1/2 in. in diameter. All Roller Bearings are bronze and self-oiling. All Rolls are made of hydraulic piping—and every part of the machine is first-class in every respect.

Some of the machines are running at Canada Mills, Cornwall; Montreal Cotton Co.'s Mills, Valleyfield; Wm. Parks & Son, St. John's, Dominion Cotton Mills, Halifax.



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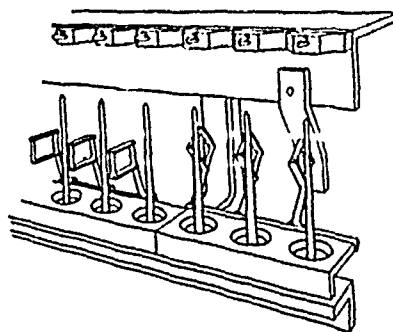
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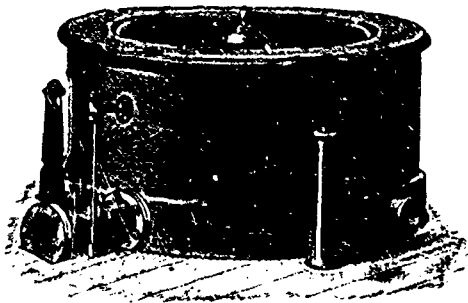
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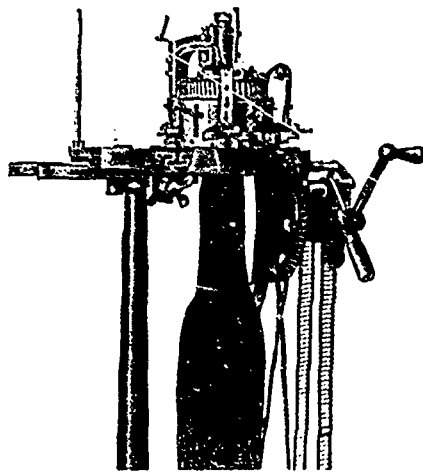
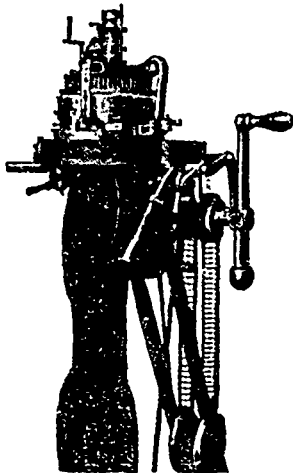
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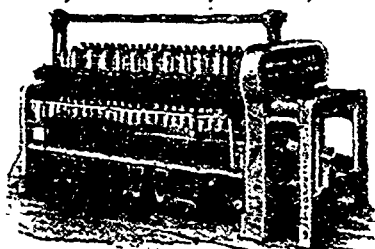
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No.	Date of Issue	No.	Date of Issue	
1	May, 1895	4	Aug., 1896	3,450
2	June "	5	Sept. "	3,975
3	July "	6	Oct. "	3,725
4	Aug. "	7	Nov. "	3,800
5	Sept. "	8	Dec. "	4,050
6	Oct. "	9	Jan., 1897	4,100
7	Nov. "	10	Feb. "	4,350
8	Dec. "	11	March "	4,350
9	Jan., 1896	12	April "	4,350
10	Feb. "			
11	March "			
12	April "			
VOLUME IV.		VOLUME V.		
No.	Date of Issue	No.	Date of Issue	
1	May, 1896	1	May, 1897	4,350
2	June "	2	June "	4,000
3	July "	3	July "	4,350
		4	Aug. "	4,400
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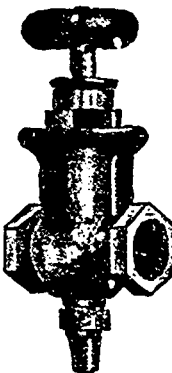
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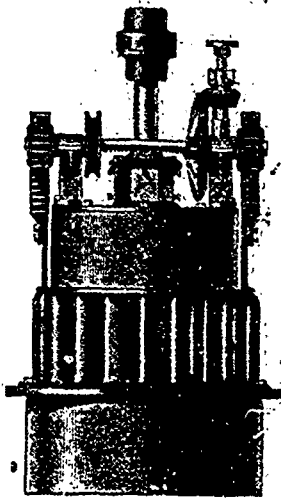
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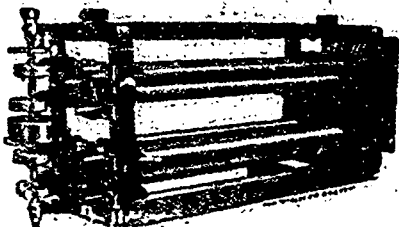
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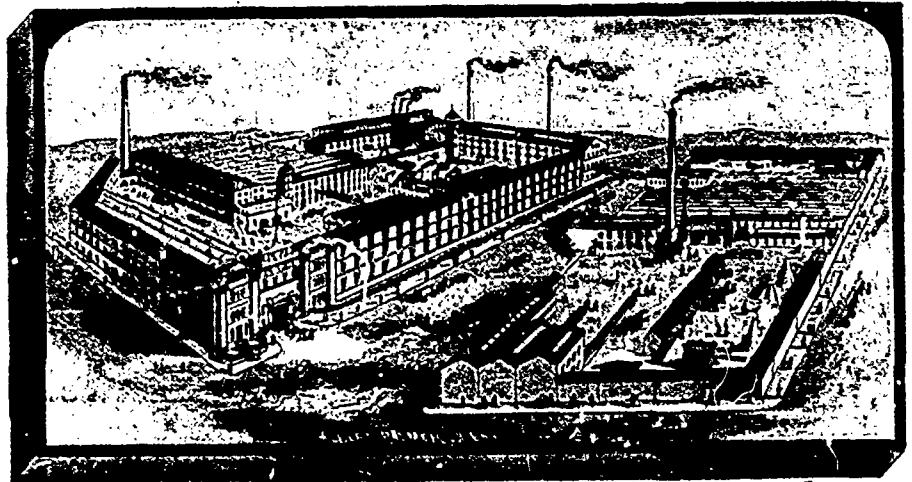
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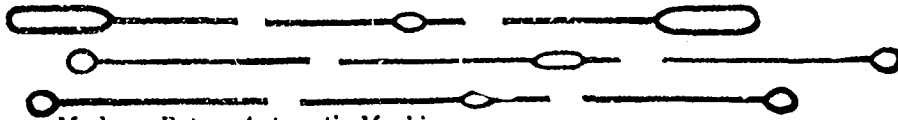
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