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# CANADIAN JOURNAL OF Fabrics

THE JOURNAL OF THE  
Textile Trades of Canada.

Vol. XVI.

TORONTO AND MONTREAL, APRIL, 1899.

No. 4.

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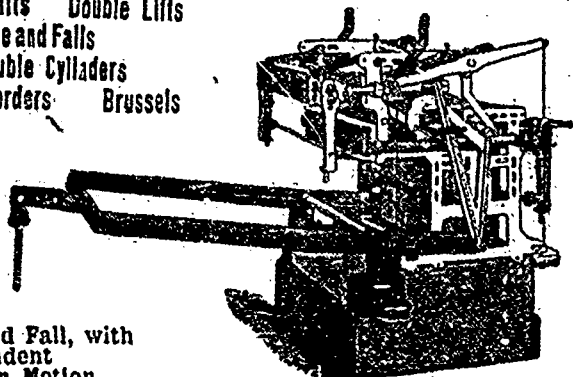
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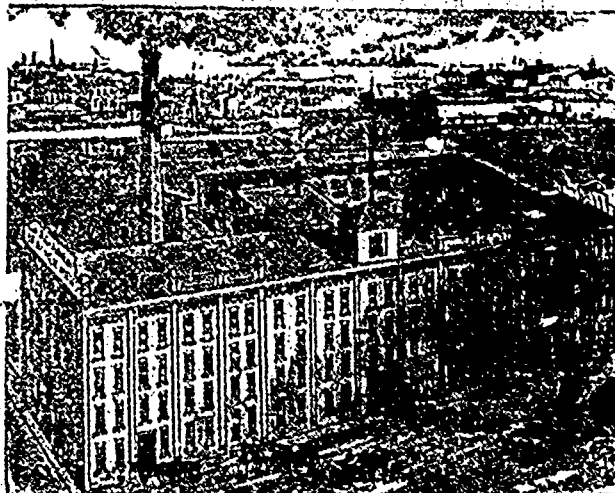
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# CANADIAN Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XVI.

TORONTO AND MONTREAL, APRIL, 1899

No. 4.

## Canadian Journal of Fabrics

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

Subscription Canada and United States \$1.00 per year Great Britain, 5s. Advertising rates on application.

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### THE CANADIAN TEXTILE DIRECTORY

A Handbook of all the Cotton, Woolen and other Textile manufactures of Canada, with lists of manufacturers agents and the wholesale and retail dry goods and kindred trades of the Dominion, to which is appended a vast amount of valuable statistics relating to these trades Fourth edition now in hand

Price, on and after publication, \$3.00 Subscribers ordering in advance are given a discount of \$1.00

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### CONTENTS OF THIS NUMBER :

	PAGE		PAGE
Among the Mills .....	116	Mercerizing Without Special Plant	110
Honus Hunters, On the .....	98	Moquettes, Machine made Axminsters	101
Carbon Dioxide in Humidifying	106	Oriental Carpets	115
Commercial Bribery .....	95	Record, The, Still Holds	106
Cop Dyeing .....	99	Rug Dyeing	115
Cotton Fabrics, Rendering Water proof .....	112	Soap and Soap Preparations	102
Cotton in Wooden Vats or Iron Vats	114	Silk Association of America, The	108
sels, The Dyeing of loose	114	Styles, Coming	105
Chemicals and Flycuffs	113	Taxation, Montreal's	97
Decadence of Hand-loom Weaving in the Silk Trade	109	Textile Designs	100
Diamine Colors on Satin, Silk and Cotton	111	Textile Centres, Foreign	103
Fabric Items .....	117	Textile Industr. Art and	113
Felting .....	101	Velvet Dyers Combine, The British	99
Flax Spinning .....	98	Viscose	111
Khaki .....	115	Wool Market, The	115
Literary Notes .....	114	" Sales, The London	98
London Fur Sales	118	" Chroming	106
Mercerizing, The Present and Future of	100	" Press, A	114
		Woolen Co. The New	108
		Yarn Economies	113

### MONTREAL'S TAXATION.

The ratepayers of Montreal find the present taxation of the city none too easy to be borne, and are constantly threatened with increases. The majority of the electors in the city do not feel a serious responsibility in the matter of the city's finances, being chiefly tenants or holders of small properties which bear a very low valuation. They do not therefore check the extravagance and recklessness of the city council, which are flagrant. The only recourse of the more economical portion of the people

is to the Legislature at Quebec, many of whose members are not prepared to deal with questions of the magnitude which Montreal's money affairs assume. There has therefore existed hitherto a free expenditure of money, a large part of which never reached the objects for which it was voted, and a constantly growing civic debt for whose payment no means exist if the city is to be maintained in a habitable condition. The city council is constantly looking for fresh subjects for taxation because the limit of the borrowing power has been already reached on the present assessment. At the last session of the Quebec Legislature the city charter was revised and all machinery was expressly made taxable. This has raised a storm among the owners of plants in Montreal, meetings have been held and most vigorous protests made. Some of the leading manufacturers have spoken very plainly on the subject of their removal to more advantageous locations if the tax is imposed. Those who had the charter amendment in charge explain that the city has always had power to tax machinery under the head of "immovables," and the present clause was framed so as to make taxable the wires, rails, etc., of the electric companies which are at present exempt as not being attached to the property of the assessed.

Montreal's debt is twenty seven millions of dollars. It is made up of \$28,744,401 of consolidated debt and the following items \$1,146,558 of temporary bonds authorized by statute 60 and 61 Victoria, Bank of Montreal advances, \$1,112,000, Harbor balance (of a million dollars), \$652,106, and sundry other floating debts (less cash on hand or unexpended balances of revenue), \$811,695. These items constitute the exact sum of \$27,000,000.

While this explanation shows that the city council has no present intention of placing a tax on manufacturing plants, yet the existence of the clause is a constant menace to the manufacturers at present within the city limits, and a deterrent to others establishing themselves there. It will build up the small towns surrounding the city, and will be an incentive to those bonus offering towns like Sherbrooke, Que., or Belleville, Ont., to grant inducements to secure the taxed industries. A manufacturer who is heavily taxed on his machinery to raise funds for street paving which is not put down (that is the method in Montreal) is apt to look longingly to towns where there are no taxes on machinery and a large cash bonus is available for buying new plant

### COMMERCIAL BRIBERY.

The British commercial public has wakened up to the fact that wholesale corruption pervades its business life. Tips, commissions, bonuses, concealed discounts are so nearly universal as to exceed belief. If politics in England are free from the hideous corruption which has made democracy a byword in France and the United States, the business world seems to be actuated by the same principle as the old-time highwayman or buccaneer. It is stated in reputable journals in Great Britain that the revelations of the ways of company promoters made at the Hooley trial are only an indication of what would be discovered if a similar investigation were made in other lines of business.

Persons who tender, or those who take any tip or other secret payment, will have to walk very warily in future if the bill proposed to be introduced by the Lord Chief Justice should become law. Its specified purpose is "To check corruption," and a Memorandum explaining its scope and provisions has already been issued. It creates five offences thus scheduled:—

- (I.) The making of a corrupt payment.
- (II.) The offering of it.
- (III.) The receipt of it.
- (IV.) The solicitation of it.
- (V.) The omission to state any discount, etc., on any account rendered to any agent.

All payments to servants or agents by persons having business relations with the master are pronounced corrupt, and payments made to third parties, or to relatives of any agent or servant, will be deemed corrupt also. Some wives of buyers or other trade intermediaries may have occasion to bewail a considerable shrinkage in the presents and substantial compliments which they now receive, if these provisions pass intact, and further application of the clauses of the bill bring in as corrupt any secret payment made in respect of advice given to, or influence exercised over a third person for the benefit of the donor. The only exception recognized in this proposed repression of these underhand transactions is that bona-fide "vales," or vails, strictly rendered, money given to servants by visitors, will not be considered as coming under the operation of the Act.

### ON THE BONUS HUNTER.

The Ontario Legislature just at the close of the last session put through a good deal of legislation which has been criticized adversely, but among the acts was one on which there can hardly be two opinions, i.e., the clause respecting the granting of bonuses by municipalities in amendment to the Municipal Act, which deprives municipal councils of the power to exempt manufactories from taxation. Hereafter such exemptions can only be obtained on a popular poll, at which not less than two-thirds of all the electors on the lists must cast their votes. The Act was a Government measure, designed, no doubt, to put a stop to competition between towns and villages for the location of manufacturing concerns. The granting a bonus is usually the result of two forces: first, the municipality

whose self-confidence or jealousy of successful rivals, heeds the belief that it is a suitable location for any industry, whether a rolling mill or a lace curtain factory; and second, the manufacturer whose business is handicapped either by old machinery or old debts. When these two meet a bonused industry results. The history of these is not pleasant reading. There are too many failures, though there are many successes. A bonus to an entirely new industry in a location having great advantages is sure to be followed by success, but such conditions usually produce success without any bonus. Too often bonus granting is a sort of legalized highway robbery by which a town deprives another of its means of existence. The day when every small town could hope to have a woolen mill and the cross-roads to support a custom carder are past. Great masses of capital applied to the cheapening of production have rendered the competition of the small mill hopeless except where special circumstances serve to maintain it.

The side of the question as far as Ontario is concerned which perhaps might have received more consideration at the hands of the legislators is, that if Ontario gives no bonuses and Quebec grants them, as she now does, and probably always will, the people of Ontario are placing themselves at an enormous disadvantage commercially, because Quebec has greater water powers for electrical development than has at least Southern Ontario, and has also a population which makes better operatives at a lower wage than Ontario and has also ocean freight rates.

### FLAX SPINNING.

A number of experiments were made some years ago in the Western States looking towards the manufacture of coarse toweling, etc., from native flax. Finally it was found that when run on wool cards a uniform sliver could be produced which was spun and woven to great advantage. It is expected that this process will be introduced into Canada at an early date.

The following account of a new departure in flax spinning appears in a contemporary: "In this invention flax and cotton are combined to form a yarn. This combining may be done in the spinning, and if so, the flax is spun wet and the cotton dry. The combination can also be made with a slightly twisted cotton yarn and an ordinary flax yarn; or, again, it may be made by running a flax sliver and cotton sliver through the roving frame."

### THE LONDON WOOL SALES

At the wool sales which closed March 23rd, to resume May 2nd, the buying has been of the very best kind, and the closing rates were very stiff. For the average strong combing 60s. quality, the German demand was extremely keen and sharp at the best prices of the series, though the Yorkshire buyers competed keenly. This persistence on the part of the German manufacturers and their anxiety to secure the largest share of the offerings of this particular class (though they also bought a big lot of the finer counts—64s. to 80s. and at the end for 40s. to 50s.) was a distinguishing feature of the series. Rarely has there been so continuously firm a market as that which prevailed for merinos and

fine crossbreds. In making a comparison between the final rates of the January sales and those which have been established by the auctions which have just terminated, it is apparent that a very decided advance has taken place in the value of Australasian merino wools generally. The experience of scoured Australasian merinos was different from that of greasies in this respect, that fair to good wools showed the greatest improvement. To some extent, no doubt, this was due to considerable buying on account of Russia, the operation of that country's tariff favoring the importation of wool in the scoured state. A few lots of extra quality realized very full rates, but generally speaking the best sorts were only ½d. per pound dearer than at the end of January, while the classes above mentioned, inclusive of pieces and locks, were quite a penny up. Like the corresponding classes in the grease, decidedly faulty parcels of all kinds were unaltered.

South African produce participated in the improvement achieved by other wools of merino quality. In no case was the gain as much as 10 per cent., but on the other hand, there was no exception to the upward movement.

The total quantity catalogued was 170,600 bales, and that sold amounted to 163,000 bales, of which it is estimated 85,000 bales are going abroad, inclusive of 1,000 bales to the United States. Some 12,000 bales remain on hand and will be carried forward to next series, which will commence May 2. The arrival list is to close on the day that a total of 250,000 bales gross is reached. A considerable proportion of the wool will go forward to the manufacturing districts, hence it is anticipated that the quantity for auction will not much exceed 180,000 bales. The following are the offerings and sales of colonial wool in the first two series of the current year, as compared with last :

	1899. Bales.	1898. Bales.
Held over .....	20,000	32,000
Net imports, two series .....	320,000	336,000
	<u>340,000</u>	<u>368,000</u>
Home trade purchases....	155,000	169,000
Continental " .....	166,000	173,000
American " .....	7,000	10,000
	<u>328,000</u>	<u>352,000</u>
	12,000	16,000

**BRITISH VELVET DYERS' COMBINE.**

The velvet dyers' combination in the Manchester district which is now being organized is said to include all the velvet dyers in England, among the principal firms being Worrall, Ordsall Works, Salford; Henry Crabtree & Sons, Ardwick, Manchester; Thomas Crabtree, Ancoats, Manchester; William Clemson & Co., Red Bank, Manchester; Reuben Michaelis, Newton Heath, Manchester; Ashton & Co., Pendleton; The Littleborough Dyeing Co., Littleborough; Joseph Clare, Greenfield, Oldham; and Dickins & Heywood, Middleton, Manchester. Notices have been sent out by the combination to fustian cutters and merchants that an advance in dyeing price will now take place. Japan and China goods have been increased

¾d. a yard for dyeing, which means that work formerly done for 12s. will cost 21s., we learn from the Dyer and Calico Printer. India and Java goods are advanced ¾d. per yard. American goods are advanced from 1d. to 2¼d. per yard, which means in some cases a jump from 12s. to 30s. In the home trade, blouse dyeing has been increased 75 to 100 per cent. An important factor in the situation is that what the English dyers have been doing for 14s. the Germans can do for 12s., including carriage to and from England.

**COP-DYEING.\***

The real key to the difficulty is in matching lots dyed at different times. To a layman nothing appears easier than to obtain the same color by taking precisely the same amounts of chemicals and the same weight of goods, and in this way try to obtain uniform dyeings, day after day, and week after week. It is a fact, however, that no one who has had any experience in colors will gainsay, that it is impossible, even where the most conscientious care is used, to get identically the same results day in and day out. All of this seems absurd to the theorist, but it is a sad fact that the dyer cannot get uniform shades even when using, to the very best of his ability, identically the same amounts. Therefore, as the order always comes from the commission house, "Dye THIS red," and not "Dye A red," it is not possible to make a commercial success on a commission basis of a process which does not enable the dyer to return the goods to the commission house dyed precisely and identically THIS red. Per contra, if a mill uses up its own dyeings, the dyeing of the cops can be used to effect a very material economy.

Another cause for a great deal of trouble in carrying out to a practical success the idea of cop-dyeing is that, if the cops are handled in the least roughly or squeezed so that the shuttling is in the least delayed, there is a loss, because in this country, where several looms are kept in operation by one hand, this operation of shuttling must be easily done, or the whole bobbin is thrown in the waste heap. We have not the careful labor in this country, and it is made more careless because of the migration of mill help from one manufacturing centre to another. Abroad this migration is not so easy, and consequently the mill hands stay longer in one place and get used to a certain kind of work.

To enumerate cop-dyeing machines: The first, that of M. Charles Weber; second is a cop-dyeing machine used in a cop-dyeing machine used in Providence; and third is mentioned in the Consular Reports for September, 1892, page 152; Mr. C. R. English, of Boston is agent, we believe, for more than one cop-dyeing machine, and should be addressed.

Perhaps the newest machine in cop-dyeing is the Hallewell machine, for which R. B. Maclea, 83 Worth street, New York city, is the agent.

A late number of the Textile Manufacturer has an article on an improved cop-dyeing machine made by Mr. Beaumont, of Stockport.

\*From the Year Book for Colorists and Dyers.

### THE PRESENT AND FUTURE OF MERCERIZING.

Mercerizing has attracted so much attention in the last few years and especially in the last few months, that a few words on the subject may not be without interest. although so many articles and notices have appeared, writes A. Sansone in the Dyer and Calico Printer. The question arises, is lustre mercerizing only a temporary and passing whim of the textile industries, is it an industrial fad, or is it likely to be a lasting improvement and a valuable addition to cotton manufacture? Without wishing to give mercerizing an undue importance in its future applications, I still think the process, even as it is, a very valuable adjunct to the cotton manufacturing processes, and believe that it has won a regular and recognized place in the future textile industry in this and other countries. The Turin Exhibition, owing to the very exciting political events of last year, attracted very little attention outside Italy, but nevertheless it showed the importance acquired by the mercerizing or lustreing processes, and the many and extensive applications to which it had already given rise. Almost all the best exhibits included mercerized goods and very well they looked, even when shown in cases where silk yarns and silk goods were exhibited at the same time. Italy is the largest European producer of raw silk and the Turin Exhibition had as fine a collection of silk exhibits as could be wished, not only in the raw or reeled yarn, but in the manufactured state, thus showing the enormous industrial progress made by the country of late years. By the side of the silk exhibits the mercerized cotton yarns and goods did not cut at all a bad figure either for lustre of fiber or for delicacy and brightness of shade. Among the goods were also some which had been produced by another and more expensive process, the yarns having been treated in a silk solution which left on them a thin film of silk. The majority of the exhibits of silk imitations, however, were obtained by the process of treatment with caustic soda.

We are in reality only at the beginning of the employment of these lustreing processes, and a greater and much more important development is sure to follow. Up to a short time ago the comparatively high cost of mercerizing was a hindrance to the more extensive employment of the process. A very clever silk and cotton yarn dyer in Milan told me some months ago that mercerized yarns were then too expensive to be able to compete successfully with silk yarns. But the conditions have changed, and since the development in the lustreing operations which has taken place in this country, especially in the case of yarns, they are now employed very largely for a variety of purposes. It is notorious that although the mercerizing processes had already been carried on for some months in Germany on a manufacturing scale, it was through Liebermann & Kerr & Hoegger that the fact was made known that the best lustreing results could only be procured with Egyptian and Sea Island cotton and other long-stapled fibers, and that with all the other varieties the lustreing effect was not so good, in fact it was of such poor quality to be of no really great value, having regard to the expense incurred. It will be easily understood that those

varieties of yarns produced with Egyptian cotton, and not too tightly spun or twisted, give the best results. The yarn lustreing machines work in Kerr & Hoegger's establishment, and are the invention of the firm: consist of two parallel rows of strong arms, between each pair of which the yarns are stretched and revolved, while being impregnated at the lower end in a large shallow tank in caustic soda at 50 deg. to 54 deg. Tw. This treatment only lasts a few minutes, and the caustic soda lye is allowed to fall back into a tank below, from which it is pumped afterwards again into the shallow tank for the subsequent operations. When the caustic lye has been run off, a specially arranged iron side door is lowered, so that in the subsequent washing of the yarn the wash waters may be run off and afterwards collected and used again. The hanks are then removed, and washed, and soured in the ordinary beck, where they are then dyed. Either the dyeing or the mordanting of cotton is done at the same time that the lustreing process is carried on, by the joint use of the caustic soda and direct dyeing coloring matters, or appropriate alkaline mordants.

One reason why mercerizing processes will find still more extensive applications is the greater strength acquired by the fiber, which ranges from 10 to 25 per cent. It is also very likely that the electrolytic processes for the manufacture of caustic soda may bring this product down in price, and in this case the cost of the lustreing processes may also be considerably reduced, and the employment of the goods consequently very largely developed. A great variety of goods, plain and fancy, are being already produced with the lustred yarns, and some very fine effects are being obtained, such as woven articles of great variety in designs or color. Jacquard goods of great beauty and brilliancy are manufactured with these yarns, which, of course, on account of their glossy appearance, are finding their way also into a large variety and number of mixed goods, especially in connection with wool and silk. A purpose for which the lustred yarns are especially well adapted is for embroidery and other fancy work for which the glossy lustre is of importance

## Textile Design

HEAVY-WEIGHT ALL-WOOL FANCY SUITING  
Cassimere finish cheviot Yarns dyed in stock. Finished weight  
22 to 23 ozs for 56-inch width.

Dressed.  
5 times { 4 light mix  
          { 4 brown  
          { 4 light mix  
          { 3 brown  
          { 1 red and black d. and t  
—  
48 threads pattern  
5) 1,680 ends, 6-4 width  
   336 " section  
   7 patterns  
Woven.  
Dark red 1 red and black, d. and t.  
          3 black  
          4 olive  
5 times { 4 black  
          { 4 olive  
—  
48 picks to pattern  
(32 picks to inch)



Draw straight on 8 harnesses Reed 72 inches inside selvage, equal 74 inches over all.



Twill weave to right  
Warp and fill twist to right

1,680 ends, 1 1/2-run warp, equal 12.32  
32 picks, 2-run fill, " 13.02

Weight 6-4 yard from loom equals 25 3/4 ozs.  
25.34 ozs shrink 12 1/2 per cent. equal 29 ozs. nearly.  
—A. W. & C. R.

### FELTING.

Concerning the felt branch of the woolen industry very little has been published in the textile press, although quite an amount of textile goods is to-day replaced by feltings. Much of the waste products of the woolen mill find a ready use in the felt making industry, not alone in the lower grades, but in many of the finer grades also. This is due, says a writer in *The Textile World*, to the fact that the stock need not be of such a nature as to be capable of being spun into a thread, as is the case in the textile business, but the chief requirement here is the felting quality. For linings and trimmings felt has almost become an indispensable article, and gloves of the cheaper class are lined with a cheap grade of felt. The shoe and rubber trade also uses up quite a large amount of felt of one kind or another; and in the saddlery trade, for padding and such purposes, felt has come to be regarded as the best thing obtainable.

The stock used in making felt consists chiefly of wool and its wastes, with a generous admixture of cotton in many instances, to bring down the cost to its lowest limits. In the felting industry, especially that of the cheaper grades, it is the same as in the textile business, for the sole aim and end is not to make the best possible article, but to make the goods look well enough to sell, from the cheapest stock which it is possible to crowd into them. It will thus be easily seen that the selection of the stock and the judicious mixing of the same is one of the secrets of success in this industry. In following the stock through the various processes, it is necessary to start at the picker house, as this is the first operation through which the stock has to pass. All the waste which is to be used in the making of the felt is first passed through a duster, which leaves the stock in the best possible condition for mixing. When a batch is about to be made up for the picker, the aim is always to have it as large as possible, so that an order may be filled from one batch or mixture, for on cheap felts, the grade mostly used in the trades mentioned, a large amount of waste is used, and it is quite a problem to get another batch exactly like the first. Therefore, large batches are always preferred. The stock is opened out and spread on the floor of the mixing room, and usually the longest stapled waste is used for a bottom layer, or, if new wool is used, a thin layer of this is spread on the floor first. The cotton, if any is used, is then put in thin layers on top of the wool. A thin layer of waste is then put on, and in this manner the batch is built up, taking good care that the better stock is as evenly distributed as possible. Now this may seem quite an unimportant item, but it should be remembered that herein lies the success or failure of the whole business. The rest of the work is all of a mechanical nature, and while some parts of it require skilled help, most of it can be well done by unskilled labor, but in the mixing of the stock a good judgment and an intimate knowledge of felt making are required. As most of the waste used comes from woolen mills, it always has more or less oil on it, and this item has to be taken into consideration when a mixing is made, for

it will not do to have too much oily waste in any one batch as it destroys the hardening capacity which is required to bring the felt into that condition where it can be handled in the tulling mill. Once the felt gets as far as the mill, of course the use of soap will soon overcome the oil, but the felt has first got to be in that condition where it is fit to go to the fulling mill. All oil is therefore rigidly excluded from the stock, and the usual oiling process in the picker house is omitted here.

After the batch or mix, whatever it may be termed, has been made, the stock is run through the picker, and care must be taken that the stock is properly fed on the machine to ensure proper mixing. Usually both burr and mixing pickers are employed, and the stock is run through each to ensure proper mixing, after which the stock is sheeted up and taken to the card room for further operations. In the card room it goes to the first breaker, the same as if it were to be carded for spinning, but instead of leaving the card in the shape of roping, the stock is deposited on a revolving drum, and when quite an amount is thus deposited it is taken off in the shape of a sheet, which is as wide as the card and as long as the circumference of the drum, whatever that may be. The sheets are folded and taken to the second breaker, where the same operation is repeated, after which it is ready for the finishing card, or former, as it is termed in felt-making card rooms, for here the future piece of felt receives its form, or shape. On the feed apron of this card are found guide boards, which make it possible to regulate the width according to the requirement of the goods to be made. The goods range in width from 60 to 100 inches, and over sometimes, and it is, therefore, apparent that these cards need to be very wide, for the feed of a piece of felt to finish 100 inches wide has to be at least 110 inches, and, therefore, these cards need to be wide enough to make goods of the greatest width required, and they are mostly 112 inches wide, that is, the carding surface is that width.

The web for horse and saddle blankets was simply rolled on a bat-stick, and was then ready for future work, but in the case of the web for felt the bats are taken to the trimming table, and the sides are there trimmed to the width the goods are required to be. This is made necessary on account of the edges being always thinner than the body, and due allowance has to be made for this trimming when the stock is weighed for the finishing card. After trimming, the bats are again rolled up, and they are then ready for the next step in the process.

At the trimming table there is also a chance to regulate the bats as to size, that is, thickness, for the length is always the same and the width is got by trimming the edges. For instance, if goods are wanted to weigh two or three pounds to the yard, it would be quite a strain on the apron to have this amount of stock on it, and the chances for breakdowns would be frequent. Therefore, the stock is divided into two, three or more feeds, and as they are rolled on sticks two or three are laid on top of one another, and trimmed and rolled up.

If the goods go beyond the limit where it would be advisable or convenient to handle them this way, on account of their size, another sub-division is made, and they are finally brought to the required size in the next operation by putting two or more bats on top of one another, until the required size of the goods to be made is reached. The hardening process is the next step.

### MOQUETTES MACHINE-MADE AXMINSTERS.

The carpeting which first bore the name of "Moquette" originated in France as an imitation of the hand-made rugs of the Orient. In the United States moquette is the name applied to a tufted pile machine-made carpeting first manufactured by Alexander Smith on a loom invented by Halcyon Skinner and patented in 1856, says *The Textile World*. At the present



time the name of Axminster is also used to designate carpeting which is practically the same as moquette, differing mainly in the number of tufts of wool to the inch or in the manner of fastening the tufts more or less firmly in the fabric. In the Skinner moquette loom the warp is composed of two parts mounted on separate beams and comprising threads of different grades of fineness, the warp of coarser threads being under greater tension than the other so as to be kept as straight as possible, that of the finer thread being under less tension, so as to be bent around the woolen pile tufts and the weft threads. The straight or coarse warp is sub-divided into two parts, one being called the tufting warp because the tufts are secured to it, and the other the body warp, because it gives firmness to the fabric. The pile consists of a succession of the tufts of yarn referred to, extending across the fabric, with the ends standing upward. To carry the yarns which form the tufts, spools about as long as the width of the fabric are employed, the number of spools comprising a series being equal to the number of ranges of tufts required to complete the pattern desired. The yarns are wound on each spool with such an arrangement of colors as may be required by the part of the figure supplied by that spool. The spools are mounted in succession on the links of a pair of endless chains which move in unison and with a positive motion, to bring each spool in succession to the position for introducing one range of tuft into the fabric. The journals of the spools work in a frame which engages with the links of the chain by means of spring clips. In beginning the weaving, the mechanism of the loom detaches the first of the series of spools with the frame from the chains and carries it down in front of the lay just over the tufting warps. The tufting yarn is then grasped by a series of nippers, drawn out and carried around the pairs of tufting warps, these nippers being mechanical substitutes for the Oriental weaver's fingers in his hand-loom. The heddles are then operated so as to hold the tufts in position while the nippers let go their hold and two steel blades then cut the tufting from the several parcels in the spools. The tufts are then woven into the body of the fabric, thus completing one row of tufts in the fabric. This operation is repeated for the next row and so on continuously. Since Halcyon Skinner's loom was first put into use many changes have been made in both the mechanism of the loom and the fabric manufactured on it, but the essential features of the weaving process remain as here described.

#### SOAP AND SOAP PREPARATIONS.\*

By allowing caustic soda or caustic potash to act upon animal or vegetable oils or fats, a double decomposition takes place; the glycerine is liberated and the alkali combines with the fatty acids to form oleate, margarate or stearate of soda or potash, a combination known as soap. This name has however, been extended to compounds of oleaginous bodies with some earthy body, as lime, barytes and strontia; also with metallic bodies, as oxides of lead, mercury and bismuth; all of which have few properties in common with soap, properly so called. The soaps of commerce may be divided into three classes, namely, hard, medium and soft. The chief differences are to be found in the alkalies and the fats employed, but in all cases the substances should be brought together in such proportions as will neutralize one another. Taking the molecular weights in round numbers, 1 part of soda ( $\text{Na}_2\text{O}$ ) is required to saponify 8.5 parts of fatty acid; and 1 part of potash ( $\text{K}_2\text{O}$ ) to saponify 6 parts of fatty acids.

In manufacturing hard soaps, hard animal or vegetable fats and weak solutions of soda are generally boiled together until

the thin paste is saponified, when the soap and the glycerine remain suspended in the water; they are next separated by brine or common salt, in which soap is not soluble. Any excess of alkali, all the glycerine, and the water, combine with the salt and so throw the soap up to the top in a granulated mass. The spent lye containing the glycerine is withdrawn through a tap placed at the bottom of the boiler, and the soap curd, after being melted, may be run direct into wooden or iron frames to cool and harden, or it may be further treated with alkali, again salted, melted and adulterated. Finally, it is cut into bars for the market. Medium soap may be made by what is known as the cold process, namely, at a temperature below the boiling point of water. The proper proportion of hard fat is then sufficiently heated to liquefy it, and a caustic alkaline lye of known density is measured out, added to and well stirred up with the fat, the heat evolved by the chemical reaction being sufficient to convert the whole mass into soap. When allowed to stand and cool the mass solidifies. By this process the glycerine and saline impurities of the lyes remain in the soap, and, on account of the difficulties of exactly proportioning the fat and the alkali, one or the other is generally in excess. For the above reasons marine and hydrated soaps, which are of this class, are more deliquescent than hard soaps. Soft soap is usually manufactured by saponifying such oils as whale, seal, linseed, olive or cottonseed, or some soft fat, with caustic potash, and subsequently evaporating the resulting compound to the desired consistence. As in medium soaps, when manufactured as above described, every element of the materials used is retained. But, broadly stated, if the glycerine of the fats is replaced by potash, a soft soap is obtained, if by soda a hard soap; nevertheless "soft soaps often contain large quantities of soda in place of potash." Also, while in hard soaps the water is chemically combined, in soft soaps it is mechanically mixed. The latter are not all equally deliquescent, for some may be exposed to the atmosphere for a considerable time without greatly reducing their consistence, but others become almost liquid. In these soaps the granular texture of a fig is often imitated by adding tallow, which, by producing stearate of potash, gives the white marking technically termed "figging."

Few articles are subjected to so much change and adulteration as the soaps used by textile manufacturers. They contain a wide variety of ingredients, both in alkalies and fats. In the latter it is not uncommon to find palm, nut, cocoanut and cottonseed oils mixed together. Adulterants are equally varied, but of these water takes the first place—especially in hard soaps made from fats which freely absorb water, such as cocoanut oil, with a maximum percentage of 80. Next to water must be placed silicate of soda, also known as soluble glass and water glass; it favors the introduction of a large percentage of water, and it possesses a high detergent property, but is injurious to size. Sulphate of soda or Glauber's salt gives hardness with a reduced percentage of fatty material. Resin, china clay, chalk, baryta, gypsum, pumice stone, ochre, flour, starch, dextrine, Irish moss, gelatine and a host of other substances are employed, few, if any, of which are serviceable in the sizing room when incorporated with soap.

The value of a soap depends upon its purity, the small proportion of water it contains, the nature of the fatty acids and the correct ratios of fat and alkali. Since the needs of a manufacturer vary with his surroundings, such as the composition of the water available, the condition of the fibrous substances, and the nature of their previous and subsequent treatment, the work to be done should determine the kind and quality of the soap which will best do it. But unless a user understands the composition and ingredients of the article he employs, it will be impossible to make a suitable selection, for no single soap can be adapted to all kinds of work; one may be perfect for a given process, but useless for a different one. That in the textile in-

\*Reprinted from the Textile Recorder, Manchester, England.

industries soaps of varied composition are needed will be seen from the following, which are given as suitable for the purposes mentioned.

For wool washing a high percentage of soda is needed to loosen the grease, glue and dirt, but if too high the fibers become dry and stiff, cocoanut oil should be one of the ingredients. For fine wools potash soap is preferred by some to soda on account of its greater softening power.

	Per cent.
Fat .....	61.0
Soda .....	8.9
Water .....	30.0
	—
	99.9

For fulling the composition approximates to—

	Per cent.
Fat .....	61.4
Soda .....	8.6
Water .....	30.0
	—
	100.0

It must not contain such an excess of alkali as to injure the delicate colors of dyed wool.

“For silk dyeing the following percentage of soda is sometimes exceeded, but the proportions give a fair notion of what is required:”

	Per cent.
Fat .....	65
Soda .....	8
Water .....	27
	—
	100

On the continent olive oil soap is used for bleaching raw silk.

For calico printing the proportion of soda is important, as any excess would spoil certain colors—render some dull, but add to the brilliancy of others. A good hard soap contains—

	Per cent.
Fat .....	67
Soda .....	6
Water .....	27
	—
	100

Grace-Calvert suggests the following soaps for producing the highest brightening effect upon the under-mentioned colors:

For Madder Purples—	Per cent
Fat .....	60.4
Soda .....	5.6
Water .....	34.0
	—
	100.0

For Madder Pinks—	Per cent.
Fat .....	59.23
Soda .....	6.77
Water .....	34.00
	—
	100.00

For Rose and Reds—	Per cent.
Fat .....	56.3
Soda .....	6.7
Water .....	37.0
	—
	100.0

## Foreign Textile Centres

MANCHESTER.—The demand for heavy goods generally, recently, may be described as much more satisfactory than for some time previously. The lace departments have been busy of late, and agents appear to be much more hopeful as to the future. Some of the Calais people grumble, but that must not be taken to indicate that lace is neglected. Even Calais houses have booked orders forming in the aggregate a considerable total, although the demand for lace may, to a large extent, be directed to qualities made elsewhere—Nottingham descriptions, for instance, with a good sprinkling of orders for St. Gall and Plauen. Imitations of Luxeuil lace, all-cotton and all-silk have had a fair run. In the cotton trade employment for machinery remains steady, although many manufacturers are now running down their order lists, and would like to see some fresh business coming in to fill up the gap. There is not perhaps so strong a tendency to adhere to extreme quotations, but the general attitude is one of firmness. Some of the leading foreign outlets, such as Calcutta, are not buying much. The plague cripples business with Bengal for the time-being. Home trade houses are not buying much cloth at the moment, says The Draper's Record, London, Eng., for Canada shipments go forward steadily, and there is a fair sprinkling of goods for London, Hamilton, Brantford, Woodstock, and other Ontario centres sending buyers to this side. In a criticism of the proposed calico printing syndicate, a member of the trade protests against the suggestion that the warehouses and the works shall be joined. He agrees with combination of the works. Prices could then be fixed by the syndicate for printing, while the warehouses would be left free to do their part in getting up styles, looking after business, and supplying the syndicate with plenty of work. The warehouses would be free from the care and pressure of the works, and could apply all their skill in getting up styles. The maker of the suggestion thinks that his plan would give life and stimulus to the trade. In the meantime, one hears nothing as to the progress made by the promoters of the oldest scheme, although several weeks ago it was stated that owners of about four-fifths of the machines in the trade were favorable to the proposal. The ready-made clothing houses are busy, although individual retailers do not appear to be giving out large orders. In the aggregate, however, the business coming forward is considerable, although on some parts of the Lancashire ground there is some slackness noticeable. The settlement of the wages dispute in the spinning section of our staple industry cleared away any anxiety that may have been harbored in regard to a possibly unfavorable outcome, without, however, having any very noticeable effect upon the market. The prospect of such disagreements being settled in the future by means of a sliding scale is generally regarded as being worth the sacrifice of the present advance in wages, and the fact is not overlooked that the trade has already derived no small benefits from the operation of the Brooklands Agreement.

LEEDS.—In Leeds business was very active at the holidays' approach, and the satisfactory state of the labor market in nearly all the great industries of the country is expected to keep business good. Better-class goods and special orders seem to be distinctly increasing, whilst the demand for the very cheapest kinds of men's wear is falling off in the home trade. Worsteds coating makers are finding a fair demand for good home trade qualities, but the demand for America is still very small, and in the Eastern markets wool coatings are being to some extent replaced by imitations of cotton. In the heavy woolen district, although some of the mills in Batley and Dewsbury are well

employed on army work and clothing orders, there are some makers of regular goods who are still not able to run full time. In Morley some of the best makers have already booked some very good lines in ladies' costume cloths for next winter's trade, but those who have confined their attention to the old-fashioned Melton production are far from busy. The prospects of the blanket makers for next season are certainly better, and the trade will be kept in much more even channels if the proposed combination becomes an accomplished fact. Business at the cloth market recently was up to the average for all light makes of woolen, worsted, and tweed clothing, which are now in season. Moreover, the severe weather has resulted in a nominal improvement in the trade for heavy woollens. In some kinds of old stock merchants have been able to sell a little at rates which were fairly remunerative, but only a few firms who make heavy materials of the character of beavers and presidents have had occasion to initiate any fresh production. Some further shipments of this description have been made to Australia, together with small parcels of covert and union coatings, frieze, and curls. The dark weather has checked business in specialties for the current season. Fine worsteds are only procurable at top prices. Wool and worsted serges are less firm as compared with last week. Black suppers and wool serges make extreme rates, and supplies of fancy trouserings are hardly equal to the demand, and quotations are strictly upheld. Meltons have a quiet market. Mixture worsteds are in good request for a growing Colonial trade in ready-made clothing. Mantle and costume cloths are the turn better, and special light-weights in unions are in good demand for India. The Continental trade in serges comprises a large variety in new shades. In Army cloths there is no change, but blankets are rather more active. Rugs steady. Cloth finishers are somewhat slack, but dyers are busy.

**HUDDESFIELD.**—In Huddersfield the makers of the medium and better classes of fancy woollens continue to be well employed, and there is also a good demand for good vicunas and serges.

**BRADFORD.**—Now that sufficient time has elapsed since the conclusion of the recent series of colonial wool sales in London, to fully estimate the position of the wool market, one finds that large operations in fine merinos are extremely difficult to negotiate. During the latter part of the London sales French and German buyers appeared to be able to pay rates for fine colonial wools which were quite beyond this market, and as a proof of this 60's merino tops of a superior quality to the standard 60's B. Antwerp top are to-day quoted at practically the same price. This comparatively poor demand for the fine colonial merino wool here is no doubt largely accounted for by the continued quietness of the demand for fine worsted coatings on American account, as very large quantities of these fine wools are consumed for this manufacture. Another important factor in the situation is that cloth materials are extremely fashionable for ladies' costume materials, and for these the shorter and cheaper kinds of South American merino wools are the most suitable, and the continental manufacturers have always laid themselves out specially for dealing with these wools. In cross-bred colonial wools there are signs that at last the extremely low price which they have reached is gradually attracting attention, and there are more enquiries for yarns made from these wools, both on home and continental export account. In English wools business is still quiet, but there is all the time a steady demand for the best lustre wools suitable for making the wet yarns for bright dress goods of the Alpaca character. In raw mohair there has been a distinct increase in both enquiries and orders for the best Cape and Turkey kinds, and holders of raw material are able to make better prices than was the case even a week ago. Alpaca is also quite firm. As

will have been seen from the above, spinners of all kinds of worsted yarns are better off for business, both on home and continental account, and mohair spinners are all extremely busy, and very independent as regards prices. There can be no doubt that the extremely cold weather recently, accompanied, as it was in many districts, by more or less heavy falls of snow, has had the effect of retarding the purchasing of those classes of dress goods intended for midsummer wear, and the sales of such fabrics as silver-grey mohairs and fancy cotton and silk blouse materials have been smaller on that account. The demand for black and white costume checks continues good and there are absolutely no stocks at all of these stylish fabrics. The demand from the United States for "Blister" mohair crepons is still extremely active, both for the present season and for the autumn, and should the demand for these fabrics in the home trade revive to any great extent there will be great difficulty in obtaining deliveries from the makers here. There can be no disputing the fact that in mohair crepons, at all events, Bradford leads the way. The autumn trade in dress goods is opening out slowly, partly because buyers are very busy with their spring season's deliveries, and partly because the last two winters have been so mild that very heavy fabrics have not been wanted, so that this season's buying is being approached with the greatest caution. It is announced that a new process of dealing with wool-combers' refuse grease has been perfected, which will not only render this previously troublesome product a source of income, but will obviate the immense expenditure by Bradford for a special system of sewerage for the wool-combing industry which seemed to be imminent before this discovery.

**ROCHDALE.**—Business in the flannel market recently, says The Textile Mercury, was somewhat quieter after the recent activity. A fair number of the season's orders have now been placed, the total quantities being possibly somewhat larger than usual. Prices are generally supposed to be at a small advance upon last year's rates, amounting to about 1/2d. per yard, but this does not cover the increased cost of the goods made from the finer descriptions of wool. Full time is now general.

**KIDDERMINSTER.**—The carpet trade is busy. A good deal of the pressure is due to small orders urgently wanted, but besides these special orders, which, by causing overtime, are apt to make the trade appear busier than it is, there is a steady all-round business. The yarn market is distinctly flat. There is, and has been for some time past, an absence of new business in carpet yarns, and buyers are still holding off the market. Prices, however, are helped by a rather better trade for outside markets, and are firm. Spinners are, on the whole, very fairly employed on a wide variety of yarns.

**NOTTINGHAM.**—There has been a steady demand for lace and curtain yarns, and a fair amount of business has been done recently. This week the tone of the market has been less favorable to spinners, and concessions are required for current prices. Merino and fine cashmere yarns for hosiery are in good request, prices tending upwards. Prices of bobbin nets and all plain goods remain firm, and orders are in arrear. There is more business doing in the fancy millinery lace warehouses.

**LEICESTER.**—The hosiery industry is fairly healthy, with a good delivery on shipping account, but the home trade in light spring fabrics is checked by the severe weather. Specialties and fancy goods are in fair request, but plain goods sell much more freely. The volume of business in the yarn market is of fair extent, and with low stocks prices are a shade firmer. Particulars for delivery come to hand more freely, and new business is coming forward for larger quantities. Cashmere yarns are in very good request, and spinners insist on the full limit of the advance, while there is a steady turnover in fancy and lamb's wool yarns. Cotton yarns sell more freely for use in combination with wool.

**KIRKCALDY.**—The recent improvement in the linen industry is being well maintained, both the home and foreign markets showing greater strength. Floorcloth and linoleum manufacturers continue very busy, and while, as the result of the high tariff imposed on these goods by the States there has been shrinkage in the American trade, that loss is more than made up by the increased demand from other quarters, and the volume of trade at present is larger than at any former period in the history of the industry.

**BELFAST.**—Trade has been gradually improving, and the number of enquiries as well as the actual amount of fresh business have reached satisfactory proportions. There is a very healthy tone apparent, and values in all directions are gradually hardening. Manufacturers are well sold in advance, though they are working on basis of old rates, which leave but scant margin of profit. For fresh contracts, however, they are stiffer to deal with, and this has somewhat checked buying. There is a large amount of unplaced business floating around which will have to be given out sooner or later and the general outlook is encouraging. The yarn trade has shown more life, and lately there has been a very fair amount of business put through. Weit tows have met with more attention and prices are not likely to remain at present low level. Line wefts are going steadily into consumption, coarse counts having most attention. The various makes of brown-power and hand-loom linens have met with a regular and steadily increasing demand, and business is slowly but surely expanding. Unions of all kinds continue to move briskly at full rates, and there is more doing in tow-made goods. Damasks, housekeeping goods and handkerchiefs are selling freely and prices are very firm. Power-loom bleaching cloth is changing hands in fairly respectable parcels, and makers are inclined to hold for some advance in prices. General export trade is rather more than maintained. With Cuba there is a very gratifying business passing, and from the States orders are being received in regularly increasing number. Taken all over our market has evidently well got round the corner and steady progress is now confidently counted upon.

**LYONS.**—More buyers were in the Lyons market recently, but ordering for fall is still backward. The resistance against paying the higher prices which the mills are now forced to ask continues, and only articles specially favored by fashion, such as mousseline and similar weaves—of which there are no stocks—can be brought up to an adequate price level, writes the special correspondent of *The Dry Goods Economist*, New York. In all other fabrics hesitation continues, while goods from stock which manufacturers are willing to sell at old prices are readily bought. Many old lots have been sold in this way, and the market is at present cleaner than it has been for years. This is one of the good effects of the advance in the prices of raw silk, and if it were the only one the movement would have been welcome; but it is thought that the industry will be benefited by it permanently, and that profitable business will develop hereafter. Buyers who have withheld their orders in the hope of seeing lower prices will have to place their orders soon or run the risk of being without supplies in a bare market. With regard to fall styles, armures in soft makes are frequently spoken of, principally for the better-class trade. These include satin weaves, indicating an impending change in the fashion. For low-priced goods taffetas in plain and fancy continue to hold the lead, but changeable effects are less favored. The velvet trade has been quiet. Some plain velvets were bought for millinery purposes, but no large deals were effected. The ordering business for fancy velvets was also slack. The ribbon trade has been moderately active. Plain taffetas, ribbons in wide widths, were bought, as were also stripes and warp prints. Black and colored-satin ribbons were in better demand than during the preceding weeks.

**CREFELD.**—Although the situation of the Crefeld market has been very satisfactory for some time, there has been a further increase in activity. Numerous orders arrived lately, the growing demand from retailers being particularly gratifying. Higher prices, too, were more readily paid, and there is little doubt that the advance in the cost of raw silk is the real cause for the eagerness shown by buyers to secure supplies for next season at this early date. The fear that higher prices will rule later on is evidently influencing wholesalers as well as retailers, and a good season is already assured. With regard to fashion, nothing new has developed, nor is a preference shown for any particular styles. The demand is well divided, with taffetas naturally in the foreground. Plain goods continue to lead, plain-colored taffetas being in particularly heavy demand; but stripes, checks and small figures are also favored. There is a fair demand for plaids. Silks for blouses, skirts and linings form the bulk of the orders, but liberal preparations have also been made for better goods, such as satin duchesse, peau de soie and armures. Moire velours still play an important role, being largely bought by mantle manufacturers. The velvet trade is unusually quiet, there being little demand except for velours du nord and fancy velvets. The strike in the mills in town is still going on, but it may be mentioned as a significant sign of the quietness in this branch of the industry, that the outside mills are able to meet the demand by only working part of the usual time.

**ZURICH.**—The market for manufactured goods showed no particular animation, and there were only few buyers here lately, but an improvement can be registered. Some important orders for new goods were placed at advanced prices, and, although these prices are not quite on a level with the present cost of raw material, it is gratifying to note that manufacturers have gained their point. It is confidently expected that prices will gradually work higher. New orders were principally for plain goods, surahs and taffetas, but low-priced fancies also commanded attention. Goods from stock are readily bought, old prices being accepted by the manufacturers, but stocks have nearly disappeared, and these transactions were therefore of comparatively little importance.

### COMING STYLES.

The following article on fabrics and styles for the spring and summer of 1900 is translated from an article which appeared in a recent issue of a German contemporary: "The high price of raw worsted yarns may force many manufacturers to look for a quality of yarn not so much affected by the advance in price. These yarns are principally of the coarser variety made out of crossbreds. Out of these the spinners may make a so-called coating yarn resembling in quality the merino yarn without showing a cheviot character. It is supposed that these coating yarns will be greatly taken up as a substitute for the best worsted yarns, owing to the fact that there is a scarcity of the fine combing wools such as enter into the best quality yarns. Of course, it is not assumed that the new yarn will entirely take the place of the best, as it cannot be spun higher than 40's, while 52's and 56's are principally used in fine worsted goods, especially in piece-dyed and corkscrews. Spinners are doing a great deal of experimenting, but they have not as yet so far as is known, succeeded in producing a yarn which will give a new and novel effect. This is so much more to be pitied because fashions and styles have not been developed into new channels for a long time, while there is a demand for something out of the ordinary. Designers will probably have to follow the same trend of designing as in the last few seasons. In the making of designs for the summer season of 1900 designers will be confined in their efforts in the production of novelty effects

to color combinations; they will probably have opportunities to improve the color and appearance. There is a great deal of uncertainty regarding the colors to be used in dress goods, it being impossible to forecast at this time what colors will be fashionable. There is a feeling that the loud mixed color effects will not be in vogue, but on the contrary that it will be quite important that the different compositions of colors will be of mild and soft appearance. To accomplish the mellow and soft character of the fabric to its greatest possibility it may be advisable to use a loose-twisted moulse yarn. Worsted fabrics will retain the prominent position for men's wear which they have held for the last few years. There is a disposition among the tailors not to buy chevots for their best trade. Serges and melons and light solid colors will be in great demand. As the tendency will be toward soft, coarse yarn cloths, the finish must naturally be dull, having very little luster.

### THE RECORD STILL HOLDS.

It is no new thing for us to see records established one day and beaten the next, the top place nowadays being no sooner reached by one individual than challenged by another. The record in the manufacture of cloth, however, with which this article deals, though of 88 years' standing, has never yet been eclipsed. The scene of this remarkable achievement in the sartorial art is the village of Newbury, Berkshire, and it came in this way: John Coxeter, a then well known cloth manufacturer, the owner of Greenham Mills, at the above named village, remarked in the course of conversation one day in the year 1811, to Sir John Throckmorton, Bart., of Newbury: "So great are the improvements in machinery which I have lately introduced into my mill that I believe that in 24 hours I could take the coat off your back, reduce it to wool, and turn it back into a coat again." The proverb says, "There's many a true word spoken in jest." So great an impression did Coxeter's boast make upon the baronet, that shortly afterwards he enquired of Coxeter if it would really be possible to make a coat from sheep's wool between the sunrise and sunset of a summer's day. This gentleman, after carefully calculating the time required for the various processes, replied that in his opinion it could be done.

Not long after the above conversation, which took place at a dinner party, Sir John Throckmorton laid a wager of a thousand guineas that at 8 o'clock in the evening of June 25, 1811, he would sit down to dinner in a well woven, properly made coat, the wool of which formed the fleeces of sheep's backs at 5 o'clock that same morning. Such an achievement appearing practically impossible to his listeners, his bet was eagerly accepted. Sir John entrusted the accomplishment of the feat to Coxeter, and shortly before 5 o'clock on the morning stated, the early rising villagers of Newbury were astonished to see their worthy squire, accompanied by his shepherd and two sheep, journeying toward Greenham Mills. Promptly at 5 o'clock operations commenced, and no time was lost in getting the sheep shorn. . . . All implements to be used were placed in readiness on the field of action, and the smallest actual operations in the making of the coat were performed between the hours mentioned. . . . The sheep being shorn, the wool was washed, stubbed, carded, spun and woven, the weaving being performed by Coxeter, junior, who had been found by previous competition to be the most expert workman. . . . The cloth thus manufactured was next scoured, fulled, tented, raised, sheared, dyed and dressed, being completed by 4 o'clock in the afternoon, just 11 hours after the arrival of the two sheep in the mill yard.

In the meantime, the news of the wager had spread abroad among the neighboring villages, bringing crowds of people eager to witness the conclusion of this extraordinary under-

taking. The cloth was now put into the hands of the tailor, James White, who had already got all measurements ready during the operations, so that not a moment should be lost; and he, together with nine of his men, with needles all threaded, at once started on it. For the next two hours and a quarter the tailors were busy cutting out, stitching, pressing and sewing on buttons, in fact, generally converting the cloth into a "well woven, properly made coat," and at 20 minutes past 6 Mr. Coxeter presented the coat to Sir John Throckmorton, who put the garment on before an assemblage of over 5,000 people, and sat down to dinner with it on, together with 40 gentlemen, at 8 o'clock in the evening.—The Strand Magazine.

### CHROMING WOOL

A French patent has been taken out for a process of increasing the power of wool to take up chrome by previously impregnating it with the hydrate, carbonate, or tannate of an alkaline earth; 100 lbs of wool are impregnated with limewater, washed, and then boiled for two hours in a solution of 12 lbs. fluoride of chrome. The imed wool may be exposed to the air before boiling with the fluoride to convert the lime into carbonate. Another way is to treat the 100 lbs. of wool with 10 lbs. of tannin or the equivalent amount of sumach, then treat with lime, and finally boil the wool now containing tannate of lime with fluoride of chrome. The ease with which the chromium is taken up after the preliminary treatment is shown by the fact that 40 gm. of loose wool will exhaust a bath of 750 c. c. of water containing 2.5 gm. of chromium fluoride.

### CARBON DIOXIDE IN HUMIDIFYING.\*

Ventilating has a direct relation with sizing and humidifying. It is not necessary to inform you, gentlemen, that the operation of sizing is a necessity, but the general public believe that the sizing of cotton goods is one huge fraud on the purchaser. As my remarks to-night will be published, I am going to inform the public through you that the trade is a perfectly legitimate one. The merchants in Manchester know what they are buying, the merchants in India are not imposed upon, and, most important of all, the natives who use the cloth know what they are getting when they buy cloth with 100 per cent. of size in it. The English people do not understand how this cloth is used, and, knowing how they treat new cotton themselves, believe other people do likewise. But in India this class of cotton is never washed. A native buys a piece of cloth, which he winds round his body, and when the upper portion gets too dirty for wear he tears it off and exposes the clean surface below. Heavily-sized cloth is within the reach of the poorest, whereas pure cotton he cannot afford to buy. Moreover, heavily-sized cotton wears much better and resists dirt longer as worn. I know personally that the manufacturers would prefer to make what are known as pure goods, but so long as there is a demand for heavily-sized goods the manufacturers must make what is asked for or stop their looms. I have shown you that heavy sizing is necessary and legitimate, and I will give you a little illustration. Some years ago a chemist brought himself prominently before the public by denouncing the paper makers for, as he said, fraudulently adulterating paper with china clay. This caused a great stir at the time, and the following year the Government stipulated in their paper contracts that all paper must be made from pure paper pulp. They got it, and nice stuff it was. The writing on it looked like a letter written on blotting paper. The public wisely concluded that if they could get a beautiful appearance with adulterated paper, and could write upon it in a respectable manner, they would have it, and chemists with fads could shout

\*Abstract of a paper read by Percy Rees, analytical chemist and textile expert at the Haysle Institute, Preston, Eng., Feb. 26, 1880.

to the winds. In reality the paper manufactured to-day is nearly all mineral matter. But it fulfils its duty much better than if it was the genuine article; consequently there can be no suggestion of fraud.

Having made my first point clear, namely, that heavy sizing is a necessity, I will proceed to my second. It is well known that the condition of the atmosphere has a great influence upon the weaving of cloth, and that even for pure cloth a moist air is necessary, and for heavy sizing even more so; hence the steaming in weaving sheds or other methods for humidifying the air. Some years ago there was a great outcry against the use of steam. You will all remember it. Only last week I came across an article written by one of the operatives' leaders, where he says he will never be content until steaming is finally abolished. I want to show you that steaming, not overdone, is beneficial and not injurious. This is a strong statement to make after the agitation we have had against steaming, but I will give you my reasons for making it. If steam was not used you would have the following conditions in all heavy size weaving sheds: (1) The cloth would weave badly, and you would have the operatives complaining. (2) The size would fly off in the form of dust, and would be dirty and most objectionable to breathe. (3) The deliquescent substances in the cloth, which are put in to absorb moisture, having no steam to absorb, would absorb the moisture from the bodies of the operatives, causing skin irritation, and would produce an air of unnatural dryness which, combined with the dust, would give rise to all sorts of lung troubles, especially bronchitis.

You must remember that we in Lancashire are acclimatized to a damp atmosphere, and that excessive dryness in the workshop would be injurious after getting into the ordinary air. A moist atmosphere will never do any harm if the operatives will wrap up before going into the cold air, and at any rate it is the lesser of two evils. If the air were heated to 65° F. without steam we should have the following effects: The fresh air would get heat from the shed and would then be capable of absorbing a large volume of water. This would have to come from the cotton (which contains 8 per cent. of natural moisture), and from the bodies of the operatives. Putting aside the question of the operatives, it would have disastrous effects on the weaving, as the following figures will show:

	Original weight of yarn.	Condition of same.	Percentage of moisture.	Breaking strain.
(1).....	33.21	Unaltered.	8.93	64.0 lb.
(2).....	33.33	Moistened.	17.39	69.2 lb.
(3).....	33.35	Dried.	2.89	39.0 lb.

From these results it will be seen that an increase of moisture to the extent of 8.46 per cent. only increases the breaking strength 5.2 pounds, whereas a loss of 6.04 per cent. of natural moisture reduces the strength by 24.1 pounds. These figures will show how important it is that warp and weft threads should not become too dry during the process of weaving—hence the use of deliquescent substances in the size and the necessity for steaming.

Having shown that both sizing and steaming are necessary for manufacturing, I will call your attention to the ventilation of weaving sheds. If it was only a matter of fresh air the problem would be easier of solution; but the fresh air must be conditioned, otherwise it would not do for weaving, and we have also to remember that the workers expect to be able to make a wage. Last June an Act came into force which said that you must not have more than nine volumes of carbon dioxide in 10,000 of air at any time of the day. Why this standard of nine was fixed I do not know, but this I do know: So long as it is the law you will have to obey it or take the consequences.

Now a few words about carbon dioxide, the gas which has given rise to so much discussion; This gas is a compound of carbon and oxygen. It is produced by the combustion or burning of all bodies containing carbon in oxygen. It is a product of respiration, and is largely evolved from subterranean sources; it is constantly present in the atmosphere under normal conditions to the extent of from three to four volumes per 10,000. In addition to the above sources, carbon dioxide is largely produced by the processes of decay and fermentation. Carbon dioxide is a colorless gas, and will not support life or combustion. It is irrespirable; animals soon die when placed in it, both on account of the absence of free oxygen and from the direct poisonous effects of the gas. It is possible for a man, however, to exist for a short time in an atmosphere in which a candle ceases to burn. It is found that a candle goes out in air which contains 250 volumes of carbon dioxide in 10,000 of air. An adult in breathing gives off about 400 volumes of carbon dioxide in every 10,000 volumes of air, and two ordinary gas jets produce about the same quantity. Carbon dioxide has its important uses. It is essential for plant life, just as oxygen is required by human beings. In the presence of sunlight, the green portions of a plant take up carbon dioxide, and by a process decompose the gas. The carbon it requires for its own structure; the oxygen is given up to the air again. So plants keep up the balance, and restore for human use good air for bad. Hence the value of plants in houses and parks in our large towns. There is no waste in nature; bad gas given off by animals is food for plants, which in turn become food for animals. The researches of Saussure, Angus Smith and Roscoe have further shown that the amount of carbon dioxide in air is not absolutely constant. It would appear that during the night the amount of carbon dioxide increases; it is sensibly greater during the prevalence of dry winds, and during fogs, as much as 8 or 9 volumes of carbon dioxide in 10,000 volumes of air being frequently noticed on a foggy day. These are the reasons why I consider the Act is unfair to the manufacturer. There is nothing to stop an inspector collecting samples on such a day.

The question now arises: "Is not the standard of ventilation altogether too high?" I will give you figures directly supporting my contention that too much is expected from the manufacturer. First of all, I will tell you the amount of the gas in some of the operatives' houses. In one case I took a sample at 10 o'clock at night from the kitchen and found 11.1 volumes of carbon dioxide in 10,000 of air. There was no preparation for this. I also got a sample at 5 o'clock in the morning from a bedroom where two adults and two children had slept; this gave 9.2 volumes per 10,000. In the dining-room of a well-known Darwen gentleman I got 12.47 after we had been in an hour and a quarter, with one gas jet lighted; time, 7 o'clock. From a bedroom in the same house the following morning I obtained 10.29. I have estimated the air from a billiard-room, and got 16.65 volumes in 10,000 at 10 o'clock at night. The air in a well-known church in Blackburn gave the following at 8 o'clock on Sunday: Basement, 23.3 volumes in 10,000; gallery, 52.26 volumes in 10,000. The police court at the town hall gave 15.5 volumes in 10,000, and the one in King street 11.1 volumes in 10,000, each on the rising of the court at 11.55. A sample of air taken from the Cotton Exchange, Manchester, on Feb. 21, 1899, showed 23.3 volumes of carbon dioxide in 10,000 of air, and one from a meeting of operatives' leaders at the office of the Northeast Lancashire Masters' Association, held on February 20, 1899, gave 13.31.

Let us compare these results with the ideal of 9 volumes in 10,000 required by the Act, and also let us make a comparison with the average weaving shed, where some system of ventilation is in force. From one shed I got the following results, all taken at the same hour, but on different days:

1      2      3      4      5      6      7

(1) 7.71   7.7   11.0   9.72   11.3   10.72   11.46

(2) In the same shed I was interested to see what difference the gases being lighted would make, and at 4.30 in the afternoon I took a sample just as they were proceeding to light up. The result was 11.3. At 5.30 I took a second and a third sample from the same room—one at breathing height, the other near the roof. The results were as follows:

Before lighting gases ..... 11.3  
 After gases had been lit an hour..... 17.2  
 Increase..... 6  
 After gases had been lit an hour, at roof..... 27.7  
 Increase..... 16.4

I am not going to set myself up as manufacturers' advocate. I am giving expression to independent thought when I contend that the standard is too high to be fair, and that from 12 to 14 of carbon dioxide would have been more like justice, considering that the outside air varies so much. My contention is this: Laws are not passed by Parliament for the sake of embarrassing conscientious employers who are trying to do their duty to their workpeople, but to protect the operatives from mean employers who will do nothing. I have spent hours in sheds I know, with the atmosphere containing 14 volumes in 10,000 (of CO<sub>2</sub>) without feeling any inconvenience, and I should feel it very soon, as I am used to being in the fresh air all day. But to put employers in the position of being prosecuted because of the variability of our climate is harsh. Employers can no more control the weather than can the operatives. I admit the amount in some sheds can be brought down to nearly 7 volumes in 10,000 on certain days, but my figures prove that even such sheds will go up to 11, 14, and 16. It must also be borne in mind that a man with no experience of factory life might go into a shed, and his impression would be, "What a vile atmosphere." But he would be judging by his sense of smell, and as practical men you know this arises, not from carbon dioxide, which has no smell, but from the tallow and flour in the size in the cotton. This does not hurt the operative and he becomes used to it.

Professor Thorpe, of the Yorkshire College, Leeds, one of our most prominent scientists, says in an article on ventilation: "The air near the floor of a well-ventilated room contains from 6 to 8 volumes of carbon dioxide in 10,000 of air, and near the roof more than double." I found in a well-ventilated room 8 volumes of carbon dioxide at a height of 3 feet from the floor, and from the dining room in my father's house at 11 o'clock on Thursday night (February 23), 15.84 volumes. In an elementary day school this morning at 11.45 I got 23.7 volumes in 10,000.

Carbon dioxide is heavier than the air, but at the temperature at which it is given off from the lungs, and from gas jets it is lighter, consequently you get a larger volume of the gas near the roof. But in a weaving shed the air is more evenly diffused on account of the general heat and the motion of the straps and looms. In conclusion, I will estimate a sample of air from this room and give you the result. This has been collected for me by a gentleman in the audience. The result is 20.5.

#### THE NEW WOOLEN CO.

The new combine among the woolen goods manufacturers in the United States is to be known by the name of the New Woolen Co., and the management is to include in its officers E. D. Thayer, jr., Worcester; R. F. Greeley, Hillsboro Bridge, N. H.; Robert Bleakie, Hyde Park; H. J. Beebe, Holyoke; C. Johnson, Stafford, Conn.; Galen C. Moses, Lisbon Falls, Me., and John S. Bleakie, Sabattus, Me. The mills already definitely

included in the combine controlled by the management are as follows: Worcester Woolen Co., Worcester, Mass. (cassimeres), capital, \$90,000; Merchants' woolen mill, Dedham, Mass. (cassimeres, suitings, chevots, meltons, kerseys), E. D. Thayer, owner; Thayer Mills, Cherry Valley, Mass. (chevots and dress goods), E. D. Thayer, owner; Hillsboro Woolen Mill Co., Hillsboro Bridge, N. H. (diagonals, cloakings, beavers, suitings), capital, \$100,000; Robert Bleakie Co., Hyde Park (cassimeres), capital, \$200,000; Beebe, Webber & Co., Holyoke, Mass. (cassimeres), Beebe, Webber & Co., owners; Riverside woolen mills, Stafford, Conn. (cassimeres), capital, \$50,000; Central Woolen Co., Stafford, Conn. (cassimeres), capital, \$50,000; Worumb Manufacturing Co., Lisbon Falls, Me. (coverts, cloths, flocennes, diagonals, jerseys, beavers, meltons, cloakings), capital, \$500,000; Webster Woolen Co., Sabattus, Me. (cassimeres), capital, \$100,000. This is said to be only a partial list of those in the combination. It is announced that no water whatever will be allowed in this corporation, the mills being taken on at a fair valuation. The capital stock has not yet been decided upon and will not be settled until the list of mills is completed. The selling agents have not yet been decided upon, but they will not be any existing commission house, but a new organization to be formed later. The New Woolen Co. includes woolen mills only, and is not intended as a rival of the American Woolen Co., which includes worsted mills almost exclusively, controlling the manufacture of fancy worsted, clay diagonals and other products of worsted machinery.

#### THE SILK ASSOCIATION OF AMERICA.

The annual meeting of the Silk Association of America was held March 28th; officers and a board of managers for the ensuing year were elected, the president being Albert Tilt. The annual reports of the secretary and the treasurer were presented, and reports from the different divisions of the industry and from the Silk Conditioning Committee were read. In the course of his report Secretary Franklin Allen said that under the Dingley tariff the average rate of duty on foreign silk goods was higher than it had been for fifteen years, being 7¼ per cent. higher than for the year 1897.

The secretary sounded a note of warning as to the danger of overproduction. He said there were over 27,000 power looms for broad silk weaving and 6,000 power looms for ribbon weaving in the country. During the year there have been a number of additional plants established in this country by foreign firms, and naturally there has been some extension of facilities by our older manufacturers. The number of new mills and firms added to the industry in 1898 aggregate forty-nine. In Pennsylvania alone mills for broad-silk weaving have been established in the past two years in sixteen towns and villages, and plants for throwing and ribbon weaving in thirteen additional towns—twenty-nine towns invaded by the silk industry in one State in two years! While additional facilities of manufacture is a gratifying omen, it also emphasizes the possibility—indeed the probability—of overproduction.

The development of the silk manufacturing industry of the country was illustrated by the following table of production:

	Broad Goods.	Ribbons.
1873.....	\$ 2,847,917	\$ 2,652,011
1880.....	11,224,895	6,023,100
1881.....	13,332,194	6,213,804
1883.....	12,989,310	9,034,650
1890.....	25,096,776	17,081,447
1898 (estimated).....	40,000,000	20,000,000

Mr Allen estimates that American mills now supply two-thirds of the home market and consume at least 25 per cent. of



the world's surplus production of raw silk. The secretary also submitted figures showing the number of silk mills in operation in the United States in January, 1899, to be 861, 257 of which are in New Jersey, 228 in New York, 172 in Pennsylvania, 66 in Connecticut, 59 in Massachusetts, 26 in Rhode Island, 13 in Illinois, 7 in New Hampshire 5 in California, 5 in Wisconsin, and the remainder in other States.

The report of the Silk Conditioning Committee stated that replies to the committee's circular of February 20th had been received from forty-one firms. This circular contained the proposition that all contracts for silk purchased in the New York market after May 1st next shall be based on conditional weight, such weight to be established by conditioning not less than one bale out of five of the lot purchased.

A review of the ribbon industry was presented by Bernard Loth, of Joseph Loth & Co. In the course of this report Mr. Loth said that the future of the ribbon industry is bright; but not for all. Competition was lowering the quality and prices would suffer.

The raw silk season of 1898-99 was reviewed by George L. Montgomery, who in reference to the immediate future of the market, said consideration should be given to the point that even with good crops at all points the bare consuming markets would need replenishing. "That," said he, "with consumption on its present scale, will absorb a large yield, so that without some unlooked for and important political complication, it would seem as if our manufacturers must adapt themselves to a higher level of prices than has been current for the last few years."

#### THE DECADENCE OF HAND-LOOM WEAVING IN THE SILK TRADE.

Proud though her position may seem to many as the Queen of Textiles, silk has not had an unbroken career of prosperity in the industrial history of recent times. In Great Britain the trade has not maintained its own for reasons pretty well understood by those having any connection with the business. It has suffered from the effects of foreign competition in the home market, from the crippling influence of foreign tariffs, which have enabled the Americans, Germans, French and Italians to preserve their home trade almost entirely to themselves, and also from other influences, such as the cheapness and increasing attractiveness of cotton and woolen goods, says the Drapers' Record, London, in a recent issue. Cotton has been a great enemy to fibers other than silk. It has helped to crush some sections of the flax industry, and where it has not been able to destroy certain branches of the woolen business, it has insidiously crept in as a cotton warp. In addition, silk has suffered from the introduction of Japanese and Chinese goods produced by the cheapest class of labour, and woven in districts where the raw material is grown on the spot. About 60 per cent. of the world's output of raw silks is produced in China and Japan—rather more in the Celestial Empire than in that of the Mikado, as far as raws are concerned, although the Japanese exports of manufactured silk articles are larger than those of China. The industrial development of Japan during late years has induced the manufacturers of the country to pay much closer attention to the western markets, with the result that not only has the hand-loom industry of this country suffered from the attacks of the Japanese, but the power-loom branches as well. Roughly speaking, the world now turns out about 33,000,000 lbs. of raw silk per annum, exclusive of the Eastern consumption. Great Britain last year imported rather more than 2,000,000 lbs weight. In 1857 we imported 12,000,000 lbs.

The foregoing figures indicate generally the relative posi-

tion of the country compared with the rest of the world as a producer of silk goods. They refer as far as our consumption of raw silks is concerned, not only to the takings of the power-loom factories, but to the requirements of the hand-loom as well. It should be noted in this connection that there is a small re-export trade in raw silk. At one time London was the great world's market for raw silk. Last year the exports were only 107,000 lbs. There is a small inward and outward movement in thrown silks, but the trade does not materially affect the conclusions to be drawn from a study of the foregoing details.

It appeared necessary to mention a few broad facts before entering upon the subject which is to be principally dealt with here—the decadence of the hand-loom silk trade. It is not an easy matter to obtain figures bearing on the question, but it may be mentioned that in the power-loom silk factories of the country there were employed in 1870 nearly 50,000 hands, against 35,800 in 1895, 24,000 being females. In Scotland, the trade is slowly increasing; in England gradually declining. Many warps are now sent by Macclesfield houses to Strathaven and other Scotch centres, where they are woven and returned to Cheshire. Labor is cheaper in Scotland, not even the railway carriage both ways sufficing to destroy the advantages which the Scotch weavers seem able to offer. In the power-loom department Scotland is also going ahead, such firms as Caldwell, Young & Co. now ranking amongst the leading houses in the country. Scotland has taken away from England much of its foreign trade, particularly that with Rangoon. There are about 2,200 operatives in the Scotch power-loom factories. The number of the hand-loom weavers cannot be exactly ascertained.

Some of the most interesting reminiscences of the hand-loom silk industry, now a declining one, are to be found in out-of-the-way nooks of rural England. In the Midlands the business was formerly a very important one. The better class of hand-loom weavers, formerly as now, consist of decent, steady people, with habits generally good. In the old days the method of saving was to purchase looms or make deposits in benefit clubs. At weaving, winding, and warping the wives of many of the men were formerly able to make good wages, but the average earnings to-day are not high. There are some families engaged in cottage hand-loom weaving able to show bank credits of some hundreds of pounds, but their numbers are few, and exceptional ability and energy are responsible for this condition of affairs. In Spitalfields, a district which the writer thoroughly explored a short time ago, the decline of the trade has been lamentable.

The number of apprentices taken by the weaver has greatly diminished since the depression set in some time ago, and even in case of a revival it would, therefore, be difficult to obtain hands. There are very few power-looms in the London silk-trade, the number at the time of my visit being confined to a few engaged in the weaving of umbrella silks. The hand-loom have also sadly diminished in number. At one time—so many years ago one hardly likes to recall the date—the neighborhood of Bethnal-green was a hive of busy and prosperous weavers. There were 3,000 hands engaged in silk dyeing alone, against a mere handful now, only about 100. In 1825 there were 24,000 hand-loom. There are very little over 1,000 now. In fact, I doubt whether a thousand looms could be counted in Spitalfields. Ten years ago a prominent manufacturer in the trade assured me the numbers did not exceed 800. It is also startling to learn that at one time Spitalfields employed some 60,000 operatives in the silk trade, then all conducted by hand. The residences of the weavers extended over a very wide area. I am told that very good men, working on the highest class of cloth, can still earn from 25s. to 30s. a week in Spitalfields, but the figure is certainly much above the average. In the North of England, amongst the rural districts of Cheshire, a man may make 20s. a week in the production of sarsenet, 18 inches wide

for which he gets paid 4d. a yard, single width, or 6½d. double width. A few decades ago the industry was a source of considerable profit to the cottagers of Wilmslow, Bramhall, Prestbury, Cheadle, Hulme, Woodford and Hazel Grove. At Prestbury probably 200 weavers at one time were employed, including the operatives at a factory by the Bollin, where the looms were driven by water-power. The factory has since been demolished, and there are about a dozen looms in the village. In the Cheadle Hulme district the industry exists in larger proportions, a local firm giving out work to the operatives. The weavers live simple lives. Their rents are low—a couple of shillings weekly will pay for a comfortable little cottage with a garden, and in the better classes of work employment is fairly steady throughout the year. But it is only because the power-loom has been unable to compete with the hand-loom in the production of the special class of goods referred to that hand-weaving is able to exist in the country villages of Cheshire. In Macclesfield there are said to be 1,000 power-looms, and from 2,000 to 3,000 hand-looms, but the accuracy of the figures I cannot guarantee. The goods produced include sarsonets, ladies' ties, scarves, plain and figured handkerchiefs, and piece goods. Failsworth makes Macclesfield goods, and at one time Bedford Leigh was an important centre for weaving of silks for Macclesfield firms. The mill formerly engaged in the business has now, I understand, been acquired by Messrs. Courtauld, the silk crape manufacturers. One does not look upon silk weaving as a particularly remunerative occupation. Not only has the competition of cotton to be reckoned with, but there is the opposition of foreign textile centres such as Lyons, Zurich, Basle, Elberfeld, and of late years Como as well. The Italian competition has become increasingly severe of late, and threatens to increase in intensity. Five years ago the value of our imports of silk and satin broad stuffs was only about £5,500,000 sterling. It is now nearly £10,000,000 a year, and the trade seems to grow steadily. Some progress has been made of late years in the English section of the industry, but the advance has not been great. The purchase of foreign silk ribbons alone is now over £3,250,000 per annum, and this accounts for the decadence of Coventry, now fortunately able to derive support from the cycle industry. At one time silk was the mainstay of the city, and the weavers earned good wages. But, as was the case in other—in fact, all—centres of the British silk industry, the Anglo-French treaty of the sixties played havoc with the town. There was a time when merchants came from the south to Coventry, through the pleasant agricultural country watered by the meandering Sow, for the purpose of purchasing broadcloths, caps and bonnets. Silk subsequently became in the ascendant, and in 1858 there were eighty ribbon manufacturers there. Most of them have since been ruined, failing with assets not at all proportionate to the liabilities. Probably 700 power-looms now represent the productive capacity of the district, against 1,800 in 1860, besides about 7,000 hand-looms. It is risky to prophesy, but some authorities say that capital invested in the Coventry silk trade now would bring in a satisfactory return. There is certainly considerable energy left in the trade, which goes to prove that the Englishman is still endowed with the dogged spirit of determination which resulted in the shattering of the Napoleonic squadrons at Waterloo. The most serious difficulty against which the silk manufacturer has to contend is the difficulty of keeping his labor together. Other occupations, more remunerative in character, assist to curtail the already feeble supply of operatives in the silk industry, and one is under the painful necessity of admitting, more's the pity, that the evil does not appear to diminish as the years advance.

At Bedworth and Nuneaton the inquisitive stranger can still obtain many interesting details as to the textile conditions

of the past from the old inhabitants. The young are quite useless as authorities on the subject, most of them possessing not the slightest idea as to the most elementary principles of weaving. It ought to be mentioned here that the comparatively large output from the Coventry Dye Works is not to be regarded as indicative of the condition of the weaving industry. A very important percentage of the work obtained by the Coventry dyers is from firms outside of their own city. For that reason one may state safely that the dyeing department of the Coventry silk trade has held its own better than the weaving sections. The arrivals in this country of silks from Japan have seriously interfered with some sections of the English silk industry. With cheap raw material and cheap labor at their command, the Japs are possessed of special advantages, which are increased by their native ability, which would in any circumstances render them formidable opponents. The jacquard is not universal in the country, the style of weaving being similar to that employed before the discovery of the French inventor. An impetus was given to the Japanese trade by the exhibits shown at the Viennese Exhibition of 1873, when the variety and richness of the cloths shown attracted considerable attention. At Chicago the collection of Japanese silks was also remarkably good, and it should be noted in this connection that the silk trade in Japan does not appear to be decaying, as is the case in some departments of the industry in this country. It is only during the past ten years that the export of silk goods from Japan has assumed serious proportions. Of silk handkerchiefs alone, the value of the exports is about six million yen a year, and although there has been a pronounced movement of late in favor of higher wages in Japan, the change will not seriously diminish the power of the Japanese to compete in the markets of the West. At home a good deal is hoped from the development of the movement in favor of technical education. The idea has taken deeper root of late years, and may, in the long run, have far-reaching and beneficial effects on the silk industry of the country.

#### MERCERIZING WITHOUT SPECIAL PLANT.

It is generally considered indispensable to employ, for the production of gloss on cotton fabrics by "mercerization," apparatus specially designed for the purpose. Such apparatus, as a rule, has the disadvantage of being expensive and little productive. According to Smirnoff and Rosenthal, the object can, however, be equally well achieved without special plant, an open soaper and a stenter, as found in all dye or print works, offering all necessary facilities. If the open soaper consists of seven compartments, the first compartment is left empty; the second and third contain boiling dilute caustic soda and carbonate of soda; the two next compartments are fitted with squirt pipes; the sixth compartment is charged with boiling dilute hydrochloric or sulphuric acid; whilst the last one, again, is provided with squirts. Above each compartment is placed a pair of brass and wood squeezing rollers, whilst all guiding rollers are furnished with lapping. The gray singed fabric first becomes impregnated with cold caustic soda of 40 deg. Be. in a small cistern furnished with five guiding rollers; it then passes through a nip formed by a brass and a rubber bowl, and immediately proceeds on its course through the open soaper, the various divisions whereof are utilized in the manner already described. The first empty compartment affords time for the prolonged action of the mercerizing fluid, whilst the rest of the space is devoted to neutralizing and washing. The cloth as delivered, is ready for dyeing medium and dark shades; whilst for light tints it must first be chemicked. After dyeing, the cloth is dried and simultaneously pulled out to its original width on a suitable stenter, it is then, pure or suitably finished, submitted to hot pressing at

a pressure of 250 to 400 atmospheres. The shrinkage experienced is said to be inconsiderable, and the gloss not inferior to that produced by special machinery.—Farber Zeitung.

### DIA MINE COLORS ON SATIN, SILK AND COTTON.

The continually increasing consumption of Leopold Casella & Co.'s diamine colors for dyeing satin (silk and cotton) induces them to issue a general review of the methods of application and the properties of those diamine colors which are principally used for this class of goods. Most of their diamine colors are exceedingly well adapted for the purpose in view, as under certain conditions they possess the property to dye the cotton a deeper shade than the silk. The dyeing of goods composed of silk and cotton is generally done in open vats provided with a winch; in some cases also on the jigger, if the material to be dyed requires it.

The diamine colors are as a rule dyed in a soap bath with addition of phosphate of soda, Glauber's salt or common salt and a little soda. The addition of the named salts effects a better exhaustion of the baths, they are therefore principally used for dark and full shades, whilst pale shades are dyed with the addition of soap only or in combination with phosphate of soda. Dark or pale shades may thus be produced at will by selecting the proper additions, but the fact should not be overlooked that the greater exhaustion of the baths not only increases the depth of shade of the cotton, but also causes the silk to absorb more dyestuff. Too large a proportion of salt would cause the dyestuffs to go on to the fibre too quickly and thus make the dyeings turn out uneven. A larger percentage of soap counteracts the effects of the salts, causing the dyestuffs to go on less quickly, leaving the silk lighter than the cotton, in some cases even almost white.

It is thus obvious that a general method applicable in all cases cannot be given, it will vary according to the effect desired and partly also depend on the material to be dyed. The following particulars may serve as a guide for the first baths:

(1) For pale shades per 10 gallons dye-liquor— $3\frac{1}{4}$ — $6\frac{1}{2}$  oz. soap and 4—7 drs. soda or  $3\frac{1}{4}$ — $6\frac{1}{2}$  oz. soap, 4— $5\frac{1}{2}$  drs. soda and  $3\frac{1}{4}$ — $6\frac{1}{2}$  oz. phosphate of soda. (2) For medium and dark shades per 10 gallons dye-liquor:  $3\frac{1}{4}$ — $6\frac{1}{2}$  oz. soap, 4—7 drs. soda,  $3\frac{1}{4}$ — $6\frac{1}{2}$  oz. phosphate of soda and  $6\frac{1}{2}$ —13 oz. cryst. Glauber's salt. (3) For two-colored effects or dyeings, in which the silk is intended to remain as pale as possible, per 10 gallons dye-liquor;  $4\frac{3}{4}$ —8 oz. soap, 4—6 drs. soda,  $3\frac{1}{4}$ —8 oz. phosphate of soda, and  $4\frac{3}{4}$ — $9\frac{1}{2}$  oz. cryst. Glauber's salt.

The temperature of the dyebath is generally 175 to 195° F.; in practical dyeing it is usual to boil up the fully charged dyebath, shut off the steam, enter the goods and dye for about  $\frac{1}{2}$  to 1 hour. For obtaining level dyeings in pale shades it is advisable not to enter the goods too hot, but to raise the temperature gradually. Raising the temperature or dyeing for some time at the boil will deepen the shade of the cotton, but at the same time will have the same effect on the silk, which may sometimes be an advantage, when dyeing dark shades. As a complete exhaustion of the baths does not take place, especially when dyeing dark shades, it is advantageous, nay even imperative, to preserve the baths for further use, they are then replenished with only about three-fourths of the quantities of dyestuffs used for the first bath; of soap about one-fourth and of Glauber's salt, soda and phosphate of soda, only about one-fifth of the additions are necessary. The preserving of such standing baths, which serve for bottoming, is the easier as it is not necessary to use always the same bottom for one shade, which may easily be produced by selecting the suitable dyestuffs for shading.

On a standing bath also the various depths of a given shade

may be produced. When dyeing for instance a range of mode shades or browns, the bath is charged with the ingredients necessary for the darkest shade and without any further addition of dyestuff the bath will serve for the next darkest shade and so on for the remaining shades in succession. The first bath should be prepared with condensed water; if none is at command, ordinary water should be boiled up with soda and soap and the scum removed. Clear soap baths are absolutely necessary for the production of pure shades and clean pieces.

After dyeing, the pieces must be very well rinsed and raised with acetic acid, which is best done in a cold bath with the addition of about 1 pint  $2\frac{1}{2}$  gills of acetic acid 50 per cent. per 10 gallons dye-liquor. Diamine colors being with a few exceptions very fast to acids, they will only in rare cases be affected by this treatment. These colors may be had of the companies' agents for Canada, W. J. Matheson & Co., Ltd.

### VISCOSE.

There has been brought to the attention of the technical and industrial world a new article of manufacture that appears to possess properties that will commend it to many uses and for many purposes, and is destined to play an important part in several industries. The manifold application of mercerized cotton is fully appreciated by many, but it was reserved for Cross Bevan and Beadle to discover an important reaction, which is, that the alkali-treated cotton when treated with bisulphide of carbon, forms a solution with water of great viscosity, and which property gave the name to the new substance. Viscose is finding considerable application in many ways in the textile trades; it is used for cotton printing and for the preparation of sizes, and as a fixing agent and carrier for pigments.—Textile Colorist.

### SOME CAUSES OF DEFECTS IN TEXTILES.\*

(Continued from last issue).

In blending for worsted yarns, the balls of tops are mixed by running them through a series of gill boxes, the number of ends put up at the back of the first box being regulated entirely by the proportionate quantity of each material or shade necessary to produce the desired blend. From this, I think, it will be readily understood that if one of the ends should break and the machine go on running without its being seen, that part will be short of the color or material which has broken, and will produce a slightly different sliver, and unless rectified, will give later a spun thread different from the bulk. This is one of the causes of shady places across the piece, having rather the appearance of a wrong bobbin of weft. Streaky colored mixtures are often caused by not putting the material through a sufficient number of operations to ensure the colors being evenly mixed.

The use of cheap and bad qualities of oil for working up the wool cannot be too strongly deprecated. We sometimes see wonderful compounds advertised at a much lower rate than good oil, but it is not cheap if it injures the fiber. It is found that many of them soon turn rancid and sticky on the wool and yarn, and do not readily lose their hold on it—as the dyer finds to his cost when he cannot get the piece scoured clean producing streaky and cloudy pieces. For worsted yarns experience proves there is nothing better than a good olive oil, amongst which, we may say, Gallipoli is one of the best. It pays better in the end than these cheap compounds, which are largely mineral oils. For woolen yarns oleine oil is largely used; by the addition of an alkali in the scouring liquor, it

\*Abstract of a lecture delivered at the Technical Schools, Shipley, England, by Albert M. Chapman.

produces a soap which will scour the piece clean, but an important point is to see the oil is free from any trace of sulphuric acid.

Defects in worsted yarns can sometimes be traced from the combing. The object of the process is to comb out and straighten the fibers and remove all immature and short fibers below a certain length. To do this it is important that every part of the wool be combed and the noil cleared out; if not, it is seen later in the roving and spun thread. Further, in the combing we have it in our power to take out, or leave in, as much of the short wool as we desire; the more we take out, the more equal in length the fibers will be which are left, giving an even and smooth thread as compared with the one where a fair amount of the short has been left in. In colored worsted yarns, we occasionally see very thick places or "slubs," which in fine dress goods, sunings, or trouserings, are altogether fatal, making it impossible to produce perfect goods with such yarns. The cause explains itself when we find that the slubbing or top has not been re-combed on coming from the dyer. On examining the slubbing we find the outside of it has been distributed or roughed up, and some parts are a little fast or matted. This should all be put right by re-combing before it is passed on to the drawing. It is false economy to try and save the cost of re-combing for such yarns.

In the drawing, defects generally arise from defective fallers, rollers, etc., or by reason of hurrying the work by reducing the number of operations or doublings and using excessive drafts, thereby laying the groundwork of a thread which will be uneven when spun.

What are known as "weft rows" show in the finished cloth as bars across the piece, giving a well-defined line just where a bobbin of weft begins and finishes. It is often a difficult matter to see them previous to dyeing, but afterwards they are clear enough, appearing rather duller or deeper, and leading one to think at the first glance that it is another quality of material. It may be exactly the same quality and counts of yarn, but appearing just a little fuller or rougher—just a fraction which is sufficient to show when finished. One of the chief causes of the fault is a slight variation in twist caused by spinning with slack bands. It may be done by weaving together in the same piece hard and soft bobbins, or by not dragging the weft exactly the same in the weaver's shuttle, as in the case of having one shuttle with a brush in it to drag the weft and another without; but this will rarely happen, as other complications would prevent a weaver doing so for long.

An even thread is one of the things of utmost importance in the majority of worsted yarns. Especially is this so in regard to fabrics which have a large quantity of warp on the surface, such as corkscrews, venetians, whipcords, sateens, covert coatings, etc., and which have the surface cropped clean in the finishing of all loose or short fibers and exposing very clearly any unevenness in the thickness of the yarn. To produce a good double twist yarn for either warp or weft the single yarn must be evenly spun. Though in the doubling one thread partly covers another, it cannot hide unevenness sufficiently to do for goods which show faults up so clearly as those mentioned. In addition to unevenness, the chief faults in doubled yarns are. Single yarn caused by one end breaking, slack or tight twist, snarls, etc.

We must now turn our attention to the first of the processes of preparation for the loom, viz., warping. The chief causes of defects starting with this process are varying tensions of thread, mixing of old, new, or rewound yarn, and sometimes by running the vertical warping mill both ways. One very fruitful source of defects is the mixing of various lots of yarn. It often happens that having made a warp of a certain class of yarn, a small quantity will be left, which it is desired to use

up with the next lot of the same class of material which may be made. To do this with safety requires very good judgment indeed. Two lots of yarn may be made from the same lot of wool and treated in exactly the same way in the machinery, but put through at separate times produces a defect when placed together in the form of distinct stripes in the direction of the warp. Especially is this so in regard to piece dyed goods. A yarn which has been newly spun is in a much different condition to one which has been in stock some time; it is all alive, and will curl up much more readily when the stretch on it is released than one which has been in stock awhile and got set. If it is decided to mix various yarns together, everything possible should be done to spread them equally across the width, and by mixing thoroughly, minimize as much as possible the risk of them showing stripes. To do this it is necessary to arrange the bobbins in a certain order on the warping creel—not in vertical but transverse rows. Say the yarn will run three of new to one of old, then arrange the rows of bobbins in that order and so spread the yarn across the warp. Never put one sort of yarn all together down one side of the creel, as if this is done, the yarn will come down one side of the woven piece and is nearly certain to show when dyed and finished.

(To be continued).

#### RENDERING COTTON FABRICS WATERPROOF.

In an article in the *Berlin Farber Zeitung* Edward Gruene described a method for the preparation of waterproof awnings and similar fabrics. The gray calico used was in pieces nearly 100 feet long and about 40 inches wide, and each piece weighed 23 pounds. When finished the weight was increased to about 28 pounds. The calico was first treated on a jigger with a bath of 33 gallons of water containing 6½ lbs. of 66 per cent. water-glass for every three pieces. After an hour of treatment with this bath at the boil, the stuff was wrung, and dried at 20° C. Too strong wringing spoils the appearance of the cloth. Next comes an impregnation with alumina soap in combination with India rubber and wax. This can be done with two or three baths. In the latter case the first bath is a 6° Be. solution of acetate of alumina, the second a solution of water-glass, and the third a soap bath in which India rubber and melted wax have been stirred up. In the former case the second bath is dispensed with. This is the better way, as when the goods are impregnated with acetate, dried and taken straight to the soap bath, they become thicker and more waterproof than when they have had a second treatment with water-glass. The latter seems to hinder the precipitation of the alumina. If the second bath is used it should be made of 33 gallons of water and 3¼ pounds water-glass of 66 per cent. for every three pieces, and the goods should be passed through it three or four times lukewarm on the jigger, and then dried at 20° to 25° C. The acetate of alumina is made by dissolving 55 pounds of alum in 11 gallons of boiling water, and then precipitating with 40 pounds of sugar of lead. The precipitate is filtered off and washed, and the wash waters are run into the filtrate till it is down to 6° B. The goods are thoroughly impregnated with this by passing them through it several times. They are then hung up to dry at 20° to 25° C. The final bath is made up as follows: 4½ pounds of India rubber (the best Para), having been cut up fine, are treated with 2¼ gallons of oil of turpentine. After four days' frequent stirring add another 2¼ gallons of turpentine and stir for four days more. The stuff should be kept warm in a vessel surrounded by warm water. The sticky mass obtained is brushed through a fine sieve of 150 meshes to the square inch and then through one with 200. Any India rubber which will not pass through the second sieve is treated with

about half a gallon more turpentine until it all goes through. The whole lot now gets  $2\frac{1}{4}$  gallons more turpentine and is worked up till all of it passes through a sieve with about 360 meshes to the square inch. As this part of the work takes a long time it is advisable to make up as large a quantity of India rubber at a time as possible, but it is not advisable to handle more than double the amount of India rubber above indicated at a time. Besides  $4\frac{1}{2}$  pounds of india rubber are enough for fifteen or sixteen pieces, say 500 square yards of calico. In the meantime two other liquids have been prepared, one by melting 33 pounds beeswax in a jacketed pan, and then adding  $2\frac{1}{4}$  gallons of boiled linseed oil and boiling up the whole. The other is made by dissolving 40 pounds of resin soap in 22 gallons of soft water. The solution containing  $4\frac{1}{2}$  pounds of india rubber is poured into the boiling varnish and then the mixture is sent through a hair sieve into the boiling soap. The whole is gradually diluted, with constant heating and stirring, to 44 gallons. The alumed cotton is passed through this stuff hot and without folds. It must then be dried, hung up and be then passed through the hot soap mixture again. There is danger of want of uniformity at this final stage. If a cheesy mass forms on the surface of the bath, which is to be feared, a plain solution of soap (say about 10 per cent.), should be added to prevent the separation of the ingredients of the bath.

#### ART AND TEXTILE INDUSTRY.

Before the students of the Massachusetts Normal Art School J. A. E. Stewart, manager of the designing department of the Coheco Manufacturing Co., of Dover, N.H., talked on the "Relation of Art to the Textile Industries." After speaking upon the principles and history of textile design, and describing at some length the mechanical processes involved, he said, in part:

Can any system of education be devised which shall embrace and unite objects so distinct as the instruction of artists and that of designers for textile printing are generally thought to be? The case is this: A great majority of those engaged in industrial design require artistic education—an education, as far as it goes, identical with that necessary for artists. The study should include the principles of design, the study of ancient art and the study of nature. General principles should be considered with reference to their application to particular cases. Above all, take an unprejudiced view of the sort of decoration best fitted to comply with necessary conditions.

I wish to dismiss the crude notion that as a general rule flowers and all other objects must undergo a conventionalizing process before they can be employed as matter of ornament, especially in their application to textile fabrics. The argument that we must up to a certain point preserve the nature of the fabric is good. Does not the filmy organdy which the Hindoos called "webs of woven air" suggest springtime? And does not springtime suggest the violet? Add to this our inherent love for flowers. I do not mean that designs of flowers are the panacea for all the ills the designer's art is heir to, but, like all "certain cures," they have much of the element of health in them, treated artistically and with feeling. Design that has no relation to natural forms is always open to the charge of unhealthiness. It argues that the designer has neither cultivated his memory nor his social relations.

Elaborate studies of flowers represent so much wasted energy. Make rough contours of the general shape and plenty of them; then gradually concentrate your attention on the distinguishing points. It will be found after twenty or thirty essays have been made from every reasonable position, you will have a fair idea of the form in question. Having inculcated the faculty of a thorough acquaintance with nature, study the

process by which a design is to be executed. In preparing designs which are to be reproduced by mechanical means, it is, of course, essential that the designer should be as conversant as possible with the capabilities of the process. His thought and feeling must be so inclusive that, if he is designing patterns for the southern market, his patterns must reflect the warmth and luxuriance of the southern disposition. Or, if preparing a line of fabrics for the eastern and northwestern markets, they must reflect somewhat of the more conservative and smaller type of design. Season and locality have much to do with designing for printed fabrics. Summer suggests gauze-like fabrics, with correspondent transparent effects; winter, dark and thick goods; and each has to be approached with distinct ends in view. Finally, do not forget the common principles of design and color and the study of ancient art. Add to this genius, tact, taste and discrimination, and, above all, join the life class of nature. Nature is a most willing model and never grows tired or shows repugnance to her artists, though they should approach her irreverently. She never begs to be executed, but at the slightest summons poses patiently for all. We should show our gratitude for such generous assistance by the assiduous care with which we use the opportunity offered us, deeming it a crime to make slovenly transcripts of her.

#### YARN ECONOMIES.

It is practically impossible to run a mill without the accumulation of odds and ends of yarns. These come in all sorts of counts and colors, and in all kinds of quantities and qualities. Try as best they can, the overseer and superintendent will discover this to be the fact; and the question at once arises, what is the best and most profitable method of dealing with these yarns, which come so perilously near to being mere wastes, says a writer in a textile contemporary. Yarn is never increased in value by lying about the place. Oils begin to get bad, and other difficulties creep in that make the use of the yarn in any way a difficulty, from the lack of uniformity which it is apt to introduce into the make-up of the goods. Some mill men work them into odd and unusual combinations, producing a heterogeneous cloth, which is of no earthly use except to sell to the operatives for aprons and such garments to be worn in the running of the machinery in the mill. The price which the maker gets must, of course, fall clear down to cost, and perhaps below, so that in all probability the use of odd yarns in this made-up cloth is not attended with any great amount of saving after all. And besides it always gives the appearance in the mill of a shiftless, unresourceful management, which is not able to make the very best and most paying use of waste and odd supplies, that with care and ingenuity may be employed so as not to detract from the profit and income of the concern.

It is possible to use odd yarns sometimes in striped goods, and in this way considerable quantities may be taken up. The outside thread or two of a blue stripe may be of a different blue and of a finer or coarser count, and yet if the blue is next to a white or lighter stripe, its presence will scarcely be detected. A green thread or two can be similarly used alongside a blue stripe, and only the very sharpest scrutiny can detect its presence. Take any cloth where the filling colors and threads appear most in the surface of the goods, and it is possible to work different yarns here and there in the warp, if judiciously done, without the least possibility of harm. The great thing is to put in the threads at regular intervals throughout the warp, and not in quantities anywhere while they are sparsely present in other places. If any irregular places are allowed to exist, then the presence of the different yarn is apt to be made manifest. Any cloth that shows much warp in the face must be handled

very skillfully indeed, as it will be next to impossible to make use of any odd yarns without detection. Satens and such cloths come under this class; however, if there happen to be narrow stripes in the goods, even these warp-faced cloths can be made to take a different odd thread or two, if the necessity arises. Stripes made with the corded effect are a class of goods that take odd yarns very nicely. It is possible here to work in a heavy yarn for two threads half its count, and yet not disorganize the construction or injure the appearance. Then a coarse and a fine thread may be used to take the place of two fine ones, and the change will scarcely be noticed. Stripes, of course, are most naturally selected as the cloths in which these remnants of yarn should be used. In figured weaves, great care has got to be exercised, and the design has got to be thoroughly mastered, or the odd yarns will show. The thread of different color or size must always be inserted at the point where least prominence of design is noticed. Any place that stands out conspicuously in the design will look even more conspicuous with any addition of a variously colored or sized yarn.

Sometimes it will happen that by lying about in the boxes or bins, or in places where dampness or heat is present, the yarns that are left in small lots will become a little tender. This introduces a new feature. And yet if judgment is used, even these yarns can be so worked into the goods as to add no weakness to the cloth. It can only be done, however, where the strain is least, and where friction is at its lowest point. To know where the yarn can be most safely inserted will require, therefore, a clear knowledge of the weave, and all its parts. A stripe of heavy yarn that takes the strain of the warp beam, or that interweaves very frequently with the weft, will, of course, be a bad place to put a weakened yarn. All such features must be understood and taken into account in the use of such yarns. In some weaves and in certain designs some of the particular threads will work in loosely with but little interweaving and little strain; these are the yarns that ought to be replaced by the soft or tender odds and ends, if such are to be employed at all. If four or six threads enter into a design under these conditions, one of them may be replaced by the tender yarn without in the least injuring or impairing the fabric.

As it has been shown that warp yarns in odd lots may be worked off in certain kinds of goods, so the same is quite true of filling yarns. Take filling yarns that are a little off in color or size, and they will work in a few threads, and regularly in colored checks of small design, and no detection would be possible by the uninitiated. A fine yarn in filling may be doubled with a coarse one, and the two together make about the same size as the two of the right size. Then, too, in all weaves where warp is mainly on the face, such as twills, the filling may be used to hide the presence of odd yarns among its number. Dark green and indigo will go all right in such cases, and no difference can be noted. The main thing is to get them so regularly distributed as not to bunch the odd yarns in any one place. White yarns often get dirty and soiled in lying about the concern, and it is often of advantage to be able to use these yarns, if they can be used without any detriment to the face appearance of the cloth. In checks of small pattern where two or more colors are present, these soiled yarns can be worked in with little difficulty, if it is done only one or two threads at a time, and at regular intervals. The designer if he chooses can do much toward using up these odd lots. They will accumulate in every establishment, and the only economical method is to work them off in this fashion, a very little at a time. If it is attempted to put them into one fabric, the effort results usually in the production of a very poor second, because there is so little of the yarns, and they are in such small lots, that to make a salable line of goods from them is quite out of the question. Careful and thoughtful effort, with the using up of these yarns

directly in view on the part of the designer, will have the same effect in the long run, and lead to the very best and most satisfactory results.

### THE WOOL PRESS.

There is now being made in Toronto a wool press as now so successfully employed in Manitoba and the Northwest Territories. It is especially useful to the wool growers of that section of Canada, because it enables them to effect enormous savings in freight charges, and may, indeed, in many cases, be said to make the difference between wool growing at a profit and wool growing at a loss. By the use of the wool press twice as much wool can be placed in a car, and the pressed wool has also the advantage of being listed by the C.P.R. as third-class freight, being baled, while sacked wool is listed as second-class freight. The ordinary car will hold about 60 sacks of wool, but by pressing 70 bales can be placed in a car, each bale containing from 400 to 500 lbs. of wool. This wool press is being manufactured and placed on the Canadian market by Geo. Reid & Co., 118 Duke street, Toronto.

### THE DYEING OF LOOSE COTTON IN WOODEN VATS OR IRON VESSELS.

For 100 lbs. of loose cotton, charge the bath with about 178 gallons water, 8 lbs. soda ash,  $2\frac{1}{2}$  lbs. sulphide of sodium, 2 lbs. Turkey red oil, 12 to 14 lbs. Immedial Black, 48 lbs. common salt, boil up, enter the dry cotton, boil and work until it is thoroughly impregnated, then cover the vat and continue boiling for about another hour. Then lift into baskets, rinse and if necessary treat for half an hour at about  $160^{\circ}$  F. with 2% bichrome, 2% sulphate of copper, 2 to 3% acetic acid, rinse and grease.

When dyeing on the standing bath add for subsequent lots of 100 lbs. of cotton about 40 gallons water and then charge the bath with 2 lbs. soda,  $2\frac{1}{2}$  lbs. sulphide of sodium,  $\frac{1}{2}$  lb. Turkey red oil, 10 lbs. Immedial Black, 12 lbs. common salt, and dye as mentioned above. This method is recommended by W. J. Matheson & Co., Ltd.

### LITERARY NOTES.

The Century Magazine is redeeming its promise to cover the war of 1898 as authoritatively as it did the campaigns of 1861-65, though the late and shorter war demands much less time and space in the magazine, and, in fact, as a magazine feature, the April and May numbers will practically close the series so far as it relates to active operations. An account by the American director of the school at Athens of recent American discoveries at Corinth includes the turning up of "A Relic of St. Paul." In this connection should be mentioned an entertaining description of Jerusalem and its environments, written especially for The Century, by the distinguished French artist, J. James Tissot. Now that Russian affairs are so much before the world, the "Notes from General Sherman's Diary" concerning his visit to Russia have a timely interest. Prof. Peckham's article on "Absolute Zero" gives with scientific authority an account of recent inventions for the production of liquid air. A striking literary feature of this number is a new poem, "Cities of Hell," by the young English poet, Stephen Phillips, author of "Christ in Hades." One of Mrs. Wilcox's most serious poems is "Recrimination," a series of three sonnets. Prof. Wheeler, in his popular "Life of Alexander," describes a remarkable episode of that life, namely, "The Famous Siege of Tyre," illustrated by Castaigne. "Franklin as Printer and Publisher" is not the least entertaining of Mr. Ford's biographical serial. Marion Crawford's romance of the second



crusade furnishes the principal fiction of the number, along with a story called "Jack," showing the curious relations between the Whites and the Canadian Indians. The story is by Miss Goodloe and is illustrated in an original way by Jane Hambridge. Lovers of art will be specially interested in Cole's "Stable Interior," exquisitely engraved after George Moreland, which is the frontispiece of the number; Gilbert Stuart's portrait of Mrs. Rawle and Julia Weir's "Green Bodice," both engraved on wood by Henry Wolf.

### "ORIENTAL" CARPETS.

The production of imitation Smyrna carpets is becoming an important industry in the province of Silesia, its headquarters being the town of Schmiedeberg. The carpets range in price from 12s. to 25s. per square meter (10.76 square feet). The process of manufacturing is described as follows, says an exchange: The threads are twisted from German and foreign wool; various wools are used to find the right combination of strength and smoothness. Artificial wool is added to the inferior kinds, and the cheapest qualities are made entirely from the latter material. The wool of which the thread is to be made is first placed upon a machine called the "wolf," or "devil," by which it is torn to small pieces. It now proceeds to another machine called the "krempel," or "carding bench," which further completes the work of tearing. At the lower end of this carding bench a cylinder is located, around which the thick, smooth wool finally gathers, to be afterward taken to the spinning room. Here the wool is twisted by a machine into a two, three, or four-ply thread, according to requirement. This thread is now taken to the dyeing room, where it first undergoes a good washing to clean it from all dirty and oily substances. Only vegetable dyes are used. The colored threads are then cut into small lengths of about 3 centimeters (1.18 inches) each, to form the material for single loops. These loops are now sorted by color into small wooden boxes, and these are handed over to a female laborer called the "knuferin," or "tier." The production of the carpet now commences. The looms in use consist of two side parts connected by iron or wooden bars. The broader the looms, the broader these bars, and, consequently, the carpets they produce. The looms have two fronts, so that work may be carried on on both sides at the same time. The smallest looms measure 1 meter (39.37 inches), the largest up to 15 meters (49.2 feet). The number of the working women depends upon the size of the carpet to be made. A space of three-fourths of a meter (29.5 inches) is allotted to each of them.

Clever and intelligent workers, however, frequently undertake to manage double space. All the girls sit in one line or row and work simultaneously. At the top of the loom is the warping beam holding the warp of linen or jute, while at the bottom the finished fabric is wound up. The warp threads are fixed midway between top and bottom of the loom in boxes. They are passed through the shuttle and afterward twisted round an iron bar. After this the chain is tightened and a seam made, upon which the first row of loops is fixed. As soon as a row of loops has been finished across the whole width a thick end thread of jute is passed across twice. After each passing the shed operates so as to form a firm weave. Another row of loops is then tied and the edge formed, and so on. The working girls are seated on low wooden stools, having at the height of their heads the pattern of the carpet before them, which they have to copy. Each has at her side the above-mentioned wooden boxes, containing loops of various colors. The patterns are printed or drawn on paper and show small squares, each of which indicates a loop, and the colors on the paper correspond with those of the required loops. The

girl starts with the first square at the left hand side at the bottom row and continues going to the right as far as her space allows it. As soon as a row of loops has been finished the selvage is made in the usual way, and this process is carried on until the whole pattern is completed. At the finish a seam is added and the carpet is cut off. The loose wool and the dirt are removed and the carpet is well beaten on the back to loosen the weaving, which has become hard during the process of manufacture. Next, the shearing machine clips the top five or six times, until a smooth, plush-like surface is produced, whereupon the seams are renewed and false loops replaced by others, and the carpet is ready for use. The work is entirely done by piece, and a clever, industrious girl naturally earns more than one less capable. The average wage for a girl amounts to 1s. 6d. a day, but the best workers earn double that sum. There are about 450 hands employed at Schmiedeberg, and over 4,000 carpets of various colors and sizes are turned out during a year. The material used per year consists of 205,365 pounds of wool thread, 84,367 pounds jute and 2,160 pounds linen. The carpets are such a good imitation of Smyrna goods that it takes an expert to distinguish them from the genuine. They are also a great deal cheaper than the Smyrna carpets, and there is naturally a large market for them throughout Germany; while they are exported to Austria, Italy, Scandinavia and Belgium.

### RUG DYEING.

A German patent has been taken out for dyeing hair with a comb so as to avoid the unequal dyeing obtained with using a brush, which dyes the outside more than the inside. The comb used has a double set of teeth, between which is a reservoir for a dye in the form of paste. The teeth of the comb apply the dye somewhat as a pen applies ink.

### KHAKI.

Khaki, now so widely applied to duck and jean for soldiers' wear, means an earthy color, and the word itself in Hindustani means dusty or earthy. A British patent has been taken out by Gartside & Co., Ltd., Manchester, and William Warr, Stalybridge, England, for dyeing khaki shades on vegetable fibers. The main process consists in giving the goods first an acid bath of a chromic or a ferric salt, or both. The oxides are then precipitated by passing the stuff through a bath of alkali. The color is thus produced, and is due to chromic or ferric oxide, or both. It is, however, though fairly fast to alkalies, not sufficiently so to acids. Hence the goods undergo a further treatment with boracic acid or ammonium borate in a bath or by padding and steaming. The best process is to pad on a solution consisting of about 5 oz. of boracic acid and 12 oz. of 25 per cent. solution of ammonia to 2 gallons of water. A steaming for about twenty minutes concludes the process.

### THE WOOL MARKET.

Toronto.—There is no fleece-washed offering, except last season's clip, of which there is a large quantity held over by country dealers. Quotations are nominal at about 14c. There is little or no business, as the wool has cost the holders far more than this figure. It is thought the new clip will open at 13c. for washed, and 8 to 8½c. for unwashed.

Montreal.—The market is strong with upward tendency; about 250,000 lbs. Capes have been sold to the mills since April 1st, at prices from 16 to 18½c. in the grease. Natal and Australian scarce in this market. B.A. are still advancing; nothing in this market under 33 to 36c.



## 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.

MacFarland, Gray & Southgate, Yonge street, Toronto, now have their overall factory fully running.

W. D. Van Egmond & Sons, Seaforth, Ont., will double the capacity of their plant if \$10,000 bonus is secured.

The Montreal Cotton Co.'s new mill at Valleyfield nears completion, and the first shipment of looms is now on the way.

The Dodge Mfg. Co., Ltd., Toronto, is working a large staff of employees full time, turning out pulleys and rope drives, etc.

The H. Boas Mfg. Syndicate is the name under which the well-known St. Hyacinthe, Que., manufacturing firm is now doing business.

The Penman Mfg. Co., of Paris, Ont., is adding an 8½ k.w. generator of the Canadian General Electric Co.'s make to their present plant.

E. R. C. Clarkson has been appointed liquidator of R. Hughes & Co., manufacturers of hats and caps in Toronto. The creditors will be paid in full.

A delegation of English capitalists was in Stephen, N.B., recently, looking over the different sites with a view of starting a pulp mill on the St. Croix river.

Alex. Alexander has returned to Canada from Chicago, and will represent Geo. S. Plow as agent for Cornwall Woolen Co., and Richelieu Woolen Co., in Toronto.

Walter Morson, who has represented the Paton Manufacturing Co. in Toronto for several years past, has resigned to go into the stock broking business on his own account in Toronto.

Law Whiteley, late of the Montreal Woolen Mills Co., has been appointed manager of the Cobourg Woolen Company, Cobourg, Ont. His successor at the Montreal mills has not yet been appointed.

J. J. Hofland and Fanny E. Hofland, North Toronto, Ont.; F. H. Hofland, W. E. Hofland and Eleanor Hofland, Toronto, have been incorporated as the Standard-Star Laundry Co., Ltd.; chief place of business, Toronto; capital, \$35,000.

Young Bros., Almonte, Ont., have just supplied S. T. Willett, woolen manufacturer, Chambly Canton, Que., with one of their latest style fulling mills fitted with their new friction drive. They are also supplying a large rotary pump to Uxbridge, Ont.

Some sixty girls in the employ of the Standard Shirt Co., Delormer avenue, Montreal, went out on strike one day recently, because they were given some work which they thought was not in their department. They returned to work the next day.

The carding and spinning machinery from the Glen Tay, Ont., woolen mill, has been bought by J. B. Molleur, St. John's, Que., who is establishing a four-set knitting mill in that town to run on medium and fine underwear. Geo. Reid & Co., Toronto, made the sale.

The Dominion Oilcloth Co., of Montreal, has placed an order with the Royal Electric Co. for the complete equipment of its factory with "S.K.C." motors. The different units as required throughout the building in the different departments, aggregate over 150 h.p.

The extension of the clothing factory of the Sanford Company, Hamilton, is intended to be well built, and with that end in view, Thomas Oliver, along with architect Mills, is visiting large manufacturing clothing houses in the United States for information.

Binder twine made in Canada now enters the States free of duty. The American tariff imposes a duty only on this article when imported from countries where a duty on it is levied, so that as there is now no duty on it levied by Canada there is no American duty on our product.

The workmen engaged on the new addition being built for the Canadian Cotton Mills Company, Merriton, Ont., were laid off work some time ago on orders from Superintendent Thompson of the Welland Canal, who claims that the building encroaches on Government property.

The case of Stroud vs. Wible has been attracting the attention of the trade lately. The new proprietor of the Paris, Ont., wincey mill is suing the former owner, claiming that he had over valued the plant. Had an expert valuation been held previous to the sale the dispute might have been avoided.

The Consumers' Cordage Co., of Montreal, is fitting out its factories with electric power and has placed its order with the Royal Electric Co. for two 50 h.p. "S.K.C." synchronous motors. The current for these motors is to be furnished by the Chambly Mfg. Co. as soon as it has its current in the city, which is expected about the first of May.

The Chatham, Ont., firm, Frank Broderick & Sons, have arranged to remove their factory to Toronto, for the manufacture of all the uniforms needed for the next year by conductors, train hands, depot masters, and all other officials on the lines between Kingston and Sarnia tunnel on the Grand Trunk, and from Montreal to Windsor on the Canadian Pacific.

The Montreal Cotton Co., Valleyfield, Que., is constantly increasing its large electric transmission plant, of which the three-phase induction motor is found so satisfactory for cotton mill operation. There have recently been ordered from the Canadian General Electric Co., Ltd., three motors of 75, 50 and 10 h.p., respectively.

Eight years ago Harding & Co., Michael Harding being the sole owner, started a shoddy mill in Simcoe, Ont., and did pretty well with it for some time, but Mr. Harding locked up a large portion of his capital in plant and building, and his banker has become his chief creditor. According to his statement made one year ago, his nominal assets are \$22,850, and his liabilities about \$15,000. Want of realizable capital has been his chief difficulty, and he has now assigned.

The sale of the immovable property belonging to the Cascapedia Pulp and Lumber Co., in liquidation, took place, as ordered by the Court a short time ago in Quebec. The property known as Green Point, at Maria, County of Bonaventure, and all the buildings thereon, were sold for \$15,000. The timber limits known as the Salmon River, Grand Cascapedia, No. 2 north, and Cascapedia No. 3 south, containing in all about 76 miles, were purchased for \$2,900, and the Skiminac farm, with the buildings thereon, for \$2,850. The purchasers were Carrier, Laine & Co., Levis, Que., and R. McLellan, St. John, N.B.

The Riordon Paper Mills Co., Hawksbury, Ont., is lighting its plant throughout by electricity. An order has been placed with the Royal Electric Company, Montreal, for a 25 k.w. "S.K.C." two-phase generator, wound to deliver 110 volts. There will be 200 incandescent lamps installed from this throughout the mills, as well as ten alternating enclosed arc lamps. This is the fifth large mill or factory which has within the past year installed alternating current apparatus of the "S.K.C." two-phase type.

J. W. Gale, of the Gale Manufacturing Company, Toronto, died early this month.

The American Woolen Company, with a capitalization of \$65,000,000, was incorporated March 29th.

Percy Jamieson, Ottawa, is now on the office staff of Wm. Thoburn, woolen manufacturer, Almonte.

The Rosamond Woolen Co., Almonte, is now running on a special line of cloth for militia uniforms.

Dundas, Ont., is going to grant special privileges in the Royal Distillery Co., to change its old cotton mill to a gin mill.

The Penman Mfg. Co. has engaged Mr. Wedge, of North Adams, Mass., U.S.A., as head of the spinning in its Thorold knitting mill.

E. A. Small & Company have effected a settlement with their creditors, and the figure is said to be 39 cents on the dollar. It is understood that Mr. Small will resume business immediately.

George Wilson, manager of the Dominion Cotton Mill, Kingston, Ont., has been notified of his appointment as manager of the mill at Moncton, N.B. He will be succeeded by Mr. Gray, formerly engaged in the Kingston mill.

The Chicoutimi, Que., Woolen Factory has obtained the contract from the Militia Department for 5,000 camp blankets, 2,000 of which are to be delivered by June 1. It is said that it has also received a similar order for the camps of 1905.

The reports of the British Fire Prevention Committee continue to be of great interest. No. 14, just received, contains the statement of a test made by the committee upon a floor built by the Expanded Metal Co., Ltd., London. In this test a room lined with expanded metal lathing and floored with concrete laid upon expanded metal, withstood a temperature of 2,000 deg. for an hour, and only showed slight cracking when water was thrown from a hose at 20 lbs. pressure for three minutes.

In addition to the efforts that Parsboro, N.S., is making to have pulp works built there, it is also offering a bonus of \$2,000 for the establishment of a woolen mill to employ not less than 20 men and to have a capital of not less than \$15,000. A few such industries conducted on the proper lines in many of our provincial towns would do more to improve the material prosperity of the province than all other factors combined.

W. H. Conibear, formerly of Cornwall, but recently of Cardinal, Ont., has accepted a position with the Dominion Cotton Co., Hochelaga, Que. He is in charge of the installation of the electric power plant and lights in the Hochelaga mill, which is to be run altogether by electricity. The power required will be about 2,000 h.p., which will be supplied by the Royal Electric Co., who have a five year contract for same. The motors are to be installed in two towers erected specially for them. The largest motor will be 400 h.p. When this plant is in full running order the Hochelaga mill will be a very modern one, particularly in point of power.

John Crossley, Almonte, Ont., died a short time ago at his home in that town, and we gather from The Gazette the following details of his life: He was born in Rochdale, England, 78 years ago. After his boyhood years he worked at the cotton business for a time in his native land. He crossed the Atlantic fifty-five years ago, and spent nearly twenty-five years (as boss weaver and superintendent for much of that time) in some of the big factories in the United States. He came to Almonte in 1868, spent three years as boss weaver with the Rosamond Woolen Co. He then spent a few years in partnership with Teskey Bros., Appleton, Ont., in the factory there. Later on he became postmaster and storekeeper at Bennie's Corners,

Ont., remaining there seven or eight years, when he again moved into Almonte, and spent the remaining years of his long life here as a weaver of carpets, etc. Fifty-two years ago, in Rochdale, England, he was married, and his wife survives him.

### FABRIC ITEMS.

J. Hutcheson & Co., dry goods, Victoria, has been incorporated under the style of The Hutcheson Co., Ltd.

Boulter & Stewart, fancy dry goods, now occupy the whole of 13 Front street west, Toronto, with their warehouse and factory.

The W. & D. Dineen Co., Ltd., Toronto, has been incorporated to carry on the hat and fur business of W. & D. Dineen.

John C. Green, wholesale millinery, London, Ont., died at his home, April 11th. He had been in business in London since 1871.

J. A. Sutcliffe, manager for the C. Ross Company, Ottawa, has gone to Peterboro', Ont., where he will enter into business with his father, J. Sutcliffe.

The R. Simpson Co., Ltd., department store, Toronto, has bought the corner of Richmond and Yonge streets, and will build a large extension to the store at once.

S. Greenshields, Son & Co., have informed the dry goods trade generally in British Columbia that they are now quite settled in their new premises in Vancouver.

Geo. H. Hees, Son & Co., Toronto, manufacturers of window shades, etc., now carry furniture coverings, draperies, curtains, etc. The new department will be under the direction of Nicholas Miller.

It is reported from St. John, N.B., that the difficulties of the wholesale dry goods house of W. C. Pitfield & Co. have finally been arranged by a composition at 45 cents, 20 cents cash, and 25 cents secured, payable in 6 and 12 months.

R. J. Smith, G. K. White, A. E. Revell, J. H. Clements and A. Johnston, of Ottawa, Ont., have been incorporated as the R. J. Smith Company, Ottawa, Ltd., to make and deal in clothing, etc.; capital, \$45,000; chief place of business, Ottawa.

The T. Eaton Co., Ltd., Toronto, has given the Canadian General Electric Co., Ltd., a contract to supply another 130 kw. 110 volt direct connected generator, as an addition to its already extensive plant. This company will now have probably the largest and most modern isolated plant in Canada.

A dividend of 43½ cents on the dollar is expected to be paid by the United Service Clothing Company, Toronto, this being the amount which the estate will yield, exclusive of a claim of \$2,000 held by Mrs. Score. She has consented to forego this claim if the creditors will accept this dividend, and give a discharge.

The old firm, Flett, Lowndes & Co., Toronto, which has for twenty years conducted a wholesale business in dry goods specialties in Toronto, has been formed into a joint stock company, under the style of Flett, Lowndes & Co., Ltd., with a capital stock of \$100,000. The directors of the new company are: John Flett, president; Henry Lowndes, vice-president; C. B. Lowndes, secretary; Geo. A. Baker, director.

The Hamilton, Ont., firm of Campbell & Pentecost dissolved early in February. A. L. Pentecost is opening up the store corner McNab and York streets, Hamilton, under the firm name of A. L. Pentecost & Co., to do a dry goods business. Mr. Pentecost had been connected with the firms of the late Thos. C. Kerr & Co., and D. McInnes & Co., for the past twenty years. Mr. Pentecost has since been prominent in carrying on one of the most successful retail dry goods businesses in the city.

**LONDON FUR SALES.**

Following is a report of the March London fur sales; the figures given varying slightly from the previous report on some furs:

Hudson's Bay Co's sale Prices compared with March, 1898: Fisher, 10 per cent. lower; fox, silver, \$9 per cent. higher; fox, blue, 250 per cent. higher; fox, cross, 22½ per cent. higher; fox, red, 60 per cent. higher; lynx, 40 per cent. higher; mink, 50 per cent. higher; marten, 60 per cent. higher; skunk, 45 per cent. higher; wolf, 25 per cent. higher; wolverine, 70 per cent. higher; otter, firsts, 10 per cent. lower; otter, seconds, 5 per cent. lower; otter, thirds, 15 per cent. higher; bear, black, 10 per cent. lower; bear, brown, 10 per cent. lower; badger, 39 per cent. lower; bear, gray, 15 per cent. higher; musk ox, 15 per cent. higher; raccoon, 15 per cent. higher; hair seal, 25 per cent. higher; beaver, 5 per cent. lower than January last.

Lampson & Co's sale Prices compared with March, 1898: Fisher, 10 per cent. lower; dry fur seal, same as a year ago; wolverine, 50 per cent. higher; fox, blue, 110 per cent. higher; fox, red, 40 per cent. higher; fox, cross, 15 per cent. higher; fox, silver, 50 per cent. higher; fox, gray, 200 per cent. higher; fox, white, 60 per cent. higher; marten, 50 per cent. higher; wolf, 20 per cent. higher; lynx, 40 per cent. higher; otter, 10 per cent. higher; sea otter, 50 per cent. higher; Russian sable, 20 per cent. higher; musk ox, same as a year ago; badger, 20 per cent. lower; cat, wild, 10 per cent. higher; hair seal, dry, 25 per cent. higher; bear, black, same as a year ago; bear,

**WANTED**—Man thoroughly acquainted with the manufacture of Worsted and Mohair Braids. None but experienced hands in the manufacture of braids need apply. Address No. 6, Canadian Journal of Fabrics.

**POSITION WANTED**—By a designer, eleven years' experience in Cloakings, Beavers, Kerseys, Cassimeres, Coverts, Worsteds, Dress Goods, etc. Compliant to take charge of weave room or dressing room. At references. Address "DESIGNER," care of Canadian Journal of Fabrics, Montreal, Que.

**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.

**FOR SALE**

**Entire Equipment of Cotton ... Mill ...**

Spinning, Weaving and Twisting; 8,000 spindles all in first-class condition; cash or part cash and part bonds. For particulars address **COTTON MILL**, Office of the Canadian Journal of Fabrics.

brown, same as a year ago; bear, grizzly, same as a year ago; bear, white, 25 per cent. higher; bear, Russian, 10 per cent. lower; mink, 35 per cent. higher; raccoon, 10 per cent. higher; kunk, 15 per cent. higher; civet cat, 20 per cent. higher; opossum, 100 per cent. higher; grebe, 50 per cent. higher; rabbit, same as a year ago.

—Besides with potassium chromate, glue may also be rendered impervious to water by admixture of linseed oil. The glue is first soaked in warm water and then melted at a moderate temperature in linseed oil, or else a liter of glue solution is simply mixed with 100 c.m. of linseed oil. In the latter case a slight addition of nitric acid is recommended to keep the mixture liquid. A little borax will protect the glue from putrefying.

**CHEMICALS AND DYESTUFFS.**

Business continues fair; bluestone is very firm, 6½c. being its lowest price; gambier continues firm with good demand; bleaching powder has advanced. 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 .....	60 00	" 65 00
Soda ash, 48° to 53° .....	1 15	" 1 25
Chip logwood .....	1 90	" 2 00
Castor oil .....	0 09	" 0 09½
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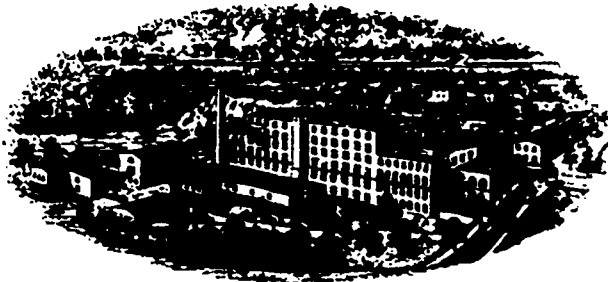
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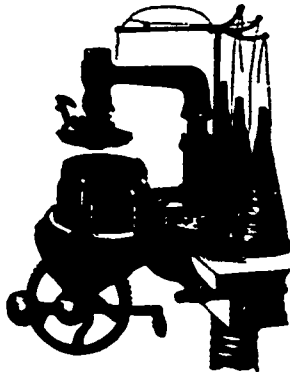
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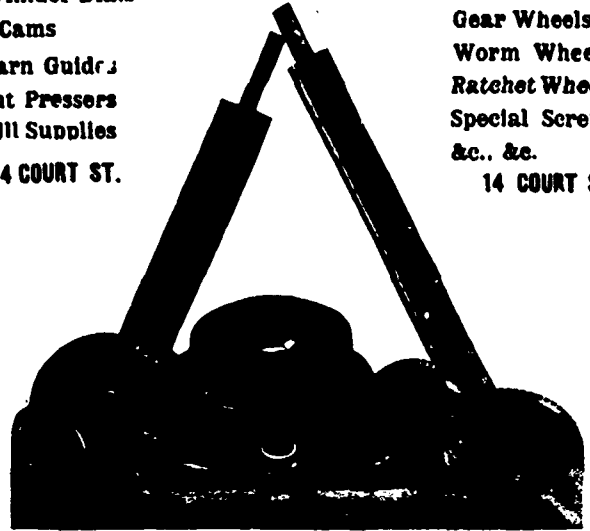
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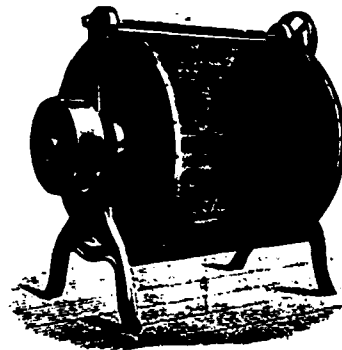
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—To extinguish oils which have taken fire, the *Illustrirte Gwerbe Zeitung* recommends the use of a fine meshed wire net of the size of a boiling pan, which should be kept on hand in every varnish factory, etc. In the same moment when the netting is laid upon the burning surface, the flame is extinguished because it is a glowing mass of gas, which the iron wire quickly cools off so much that it cannot glow any more. The use of water is excluded, and that of earth and sand undesirable, because both dirty the oil.

Supt—Mr. Old Style overseer what are you unrolling that belting for?

Mr. Old Style overseer. To measure it. You see, I have to report the number of feet received in each roll.

Supt—Oh, well, there is no necessity of unrolling it. Just add the outside diameter and the inside diameter (or diameter of the hole) together, and divide by 2. Multiply that by the number of coils, and that by 3.1416, and divide by 12. This gives feet. Here, this roll is 20 inches outside and 10 inches inside;  $20 + 10 = 30$ ;  $30 \div 2 = 15$  and  $40 \times 15 = 600$ ,  $600 \times 3.1416 = 1884.06$ , divided by 12 = 157.08 feet. Not right you say? Well, we will try a rule from Kent and see how it comes out. Add the two diameters together, multiply by the number of coils, and multiply that by the constant 1.309. Thus  $20 + 10 = 30$ , and  $30 \times 40 = 1,200$ , and  $1,200 \times 1.309 = 157.08$ . —Modern Machinery.

—Slowly but surely the demand for better goods is expanding. There is no sentiment back of this growth; it is purely business says *The Dry Goods Economist*. When you offer a man something that is palpably cheap—something so tawdry and flimsy that its inferiority sticks out all over it, you invite the buyer to squeeze the price down to the very lowest notch. He knows that it is no good, and you know that it is no good and when you try to meet his argument that it is mighty poor stuff even at a price, you do it with bad grace. There is no money in selling goods of that description. On the other hand, when you offer something which possesses value, you are in the best possible condition to meet the attack

of the price-cutter, and he is likely to be less insistent than he is when called upon to purchase goods which—even when he has secured them at the bottom price—he is afraid he ought not to have purchased. No; there's no money in trash.

—An English patent describes the fixation of indigo on cotton without previous reduction. The ground indigo is mixed with an oil thickening, printed on, and then steamed for about one-and-a-half hours at 10 to 14 lbs. pressure. All the thickening is then washed out with soap and malt. The color got is a uniform blue-gray. The inventor thinks that possibly the oil dissolves the indigo during the steaming. He subsequently discovered that a second steaming after the washing enhances the fastness enormously, and he has therefore taken out an additional patent to cover a second steaming similar to the first.

—The *Montreal Witness* is published in a city where the cotton manufacturing interest is strong, nevertheless that journal advises a reduction of the cotton duties. The present customs rates are 35 per cent. on colored goods, whether dyed, woven or printed, and 25 per cent. on white and gray goods, subject to the differential in favor of British and colonial goods of one-quarter, making the preferential rates  $26\frac{1}{4}$  on colored goods, and  $18\frac{1}{4}$  on white and gray goods. About 5 per cent. on British goods and 2 per cent. on American goods may be added to the above protection enjoyed by the cotton manufacturers, the freight on the transportation of the goods amounting to about these percentages. A curious thing about the protective duties on cotton is this, that they are not so arranged as to afford all manufacturers of cotton goods a share of the protection. Cotton is free, the duties on cotton cloths, as we have seen, are 25 and 35 per cent. on American, and  $18\frac{1}{4}$  and  $26\frac{1}{4}$  on British, and the duties on collars, cuffs, shirts and blouses, and all manufactures of cotton cloths are 25 and 35 per cent. on American, and  $18\frac{1}{4}$  and  $26\frac{1}{4}$  on British, or exactly the same as the duties on the cloths which are the raw material for the shirt and collar, the blouse and shirt manufacturers, just as the raw cotton is the raw material of the cotton cloth manufacturers.

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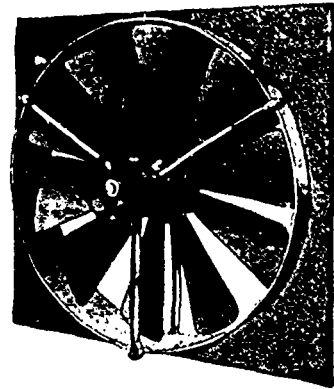
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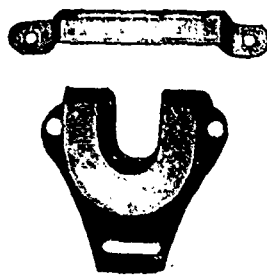
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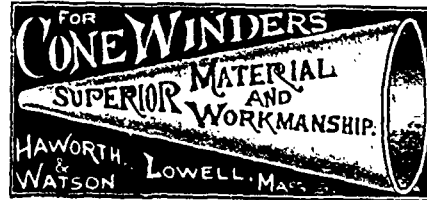


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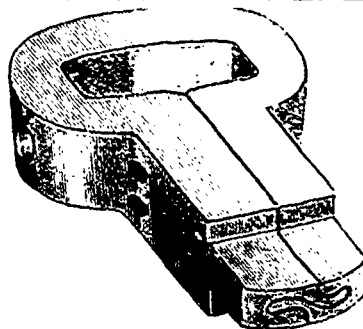
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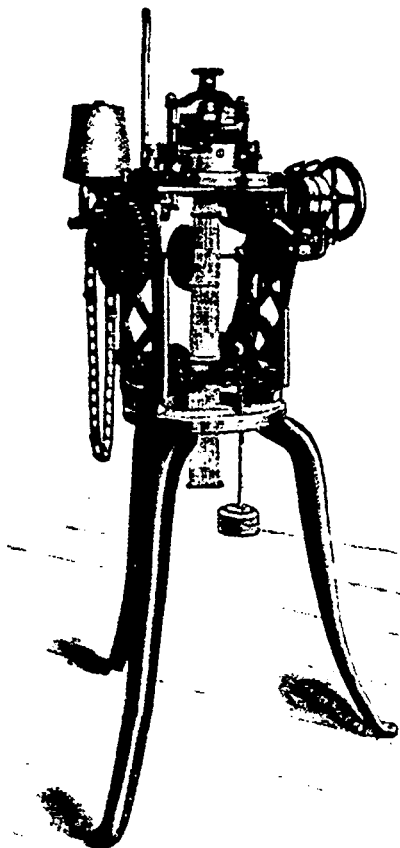
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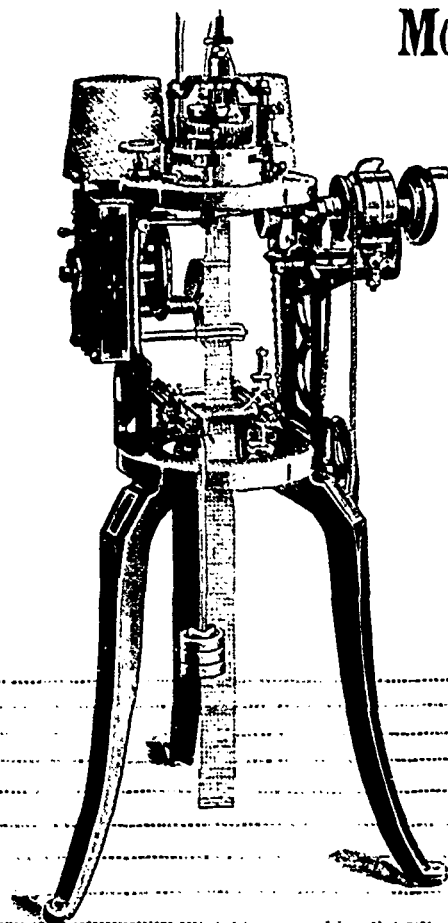
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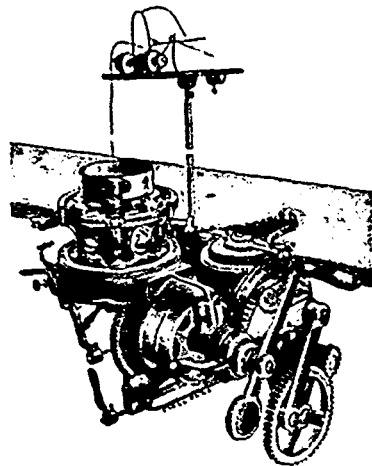
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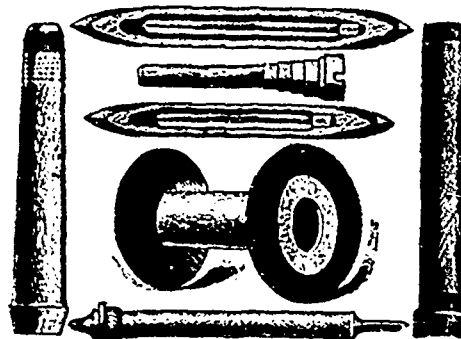
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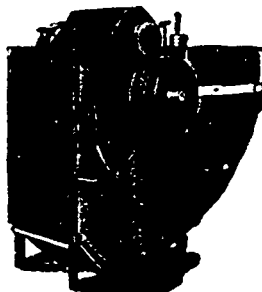
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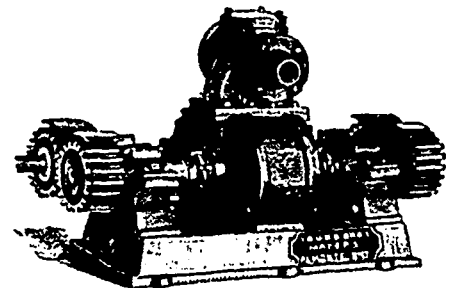
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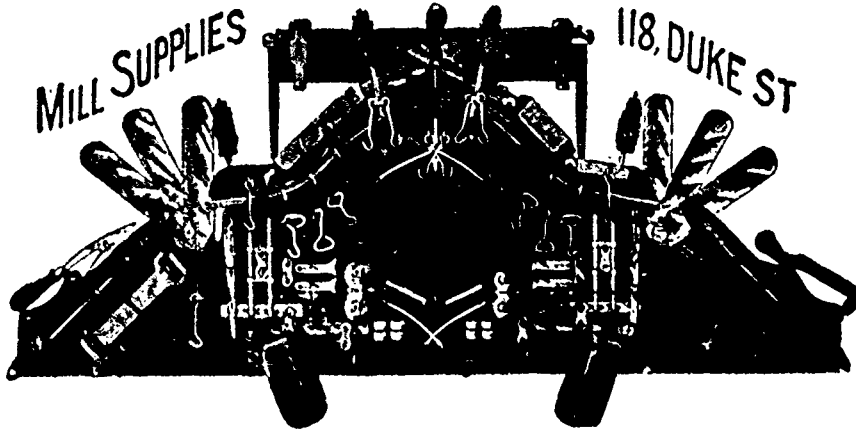


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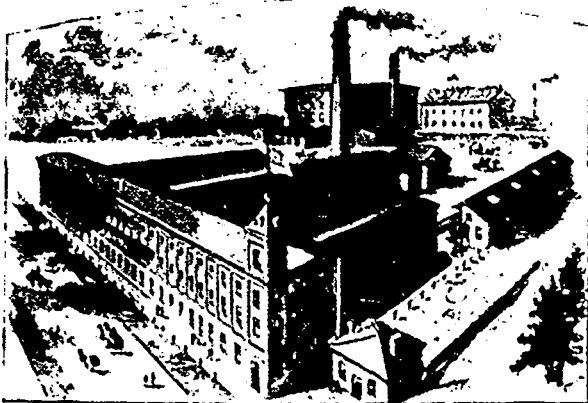
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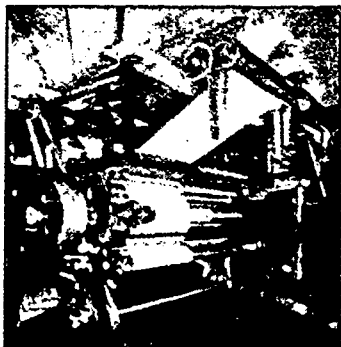
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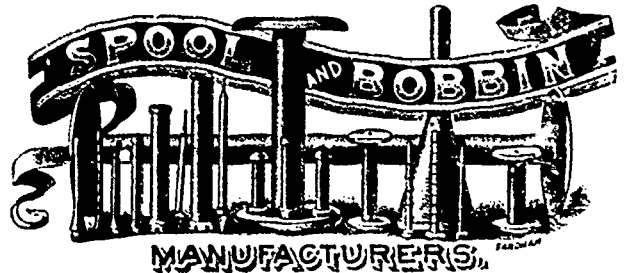


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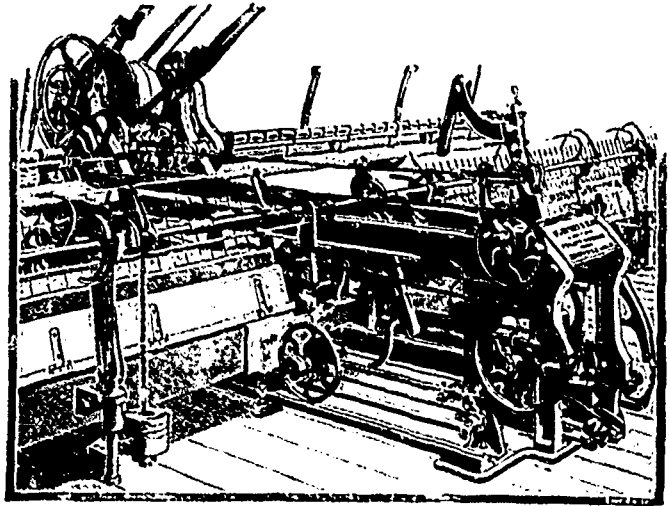
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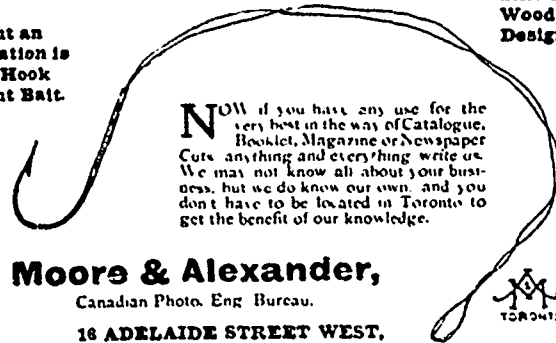
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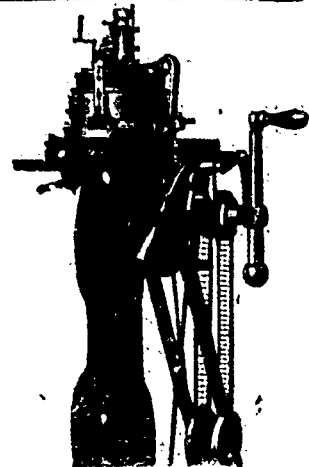
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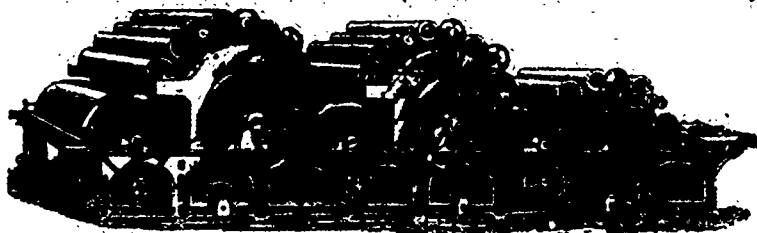
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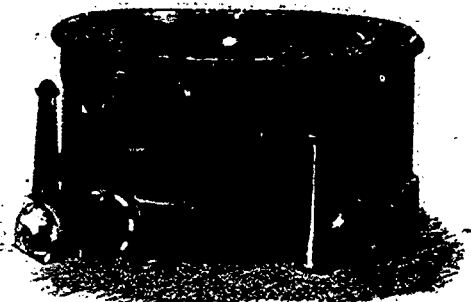
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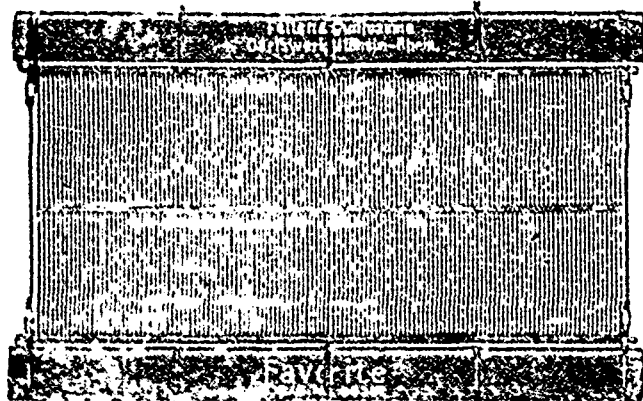
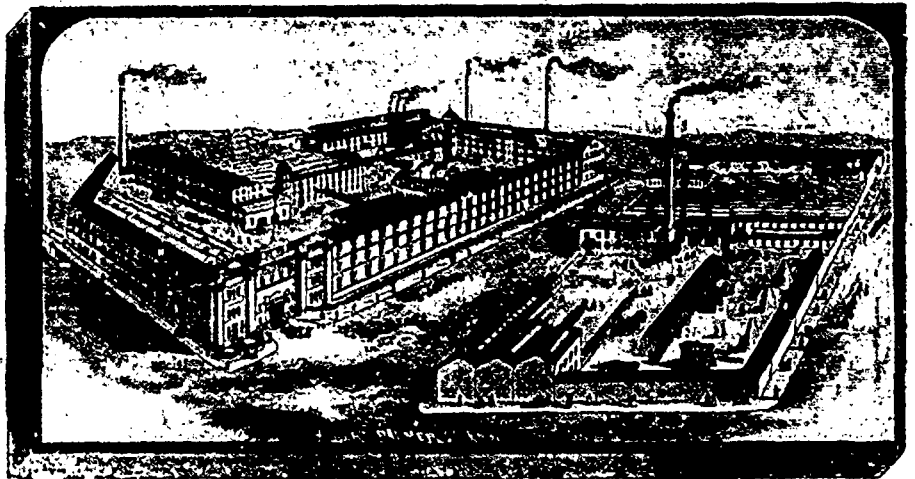
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