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CANADIAN Journal of Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XIX.

TORONTO AND MONTREAL, MARCH, 1902.

No. 3.

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Announcement
On Page 90.

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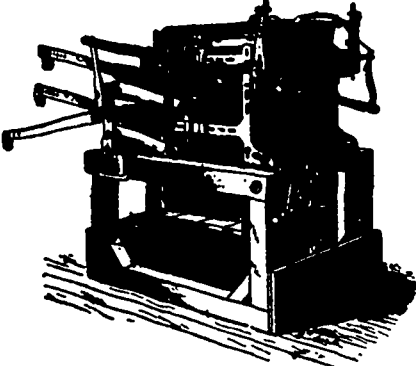
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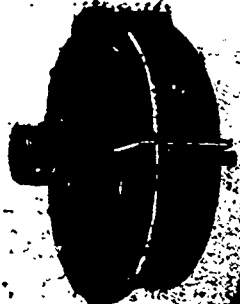
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Canadian Journal of Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XIX.

TORONTO AND MONTREAL, MARCH, 1902

No. 3

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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. Price, \$3.00.

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THE POSITION OF THE WOOLEN INDUSTRY.

As there has been a good deal of controversy on the question of the extent to which the Canadian woolen industry has declined owing to the preferential tariff, we gladly comply with a request that we should give some statistics on the subject. Those who care to go over the files of the JOURNAL OF FABRICS will find that we have had a strong conviction that peculiar injustice has been done to the woolen manufacturing industry of the country by the preferential tariff; but while holding these views we could not go the length of the secretary of the Cana-

dian Manufacturers' Association in stating that 160 sets of cards had gone out of operation in the last year or so, and that the annual value of the product of this amount of machinery was \$2,750,000, taking the production of a set of cards at about \$17,000 a year. The authority for these figures was the incomplete list of mills taken from a United States textile directory. To begin with it would be almost impossible to say what the annual product of 160 sets of cards would be in a country where all sorts of cloths are manufactured on all sorts of machinery. A set of cards might work off \$1,000 worth in a year, or it might make \$10,000 or even \$20,000, all depending on the character of the goods that were being produced. Such figures, therefore, would be mere guess-work, and of no value for statistical purposes.

We have gone over the records of this Journal for the past three years and are now able to get at as close an approximation to the facts as possible. The last issue of the Canadian Textile Directory was published in June, 1899. Shortly after its issue we compiled tables of the woolen mills, separating the knitting mills from the cloth mills. As the figures then given are compared with those taken from the Canadian Textile Directory of 1885, and as some comments were made on the census methods of dealing with the textile trades, we here reproduce a part of the article including the tables:

"When we come to the woolen industry the classifications of the census returns are still more misleading, as the extent of the industry involved is greater. For instance, according to the census of 1891 there is only one blanket mill in Canada, only one felt factory, and but one factory where woolen yarn is made. Yet we have 377 establishments enumerated under the head of 'woolen mills,' 223 under the head of 'knitting factories,' 26 under the head of 'underwear factories,' and 38 under the head of 'hosiery factories.' One naturally wonders on what plan the census takers make a distinction between 'hosiery' mills, 'knitting' mills, and 'underwear' factories. Whether the underwear factories referred to are makers of knitted underwear or of cotton night shirts or such other garments the returns are equally astray. And what 'hosiery mills' in Canada are not 'knitting mills?' But one of the most remarkable features of the census returns dealing with textiles is the statement that there are in Canada 557 'carpet factories.' It will hardly be satisfactory to anyone seeking information on carpet manufacturing in Canada to be told that these 557 carpet factories must include the hand-loom weavers of rag carpets. By the way, under the head of 'weavers' the census

gives 2,085 establishments employing 2,445 hands; a list which embraces all the people whose whole or partial occupation is the operation of hand-loom owned by themselves, and which doubtless includes large numbers of hand-loom carpet weavers. Of these 557 so called carpet factories 344 are put down to Ontario and 29 to Quebec. As a matter of fact there are 6 carpet and rug factories in Ontario using power looms, and 2 in Quebec, while in Ontario there are also 13 establishments operating hand-loom sufficient in number to be fairly classified among the 'factories.' But assuming the census figures to include the hand-loom carpet weavers they are still woefully wide of the mark, as those acquainted with the domestic industry of Quebec are well aware. The census gives 377 woolen mills and 441 carding and fulling mills in Canada. Coming to the distribution of these mills we find 303 woolen mills attributed to Ontario and 44 carding and fulling mills to the same province. Now, the Canadian Textile Directory which does not claim to have the Government facilities for gathering reports from the back districts, gives the names and addresses of 49 establishments exclusively devoted to carding and fulling in Ontario, besides 200 or 300 at which carding and fulling are carried on along with spinning and weaving. As for there being 303 'woolen mills' in Ontario, they never existed either in 1891 or in any other year. The fact is that the census takers have got woolen mills, carding mills, hand-loom weavers, knitting mills and other branches of the woolen industry so mixed that they are worse than useless for any statistical purpose.

The compilers of the Canadian Textile Directory do not claim absolute accuracy, because the textile manufacturers are not compelled to report their mills as they are compelled to report to the census takers; but the recent edition of this directory enables us to gather a large amount of information which is here for the first time presented in tabular form. In many cases where the proprietor or lessee of a mill neglected to report to the publishers the capacity in sets of cards, looms, spindles, etc., we could only estimate the figures, but the totals will not be far astray, as there is scarcely a case in which the neglectful ones operated more than one set of cards with corresponding other machinery. Our information regarding the knitting branch of the woolen industry is less satisfactory. A portion of the total of hand machines belongs to the tweed and other establishments which have in their factories a few hand knitting machines as an annex to the weaving department. The power machines do not include sewing machines, and of the power machines it must be understood that there is a great variation in the capacity and purpose of power knitting machines, so that some further classification of this machinery would be necessary before a satisfactory notion of the productive capabilities of the Canadian mills could be formed. The first tables are compiled from the first edition of the Canadian Textile Directory, issued in 1885, and the second from that of 1899, recently published. The first issue was naturally less complete than subsequent ones. It should also be noted that no attempt was made to compile a list of those who devote part or all of their labor hours to the operation of hand knitting machines in their own homes. Many of the hand machines here reported are idle, and this branch of industry is disappearing even faster than the custom carding mills:

KNITTING MILLS.

(From the Canadian Textile Directory, 1885.)

	No. Mills.	No. Hand Machines.	No. Power Machines.
British Columbia ..	...	...	...
Manitoba	1	...	5

New Brunswick	2	25	...
Nova Scotia	2	...	22
Ontario	51	184	703
Prince Edward Island.....	..	...	...
Quebec	3	...	148
	64	209	878

WOOLEN MILLS.

(From the Canadian Textile Directory, 1885.)

	No. Mills.	Sets of Cards.	Looms.	Spindles.
British Columbia .....	..	...	...	...
Manitoba	1	1	4	240
New Brunswick	7	8	32	1,920
Nova Scotia	15	23	101	4,040
Ontario	182	409	1,465	87,370
Prince Edward Island.	3	5	26	1,200
Quebec	32	69	257	13,100
	240	515	1,885	107,870

KNITTING MILLS.

(From Canadian Textile Directory, 1899.)

	No. Mills.	No. Hand Machines.	No. Power Machines.
British Columbia .....	..	...	...
Manitoba	1	3	...
New Brunswick	2	...	27
Nova Scotia	2	9	37
Ontario	54	246	1,953
Prince Edward Island .....	..	...	...
Quebec	12	21	1,422
	71	279	3,439

WOOLEN MILLS.

(From Canadian Textile Directory, 1899.)

	No. Mills.	Sets of Cards.	Looms.	Spindles.
British Columbia	1	1	5	400
Manitoba	1	1	4	200
N. W. Territories ..	3	3	13	656
New Brunswick	5	7	30	2,200
Nova Scotia	19	30	127	9,240
Ontario	199	440	1,859	129,086
Prince Edward Island.	2	3	24	1,080
Quebec	40	139	583	51,224
	270	624	2,645	194,086

The above tables do not include the carpet factories, which, as before mentioned, number about 18, and have about 213 power-loom and 98 hand-loom; nor do they include the felt factories or shoddy mills. There are 7 concerns engaged, more or less exclusively, in the production of felt goods, having, in all, about 26 carding machines and about 35 felting machines. Besides these, four concerns making paper-maker's felt are enumerated under the heading of woolen mills. In 1885 there were 7 shoddy mills operating about 30 cards and 11 pickers; in 1899 there were 19 shoddy mills in Canada, having a total capacity of 60 cards, 39 pickers, 6 garnett machines and 4 carbonizers. These do not include a small number of woolen mills, who have their own carbonizers and wool stock plants."

Now as to what has happened since June, 1899, when

the last edition of the Textile Directory was published. Dividing the time into two periods so as to show the record at the close of the century, we find that in the tweed and other branches of the woollen cloth trade, there were the following changes up to the end of 1901 :

NEW MILLS OR ADDITIONS TO OLD MILLS.

	Sets Cards.	Looms.	Spindles.
June, 1899. to Dec. 1900....	12	26	2,280
Year 1901	7	13	1,680
Total	19	39	3,960

MILLS CLOSED OUT.

	Sets Cards.	Looms.	Spindles.
June, 1899, to Dec., 1900....	45	177	10,241
Year 1901	7	12	464
Total	52	189	10,705

Thus, while in previous periods there has been an increase in the manufacturing capacity of Canadian mills, there has been a net loss since June, 1899, (when the preferential tariff had got into full swing), of 33 sets of cards, 150 looms and 6,745 spindles. These figures do not include the mills which are at present idle, but is simply a record of mills that are out of business entirely, either by insolvency, abandonment by the proprietors, or destruction by fire. It is worthy of passing note that of the half-dozen or more mills that have burned down in the past year or so, not one has been rebuilt. Moreover, the insurance companies have in numbers of cases cancelled their policies on woollen mills, and it is difficult to effect new insurance on any terms on small mills. These facts of themselves should be sufficient to convince the Government that they have brought disaster on an industry that was once one of the most substantial and prosperous in the country, and which, notwithstanding periods of depression, showed a steady growth up to the date of the preferential tariff.

To prove that this condition of things is directly attributable to the tariff, we have only to contrast the foregoing record with that shown by the knitting and carpet branches of the woollen industry. Since June, 1899, eight new knitting factories, including a new mill now getting ready for operations, have been started in Canada, having about 250 knitting machines of various kinds, besides sewing machines, while in the same period only three of any size have closed up permanently, showing a net gain of five factories and about 150 machines. These figures only comprehend factories where power is used. In the carpet manufacturing industry, five new factories, operating over 200 looms, have started in Canada since June, 1899. The reason of this is that the Government has made tariff concessions to the knitting and carpet factories in the matter of importation of yarns. It is true that these concessions have been made at the expense of the woollen and worsted branches of the home industry, but the result shows the responsibility of the Government for the present predicament and dismal prospects of the main branch of the woollen manufacturing business. If it were not for the large War Office contracts that have been

given to certain favored mills for hosiery, underwear, knitted caps, blankets, etc., through the medium of the Dominion Government, the position of the industry would be ten times worse than it is. We would observe, however, that war is not the normal condition of things in this part of the world, and would warn the manufacturers who have been lulled into a feeling of apathy by these special contracts that they are sleeping in a burning house.

It may be well here to summarize a few of the arguments used in previous issues dealing with the woollen situation.

The position of the Canadian woollen mills is different from that of any other large branch of manufacturing affected by the preferential tariff. In most other lines the home manufacturers are better able to hold their own, while in many lines, such as furniture, wooden-ware, boots and shoes, food products, etc., Canadian manufacturers can actually undersell British manufacturers in their own market. Hence the preferential tariff has no terrors for them. The woollen manufacturers, however, have to bear the full force of competition in a line of manufactures which the British people have for a long period of years made peculiarly their own, so much so, that they have overcome competition in all parts of the world, even in countries having high protective tariffs.

Of all branches of home manufacturing in textiles the woollen mills suffer most. The preference in favor of British goods does not affect the linen and jute trades because there are no linen or jute goods woven on power looms in Canada. Silk goods are unaffected because this industry is itself a decaying one in Great Britain, and such silk mills as we have are on specialties that have nothing to fear from British competition. The Canadian woollen manufacturers alone receive the full force of competition from Britain's best equipped industry.

Canadian mills have been equipped with machinery which has cost 40 per cent. more than those of Great Britain, yet our manufacturers if they buy special machinery in the States or Germany, still have to pay the highest price for their improvements.

The crippling of the Canadian woollen industry by the preferential tariff is also a blow at the sheep raising industry of the country, which is a double misfortune, for in strength of fibre Canadian wool is not excelled by any in the world.

The preferential tariff has opened a wide door to smuggling in the textile trades, by which German, Austrian and French goods are brought to England, put through a fictitious process of "finishing," and shipped on to Canada in English styles of packages and under English labels, thus defeating the prime object of the preferential tariff.

There are other reasons, but these are surely enough to convince any fair-minded man that the Canadian woollen manufacturers suffer peculiar injustice under the present tariff.

—The Shareholder rises to remark that Great Britain has been sending for years millions of dollars worth of yarns to the United States.

COTTON MANUFACTURING IN THE UNITED STATES

The United States Census Bureau has issued a preliminary report on the cotton manufactures of that country. The following is a summary, exclusive of manufactures of small wares:

Number of establishments	960
Capital	\$460,842,772
Average number of wage-earners	297,929
Total wages	\$ 85,126,310
Cost of materials used	173,441,390
Cotton consumed, 3,660,613 bales, costing	124,905,075
Value of products	332,804,455
Total spindles	19,008,352
Number of looms	450,682

The statistics of manufactures of cotton small wares are as follows:

Number of establishments	82
Capital	\$6,397,385
Average number of wage-earners	4,932
Total wages	\$1,563,442
Cost of materials used	3,110,137
Cotton consumed, 7,213 bales, costing	264,541
Value of products	6,394,164
Number of spindles	42,600
Number of looms	5,070

Analyzing the returns by States, we find that Massachusetts leads in cotton manufacturing, its output being in value nearly four times that of the next largest, which is South Carolina. North Carolina comes next, and then follow the little State of Rhode Island, Pennsylvania, New Hampshire, Georgia, Connecticut and Maine. All the others are small in comparison. In small wares, Rhode Island leads, with Pennsylvania not far behind, and then come New York, Massachusetts and New Jersey.

These figures will be of scarcely less interest to Canadian textile manufacturers and dealers than they are to the people of the country more immediately concerned.

A SUGGESTION.

Editor, Canadian Journal of Fabrics:—

Sir,—Would be glad to be informed if there is any book published dealing with wools, their marks, shippers, classes, origin, and so forth. For instance, in the lumber trade, the deals, etc., are branded denoting their origin, shippers and quality, and the Timber Trades' Journal of London issue a book giving a complete list of these brands, so that anyone in the trade may readily know their characteristics. What I desire to know is: Has this idea been applied to the wool business, and the results published in book form?

JAXOREL.

We may inform our correspondent that so far as our enquiries have gone, no such book is published, but a work of reference of this kind would be valuable, and the suggestion is worth the consideration of some technical book publisher in Great Britain. A registration of brands of sheep and cattle is carried

out in Manitoba and the North-West, but this is for the purpose of identifying the living animals, and not their pelts. The sheep breeders of Australia have also a system of registering the wool products of their flocks, but this again is for the purpose of classifying grades of wool for export, the same as Manitoba wheat is graded. What is wanted is a means of identifying the marks on wool, not only from Australia, but from South Africa, Buenos Ayres, and all other large wool-producing countries.

—Acetylene gas, owing to the fact that it has the merit of bringing out color shades in their true rendering, is likely to be a favorite illuminant in textile factories. A large installation has been made in a cotton mill at Muhlbach, in Alsace, where 500 hands are employed. Between 800 and 900 jets are in use, and provision is made for an increase to 1,300. The light gives much satisfaction.

—One of the results of Chinese intercourse with foreign nations will probably be that the people will ultimately adopt woolen fabrics instead of cotton or silk for outdoor wear, and so a new market for our woolens may be opened up. But a certain amount of home manufacturing will also be engaged in, for the Chinese are very deft in such matters, though slow to adopt the ways of foreigners. There was one woolen mill in China—at Tien Tsin—the machinery having been sent out from the United States. It was destroyed during the recent disturbances, but now that matters are becoming settled, it is sure to be more than duplicated.

—The woolen manufacturers of Canada cherished the hope, from what transpired at the annual meeting of the Manufacturers' Association, at Montreal, and from subsequent straws which seemed to indicate a breeze blowing in their favor, that some modification would be made in the tariff at the present session of Parliament, to relieve them from the difficulties under which they labor through the operation of the preferential tariff. We fear that after all they have little reason to expect much if any relief. A deputation waited on the Finance Minister at Ottawa recently, and again presented their case. While listening attentively to what they had to say, the Hon. Mr. Fielding did not give them much encouragement. Of course the Government never gives any intimation of tariff changes in advance of the budget speech, and it may be that Mr. Fielding has a card up his sleeve which he will yet play in their favor, though it does not look much like it. A stable tariff, which the Government claims to be its policy, is all right, but the position of the woolen industry, under existing conditions, is an exceptional one, and merits special consideration.

STRAW MATTING LOOM.

Inventive skill applied to problems in weaving has made the production on a large scale of many textiles whose manufacture was considered impracticable, except by the tedious process of hand weaving. Such a textile, says the Carpet and Upholstery Journal, is straw matting. This durable and attractive floor covering, which is in use also for a constantly increasing variety of purposes, has been woven for centuries in China, entirely by hand. At best a good weaver, with two helpers, can produce by hand in a ten-hour day, not over six yards. In recent years the Japanese have taken up the art, and they weave by hand large quantities of matting of a high grade. Within the past decade the use of matting has increased so enormously that the United States now imports nearly 800,000 rolls a year.

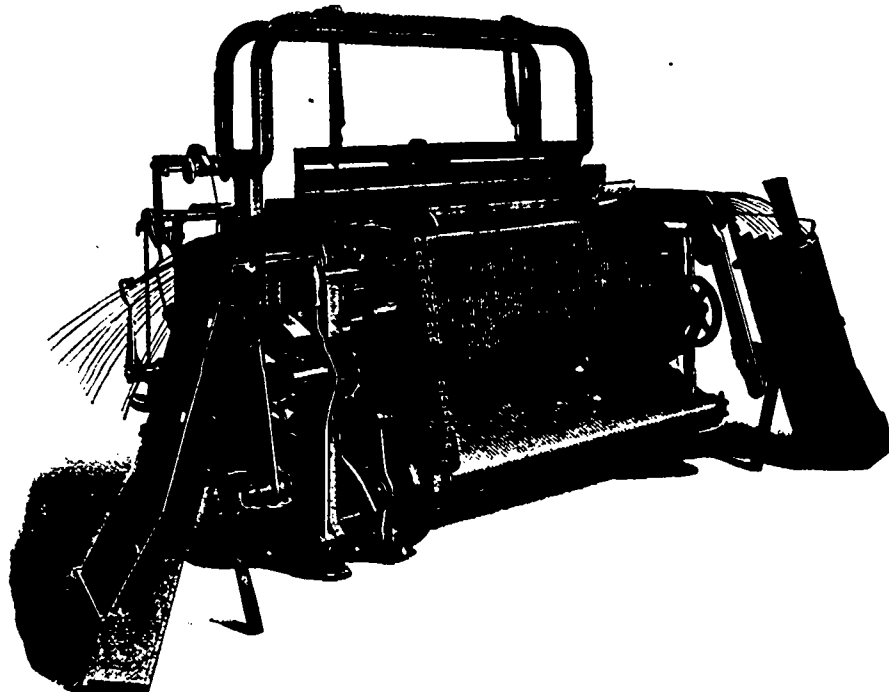
The Crompton & Knowles loom works, of Worcester, Mass., has produced a loom for weaving this fabric. This new power loom, occupying but 10 square feet of floor space, and running at a speed of 95 revolutions a minute, produces from thirty-five to forty yards of 80 pound matting per day, as against six yards a day made on the hand looms in Canton, China. The advantage of weaving straw matting by

comes this difficulty. An ingenious device operates to turn the extended straw ends around the selvage cord to the under side of the goods, where they are bound into the fabric by the natural process of weaving. The loose ends are trimmed off by a machine cutter, making a selvage of exactly the same thickness as the body of the fabric. When laid on the floor a carpet of perfectly level surface is secured.

IRISH POPLIN INDUSTRY.

The interest which is being taken in the English silk industry, and the efforts to revive its ancient glories, will fall short of the good intended if the Irish poplin industry is not included and prominently brought before the British public. At present there is a decided improvement in the trade, due probably to three causes—the active interest taken by the Queen in the British silk industry, Irish as well as English, the peculiar suitability of the material to the fashions of the day, and the special favor shown it by many of the leading English, French and American firms, who have lately given large orders.

Like the English silk industry, the Irish poplin trade owes its origin to the revocation of the Edict of Nantes and the



machinery is by no means confined to this heavy increase in the quantity of the product. Automatic motions in the let-off and take-up devices ensure an even quality in the finished product that hand weaving cannot equal. This evenness in quality, yard for yard, is especially desirable in mattings which carry a figure, since it makes possible the perfect matching of the design over broad areas. A recent improvement in the selvage motion has made the product of this loom well nigh perfect. In hand weaving it is customary to turn the extended ends of the filling straws, or China grass, over the selvage cord to the upper side of the fabric, where they are bound under a warp thread, and then turned back and thrust down between the warp thread and selvage cord to the under side of the goods. This turning back of the straw ends causes a ridge to form along the selvage, and makes the matting thicker at this point than in the body of the goods. The Crompton & Knowles matting loom over-

expulsion of the Huguenots from France. Many of the emigrants settled in Dublin, and the trade still remains in the hands of their descendants. The rule is rigidly enforced that none who have not served a seven years' apprenticeship, and who are not the eldest sons of regular tradesmen, may work or will be recognized as weavers. This may have much to do with the high class of work produced.

The earnings of the poplin weavers vary a great deal. The average wage is about £15s. (\$6.08) a week, but all depends on the quality of the fabric. They are paid by the yard. For some weaving, the workmen receive as much as 4s. (97 cents) a yard. To the very best and most experienced "hands" are given the magnificent heavy gold and silver brocades, and these men receive up to 8s. (\$1.95) a yard. As the tissue is of pure metal, this weaving requires the highest class work, and proceeds very slowly, so that the earnings of these trained artisans often do not exceed £3 (\$14.60) a week

In weaving with gold and silver, the workman has continually to stop to make sure that the thread lies perfectly flat, the thread being sometimes so fine that it can hardly be felt. In former times the weavers worked in their own homes, but now the large establishments have their own factories, where the material is stored and given out to the weavers as wanted.

The silk used for poplin comes from China, it is dyed in Dublin, the colors being unrivalled in brilliance. Dublin seems to be the only place where this exquisite fabric can be satisfactorily made. This has been put down to some peculiar quality in the water. Poplin is, as everyone knows, a combination of silk and wool, so woven that the upper and lower surfaces are of the purest silk, while the interior of the material is of wool, thoroughly shrunk before weaving, so that "cockling" is an impossibility. Considering of what it is composed, this material is wonderfully inexpensive, the prices ranging from 3s. 6d. to 10s. (85 cents to \$2.43) a yard, while the brocades vary from 6s. to 18s. (\$1.46 to \$4.38) a yard. Gold and silver brocades are not included in this estimate. Lengths of any color can be made in fourteen days, while original designs can also be carried out. It is a most economical material, for it outwears all others and looks well to the end. Poplin is divided into three classes—single, double and terry. The first two are so much alike that the uninitiated could not tell the difference, which consists in the quality of silk used in the warp; the third is corded, and is that class which is mostly associated in the public mind with Irish poplins. So much ignorance of this beautiful material has existed, that those interested in the Irish poplin industry are earnestly hoping that the festivities connected with the coronation will attract public attention to it.

CONSUMPTION OF COTTON.

According to Cotton Facts, Great Britain for season 1901 consumed (in 500 pound bales) 3,269,000 bales, as against 3,334,000 in the previous season; the continent 4,576,000, being the same as in the previous year; the United States 3,435,000 as against 3,687,000 in 1899-1900, and India 1,087,000, against 1,162,000. The percentage of increase during the last ten years shows that Great Britain has increased by 1.3 per cent., the Continent 33.3, America 56.9, and India 34.9 per cent. These figures are very significant. Great Britain is only just holding its own, whereas other countries have increased abnormally. The above figures do not include about 350,000 bales of Asiatic cotton used in Russian mills, nor about 325,000 bales spun by hand machines in India, also a small quantity of Egyptian and Peruvian cotton used in the United States.

UTILIZATION OF PEAT FIBRE.

Karl Geige, of Dusseldorf, Germany, has discovered a means of using peat fibre. He has managed to produce a fibre capable of being spun, which is absorbent, and which can be bleached and dyed. Geige first of all isolated the vegetable fibres, and treated them with acids and alkalis, the result being a peat wool consisting of nearly pure cellulose. This turf wool is soft, elastic, and capable of being spun in the same way as sheep's wool.

With the addition of cotton or sheep's wool, yarn can be spun which is useful for various clothing fabrics. The quality of absorption which it possesses renders it very suitable for summer wear, and the same may be said for its warmth in winter. The felt manufacturer uses it in the production of peat-felt hats. If the inventor is successful in reducing this

peat yarn to a still finer thread, it will find great use in hosiery manufacture, for which, as it is a bad conductor of heat, is absorbent, and cheap, it is especially suitable. Geige has produced not only dress-stuffs, but carpets (Smyrna carpets), and other such like goods, which are capable of being bleached and dyed. Peat wadding is specially valuable for sanitary and surgical purposes, keeping wounds clean and dry.—Kuhlow.

THIS IN FREE TRADE ENGLAND.

We learn from Manchester that a petition has been extensively signed there in favor of imposing a tax on imported foreign manufactured goods. The increase in many articles imported during the last quarter of a century is much greater than most people have any idea. In a list enumerating 50 classes of imported manufactured articles, the value has increased from about £71,000,000 in 1874 to over £136,000,000 last year. One of the most significant facts is that the value of imported cotton manufactures has advanced, during this period, from £1,630,661 to £4,751,309. The petition has been organized by the British Empire League.

WOOLEN EXHIBIT AT OTTAWA.

The Woolen Section of the Canadian Manufacturers' Association having accepted the offer made by the Minister of Public Works of a room in the House of Commons at Ottawa, in which to make an exhibit of Canadian manufactured goods, a display was made there during the second week of the session. Though the room was small, an exhibit was made which must have convinced members of Parliament, and others, that Canada can produce the very highest class of woolen goods, which was the object with a view of removing the impression which seems to have got abroad that the preferential tariff is hurting the woolen industry in Canada, mainly because our goods are inferior. Members of Parliament were individually invited to visit the exhibit, and most of them did so. They had an object lesson which was an education for many of them, and which will, we hope, be productive of good results.

All branches of the woolen trade were well represented, but cloths and tweeds were specially good. The following furnished goods for the display:

The Rosamond Woolen Co., Almonte, worsteds, overcoatings, and tweeds.

The R. Forbes Co., Hespeler, worsteds and serges in all weights and patterns. These two displays attracted much attention.

The Cobourg Woolen Mills, pure woolen and worsted cloths and ladies' costume cloths. This display was a different class of goods from most of the others, and was much admired.

S. T. Willett & Co., Chambly Canton, Que., flannels, overcoatings and suitings.

The Canada Woolen Mills, tweeds, serges and ladies' dress goods.

The Canadian Woolen Mills, St. Hyacinthe, suitings and heavy overcoatings.

Duften & Sons, Stratford, Ont., homespuns and tweeds. George Pattinson & Son, Preston, homespuns and heavy overcoatings.

The Montreal Woolen Mills Co., samples of their medium and low-priced goods.

The Brook Woolen Co., Simcoe, tweeds, Halifax tweeds, horse blankets, and fancy rugs.

The Paris Wincey Mills Co., flannels, winceys and tweed suitings.

Toronto Carpet Manufacturing Co. Toronto, Axminsters and Ingrain carpets. Their rugs were much admired, particularly a splendid Smyrna rug.

Guelph Carpet Mills, Guelph, Brussels and Wiltons.

Dominion Carpet Co., Sherbrooke, Brussels carpets, borders, etc.

Penman Mfg. Co., Paris, Ont., knitted underwear, socks and stockings and fine hosiery, men's top shirts and boys' and men's sweaters.

The Galt Knitting Co., Galt, knitted underwear.

Brown & Wigle, Kingsville, blankets, fully equal to blankets made anywhere else in the world; all-Canadian wool.

The Montreal Cotton Co. had samples of their goods, the colors and patterns of which were handsomely set out.

The exhibition was a success, and drew forth many expressions of commendation.

A NEEDLESS SCARE.

Much has been said within the past few years regarding the probability of the demand for rubber exceeding the supply. A year or so ago there was quite a furore created in rubber circles over the question, and speculation was rife as to the best means of averting such a catastrophe. Numerous substitutes were invented. The reports being received at present from those who are searching for new fields from which a supply of rubber may be obtained are gratifying, and show that any anxiety regarding the future of the market need not be entertained, for some time at any rate. The list of rubber plants is constantly growing, and within the past two years a number of plants and trees, never heretofore used, have begun to yield a harvest of rubber. Along the valley of the upper Nile, which ten or fifteen years ago yielded practically nothing to the wealth of the world, now exists a rubber industry that is in a very flourishing condition. The export trade of the Congo Free State, French Guinea, Madagascar, and Lagos, has been increased wonderfully of late years, which is almost altogether attributable to the India rubber found there. In Africa, the discovery was made two years ago that six varieties of Landolphia, one of the Ficus, and one among the Kickxia species, yield rubber of excellent commercial value. These are a few of the places in which the yield of rubber is enormous, but others might be mentioned. One other is worthy of note, the region known as Upper Laos, in French Indo-China. The district of Ninh alone sent out 340 tons in 1900, and this is only a very small portion of the rubber-growing district.

BAD FIRE IN TORONTO.

A destructive fire occurred in Toronto on the evening of February 20th, by which the Menzie-Turner Window Shade Co., and the Merchants' Dyeing and Finishing Co. sustained heavy loss. The fire broke out in the third story of the Menzie-Turner main manufacturing building, and is supposed to have originated from spontaneous combustion among waste from the finishing machines. The waste is thrown into iron pails, which are emptied at 5.30 p.m., but it is believed that after being emptied, some further waste had been placed in these receptacles. With so much inflammable material about, the fire spread rapidly, and before it could be mastered, the main building and machinery were completely destroyed, but the office, stock and shipping rooms, kiln and benzine house were saved. The fire spread across a ten-

foot lane, which was all that separated them, to the premises of the Merchants' Dyeing and Finishing Co., whose stock and finishing rooms, together with a most expensive machinery plant, was destroyed. The dyeing rooms partially escaped. The Menzie-Turner Co.'s loss is placed at \$75,000 on buildings and machinery, with \$40,000 insurance, and \$25,000 on stock, from smoke and water, with \$65,000 insurance. The Merchants' Dyeing and Finishing Co. lost \$26,500, which was more than covered by insurance. Fortunately, they had a few hours before removed a large load of finished stock to their warehouse in the city.

JUTE MANUFACTURING IN MEXICO.

The first jute factory in Mexico was inaugurated in 1894 by J. F. Kinnell, near Orizaba, in which electric motive power is used. The Mexican Journal of Commerce states that the concession obtained by Mr. Kinnell from the government was dated December 3, 1892, under the terms of which the factory was to be finished and in operation within three years from that date. He commenced building the factory nine months after obtaining the concession, and had it ready to inaugurate within fifteen months, when it began to manufacture carpets, sacks, packing cloth, etc., from jute. These articles are now in active demand, and a new and profitable industry has been successfully introduced.

—During the past year 59 cotton mills were built in the United States, of which 39 are in the south and 20 in the north. The spindles in the new mills amount to 291,424, as compared with 1,306,784 in 1900.

—In 1900, Germany exported \$1,500,000 worth of rugs and carpets, chiefly to Denmark, Holland, England, Austria and Switzerland. Germany also imported 259 tons of carpets from countries which compose the Turkish Empire.

—A patent has been obtained by John Stevenson, of Edinburgh, for dyes and pigments, which when applied to a textile fabric, gradually change on exposure. Two or more substances are used for each color, all of which may be non-permanent, or only some of them. Hence, the color gradually changes by the destruction of the non-permanent ingredients, and by fresh color-combinations among the others if such are present.

—In September of last year there were 50 cotton mills in Japan, operating 1,038,847 ring spindles, and 61,871 mule spindles, being an increase of 79,612 during the previous year. The average working days were 27½ per month, and hours, 21 per day; average yarn spin, 19's on ring spindles and 37½'s on mules; amount of yarn spun, about 24,000,000 lbs., an increase of 833,000 lbs. over the year before; consumption of cotton about 4,000,000 lbs.; consumption of coal, 60,842,000 lbs.

—The cotton millmen of Fall River have recently undertaken a new plan, which, if it proves practical, may be the means of settling most labor troubles without strikes. It provides for the appointment of a committee of manufacturers, who shall have power to investigate disputes, meet the representatives appointed by labor unions to present their side of the cases, and act for the mills interested to the extent of determining which side is right and the amount of support that shall be given if the committee decides that the mills are in the right.

THE LARGEST LOOM IN THE WORLD.

The item which appeared in our January number stating that the biggest loom in the world was at the Lachute woolen mills, owned by Hamelin & Ayers, Lachute, Que., has been extensively copied. There has been some incredulity among Canadian woolen mill men, and we must confess that when the facts were reported to this office we thought there was some mistake in the figures. Since the publication of the item, however, a representative of this journal has been to Lachute, and was permitted to see the loom working, and can now assure those interested that the figures are correct. The reed of this loom, which was made by the J. C. McLaren Belting Co., of Montreal, is as stated, 50 ft. 3 in., and the shuttle travels this immense distance with ease and accuracy at 14 picks per minute, which as far as the distance traversed is concerned is equal to the speed of the modern fast running loom. We are not authorized to publish an engraving of this loom or mention the purpose to which it is applied, but we may say that three looms, having 23 ft. reeds are in use in this factory, and a new loom to take a reed 95 feet long is now being planned.

This new dyestuff is remarkable for its cheap price and gives a full and deep shade of good fastness against air, light, alkali and acids. In Unions and in silk and cotton mixed goods, the cotton is dyed a deeper shade than the animal fibre. Direct Violet O may also be diazotized and developed, its shade becoming a

Dark blue by means of Beta Naphthol.

Reddish blue by means of Alpha Naphthol.

Greenish blue by means of Ethyl Beta Naphthylamine.

Grayish blue by means of M. Phenylendiamine.

Bluish gray by means of Phenol, Resorcinol or Toluylendiamine,

Bluish violet, by means of Soda.

Of these shades, the dark blue obtained by development with Beta Naphthol, is standing best against alkali, washing and acids, being thus most appropriate for velveteen chains which have to stand topping in an acid bath. The reddish blue obtained with Alpha Naphthol, too, is of interest. Fastness against light and washing of the developed shades is improved by a treatment with blue stone.

Direct Violet O is a new shade just put on the market by the Society of Chemical Industry of Basle, for whom Watson, Jack & Co., Montreal, are Canadian agents. Its cheapness, its fastness against light, alkali and acids, and the readiness with which it can be diazotized in different ways combine to render it quickly popular.

LITERARY NOTES.

Among the interesting articles in the March number of the Canadian Magazine are three special ones on the future of the Territories, entitled, "The Movement for Autonomy," by H. W. H. Knott; "When Edmonton and Prince Albert are Connected by Railway," by John Howey, and "Manitoba and Territorial Autonomy," by W. Sanford Evans. Other articles of interest are "John Bull in His Shop," by A. R. Carman; "The Making of Pemmanic," by Blesdell Cameron, and "Commercial Education," by Prof. John Cox.

The Prince Edward Island Magazine for February is late in coming to hand, but it contains a number of interesting articles, bearing mainly upon the early history of that province. The frontispiece is a view of the city hall, Charlottetown.

The Ladies' Home Journal for March is, as usual, full

of good things. This publication ranks as one of the very best of the day. Curtis Publishing Co., Philadelphia.

The April Delineator will inform our lady friends as to the latest fashions, besides giving them some interesting reading matter, hints as to house decoration, etc. Butterick Publishing Co., New York.

The Century Magazine is too well known to require any commendation. The March number will be found as usual full of interesting articles of a distinct literary flavor, and well illustrated. The frontispiece is a portrait of Lord Tennyson. An account of Kubelik, the great violinist, now in this country, and an article on Marconi and his trans-Atlantic signalling work are particularly timely.

The Lachute Shuttle Co., Lachute, Que., have got out a 58 page catalogue of shuttles, bobbins and spools manufactured by them, and of mill supplies in kindred lines in which they are dealers. This business was started in 1883, and since Mr. Ayers took hold of it a couple of years ago the plant has been greatly improved. A number of special machines have been installed during the past year, and the factory is now running full time with a large force of hands. In the catalogue under notice about 30 different kinds of shuttles are illustrated, some of which contain ideas worked out by the firm. One of these new shuttles is considered the simplest and safest shuttle on the market, and one of our large cotton mills has equipped all its looms with this new type, after making a thorough test of it on a few looms. A copy of the new catalogue will be sent to textile manufacturers interested.

—The suspender manufacturers are asking the Government for increased protection.

—M. Saxe & Sons, clothing manufacturers of Montreal, have assigned with heavy liabilities. They have been in business twenty-five years.

—The Canada Thread Co., of Montreal, is being prosecuted for refusing to answer the questions asked in connection with the census.

—Scougall Bros., dry goods merchants, of Vancouver, have assigned. They have been in Vancouver for five years, having gone there from Cobourg.

—The Northrop loom seems to stand well in English manufacturing districts. A deputation, representing the weaving industry in Lancashire, is coming to America for the purpose of seeing that loom at work, and to thoroughly inspect other improvements in American textile machinery.

—The Master Cotton Spinners' Federation in Britain, which has a paying membership of 21,000,000 spindles, has passed a resolution strongly recommending its members who are spinning American cotton to stop their factories two days a week, so as to curtail the output.

—On the 13th inst. a peculiar accident happened to W. P. Blackley, manufacturers' agent in fancy dry goods, Toronto, and formerly manager of the wholesale millinery business of D. McCall & Co., Toronto. Mr. Blackley was awaiting a street car at the corner of King and Yonge streets, when a draw head, thrown into the air by the force of a collision between a motor car and a trailer, struck him on the head, fracturing his skull above the temple. He was taken to the Emergency Hospital. Mr. Blackley's many friends will join in the hope that he will soon recover.

COTTON MILLS OF INDIA.

A report of the India Department of the British Government gives some interesting facts about India's cotton mills: There were in India at the end of 1900—1901, 190 cotton mills (of which 16 did not work during the year), containing 40,542 looms and 4,932,602 spindles. Of this number, 106 were exclusively spinning mills; three were exclusively weaving mills; and in 81 both spinning and weaving were carried on. They employed a daily average number of 156,039 persons; 99,697 men, 31,247 women, 15,564 young persons, and 9,531 children. The 16 mills, which were not worked in the year, contained 690 looms and 242,173 spindles. There were many other mills in which no work was done for more or less considerable fractions of the year, while depression was at its worst. The consumption of cotton by the mills is estimated to have amounted in the year ending June 30th, 1900, to about 1,424,300 bales, of 400 pounds each, or say 5,087,000 hundredweight, a quantity representing a material proportion of the whole production of cotton in India, which may be taken in an ordinary year, allowance being made for unreported areas, at about 3,000,000 bales. The prosperity of the cotton spinning and weaving industry is consequently of great importance in Indian agricultural economics. The mill consumption included 188,796 hundredweight of imported cotton, mostly long stapled cotton from Egypt and other countries not in Asia. The industry dates from 1851, when the first mill was started. In the last twenty years the number of mills has increased by 206 per cent., and their working capacity has been proportionately augmented, the number of looms having increased by 182 per cent. and of spindles by 218 per cent. In the last three years as many as 27 new mills have been started, the looms and spindles added in the same period numbering 3,596 and 721,846 respectively.—Excelsior.

WHITE WOOLENS.

We are indebted to Hofmann, of Dresden, for an interesting communication upon the processes employed in obtaining a pure white on wool.

As is well known, it is impossible, even with the most energetic bleaching agents, to remove from wool a slightly yellow tinge which is readily seen if bleached wool is compared with bleached cotton or silk. When attempts are made to hide this shade by means of a complementary blue, as is done on cottons, curtains, paper, etc., bad results are obtained.

Many attempts have been made to give the wool a brilliant white by covering it with white substances such as carbonate of magnesia, for example, and this was used for some time for this purpose. But its use has been abandoned on account of the dust which comes from the wool when the goods are in store. It has been proposed to cover the wool with cotton by dissolving the cotton in ammoniacal copper solution, impregnate the wool with the solution, and then fixing the cotton on the wool by means of acid. An ether bath has been finally applied to render the cellulose opaque.

Hallab reaches the desired result by the use of hydrosulphite of soda and indigo. The effect is a double one: the hydrosulphite acts as an energetic bleaching agent, and on the other hand it renders the indigo which is deposited mechanically upon the fibre soluble and causes it to penetrate the fibre. By subsequent oxidation in the air, the indigo comes out with a complementary blue shade which neutralizes the yellow of the wool. It is doubtful, however, if an absolutely perfect neutralization of the yellow can be reached with a blue pigment in this way.

As we have said above, the numerous experiments with different coloring matters, such as ultramarine, sulphindigotic acid, aniline blues, etc., have failed to give satisfaction.

The following recipe for the use of hydrosulphite is taken from the *Deutsche Farb. Zeit.* The hydrosulphite of soda should be made just before it is to be used. Digest seven parts of zinc powder, or twenty to thirty parts of feathered zinc or sheet zinc with a concentration solution of bisulphite of soda representing 100 parts of the dry salt. This must be done in a closed vessel, and the mixture must be stirred from time to time for an hour. Decant the clear liquor which contains the hydrosulphites of soda and zinc.

The goods must be carefully purified, washed and scoured, and then worked in a bath of cold water containing indigo in suspension in a very finely divided state. The best indigo to use is that which furnishes reddish-blue shades in an ordinary vat.

The wool should come from the bath evenly covered upon the surface with particles of indigo, and it is then plunged into the bleaching bath. This bath is composed of water and of the hydrosulphite liquor described above, prepared so that the bath will stand from one to four degrees B. While the wool is passing through the bath add a quantity of acetic acid equivalent to the hydrosulphite present. The goods must be properly worked in the bath so that there may be no unevenness in the reduction of the indigo.—*Moniteur Scientifique.*

BOILER COMPOSITION AND STEAM FOR DYEING.

If the steam user could get hold of pure water he would have no need to use preparations for the prevention of scale in his boilers, nor would the dyer have need to consider whether such preparations if they get into the steam that heats his dye-vats, have any effect on his colors. But, unfortunately, the steam user cannot get hold of pure water, and must be content to employ such water as nature supplies him with, even if that water be highly charged with lime and magnesia salts that form a scale in his boilers. In order to prevent the formation of this scale he purchases "boiler compositions," and sometimes, if he is a dyer, he has an uncomfortable feeling that these might affect the dyeing operations by going over with the steam. Now all the substances which the writer has found in boiler compositions have been of a perfectly non-volatile character, and so, theoretically, they will not pass over in the steam, and hence cannot get in the dye liquors. The only chance of their being carried along with the steam is when the sludge, scale and composition are allowed to accumulate to such an extent that the water inside the boiler does not boil quietly but in spurts and jerks, and then some of the water is jerked into the steam pipe and is then carried along the pipe by the steam. Another cause is the want of sufficient steam space in the boiler. There should always be allowed sufficient room in the boiler for the natural ebullition which occurs by the water boiling, so that any particles of water carried up into the steam space can settle down before the steam passes into the steam delivery pipe.—*Textile World.*

NEW COAL TAR DYES.

During the year 1901 some 136 new dyes, derived from that everlasting source, coal tar, were put upon the market according to the *Textile Mercury*. Of these, 11 came from English works, 20 from Swiss works, and the rest from German works, a circumstance which indicates the preponderance of German efforts in introducing new dyes. Thirty-two

of these dyes belonged to the group of sulphur dyes now coming so much into prominence, while only nine were basic dyes which small figure indicates the decay in the development of really the oldest type of dyes. Forty-eight dyes belonged to the direct cotton dyes; 35 were acid dyes for wool and silk, and 12 were mordant dyes capable of being used in wool dyeing and calico printing.

THE LOOM OF TIME.

(See Job vii., 6, and St. John xiii. 7.)

"Man's life is laid in the loom of time
To a pattern he does not see,"
While the weaver works and the shuttles fly
Till the dawn of eternity.
Some shuttles are filled with silver thread,
And some with threads of gold;
While often but the darker hue
Is all that they may hold.

But the weaver watches with skillful eye
Each shuttle fly to and fro.
And sees the pattern so deftly wrought
As the loom moves sure and slow.
God surely planned the pattern—
Each thread, the dark and fair
Is chosen by his master skill
And placed in the web with care.

He only knows its beauty,
And guides the shuttles which hold
The threads so unattractive,
As well as the threads of gold.
Not till each loom is silent
And the shuttles cease to fly.
Shall God unroll the pattern
And explain the reason why
The dark threads were as needful
In the weaver's skillful hand.
As the threads of gold and silver,
For the pattern which he planned.

QUICK WORK IN CARPET MANUFACTURE.

The Carpet Trade Review tells of an example of remarkably quick as well as high grade work in carpet manufacture, which was shown in the execution by the Whittall Mills, Worcester, Mass., of an order for 20 yards of Victoria Wilton carpet to be used on the pier in New York when Prince Henry landed. The committee having in charge the reception of the Prince expected him to arrive on the morning of the 22nd February, and asked a carpet firm to provide royal purple carpet for the occasion at practically one day's notice. The Whittall Mills received the order at 8.45 o'clock on the 20th, and from that moment every second was made to count. Immediately one of the vats in the dyehouse was emptied of its contents and clean water was pouring through it, making everything ready to receive the purple dye. It took two hours to finish the dyeing of the yarn. At 11 o'clock sharp a sample of the yarn was given to the colorist, who passed the color as perfect, and the yarn was out of the tubs and gone to the extractor. At 11.15 the yarn was in the drying machine and an auxiliary engine was kept going through the noon hour

that there might be no let-up in the process, which occupied one hour and twenty minutes. The yarns had next to be wound from the skeins onto bobbins. Instead of using one side of a frame, with two girls to do the work, two sides of the frame were employed, with eight girls, each picked for her exceptional skill. In 45 minutes the work was completed and at 2 o'clock a light express team had hurried the yarn to the weave sheds. A carpet had been cut out of a loom. The cards had been cut, not a long process, because a perfectly plain carpet was to be woven. The most expert weaver in the mill, with two spare boys to help him, put the yarns into the loom, and before 3 o'clock had struck the loom was weaving Prince Henry's carpet. At 11 o'clock on the 21st the 20 yards were woven, but it was necessary for two girls to go over every inch of it as it was pulled over a table looking for imperfections, and make them good if any were found. Then the carpet went into the shearer, and through the steaming process and drier, was passed upon by the expert and pronounced perfect by him and then resheared. Finally, instead of being rolled, it was packed into a great trunk, hurried into a wagon in waiting for it, and a messenger, mounted on a fast horse, took it to the railway station just in time for the New York train. It was delivered at the store of the firm which ordered it at 6 o'clock p.m. of the 21st, made up by them at once and was ready for the landing of the Prince when he arrived on the 22nd.

THE COST OF LUBRICATION.

The entire cost of oil and grease used to lubricate the machinery in a mill, shop or factory is small when compared with the total expense of operating the establishment, yet if there is a chance to save a few dollars per year on this item, we are sure that there are many concerns who would accept such a saving with much satisfaction, therefore we wish to present a few ideas on the subject which may assist along this line.

So much has been said and written concerning the foolishness of buying oil that is cheap without regard to its lubricating qualities, that anything more may seem superfluous, nevertheless there still appear to be some managers who overlook this fact, judging by the quality of oil they buy.

Their persistency in buying oil that is low in first cost may be due to a conviction that the men who use it will waste about so much any way, without regard to quality or cost, and we must admit that they are not to blame for this in many cases, as the facts warrant it. The moral of this is that men should be more careful of the supplies they use, but on the other hand the habit of wastefulness is sometimes caused by the enforced use of stuff that is totally unfit for use on decent machinery.

The use of grease is sometimes favored because the boxes on the shafting have been filled with it many months ago and they are not empty yet. This grease may be so hard and dry that the shafting turns hard, thus requiring much more power than would otherwise be necessary, and this extra cost of power may be sufficient to pay the entire oil bill, for good oil, too.

There are some places where the engines are overloaded, simply because poor oil or bad grease is used on the boxes. Thorough reform in this matter would make a great difference, and might make the expense of a new engine entirely unnecessary.

A very practical way to demonstrate whether an improvement can be made along this line or not is to take indicator

diagrams from the engine with the shafting and loose pulleys alone running, and carefully note the power required.

Discontinue the oil previously used and try something supposed to be better. After this has been in use not less than one week, more indicator diagrams should be taken and the power they show carefully determined. A comparison of the two sets will quickly show whether an improvement has been made or not. Great care should be taken to know that none of the machines are running in oils are considered, for when a man gets used to using a certain kind of oil he frequently declines to change. We have heard that a financial consideration in the form of bribes given and taken has sometimes hindered changes that might have resulted in a saving of power, and prevented undue wear of machinery, but of this we have no positive knowledge, therefore cannot claim to judge the matter except to say that such practice is poor policy, and should be discontinued at once. Every time that a man takes a bribe he forges a link in the chain that will finally ruin him.

Every engineer or other employee should be perfectly free to use the articles that will answer the intended purpose best, as merit alone should decide the question in every case.—The Tradesman.

Foreign Textile Centres

Bradford.—The tone of the market is well maintained, and topmakers are firm in spite of the small amount of new business. For the time being they are well employed, and generally disposed to await developments, as they are convinced that at the next London sales fine wool will be firm at full rates. In the heavy woolen districts business shows a distinct improvement, and makers of tweeds, serges, and mixtures are, as a rule, well employed, some firms being enabled to start machinery which had long been idle. Spinners cannot yet command better prices for Botany yarns, and they are not inclined to take tops in anticipation. The crossbred trade continues healthy, and there is a large turnover. The finer sorts are firmer. Home-grown wool is not active. Good classes of both raw alpaca and mohair are quite firm in price, and recently there has been a better enquiry from the woolen trade for some classes of short winter hair in the latter material for mixing into woolen fabrics. There is some improvement in the continental demand for men's wear cloths, and the South African and colonial business continues very good.

Leeds.—Milder weather has had a good effect, and, with the exception of low class woolens, producers are tolerably well employed, while the sales from stock are up to the average at this part of the season. All worsteds of the better class are going into consumption in large quantities and a considerable proportion of the bulk is being taken by Australia, whose orders seem to indicate a vigorous demand by the Colonial spring market. Canadian business is likewise encouraging. The export to the Japan market, which showed a serious falling off last year, has revived and is the most hopeful feature of the trade situation. Rainproofs are in demand for the home market. It is now generally expected that gray will be the most conspicuous color for spring suitings and summer wear. The clothing factories are fully employed, as a rule. Wool is very firm and worsted yarns advancing.

Belfast.—The linen market is quiet, but steady. There is no change in the general situation, business being placed to a

moderate amount day by day, but no briskness. The spring demand continues to drag and orders are only for assortment. Prices keep unsatisfactory, yarns being salable only practically at cost price, or even below it. The manufacturing end is in a fairly healthy condition, but there is not much buying in advance of immediate need. The home trade in white goods shows a further slight improvement. The shipping business is well maintained, and a trifle larger. Orders from the colonies are improving, those from both Canada and Australasia, particularly the former, showing an increase both in number and value. Trade with the continent has begun to recover to some extent. In the brown cloth market a steady and slightly growing business is passing, and rates are well sustained. Powerloom linens for bleaching are in moderate request. Cloth for dyeing and hollandis is selling quietly. Unions are in fairly active demand. The trade in damasks and housekeeping continues to be large and satisfactory. The handkerchief branch is rather quiet, but cambric cloth is in request at full rates.

Dundee.—The trade in Dundee is without marked change. Jute is rather easier. At this season of the year jute generally arrives less satisfactory than early jute. This has led to rather numerous arbitrations, which have generally been decided in favor of the buyers. First-rate qualities are still scarce. Some orders are coming in day by day from the United States and other over-sea buyers, and in a few weeks makers think that the enquiry will be further improved.

Nottingham.—There is a steady demand for lace and hosiery yarns, but there is no speculative business doing, and prices are unaltered. Bobbin nets and plain tulle are moving in good quantities, and there is no further change in values. There is a brisk business doing in fancy cotton, millinery laces and nets, and orders are running in arrear. The hosiery trade is moderately active. Wool and mixed goods are firm in value.

Leicester.—The hosiery trade is in a sound condition, and the new business coming to hand gives promise of a large increase over last spring. The yarn market is active and the turnover is above the average, while the firmer prices are attracting many enquiries with the view of covering future requirements.

Manchester.—Handkerchief printers are busy turning out large quantities of flags, etc., for the coronation decorations and find difficulty in keeping pace with the orders. In the calico printing trade a "muslin year" is anticipated. The new designs in this class of goods are most artistic.

Kidderminster.—The tone of the carpet trade is healthy, but there does not appear to be any great pressure in business. The deliveries of goods, ex-warehouse, continues, and this gives an air of activity, but it must be admitted that trade is not as brisk as it ought to be at this season. Full time prevails at the mills, but all the looms are not continually employed. The London carpet season has opened later than usual, and orders are now coming in, but buyers do not seem very eager for the work. The demand for the best grades of Wiltons and Brussels is represented as being unusually strong in America, and one or two Canadian carpet representatives have been on this side of the water during the last few days. The yarn trade is unchanged as far as prices are concerned, but it grows stronger on account of a rather better general demand.

South of Scotland.—Business continues extremely steady in the tweed districts of the South of Scotland. All the mills are working full time, and in a few cases overtime has to be resorted to in order to overtake orders. Few transactions are

reported in wool. The improvement in the Kirkealdy linen trade continues. The floorcloth linoleum industry is also picking up.

KNITTERS AND KNITTING, OLD AND NEW.

Nottinghamshire.

There is a tinge of romance in the events which led up to the invention of the stocking frame and the founding of the knitting industry in Nottinghamshire, pathos, too, in the fate of the inventor, making sad reading in the history of a trade which has had its full share of vicissitudes and embraces many stirring and even tragic events in its records.

The origin of the first machine to reproduce by mechanical means the swift intricate motions of knitting pins, deftly manipulated by women's supple fingers, is inseparably linked with the unrequited love of the Curate of Calverton, Notts., William Lee. The story carries us back to the reign of "good Queen Bess," when we find the gentle country cleric paying his addresses to a lady of the village who—Blackner, a local historian, tells us—"was always more intent on her knitting than on the caresses and assiduities of her suitor."

Failing in his suit, the disappointed lover sought solace and distraction in the absorbing and ever-open field of mechanical invention. Thus it came about that in 1589, when the echoes of the village joy-bells, celebrating the repulse of the Spanish Armada, had scarcely died away, we find the first crude stocking "frame," the outcome of the country parson's patience and genius, completed and successfully working at the neighboring village of Woodborough.

"Then," Deering tells us in his history, "after he had worked awhile, he taught his brothers and several relations to work under him, and for some years Lee practised his new art at Calverton."

This would mark the first steps in the establishment of framework knitting in Notts., and it is on record that Wm. Lee's relatives thought the new employment so honorable as to justify the wearing of silver work-needles suspended at their breasts by a silver chain.

The increase of production effected by Lee's first machine would be remarkable even in these days of never-ending improvements in hosiery machinery. If we take one hundred loops per minute as the maximum of work that could be accomplished by an expert hand-knitter and consider the fact that Lee's machine had a capacity of 500 to 600, we can form some idea of the value of his invention, and the stir it would create in hand-knitting circles at the time of its inception. By the time the inventor had so far perfected his machine as to work silk, he had increased its speed by 50 per cent., i. e., 1,000 up to 1,500 loops per minute.

Manifold and varied are the improvements which have been introduced by successive generations of clever hosiery machinists, in the time that has elapsed since Lee's day, but we fancy that the machine builder who could increase the productiveness of the perfected "Cotton's system," and the "automatic" knitters of to-day in the same ratio, would find a ready market for his wares and a warm welcome at the hands of the manufacturers, who find their profits declining to vanishing point in these days of fierce competition.

We may pause here to admire the ingenuity, the patience, and the skill of this sixteenth century inventor, equipped only with the primitive tools of three centuries ago. The difficulties to be faced would be legion, and his would be a

herculean task, compared with that of the inventor of the present day, who finds his path made smooth by the aid of the labor-saving devices installed in modern machine shops. Its successful accomplishment is an achievement of which the inventor and the county which gave him birth might well be proud.

We can only touch briefly on the later career of this unfortunate inventor. His lot was that of many another unappreciated genius, fated to suffer neglect and misfortune, and after a troubled life to be robbed by death of the just reward of his inventive skill. Wm. Lee carried his frame to London and found a friend at court in Lord Hunsden, a kinsman of Elizabeth, who induced his Sovereign to journey to Bunhill Fields to see the wonder-working frame at work. But the machine and the coarse woollen web it produced failed to please the royal visitor, who fancied, with kindly but mistaken forethought for the welfare of her humble lieges, that the general use of the new machine would result in loss of employment and disaster for many of her loyal subjects, the hand-knitters.

Hence the following characteristic reply of the Virgin Queen to Hunsden's appeal on Lee's behalf for a patent for the invention:

"My Lord,—I have too much love for my poor people, who gain their bread by the employment of knitting, to give my money to forward an invention that will tend to their ruin by depriving them of employment and making them beggars. Had Mr. Lee made a machine that would have made silk stockings, I should, I think, have been somewhat justified in granting him a patent for that monopoly which would have affected only a small number of my subjects; but to enjoy the exclusive privilege of making stockings for the whole of my subjects is too important to be granted to any individual."

Despite this letter, which does more credit to the monarch's heart than head, Lee continued to enjoy the friendship and support of Hunsden, who showed his high opinion of the invention by apprenticing his son, Sir William Cary, to the trade. Thus the framework knitting industry enjoys the distinction of having for one of its earliest apprentices, a knight, the son of a peer of royal blood.

In 1598, Lee had so far perfected his machine as to make silk hose thereon, or as Stowe quaintly puts it in his Chronicle, "devised and perfected the art of knitting silk stockings by engines and steel looms." He had now, we should imagine, from a mechanical point of view, reached the height of his ambition, and it was, doubtless, with feelings of pride and satisfaction at the successful result of years of patient experiment that he presented a pair of the dainty silk hose to his Queen.

But the royal favor was still withheld, and the accession of James I. brought him no nearer the realization of his hopes of royal patronage. Need we wonder, then, that the inventor, heartsick at the neglect and indifference of the rulers of his native land, yielded to the strong inducements held out to him by our Gallic neighbors (through Sully, Marquis de Rosny, a special envoy to the English Sovereign), and transferred his little plant of frames, nine in all, from London and the Midland shires to Rouen. Here the new industry, thanks to the fostering care of the French ruler, for a time flourished and thrived apace.

The final blow to Lee's hopes was yet to be struck, and the assassination of the French King was but the forerunner of a train of disasters to the ill-fated inventor. Following on the loss of his royal patron and protector, misfortunes—not in single spies—came quickly, and Lee died, after a troubled life, of grief and despair, in Paris, in 1620. He lies

in an unknown, unmarked grave, and for nearly three centuries no memorial existed to honor his name, save the shrill sound of slurcocks restedlessly oscillating from side to side with noisy activity, the heavy rhythmic roll of cam-laden shafts and the ceaseless rattle of revolving cylinders in the huge factories scattered over two hemispheres.

These, indeed, attest his fame more eloquently than sculptor's stone or bronze; but ten years ago came long deferred recognition of the value of his invention and the immense industrial advantages which followed in its train, and a fine block of buildings, comprising schools and a men's institute, now stand in the village of Calverton, Nottinghamshire, keeping green the memory of the founder of a great and ever-increasing industry, which has radiated from the Nottinghamshire hamlet to every quarter of the globe.—Hosiery Trade Journal.

POINTS AS TO WOOL.

A fleece of wool is the product of a single sheep, a sack of wool of a number of sheep, so that the term wool implies an aggregation of fibres. It is a commercial term, and although it is known only as wool at the mill, it is treated from the beginning to the end of first processes as fibres; that is to say, the fibres are treated as nearly alike as possible. Hence the subject should be considered from a microscopical point of view. Anent the application of oil to wool fibres. The object is to lubricate the individual fibres, but by no known process is that object attainable; the next thing is the nearest possible approach to it. Old methods are familiar; automatic distribution is not so widely known. The large majority of mills are using one or another of the old methods. In the old times the carder himself attended to the oiling. He pulled off his boots and stockings, rolled up his trousers, walked from side to side over the thin layers of wool, with a pail of warmed oil, flicking it from his fingers as he slowly passed along. This was a slow process, but as to the distribution it is doubtful if it has been much improved upon. This for the benefit of those who do not possess the means of automatic distribution. Paddles and garden sprinklers are the most unreliable of all the old methods. Wool fibres will absorb a certain amount of oil, and all in excess of this is loss. They will also hold large quantities in excess of absorption, as in the case of a handful of fibres dipped in oil. This is saturation, and is the evil attendant upon the use of the paddle and sprinkler. The walls and floors of oiling and gauze rooms are mute evidence of this. All loose oil will find its way to whatever will absorb it. It will not remain on the fibres if they come in contact with a more free absorbent of any kind. After oiling a batch should not be used at once. It is better to lie over night, or longer, if possible, as fibre will not absorb the oil instantly, and colored fibres less quickly than those in their natural state. If the scales are hardened there is little, if any, absorption. It is, of course, impossible to treat every fibre alike, be the batch large or small, but any neglect to make the best use of any method is attended with grave risk. The more evenly the oil is distributed in the carding and spinning, the easier it will wash out and the better the cloth will full. Saturation is the worst feature in applying oil to fibres. No one of the various processes of woollen manufacture has received so little attention at the hands of textile writers as that of oiling wool. The methods generally employed were so crude and unsatisfactory that doubtless those using them could find little to say. Carders recognized the need of something better, and it was constantly in evidence, in one form or

another, that uneven oiling is a serious matter. They are aware that sheets or fillet soaked with oil will not hold the teeth firmly in place, and that some oils are of no advantage to card wire. Leather is especially sensitive and becomes hardened and brittle under this deleterious influence. Wood is also susceptible to this evil. But the carder views the matter from other standpoints. He knows the effects of uneven oiling, but, although he does his best, fails in what he desires to accomplish. Four quarts of oil to one hundred pounds of wool has become a recognized proportion, and the condition of the wool is seldom taken into consideration. If it comes from the dye house containing color refuse sufficient to absorb a percentage of the oil, large or small, no allowance is made; the four quart law applies, and all absorbed by the refuse is so much lost to the wool. The absorbing process is not the only evil. The compound of oil and foreign matter is converted into a gum which adheres to the fibres and partially or wholly prevents the penetration of oil. Fibres thus coated are not in the best condition to be carded and spun. If oil is unevenly distributed upon wool containing absorbent material, matters are made only so much the worse; the coated fibres will become stiffened and their pliability affected. Whatever may be expected of the carder, he cannot handle these fibres alike. The worst conditioned exert a controlling influence, and the result is more or less deterioration, as when shoddy is mixed with wool. The softest coatings will harden in time, and possibly before reaching the last card. Before reaching this stage the card teeth will have become glazed with the gummy substance, and so the actual carding principle will be rendered ineffective, as all carding is done below the points of the teeth. It is an established fact that the more perfect the blend of the fibres of different lengths the more uniform will be the resulting product. No less important is the fact that the more even the distribution of the oil over the fibres the nearer we approach uniformity of product.—Dick in Fibre and Fabric.

INCREASE IN WASTE.

The subject of waste is an important one, alike to cotton manufacturer and operatives, although a great many of the latter do not appear to realize its importance, judging from the manner in which some of them make unnecessary waste. Manufacturers of print cloth estimate that out of every one hundred pounds of cotton purchased 15 per cent. goes to waste. This estimate is made by men who watch every source of waste, and if it be correct there must be something radically wrong with modern machinery. Sixty years ago manufacturers estimated that the waste in one hundred pounds of cotton was only from 8 to 12 per cent.

The sources of waste are as many as the machines used, but the larger part is produced in the picker house and the carding room. The amount of waste made in spinning, spooling, warping, slashing and weaving will not exceed 1 per cent. in well regulated mills, but the greater the amount of labor put into the material before it becomes waste, makes waste from those departments more expensive to the mill than that from the earlier processes. Thus a pound of waste made at the loom costs the mill at least 50 per cent. more than a pound of waste made at the cards, and the finer the yarn the greater the loss to the mill compared with the price of the raw material.

The small amount of waste made after the material leaves the carding room has no appreciable effect on the weight of the finished fabric, as the sizing makes up for that loss. The larger part of the loss sustained in the picker house consists

of dirt and sand, a part of which may be classed as invisible, as after the cotton and visible waste is weighed, and the amounts added together, there is always a discrepancy between the weight of the cotton before cleaning and the weight of the clean cotton and waste. This discrepancy is the invisible waste that passes off in the shape of dust, and if all the loss of weight the cotton sustains in the picker house could be saved, it would be of no value.

In the carding room the waste is generally proportioned as follows: Carding machines, 5 per cent.; drawing frames, 2 per cent.; slubbing and intermediate frames, $2\frac{1}{2}$ per cent., and roving frames, 1 per cent. According to these figures, the preparatory machinery of a modern carding room produces nearly as much waste as the greatest waste producers among the old-time mills. The question that all are interested in is, cannot the large production of the modern machines be accompanied with a corresponding reduction in the percentage of waste?

If the modern machines produce two and three times as much as the old machine, why do they produce more waste? In this case it would appear that the tendency of modern invention is not to reduce the percentage of waste to the lowest possible point. Inventors in their desire to satisfy manufacturers with a large production have largely overlooked the question of waste.

In the opinion of a great many practical cotton mill men, the present revolving flat card is responsible for the increase of waste. Most of those who have given the question consideration attribute the increase in waste to the licker-in, the teeth of which pass through the end of the lap with a velocity sufficient to knock out any impurities therein. In this removal of the fibres from the lap to the cylinder by the licker-in the action is similar to the saw gin, and the fibres are more or less injured. The effects are demonstrated in the succeeding processes by an increased amount of waste. One reason why the modern card is more productive than the old card, is that the cotton is better prepared, and many believe that with a few improvements in the old card it would produce as much as the modern with less waste.—Wool and Cotton Reporter.

HOW THEY MAKE LINEN IN BOHEMIA.

First in general importance among North Bohemia's numerous and diversified manufacturing industries are those producing woollen, cotton, and glass goods. Then comes the linen industry, which, while only fourth in importance in Bohemia, stands at the head in the value of its exports to the United States.

The linen industry is concentrated in the extreme eastern part of this consular district (Reichenberg). The only apparent reason is that, generations ago, some one in that locality began weaving flax yarn into cloth by hand; neighbors did likewise, till gradually it became the chief occupation of the local population. Then power looms were invented, whereupon, as was natural, someone engaged in hand weaving built a factory. Other factories followed, some being erected by outside capitalists, who came to that particular spot because everybody thereabout understood linen making, and consequently a plentiful supply of skilled workers were right at hand, so the tendency has been down through the years to the present. Other localities have offered superior conveniences for linen making—good railroad facilities, better water supplies, more bleaching grounds, etc., but the industry has always clung to the locality where it originated, though out of the way as to transportation facilities, and therefore at a disadvantage in respect to freight rates and other incidents. A quarter of all the linen produced in this district is

made in one little town several miles from a railway station, and consequently a long and expensive haul by wagon is necessary to the shipment of goods.

The twenty-five flax-spinning mills in this district employ 10,414 people, many of whom are women and girls. The employees generally work by the piece, and earn from 1s. 3d. to 2s. 6d. per day, the maximum being considered very good wages, for piece-work females receive the same pay as men; while if working by the day they only receive 1s. 3d., where males receive about 1s. 8d.

The annual value of the yarn spun by the twenty-five mills is about £1,600,000; total number of spindles, 200,000; the largest mill using 30,000. All are of British make.

That a flax mill is health-destroying and life-shortening to those employed in it, is the first impression of the visitor. Before the flax can be spun, it must be thoroughly cleaned of dust and waste, which is done by a fanning process. This keeps the working rooms constantly filled with a stifling cloud of small particles, which many of the employees—being mouth-breathers, as I have noticed—take into their lungs. Nevertheless, it is asserted that these people are not short-lived; and in fact they do not look so; some being gray and old, with records of thirty to fifty years of steady work in such apparently deadly surroundings.

There is a large export of linen yarn, and also some import. For fine linens, a quality of yarn imported from England is often considered the best.

In this consular district twenty mills use 1,598 power looms operated by 1,643 persons, and 2,688 hand looms operated by 2,153 persons. Linen weaving is, however, largely a home industry, as in houses scattered about the linen territory, there are 95 power looms, employing 95 people, and 6,805 hand looms, employing 7,678 people. The annual aggregate value of the product in factories and houses, as reported to me, is about \$4,000,000. This seems small, and I should doubt the accuracy of the figures if they were not from reliable official sources. From these figures, and from the value of exports declared at this consulate, it appears that one-seventh of the total linen product of the district is sold in the United States.

The mills do not use house labor, unless to fill some unusual order requiring skill which their mill hands lack, or to assist in supplying the demands in very busy seasons. There are, however, numerous firms who have no mills dealing heavily in linens; these employ house looms.

The finest grades of linens are not made in this district. It is possible to produce them here, but the foreign trade, it is asserted, has become so accustomed to ordering only the cheaper grades from Bohemia that no sale can be found for fine goods if made in this country; this, one producer told me, he had demonstrated by actual experiment to his serious loss. The linens made are of the qualities in special favor with department stores in the United States, and are such as hotels, restaurants, and families in comfortable circumstances find suitable for every-day use. Fine linen handkerchiefs are, however, made here, and are largely exported, especially to Germany, though their sale to that country is seriously threatened by the provisions of its proposed new tariff law.

Whether or not power-looms make the best linen is a mooted question. The mills, of course, claim superiority for the latter, while the dealers employing house labor naturally award the palm to the former. The public is divided in opinion. It is a fact, however, that the finest, most beautiful and expensive linens are produced by power looms.

Mill weavers earn about the same as spinners—1s. 3d. to

2s. 6d. a day, according to skill and rapidity. House weavers earn a trifle more per day, though at present the excessive dullness of the linen business—some producers declare it stagnant beyond all precedent, has thrown most of them out of work. Many who live on barren mountain slopes are in sore straits. They are trained to nothing but weaving, and live where there is no other pursuit to follow. To this misfortune is added the sterility of the soil, preventing their sustaining life by cultivating gardens about their dwellings.

There are silent looms in every mill. One which had the temerity last season to add a large, new building to its plant, intending to double its capacity, has this year lost courage. The new building stands empty, and, worse yet, some of the looms in the old factory are silent.

Steam is universally the chief motor power in flax and linen mills, though they are often equipped for water power also. Water is, of course, far cheaper than steam. The cost of equipment is 10 per cent. less, while the cost of operating is at least ten to one in favor of water. But the latter is too unstable in volume to be solely relied upon, even in a country so rain-soaked as Bohemia.

The scarcity of orders causes a fierce and determined competition among sellers of linens. A visiting buyer need not go out into the linen district, which is a tiresome day's journey from this city. He often prefers to make the trip, but he need only send out his card, and the linen manufacturers and dealers will come to him en masse. The high price of linen yarn, based on the enhanced price of flax caused by crop failures, is all that prevents linen goods from dropping to a very low selling figure. Linens have, in fact, advanced 10 to 15 per cent. in price during the past two years, but that is substantially a great reduction, since flax in the same period has doubled in cost.

There is no agreement as to prices among producers of linens, and none is possible at present. The buyer does not literally name the price, but he can materially affect it. The utmost the seller can do is to protect himself from actual loss. Good flax crops in Russia for two or three years would be a priceless boon to him. The reports from that country as to this year's crop are favorable.—Boston Journal of Commerce.

STEAMING KNIT GOODS.

"It is not claimed that steaming knit goods is a substitute for washing or bleaching," says "Old Superintendent," in *The Textile World*. "It is rather a supplementary process, the principal effect of which is the softening of the goods, and for fine knit goods it is unexcelled. Even after the goods have been thoroughly washed, bleached, colored, or tinted, there still remains a certain amount of foreign material which gives the fabric a stiff, harsh feel. It is this last residue which is removed by steaming, and with its removal disappears the harsh feeling referred to, and the goods become pliable and soft to the touch. They acquire a lofty handle, which makes them much more desirable. This I know from experience.

In the case of many colors, there is a certain amount of loose dyestuff on the fibre, which is very objectionable, if left in the garment. This is completely removed by the steaming process, and if the colors are such as will stand the steam, the shades are brightened by having this loose residue removed.

Some time ago, I advised a manufacturer of fine underwear to adopt this steaming process in the finishing of his goods, which were for infants' and children's wear. This was done,

and the improvement in the goods was so marked as to be followed by a large increase in the sales, and the manufacturer could not now be induced to abandon the method.

While steaming is especially well adapted for high grade goods, it is of great advantage on medium and lower grades; but, of course, it entails some expense, and consequently it is not as well suited for these lines. The goods, after being thoroughly washed and rinsed, if no bleaching or coloring be required, may be extracted, then put in the steam house or chest and steamed for thirty to forty minutes. They are then extracted as hot as possible, and dried at a moderate heat.

If any reader of these lines doubts the improvement which this simple process will effect, all he has to do is to fix up a temporary arrangement in which to steam a trial lot. 'The proof of the pudding is in the eating.' I believe that I was the first one to adopt this process.

The apparatus required is very simple. The size of the box should, of course, depend upon the quantity which it is required to treat at one time. The steam chest is best adapted for white goods, such as hosiery, infants' and children's small underwear, etc., while a small building is necessary for colored goods, and will answer equally well for white goods. The chest can be made with a removable cover. Iron rods project above the edge of the box, one at each cover, and if the box is large, one in the centre of each side. These bolts fit into holes in the cover provided for that purpose, and are threaded with a coarse thread say eight or ten to the inch. The cover should not be less than two inches thick, and is fastened by thumb screws at each bolt.

Trays supported on wooden cleats are placed inside of the box. These trays should be made of copper, or some material that will not rust. Nail heads should be excluded from the inside of the box, otherwise rust will damage the goods. If the chest is large, it is better to make it with a solid top and removable side, built to run on rollers; when soaked with water, it is very heavy. The bottom should be made a trifle lower at one end, so that the condensed water can be collected and discharged through a drip pipe. The steam may be introduced through a short length rubber hose, which can be easily attached to steam pipes in various parts of the room.

If a house is built in which to steam the goods, it should be constructed on the same plan as a bleach house. Trays or shelves are built for supporting goods, or they may be hung up as in the bleach house. Great care must be used in introducing the steam. If direct live steam comes in contact with the goods, it is liable to spot them, and in the case of some colors to injure the shade.

Fine spray nozzles should be used on the steam pipes, so that the steam may be diffused uniformly through the box or room. The roof of the steam house should have a steep pitch, so that the steam as it condenses will not fall in large drops on the goods, but will trickle down the roof to the sides of the building.

These observations on steaming knit goods are based upon experience covering sixty years, and they are submitted to the trade with every confidence that a more extensive adoption of the steaming process in finishing will be accompanied by a great improvement in the appearance and wearing qualities of the goods."

MILDEW IN WOOLEN GOODS.

The formation of mildew in woolen goods, as in those of cotton, is due to the development of fungoid growths in the presence of air and moisture at a certain temperature. The

most favorable time for the appearance of these fungi is in the summer, and especially in the month of August they occur very frequently. Certain dyes, like vat blue, are particularly liable to this growth, probably on account of the alkaline reaction of the dye liquors. The danger can only be avoided by not allowing the goods to lie in a heap for any considerable length of time. One of the primary causes of mildew can frequently be observed in the process of weaving moist cloth. Two different kinds of fungi may appear at this stage, according as to whether the fabrics remain cold or become hot. In the first place the fibre is not attacked or disintegrated, and also the fungoid growth often extends over a considerable area. Dark shades are hardly ever affected. The mildew can easily be brushed off.

Much more serious is the second kind, which appears in the form of smaller or larger patches, generally disintegrating the fibre. Mildew stains of this kind show after the milling as bare patches, and the fibre appears quite rotten. The same stains are often caused through the cloth, after the milling, being left to lie unwashed. Undoubtedly the highly alkaline reaction of the cloth at this stage is very favorable to the growth of the fungus. There occur, however, other stains in woolen cloth, which in their appearance are very much like mildew stains, but are due to quite different causes, and only a microscopical examination can reveal the true nature of the stains. Under the microscope the fibre of mildewed wool is found to have lost its characteristic scales almost entirely, and to be split or dissolved into numerous cells so that the ends of the fibres possess the appearance of a brush. Such mildew stains are in dyeing quite indifferent to coloring matters, so that according to the degree to which the fibre has been affected the stains appear after dyeing of a higher color than the rest of the cloth, or they may remain altogether undyed. The behavior of mildew stains towards various dyes was found to be as follows:

Scarlet, dyed in one bath with cochineal, tin crystals, and oxalic acid; white spots of varying sizes.

Billiard-cloth green, dyed with acid green, sulphuric acid, and Glauber's salt; white spots, fibre very rotten.

Moss green, dyed with indigo, carmine, fustics, and alum in one bath; light greenish-yellow stains, the pile of which is entirely destroyed.

Vat blue, topped with logwood; large and small stains, dyed an uneven light blue.

Vat blue, medium shade; irregular white spots.

Dove gray, dyed with alizarine blue SW; pale blue spots.

Dark brown, dyed in one bath with fustic and camwood, with copper and iron sulphate; large and small light brown stains.

Logwood black, with ferrous sulphate; light bluish stains.

The mildew stains on the logwood black, says the *Farber Zeitung*, are very similar to the stains caused by soap remaining in the cloth in the washing. In all cases the microscopical examination of the above samples showed the scaleless and split fibres.—Textile Manufacturer.

DEVELOPMENT OF RAW COTTON.

The story of the development of raw cotton in the United States reads like a tale of adventure. About 1600, experimental crops were raised in Virginia. In 1700 the crop was about 3,000 bales, reckoning 500 pounds to a bale. At that time a pound of cotton brought 20 cents. The next century saw a big increase in production, and in 1800 the yield had

reached 73,000 bales. The following hundred years witnessed a wonderful gain in the yield, and in 1900 the crop totalled 9,436,400 bales. The highest price paid for cotton of our own culture was 80 cents per pound, given in 1865, when the war had unsettled finance. In 1786 it is believed that Governor Tatnal, of Georgia, planted the first Sea Island cotton, having obtained the seed from the Bahamas. After that Hargrave, Arkwright and Crompton, in England, increased immensely the consumption of cotton by their inventions, and later Eli Whitney invented his famous gin. So the development of cotton manufacture has gone on from stage to stage, until now it stands in the foremost of the world's great industries. Nor is there any likelihood that these attainments mark the end of its growth.

Textile Design

WORSTED TROUSERING.



Complete Weave.
Repeat 12 x 8.

Warp:—3,960 ends, 12-harness straight draw.

Reed:—20 x 3.

Dress:—

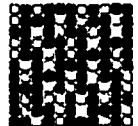
1 end, 2/28s worsted, navy blue,
4 ends, 2/28s worsted, cream,
1 end, 2/28s worsted, crimson,
7 ends, 2/28s worsted, brown,
1 end, crimson silk,
3 ends, 2/28s worsted, green,
7 ends, 2/28s, worsted, brown,

—
24 ends in repeat of pattern.

Filling:—62 picks per inch, all single 16s worsted, brown.

Finish:—Worsted finish; 56 inches wide.

HEAVYWEIGHT COATING.



Complete Weave.
Repeat 11 x 11.

Warp:—2,240 ends, all 2-ply, 6-run, woolen yarn, heather mixture 11-harness, straight draw.

Reed:—8 x 4

Filling:—46 picks per inch, all single 2 3/4-run, woolen yarn, black.

Finish:—Clear face finish; 56 inches wide.

CONCERNING THE DYEING OF SHODDY.

There is no more unpleasant, we might say vexatious, work for the wool dyer than the dyeing of shoddy, whether in rags or in the loose state, owing to the very heterogeneous nature of the article, which consists of scraps and waste of all kinds of woolen tissues made of various kinds of wool and dyed different colors. Besides, it may contain admixtures of vegetable fibres, the proportion of which is unknown, but whether large or small, it has an appreciable effect on the result and on the method of dyeing. Sometimes the shoddy as delivered to the dyer has been carefully sorted according to colors, blue, brown, black, dark red and dark green, or mixtures of all colors, especially light shades. The first thing the dyer has to do is to remove as much of these colors, that he can utilize what remains of them as a bottom for the color which he is requested to dye, eventually to strip off the old color entirely, or at least as much as possible, and then to select his dyestuff according to the bottom color which remains.

There are various ways of stripping off the color from wool, that is, destroying the dy. tuff, in all cases, however, the dyer must have due regard to the preservation of the material, and must regulate the strength of the discharging solution accordingly. Boiling with $\frac{3}{4}$ per cent. potassium bichromate and six per cent. sulphuric acid, will in most cases destroy the color and presents the advantage that the chromium dye, which remains fixed on the fibre, can be utilized as mordant for the new color. Or, the goods may be boiled with eight per cent. sulphuric acid of their weight, in which case, however, they should immediately be very thoroughly rinsed in water, and, in order to neutralize the acid, it is recommended to add a little soda to the first washing water. It is also a good plan to boil dark-colored shoddy with four per cent. exalic acid, and four per cent. sulphuric acid. In no case should the material be allowed, after stripping, to lie for a length of time before washing out the acid.

For safety it appears recommendable to begin all operations, after dusting, with a light scouring with soda, and rinsing, to remove all grease that may be contained in the wool; and finally to dye as much as possible with direct dye-stuffs, which cover the cotton that may be contained in the shoddy, as well as the wool.

When fabrics made of shoddy material are dyed, the cotton fibres and threads are apt to come up, after the dyeing, white or but partly tinted, which is considered a defect, and to cover up these threads is not easy. Attempts are usually made to do so by the use of logwood in cold baths, but the results are not always satisfactory. Advantage may be taken of the fact that Dianil Black CR will dye the cotton very well in a soap bath, while it will not touch the wool; the covering of the cotton may, therefore, be done with it during the fulling process. The following is a good mode of working it, viz.: The goods are rinsed well and then put into the fulling machine, when for 10k. weight of goods 155g. Dianil Black CR is dissolved in a bath of the soapy fulling liquid, and added to the latter. About ten to fifteen minutes before end of the fulling operation about 0.906l. Glauber's salt is added, to ensure the complete absorption of the dyestuff from the liquid (Dyer and Calico Printer). This method may be turned to special use by garment dyers, if shoddy garments come to hand which are worth the trouble of stripping and redeyeing.

EXTRACTION OF INDIGO IN SUGAR FACTORIES.

At the present time, when considerable attention is being directed to the indigo industry in India, planters have been advised to combine sugar-cane planting with the cultivation of the indigo plant. The Pioneer contains the letter of a correspondent, who goes a step further, and suggests the erection of plant which can be used for cane sugar manufacture, and equally well for indigo production. He puts forward a strong case in favor of the diffusion process for the treatment of the sugar cane, the only disadvantage being the need of more fuel for the evaporation of the extra liquid; while the process has the advantage of producing a greater yield of white sugar of a better quality than that obtained by crushing the cane in the mills; further, the diffusion process is, much more than any other, suitable for the manufacture of sugar from beet, an industry which he asserts will occupy a prominent position among Indian sugar growers in the near future. Having drawn attention to this point, in favor of the diffusion process for sugar manufacture, the correspondent considers that the diffusion batteries, after they have worked off the sugar cane, will be found to satisfactorily replace the

steeping vats in the indigo process. Not much is known at present as to the correct conditions of steeping, etc., in fact it is generally admitted that the total content of the plant is not all obtained by the process as usually carried out. The diffusion would be a continuous washing or steeping, carried out until the plant was exhausted, and it could be rendered still more efficient, by the use of hot water, as recommended by Dr. Schulte, who found that a larger and better yield was obtained thereby, although his experiments were handicapped by the open air vats in which they were carried out. If it is found that the fermentation, which is supposed to go on in the steeping vat, does exist and is a necessity, then it is likely that the diffusion batteries would be useless, as they do not permit of prolonged contact of the plant with the same portion of water. Under those circumstances, a complete double steeping in an improved steeping vat should answer the question more satisfactorily. Therefore, either of two methods is required: First, a more thorough steeping; second, a diffusion process which can be continued till tests show that no more indigo is being extracted from the plant.

WATER AND AIR-PROOFING OF TISSUES.

The Carl Baswitz patent employs an emulsion of asphalt, papier-mache and tanned size, with the addition of goudron, vaseline, glycerine, or of any other similar substances for the purpose of ensuring flexibility. The papier-mache is comminuted as much as possible, and the asphalt reduced to a very fine powder. These are then mixed in the proportion required with a simultaneously prepared solution of size to which chromate has been added, and one of the other ingredients is introduced. The whole is subjected to a thorough mechanical stirring, the result being that the papier-mache, which swells up considerably, is entirely broken up and absorbs the asphalt particles; in this condition it is applied to the tissue. The fabric treated need not necessarily be of close mesh; large mesh tissues, as, for instance, jute sacks, intended to hold a fine powder like cement, etc., may be rendered by this process air and water-tight.—Kuhlow.

PROSPECTS OF THE MOHAIR INDUSTRY IN AUSTRALIA.

The following notes on the prospects of successfully breeding the Angora goat and creating a mohair industry in Australia, are from the New South Wales Agricultural Gazette :

The progress of the mohair industry, at its inception both in South Africa and the United States of America, has been by slow degrees, due in a large measure to the high cost of obtaining the original stock from the Turks in Asia Minor, and to the prejudices of stock breeders against all classes of goats.

It appears that a sine qua non with the Angoras is dryness of climate; given dryness, they have been proved to do well in extremes of hot and cold, but they will not stand wet and cold combined, more especially after shearing; and in those districts where this class of weather is experienced, it would be necessary to build shelter sheds for protection. The greater area of Australia can emphatically claim the possession of a "dry" climate, a feature which protracted droughts of the past few years have impressed indelibly on the minds of all connected with wool—the greatest national industry. Australia, then, may claim to hold one essential to the satisfactory establishment of Angoras.

The next factor to determine is whether the class of food at hand will be such as to enable the Angoras to thrive and fatten, and grow a good quality of mohair. The manner in which the goats have dealt with the scrub at Murinbin affords a striking and practical answer to this question. The order of their food appears to be in inverse ratio to that of sheep, horses, and cattle, as the Angora prefers shrubs, weeds, and other rubbish before grasses, while sheep and cattle naturally eat grass first, and shrubs, etc., when forced to by the absence of grass and the pangs of hunger.

Angoras readily adapt themselves to the surrounding conditions. They breed once a year, and increase rapidly, the average percentage being reckoned from 80 to 110 per cent. An American breeder speaks of them as follows:

They are a very hardy animal, having lots of sense, are good rustlers, and will not starve if there is anything in the neighborhood to eat. They seem just as happy gnawing the bark off a dogwood sapling as barking your choicest apple tree. They feed in flocks, and do not scatter over the pasture like sheep. When alarmed, they will bunch together to defend themselves. They are browsers, not grazers, and prefer weeds and brush to grass; in fact, goats are ideal brush exterminators; they do it at a cash profit instead of a costly outlay.

The Agricultural Gazette goes on to say: The advance of the industry in Australia cannot be otherwise than gradual, owing to the limited amount of pure stock available, but the extension of the industry will have to be on similar lines to those which have proved so eminently successful in South Africa and the United States—namely, by careful cross-breeding up flocks from the common goat, of which there are ample supplies available in the various States, and especially so in the case of Queensland. But there is no reason why the industry should not go rapidly ahead, when once it gets a footing in Australia, as the difficulties of obtaining stock from foreign parts are now reduced to a minimum by the transport facilities which modern ships afford; and as to the prejudices, the practical success which has been accomplished in the above-mentioned countries should effectually remove them. Among the sheep-raising countries of the world Australia takes pride of place with the success she has achieved with the merino, and the example of such an achievement will, no doubt, stimulate her to make similar efforts to obtain first place in the production of mohair. There is no doubt, when once stockbreeders realize that, with the Angora, they can clear land smothered with the redoubtable and often despised gum at a profit, instead of sinking a further ten or fifteen shillings per acre in it, the future of the Angora in Australia will be assured.

They should, indeed, prove the salvation of this class of land, for to improve its carrying capacity for sheep by clearing, ring-barking, etc., means in all probability, the raising of its capital value to a point where a reasonable return for the capital invested cannot be expected.

RAMIE-GROWING IN THE TRANS-CAUCASUS.

A most important branch of agriculture for the Trans-Caucasus would be the cultivation of the ramie plant, which, according to experiments made by the Imperial Domains authorities on their lands at Chackva, grows very successfully on plots carefully selected for the purpose, in view of the fact that the soil should not be of a marshy character, and that it should be nourishing and porous. Besides the Imperial Domains, several individuals have also started the cultivation

of the "Chinese nettle," and (according to a report from Mr. Consul Stevens), have invariably obtained good results. Unfortunately, manual labor is very expensive in that country, and such being the case, it is quite out of the question to have recourse to stripping the fibre off the stalk by hand, as is done in China, where labor is excessively cheap. The peasantry of the country are still unfitted to admit of the possibility of the general adoption of decorticators, or of using chemicals for stripping the stalk. For this purpose the peasants would have to be educated up to using the decorticators, etc. The plant has been known in the Caucasus for many years, and attempts at cultivating it have also been made in the governments of Kutais and Tiflis. It would appear that it grows to a very old age, and shoots off a large number of branches every year; the fibre of these latter when stripped, furnishes excellent material for making parchment of a certain kind and also ropes, etc. Mr. Stevens states that he saw at the Agricultural Exhibition at Tiflis some excellent samples of rope, cord, and twine, prepared by a factory in the South of France, from the fibre of the ramie plant grown in the Caucasus. This is of pure white color, and the material manufactured out of it looks very serviceable, and the rope is exceedingly strong. By all appearances, it is as good as the best Manila rope, and is capable of sustaining a good deal of tension or straining. No information as to its exact power of resistance, however, was obtainable. Mr. Stevens understands that in some parts of France the cultivation of the ramie plant is generally adopted, and in those districts, where it is being grown, improved decorticators are being successfully used; the method of stripping the fibre off the stalk by chemical process is also a good deal in vogue in those districts. He believes a company was promoted some time ago in France, which now has extensive plantations of ramie in Algiers, Sumatra, and several other countries. This company (he is informed), has also entered into arrangements with certain growers of the ramie plant in the Caucasus to purchase all their produce for transportation to its factory in France.

PITA FIBRE.

The pita fibre is derived from a species of agave, but is usually sold as Sisal hemp, or ixtle, and used for cordage and bags. The German consul at Popayan reports on it as follows, viz.: The true pita fibre plant grows wild principally in Central America, in Columbia, Ecuador and northern Peru. The production of the fibre is at present still of the most primitive kind. The fully developed leaves are cut off close to the ground, the sharp thorns along the edges of the leaves are removed, the latter placed upon a board and scraped upon both sides with a piece of wood in the shape of a knife, until all pulp is removed and the fibres laid bare and clean from all adhering parts. They are then, according to the intended use, either first washed or directly after the scraping hung up to be dried by the sun. The half-civilized inhabitants of Ecuador and Columbia use these fibres as yarn to sew shoes, saddles and harness, etc.; they are also used for netting on account of their strength and resistance to the action of water. For wearing purposes is the fibre thus far only used by the uncivilized Indians inhabiting the eastern portion of Ecuador, who make of it their hip-cloths and loin-cloths, which are said to be extremely durable. Experiments have been made for some time with this fibre in France and in Great Britain. It is said that yarns spun from pita fibre are superior to linen yarn in fineness, strength and lustre, so that they may be used as substitute for silk in mixture with wool and cotton. It is also

stated that some capitalists have organized a company in Paris for the production of pita fibre on the Isthmus of Panama.

FABRIC ITEMS.

Knight Sons, of Raymond, Alberta, have bought 37,000 ewes in the States.

The clothing store of A. Young at Rat Portage has been burned. The stock, valued at \$10,000, was altogether destroyed.

Blouses for spring are in greater variety than ever. White will as usual be popular but there will also be a large demand for colors.

The clothing stock of John Calder & Co., Hamilton, was sold at a discount of 37 per cent., to John Riach, a dealer in bankrupt stocks.

F. G. Campbell, of Perth, has entered into the wholesale business, having formed a partnership with an Irish firm of linen importers. Mr. Campbell will travel in Ontario for the firm.

A good many retail men are dissatisfied this season with their sales of dress goods. The reason for the falling off is the large supply of ready made skirts and suits now being carried by nearly all the leading stores.

An exchange has an illustration of a rug 7 x 12, made from a carpet that had been in constant use for 33 years, and which is now good for 25 years more. The rug is $\frac{3}{4}$ -in. thick, has a thick, soft nap, and is alike on both sides.

M. Lewis & Co., dealers in clothing, Ottawa, have assigned, after a business run of less than a year. Lewis was formerly a traveller for a Toronto house, who started him in business, and who afterwards entered suit against him for some \$3,000.

A special freight train from Kentville, N.S., recently took twelve cars of pulp (2,450 bales) from Weymouth to Halifax for shipment to England. Large shipments of pulp are being made from the same part of the province by schooner to St. John for England. The Sissiboo Pulp and Paper Co. has a large number of men in the woods this winter getting out pulp wood. In the spring they will have about 6,000,000 feet.

A company is being formed in the United States with a capital of \$10,000,000 for the manufacture of rubber footwear by a new process introduced by Joseph O. Stokes. It is claimed that rubber shoes made by this process can be produced more cheaply than by present methods, that the initial mechanical equipment necessary is over 50 per cent., and floor space required 80 per cent. less than in existing factories, that by means of it a better article may be produced from a cheaper compound, and this both in finish and quality. If this is true the rubber goods trade should be revolutionized.

One of the principal local rubber jobbers in Boston recently stated that there was no question that Canadians were turning out a higher average quality of rubbers than the United States manufacturers. The fact is, says the Shoe and Leather Reporter, that rubbers made for the Canadian climate must have a much larger percentage of rubber than those in the United States. Some dealers who invested in American goods last year have been greatly disappointed with the goods, there being many complaints from customers of their poor wearing qualities. There may not be, perhaps, the variety in style, not the perfection of finish that is the result of specialization, but taking them all around our rubbers are far superior.

Notice is given in the Canada Gazette that the capital of the Alaska Feather and Down Company, Ltd., has been increased from \$50,000 to \$100,000.

J. M. Hamilton & Sons, wholesale millinery, Toronto, recently burned out, have assigned. Mr. Hamilton was formerly a manufacturers' agent, and about three years ago went into the wholesale business with his two sons.

One of the most popular things this season is Shetland Floss. It is a comparatively new thing on the Canadian market, but the people have taken to it amazingly. In the United States they call it Cumbria, and last summer it was all the rage. Shetland Floss is used in making hoods, shawls, and other crochet work. It is made in many different colors and it is not more expensive than Berlin wool.

At the annual meeting of the Cornwall Manufacturing Co. held recently in Montreal, the following directors were elected for the ensuing year: W. M. Ramsay, Robert Meighen, Lord Strathcona and Mount Royal, A. T. Paterson, H. Montagu Allan, W. A. Hastings and John Turner. At a subsequent meeting of the directors, Robert Meighen was elected president and managing director, and W. M. Ramsay, vice-president.

Joseph Cote, a resident of Island Pond, Vt., a telegraph line repairer on the Grand Trunk, was recently arrested by Deputy United States Marshal Miles, for smuggling 110 packages of furs, valued at \$25,000, which came from Montreal. These furs were shipped to stations near the border, in Canada on the Grand Trunk, taken over the border to Gilead, Maine, and sent there by express. The express agent at Gilead, and Peter Marchand, Grand Trunk freight conductor, were arrested in connection with the same case.

The Dry Goods Economist tells of an ingenious plan adopted by a boot and shoe man to increase his sale of shoe laces. When colored laces came into vogue last year he thought a red, white and blue lace would be popular, but he could not obtain such from the manufacturers, so he procured a quantity of white laces and some red and blue aniline dyes, and dipping the ends of the laces in the dye soon had what he wanted. When applied to use the laces showed a white centre with the bows and ends red and blue. The public caught on and his sales of tricolored laces ran up enormously.

The following textile items have been placed on the free list when imported into Canada by manufacturers for use in their own factories: Hemp bleaching compound for the manufacture of rope; yarn of jute, flax or hemp, for the manufacture of towels. In the case of hemp bleaching compound, the reason for placing it on the free list is to enable Canadian manufacturers to produce cordage of a lighter color, so that they may successfully compete with foreign manufacturers. Heretofore, degreas, which is on the free list, has been used as a lubricant in the manufacture of cordage in Canada, but it was found that it spoiled the appearance of the cordage, producing too dark a color. Hemp bleaching compound is considered to be a much better lubricant. Inasmuch as it takes the place of degreas, which was on the free list, the Government deemed it advisable to allow it to be entered free hereafter. The concession does not interfere with any Canadian interest, the compound not being manufactured here. The order placing yarn of flax, hemp, or jute, for the manufacture of towels, in the free classification is an extension of the clause now in the free list of the tariff which provides for the free entry of such yarn when imported by manufacturers of carpets, rugs, mats, jute webbing, jute cloth, hammocks, twines and floor oil cloth. The yarn specified is not produced in Canada to any appreciable extent.

Lindsay Bros., extensive dry goods merchants, St. Thomas, have made an assignment.

The Crown Whitewear Co., with head office at Toronto, and a capital of \$100,000, has been incorporated. A. C. Rogers, T. C. Hallam and George Kappelé, are provisional directors.

The American Thread Company, incorporated under the laws of New Jersey, and the Canadian Spool Cotton Company, incorporated under the laws of Quebec, have been licensed to do business in Ontario.

The imperial Clothing Co., of Ottawa and Montreal, which got an extension of time just a year ago, are now seeking a settlement at 40 cents on the dollar. The liabilities are about \$10,000.

The gents' furnishing stock of T. Deegan, Winnipeg, was damaged by fire recently to the extent of \$1,000. The boot and shoe stock of Chas. Wellband, in the adjoining store, was also damaged. Loss covered by insurance.

Hodgson, Sumner & Co. have acquired the wholesale dry goods business carried on by J. G. Mackenzie & Co., Montreal, for three-quarters of a century. J. P. Cleghorn, who has been connected with the latter since 1853, has retired.

Mrs. Rachael Wolfe, doing business as a furrier, under the name of R. Wolfe & Co., Toronto, whose assignment we noted last month, has since been arrested in connection with the failure. A quantity of valuable Persian lamb skins at her house were seized.

A well known cotton expert of New York said recently that he had every reason to believe that cotton, which has been advancing, will continue to go up till very much higher prices are realized. It is generally recognized that the supply is inadequate to the world's consumption at present prices.

The action which has been before the courts for two years, brought by T. Sheehan, a former shareholder in the Toronto Rubber Shoe Manufacturing Co., against W. C. Harvey, C. C. Van Norman and J. H. Taylor, has at last been concluded by Judge Street dismissing the action, in which he exonerates the defendants from the charges made against them.

At the annual meeting of the shareholders of the Dominion Oil Cloth Co., Montreal, last month, the following were elected directors for the ensuing year: J. O. Gravel, Andrew A. Allan, J. J. McGill, Hugh A. Allan and John Baillie. At a subsequent meeting the following officers were elected: President, J. O. Gravel; vice-president, Andrew A. Allan; secretary, John Baillie.

An Ontario charter has been granted to the Parisian Laundry Company of Hamilton, Ltd., to carry on business as laundrymen, renovators, cleaners and dyers, and to acquire the business of the Parisian Steam Laundry Company of Ontario, Ltd., at Hamilton. The incorporators are: J. W. Lamoreaux, W. T. Armour, Walter Graham, John G. Gauld and James Dickson, all of Hamilton.

Referring to the question of using flax for binder twine spoken of in the last issue of this journal, one of the members of the Ontario legislature asked the Government if they had taken into consideration the question of utilizing Canadian-grown flax in the manufacture of binder twine and rope, instead of procuring the raw material from Manila, New Zealand and elsewhere, to which Hon. Mr. Stratton replied that the subject was under consideration, with a view to such action being taken as might be considered practicable and advisable.

The Boas Felsen Company is applying for a Quebec charter, with a capital of \$25,000; headquarters at Montreal; to manufacture, sell and deal in ladies' mantles, cloaks, blouses, shirts, suits and generally all kinds of ladies' wear. The applicants are: A. B. Boas, Morris Felsen, M. H. Davis, Bernard Boas and B. A. Boas, all of Montreal.

A Canadian speculator recently shipped two carloads of binder twine, made in the Kingston penitentiary, to Boston. There were 50,000 pounds of twine, valued at \$5,000. The twine was assessed \$1,632 for duty at Richford, Vermont, as Manila twine, but the consignee protested that it should enter free of duty because it was made of sisal instead of manila hemp. While the matter was being investigated the customs authorities at Richford got word that it had been made in the penitentiary, and therefore under the law, could not be admitted into the United States, and the two cars of twine were confiscated.

About the middle of January there was an advance in domestic ducks of $\frac{3}{4}$ c. to $1\frac{1}{4}$ c. About the middle of February there were further advances in nearly all lines of $\frac{1}{2}$ c. Denims also advanced $\frac{1}{2}$ c. on nearly all lines of blues and browns. These advances were not unexpected and there may be a general advance in all cottons. There has been in certain lines of grays. A mill in the province of Quebec has put up the quotation on one number $\frac{1}{2}$ cent. Mill men claim that they are making certain numbers at a loss. Stocks of both raw cotton and manufactured goods in England are said to be light, and mills will accept orders through agents only subject to confirmation.

Two companies formed in British Columbia to engage in the manufacture of pulp and paper have been engaged in exploring for suitable water powers and timber areas, and have succeeded in obtaining what they want. The companies are the Industrial Power Company, of Nelson, and the Pacific Coast Power Company, of Victoria. The former will locate on Sechelt Inlet, at the mouth of the Clowhom river, where there are falls which can develop 12,000-h.p. The latter company has secured a power on Powell river, about 80 miles north of Vancouver, where there is 18,000-h.p. Both have secured large pulpwood areas and expect to export largely to the Japanese and Australian markets, where there is a large and growing demand.

There is a continued demand for fine Canadian woolens. Mills which make the best class goods have no difficulty in disposing of them. Consumers are able to pay good prices for fine goods, and will take only what comes up to their requirements. There is more profit in making the better class of goods, so that the mills which make the better class of goods have decidedly the advantage. It is satisfactory too to note sales of Canadian goods for leading Old Country centres. Two shipments of Canadian woolens were recently made in one week from the Oxford, N.S., mills to Huddersfield and Hawick, both great centres for the English woolen industry. Fine woolens in England have apparently seen the last of low prices for the present, and there is likely to be a steady advance for some time. Owing to peculiar conditions of the sheep industry in the Argentine Republic the production of wool there is likely to run more largely to the coarser grades, so that fine merino wools will be more in demand than ever. The latter have advanced in Europe from $7\frac{1}{2}$ to $12\frac{1}{2}$ per cent. In Canada spring woolens are in good demand, both foreign and imported, including Scotch tweeds, especially the finer grades. Stripes are in great favor, in brown and gray effects. Gray waterproofs for spring overcoats are in request.

The Standard Woolen Mills Co., Toronto, has added two new Platt mules and other machinery.

The yarn spinning plant of the Toronto Carpet Manufacturing Co., recently put in, is now in full operation.

Mr. Macdonald, late of the Seaforth clothing firm of Greig & Macdonald, has severed his connection with that business, which will henceforth be conducted by Greig & Stewart.

A quantity of mink, fox and coon skins were recently stolen from the warehouse of B. Powell, at Hatchley, near Brantford. The thieves were arrested in Michigan, and have been brought back for trial.

Experiments by German chemists have convinced them that sunflower seed oil is likely to prove a rival of cotton seed oil as a cheap substitute for olive oil in various processes in the arts. Among other things it may be used for dyeing purposes.

In the United States the tendency is generally in the direction of higher rather than lower duties, and therefore rumors of a reduction on linens, to the extent of as much as 15 per cent., comes rather as a surprise. The absolute effect of such a reduction on the importations it is difficult to estimate.

At a recent meeting of the Dominion Sheep Breeders' Association at Toronto, it was decided to send a special agent to the Northwest to open up a trade in thoroughbred sheep similar to that already so profitable in cattle. The field in the northwestern states will also be occupied. The president of the company is R. H. Harding, Thorndale, the vice-president, J. M. Gardhouse, Highfield, and the secretary-treasurer, A. P. Westervelt, Toronto.

The situation in cottons is very strong. A short time ago an advance was made in ducks and goods of that class, as referred to elsewhere, and now comes an advance of from 5 to 10 per cent. by the mills, on nearly all lines of cottons, including sheetings, pillow cottons and gray and white cottons. Further advances are not improbable. The strength of raw cotton, is, of course, the foundation for this. Speaking of the latter, Theodore H. Price, of New York, an authority, says, "I believe that cotton at 9 cents a pound is very cheap."

Dr. Nichol, of Montreal, recently patented a process for the manufacture of felt for the construction of boats. The felt is chemically treated and moulded to any design required. The doctor had a boat on the Rideau last summer made of this material, and though it was subjected to the hardest usage it was found to stand the test most satisfactorily. A company has been formed to manufacture these boats, and they are negotiating with T. A. Code, of Perth, to supply the felt. The Perth mill is said to be the only place in Canada where it can be made.

—A sign of the times is the resolve of the French Government to establish, probably in Philadelphia or Chicago, a central bureau or college, with directors skilled in trades, for the study by young Frenchmen of the industrial methods of the United States. One of the sub-chiefs of the Department of Commerce, Mons. Bouquet, says his chief, M. Millerand, has originated the scheme. He adds: "We realize that America now leads the van in industrial progress. She is far ahead of England, Germany and ourselves, in organization and methods of work. Hitherto we have been sending numbers of engineering students to Germany, England and Belgium. But, the Minister is resolved to concentrate his efforts in the United States though a few students will still be sent to European countries, to study special industries."

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.

The St. John cotton mills now have about 550 persons employed.

The Magog Woolen Company, Sherbrooke, has its new dye and finishing house completed.

The Canadian woolen mill at St. Hyacinthe is running day and night, and has a large number of orders on hand.

The Penman Manufacturing Co. are running knitting mills at Paris, Thorold and Port Dover, Ont., and Coaticook, Quebec.

U. Wolverton, of the Brandon Binder Twine Co., has been appointed managing director and will devote his whole time to the business.

The Perth Woolen Company made what was pronounced the neatest exhibit in the recent display of textile fabrics by Canadian manufactures at Ottawa.

The Cornwall & York Cotton Mills Company, St. John, has placed an order with H. C. McKerrow, of Boston, for new Taylor, Lang & Co.'s mules.

Albert Stern and R. I. Kohen, of New York, representing William Openhym & Sons, are about to establish a silk mill at Ogdensburg, across the river from Prescott.

T. A. Code, of Perth, has recently placed in his mill another new knitting machine, costing several hundred dollars, owing to the increased demand for the Tay knitting mill goods.

The damage done to the York cotton mill at St. John by the storm has been fully repaired. Besides the injury to the building considerable damage was done to the machinery in the mule room.

A Mr. McConnell, of Ottawa, has purchased the old Gemmell woolen mill at Port Elmsley, and intends converting it into plumbago works. Mr. Falla, the late owner of the mill, is moving out his woolen machinery.

The situation with regard to next fall's underwear looks well. The majority of the mills are in fair shape, as far as orders are concerned, although they all allege that these orders have been taken at a figure which allows little or no profit.

The new carpet factory at Galt has just received its finishing touches at the hands of the plasterers and carpenters. Some of the fixtures from the Guelph factory have arrived, the engine and boiler will be put in at once.

An order has been issued by the court at Toronto for the compulsory liquidation of the Western Canada Woolen Mills Co., with headquarters at Toronto, and mills in the Northwest Territories. The liabilities are about \$11,000.

The employees of the Standard Woolen Mills Company, Toronto, had an enjoyable sleigh ride on February 21. A pleasing surprise was sprung at the supper table when Evérett Metcalfe was presented with a gold-headed cane for his successful management of the affair.

A statement that the weavers of the Paton Mills, at Sherbrooke, who went out on strike recently, took this action as a result of a difference between the boss of the department and themselves is not correct. The strike was simply for an increase in pay, and was settled satisfactorily within a few hours.

The Pembroke Woolen Mills, which recently added new machinery to its weaving and carding departments, is now installing two up-to-date machines in the finishing room, a press and a shear. The factory is running overtime, with likelihood of a further increase in the staff on account of large orders, and prospects of a very busy season.

There has recently been some discussion as to where the largest looms are to be found. A Worcester exchange says that at the Crompton & Knowles loom works, the champion is being built. It is of the Moquette-Axminster type, and will weave a carpet 12 feet wide, 3 feet wider, it is claimed, than ever before attempted in a power loom.

The Montmorency Cotton Company notified the Montreal Stock Exchange that owing to the state of the cotton trade the company would not pay the quarterly dividend. The last quarterly dividend was 1½ per cent., or at the rate of 6 per cent. per annum. The company is capitalized at three-quarters of a million dollars. This is the third instance of the large cotton companies failing to pay a dividend within a few months, the other companies being the Dominion and Merchants'.

The Atlantic Pulp and Paper Co. is the name of a new business concern which will erect a factory near New Richmond, on the Atlantic and Lake Superior Railway, in the Gaspé peninsula. The factory, when in full operation, will turn out 100 tons of material a day, 75 tons of which will be paper. The incorporators are: W. C. Edwards, Ottawa; Chas. H. Waterous, Brantford; R. H. Thompson, Buffalo; A. J. H. Eckardt, Toronto; John Sullivan and C. S. Cameron, Ottawa, and W. R. P. Parker, Toronto. The capital is \$3,000,000, and the head office, Toronto.

There has been trouble in connection with the liquidation of the Imperial Woolen Mills Company of Streetsville. Three of the directors assigned their unpaid stock before the winding-up order was granted, and on application of W. J. Elliott the Master-in-Chambers has decided that the transfer was invalid. The directors and the amounts they are held liable for are: John Graydon, Streetsville, president, 120 shares at \$100, \$12,000; Dr. Bingham, Hamilton, 30 shares at \$100, \$3,000; J. Switzer, Streetsville, 35 shares at \$100, \$3,500. J. P. Langley is the liquidator of the company. The liabilities are estimated at \$15,000.

A judgment affecting the liability of employers for accidents in mills has just been given by the Court of Appeal at Montreal. A man named Kerwin was killed in the Canadian Colored Cotton Mills Co.'s mill, by being caught in a revolving shaft and dashed against a beam. No one saw the accident. His wife and children sued the company for damages, negligence being charged in not having the shaft properly protected by a guard. The jury gave them a verdict, but the Court of Appeal, to which the case was taken, held that in cases of this kind two facts must be established: 1st, negligence on the part of the master; 2nd, that that negligence was the cause of the injury to the employee. Without satisfactory evidence of both these facts, there is no case to go to the jury. This judgment is in accord with decisions in similar cases in Ontario. This establishes an important point with reference to accidents in factories. It is not enough to prove that the machinery was not properly guarded. It will have to be established that the accident was the result of such neglect. This cannot be done, of course, where the accident was not witnessed by anyone, if the victim of the accident is killed.

—Within five years Italy's production of cotton goods has doubled, increasing in value from \$10,000,000 to \$20,000,000.

Personal

Matthew Luce, one of the best-known wool merchants of the United States, is dead.

A son of Duncan Giles, manager of the McKellar, Ont., woolen mills, was drowned a few days ago.

George Pattinson of the firm of George Pattinson & Co., Preston, Ont., has gone to England on business.

James Cook, overseer of carding in No. 2 mill at Paris, Ont., has occupied that position for the past 28 years.

David J. McArthur, head of Colin McArthur & Co., wall paper manufacturers, Montreal, died of pneumonia, Feb. 27. He became head of the firm on the death of his father only a few months ago.

R. M. Kennedy of Amsterdam, N.Y., has been appointed superintendent of No. 2 mill of the Penman Manufacturing Co., Paris, Ont., succeeding Richard Thompson, who has been made assistant manager of the mills under J. B. Henderson, general manager.

J. W. Campbell has secured a position as loom fixer in the mills at Valleyfield. He has been working in the Rochester cotton mill, which has been sold to the gas and electric company of that city, and will go out of business as soon as the stock can be run out.

Frank W. Hicks, formerly employed at the Montmorency cotton mill, near Quebec, and subsequently at Newport, N.H., and as overseer of carding and spinning for the Tremont & Suffolk mills, Lowell, Mass., in the woolen carding department, has secured a position with the Davis & Furbur Machine Company.

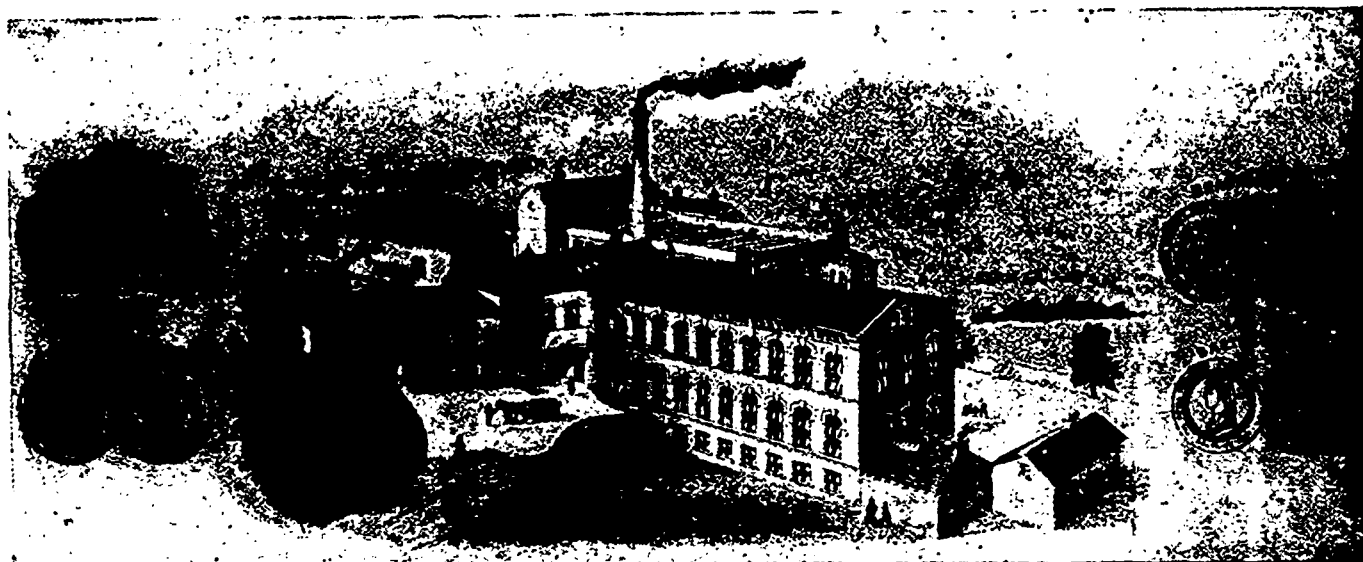
Robert Middleton, president of the Globe Woolen Co., of Utica, N.J., and one of the best known woolen manufacturers of the United States, is dead. His father was a woolen manufacturer before emigrating from Scotland to the United States to settle on a farm, but the son took up his father's employment and made it a great success.

—A man's house is spoken of in Japan, not by the size of the rooms, but by the number of mats which are laid upon the floors. None but Europeans who live in China or Japan use European carpets in these countries.

—S. Carsley personally has been fined \$200, and the company of which he is president, \$400, for having failed to register their partnership in the dry goods business in Montreal. It appears that in some way the duty of registering was overlooked, and though it was pleaded by the defendants that the action was proscribed more than a year (in fact five years having elapsed), the court held that fact did not relieve them from the penalty. The plea amounts to the proposition that by continuing to violate the law during a period of over a year a party can thereby acquire immunity for all time to carry on business regardless of the provisions of the statute, and thus render the law nugatory.

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- Loom Fixing; a handbook for loom fixers working on plain and fancy worsteds and woollens; containing chapters on shuttles and bobbins, and their management; head motion; putting in warps; filling; adjusting and starting new looms; chain building, etc.; 104 pages, by Albert Ainley\$1 00
- Technology of Textile Design; explains the designing for all kinds of fabrics executed on the harness loom, by E. A. Posselt 5 00
- Structure of Fibers, Yarns and Fabrics, the most important work on the structure of cotton, wool, silk, flax, carding, combing, drawing and spinning, as well as calculations for the manufacture of textile fabrics, by E. A. Posselt 5 00
- Textile Machinery Relating to Weaving, the first work of consequence ever published on the construction of modern power looms, by E. A. Posselt..... 3 00
- The Jacquard Machine Analyzed and Explained; explains the various Jacquard machines in use, the tying up of Jacquard harness, card stamping and lacing, and how to make Jacquard designs, by E. A. Posselt..... 3 00
- Textile Calculations; a complete guide to calculations relating to the construction of all kinds of yarns and fabrics, the analysis of cloth, etc., by E. A. Posselt.. 2 00
- Wool Dyeing; an up-to-date book on the subject, by E. A. Posselt 2 00
- Worrall's Directory of Cotton Spinners, Manufacturers, Dyers, Calico-printers and Bleachers of Lancashire, giving the mills of the British cotton district, with number of looms and spindles, products of the mills, cable addresses, etc\$2 00

- Worrall's Directory of the Textile Trades of Yorkshire, comprising the woolen, worsted, cotton, silk, linen, hemp, carpet, and all other textile mills, giving looms and spindles, and the various lines of goods manufactured, etc\$2 00
- Worrall's Textile Directory of the Manufacturing Districts of Ireland, Scotland, Wales, and the counties of Chester, Derby, Gloucester, Leicester, Nottingham, Worcester, and other centres not included in preceding works, with capacity, products of mills, cable addresses 2 00
- The Wool Carder's Vade-Mecum, by Bramwell; third edition, revised and enlarged; illustrated; 12mo..... 2 50

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Business has improved considerably during the last month. Enquiries are numerous for spring importation. Market remains firm in all lines:

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- Chlorate of potash 0 10 to 0 11
- Alum 1 35 to 1 50
- Copperas 0 70 to 0 80
- Sulphur flour 1 70 to 2 00
- Sulphur roll 1 90 to 2 00
- Sulphate of copper 5 50 to 6 00
- White sugar of lead 0 07 to 0 08
- Bich. potash 0 08 to 0 09
- Sumas, Sicily, per ton 50 00 to 58 00
- Soda ash, 48° to 58° 1 30 to 1 40
- Chip logwood 1 90 to 2 00
- Castor oil 0 09 to 0 10
- Cocanut oil 0 10 to 0 11

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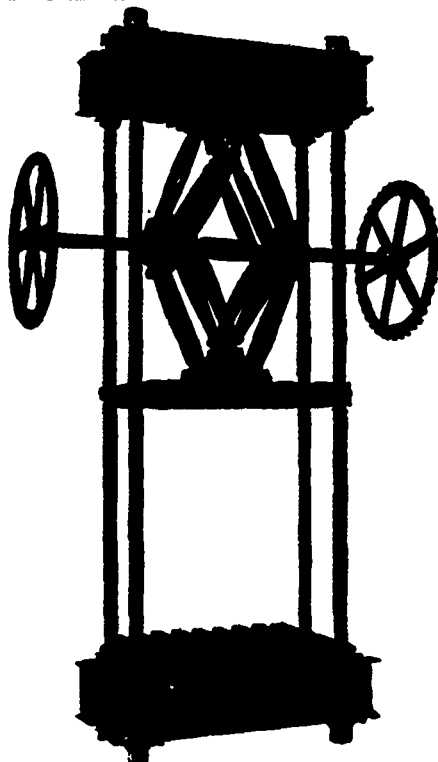
THE WOOL MARKET.

In England the general features of the wool market are favorable. Confidence is generally restored, and in most quarters very firm prices for merino classes are reported. Stocks in users' hands all over are light, and mills are well supplied with orders for goods. This is a very different state of affairs from what existed in October or December. As regards prices, although the basis is still very low, there has

so far been a manifest disinclination throughout all branches of the industry to support higher rates for the manufactured article. In Yorkshire, a good 60's Australian top at 21½d., which is about actual recent London cost, has not been very salable, spinners holding off from the market as far as their immediate requirements permitted. They may be aided in this reserved attitude by forwarding contracts for tops. In regard to crossbreds, there is no particular change to note. Medium and coarse types are being largely taken up by the trade; but the drift of fashion is not in their favor, and so long as the sources of supply of such qualities from South America continue as large as they are now, it might be sanguine to look for any early return to the basis of value which prevailed only a couple of years ago for Australasian wools. The second series of colonial auctions was announced for March 11th, but had to be postponed on account of fog. The list of arrivals has closed and totals 251,059 bales. Deducting the quantity forwarded direct, 103,000 bales, and adding old stock, 15,000, the net available total for the sales stands at about 163,000 bales, compared with 218,000 bales for the corresponding series of 1901. This falling off in the supply will probably have the effect of keeping prices up.

In the United States the volume of business is small, and in some quarters a slight uneasiness with regard to prices is noted, but any weakness is confined to those who are anxious to realize on their holdings, and as there are very few such connected with the wool trade to-day, it does not seem probable that any general giving way is possible. The statistical position of practically all grades of wool grows stronger with each week, but the great obstacle in the progress of the market is the fact that the manufacturer cannot be interested in good-sized lines of wool, except at a tempting price. His purchases, not at any time during the last three or four months large or speculative, have more than supplied his immediate wants, and his future needs will be filled when they are more fully realized and more carefully defined. The prices that have been paid in the West are regarded as unwarranted by the condition in seaboard markets and buyers realize that any movement on their part would simply confirm the payment of prices for the new clip higher than they are prepared to give. The manufacturing situation is not as encouraging as a few weeks ago, but both manufacturer and

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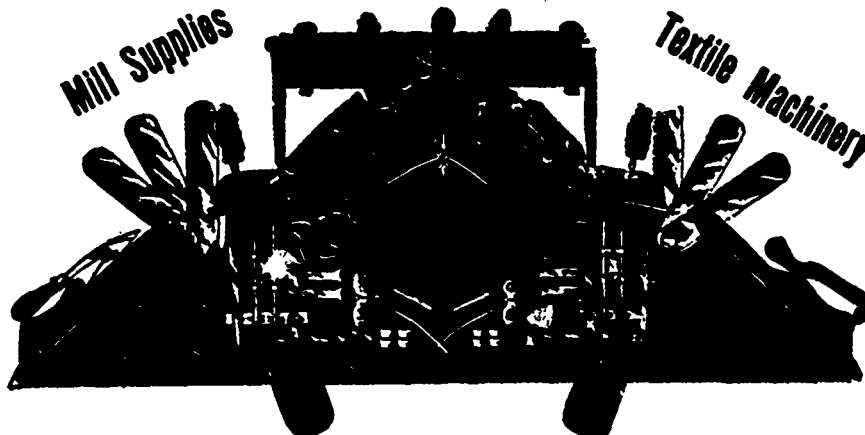
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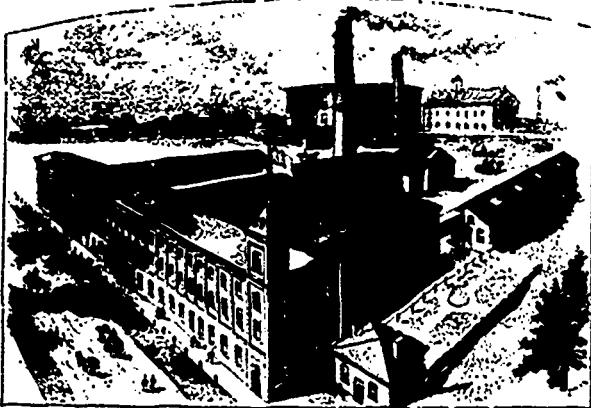
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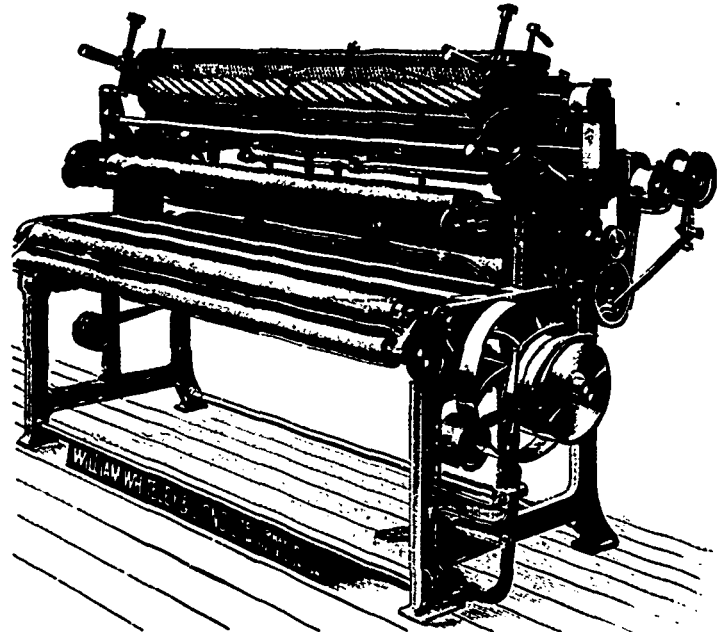
Quotations at seaboard markets are as follows: Washed fleeces, 22c. to 27½c.; unwashed, combing and clothing, 18½c. to 22c.; territory, 12c. to 17c.; pulled, scoured, 27c.; for C supers, to 50c. for extras; Buenos Ayres, crossbred, 22c. to 23½c.; Canada combing, 27c. to 28½c.

In Montreal the market is very bare of fine wools, and prices are advanced 5 to 10 per cent. Cape is now quoted 14c. to 16c. for new stock. A further advance is expected on the opening of the second series of the London wool sales. Canadian wools are firmer with very little stock in first hands. B.A. pulled wools are 10 to 12½ per cent. advanced; on fine merinos, crossbred, 5 to 7½ per cent.

In Toronto the demand is slow for all kinds. There is an absence of export bids at anything like a price which would yield a reasonable profit. The exports, however, for the last six months of 1901 totalled 905,000 lbs., and dealers figure out that there cannot be more than some 500,000 lbs. left in this province, in which case this balance will be held at stiffer figures. Ontario wools have, however, come into direct competition with South American wools in the United States, and one instance is related where an offer made to a large dealer was rejected, after careful figuring. South American wools having been purchased instead. For fleece the demand continues slow and the market is dull. Quotations are 13c. for washed, and 7½c. for unwashed. Pulled wools are quiet. The home mills are taking only moderate lots. Quotations are steady at 48c. to 19c. for extras, and 14½c. to 15c. for supers.

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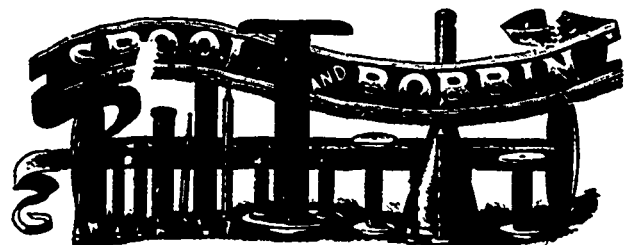
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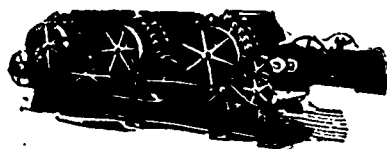
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—The German Government has de-
 cided that artificial indigo is superior
 to natural, and all military clothing
 is to be dyed with the former.

—The exports of wool from Britain
 to Canada for the last month for
 which the returns are out, show a
 great falling off being £770, as against
 £1,630 for the same month last year
 The exports of manufactured wool-
 ens, however, show an increase, as
 do cotton and jute piece goods.

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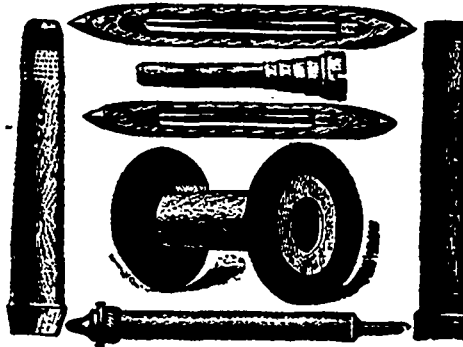
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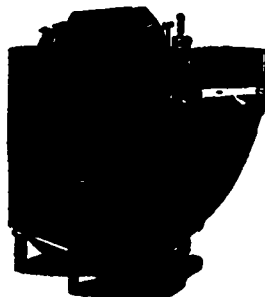
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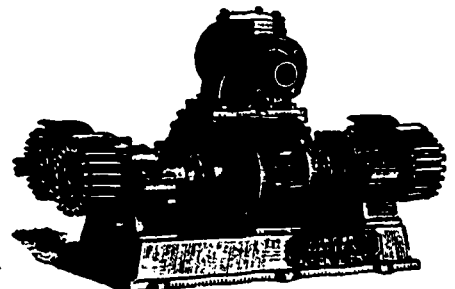
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 Shafting, Hangers, Castings, Pulleys, Gearing, Forgings.
 Equipment of mills of every kind. **YOUNG BROS., Almonte, Ont.**

—Under an order of the United States treasury department, the selv-edge of Oriental rugs is included in the measurement of size for calculating the duty.

—The Rubber Shoe Manufacturers' Association held a meeting recently at Montreal. Their year begins April 1st, and it is understood a statement will be made with reference to the trade before that time.

—The American Tent and Awning Co., of Toronto, with a capital of \$40,000, has been incorporated. The company is composed of L. Solman, Eugene Parsons, H. A. Van Uum, Norman Somerville, and F. D. Hogg, all of Toronto.

—Training classes in the art of weaving silk are to be established at Ogdensburg by the promoters of the silk manufacturing establishment to be established there. It is the intention of the manufactures to secure girls and instruct them in the work in classes as large as the building will allow, so that by the time the factory is completed, they will be able to start work with a large and experienced staff. It is expected the building will be ready by July.

—Some of the cotton mills at Sao Paulo have 200 looms and employ 300 or 400 men. The raw material is mostly obtained from the State. The output is of good quality, and durable, though not so well finished as the imported article. The machinery is mostly of English manufacture, and the heads of departments are outsiders, mostly from Lancashire.

You are Interested in the Metric System Of Weights and Measures,

because it will soon be adopted in Canada. See page advertisement in this issue.

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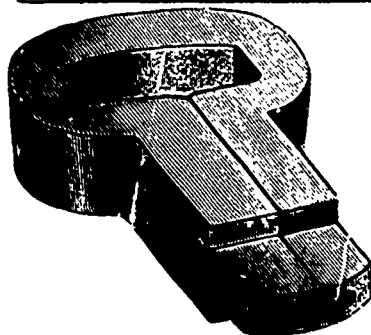
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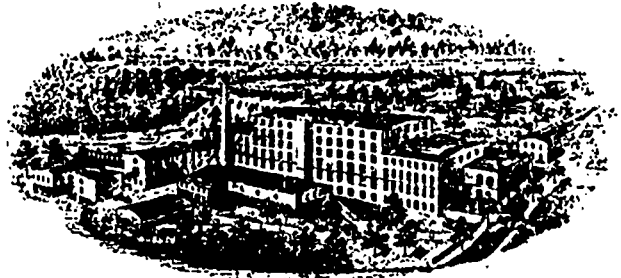
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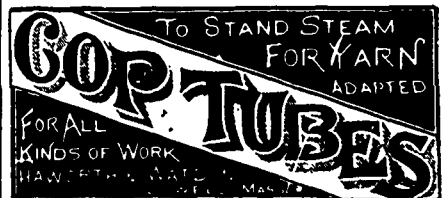
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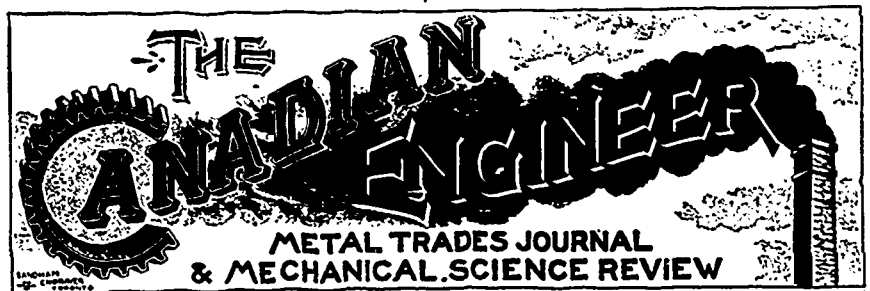
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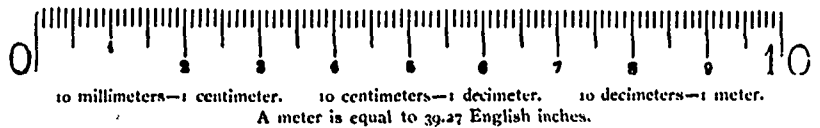
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Opinions of the Press

CHART OF THE METRIC SYSTEM.

The publishers have received many letters complimenting them on the issue of the popular Chart of the Metric System of weights and measures. The following are a few sample opinions:

I have very much pleasure in seeing you step to the aid of those pressing the Metric System to the front. I shall be glad to call the attention of teachers to your chart. The Metric System has for a number of years—since I came into office—been taught in all the schools of the province; and the metric measures are those called for in the returns from all our high schools—dimensions of school rooms, etc. I have much pleasure in sending you a few copies of my brochure on the "Three Great Reforms," in which it will be seen that for a number of years I had been an advocate of the system—even in the conservative city of Toronto. Wishing you much success.—A. H. Mackay, Superintendent of Education, Nova Scotia.

I am in receipt of your favor of the 7th ult., together with a copy of The Canadian Engineer for June, and a specimen of the Chart of the Metric System prepared by your firm. I am very pleased to read your article, but I wish particularly to compliment you on the chart. It is, I believe, the best I have seen for explaining briefly the principles of the Metric System. It will afford my committee much pleasure to hear of this awakening interest in Canada. Australia too is showing a growing disposition to adopt Decimal Coinage and Metric Weights and Measures, and here we keep gaining a step month by month.—E. Johnson, Secretary Decimal Association, London, Eng.

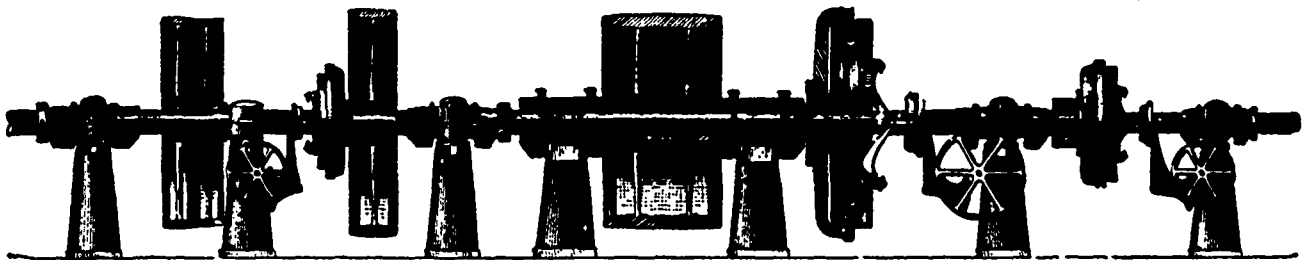
We see that you, too, advocate the general adoption of the Metric System of weights and measures, and we believe that as much as possible everywhere the same means should be employed to accomplish the desired aim. The widest possible distribution of your chart would no doubt be a good step forward. We request you therefore to forward to us two copies

for our office and for the library of the American Society of Dyers.—L. M. Carriat, Philadelphia.

The Monetary Times has a review of your Chart of the Metric System. I notice the price is stated at ten cents per copy, but if you have any other more expensive editions printed, I should be glad to receive a copy or two; as it is my intention to frame a copy (if possible), and present it to the library of the society of which I am an associate, viz., the Incorporated Accountants (Eng.). It is high time that British traders and accountants awake to the necessity of adopting decimal coinage and measures. Enclosed please find \$1 (Canadian), to cover your expenses for as many copies as the remittance will pay for. Trusting you will be able to assist our efforts on this side to foster "intercolonial and home-country" trade, and lessen the tide of German competition, which is a danger to all the English-speaking countries, if Germany gets the upper hand (both politically and socially), and assuring you of the awakening of the British to their surrounding dangers of subsidized continental competition.—E. Woodroffe, 121 Stapleton Hall Road, Stroud Green, London, England.

Please accept my thanks for the Metric System Charts. The adoption of the Metric System must shortly take place, as everything is to be said for it and next to nothing against it. As to the chart, I consider it is a valuable one, and one which every progressive citizen ought to have in his home. The mass of information, which it explains, is handled in such a simple manner that anybody can understand it without becoming in the least confused as to the use of the different terms, which is the only drawback, that I know of, to the Metric System. There is no doubt though that, if the system were adopted, the terms would be abbreviated to suit the rapid business methods this side of the Atlantic. I expect that a number of people, to whom I have shown the chart, will be calling upon you for copies of it ere long, as they have already expressed intentions of doing so.—Dermot McEvoy, Mechanical Engineer.

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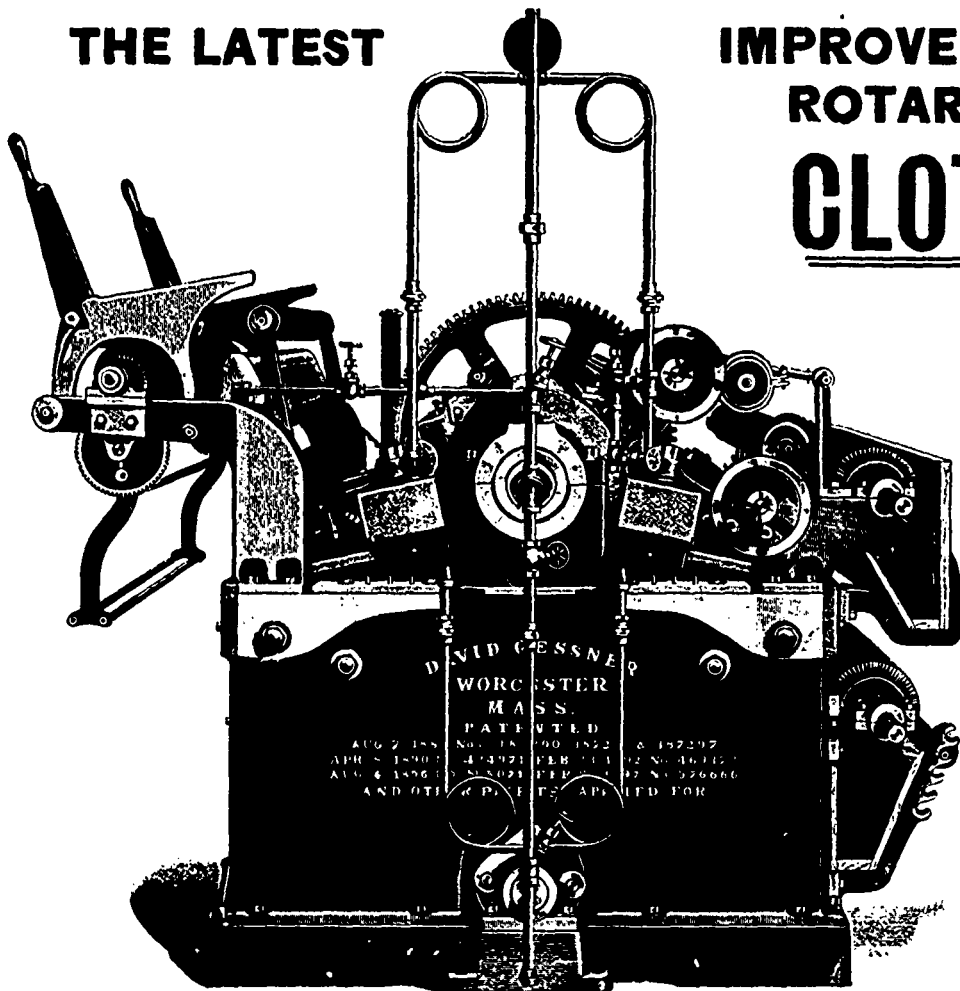
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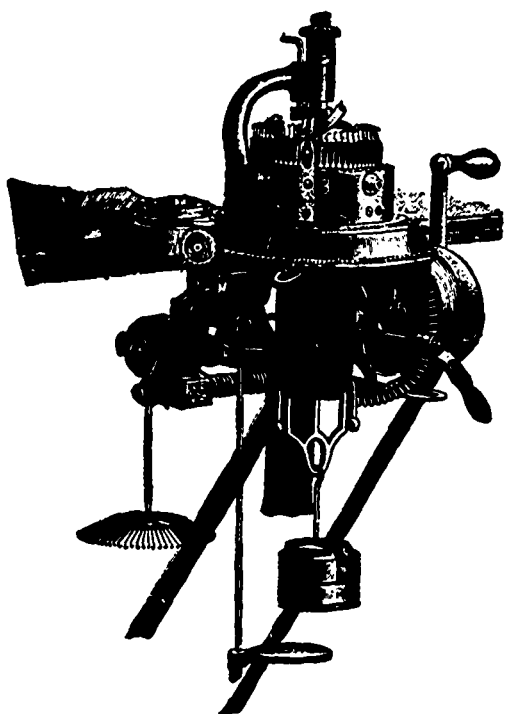
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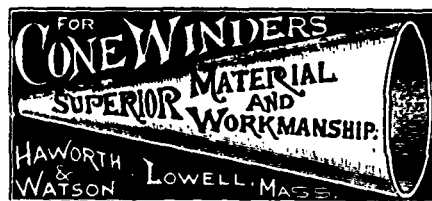
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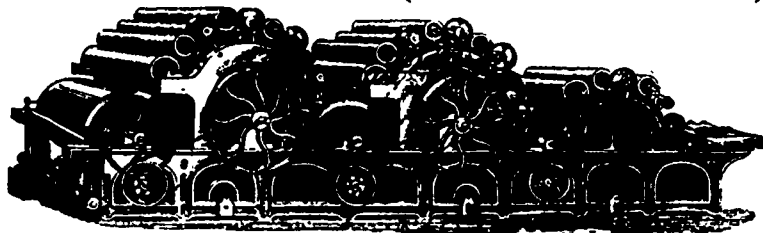
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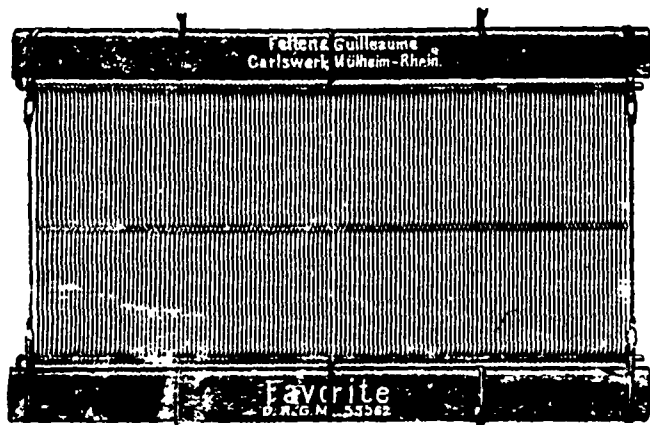
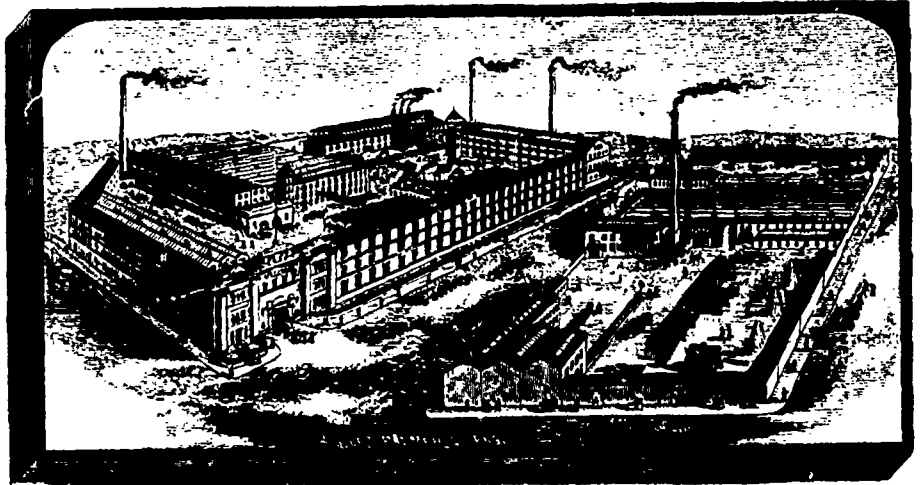
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