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CANADIAN Journal of Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XIII.

TORONTO, JULY, 1896

No. 7

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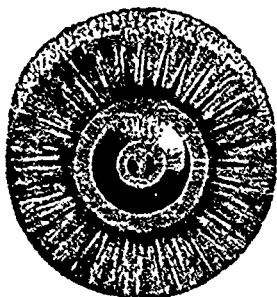
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Textile Trades of Canada.

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TORONTO, JULY, 1896

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Editorial

Lost Profits. A most important decision has recently been handed down by Justice Collins in the English Commercial Court. By this judgment damages were recovered in a suit which arose because of a manufacturer's delay in filling an order, not for an actual loss by reason of having to sell the goods at less than cost, but for the loss which would have been sustained by reason of the buyer being obliged, had he accepted the goods,

to put them on the market at a smaller profit to himself than would have been his had the contract been carried out and the goods delivered at the date agreed on. As the buyer had refused to receive the goods when delivery was offered, he had been at no expense whatever in the transaction, and it would now appear that if you can induce a manufacturer to accept orders which he cannot fulfil at the exact date, you may refuse the goods, recover damages and thus make money, having invested only as much capital in the venture as the postage on the order costs you. If this judgment is upheld in appeal, as is possible, it may be held to govern in Canadian cases, so that the whole matter is worth careful study on this side of the Atlantic as well as in England.

Sprinkler Insurance.

The loss which is caused by the automatic sprinklers is often the most serious part of a mill fire. It has been proposed for some time to insure against this, as well as against damage from fire, but legal obstacles have interposed. Recently, however, the necessary legislation has been secured, and a company in Boston, Mass., is prepared to take sprinkler risks in addition to their regular policies. A separate policy is necessary.

Irresponsible Persons.

The tramp who has been put off a train and then by way of getting even with the railway company, proceeds to obstruct the track, derail the train, and bring calamity into many homes, is recognized as belonging to the criminal classes, and is removed from active life as quickly as possible. Less criminal, but none the less disastrous, are the deeds of those whom the law looks on as irresponsible persons, whose acts are not the logical outcome of their circumstances. We do not believe that the *Canadian Manufacturer*, in its recent attack on the new administration, was moved by a desire to antagonize the administration to the manufacturing interests of the country, nor can it be possible that the wholly unfounded statements made about the condition and prospects of the trade were deliberately aimed at wrecking the credit of our manufacturing companies. We prefer to class our contemporary with those irresponsible persons who should be at all times carefully watched, and when necessary, forcibly restrained. The train has not been thrown from the track, nor is it in any danger, but thanks only to the lack of weight in the obstacle interposed to its progress.

Textile Tendencies.

The Woolen Market.

Canadian wool markets present a marked contrast to their situation a year ago. The season is now well advanced, and the bulk of the season's clip has passed out of growers' hands. In July, 1895, large shipments were being made from Toronto, Hamilton, London, Chatham, and other Ontario centres to the American markets, sales being made at prices ranging from 22 to 24 cents per lb. In July, 1896, the wool has got no farther than the hands of middle-men. The American market is stagnant. And yet affairs in the United States are not in the position to warrant ideas of approaching demoralization in wool and woolen goods. Statistics show that any deficiency in the receipts of new wool will be much more than offset by the big surplus of old wool carried over, and by the curtailed demand resulting from the depression in the manufacturing trade, which has caused a number of the most important mills to run only on halftime; but the surplus of old wool is not for sale at present market prices, and as it cannot at present be undersold by foreign wool, the holders have locked it up for higher prices. As an element in the present supply, the stocks of old wool are not a factor. The present condition of the market may, therefore, be epitomized as dull but very firm. There is practically no enquiry for Canadian wool as yet from the United States, and the few transactions reported have been made at very low prices. Toronto merchants are paying 20c. for good merchantable fleece, 15c. for rejects, and 11½c. for unwashed. Notwithstanding the low prices the wool came in readily, indicating that farmers were either in need of money or had no confidence in the future of the market. The clip will probably be no larger than last year. Wool growing in Canada is not taken up as seriously as it should be, although the returns reported in some cases are excellent. One farmer sold forty-six fleeces of pure Lincoln, weighing, unwashed, 746 lbs., for 12 cents a pound, bringing nearly \$2 a fleece. Another had 250 fleeces, Cotswold, weighing a little over 13 lbs. a fleece, which sold early in the season for 12½c. a pound. The Hon. John Dryden, Ontario Minister of Agriculture, had 130 pure bred Shropshires, which weighed 10 lbs. a fleece. He received \$1.20 per fleece. These clips are very creditable, and should give good returns to growers.

Cotton Markets.

The cotton goods situation shows signs of ultimate improvement. Many of the large mills in the United States have closed down in order to curtail production. However, large stocks are held; the Fall River mills alone hold over 2,000,000 pieces, and some time must elapse before the effects of the shut down are felt in the market. The English market is featureless and will be without change till the new cotton appears on the market. Canada, in common with the rest of the world, has experienced a sharp advance in thread prices since the amalgamation spoken of in another column. In

addition to the advance the Central Agency is making some changes in terms and dates.

CANADA FOR THE CANADIANS.

So much is heard of the superior advantages offered to residents of towns in the United States to those enjoyed by Canadians, that more than a passing interest will be taken in the contrast here drawn between life in a Canadian mill town and that in, say, a New England manufacturing centre. We quote a United States contemporary:—

"If there be an element of good society and culture in a manufacturing town it is not, as a rule, because of the mill operatives, but in spite of them. The operative brings trade, and consequently trades people to the town, and the mills may bring the families of the mill officials, and these together with the older families of the neighborhood, if the town be an old one, will form one or more 'sets' or 'cliques' in accordance with the plane on which its members have been accustomed to move; but the common operative is outside the pale of these sets, and is ostracized from any participation in their social events. In most cases the ordinary operative is looked upon as a necessary concomitant of the mill, and, therefore, an evil to be endured. That this should be so is not unnatural, for the operatives are almost entirely foreigners, herding together, and in many instances living amidst surroundings not conducive to the promotion of cultured taste. Education is not prevalent among them, and on account of their large families the children are forced into the mill at the very earliest age possible, thus depriving them of any but the most limited of public school advantages. Of course there are exceptions where some individual possesses more than a modicum of ambition, and by hard work becomes not only thoroughly conversant with the details of his trade, but also acquires a fairly liberal education, and is thus in a position to make a step forward into a better class of associates. This, however, is true only of the few, while the great majority struggle along as they best may with little or no ambition beyond the obtaining of the absolute necessities of life."

Read in connection with this the following paragraph taken from the January issue of THE CANADIAN JOURNAL OF FABRICS, which gives a brief description of life in what may be considered a typical Canadian factory town—Almonte, Ont.:

"The operatives are most intelligent and prosperous in their appearance. Many of them hold responsible positions in the town council, school boards and the managing bodies of the different churches. A large number of them who have been employed by the company for a long period, own their houses, and this is true not only of the men, but there are also property-holders among the women. The ordinary system of hiring people for what their work is worth, and discharging them when incompetent or wasteful, is followed; and there is absolutely no labor question in the town, nor has there been at any time.

There is no labor union, nor has there ever been a strike, lockout, or any disturbance or trouble among the working people. In many cases, the employees in the mill to-day are the children and grandchildren of those who were in the mill forty years ago. Some time ago, a system of profit-sharing among the employees was undertaken by the management, but as it was found to be unsatisfactory, the old system was restored. A number of those employed in the more responsible positions in the mill are stockholders to a small extent. The majority are Canadians of Scotch and Irish descent, who have been accustomed to the mill from childhood, and take a pride in the splendid property."

ALUMINIUM MORDANTS IN WOOL-DYEING.

The salts of aluminium, which are used as wool mordants, are the *sulphate* and the *double sulphates* of aluminium with potassium or ammonia (alums).

Aluminium sulphate ($\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$) is in its commercial form a white solid mass or irregular lumps, known as "cake alum," "lump alum," "patent alum," or "concentrated alum." When pure the crystalline salt contains 51.35 per cent. $\text{Al}_2(\text{SO}_4)_3$, but the commercial article often contains upwards of 55 per cent., having less than the normal amount of water of combination. The impurities chiefly to be feared are excess of acid, and iron; and although cheaper than ordinary alum when equally pure, should always be examined for the above-named impurities.

Alum mordant must always be employed in conjunction with some assistant. When used alone, the wool, by virtue of its great affinity for acids, decomposes the salt, with consequent precipitation of the base. The latter, however, does not remain as a deposit in the mordanting liquor, but is taken up by the fibre, an analysis of the waste mordant liquor showing that almost the whole of the alum, both base and acid, has been removed from the bath. From this it might be inferred that the mordanting process had been satisfactory, but that this is not the case is readily seen on dyeing the wool. The explanation of the poor results which are obtained by mordanting with alum alone is that the mordant base is fixed upon the fibre in a mechanical manner only, and not in a state of true combination with the fibre substance. Therefore, during the washing off after mordanting, and also during the dyeing operation, much of the superficially-deposited mordant is removed.

In order that a proper mordanting of the fibre may take place, this association of the mordanting salt must be prevented, or at any rate must only take place within the fibre substance itself, and these conditions are fulfilled when a suitable amount of an organic acid, or organic acid salt, is added to the bath; and this explains the well recognized beneficial action of tartaric action, cream of tartar or other similar substance, when used as assistant along with alum mordant. Experiment shows that when the mordant is applied previous to the coloring matter, cream of tartar is usually the best salt

to employ; but that when using the "single bath" method, oxalic acid is generally to be preferred—probably on account of its greater solvent action upon the color-lakes which are produced in the bath. The explanation usually given of the necessity for the addition of cream of tartar is that, by double decomposition, a tartrate of alumina is formed, which, being less stable, is more easily decomposed by the fibre than the sulphate. The actual interpretation of the facts has, however, been shown by Liechti and Hummel to be almost the reverse of this, as above explained.

When mordanting with 10 per cent. aluminium sulphate, or an equivalent amount of pot. sh or ammonia alum (viz., 14.2 or 13.6 per cent.), an addition of three to four molecular equivalents (8.4 to 11.2 per cent.) of cream of tartar gives the best results; but, on grounds of economy, this is frequently reduced to about 5 per cent. The temperature of the mordanting solution should be raised comparatively slowly in order to ensure equal and regular deposition of the mordant, and the wool should be subsequently well washed to remove as far as possible the absorbed acid.

A notable feature of the use of aluminium mordants is, that in many cases the resulting shade is much improved by adding a certain amount of chalk or acetate of lime to the dyebath. This neutralizes the acid which invariably remains in wool after mordanting with alum, however thorough the washing may be, and therefore facilitates the dyeing process; but the essential action of the calcium salt is to be explained by the fact that in many cases a triple compound or color-lake containing aluminium, calcium and coloring matter is formed, the color of which is much richer than that of the simple aluminium lake. For example, the color obtained on dyeing alum mordanted wool with alizarin in pure water is a dull orange, whereas when calcium is present a bright red shade is produced. The property does not appear to be confined to salts of alumina, but is also found to exist in the case of the salts of other sesquioxides, such as Fe_2O_3 and Cr_2O_3 .

Aluminium mordant is frequently applied along with the coloring matter, i.e., by the "single bath" process, in which case, as already mentioned, oxalic acid should be employed as assistant. The amounts of mordant and assistant should be influenced to some extent by the character of the dyestuff and the depth of shade which it is desired to produce, but from 4 to 6 per cent. alum, with addition of 3 to 4 per cent. oxalic acid, may be taken as an average amount. Generally speaking, the shade obtained by the single bath process is somewhat paler than that produced by an equal amount of coloring matter when the two bath method is employed.

The aluminium mordant must be classed as next in importance to chrome mordant, being used for most shades where the latter is inadmissible. It may be considered as the general mordant for bright colors, tin, which gives still brighter shades, being used in special cases only, e.g., cochineal scarlets and flavin yellows.

Usually the alumina lakes are somewhat less fast

to light than the chrome lakes, but equally fast to milling.

Under the old *regime*, before the introduction of the coal-tar colors, salts of tin were of much greater importance as mordants for wool than is now the case. Many solutions of tin were made and used for special purposes, being distinguished by such names as "scarlet spirits," "plum spirits," "yellow spirits," "finishing spirits," etc. These were usually made by the dyer himself and were of very varied composition, each dyer having his own receipt. In general, however, they consisted of a solution of tin in hydrochloric or nitric acid, with the addition of sulphuric, oxalic, tartaric, or acetic acids. A solution of tin in nitric was known as "bond spirits" and required very careful making, since if the reaction is allowed to become so vigorous that the temperature of the solution becomes at all high, brown nitrous fumes are evolved and an insoluble oxide is often deposited. The solution is then said to have been "fired" and is practically worthless.

The two chlorides of tin are now the chief tin salts employed.

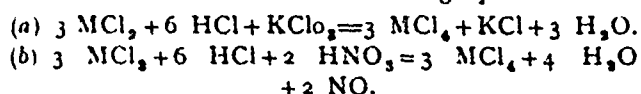
Stannous chloride is commonly known as "tin crystals" or "tin salt," and has the composition $MCl_2 \cdot 2H_2O$. It is prepared by dissolving feathered tin in boiling concentrated hydrochloric acid to saturation, and allowing the solution to crystallize. It is a somewhat unstable body, slowly decomposing on storage, particularly when exposed to light and air. It dissolves unchanged in a small quantity of water, but on slight dilution it is decomposed, with partial precipitate of oxychloride. The crystals may, however, be dissolved in dilute hydrochloric acid without decomposition, and such acid solutions of stannous chloride are sold as "muriate of tin"; "single muriate" being of a strength of 50° Tw., and "double muriate" 100° to 120° Tw.

Stannous chloride is a powerful reducing agent, and this fact must be borne in mind when employing it as a mordant, since, on account of this property, it sometimes exerts a powerful action upon coloring matters, e.g., nitro-alizarine.

With hydrogen sulphide stannous salts produce a dark brown precipitate of stannous sulphide.

Stannic chloride is usually found as a heavy, colorless liquid, which, if very concentrated, fumes in the air. It may also be obtained as a hygroscopic crystalline solid, having the composition $MCl_4 \cdot 5H_2O$, and when mixed with about one-third its weight of water forms a buttery mass known as "butter of tin."

This salt may be prepared by passing chlorine gas through a concentrated solution of stannous chloride ($MCl_2 + Cl_2 = MCl_4$), or by oxidizing the latter in presence of the necessary amount of hydrochloric acid in accordance with either of the following equations:



In the first mentioned reaction potassium chloride remains in the solution, but in the latter pure stannic

chloride is produced, the nitrous oxide escaping in gaseous form.

Stannic chloride produces a yellowish buff precipitate, with hydrogen sulphide H_2S (distinction from stannous chloride). In dilute solution it spontaneously decomposes on long standing, and gives immediately a precipitate of stannic hydrate on boiling.

The use of tin mordant is now almost entirely limited to the production of cochineal scarlets, flavin yellows, and certain shades of red and pink, with alizarin. The single bath process is usually employed, because, with few exceptions, better results are obtained by this method. The assistant used should vary according to the coloring matter, but a mixture of cream of tartar and oxalic acid is found by experiment to be most useful in the case of cochineal scarlets.

Tin salts, particularly stannous salts, undoubtedly exert a great effect in deteriorating wool fibre, tending to destroy its milling properties, to reduce its strength and elasticity, and to make it harsh and rough to the touch. This effect is greater the larger the amount of mordant used, and on this account the minimum amount possible should always be employed—4 or 5 per cent. stannous chloride being the utmost amount that can be used with safety. The injurious action of *stannic* chloride is much less marked, but unfortunately the shades obtained are not so satisfactory, and the use of this salt necessitates a large addition of cream of tartar.

A mixture of equivalent amounts of stannous and stannic chloride is found to give good results in many cases; in fact, for cochineal scarlet this is the best possible mordant.

The defect of rubbing off, which is frequently noticed in colors dyed with the mordant, is due to the amount of assistant used in the mordant bath having been too small. With a view to economy, the amount of tartar and oxalic acid employed is frequently reduced below due limits; and there is a greater tendency to do this on account of the fact that the color is thereby not injuriously affected, but even may appear somewhat fuller. This is due to superficial deposition of color-lake, which is precisely the cause of the color rubbing off.

LIFE OF THE WORKPEOPLE IN THE HOSIERY TRADE OF CHEMNITZ.

A boy of the working classes, in Chemnitz, is compelled to enter the elementary school at the age of six, and receives a sound education in writing, reading, arithmetic, and Biblical history. He also has lessons in geography, history, and natural history.

At the age of thirteen he is confirmed. Before that age he is not allowed to work for wages in a factory, and only then, provided he has passed the necessary school standard.

The hours of labor for boys under fourteen may not exceed six hours, and for boys between fourteen and sixteen the maximum is ten hours, says the *Knitters' Circular*. Their work may not commence before half-past five in the morning, and must cease by half-past eight at night.

Every period of six hours' work, for boys under fourteen, must be broken into by at least two intervals of rest of half an hour each. Other juvenile workers must have an hour's rest in the middle of the day, and an interval of at least half an hour both before and after noon.

No juvenile worker is permitted to remain in the workshop during these intervals, except under very special circumstances, if no other place, convenient for their reception, is available.

On Sundays, and certain holidays, juvenile workers are forbidden to work at all. For very pressing reasons special permission may be obtained from the police authorities, but it is very rarely granted.

The same regulations apply to girls up to the age of sixteen.

The hours of labor for workpeople, both male and female, after the age of sixteen, in the Chemnitz hosiery mills, are as follows:—In the factory—from April 1st to September 30th, 6 a.m. to 12 a.m., and 1 p.m. to 7 p.m.; from October 1st to March 31st, 7 to 12 a.m., and 1 to 7 p.m. In the warehouse the hours are—from April 1st to September 30th, 6.30 to 12 a.m., and 1.20 to 7 p.m.; from October 1st to March 31st, 7 to 12 a.m., and 1.20 to 7 p.m.

On Monday, work commences at 7 a.m., everywhere, throughout the year.

The morning's work is interrupted by an interval for lunch, from 8.30 to 8.50, and the afternoon's work, for tea, from 4 to 4.20.

Women over 16 years of age may not be employed for over ten hours on the day before Sunday or a holiday, and must leave work by 5.30 p.m. on such days. By special permission of the police authorities, however, work may be continued up to 8.30 p.m. on very exceptional occasions. All Sunday labor is forbidden.

Every working person is taken on trial for a week, and can leave, or be dismissed, without notice during this period; subsequently, both parties have to give a fortnight's notice. Any workman leaving before the fortnight is up, forfeits his wages.

Wages are paid, according to the nature of the labor, by the hour, the week, or the piece. Wages are paid out every other Friday, for the fortnight ending on the previous Tuesday, but workpeople can get something on account at the end of the first week of the period.

Leggers, footers, folders, trimmers, menders, winders, turners-off, seamers, and runners-on are employed on piece wages. Smiths are paid by the hour, and foremen, overlookers, firemen, packers, and errand boys by the week.

The average wages earned per fortnight are: Leggers, 38/-; footers, 37/-; runners, 19/-; factory menders, 15/-; seamers, 16/-; turners-off, 15/-; winders, 23/-; folders, 19/-; trimmers, 19/-; trimshop menders, 20/-.

Compulsory deductions are made from the wages for the sick, invalid and old age insurance organized by

the State, to which all people are liable who have an income under £100 a year.

Every master is compelled by law to insure his workpeople against injury from machinery. For instance, for 300 workpeople, coming in contact with machinery, he would pay 300 marks (£15), and he has further to insure all people in his employ against accidents on his premises. Supposing a master employs another hundred people, in addition to the 300 coming in contact with machinery, he would pay another 180 marks (£9), in addition to the above, to cover accidents to any people in his employ, happening on his premises, though not arising from machinery.

The amount insured for is classified in four divisions, according to the seriousness of the accident, and the amount of wages earned by the injured person.

The sick-invalid and old-age insurance has four classes, arranged as follows:—

	I.	II.
Weekly wage	under 7s	7s to 10s.
Weekly premium	14 pf.	20 pf.
	III.	IV.
Weekly wage	10s. to 17s.	over 17s.
Weekly premium	24 pf.	30 pf.
	(8 pfennigs = 1 penny)	

[Of this premium the master pays half]

The sick insurance only is arranged in classes as follows:

	I.	II.
Weekly wage	under 6s.	6s to 7s 10s.
Premium	13½ pf.	18 pf.
	III.	IV.
Weekly wage	7s 10s to 15s.	over 15s.
Premium	34½ pf.	40½ pf.

[Of this premium the master pays one-third]

This insurance supplies the workpeople with free medical advice, medicine, trusses, spectacles, etc.

If illness renders a workman incapable of work for more than six days, he receives an amount equal to half his average earnings, commencing from the third day of his incapability.

The insurance is compelled to pay this support for at least thirteen weeks, but old-established sick funds, with a large capital, may vote for the continuance of the payment up to twenty-six weeks, or even longer.

If a workman becomes a confirmed invalid, and can earn nothing, or only small wages, and has contributed to the invalid insurance for five years—which he has done at the age of twenty-one, if he began, as is usual, at sixteen—he is entitled to a pension of ten to twelve shillings a month for the rest of his life, or until he is again able to earn full wages.

A workman reaps the benefit of the old-age pension at seventy years of age. The pensions are arranged in four classes, depending on the number of years' contributions that have been made. The pensions vary from about 8/11 to 10/- per month, at present.

The old age pension is only for people having an annual income under £100. Should the income of a person who has earned over that amount, ever fall below it again, he is obliged to re-join the insurance.

This old-age insurance is a new venture, and if it

proves satisfactory, no doubt the conditions for benefiting by it will be made more favorable

Every birth that occurs in Germany has to be notified to the authorities, who keep a register. When a youth arrives at the age of twenty, he receives a written order to present himself for military service. He is then examined by the doctor, and if unfit, rejected, or if not sufficiently developed, put back for another year. This may happen a second year, but the third year he is either accepted or entirely rejected. Of course, workmen of the hosiery trade are subject to this just as everyone else. The term of compulsory service is now two years, but a man remains in the reserve for another five years, during which time he may be drawn in twice for a period up to eight weeks; after that he remains in the Landwehr (subject to service if the country is invaded) until he is thirty-eight, and is again liable to be drawn in twice in the same way during this last period. After that he is only liable to service in case the empire is in imminent danger.

(To be continued.)

FOR THE CANADIAN JOURNAL OF FABRICS
**THE PRESENT CONDITION OF THE WOOLEN INDUSTRY
 IN CANADA.**

BY "WOOLEN MANUFACTURER."

(To be continued.)

In my June letter, the words "Winter" and "Spring" should have been reversed. These words were misplaced inadvertently; so, kind reader, be pleased to understand this correction.

At the time the June letter was written a meeting of the principal woolen manufacturers and their representative selling agents was being held in Montreal, and the question of the undue terms exacted by the woolen merchants was discussed, and resolutions adopted on the same lines as were suggested in my letter. It is not too soon for steps to be taken to rectify this gross inequality and injustice. There is another view of this question, viz., the heavy responsibility assumed by the selling agents, who guarantee the woolen mills' accounts. They not only never seem to be quit of the responsibility of the debts incurred by the sale of manufactured products, but often do they assume the debts made by the manufacturer for material. The reason of this is because the banks, who honor the hypothecation notes, always know the condition of the affairs of the manufacturer, being so surrounded, as it were, in the grip of the selling agent from hypothecation liens and chattel mortgages, that the manufacturer has really no business standing financially but what is certified by the signature of the selling agent. Real estate and machinery have the value of but twenty-five per cent., or thereabout, of its cost for security, when the manufacturer has to seek aid from the banks to run his mill, yet mills and machinery are the means by which the manufacturing of goods is necessarily carried on, and the trade's existence is based upon them.

This state of things would be materially changed if terms of credit were reduced to one-half of the time that

now exists. Upon this point it is well worth the while of all persons interested in this question to read the speech of George Hague, general manager of the Merchants Bank, to the shareholders of that institution at the annual meeting, held June 17th last in Montreal. He says: "Customers of banks who give too extended a credit generally want similar credit from their bankers—especially in the way of discounting long paper and borrowing on long advances." That is why "many people have been leaning too heavily upon their bankers for some time back," because "they (the bank customers) have been allowing their customers to lean too heavily upon them."

"The whole system of credit in Canada wants a revision. . . . If such a thing could be brought about as a general cutting down of the length of credit, say one-half, the result would be a reduction of losses one-half," and the consequent result again would be that many businesses which now yield no profit at all would return a fair remuneration for the capital invested. "Such terms as are given in Canada are entirely unknown across the line in the United States. Credit there is much shorter, and to the great advantage of both seller and buyer." Another quotation from the same speech, viz.: "It is a settled principle of sound banking that all advances must rest upon goods, wares and merchandise, and not upon real estate."

The importance of this question of long credit is greatly emphasized by this masterly speech of George Hague. I take some pleasure in the fact that my remarks, statements and suggestions for a revision of the unjust terms now in existence in the woolen trade are so particularly supported by so high an authority. It is evidently a factor in the minds of all bank managers when dealing with accounts of the various branches in the woolen trade. The past eight years has been a period of gradual decadence and vanishing of profits in the trade. Some mills have tried to stem the falling tide by making improvements and renewals in their machinery to meet the demand for lower-priced goods, and to reduce the cost of manufacture, and have succeeded considerably by so doing. The styles of woolen machinery used and in operation in most of the woolen mills in Canada are of the American pattern. Why this is so can only be accounted for from the fact of the ability and intelligence that were found in this country when such mills were being built and machinery added; this knowledge had been acquired in American mills. This is a very strange fact, because the greatest competitors which the woolen manufacturer has to meet in this market are English and not American. Then, why adopt the American plan or system of working machinery? If to copy at all, or follow an example, why not follow that of the successful competitors. In these remarks I must particularly refer to the carding and spinning departments of woolen manufacturing. I may be met with the assertion that this is a matter of opinion. Every woolen manufacturer has an opinion, and may be no two are alike as to the best class of machinery to

put in a woolen mill. The question of narrow or broad looms is acknowledged to be in favor of the newer type of broader and heavier framed looms.

It is a good sign of improvement in these critical times when one hears of a manufacturer throwing out his narrow, light-made, tweed looms and replacing them with broader and heavier framed looms, particularly when nearly the same wage pays the broad-loom weaver, as is paid the narrow-loom weaver, with double the production. The cost of superintendence and running expense being no more, where will the margin of profit be at the annual balancing up? This will tell its own tale. The sooner our woolen mills have a turn-out of their obsolete machinery the sooner will we hear of better margins of profits. Concerns which cannot add improved machinery must not expect to win in this race of the woolen manufacturer for existence. We have a change in our Ministry at Ottawa. New brooms sweep clean generally, and there is an evident scare by the woolen merchants and manufacturers that Laurier and his ministers are going to mix up things in the tariff revision they have promised the country, but in my opinion the question of renewing and replacing machinery for more improved type will help the woolen manufacturer to make better margins than can be expected in these times by any revision of the tariff. We must wait to see if it is the design of the Laurier Administration to help to build up existing industries and not to injure any more the industries already heavily-burdened by the circumstances surrounding them. Let us hope for the best in these changing times.

SAXON COTTON INDUSTRIES.

It was in the year 1560 that cotton was first introduced into Saxony, and from that time to the present it has formed an important industry. During the thirty years' war, however, and for a long time afterwards, the industry was suspended. England, taking advantage of this Saxon embarrassment, pushed out into the world's markets, and the battle thus begun has been waging ever since. England, by advantages of buying, controlled the American market, and for many years enjoyed large profits. The Napoleonic politics and large protective tariff, which kept England from the Saxon markets, led them to neglect any armament for war in the open field.

The year 1865 brought in a reduction of the duties on cotton yarn, and with it the necessity for better technical systems, if the Germans, or Saxons, were to hold for themselves what England was fast winning. This they partially succeeded in doing, by bringing in English self-acting machines, especially mules, to take the place of the old-time hand mules. In spite of all this, England, by means of her large establishments reducing cost of production, by dividing up the labor better and more systematically, by the development of skilled spinners, and having Manchester favorably situated as a centre for trade, and Liverpool as a great cotton market, kept Saxony out of her markets.

From 1879, protected by tariffs, and remembering her neglect of opportunities from 1847 to 1865, Saxony prepared for the future. She opened technical schools in every manufacturing town or city, places of not more than 5,000 inhabitants having industrial schools. Limbach, a great centre for hosiery and underwear, had an industrial school, the first of its kind in the world. Besides the industries of Limbach, the Alpha and Omega of knitting and weaving machines was and is taught. Downstairs, in a large room, are knitting machines of all kinds. These are run by the scholars under the eyes of their teachers. What is made is exhibited and then turned over to the scholar who made it. Every movement of the machine is analyzed, from the simplest to the most intricate. The causes of accidents, bad work, etc., are all pointed out and explained, besides the study of gearing, belts, etc., or the thousand and one things that come up in the course of a year's work. The principal and his assistants are all most devoted to their work. This course is of two kinds, theoretical and practical, and scholars learn both.

By means of these schools, Saxony has driven Nottingham and England not only out of Germany, but out of many houses in New York and South America. The English machines in her mills have been rapidly replaced by machines made here. To-day, in Saxony, a kingdom with 3,000,000 people, there are 1,243,905 spindles spinning cotton yarns—more than Bavaria has (Bavaria spun the first cotton yarn that was spun in Germany), and almost as many as there are in Prussia. The average number in each mill now is 19,609, while in England the average is 29,506. Since 1887 the increase in spindles has been more than 20 per cent.

To-day, by persistent effort, notwithstanding the dryness of the climate, being far inland and remote from the softening and humid influences of the sea, Saxony is in a position, not only to get along without English yarns herself, but is sending out agents who are selling her yarns in territories once entirely ruled over by Nottingham and Manchester. Numbers from 60's to 120's formerly produced only in England, and long deemed impossible in Saxony, are now spun here on machines made here.

These triumphs Germany owes to her technical schools. Without them she had never been able to get up. Take them away, and she goes to pieces. A manufacturer said, only a short time ago: "Let the Government take its hand from behind the schools and we manufacturers will support them. They are indispensable in helping us to keep what we have, and in enabling us to go out and get more."

Wherever you go in England or Scotland, "Made in Germany" confronts you on very many of the boxes you buy. If you make a trip into strange places and want souvenirs, you buy boxes, Chinese dolls, cups, fans, guns, pictures—"Made in Germany." Much of the jewelry bought in Paris, London and Vienna, comes from Pfarzheim, in the Black Forest. Crimmitzschau makes and sends yarns to England. Crimmitzschau and Werdau, near Chemnitz, two small places, un-

known, unheard of in the big world until a few years ago, now rule the world's markets in one kind of yarn, strickgarn. The manager of a large English concern that sold yarn to the Germans for twenty years, boys here now and sends to Nottingham and Manchester.

The causes that have brought this about come mostly from the plodding perseverance of the Germans, and a certain accuracy that no other people possess. Their schools do much to make this accuracy possible. Saxony, with her 3,000,000 people, one-fifteenth of the population of the Empire, has one-fourth of the textile mills of Germany. This she owes to her famous schools, at the head of which stands a government institution for the encouragement of art and commerce, in Dresden, the capital. In every city, town, or large manufacturing village, these schools are slowly, surely and silently building up not only the German captains, but the men and women who are to work in the shops of industry. They explain what seem at first, to the visiting stranger, a hard thing to understand, and that is, why certain sections give themselves up entirely to one thing—to toys in the mountains and at Nurnberg, to passementeries in Annaberg, to knit goods in Chemnitz and Limbach, to dress goods in Glauchau, to lace in Plauen, to silk in Crefeld. The schools in these places are designed for and devoted to the special industries of the places. In Pfarzheim it is jewelry, at Furtwangen in the Black Forest clocks, at Pirmasens boots and shoes, etc. Bismarck, in a speech before the Bavarian teachers, recently said, "Wer die Schule hat, hat die Zukunft"—who has the schools has the future.

THE THREAD AMALGAMATION.

The amalgamation of the leading spool cotton companies of Scotland and England, which has been attracting considerable attention in trade circles, is understood to have been effected by the direct purchase by the J. & P. Coats Co. of the various concerns included. These are, it is said, four in number—the Paisley-Clark Co., or the Clark O. N. T., as it is frequently called; Jonas Brooks & Bros.; James Chadwick & Bros., the Clark Mile-End Co.; and the English department of Kerr & Co., which was purchased by the Coats company some time ago. It is understood the American establishment of the last-named concern is not included. All of these concerns except Jonas Brooks & Bros. have factories in this country. The American plant of the Coats company is at Pawtucket, R.I.; that of the Paisley-Clark Company, at Newark, N.J.; that of the Chadwick Company, at Greenville, N.J.; and that of the Clark Mile End Company, at East Newark, N.J.

So far as has been learned, no concerns owned in the United States have been absorbed in the amalgamation, but only the British ones and their different branches. The sale of the products of the amalgamated companies, it is understood, will be conducted by means of a central agency, with branches throughout the country, a similar system having been employed for some years by the Paisley-Clark, the Coats and the

Brooks companies, in their business abroad. It is said that the central agency in England has advanced prices of the product considerably. It is believed by some, however, that the Coats company will not advance prices sufficiently to encourage competition, but that, on account of their enormous product and the reduction of selling expenses which will result from the amalgamation, they will be able to realize large profits while selling at moderate prices.

FINISHING WHIP CORDS.

The initial process of finishing this class of cloth is the same as that on all other kinds of worsted goods. The utmost care to have all the threads in the proper place must always be exercised, and for this reason the menders or sewers should be closely watched. In fact, the best results are obtained if the goods are properly perched, both before and after the goods are burlled and sewed.

The first inspection is for the purpose of determining the amount of work on the piece, a tolerably sure guide as to the amount of time required to do the work properly, which is of great importance to the one having charge of day workers; but if the work is done by the piece, it should also be done first so as to determine the amount the sewer or mender should properly claim for the work. However, this is more a question of management than of finishing.

After the goods pass the final inspection and are ready for further proceedings, take them in sets of eight and sew the ends together on a machine, thus making one string of the eight pieces; then take them to the singeing room.

No doubt this operation is not as widely known as it should be, but there is no denying the fact that whip cords at least cannot be properly finished without using this process. The benefit of singeing the goods consists in the removal of all loose fibres, thus removing most if not all the cause of the felt which is apt to obscure the threads to the detriment of the looks of the goods.

One of the chief reasons that so many finishers object to the use of the fulling, when finishing these goods, is the felt which is sure to show itself unpleasantly wherever the fuzz and loose fibres are not first removed, but after being singed the chief cause of objection against the fulling mill has been removed, and the goods will be greatly benefited in feeling and general handle if they are allowed to run about thirty to forty minutes in the mill.

The chief cause of felt is found in the amount of soap put on the goods, for we find that a fabric will felt better when running rather on the wet side while fulling, than when running a little on the dry side.

Another aid to felting is the body of the soap, for the heavier the body of the soap, the better its felting qualities. On worsteds of all kinds, and on the class under consideration more especially, it is useless to use anything but the best quality of soap.

Nothing less than a good pure olive oil soap ought ever to come in contact with these goods.

The goods should be wet evenly with a good pure soap of not too heavy a body, but this wetting must be kept in as close limits as possible, and be sure above all not to have the goods too wet. While it is true that the heavier the soap the better its softening qualities, it is also true that it thus enhances its felting capacity, and therefore makes up in quality what it is impossible to do in quantity.

That is, on account of being unable to use as heavy bodied soap to soften the goods, it will be necessary to take a better quality of soap and thus endeavor to reach the same result.

Next in order is the washing. It should start with a run of about fifteen minutes with a generous supply of warm water, which will soon turn into a good rich lather, which of course will contain considerable, if not all, of the grease and dirt which it is wished to remove from the goods. At the end of the specified time this dirty lather is drawn off and another supply of warm water is introduced, letting the goods run in this second warm water for twenty to thirty minutes; when the rinsing is in order, which should be successfully done in three-quarters of an hour.

The goods are now taken and extracted, and after that they are tightly rolled up and laid down flat over night at least. After being unrolled in the morning they may be taken to the singer again and subjected to two very thorough runs, after which they are ready for the steaming process. On the steamer of to-day, the process has narrowed down to very simple proportions.

WOOL.*

The great elasticity of wool, and its serrated scaly surface, are the two qualities which separate it from all other fibres, and give it so wide a range of usefulness in the field of manufactures. After describing the nature of a sheep's skin, and the texture of woollen fibres, Mr. Greaves denounced the manner in which American dealers put up their wool, being in strong contrast to the way foreign wool came to this country. Besides all the extraneous things the sheep naturally picked up in their ramblings, the fleeces were often stuffed with twine, fallen leaves, straw, tags, and short belly wools, to say nothing of dung locks. The decomposition of the excess of vegetable matter discolors the wool, and no amount of washing will restore it to the original condition. In certain dyed colors, where any unevenness of shade is noticeable, if it could be traced to its proper source, in numerous cases, irregularity of color in the raw wool will be found to have played an important part. The use of an unusual amount of cheap twine, especially of sisal twine, was a fraud, and a source of much streaky cloth, as it sometimes got worked up into manufactured goods.

The increased demand for foreign wools has, of course, been largely due to the placing of wool on the free list, enabling the manufacturer to use any blend he finds most suitable to produce the effect most desired in

his fabric. This is not the only reason, however, and the careless manner in which American growers prepare their wool, is responsible for no small share of the change. If wools were properly prepared, only a small portion would have to pass through the carbonizing process, which adds to the expense, and certainly does not improve the fibre. As the future points to a closer competition than in the past, and a finer grade of yarns will be demanded, it behooves the manufacturer to insist that his wool shall be as represented. On the other hand, the grower, if he wishes to have a ready market for his wools, at remunerative prices, must persist in his efforts to overcome the preference for foreign wool (which his carelessness has in a measure created) by putting up his wools in a clean and business-like manner.

It has been said that wool is a kind of hair; still, it possesses one marked property which hair does not—that of fulling or felting, a fact which constitutes the great value of wool, as distinct from every other fibre. When spun into yarn, the fibres of wool remain as they are placed. The serrations, which are about 2,500 to the inch in fine Saxony wool, interlock with each other, those on one fibre catching and holding those of another, and when this intermingling is complete, it is nearly impossible to tear the fibres apart. This property is the basis of the great value of wool, as a fibre, for making a solid bodied cloth, capable of affording protection from the varying elements.

Wool seldom arrives at the mill twice alike, even when it is rated the same grade, and often there is a liberal distribution of the unnecessary stuffings mentioned previously. How to secure uniformity must not only be understood by the wool-sorter, but he should also have a knowledge of all essential points, such as shrinkages, the percentage of sand, dirt, etc. Familiarity with handling the different grades under various circumstances, will soon bring experience, but to be a profitable man in his position, he should have a fair knowledge of other branches. It is not necessary for the sorter to know as much about carding as the carder, or of spinning as the spinner. Still to bring the finished product up to a proper standard, he ought to have some acquaintance with both departments. The field open to the wool-sorter is much wider than is generally supposed, and should be taken advantage of by all men ambitious to rise in their position.

There does not seem to be any recognized standard of names for the different qualities of wool, the titles varying from one locality to another, each mill using those of their own selection. The following are the common names for most English grown wools, for the woollen trade around Yorkshire, Eng.: Picklock, Prime, Choice, Super, Seconds, Downrights and Britch. For the worsted trade: Blue Fine, Neat, Brown, Britch and extra strong, which is called Cowtail.

If the wool is to be spun to its full limit, economy requires that it should be carefully sorted. Though it is one of the most important, the sorting of wool in this country is a branch of the industry which is sadly

*An abstract of a paper read by Edward Greaves, at Woolen and Worsted Overseers' Association.

neglected. Where wool is properly sorted and blended it will produce a stronger and more even thread, which is a great step towards making a perfect cloth. The man in charge of blending should thoroughly understand the nature and spinning qualities of the wool he intends to mix. An experienced sorter uses both the sense of touch and sight in separating the qualities, and that of feeling is perhaps the most delicate. The manufacturer who thoroughly knows wool, or has a manager possessing that knowledge, will always have an advantage over competitors not similarly placed. His yarns will be more uniform in strength and quality, and in case of close competition on prices his knowledge of the nature of wools will again serve him in the selection of material best suited to meet his requirements. In closing, Mr. Greaves urged all in this department of the mill to study wool more closely, as the knowledge gained will amply repay any extra outlay of time and labor.

The paper attracted much favorable attention and the author was given a vote of thanks.

THE SMOOTHING OF MELTONS.

In no weave is the formation of creases in washing and mulling so disagreeable as in that with melton finish. Goods that are not giggered are but too prone to retain the impressions received in washing or mulling, while in giggered goods the creases and cockles, if not too pronounced, can be gotten out by teasing upon one or both sides, thereby loosening the nap; a good stretching in the tenter will accomplish the rest. Complaints about creases, cockles, etc., in melton finished weaves are to be heard on all sides, both by manufacturer and consumer.

Without taking into consideration that the fuller must on his part do everything to prevent these disagreeable visitors, such as keeping his engine thoroughly clean, shifting and stretching the cloth, etc., it is especially the business of the finisher to remove all creases, folds, etc. In rare and light cases only will during the drying a simple stretching in length and breadth accomplish the purpose. Nevertheless, a strong stretching in breadth—stronger than is customary in napped goods—will often be sufficiently effective, to dispense with special correctives being made use of. If the tenting machine is in good order, the length of the cloth may be stretched five to six per cent., the breadth eight to nine per cent.

A means often employed for smoothing is the rolling of the wet pieces, as they come from the washing machine, upon wooden rollers, and leaving them to stand for 24 to 30 hours. They must be wrapped firmly, two pieces generally upon one roller. If the creases are not too strong, they will be removed in this way; beside this, the cloth also takes some gloss. The rolling up in a wet state is useful especially for cheviots, worsted imitation, tricots, etc. With more strongly pronounced folds the broad washing machine must be used to serve as smoothing machine. The cloth, if it is

not already washed and thereby smoothed, is, after coming in a clean condition from the rope washing machine, again treated in the broad washing machine, in which it is passed with full pressure through water of 122° to 140° F., after which it is rinsed clean in cold water. If the machine has two kinds of gait, let it run slow so that the cloth will run quite smooth, and receive full pressure. A hydro-extractor is sometimes placed directly behind the washing machine, for whizzing in full breadth; the cloth is placed in direct after washing and smoothing, so as to prevent all formation of creases. Some mills use smoothing for stretching machines of different systems, the so-called openers or expanders; but little can be said in their favor, because they attack the cloth too much.

Another means is the wet treatment. This process is used only in case of unusually obstinate creases and cockles. The cloth is first dried, and then stretched in length and breadth, so that it appears perfectly smooth. After drying, the pieces are wrapped very tightly upon wooden or copper rollers, and immersed over night in water from 175° to 195° F. They are withdrawn next morning, and left to stand for from 6 to 8 hours—that is, until thoroughly cold, before being unwrapped. This treatment is apt to make the cloth boardy, lean in feel and lighter in weight; for which reasons it is employed only in extreme cases. The hard and boardlike feel may be corrected partly by letting the pieces run slowly and with gentle pressure for about 15 minutes in water of 140° to 160° F. in the broad washing machine.

Generally speaking, it is well always to let wet treated cloth run for a short time in the broad washing machine, so as to remove by the hot water all traces of soap, fullers' earth, and other impurities. Do not rinse in rope, because new creases are easily made in the still hot cloth. A good broad washing machine should be found in every finishing establishment.—*Translated from the German.*

CHEVIOTS.

The cheviot is a coarse, full, loosely woven cloth, with a soft, agreeable handle, and a bright, clear and animated appearance. A dead, dull cheviot, whatever its color or design, is a worthless piece of cloth. Indeed, in the eyes of many consumers, the value of the cheviot lies very largely in this particular quality, a quality which is, of course, self evident. Many serges possess the same quality; it can hardly be described, but if you place two pieces side by side, the one with the dead, lifeless cast or appearance, and the other with the fresh, lively and vigorous cast, you will not be long in determining which is the superior cloth. Even in solid colors, blacks and blues, there is the widest difference.

These goods get their name, as almost every one knows, from the cheviot sheep, a breed that ranges upon the Cheviot hills in Scotland. There is a peculiar length and beauty to the cheviot fibre that particularly adapts it to this class of cloth, and while other wools may be worked into the cheviot, the results are not the same.

There are two classes of cheviots—the rough-faced cheviot and the smooth. The former of these, the rough, was the original cheviot, the one which has survived all changes, and is accepted even now as one of the most durable and valuable cloths on the market. The latter is a clean or close finish cheviot, which is a later product, which while it has the free, loose body of the cheviot, has not its rough and undressed face appearance. The threads are cleaned out, and they show up in the face of the goods almost as clearly as in the cassimere and kindred cloths.

With regard to definite finishing rules, let us now look with precision into the method which is in vogue in dealing with these cloths.

The fulling is but short, an hour or an hour and a half being quite sufficient for most of the grades that call for attention. This, too, because a firm, heavy body is not one of the requirements of the class. But it often happens, too, that colors are bright and more or less perishable, and where this is the case, care has to be exercised in order to insure the best results. The soap will only need to be fair bodied. If it is too heavy, it will enhance the solidity of the goods too much. If too light, it will leave them too flimsy. The mean is required. We must not allow anything that is going to make the goods hard or "boardy," and we must avoid everything that is going to take away from the time and work necessary in the washing. The scouring has a very intimate bearing on the finish of the cheviot, and any step that is going to end in rushing the washing process is going to impair the value of the goods. On account of the loose, soft character of the goods, too, it is necessary to guard carefully against creases in the mill by even moisture, and by loosening and shaking out the piece occasionally while it is being fullled.

In the washing now, add warm water first, seven or eight pails to the piece, and let the goods lather up. After 15 minutes in this, which is the first dirt and grease that is taken from the cloth, the liquor is run out and renewed again in warm water at intervals until the dirt and lather have been thinned out and all traces of soap removed. Rinse now in cold water until everything is perfectly cleaned. A half hour ought to do all that is required.

Just now it is a good plan to give the pieces a bath of sulphuric acid of about the strength of weak vinegar, and then follow at once with the burr-dyeing. Fifteen minutes in the dye ought to be sufficient, and then a thorough rinsing follows all. To add to the life and clearness of the finish, the fuller's earth bath is now undergone in the ordinary manner, and then the goods are taken out and rolled to stand over night. If it happens that cotton is present, it is not well to allow the cloth to stand in the wet at all. The thing to do then is to rush it right ahead, and to get it dried as soon as possible.

Shearing then comes, which is true as well in the rough finish goods as in the smooth. The long fibres

are removed in the former case, and so a more uniform surface results. And in the latter case the nap is entirely cleared away, and the threads exposed. The brush is taken away on the shearing of these goods, so as not to lay the fibres during the process. As to the exact state at which the shearing is discontinued, it will vary entirely with the required finish or with the taste of the producer. But the shorn cheviot wants to be brushed as usual preparatory and subsequent to pressing. This tends to even out the face and make a handsomer finish. The rough or original cheviot does not go through this process, as there is nothing allowable with that grade of cheviot which is going to lay or mat down the face fibres to any extent.

LONDON WOOL SALES.

The fourth series of London sales of colonial wool commenced 30th June, with catalogues comprising:—

Sydney	1,624	bales out of an available total of	72,000	bales
Queensland ..	2,520	" " " "	33,000	"
Port Phillip ..	491	" " " "	58,000	"
Adelaide	484	" " " "	19,000	"
Tasmania	" " " "	13,000	"
W. Australia	111	" " " "	9,000	"
New Zealand	4,322	" " " "	77,000	"
Cape	366	" " " "	21,000	"

9,918 bales out of an available total of 302,000 bales

There was a good attendance of home and foreign buyers and animated competition. Prices, as compared with last sales' closing rates, showed no appreciable change. Good Australian merino wools maintained their former level, while medium and faulty kinds ruled somewhat weaker. Crossbreds were in good demand at unchanged prices. The little that was offered of Cape sold also at about May prices.

The list was closed at 4 p.m. on the 5th June, when the fresh arrivals amounted to 302,403 bales (240,411 bales Australasian and 52,992 bales Cape). Deducting what has been forwarded direct, but adding the wools held over from last series, the total available amounts to about 302,000 bales.

As at present arranged the sales will last till the 27th July.

TEXTILE IMPORTS FROM GREAT BRITAIN

The following are the values, in sterling money, of the textile imports into Canada from Great Britain for May, 1895, 1896, and the five months to May, 1895 and 1896

	Month of May		Five months to May	
	1895	1896	1895	1896
Wool	£ 796	£ ..	£ 2,257	£ 5,211
Cotton piece-goods	23,277	19,768	230,978	233,981
Jute piece-goods	6,120	13,955	42,060	61,922
Linen piece-goods	7,627	5,408	64,455	70,975
Silk, lace	1,087	704	17,231	5,655
" articles partly of	2,255	1,002	12,747	13,053
Woolen fabrics	8,306	8,182	81,918	98,394
Worsted fabrics	23,583	20,590	209,766	236,647
Carpets	5,547	5,254	102,061	104,690

Foreign Textile Centres

MANCHESTER—The home trade during the month has been active, although complaints are heard in some quarters. The heavy branches are not doing so well, and, amongst others, the linen agents say that orders are not readily secured. The demand for cloth for the making up trades has been fair, but a large portion of the business is done in the North of Ireland, where the apron, pinafore, and allied trades have made very considerable strides. The feature of the season has been the demand for thin linens suitable for costumes. These goods have been offered in very attractive styles, and have been freely ornamented. The impression, however, prevails in some quarters that next year the demand will not be so large. The trade has not been on the whole satisfactory to Scotch yarn producers, as it favors cheap wet spuns rather than dry spuns. It is rumored, by the way, that a large home trade house intends adding new departments, in which linens will be included. The trade is one for which the city has always borne a good reputation amongst drapers generally, the department being an exceptionally strong one with several houses. Business on 'Change, as far as yarns are concerned, has not been brisk, and spinners, unless well engaged, have not been indisposed to consider lower offers. Offers for cloth from Calcutta have been numerous, staple goods being freely inquired for. The situation is, of course, affected by the weakness of raw cotton, which has reverted to the low rates current earlier in June, and this in spite of the efforts to create a feeling of alarm by reports as to insect pests in the crop. Changes are taking place in the China silk trade which are destined to have a very important effect upon the growth of the fibre in Europe. Of late years the number of steam filatures in Shanghai for silk reeling has grown very rapidly, and there are now 25 distinct establishments, against only two or three a few years ago, of the productive capacity being 1,866,000 lb per annum. The result of this will be to largely increase the output of China silk. The native method is to reel from the fresh cocoon, and this must be done between the time when the worm has finished spinning the cocoon and that when the moth would be hatched—about ten days. The period cannot be exceeded, as the moth would eat its way out and the cocoon be spoiled. The natives, therefore, never produced more cocoons than they could reel in ten days, and as a consequence a limit was put upon the output of silk in China. All this has been altered by the establishment of steam filatures, while the cocoons are baked or sun-dried so as to kill the moth, so that the reeling practically goes on all the year round. The filatures buy their cocoons in the country districts, and their operations must greatly increase the production of China silk, with what results upon the European sericulturist time will soon show. The raw silk markets of the world are no longer controlled by the European crop, but by that of China and Japan, and the probabilities are that with the increased production promised in the future silk will be cheaper than ever. It will be the fault of the silk manufacturers themselves if with this fact in their favor they do not succeed in enormously increasing the consumption of silk fabrics.

LEEDS.—In Leeds there are signs of a slackening off in the clothing trade. Though most of the factories are still well employed, there is an increasing number of idle looms in the mills. In the heavy woollen districts business is reported to be quiet, and manufacturers at Batley are complaining a good deal of the falling off of business. Fancy goods on order for the United States have been cancelled, and the demand for low tweeds and serges, which up to now has been particularly good, is quieter. The season is opening out fairly well in the flannel trade. As it is becoming customary for merchants to fix the time for taking in season's goods later every year, there is not much going away from the manufacturers at present.

BRADFORD.—There is a more cheerful tone in the wool market generally. In the top market, merinos are reported to be firm, and some of the quotations for the coarser kinds of crossbred tops have actually been slightly advanced. In the country business in home-

grown wools still hangs fire, and farmers are very loth, indeed, to accept to-day's prices, as they are hoping for a similar boom to that experienced last year in July and August. Very little new wool is seen in the streets of Bradford at the present time. There is not much activity in mohair, but some important sales of alpaca are reported at fully a penny per lb. above recent rates. As the demand for alpaca, which is only suitable for black goods of a fine character, is distinctly improving, it is probable that raw alpaca will soon show a further advance. Although there is no great activity in any department of the worsted yarn trade, there is a more cheerful feeling, and offers from the Continent for two-folds have been made at rates slightly under to-day's prices. Spinners who are more confident, however, would not accept these. In piece goods only a few makers of high-class fancy goods are really busy, but they are getting some good repeat orders for the autumn trade, and they are also well advanced with the preparation of their new samples of spring season novelties, as they anticipate a fairly early season. The belief is growing here that bright fabrics, especially in fine expensive goods, will again be wanted for the summer of 1897, and already some speculative orders have been placed in good alpacas and in silk warp glace styles. The adherence of Mr McKintley to the "solid money" platform, and the increasing probability of his election, have brought about some discussion as to the probability of an improved American trade, and it is expected that there will be at least one more good season before the new President imposes an increased tariff.

SOUTH OF SCOTLAND.—There is no great activity in the South of Scotland tweed districts. Of course, as it is now between seasons, makers do not expect to be busy. With regard to next season, good sample orders have been placed, and these are taken as an augury of a good turnover. Repeat orders have fallen much below the average, with the result that many looms are idle. It is generally believed that a decided improvement in this important industry will set in soon, as it is understood retailers' stocks are small.

KIRKCALDY.—The Kirkcaldy linen trade is reported to be dull. The demand has fallen off considerably, and stocks are increasing more rapidly than manufacturers care about. The floorcloth and linoleum industries are in a fairly active state. Some establishments are being enlarged, while in others new machinery is being fixed up.

NOTTINGHAM.—Certain classes of cotton millinery laces are selling well for export, but the home demand is not so brisk as one could wish. A steady demand is still experienced for Valenciennes of various widths and colors. Some beautiful qualities are produced in new goods, with special tints for the highest centres of fashion. Maltese, Brabant, Torchon and muslin combination laces are somewhat slow of sale. The cheap laces produced on curtain machines still sell freely. In these goods, however, if the output is a large one, the monetary return is just the reverse. There is severe competition, too, to secure orders. Silk laces are neglected, except a few specialties required for trimming hats and bonnets. The supply of chenille-spotted falls and veilings has now more than overtaken the demand, and there is much competition both at home and abroad. The demand for silk tulles has almost abated, and there is now an abundant supply of these goods. Although not so buoyant as formerly, the bobbin net trade keeps fairly active. Heavy foundation nets are neglected. Antique, guipure and mosquito nets are firm in value. Fair quantities are selling for export and for embroidery and corsets. A capital business is being done in aprons, caps, collarettes and other fancy articles, which finds employment for a good number of hands. Bean ideal and everlasting embroideries for underclothing are slow of sale, and production is curtailed. No improvement is noticeable in the Irish trimming and Swiss embroidery branches, which keep in a dull and lethargic condition. Honiton braids, beadings and purls are in good request for the home trade and for export. There is nothing new to report in the curtain and window blind branches. There is a large output of goods, and finishers are fairly well employed upon orders running to completion, but little new business has been forthcoming, and the attention of manufacturers is now directed towards the production of

novelties for another season. The cotton branches of the hosiery trade are depressed, and though a few articles are selling, this part of the trade has lost its former elasticity. Prices of stockings and larger goods are unprofitably low, owing to the strong competition at home and abroad, coupled with the fact that the actual demand is much below the possible rate of production. Merino and fine cashmere stockings and half-hose in black, tan and light brown, are in good demand. Fancy half-hose and seamless stockings are now in great variety. Natural wool vests and combinations are firm in value, and there is a considerable output of goods for the home trade and for shipment. Fancy embroidered stockings and silk goods are tolerably well inquired for.

LYONS.—Considering the time of the year the Lyons business in silk fabrics may be called fair. Taffetas and failles are in rather fair demand for foundations and have been in fair movement in black, plain colors and in shaded effects. All-silk and half-silk muslins continue in demand. Malines tulle in light shades and crepe lisse find buyers. Silk embroideries and laces also find a good market. In dress fabrics radzimir and satin duchesse in black and colors have been ordered. Piece-dyed hangings sell in the ordinary qualities of satin, china and similar goods. A fair demand is reported for umbrella silks, especially in the all-silk varieties. In ribbons the demand is on the decrease, but a good business is still being done on plain cotton-filled ribbons. Velvets are unchanged, and the outlook is more favorable than otherwise, while the looms have enough to do on plain velvet. In fancy and striped velvets some orders have been placed recently.

BELFAST.—In the wholesale drapery warehouses little of any moment is passing beyond the completion of stocktaking arrangements. The balances this half year are expected to be more than usually favorable. Stocks in all the departments have been reduced to satisfactorily small bounds, indeed, in the fancy departments, it is long since the season's trade has left stocks so "clean" in every way, as well as being of limited extent. Trade in these departments has been well sustained up to the present, and small sorting orders from them to supply immediate requirements are of daily occurrence. In the dress and woolen departments there is the usual partial cessation of business occurring at this period of the year, although it is said that forward orders for delivery next month and in August have been booked to an extent much beyond average. Another matter of much importance, and one that will tell most favorably upon the net results of the half-year's trading, is that the amount of bad debts made during the past six months has been unusually small as compared with the turnover. In this respect this is said to have been one of the best half-years that has been experienced for a very long time past. Not only have failures been few, and losses in this way comparatively slight, but the accounts of the provincial drapers generally have been settled with satisfactory promptitude, the season's business altogether marking a distinct improvement in the condition of the trading classes throughout the country.

CREVELD.—The piece goods market is quiet and the demand by retailers is limited. Consumption of fabrics for spring and summer wear is not likely to stop, however, for some time, and with favorable weather conditions a lightening of stocks may be counted upon, which will help to clear the market and pave the way for the autumn trade. The outlook for the future, as far as dress silks are concerned, is, however, not very bright. Buyers have ordered sparingly for next season in the fear that fashion might show the cold shoulder to pure silk stuffs and turn its favor to some other articles. What the latter will be remains to be seen, but it cannot be denied that broad silks as articles of dress wear are threatened on one side with the competition of woolen goods, and on the other with that of velvet. But even if fashion should be against silks for dress purposes, it might leave for them, for use as trimmings, a field sufficiently wide to compensate for that loss. Even taffetas seem to have lost the attractiveness they have had for several seasons, and while their consumption is not likely to cease soon, they have probably already lost the position of first leaders. This is to some extent seen by the fact that while novelties in taffetas have been made for next season, buyers have only ordered on

these with great caution. The conditions of production in the industry are not changed, the looms are working on old orders and there has been little new business. Between seasons conditions rule in the tie and umbrella silk branches, and for these, as well as for dress silks, the producing activity is not likely to be very great this summer. In ribbons, orders should have already been placed by this time, and the season is late. If the conditions in the silk industry are not very bright, those of the velvet industry are improving day by day. Manufacturers experience better inquiry for velvet novelties as well as for plain velvet, and in plain chappe pile goods the improvement is especially noticeable. Cloaking plushes are quiet.

CHEMNITZ. Spring trade is still very quiet in this market for the month of June. In other seasons large stock orders were nearly all placed by this time, while this year buyers have placed but few orders, many coming to town merely to make inquiries. Prices are very low on all grades of hosiery. No advance may be expected, and on the other hand there will hardly be any reduction during the entire season. Ladies' black hosiery with lockstitch soles is largely in demand, and as it is now made in low grades, can be had at prices to retail from 25c. up. Also colored soles on in grain goods, with top to match, are taken a good deal. All maco feet are still selling, but not to the extent of former seasons. Fancy striped goods and ladies' hose with plain black boot and colored top are asked for more than last year. In embroidered and extracted goods a number of novel features are shown which take well. In lisle hosiery the lines of most manufacturers show extra fine qualities and gauge goods, and in drop stitches and Richelieu ribs they all show variety of new designs as in no former season. Hermsdorf-black opera hose can be bought now so they may be sold at 25c. and still pay a profit. Ladies' black lisle hose may also be had at this price. Manufacturers have been working hard to get up these sample lines to show something different from the plain black stocking which has been selling almost exclusively for the last few seasons.

BURR PICKERS.

Looking from the finisher's standpoint, or from any point whatever, it will be found that burring machines play a more important part in manufacturing than is generally supposed. There are a great many points throughout the woolen mill where careful study will soon convince the observer that the burr pickers are machines which cannot very easily be dispensed with. This may not be quite as evident to the observer in a mill where they are not in use, and the benefit to be derived can only be properly estimated by a careful comparison being made.

With the advent of the carbonizing process, the burr picker was thought to be doomed, but it has yet a mission to perform, and before it can be done away with the carbonizing process will have to be considerably improved and simplified.

The first disadvantage due to the absence of burring machinery will naturally show itself in an unpleasant manner in the card room, although in many places this difficulty is, in a manner, somewhat reduced by the use of cone dusters. It can be argued that a duster can never take the place of a burr picker, but the fact remains that it is done in many mills at the present day. There is a place in every mill for a good duster, but it should be in addition to, and in connection with a first-class burr picker. But if it is a question of a duster or nothing, then, to be sure, the duster must be considered an excellent machine for the purpose.

A very important question, and one which is often overlooked by carders, is the mistake of picking wet or moist stock. Anyone who is at all conversant with the preparatory work of the card room, will admit that it is almost impossible to properly clean moist stock on a burr picker, but it is wasting time and labor to run moist stock through a duster, for it will not accomplish that for which the work is performed. The damage resulting from the practice of running wet stock ought to be well enough known not to need special comment. How a carder can keep his work even with moisture in the stock an unknown quantity, is a puzzling question.

In the spinning room the effect of moist stock will show itself in the number of ends down at every draw, but as the spinner is usually paid so much a hundred runs, it simply means so much less wages for him, to say nothing of the quality of the yarn. Moist stock would not bother the spinner so much if only the burrs were removed.

Spooling is made a trying bit of work under such conditions, so is also the dressing, and, in fact, at every step the ill effects of imperfectly cleansed stock are seen. It matters not what the reason of the condition is, whether it is due to the absence of proper machinery or to carelessness in drying the stock, the result is practically the same.

After the dresser has had his turn, the weaver has his, and finds, after much hard work, the yards do not pile up very fast. This is one of the great drawbacks to weaving, the harder the work, the less pay, the easier the work, the more pay. Not alone does the weaver suffer, but the manufacturer also finds that he is off in his calculations as to production when the overseer brings in his report. But, as bad as this no doubt is, it is nothing in comparison to the results which manifest themselves in the finishing room.

Seeing the goods full of burrs and vegetable matter, the only remedy left to the finisher, aside from hand work, is burr-dye, and he certainly uses this to the full extent. But for all that, the speckers soon fall behind, for they are unable to keep up, and the goods begin to pile up ahead of them. Of course the speckers are urged on to do their utmost, but even that falls far short of the requirements. The next thing is to hire more help, and a small mill is sometimes severely taxed to find room enough for all the speckers they need.

But after all this, the goods do not, by any means, show up as clear from specks as they should, for there are pieces of vegetable matter which the burr-dye has darkened down sufficiently to escape the notice of the speckers, and, when the goods are pressed, they will show up to quite an alarming extent; not but what the color is dark enough, but the pressing has imparted a certain lustre which differs greatly from the general appearance of the goods, and makes them look as if they had never been specked.

It should not take a manufacturer long to figure out on which side the most profit lies, for certainly 10 cents worth of labor at the burr picker and duster will give better results than five dollars worth of labor with the burling irons.

HISTORY OF THE READY-MADE CLOTHING TRADE.

(Continued)

The northern counties, from their proximity to all the leading textile markets, and from the absence of trained labor at the right prices, have not laid themselves out for the manufacture of clothing on any scale deserving of mention. Newcastle itself, the metropolis of the North, although now in some respects quite as important a centre for the general wholesale drapery trade as Leeds, for not only are there the local firms but most of the leading Glasgow, Manchester, Leeds, and even some London houses, have their agents on the spot, and stocks of various classes of goods. With the exception, however, of pit flannels, and some lower classes of ready-mades, there is but little clothing manufactured in that town.

Various attempts have been made in Sunderland, Carlisle, Annan, Penrith, Whitehaven, and some other towns within the last twenty years, to establish clothing factories, but none of them have proved successful to any appreciable extent.

GLASGOW—With its leviathan general houses, its enormous shipping interests, and its now huge population, is one of the most important centres in the world for every branch of the great textile industries. Whether it was, however, that the class of labor which had been principally employed in the manufacture of slops and shirts, did not form suitable workers for the ready-made trade—or that the Jews did not take kindly to "canny" Scotland, certain it is, that the example set by Messrs Arthur & Co., in removing their clothing interests to Leeds, has been followed by most of the other leading houses. In 1868, when the sweating system was brought prominently before the public, there were 29 Jewish master tailors in Glasgow, employing 370 adults, consisting of 86 Jews, 74 Jewesses,

10 male Christians, and 200 female Christians, and in addition 12 apprentices. In all 382 workers. This does not say much for the coat trade in which the Jews are principally employed, and so far as the juvenile clothing and trousers trades are concerned, Glasgow goods have not certainly much name in the market. In the trousers trade, the goods which have been mainly sold have been cords and moles, and the lower grades of woolens. Still, we cannot but refer to the tenacity with which great houses like those of Mann, Byars & Co., Hunter, Barr & Co., and others, have held on to their clothing departments, and such has been the great expansion of the trade, that, no doubt, their manufactures have commanded a wide market. Everything depends, in the near future, upon the quality of the workmanship employed, and if Glasgow is still to hold her own, attention will have to be given in this direction, so that the unemployed females who still vegetate in the slums of the great city may have a chance of being saved from starvation.

IRELAND, with her abundance of cheap labor, her improved railway service, and her constant intercourse with the English and Scotch markets, has done but little as yet to utilize her resources in the direction of the manufacture of clothing. Although an important customer for every description of ready-mades to this country, there are but few moderate producers there of any note. The firm of Sir Peter Tait & Co., of Limerick, have for many years been an important source of income to the poor females of that city, but their trade has been mainly confined to large army and navy contracts. As for any other manufacturing, it is mainly carried on by semi-retail houses, and only for local consumption. Irish tweeds being, as a rule, of too expensive a class, and inferior in appearance, smartness and design to English goods, have scarcely entered at all into the consideration of clothing houses, and it may be that the Anglophobia which has so often taken possession of the Irish mind may have had something to do with their unwillingness to make up any but their own cloths.

The shipping branch of the ready-made clothing trade has, from the first, formed a most important and rapidly developing department. Before the introduction of the sewing machine the goods that were shipped were generally of the lowest description, and were very justly denominated "slops," and the manufacturers were known in the trade as "sloppers." It was supposed that almost anything was good enough for a "nigger," and thus the trade in shirts, ducks, serge goods, and the other lower classes of ready-mades was very largely conducted by the same houses. Little or nothing was done in better goods, and indeed the quality of the labor we had then at our disposal would not have warranted the manipulation of any materials of superior quality. How very insignificant were the exports of clothing at the early part of the century will appear from the following table, especially when it is remembered that under the term "apparel" is included all kinds of made-up goods.—

	Europe.	Asia.	Africa.	America.	W. Indies.	Ireland & Channel Isles	Total.
1805 ...	£30,940	£15,664	£ 3,736	£25,736	£ 43,560	£ 24,552	£143,609
1806 ...	41,971	19,275	9,348	36,053	68,912	23,935	199,527
1807 ...	37,448	19,166	9,691	32,623	84,772	29,888	213,537
1808 ...	41,733	21,295	11,145	29,456	107,753	39,177	250,559
1809 ...	53,522	11,912	10,905	34,419	118,351	31,396	259,835
1810 ...	29,775	19,565	2,664	45,388	106,785	38,443	242,614

The fact, also, that in the early history of the trade, and the earlier development of our colonies, large quantities of made-up goods were consigned, often glutting and ruining the markets abroad, and bringing disaster upon the English houses who were too eager for an outlet from this end, did much to disorganize and paralyze the shipping trade as a whole. Then, when it is considered that hostile tariffs have always been directed against this industry, almost more than any other, both in the United States and nearly all our colonies, it is really wonderful how we have not only persistently held our ground, but steadily increased our shipments, especially to our own possessions. The huge populations of India, China and other Eastern countries will probably never be important to us for woolen clothing of any description, as their own labor is so much cheaper and more abundant than ours, whilst the intense heat of their climate will always preclude them from wearing woolen clothing to any appreciable extent.

The United States had the start in the manufacture and use of the sewing machine, and has always maintained an almost absolutely prohibitory tariff, yet it is notable how little she has contributed, by this means, to her own trade in clothing with foreign countries. The whole turnover of the States in clothing, for shipment, since the year 1870, would not be considered an exceptional return for one good English firm. In the year 1870 the exports from the United States, to all foreign countries, of wearing apparel of all kinds, amounted to £129,000

In 1878.....£183,000.

In 1888.....141,000.

The small shipments of American clothiers are limited to the West Indies and a few South American countries.

The French returns are somewhat imperfectly classified, as will be noticed in the following statistics. But they will be sufficiently clear to show that Great Britain holds her own against this market. In 1868 France exported under the head of apparel to all foreign countries in value, £1,754,000. In the year 1878 the goods classified under the same heading included men's ready-mades, women's ready mades, and second-hand clothing, and yet the value was only £1,346,000.

In the year 1887 second-hand clothing had disappeared from the list, and the amount shipped for men's and women's clothing was £1,984,000, but the greater part of this appears to have been in women's clothes. The amount shipped of men's clothing in 1878 was only £783,000, and in 1887, after second-hand clothing had been deducted, the amount fell to £741,000. When we take the category of the year 1887 as a fair sample to denote the various destinations of French exports of clothing, we shall at once see that our neighbors across the channel do not, as yet, interfere much with our trade to our own colonies, as the following table will show. For the year 1887, the total kilo-grammes* shipped were 1,229,000, divided as follows:—

Argentine Republic..	350,000	New Grenada.....	108,000
Algeria	254,000	Switzerland	66,000
Belgium	44,000	Germany	45,000
United Kingdom	52,000		

When we turn to the exports of Germany, we find, however, that between the two typical years, 1880 and 1888, there has been considerable advance made in the article of apparel, for whilst in 1880 the exports were £3,901,000, in 1888 they were £5,225,000. These figures, however, only relate to women's goods, in the manufacture of which Germany stands pre-eminent, in consequence of the better finish and superior quality of the materials made up. It will be seen, also, that we appreciate in this country these mantles from Berlin, when we took in 1880 £805,000 worth, and in 1887 £1,180,000 worth. It is only fair, however, to give the credit due to the intelligence and enterprise of English manufacturers of cloths by noticing that another great cause for the present position of Germany with regard to the mantle trade arises from the fact that since the raising of the tariff on low English woollens, of late years, several eminent Yorkshire manufacturers have settled down in Germany, and are now producing large quantities of excellent cheap woollens, which were formerly produced in Dewsbury and Batley. But these goods are not shipped when made up into men's clothing to any of our important competitive markets abroad, but are retained for home consumption, or made up into mantles for shipment.

It is also a matter of note that some of the older and most eminent English clothiers have been making, of late, great strides in the quality of their workmanship, so far as it regards the mantle trade. Houses like Messrs. Coop & Co., of Wigan, who have every possible factory appliance, and abundance of labor, have been proving that they have nothing to fear, so far as German competition is concerned, in the manufacture of the higher branches of what are termed tailor-made mantles. There is, indeed, in this branch an almost boundless market if pains are taken to still further improve and develop the styles, quality and get-up of these goods, so that Germany may not, as heretofore, take the lion's share of the trade.

The following table shows the returns of our own exports of apparel from the year 1876 to 1890 —

1875, £2,299,937	1881, £3,711,797	1886, £3,902,211
1876, 2,962,053	1882, 4,169,382	1887, 3,747,306
1877, 2,834,074	1883, 3,633,804	1888, 4,658,589
1878, 3,176,412	1884, 3,936,483	1889, 4,978,513
1879, 3,208,941	1885, 4,161,150	1890, 5,035,697
1880, 3,212,103		

These figures have fluctuated, mainly, in proportion to the increase or decrease of Colonial tariffs, but they are, on the whole, very remarkable, in comparison with those of any other exports of textile fabrics, as the amount for the last year quoted is more than double that of the first. No other increase, in any other department of textile manufacture, is equal to this in the whole list of exports, and no other bids fair to grow to so appreciable an extent, provided we can, by constant international exchange of views, persuade our children in the colonies to help the toiling poor in the Mother Country, and further the interests also of their own aboriginal neighbors, by avoiding all useless and pernicious imposts

CACHOU DE LAVAL.

This coloring matter is interesting from its mode of manufacture. It is made by heating sawdust, leaves, etc., with sodium sulphide, and hence it contains sulphur as a necessary constituent, says Arthur Sutherland, in *Textile Manufacturer*. Up to the present time its constitution has not been ascertained

Cachou de laval dissolves in water with a deep-green color. It has been noticed that cachou which has been exposed to a moist atmosphere for some time does not dissolve so readily as the fresh coloring matter, and that the solution, instead of being green, is quite brown. This shows us that cachou de laval must be kept quite dry, otherwise it deteriorates. If the solution should be brown, it must be boiled for a short time with a little carbonate of soda, when it resumes its normal condition, the solution becoming green, but such a solution cannot, of course, be so good as a fresh solution, from a dyer's point of view. The above observations will at once make clear the reason for packing cachou de laval in hermetically-sealed boxes, in which state it is sent into commerce. Moreover, for similar reasons it is unwise to make more solution of the coloring matter than is actually needed

On treating a solution of cachou de laval with acids, sulphuretted hydrogen is given off, and a precipitate is thrown down. Again, on mixing solutions of this coloring matter and such compounds as bichromate of potash, copper sulphate or ferrous sulphate, an insoluble precipitate is formed. If, therefore, this precipitate can be thrown down in the fibre, it gives us a mode of applying the coloring matter.

Cachou de laval is successfully employed in the dyeing of greys and drabs on the vegetable fibres—: g, cotton, jute, hemp, etc—but for wool and silk it is not of much use.

In making up the dyebath, first dissolve the coloring matter, and then sieve the solution to make quite sure that no solid particles of color get into the dyebath, and heat up to 60–65° C. It is advisable to enter the color solution in several portions, as unevenness may be caused if it all be entered at the beginning of the dyeing operation. After putting the color solution into the dyepan, a quantity of common salt or bisulphate of soda is added, the material is then entered and worked for about half an hour

Another way in which this coloring matter can be applied is to add all the coloring matter to the dyebath, work the material at a low temperature, gradually raising to 60° C; work for some time longer, then lift and add the requisite quantity of common salt or bisulphate of soda, and work until the bath appears exhausted, when it will present a brown color

Shades obtained in the above way are nearly as deep as they would be if fixed by passing through acid solutions or solutions of metallic salts, but they are not so fast to soaping; hence, after working in the cachou bath, they are generally worked in a dilute acid bath containing sulphuric or hydrochloric acid, or in a bath containing bichrome, blue, or green vitriol. Very little difference

*Kilogramme = 2 lbs. 3 1/2 ozs.

in the shade is caused by using any of these fixing agents, they are all light to dark yellowish drabs, according to the quantity of coloring matter used.

Cachou is attracted from a cold bath by cotton, but as the temperature increases, so does the intensity of the shade. Although the intensity of the shade is slightly increased by working at the boiling point, yet such a proceeding also makes the shade duller, and hence the temperature generally used is about 60° C.

The temperature and strength of the fixing bath are not very important factors, especially if solutions of metallic salts be used. In case of acid solutions, of course, the bath should be used as weak and at as low a temperature as possible, otherwise the goods might be tendered. 60° C. is a very suitable temperature. Excess of metallic salt in the solution does not appear to have any effect on the shade or on its fastness to soaping; but if the fixing bath be used at the boil, it is likely that the shade will be made a very little yellower. It is economical to add common salt or bisulphate of soda, as such an addition improves the shade very considerably, and also gives it intensity. When dyeing with cachou de laval, the best shades are obtained by using fresh baths for every dyeing; but as this would be exceedingly wasteful, the baths are used several times over, and then run off. The use of hard water when dyeing with cachou is to be avoided, but if used, the addition of a little muriatic acid or vitriol is recommended, sufficient acid being added so as to make the bath very faintly acid.

Cachou de laval yields shades which are fairly fast to light, and very fast to acids, alkalis and soaping. The shades, however, do not seem to be quite so red after soaping. Those which have been fixed with bichromate appear slightly faster than the others.

Cotton dyed with cachou has the property of directly attracting basic colors, and hence the shades obtained by first dyeing with cachou can be modified by working in solutions of the coloring matter, but it is desirable that a moderately high temperature—say 70—80° C.—should be used. In fact, in certain cases—*e.g.*, in dyeing dark shades and those in which the shade of the bottom color will not interfere—cachou can be used as a substitute for tannic acid, and by topping with such colors as magenta, rosolane, auramine, methyl violet, etc., a great range of useful colors can be obtained. Certain of the acid aniline colors are also attracted from their acidified solutions by cotton dyed with cachou, hence these colors, as well as the direct-dyeing cotton colors, can be used for topping cachou-dyed cotton.

In those cases in which the shades dyed with cachou have been fixed by means of a metallic salt, it will be apparent that these can be topped by means of the mordant dyestuffs—*e.g.*, the dyewoods, alizarins, etc.—when the metal, if not the cachou, will act as the mordant. To save time, and therefore cheapen the process, the mordant color—in this case the dyewoods or their extracts more particularly—could be added to the cachou bath with the same result.

Cachou-dyed cotton does not appear to be much affected by ordinary reagents, and its detection on the fibre, seeing that it is scarcely ever found as a self-color, is exceedingly difficult.

FINISHING WOOLEN GOODS DYED WITH RUNNING COLORS

In the course of finishing woollen goods, many times very perplexing questions arise, which, for the time being, seem almost beyond solution. Not alone is it hard to place the cause of certain difficulties, but often it is still harder to overcome them after ascertaining the cause to a certainty. For instance, the running of colors into each other has, scores of times, been a very serious trouble to overcome, even after the cause was well known, for after the goods have advanced as far as the stage where a defect of that nature will make itself manifest, it is of little consequence to the finisher what the initial cause may be. The question which confronts him is, how to overcome the difficulty. In such cases as these, past experience will materially aid a man, but it is not given to each finisher to acquire such experience, and it is, therefore, not

out of place for one who has had such difficulties, and has successfully overcome them, to devote a few lines to this interesting subject.

The greatest trouble is usually found on goods containing much white in combination with darker colors, and where it is of importance to show up the white in all its brilliancy. Brown-and-white, black-and-white, and blue-and-white pin checks, are usually the goods where the most trouble is found, and often covert cloths are also very troublesome. No matter how fast the colors, when soap is applied to them we always find that the soap will speedily take the shade of the predominant darker colors of the piece. This is due in a large measure to an excess of dyestuff, which, in the ordinary course of events, is not removed until the goods are fulled and washed; and oftentimes this is sufficient to stain the white to an extent which makes the goods lack that brilliancy which they otherwise would and should possess. Upon the old adage that "an ounce of prevention is better than a pound of cure," it is well when handling such goods to bear this fact in mind, and apply the ounce of prevention in time, thus making it unnecessary to resort to the cure.

Besides the surplus dyestuff, which, of course, is present to some degree in all goods, the greatest trouble, says a writer in the *Boston Journal of Commerce*, is with poor colors which will not stand the fulling process. The action of the alkali contained in the soap upon poor colors is such as to at once start them running, and once started there is no telling where they will stop. It is, therefore, necessary to resort to something which will either stop this running, or else fix things so that when the colors run the white will remain untouched. If one could invent a process by means of which the running of colors could be stopped it would prove a veritable gold mine. Another remedy might be to clean the white after becoming stained. But this is, at best, a very unsatisfactory proceeding. We have seen many a thing tried to meet the difficulties under consideration, and all of them, with one exception, with indifferent success.

The most satisfactory process which has so far come to our knowledge is the salting process, which is used with good success by many finishers to-day. Not alone has it been found that salt will keep colors from bleeding, but when it is applied properly it will prevent the surplus dyestuff from injuring either white or other bright colors with which it may come in contact. As the soap is applied to the goods in the fulling mill, of course that is where the chief damage is done, and that also is the place to prevent trouble. After the soap strikes the goods it is a question, which will not find its answer till the goods are dried, whether the goods will be stained or not, so that the medicine must in this case be given before the sickness begins. We take, therefore, about two quarts or so of fine table or dairy salt, and after the goods are put in the mill and the ends sewed together, and while the goods are running, we sprinkle on the salt in a thin stream and then let the goods run about ten minutes before applying the soap. The soap used for this purpose should be made a trifle heavier and a little stronger than usual. Of course, the soap will soon assume the darker colors, but after the goods come from the washer it will be found that the white is all there as nice as we can wish. Then, after washing, when the goods are about to be taken out, it is a good plan to give each piece a pail or two of salt water, and then take them out with all this salt water in them. It is generally held that this is not necessary on woollen goods, although it is practised with much success on goods containing a quantity of cotton. Nevertheless, we have found that nearly all kinds of fancy goods are benefited by the use of salt. Colors will certainly show up brighter, and anything which has white in it is seldom as clear and bright without the use of salt as it is with it.

We really believe that the value of salt in the finishing department is either little understood or else sadly under-estimated. We also find that in some aggravated cases it is a good idea to put some salt also in the soap, but in most cases the sprinkling of salt on the goods in the mill before the soap is applied will do the work in good shape.

When goods containing much white are found to be stained, they had best be run into the washer again, and after wetting them

down with cold water until they are wet even all through, allow them to drain for a few minutes. Then close the gates and apply with a pail, while the goods are running, about eight pails of water to each piece, to which has previously been added an amount of bisulphate of soda equalling about one quart to a barrel of water. Let run in this about fifteen minutes, then rinse thirty minutes, and everything which it is at all possible to remove will be found gone. This remedy is also good for speck-dye stains, providing the colors are not logwood colors.

LUBRICATION.

The friction of lubricated surfaces is dependent upon the following conditions:—1, the intensity of pressure between the sliding surfaces; 2, the velocity of sliding; 3, the temperature of the journal; 4, the form of the brasses and position of oil grooves; 5, the method of lubrication; 6, materials of which the sliding surfaces are composed; 7, the time the load acts upon the bearing; 8, the physical properties of the lubricant.

The load of the journal is the total pressure imposed upon it, which pressure may consist partly of a load due to dead weight, partly to tension of belts, or, in the case of a connecting rod, to the steam pressure acting on the piston, or, in other instances, to a variety of causes. The load per square inch is the total load as already defined, divided by the nominal area of the brass (measured on the chord), multiplied by the length. The frictional resistance per square inch is the total frictional resistance divided by the nominal area of the brass. The interpretation of the term "co-efficient of friction" is purely that proportion of the total pressure which is essential to actuate a body, or the frictional resistance divided by the weight or pressure on the brass. A simple mathematical problem will more clearly illustrate this principle. If a ten-ton block of cast iron was resting on the table of a planing machine and it required two tons horizontal pressure to make it slide, the co-efficient of friction would be 2 divided by 10 equal 1-5, or 0.2, the two tons being termed the frictional resistance. If the area of the block in contact with the table was 200 square inches, then a frictional resistance of

$$\frac{2 \times 2240}{200} = 224 \text{ pounds per square inch}$$

The value of a lubricant suitably applied was strikingly demonstrated by the writer within the present month, by way of experiment, with the object of discovering as nearly as practicable the difference in power required to actuate a two-ton cylindrical roll, the journals of which for the first test rested on dry brasses and which were subsequently well lubricated for a second test. The cylindrical roll referred to was an ordinary seed-crushing chilled-iron roll such as are commonly used in oil mills, and which for the occasion was placed singly in the heavy iron frame. A crank was securely set-screwed to the extremity of the roll shaft to furnish suitable leverage to effect motion. Two strong men were placed at the crank, but notwithstanding their combined efforts they were unable to move the roll in its bearings. An additional crank was secured to the other extremity of the shaft, and two more men were placed thereat and the signal for action was given. By dint of arduous straining half of a revolution was gradually made, while to revolve the roll two or three times no less than seven men were needed, the speed being probably not more than four revolutions per minute. At this point the roll was raised, the brasses and journals rubbed lightly over with good cylinder oil, when it was again lowered and the final test made. Without physical effort the writer caused the mass of iron to revolve at the rate of probably twelve or fourteen revolutions per minute by merely pressing the index finger firmly against the upper part of the roll, the speed increasing as the pressure was continued.

The comparatively insignificant power which thus sufficed to speedily accomplish what many times its capacity were spent to effect, at best, a monotonous movement, and which terminated the instant pressure was withdrawn, was thus made manifest. The experiment will also forcefully illustrate the surplus energy wasted in the form of fuel in steam-engine practice, to overcome undue

friction, which is the direct result of defective lubrication. Under the fallacious belief that economic ends are subserved by curtailment of lubricants in the management of machinery, the coal pile is rapidly melted, on the other hand, prodigality is too frequently associated with the application of lubricants to the working parts of machinery, the distinction being but indifferently understood by many.

It should be recognized that the laws which govern the friction of lubricated surfaces, such as journals, etc., are of an entirely different character to those governing the motion on dry surfaces.

Professor Goodman points out that the frictional resistance varies directly as the pressure between the surfaces, or in other words, the co-efficient of friction is constant, from which it follows that the frictional resistance is independent of the surfaces in contact. Furthermore, the frictional resistance is independent of the velocity of sliding, while it is largely governed by other influences, considering which we will consider further on.

The design and management of bearings exercise a very important influence on the character of the work maintained. The most important point to be considered in this connection consists in establishing the amount of the load or pressure permissible on iron or steel journals per square inch, running in brass or gun metal bearings. It is palpable that where a high speed is essential the load on the bearing should be correspondingly light, or less than that which is adequate for a moderate speed, therefore no specific rule may be laid down which calls for circumscribed pressure per square inch in a given case. Scientific experiments have shown that an intermittent pressure, when the load is great, may be operated with less risk of heating than when the same pressure is uniform, while the load per square inch must be in conformity with the method of lubrication or *vice versa*.

It has been found that when journals are allowed about one per cent. of their length for end play the running is more smooth, which has the effect of preventing grooves from developing. Where the use of an oil-testing machine is brought into requisition the real value of this apparently minor detail will be manifest. A radical change is essential in the method which is usually adhered to of forming brasses. A material percentage of friction may be avoided by cutting away the sides of close-fitting brasses. A series of experiments recently prosecuted by an eminent English engineer have demonstrated conclusively that the frictional resistance of a brass may be enormously reduced by methodically removing a portion of the metal from each side. This may be accomplished with facility without giving freedom of side motion to the working shaft. The principle will be readily understood by a consideration of the fact that if the width of the brass be made one-half the diameter of the journal, the friction will be less than one-half of what it would have been with a semi-circular brass. In all rolling stock operated in France and England to-day the width of the brasses are made about five-eighths to three-quarters the diameter of the journals. Friction, wear and lubrication are thus largely reduced, while the saving of power effected by this method even in a comparative small steam plant will reach a respectable sum total per year. It is palpable that the friction must of necessity diminish, as the width of the brass is lessened to the point of contact. While the foregoing rule with regard to the form of brasses is rigidly adhered to on foreign railroads, in factory work a more modified system obtains. Brasses used in stationary plants are usually about seven-tenths of the diameter of the journal, at which point many engineers assert the wear is least.

The results of a series of practical experiments, it is claimed, have shown that the practice of putting oil holes or grooves in brasses is radically wrong, being eminently productive of waste. For instance, a small stream of oil may be observed to be continuously flowing up through the box oil hole of a railroad car axle when in motion—when this nature of lubricant is used which is sufficient evidence that if the fluid can thus escape from the position where it is most needed, the efficiency of lubrication is seriously impaired.

To further illustrate this important matter, by fitting a screw down valve in the oil hole it will be shown that when the valve is

closed the friction is reduced 25 per cent, returning again to the higher figure immediately upon being reopened. A careful investigation of this circumstance will disclose the fact that the off-side of the brass will be found practically bereft of the lubricant, but by closing the valve an oil cushion will be formed on the crown of the brass. In the case of ordinary shafting in which the line of pressure passes through the bottom brass, an oil groove on the upper brass will serve its intended purpose.

To avoid abrasion and subsequent heating circular holes about three-quarters of an inch in diameter, even distances apart, are put in bearings on which enormous pressure is exerted, as on ocean-going steamers, and in which pieces of rawhide are fitted. The holes are placed well down on each side, and in such a manner that every part of the journal comes in contact with the rawhide as it revolves. The greasy substance which the hide gives off serves as an excellent lubricant, although its main function is to retain atoms of metal which have been removed from the surface of the journal by abrasion, and in which they have been imbedded by the rotary motion of the shaft. Heating is thus avoided, while lubrication is rendered facile and economical.

IMPORTS OF SUSPENDERS.

In reply to an American enquirer, we give the imports of suspenders and parts thereof to Canada for the last three years, and would refer our correspondent to the Canadian Textile Directory for statistics of previous years.

IMPORTED AND ENTERED FOR HOME CONSUMPTION IN 1893

Great Britain	\$36,516
France	1,304
Germany	17
United States	30,992

\$68,829

And distributed as under —

Ontario	\$37,476
Quebec	26,224
Nova Scotia	2,045
New Brunswick	3,092
Manitoba	1,413
British Columbia	1,087
Prince Edward Island	502
North-West Territory	50

Duty on above, \$24,090 89.

Imports for 1894, \$56,391.

(The Trade and Navigation Returns, 1894, do not give further particulars.)

IMPORTS FOR 1895.

Great Britain	\$25,657
Austria	28
China	17
France	1,182
Germany	63
United States	41,077

\$71,024

And distributed as under —

Ontario	\$34,494
Quebec	22,356
Nova Scotia	3,850
New Brunswick	4,067
Manitoba	3,712
British Columbia	1,960
Prince Edward Island	573
North West Territory	12

Duty on above, \$24,859 23

Joseph Rodgers, hatter and furrier, King street, Toronto, assigned a short time ago to E. J. Henderson, liabilities about \$25,000, assets somewhat smaller. Mr. Rodgers was charged with having disposed of some goods with intent to defraud, was placed under arrest, and was released on giving security for \$4,000.

HENNA AND RENG.

The British Consul at Ispahan, in a report on the Yezd district, mentions that next to the cultivation and weaving of silk, the most important industry there is the production of henna and reng, two dyes used from ancient times all over the East in the adornment of the person. They are applied to the nails, hands, feet, and hair, and in Persia the venerable grey beard is a rarity, for it is dyed bright red or black. Henna is the *Lawsonia inermis* of botany, and grows wild in Persia. In some places it is used for dyeing woolen yellow or brown, with alum and sulphate of iron. Reng seems to be a species of woad, which is cultivated in Bam, but, unlike henna, which is a shrub, reng is an annual. It produces a deep black, and is the hair-dye of the country. The treatment of both is the same. The leaf is pulverized in mills, which form a feature of life in Yezd. There are thirty-five of them in the town, with an average of two stones each, which are cut from the flint rock in the mountains of Mehriz, about thirty-six miles off. They are usually 8 feet in diameter by about 2 feet thick, and the whole mill is worked by a camel. About 2½ cwt a day of the leaf can be crushed, three camels taking it in turns. When ground to fine powder the henna is packed in bags of 25 drachms each, and is exported to all parts of Persia and the Caucasus. When prepared it costs ad. to 3d per lb., the cheapest quality finding its way into the wilds of Kurdistan, the finest into the palaces of Teheran. The henna bags are packed in native cotton cloth, printed entirely by hand with pure vegetable dyes. The reason why plain cloth is not used is that in the uncivilized places to which much of the henna goes the poor purchasers are glad to have prints which they can use in many ways, and can, if they wish, readily sell. The print, when finished, costs three farthings a yard.

COAL TAR COLORS.

Until the middle of this century the dyeing industry was dependent upon those coloring matters which are either found as such in the vegetable and animal kingdom, or which are produced from some of the constituents of the latter by very simple chemical processes. This whole group of vegetable and animal coloring matters embraces all the so-called natural coloring matters, while those which the chemistry of modern times has evolved from organic bodies possessing a comparatively simple composition, by operations which cause a total change of the raw material, are generally designated as artificial coloring matters.

In the manufacture of these artificial coloring matters only very few of the many organic substances employed are obtained from the vegetable kingdom (e.g., tannin, which after its conversion into pyrogallol is used for the preparation of cœrulein). The greater part of the materials which serve to furnish the artificial coloring matters is obtained from coal tar, a by-product of the manufacture of coal gas. It is owing to this fact that the history of the manufacture of artificial coloring matters, or "coal tar colors," is to a great extent intimately connected with the history of the manufacture of coal gas, and there is no doubt that the general introduction of coal gas for illuminating purposes within the first half of the present century has made the manufacture of coal tar colors possible. Nevertheless, from the 1st of April in 1814, when the parish of St. Margaret in Westminster was first illuminated by coal gas, a period of no less than 42 years elapsed before the manufacture of the first aniline dye, Mauveine, was taken in hand.

During this long period the constituents of coal tar were scientifically investigated, and thus a basis was formed on which the subsequent development of the coal tar color industry rested. Great difficulties were encountered in the study of coal tar, for sixty years ago organic chemistry was only in its childhood, and only with the gradual development of this science to its present position has our knowledge of the constituents of coal tar become perfected. On the other hand, the chemistry of to-day has been furthered to a great extent by a thorough and incessant study of this by-product. But even at the present time our knowledge of the chemistry of coal tar is by no means complete. We know that it consists of a mixture of a large number of compounds, about sixty of which

have been obtained in the pure state, but we nevertheless suppose that it contains other compounds, which have hitherto not been isolated.

A short resume of the dates of discovery of the most important constituents of coal tar is given in the following: Naphthalene was first discovered in tar in 1820 by Garden, Anthracene in 1834 by Dumas, and Phenol in 1834 by Mitscherlich. Benzene was discovered in 1825 by Faraday, but its presence in coal tar was only recognized in 1845 by A. W. Hofmann. Toluene was discovered in 1837 by Pelletier and Walter, and in 1848 Mansfield showed that it was contained in coal tar.

Aniline was first discovered in 1826 by Unverdorben in the products of the dry distillation of indigo, and in 1834 Runge proved it to be a constituent of coal tar. The latter contains it, however, in such small quantities that its isolation on a large scale would not pay. The production of aniline as a commercial product only became practicable when Zinin showed in 1842 that it could be produced by the reduction of nitrobenzene, a substance discovered in 1834 by Mitscherlich. Bechamp greatly improved this process in 1854 by the use of a mixture of iron and acetic acid as reducing agents. Within the last few years the method has been further improved by the employment of hydrochloric acid instead of acetic acid.

Runge first noticed in 1834 that aniline, when brought in contact with chloride of lime, gave brilliant colors; but it was not until 1856 that Perkin prepared mauveine, the first aniline dye, on a large scale.

In 1858 A. W. Hofmann published a work on the action of carbon tetrachloride on aniline, by which reaction he obtained Aniline Red. It was in 1859 that Nerguin first manufactured Aniline Red (Magenta) in quantity.

During the following five years, violet, blue and green coloring matters were invented and manufactured.

Aniline Black was discovered in 1863 by Lightfoot. Graebe and Liebermann effected in 1868 the synthesis of Alizarin, the most valuable coloring principle of madder, a discovery which had the greatest influence on the whole color industry.

The first Eosin dye was prepared in 1874 by Baeyer, while in later years a large number of important dyestuffs such as the Azo dyes, Methylene Blue, Malachite Green, etc., have been prepared. In the year 1880 Baeyer was so far advanced in his experiments on the preparation of artificial indigo, that the Badische Anilin und Soda Fabrik could venture to send into the market nitrophenylpropionic acid, a product by means of which indigo can be produced on the fibre. The discovery of the Benzidine dyes, of which Congo Red and Chrysamin were the first to appear in the market, may be regarded as the most important discovery of modern times as far as cotton dyeing is concerned. In going through the large number of artificial coloring matters which have been brought into the market since 1858, it will be seen that those products which are distinguished by superior brilliancy and fastness have soon taken the place of other coloring matters, to such an extent indeed that the manufacture of many dyes which at one time flourished has either had to be relinquished altogether or has at least been considerably reduced. And although it may seem to an outsider, while looking through a collection of our modern silk and satin materials, that the dazzling and pure shades obtained cannot be surpassed, those engaged in the manufacture of these dyes are, nevertheless, well aware that even to-day they have not yet arrived at their ultimate aim. Of all the artificial dyestuffs at present in use there are perhaps only a few, especially those which are distinguished by their superior fastness, that will maintain a permanent position in dyeing.

A popular prejudice still exists against the so-called Aniline dyes as being far behind the animal and vegetable dyestuffs in respect to fastness. But we now possess a considerable number of coal-tar colors which are just as fast as—often faster than the natural ones.

M. D. Mallette & Co., a small Montreal dry goods concern, has compromised liabilities of about \$300 at the rate of 20 cents on the dollar.

NAPPING MACHINES

The use of napping machines in the finishing of woollen goods has long passed the experimental stage, and it behooves us, therefore, to consider the merits of them more closely. Undoubtedly there must be some decided points of merit in these machines, else their adoption for the work of gigning would not be as widespread as it is to-day. It used to be considered an established fact that nothing could successfully take the place of the teasel point in the napping of face goods, at least, but with the indisputable evidence before us, we must admit that this is no longer wholly true. We notice that with the napping machines, as well as with almost all other kinds of machines, men have their preferences, but this we judge arises more from the fact that the machine with which a man is best acquainted, is generally preferred by him, than from any special points of merit which one style of machine possesses over another. To imitate the teasel point, or at least the elasticity of the teasel point, has been the chief aim of all inventors of napping machines, and we must acknowledge that most of them have succeeded admirably. Take almost any napping machine on the market and we find that as far as the point which does the napping is concerned, they are all alike, so that in the most important feature of these machines there is practically no difference. They all adopt the metallic point. One of the chief attractions of the napping machines to our mind consists in the fact that the workers of the machines corresponding to the teasel on the gig, always remain the same. In the first place, it does away with the delicate and difficult labor of properly setting the teasels into the slats, which of itself is considerable to be thankful for. Those especially who have been bothered with poorly set slats, will be much pleased to know that at least this trouble is done away with on the napping machines. We are always certain that if the machine is set at a certain point now, to do a certain kind of work, it will surely do the same work at the same setting, a week or a month or a year hence. We have only to consider the task it is for the gigger to keep the gigs up to the point where they ought to be, to appreciate what an amount of responsibility is taken from his shoulders.

Such an absolute uniformity of the working surface is certainly never attainable with the teasel, no matter how closely we may watch them and try to keep things as they should be. The importance of the foregoing may not be appreciated to its fullest extent by all who have to do with gigs, but all those who have ever gigned face finished goods and especially steam finished ones at that, in both the old-fashioned and the new way, will bear testimony to the great superiority of napping machines over teasel gigs for this purpose.

Another very important point is the many points of contact to be found on the nappers, and this fact leads us to the chief attraction of the machine to manufacturers—its productiveness. The claim made by the builders of various styles of these machines, that one of them will successfully take the place of eight or even ten teasel gigs, is by no means an idle boast.

On close finished goods, where it is an object to clear out the face and do it quickly, nothing can in any way surpass the efficiency of the napper, for one run over the machine will do more good in the direction of clearing out the face than any eight runs ever given to the goods on a teasel gig. Of course, we have to say right here that on these machines we can also keep away from the face and go as easy as we like, for this is needed on delicate fabrics, but, ordinarily speaking, one run is as good as eight on the gig. The different speeds at which we are enabled to run the workers, as also the goods, combined with the ease with which we can regulate the contact of the goods with the workers, makes it possible for us to produce any desired finish.

If slow gigning is advisable, all we have to do is to reduce the speed of the workers, and if we want to gig fast, we increase the speed to the desired point of efficiency. By this it will be seen that these new napping machines do possess decided points of merit which will make it advisable for the wide-awake manufacturer to avail himself of them. Many raise a point of objection, which is said to consist in the wasting of fibres which is occasioned by the use of

napping machines. On the face this objection seems to be well founded, but is not borne out by facts. Those who sold their flocks when the work was done by the gig, and who are now doing the same work with nappers, ought to be able to say at once whether they have more flocks to sell now than formerly. We must remember that much of the flocks on the gig are lost forever, whereas every fibre pulled from the goods with the napping machine is found right under the machine. There is nothing remaining in the workers as there used to be on the teazel slats, to be knocked out with the teazels on the refuse heap, and if careful account is kept of both processes we venture to say that the napper will make the least flocks.

Appreciating always any advance which is made in either machine as used in connection with the woolen industry, we cannot help saying that as far as the finishing of woolen goods is concerned, there has been nothing for the last 25 years which has been of as much benefit to the craft as the advent of the modern napping machine.

CROPPER

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 woolen mill at Port Elgin, N.B., is now in operation.

Brodie & Co., Hespeler, Ont., are putting another storey on their mill.

Walter Merns is in charge of Wallace's woolen mill at Fallbrook, Ont.

Williams, Hurlburt & Co., knitted goods, Collingwood, Ont., are running overtime.

The binder twine factory in the Kingston penitentiary will make 600 tons of twine for Ontario and the North-West.

It is reported that the web factory at Niagara Falls is to be removed across the line, probably to Boston, Mass.

Dupont & Wilson, oilcloth manufacturers, Kingston, have obtained an extension of time from their creditors.

The Brodie Mills at Hespeler have lately put in a number of new looms from the Knowles Loom Works, Worcester, Mass.

The premises of the Smith Wool Stock Company, 219 Front street, Toronto, were damaged to the extent of \$500 by fire recently.

The Dominion Cotton Mills Company's mill at Kingston, Ont., has been closed down for a week to make the repairs usual at this season.

The by-law granting a bonus to the proposed Rubber Manufacturing Company has been carried at Bowmanville, Ont., by a good majority.

The picker house which is being added to the knitting mill at Port Dover, Ont., is to be 30 x 40 feet. Some new machinery has been placed in the mill.

C. A. E. Lefebvre has succeeded to the management of the Royal Corset Co., Sherbrooke, Que., vacated by C. Freeman, who has returned to New Jersey.

The employees of W. E. Sanford & Co., Hamilton, Ont., recently held bicycle races which drew a large crowd of spectators to the East Hamilton track.

Wm Ryan (son of John Ryan) got his arm badly lacerated by being caught in the carding machinery in D. M. Fraser's knitting mill, Almonte, Ont., not long ago.

The Kingston knitting mill was the scene of some excitement one morning last month, when an explosion wrecked the feed water heater and did considerable damage to the engine house.

In April last the Talbot, Cockroft & Harvey Co., Ltd., manufacturers of carpets, met their creditors, when Mr. John Harvey, Hamilton, and others were appointed to continue the business until they got it into better shape. They have since assigned.

The Montmorency Cotton Manufacturing Company do not appear to be very much alarmed at the prospect of tariff reform. They are erecting just now a number of cottages for their workmen and a building for the Montmorency Social and Literary Club.

Work has been begun in Valleyfield, Que., on a new warehouse for the Montreal Cotton Company. The ground plan measures 170 by 90 feet, and the building is to be three stories high. The same company has commenced excavations for a large flume, to be put in at the end of the mill. It is intended to develop about 800 horse-power. What is not required for the motive power of the company's mills is to be used for generating electric power, which may be distributed to any part of Valleyfield.

A charter has been applied for by the Parisian Corset Manufacturing Company, with a total capital stock of \$10,000, headquarters at Quebec, to manufacture and sell corsets of all descriptions, and to manufacture, buy and sell all material and furnishings pertaining to corsets and dress stays, and generally to carry on the business of corsets' manufacturers. The applicants are Phileas Couet, corset manufacturer, Adelard Belanger, telegraph operator, George Norman Elliott, commission agent, of Quebec, and Philippe Bellefeuille, train conductor, and Alphonse Couet, machinist, of Montreal.

PERSONAL

Wm. Robinson has secured the position of boss dyer with the Toronto Carpet Co., Toronto, Ont.

Wm Simpson, formerly with the Galt Knitting Co., Galt, Ont., has taken a position in Toronto.

H. W. Brethour, formerly in the dry goods trade in Brantford, Ont., died at Caledonia, Ont., June 22nd.

J. G. Kennedy, the well-known clothier, of Montreal, accompanied by Mrs. Kennedy, were passengers to England by the SS "Vancouver" recently.

W. Donaldson and family, of Carlton Place, Ont., have removed to Thurso, Que., where Mr. Donaldson has secured a position as boss finisher in J. & G. Black's woolen mills.

Joseph Bond has given up the Wallace custom woolen mill at Fallbrook and taken the management of the Aberdeen woolen mill of W. C. Caldwell, Lanark, Ont., says the Almonte Gazette.

R. W. Watchorn, who has been successful in North Carolina as a woolen manufacturer, finds the climate unsuitable, and intends returning to Merrickville, Ont. He formerly lived in Lanark, and earlier in Almonte, Ont.

W. Northcote Cantlie, Montreal, has distinguished himself by the honors he has gained in the closing examinations of the Royal Military College, Kingston. Mr. Cantlie has obtained a commission in the Royal Artillery, and has carried off a bronze medal.

Wool Washers || **KITSON** - - -
Dryers and Carbonizers || **MACHINE CO.**
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FABRIC ITEMS.

E. Merrett, wall paper manufacturer, Toronto, has assigned to S. E. Townsend

Peter McArthur, dry goods merchant, of Lindsay, Ont., has had a chattel mortgage foreclosed

The flax growers of Victoria, Australia, are to receive the £2 per acre bounty next year, to encourage the production of fibre and vegetable oil

The assignment is announced of J. & R. Craig, Ottawa, Ont., tailors, who have been in business some twenty years. Their liabilities are placed in the neighborhood of \$10,000

The premises of J. N. McKendry & Co., dry goods, Toronto, were destroyed by fire on June 5th. The loss amounted to about \$170,000. The firm assigned to John Macdonald, of John Macdonald & Co., on the 13th. The damaged goods were disposed of by means of a fire sale. As there were many theories but few facts in evidence as to the origin of the fire, an inquest was held, and a verdict of "found burned" brought in.

John Reid, of Ottawa, Ontario, has arrived in Winnipeg to take the management of the wholesale branch of the Ontario Glove Works, of Brockville, which has been established here for some time, which position was rendered vacant by the death of the late D. B. McLaren. Mr. Reid is experienced in general mercantile business, and has recently spent some time at the factory at Brockville, familiarizing himself with the glove trade. *Winnipeg Commercial*

The ruling of the Exchequer Court in Stewart & Sons, Montreal, vs. the Queen, is of interest. This was a dispute as to the duty on thread. The customs claimed that duty ought to be charged on the full amount of the price, while the importers held that the trade discounts should be deducted. The judgment was that duty should be charged on shoe thread imported in connection with this case, on the full amount of the claimant's prices after deducting twenty per cent., and on linen thread after deducting twenty-five per cent. The judgment is therefore in favor of Stewart & Sons.

A new design in textiles consists of a chenille-faced carpet fabric, having chenille-faced wefts and a yarn-stuffing warp. The combination of the centre and ground wefts is disposed in pairs, the one above the other, on opposite sides of the stuffer warp; and a warp is passed around the said pairs of wefts and crossed diagonally at the centre of the fabric and between each of the said pairs of wefts, to form an inelastic background or ground web, having channels disposed at the intersections of the warp and between the centre wefts, with a binder warp passing over each chenille-faced weft, between each of the said pairs of wefts, and around the ground wefts of the backing, to tie a chenille face to the said web, whereby the chenille wefts are nested on the diagonally-crossed warps and in the channels. The complete fabric is adapted for the reception of a printed pattern.

Mr W. B. Scarth, Deputy Minister of Agriculture, is issuing a circular from Ottawa for distribution to agricultural societies, boards of trade, and others interested in the Canadian wool trade, in reference to the marking of sheep with tar. The circular will call attention to a circular from the Secretary of State for the Colonies, transmitting a copy of a letter from the Incorporated Chamber of Commerce of Halifax (England), calling attention to the very serious damage that is caused to spinners and manufacturers owing to the use of tar and similar substances in marking sheep. The tar remains on the wool, and often spoils large quantities of goods. The letter says that considerable loss and damage are caused, and recommends the use of some other substance for marking sheep, which while withstanding the ordinary conditions of weather in the open, would yield to and become dissolved by the regular process of wool-washing. The letter concludes: "The value of wool under the new conditions would be considerably enhanced."

THE WOOL MARKET.

TORONTO.—Toronto merchants are paying 20c. for good merchantable fleece, 15c. for rejects and 11½c for unwashed

MONTREAL.—Manufacturers are buying very sparingly. A few sales have been made of choice Capes at within the following range of prices, viz 13½ to 15½c. The manufacturers have a fair amount of clothing orders, which will keep them running for some time

CHEMICALS AND DYESTUFFS.

The demand from the mills for supplies has been unusually light: a slight improvement has been noted since the elections, no doubt owing to the previous extreme dullness. The following are current quotations in Montreal:—

Bleaching powder.....	\$ 2 10	to \$ 2 25
Bicarb soda, ..	2 25	" 2 35
Sal soda	0 70	" 0 75
Carbolic acid, 1 lb. bottles	0 25	" 0 30
Caustic soda, 60°	1 80	" 1 90
Caustic soda, 70°	2 25	" 2 35
Chlorate of potash.....	0 13	" 0 18
Alum	1 35	" 1 50
Coppers	0 70	" 0 75
Sulphur flour	1 50	" 1 75
Sulphur roll	1 50	" 1 75
Sulphate of copper.....	4 75	" 5 50
White sugar of lead	0 07	" 0 08
Bich. potash	0 10	" 0 11
Sumac, Sicily, per ton	60 00	" 65 00
Soda ash, 48° to 58°	1 25	" 1 30
Chip logwood	2 00	" 2 10
Castor oil.....	0 08	" 0 09
Cocoonut oil	0 06½	" 0 07

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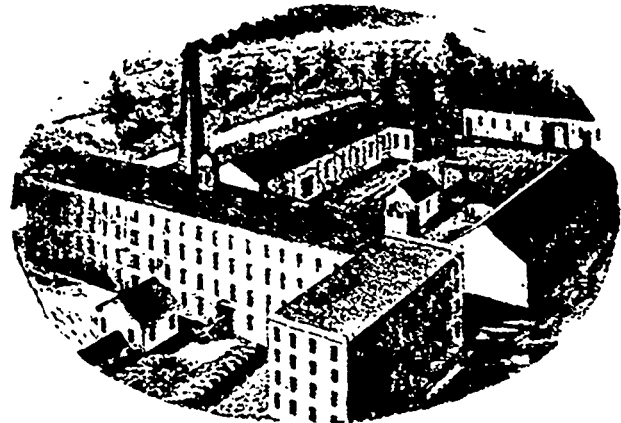
Send stamp for Catalogue and mention this paper.

FANCY BACKS.

Several years have elapsed since fancy back cloths had even a limited demand and at that time they only sold in big broad twills for overcoatings. Now there is a call for them, to cater to one of the important parts of the present bicycle craze, the suit. The covert cloth which has risen into great favor for the bicycle suit, has been taken as the most suitable style of goods on which to put the fancy backs. The face should be a regular covert, and the back some regular twill weave. The construction of the cloth is that of a regular double cloth and must contain two systems of warp and two of filling. The face cloth should be made with a twist warp yarn, and the face filling should match the darker color in the warp twist. The back cloth should be a plaid, but must not be in colors, showing a great contrast to the face color, though it should harmonize neatly. These goods are made up without lining, so as to show an effect back to the cloth when the coat is thrown open, and while large plaids are demanded for suits here, the plaid should be of a medium size, about an inch square, or an inch and a half at the outside. There is also a tendency towards fancy backs in the cloak trade, and Mali has anticipated this demand by bringing out a line of covert cloths with fancy backs. These goods should weigh 26 to

27 ounces, while those for the bicycle suits should weigh only 16 to 17 ounces. And if they can be made lighter than this so much the better. In manufacturing any class of goods, it should always be borne in mind that the chief object is to produce a fabric that will be firm and slightly, and the harmonious combination of colors is a great factor in the sale of goods, especially of new fabrics.

Weston Woolen Mills



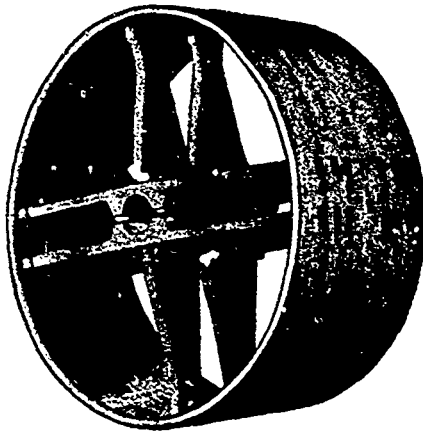
This valuable Seven-Set Mill, including 25 acres of Land, with 10 dwellings, etc., is now offered **FOR SALE**. It contains seven sets of 60-in manufacturing Cards, 2,500 Spindles (Tatham Mules), 45 Broad Looms, and all other machinery to match. It is advantageously situated on the banks of the Humber river, and has an excellent water power.

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As this fine property is offered at very reduced figures, an eminently favorable opportunity is afforded to intending purchasers.

I also have for sale, 1 set of 48-in. Cards, 2 sets of 60-in. Cards, 4 Tatham Mules, 20 Broad Looms, 2 English Gigs, 2 Chinchilla Machines, 8 60-in. Shoddy Cards, 2 Fulling Machines, 3 Shoddy Pickers, 1 Rag Duster, etc., etc.

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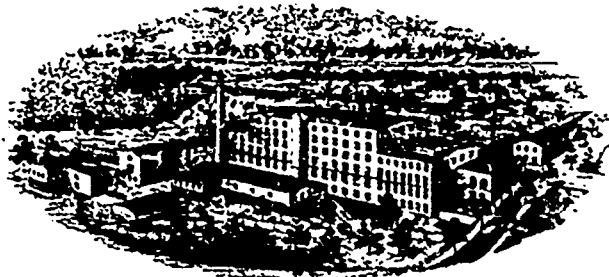
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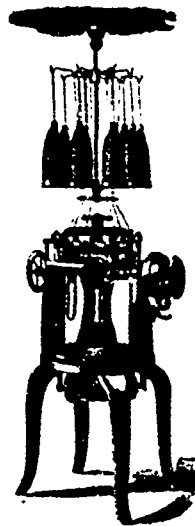
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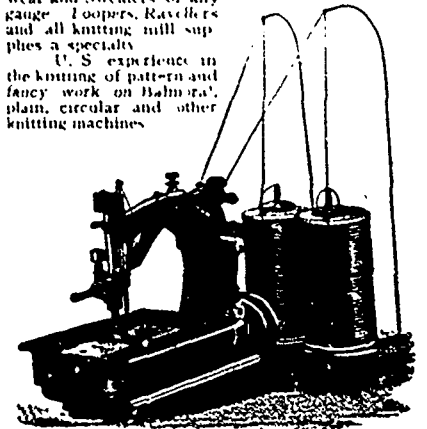
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THE BROOK WOOLEN COMPANY, LTD.

Editor CANADIAN JOURNAL OF FABRICS

DEAR SIR, —In a recent issue of the JOURNAL OF FABRICS there is a reference to Benjamin Brooks, of Simcoe, and, if your item refers to this company, or can be construed to this company, as the people who are contemplating selling to the retail trade, you will please correct the error in your next issue, as you have been misinformed, and such a statement is calculated to do us considerable injury with the wholesale trade. Your attention to the matter will oblige.

Yours truly,

THE BROOK WOOLEN CO., LTD

Simcoe, June 22nd, 1896.

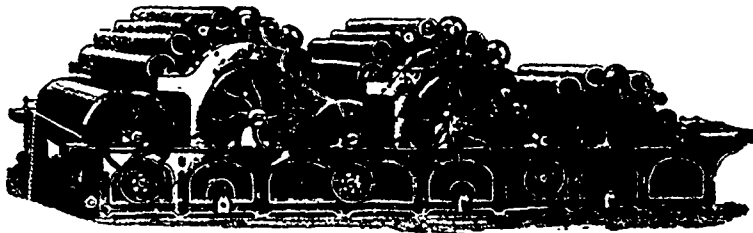
LITERARY NOTES.

In the May, June and July numbers of the *Century*, Professor Bryce, author of the "American Commonwealth," has given to the English speaking world a most timely and thoughtful review of the past and present of South Africa, with special reference to the relations of the Boers and British. The present reviewer, having spent five years in those regions, can testify as to the fair and judicial manner in which Professor Bryce sums up the situation there, and those who wish to understand the relations of the British colonist to the Boer and native races, will not find a more instructive or

more unbiased account. The other leading papers in these numbers are fully up to the high standard maintained by the *Century Magazine*. Two noteworthy coincidences are to be mentioned in connection with the June *Century*. Professor Sloane's narrative of the career of Napoleon brings us to the invasion of Russia and the capture of Moscow, and while the pages were in the press we read in the daily papers of the awful fatality at the feast, outside of Moscow, on the very plain where Napoleon camped. A very instructive account of the municipal government of the city of St. Louis is given in the very month when the attention of the world was so painfully concentrated on the frightful cyclone which laid that city waste.

The last male descendant of Jean Marie Jacquard has just died at Lyons. That the inventor of the machine which transformed the whole system of weaving should have gained but little by his invention and left no fortune behind him, will not surprise those who are familiar with the outlines of his history, nevertheless it seems strange to find the only representative of a name which the world of to-day honors as it deserves occupying so humble a position as that of a house porter. The last Jacquard was merely a poor serving man, without education and with no means of support but the wages he earned by opening the door and sweeping the staircase of a big dwelling house. The relationship in which he stood to Jean Marie Jacquard was that of grandnephew.

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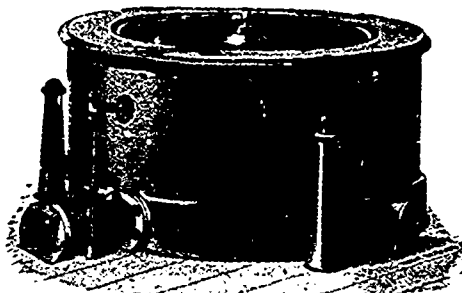
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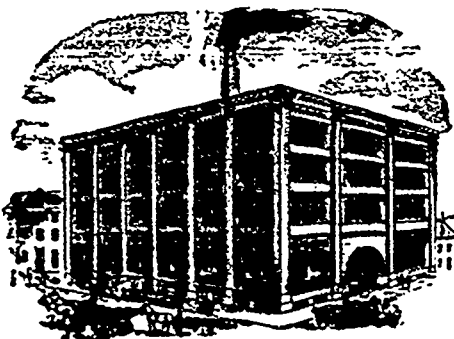
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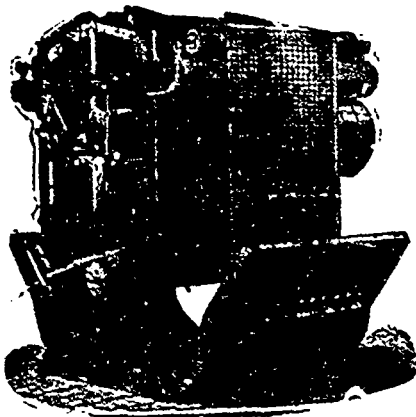
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MANUFACTURER
OF

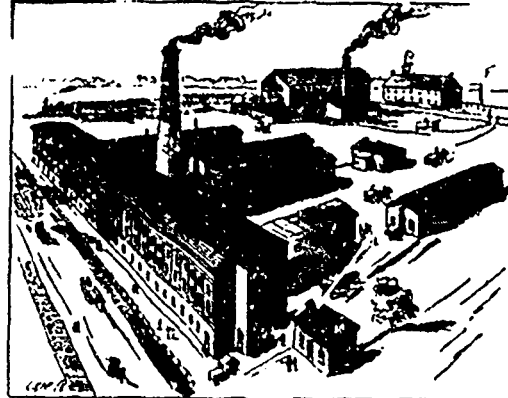
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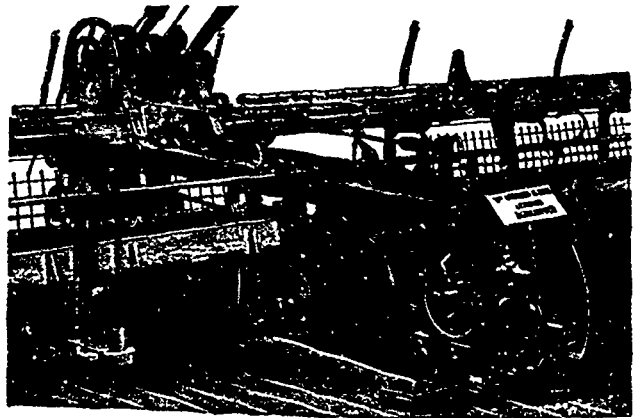
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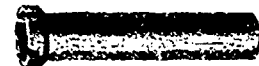
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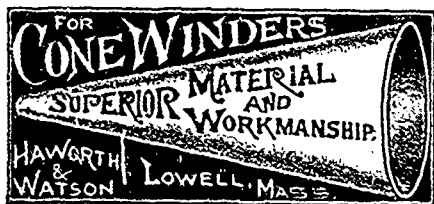
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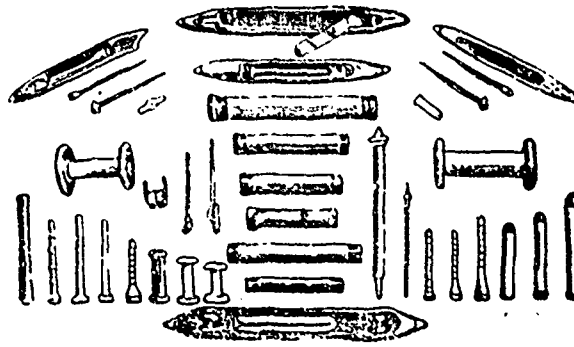
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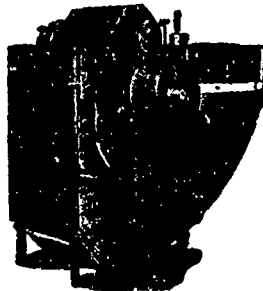


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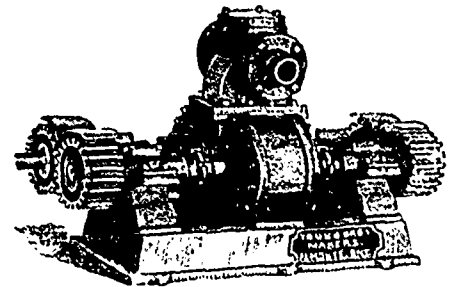


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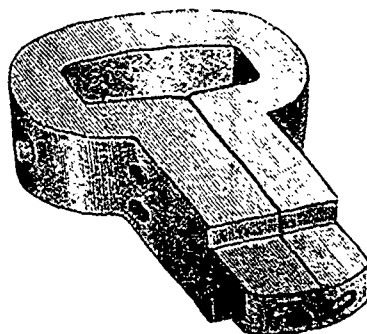


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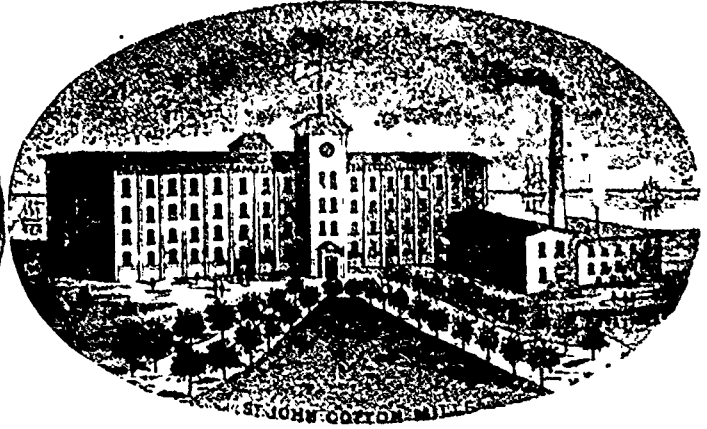
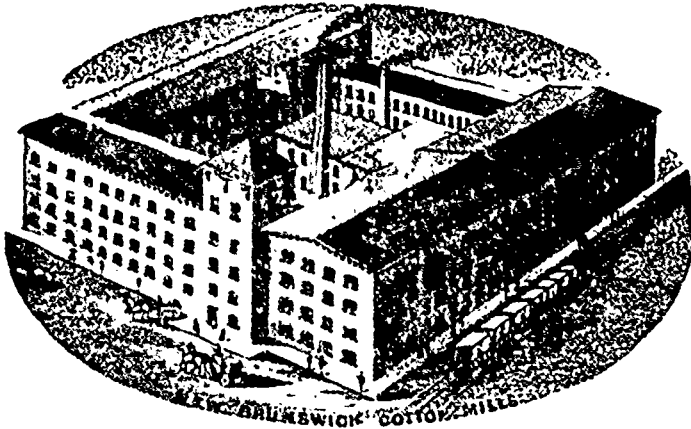
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PREVAILING IDEAS IN MEN'S WEAR.

In a recent issue the *American Wool and Cotton Reporter* gives a number of popular fabrics now in demand, mentioning their chief characteristics, and the range of their prices, as follows.

Astrakhan A cloth of silk and worsted material, with a long and closely curled pile, in imitation of the fur of that name; price, \$1 12½ to \$8

Bearskin, Dreadnaught, Fearnought A coarse, shaggy woolen cloth for overcoats, price \$7 to \$8.

Beaver or castor A cloth with very fine kersey face, with a loosely woven back, much softer handle than kersey, and used for men's overcoats; price, 55c to \$6 25

Broadcloth Fine woolen cloth, commonly black or blue, with a fine finished surface, originally named from its breadth, price, \$1 50 to \$6

Cassimere, casimir A woolen cloth closely woven and closely sheared, used principally for the quieter trade, price, 90c. to \$2 50

Cheviot, tweed A cloth more loosely woven than the cassimere, and not sheared closely; price, 50c to \$2 50.

Chinchilla A fabric made of the long fibre wool for overcoats. Roughness of face, softness and warmth being its characteristics, price, \$1 25 to \$7

Covert cloth A woolen cloth generally made of double twisted yarns, both in warp and filling, and woven very close; price, \$1 to \$6

Doeskin A woolen fabric of fine quality, without visible twill, and supposed to resemble the skin of a doe, price, \$2 to \$6 50

Drap D'Ete A worsted fabric, used principally for religious garments, very fine twill and closely woven, price, \$1 50 to \$7

Flannel A fabric made in various ways and with some nap, and used principally in blues for seamen, uniforms, etc., price, 60c. to \$2 25.

Frieze A heavy, woolen cloth, covered with an irregular nap, and having a more or less hard, harsh handle. Originally in Ireland, but now made and used in all parts of the world, price, \$1 12½ to \$6

Fustian, corduroy, moleskin, beaverteen, velveteen, thickset, etc A stout, cotton fabric, especially that which has a short twilled nap, price, 75c to \$2 50

Homespun A coarse, loosely woven woolen material, made in imitation of actual homemade cloth, price, 70c. to \$2 50

Kalmuck A coarse, shaggy cloth, resembling bearskin; price, \$5 to \$7.

Kersey, kerseymere, cordillas A fine, closely woven cloth, with regular nap, used principally for overcoats. It has a high finish, price, \$1 to \$6.25

Melton A fabric woven something like a kersey, but with a dead finish; price, \$1 to \$6 25

Petersham cloth A heavy woolen cloth, generally of a dark blue color, used for heavy overcoats, etc., price, \$1 50 to \$5.

Pilot cloth A heavy woolen cloth, such as is used by pilots for pea jackets, also for overcoats and uniforms, indigo blue being generally used, as other dyes do not stand sea water; price, \$1 to \$6 25

Satinets A cheap fabric, composed of cotton and wool, usually printed and used for the cheapest kind of clothing; price, 10 to 35 cents.

Serge A rather wiry, twilled fabric, made in all weights, and used for all purposes, price, 50c. to \$3.

Thibet: Made from very soft wool and with an unfinished face; 60c to \$3 50.

Tricots: A woolen fabric, with diagonals running straight across the piece, and something like cassimere handle; price, from \$1 up

Vicugna or vicuna A woolen cloth made from the softest kind of wool of vicugna, price, \$1 to \$5

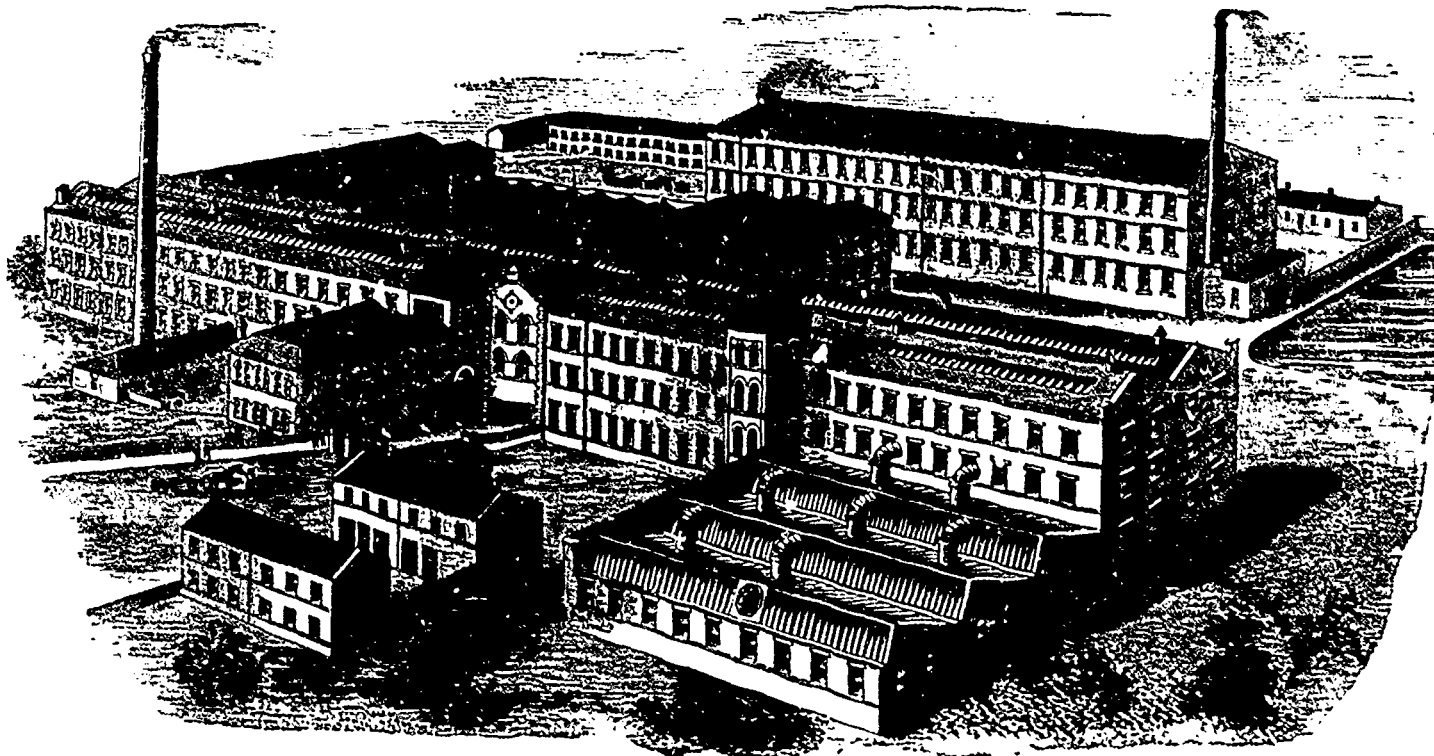
Worsted: A cloth made from long staple wool, which has been combed, and is more or less hard twisted.

Corkscrew: A fabric made from worsted, and woven with a smooth, round wale, price, 70c. to \$6.

Clays or diagonals: A variety of flat twisted worsted which is woven in a twill, similar to that of serge, the diagonal lines lying flat on the surface. On account of the weft and warp being slackly twisted, the cloth does not take a gloss, as in the case of the ordinary hard-twisted worsteds. The name is derived from an English manufacturer.

Undressed worsted: Any worsted with a rough face, such as diagonals, corkscrews or fancies; price as above

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NEW TREATMENT OF RHEA FIBRE.

The Bradford correspondent of the *Drafter's Record* says, in reference to the new Ferguson process of treating Rhea fibre that this was being carried on from the raw material to the finished yarn at the Phoenix Mills, Brighouse. The raw material is certainly of a most unpromising appearance, closely resembling in appearance heaps of dried stalks of the common stinging nettle, and obtainable in practically unlimited quantities at a cost of not more than a penny per lb. The method of treatment is most simple, and quite does away with the old-fashioned decortication processes which have been a feature of all previous treatments of the various fibres of the Rhea character. All that is required appears to be to immerse the raw fibre in a strong alkaline bath, and then, after a simple bleaching process, to put the fibre thus cleared of gum and pith through exactly the same processes of dressing, combing, and spinning as are required for the preparation of waste silk yarns, which are largely produced in this district of Yorkshire. There can be no doubt about the successful production of yarns made from Rhea fibre in this manner, as the whole of the processes could be seen in actual course of performance, and the yarns in the completed state seemed most satisfactory, both when composed solely of the fibre and also in combination with wool and with silk in various proportions. The fibre itself, when in the combed state, has a remarkable resemblance to mohair in the form of combed tops, possessing also a somewhat similar lustre to mohair. The leading objections to the use of yarns made from Rhea and similar fibres have hitherto been that the want of elasticity which they have had has been a great drawback to their use in dress fabrics, on account of the way in which creases in the fabric were retained, and also that as these fibres were vegetable in origin, and followed the peculiar formation of all vegetable fibres, they were not so warm or healthy as fabrics composed of animal fibres, such as wool and silk. The patentee claims that the Rhea fibre yarns treated by this method are more elastic and kinder and warmer to the touch than those prepared by the old methods, and are also less inflammable. Whether they will ever be considered sufficiently brilliant to replace silk, or lofty enough in appearance to replace wool, will depend largely on the price at which this product can be put on to the market in bulk, as the necessary intricacies and cost of preparation quite precludes its competition with cotton. The yarn has been dyed both separately and in conjunction with wool, but for the present the patentee seems to place most faith in the use of the yarn in a white state.

It is said that the Rhea yarn is not very inflammable, that the mixed yarns and the pure Rhea yarns are perfectly strong, and that the thread lends itself readily to the gassing or clearing processes.

PROFIT IN WASTE.

So far as the mill itself is concerned, the method of accomplishing this result is simple, as most of the work falls upon the spinner. The mill carpenter is needed first, and he should make six boxes for each mule, the same to be made of $\frac{3}{8}$ inch white pine, perfectly smooth, and the boxes to be three feet long, four inches wide at the bottom six at the top and about twelve deep. These are to be screwed to the front of the carriage of the mule, says the *Wool and Cotton Reporter*, on the lower guide board, three on each side at equal distances apart. With a stencil print on two, one on either side, "soft ends," on two others "hard ends," and on the remaining two "middle ends." This is the manner in which the mules are fixed up with boxes in the mill. The spinners use this

equipment as follows. If an end snaps off before any twist goes in, the hanging end is quickly gathered up by the spinner and is promptly tossed into the box marked soft ends. If the end has received a few hundred turns of twist, it goes into the middle box, and if wholly twisted into the hard box. At the end of the day all three sets of boxes are usually filled with clean and assorted waste. The great saving is made in that in the soft box, for this is worth just as much as formerly, as it can be put into the card feeds and run through again, whereas, if it had been mixed with the other, its value would come down to that of the latter. The waste in the middle boxes is fairly good, and can be reground without much breakage of fibre, while that in the hard box must go through the regular shoddy grinding processes before it can be used again. It will be argued that spinners working by the piece will not take the trouble to do all this, but will let the waste scatter about on the floor. This depends altogether upon the discipline of the mill. The narrator has had operatives come into his employ from other mills, or as beginners, and these have at times proven so shiftless that the appearance of the floor about their work was anything but pleasing to the man who has paid for the valuable stock which is being walked upon and scattered about as it were valueless. A few lessons on neatness and economy have often changed these people to such an extent that one of the worst of these, who at first waded in waste unconcerned, was heard to remark that "I can't work when there's waste underfoot." If the overseer can get the help into the habit of keeping the floor clear from waste, they will cling to the custom, and the rest will come easy.

Windows of workshops, toilet rooms, etc., are often painted either to soften the light or to shut off the view. A very lasting and uniform coat of paint is obtained in the following manner: The glass is cleaned thoroughly with acidified water and fossil meal and a solution of 10 parts of stale beer and $1\frac{1}{2}$ parts of potash water glass is poured over it. After drying the glass is heated moderately and as uniformly as possible, when it is ready to receive its coat of paint, for which the following prescription is given: 100 parts (weight) of Cologne glue are allowed to soak in cold water for several hours. The water is then poured off and the glue is put into a pot and melted. While the glue is melting, 200 parts of linseed oil are heated until the temperature of both substances is about equal. As soon as no more air bubbles can be observed in the glue, the linseed oil is added gradually under continual stirring. The mixture has to be kept hot over a slow fire for an hour and stirred without interruption. For stirring a round stick is the best, as an angular one will produce bubbles. Then 200 parts of slightly heated turpentine or camphor oil are added and at last the coloring substance and 150 to 200 parts of water. All these additions have to be made slowly, while stirring must not be neglected. The paint is spread on lukewarm and is dry within six hours.

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Good's Patent Combined Hackling
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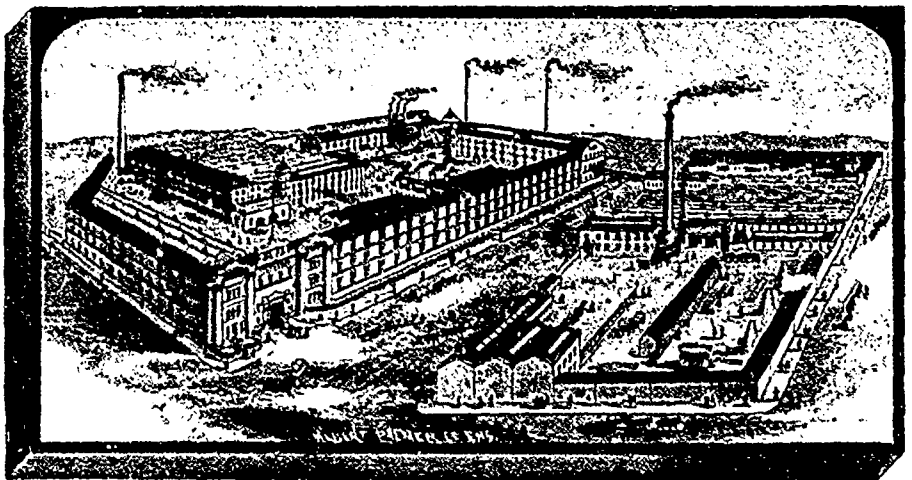
Patent Automatic Spinning Frames
Improved Laying Machines

and other special machinery for the
manufacture of Rope Yarns

— ALSO OF —

Brownell's Patent Twisting and Laying
Machines for Twines

Council Medal London 1851, Grand Medal,
Paris 1867, Prize Medal, Moscow, 1882, Diploma
of Honor Vienna 1884, Highest Award Phila-
delphia 1886, Gold Medal Paris 1889, Highest
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(ALFRED PARKER, Sole Proprietor)

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