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# CANADIAN Journal of Fabrics

THE JOURNAL OF THE  
Textile Trades of Canada.

Vol. XXI.

TORONTO AND MONTREAL, AUGUST, 1904.

No. 8.

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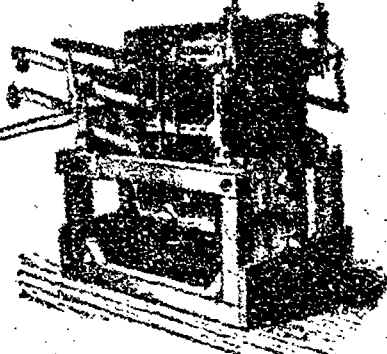
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No. 8.

## Canadian Journal of Fabrics

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### CONTENTS OF THIS NUMBER

Among the Mills .....	178	Nosing Motion for Mules ....	180
Anti Dumping Clause .....	182	Uting of Wool and its In-	
Birth of the Botany Wool		fluence on Dyeing .....	171
Trade .....	167	Personals .....	180
British Exports to Canada ..	179	Preparation and Dyeing of	
British Textile Centres .....	181	Wool-Silk Febrics .....	172
British Silk Association .....	182	Publications Received .....	184
British Wool and Textile		Ramie .....	177
Markets .....	185	Spider Web Fabric .....	182
Byways of Labor .....	179	Sulphur Colors on Hosiery...	173
Canada and Newfoundland ..	162	Technical Education in Bom-	
Cost of Textile Manufacturing		bay .....	175
in Europe and Canada .....	169	Textile Design .....	174
Fabric Items .....	184	Warp Twisting Machines .....	182
Flax Industry in Canada .....	163	"Watch Canada" .....	180
Flax Manufacturing in Canada,		Waterproofing Composition ..	180
Article III .....	164	Wool Markets .....	185
Inflammability of Wool .....	179	Worsted Industry—A Bit of	
Mohair Manufactures .....	177	History .....	184

### CANADA AND NEWFOUNDLAND.

The Canadian Engineer for August devotes an editorial to the trade relations of Canada and Newfoundland. In view of the facts already given on our textile trade with the island colony we would commend The Engineer's article below quoted to our many factories and merchants:

It is the green hill far away that charms us most. The great things in prospect are more alluring than the modest possibilities of the moment. This disposition to look beyond—and often to overlook—the facts and duties immediately at hand, seems to be prevalent in trade as well as in philosophy. We find our neighbor the United States spending hundreds of thousands of dollars and publishing volumes of reports with the object of cultivating trade and of introducing United States manufacturers into South America and other parts of the world more distant and more alien, while Canada its nearest neighbor buys more United States goods than the whole con-

continent of South America. Canada in her turn has commercial agents in Australia, New Zealand, South Africa, the West Indies, Norway and Sweden, and is establishing direct commercial relations with other countries more or less remote, while here at our Atlantic gateway is Newfoundland, one of the very best customers this Dominion has ever had, with no direct commercial representation on our part, and with a record of diplomatic dealings which has been no credit to this country. Indeed, it is questionable if a more criminal blunder was ever committed in the political history of Canada, than that through which the negotiations opened up some years ago by the Newfoundland delegates for the entry of the Island into the Canadian confederation were broken off through the haggling over a matter of \$5,000,000. But it must be confessed that the halting and narrow spirit which has characterized our relations with Newfoundland has not been peculiar to any political party or period, but has been because of our immature notions of Imperial relationship. We had not yet learned to think of Newfoundland as our nearest sister in the Imperial family to whom we owed the duty of a little help and counsel. We were all absorbed in our own selfish concerns, and as is the case in individual life with extremely selfish people, we are reaping commercially what we sowed politically and morally.

We have nothing to say against the establishment of commercial agents in the British Colonies and other parts of the world, but these steps should have been taken and the weightier matter of relations with our nearest sister colony not neglected. Our United States neighbors at all events have not neglected their commercial opportunities—as they have active commercial consuls there—and the results will be seen in the figures which follow.

In 1886, out of a total trade of over \$7,000,000, Newfoundland did \$3,123,716 with Great Britain, \$2,132,850 with Canada, and \$1,961,263 with the United States. Of these totals the island's imports were as follows. From Great Britain, \$1,911,001, from Canada \$1,937,605, from the United States \$1,672,810. In 1893 Newfoundland's imports from Great Britain stood at \$2,680,853, from Canada at \$2,886,901, and from the United States at \$1,665,227. Coming down to 1903 we find a remarkable change in the positions of the three countries, for in this year the island imported \$2,143,464 from Great Britain, \$2,869,897 from Canada, and \$2,920,914 from the United States. This out of a grand total import of \$8,479,944, and a grand total export of \$9,976,504 from the island.

Taking the export side of the account we find that Newfoundland shipped goods in 1886 to the value of \$195,245 to Canada, \$1,212,715 to Great Britain, and \$288,453 to the United States, but in 1903 she exported the following amounts. \$2,173,000 to Great Britain, \$1,02,659 to Canada, and \$1,357,031 to the United States.

The reader will see that the United States has in these ten years gained relatively at the expense of both Canada and the Mother Country. Stated in terms of 100,000s., the United States has gained from 16 to 29, Great Britain has fallen from 26 to 21, and Canada has stood still. It must be remembered that the general foreign trade of Canada has more than doubled in the ten years referred to. There is a startling significance in these figures, and if our statesmen are not awake to the meaning of the change our commercial men and manufacturers ought to use the speaking trumpet.

As a matter of interest to merchants and manufacturers, we may note some of the items in which the three countries named still lead in the trade with Newfoundland. Canada led in exports there in the following lines: Live stock, fruit, belting, biscuits, bricks, brushes, butter and cheese, grain, cabinet ware, canoes, carriages, casks, eggs, flour, ships' dories, hair cloth, harness, hay, iron bridges, rough leather and leather goods, ships' masts, oiled clothing, picture frames, ploughs, saws, tinware, and wooden ware. The United States has now got first place in bicycles, blocks (ship) candles, canvas, certain lines of wagons and wagon and carriage bodies, wheelbarrows, spokes, springs, clocks and watches, feathers, boot and shoe findings, flag stones, groceries, hardware in certain lines, rubber goods, iron and steel bars, sole leather, locomotives, several classes of lumber, machinery under each of the three classes, dutiable at 35, 25 and 10 per cent. respectively, nails, of the class dutiable at 35 and 25 per cent., nets, staves and headings, window shades; Great Britain holds first position still in textile fabrics generally; cement, several lines of hardware, chemicals, china and earthenware, cordage, drain pipes, explosives, fancy goods, hats and caps, hoop iron, metal tubes, nails dutiable at 10 per cent, paints, wall papers, pianos, ready-made clothing, small wares, spirits and liquors, shaftings, some classes of steel, etc.

Writing on the development of United States trade, a special correspondent of the Toronto Globe who recently visited the island, says: "The alarming increase in the trade with the United States led me to a special investigation among the business men of St. John's. I was told that it was due largely to neglect on the part of Canadians and enterprise on the part of Americans. The United States Consul in St. John's, Mr. J. O. Cornelius, has, since his appointment some years ago, been indefatigable in working up trade between his country and Newfoundland. He is ever on the alert for new avenues of commerce, and, the better to do so he is constantly in communication with sub-Consuls in every fishing settlement throughout the island. He studies the requirements of the people, and watches, lynx-eyed, for new developments in the colony. Immediately he discovers an opening for trade he corresponds with firms in the United States. His reports to the Washington Government are frequent and complete.

He is an energetic commercial agent. The result is that American firms, quick to respond, have not only sent down travelling representatives, but have opened permanent agencies here, by means of which a great deal of business has been turned away from Canada and Britain. On the other hand, there is no representative of the Canadian Government in this important centre of trade, and I am informed by hotel men that comparatively few Canadian commercial travellers come this way. When they do they frequently find that business has been already grabbed by their American competitors."

The same correspondent interviewed Hon. E. M. Jackman, the Colonial Minister of Customs, who frankly expressed himself against confederation with Canada. "We would lose our political autonomy," he said, "and would become the rag-end of the Dominion." He went on to say that the colony was endowed with great natural resources, such as timber, pulpwood, iron, copper pyrites, slate and other minerals, and these were now being developed by the railway. In addition to these resources and its fisheries, the colony practically controlled the bait supply of the North Atlantic. In estimating the value of the last named asset, he said: "Some of your people may think we place too much value on the control of this bait supply. Up to the year 1886 we allowed the French the privilege of purchasing bait from our fishermen, and they, receiving large bounties, were driving us out of the Mediterranean markets and ruining our people. We passed an act known as the Bait Act, the object of which was to prevent the French from either catching or purchasing bait in our own waters on the northeast or southwest coast. By a strict enforcement of the Bait Act we have crippled the French. In 1886, the first year we enforced the Act, their catch was 909,953 quintals, but it has been decreasing steadily ever since, and last year it only amounted to 418,307 quintals. This is the direct result of our refusal to give bait to the French. If we transfer to Ottawa the power to deal with these bait fishes and our general fishery laws, it may suit Canadian statesmen to use this leverage in their commercial treaties with France or the United States. It may be argued that Canadian statesmen would be jealous to safeguard the interests of this colony in this matter, but we feel that our interests in this respect are safer in our own hands than in the hands of the farmers of Ontario or our French-Canadian friends in Quebec. We can to-day control our own destiny, make our own treaties (subject, of course, to Imperial ratification) and are, as Kipling says, daughter in our mother's house, but mistress in our own. If we join the Dominion we lose our status as a self-governing colony and become, to use a localism, 'the back linney,' or lean-to, of Canada. The best policy for this colony is to remain independent and be in a position to have two great producing countries competing for our trade and placing their goods on this market cheaper than they will sell to their own people."

These reasons, it will be observed, are partly commercial, partly political, and partly sentimental. They are reasons which naturally influence a public man at a time of material prosperity, such as Newfoundland is now enjoying. But they are not of permanent force. A new generation of public men in

place in a time of adversity, or face to face with problems that far outweigh questions of yearly revenue, or which, indeed, may have no connection with commerce at all, may view this subject in a wholly different light. Meantime, the commercial aspect of the case appears to be largely influencing public opinion in the colony, and we cannot blame the islanders for taking a restricted view of federation, when Canadian public men with wider experience have taken such a narrow view of this country's relations with Newfoundland in the past.

Many Newfoundlanders realize that the industrial birth of the colony dates from the advent about six years ago of a firm of Canadians, the Reid Bros., of Montreal, who built the colony's railway and gave a chance for its mines and factories. Previous to that time, the one great industry was the fisheries. What one Canadian firm has so well started can be expanded by other Canadian firms, and our capitalists who have hitherto been putting money into enterprises in South America, Cuba, Mexico, and the West Indies, might well turn their attention to this island where investments would be safe from political disturbances, and where the people are of our own race and of an industrious hardy character.

Meantime has the Canadian Government no offer of preference or of reciprocity to make towards Newfoundland, while the question of the colony's fishery negotiations with the United States are still unsettled?

Sir Robert Bond, the Premier, while opposed to confederation with Canada, pointed out in an interview in London the other day that the United States while getting special privileges in Newfoundland in the fisheries regulations, is taxing, almost to a prohibitive degree, Newfoundland products that go to the United States, and said that Newfoundland could not let this question stand open forever. He hinted at a preferential tariff with Canada. Such a tariff would ultimately be of great advantage to both countries, and the Canadian Government should send a commission of four or five broad-gauge men to St. John's, to negotiate a commercial treaty or preferential tariff in such a spirit as will make amends for the follies of the past.

\* \* \*

## THE FLAX INDUSTRY IN CANADA.

In another part of this issue will be found the third of a series of papers on flax manufacturing in Canada. In these papers the writer considers it necessary to recall the experiences and failures in linen manufacturing here at the time of the Civil War. These failures and the causes that led to them are forgotten by the present generation. That Canada contains several hundred millions of acres upon which it is possible to grow flax of good quality, and that we now import linen manufactures to the value of over \$2,000,000 a year, are two big facts that are highly alluring to a man who looks at the surface without going into the details of a manufacturing process. As a subject upon which to build a prospectus it is more enticing than Colonel Sellers' eye-water as pictured in Mark Twain's "Gilded Age." It reminds us of the enterprise that was started about

forty years ago in Manitoba for making buffalo hair into cloth. In those days of roaring sport the prairies were dotted with the carcasses of slaughtered buffalo, and one of the Red River settlers, who doubtless knew something of woollen manufacturing before Mr. Fielding had discovered the preferential method of building up a Canadian woollen trade, conceived the idea of starting a buffalo wool factory. He proposed to engage Indians to scout the plains, gathering the wool which remained after the flesh and hides of the deceased bison had decayed, and that this wool should be brought into Fort Garry and woven into cloth. It was proved that the wool would make a warm and substantial fabric, and the scheme seemed so feasible that a company was forthwith organized, and machinery spinners, weavers and dyers were imported, and the factory started with joyful anticipations. But the proceeds of the first "clip" of wool—it one can apply the term to picking the tufts around the bleached bones of the buffalo—were spent by the Indians in potent draughts of fire water, and no further wool-gathering would they do till they were driven by necessity. Meantime, the factory had to close down till fresh supplies could be had, and when the supplies within a day's journey or so of the factory were exhausted, the Indians refused altogether to collect more wool. As the occupation did not pay the white men, the factory closed down finally amid the drunken revels of the mill hands, and so ended the buffalo woollen factory of Red River.

So it was with the pioneer linen mills of Ontario. They had not realized that the existence of their industry depended on regular and sufficient supplies of a raw material which was beyond their own control. They could no more compel the farmer to grow flax and furnish it in the shape they required than the promoters of the buffalo wool factory could compel the Indians to gather their raw material as needed.

It would be a pity if the present linen enterprises were started without a full appreciation of the fact that no native Canadian flax industry can be established without complete co-operation between the growers and the manufacturers from the start. As pointed out in the article, the conditions are similar to the beet root sugar industry, in which two serious failures have already been recorded in Ontario through failure to secure sufficient supplies from the farmer. The promoters of these new ventures should understand that for the manufacture of linen fabrics the fibre from flax that is grown primarily for seed, as at present raised in Canada, is practically useless except for coarse stuff, and that if it is to be grown primarily for fibre, with the seed as a by-product, it will have to be grown at first under instructions from those skilled in the business in Ireland or Europe. It can certainly be done if the growers have the patience and perseverance. This can best be accomplished by Government co-operation and systematic experiments, which will necessarily extend over several seasons before any large area can be successfully devoted to flax raising for fibre purposes. It is a striking fact that the world's area under flax culture has been steadily declining for years in spite of the indirect efforts of the linen trade to increase it. Russia has become the world's chief source of supply in flax as the United States

has in cotton. But no one knows what may now happen in Russia, and as linen fabrics have a recognized place in civilization which no other fibre can fill, it should be worth the while of our provincial Governments to go thoroughly into the question from the agricultural end.

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—The career of Samuel Marsden, referred to in this issue, is one of the many romances of the wool trade. His was peculiarly a romance of "real life." His object in going to Australia was to carry the Gospel of Jesus Christ to the people there, but it was at a time when the mass of Christians at home took little interest in missionary work. In fact, many clergymen publicly questioned the right or duty of Christians to convert the heathen; and some of the responsible members of the Imperial Parliament strongly opposed the opening of India to missionaries. Marsden's enterprise required uncommon courage, not only because it was opposed to popular opinion at the time, but because the hardships and hazards of such a voyage before the days of steamships were very great. He not only undertook it, but found friends in his native Yorkshire to support him with money and many prayers. Marsden sought to benefit the bodies with material comfort, as well as the souls, of the people to whom he went, and hence the trouble he took to introduce the merino sheep. But what incalculable results came from the effort! The climate of Australia and New Zealand was found to be ideally suited to the merino sheep, and the import of increasing quantities of this class of wool—the best the world has produced, except that of Saxony, which is small in amount—opened up a new era in woolen manufacturing in Great Britain. In this new development Yorkshire was advanced in a very special way, and that advance has gone on till the present day, when it may be said that woolen manufacturing is the only great staple industry in which Great Britain stands without serious rivals in the world's markets. Yorkshire is still the great centre, and it seems in a sense a legacy of this noble pioneer missionary. A student of the subject has said that it seems as if God had spoken to this effect to Marsden and his Yorkshire friends a century ago: "Because you have carried My name and My law to this end of the earth I will create a link forever between it and you. In your blessing of it I will bless you." And so it is, for even the gold mines of Australia have not equally the wealth-producing powers of the Australian sheep, while the woolen and allied industries of Yorkshire are the most potent and most promising of the Old Land. When we consider that all this is a secondary result—a by-product, as it were—of Marsden's work as a preacher of Christianity, we may wonder at this vindication of a righteous man's faith. The vindication is none the less amazing because it has come about so gradually and naturally, and has taken a century for its complete disclosure. If those who honestly doubted Marsden's work could rise from the dead and see what has developed in Great Britain and in Australia and New Zealand to-day, they would surely not join those who question the benefit of Christian missions to foreign lands.

## FLAX MANUFACTURING IN CANADA.

### Article III.

In our first article we traced briefly the history of flax and linen manufacturing in general, showing the great antiquity of flax as a material for fabrics, and explaining the conditions under which it grows. The second article gave an account of the development of flax manufacturing in Canada as a household industry under primitive conditions, and of later attempts to manufacture linen under the factory system.

In view of the efforts now being made to re-establish the industry in this country it will be useful to examine the conditions that exist to-day, and to caution those interested against the mistakes and misconceptions that led to the collapse of the industry at the close of the American Civil War.

As already shown, the paralysis of cotton growing during the struggle between the South and the North, which while it brought ruin to the cotton manufacturers of England, and starvation to the thousands of operatives, threw fortunes in the way of the linen manufacturers of the North of Ireland, and to a lesser extent to those of America. The prosperity, particularly in the last case, was short lived. The southern planters and their freed negroes were glad enough to get back to the cotton fields as soon as the war was over, and as the price of raw cotton dropped, so dropped the profit of the linen manufacturers. Those who had started linen mills in Canada, and the States, were not only unable to compete with the cheaper cotton goods of Lancashire and New England, but they could not hold their own against the superior skill of Irish and Continental workers, where it was a case of producing the finer fabric, in which linen had never been dethroned. George Stephen (now Lord Mount-Stephen) was quick enough to realize the position, and dropped the thousands he had invested in the linen mill at Preston, and stuck to the woolen business, the minutest conditions of which he knew. Elliott, his partner in the venture, is said by Mr. Peddler, to have lost \$100,000, and Hunt lost all he then had. They made table cloths, bagging and other coarse linens, and afterwards ran into twines and shoe threads. For the last named branch, they brought out a man from Scotland, who was experienced in this line, and was reputed to be a good judge of fibres, but he was of opinion that the fibre of Ontario was not of a quality good enough for shoe threads. Apart from the adverse turn of the market, it appears that some initial mistakes were made by Stephen, Hunt and Elliott in establishing their mill. To manage the mill, they brought over one Stephen Randall, (no relation of the family of Randalls who started the first worsted mill at Hespeler) from a cotton mill in Providence, R.I. Instead of getting flax machinery from Ireland or England, he put up cotton bagging looms and cotton carding and spinning machinery from the States, and it is needless to say that these were not precisely suited to the work. Some of these machines were thrown out and one stored in a barn which was struck by lightning and destroyed, the balance of the bagging looms were sold to the late Wm. Gooderham, whose linen mill was referred to in the last article, and who took Randall with him. A timely misfortune in the form of a fire closed the career of the Gooderhams as linen manufacturers, and that firm found in whiskey their consolation for losses in linen.

Now it must not be supposed—though some mistakes

were made, such as employing Randall on his claim that he knew all about the business, whereas he had been a cotton mill man without any experience in flax machinery—that the men who embarked in these ill-starred ventures were men without knowledge or judgment. They were all men of business ability and experience, as their success in other branches of manufacturing showed. There was a general belief in Canada and the States that linen manufacturing was destined to be a permanent and profitable industry. In 1868, a date at which the industry was already doomed, this belief was still held, and was expressed in the following paragraph in a book on the "Industries of Canada," by H. B. Small, of Ottawa:

"Only a few years ago, the Messrs. Perine & Company, of Doon, in the county of Waterloo, gave the impetus to flax culture there by distributing seed among the farmers, promising to purchase both the fibre and seed and start a mill for dressing the flax. Since then, they have so largely increased their operations, that they are now carrying on no less than eight scutching mills in that county, in addition to a large linen factory. At Norval also, Co. Halton, Col. Mitchell has invested largely in vats for steeping purposes, and machinery for spinning and weaving. In the village of Preston, a large linen manufactory is in operation. There need, however, be no apprehension that the country will produce more than it can consume. At the present time Barber Bros., of Streetsville, are using large quantities of yarn from the linen mills of the Messrs. Perine for warp and filling woolen weft [What the writer meant was that it was used as warp with woolen weft in producing union cloths.] thus producing a much stronger article than can be manufactured with cotton and woolen. Hence the linen manufacturers need have no more ground to fear want of demand than the woolen manufacturer."

Had the Civil War lasted four or five years longer, it is quite possible the industry might have become entrenched in Canada, because the supply of raw material of home growth could have been provided for.

Just at this point lay the difficulty, and it forms the difficulty to-day as it did in the period of the Civil War. If those who are starting out in the business now design to build up a native flax industry, they should well realize that they must begin on the farm, and not in the factory. The linen business is analogous to the beet root sugar industry, and those who have embarked in the latter field recently in Ontario, have found that it is one thing to build and equip a mill, but quite another thing to get the farmers to grow beets enough to keep the mill running. In deciding how to use his land, the farmer is not solely influenced by the prospect of working for dividends for the owner of the tall chimney, but by the expectation of making money for himself by the crop in which there is the least hard labor. The linen industry had already begun to collapse in Ontario in 1866-8, before the farmers in Waterloo and Wellington counties, in which it started, were convinced that flax growing would pay as a permanent staple crop. It is true, that flax was grown here and there all over the Province, but chiefly, as in other Provinces, to furnish fibre for the house-wife to spin and weave into towels and sheetings for family use.

It may be stated here, that the only flax firm in Ontario which survived the crisis of the Civil War was M. B. Perine & Company, of Doon, and the explanation of their survival and subsequent prosperity, is that they began at the beginning. They settled the agriculture problem first. They started their first scutching mill in 1851, and began by distributing flax seed to the farmers, from whom they guaran-

teed to take the crop at a stated price. In many cases, they had to teach the farmers how to grow and prepare it for the mill, and it was only by the exercise of great patience and perseverance, that they made the business a success. Having established their scutch mill at Doon, they widened the area of flax growing and started a second mill at Conestogo, a third at Stirton, and a fourth at Baden. It was not until 1862, that the firm started the manufacture of flax twines, which they have continued to the present day. During the Civil War period, they imported looms, and manufactured bagging, but later abandoned that branch and sold out their weaving machinery. The Livingston brothers, who afterwards started scutching mills and the manufacture of linseed oil, and through whose operations the area of flax growing was largely extended, learned the business in the firm of Perine & Company. It was thus that the flax industry in Ontario began and grew until between 1880 and 1890 there were over fifty scutching mills in this district of Ontario. Since then it has steadily declined. The Livingstons at one time had about a dozen scutching mills, now they have only three mills running. The firm of Perine & Company, have much difficulty in procuring supplies. They estimate that in the last five years, the area of flax growing in Waterloo, Wellington and surrounding counties has declined fifty per cent. Out of the fifty or more mills referred to, as existing in the nineties, the following is approximately a complete list, and several of these are running light. Doon, Conestogo (now closed), Exeter, Hensall, Zurich, Alvinston, Shipka, Dashwood (2), Crediton, Seaforth, Mitchell, Sebringville, Lucan, St. Mary's, Ailsa Craig, Parkhill, Forest, Wallaceburg, Tilbury, Dresden, Belle River, Essex, Embro, Arthur, and Palmerston

Apart from the requirements of the twine mills, the principal products of the scutching mills of Ontario have been shipped to the upholstering factories and exported to the United States for twine and upholstery manufacturing purposes. Occasionally some flax and tow are shipped to Great Britain, but seldom in large quantities. In 1897 Canada exported 2,608 cwt. of flax, valued at \$21,438, and 300 cwt. of tow, valued at \$350 to Great Britain, the exports to the United States in the same year being 35,414 cwt. of flax, worth \$283,214, and 18,535 cwt. of tow worth \$84,378. Of these totals of flax, \$3,754 came from Quebec, and all the rest from Ontario. There is considerable fluctuation in the export of flax products. In 1897, for instance, we shipped to the United States 38,022 cwt. of flax, and 18,835 cwt. of tow, but in 1898 the export was only 5,710 cwt. of flax and 11,281 cwt. of tow. In 1901 the export of flax was 32,140 cwt., but the export of tow had dropped to 612 cwt. In the year ending June 30th, 1903, the export was 19,301 cwt. of flax, worth \$175,243, and 555 tons of tow worth \$3,943, all going to the United States. In the same year Canada imported \$2,000 worth of flax and tow. It will thus seem that flax as an article of export is on the decline. The exports as far back as 1877 were greater than those of 1903 by \$3,793.

But this is not all. The flax and linen industry is also declining as a household industry. The generation of women who could spin and weave flax is fast dying out, and the flax spinning-wheel and hand-loom are heirlooms only. They are found in our museums and historical societies, but no longer in operation by the winter fire-place. The old German ladies from Waterloo county who gave exhibitions of flax spinning in the Pioneers' Building at the Toronto Exhibition last year, excited feelings in the beholder analogous to the emotions of the Jews when they gathered in Jerusalem after the 70 years' captivity. The census re-



turns show that the production of home-made linen in Canada fell from 1,771,140 yards in 1871 to 1,293,802 yards in 1881, and 633,724 yards in 1891. The last census was taken in 1901. The details are not yet issued, but if they are published in the lifetime of men now in the flesh, they will show a still greater decline. Practically the industry is limited to a few back districts in Quebec and the Maritime Provinces, to a convent here and there, and to the women in the Mennonite and Doukhobor settlements of Manitoba.

The cause of the decline in the domestic industry is self-evident. If we seek an explanation of the decline of the organized industry in Ontario we will find it; first, in the diversion of farm and village labor into more profitable fields, and second, in the exhaustion of the soil in some localities through too constant cropping in flax. Thirty years ago when the flax business of the Livingstons was in its prime, flax pullers could be had for 85 cents a day, and boys, women and girls were very glad of the work. Now \$1.50 a day has to be paid for the same labor, and it is difficult to get boys and girls at that. In those days the Livingstons would send out wagons, and in a day would gather three or four wagon loads of flax pullers. Now they are fortunate if they get one-half load of elderly women. The smart girls and boys have all gone into Berlin, Waterloo, Elmira, and other towns where work is to be had not for a brief space in the summer, but the whole year round, under more comfortable circumstances, and with a far better yearly income than on the farm. That, in a few words, is the difficulty, and until girls and boys can be attracted back to the farm this difficulty of the flax manufacturer will increase rather than diminish as time goes on. It must be borne in mind that, up to the present, no machine for pulling flax has yet been invented that will take the place of hand pulling. The writer does not say it cannot be done, but the inventions so far brought out in the States and in Europe have not solved this problem.

Turning to the United States we find the same experience. It is officially estimated that in 1859 there were produced 75,000 tons of flax in the various States, against 5,000 tons in 1896; and the product is probably not greater at the present time. The textile directories of the United States record, besides ten tow mills, the existence of twelve factories for the manufacture of flax twine, and the same number where the weaving of linen is carried on, and when it is understood that these factories do not use native flax exclusively, nor do the linen mills weave pure linens exclusively, or use yarns of flax spun altogether in the United States, it must be admitted that the showing is worse relatively than in Canada, considered as a "native" industry. The investigations of Charles Richards Dodge, the able head of the Fibre Investigations Branch of the United States Department of Agriculture go to prove that a good quality of flax fibre can be grown over a wide range of territory, but it is discouraging to find that owing to lack of patience and application on the part of the farmers, and to the attractions of other crops involving their care and skill, it is hard to extend the area of flax. Mr. Dodge reports that of the different inventions brought to notice for substituting hand pulling, not one has proved satisfactory in trials on the field. Efforts at a machine weeder have been equally unsatisfactory, and Mr. Dodge does not expect that American women and children will take to weeding flax on their hands and knees as in Belgium and Russia. We may add that we do not expect Canadian farm hands to take to this kind of labor on a large scale. As we have maintained in the case of Canada, Mr. Dodge holds that if the flax industry is to be a success in the States, it must be by co-

operation between the farmer and the manufacturer, as in creameries and the beet root sugar industry. "One of the chief reasons why beginnings have not been made in favorable localities," he says, "is that the necessity for this co-operation is not understood." There must be a class of skilled workers who will come in between the farmer and the manufacturer of the yarn and cloth. "It is futile to expect the farmer to ret and scutch his flax. It is not done on the farm in foreign countries, nor in Canada, save to a limited extent, and it will not be done here." It is done in Russia, and low-grade fibre, giving a lot of trouble to the manufacturer, is the result.

It will thus be seen that the establishment of a native Canadian linen industry on the factory system is still an unsolved problem. It is at once a question of farming and manufacturing. It may be stated that the growing of flax for the production of linseed oil has been fairly successful as a permanent business, and is capable of indefinite expansion in our North-West, since flax can be grown in a region comprising 300,000,000 acres that lie outside of the limit of wheat raising. But when flax is grown for seed it is of little use for fibre. At best, the fibre grown in this case is only used at present for upholstering. Fibre of such a sort could not be shipped from Manitoba or the Territories to Ontario factories at a profit, owing to cost of freight. An experiment of this kind was made by the Livingstons some years ago when they had a scutch mill in Manitoba, but apart from the cost of shipping it to Ontario we are informed that the fibre was not the best for manufacturing purposes. This may, of course, have been due to pulling at the wrong time, or preparing it in the wrong way, which would greatly affect the result.

From the information already given it will be seen that the prospects are not particularly bright for establishing linen factories in Canada if dependence is placed upon supplies of fibre grown at home, as farming is now carried on. The market price of the raw material as compared with raw cotton is an important factor, however, as the effects of the Civil War showed, and the possibilities arising out of market fluctuations will be considered in another article.

Meantime a word or two with regard to the new linen industries already under way may be of interest. As to the projected linen mill at Edmonton we have little definite information except that it is understood the mill will derive its fibre from farmers in the surrounding district. It is the custom in Manitoba and the Territories to sow flax on the first breaking of virgin soil, but except in the Mennonite and Doukhobor settlements flax is soon largely replaced by wheat and other grains, and the farmers there have not up till now studied the production of flax for fibre purposes. The difficulty of retaining skilled hands in the mills will also prove one of some seriousness in the North-West as other manufacturers have discovered.

The works of the International Flax Co., which we understand are under way at St. Josephs, Ont., are for the production of flax twine. As fibre for twine is not of as fine a quality, and does not require as careful manipulation as for linen cloth, the success of this company, whose promoters have had experience in the States, is only limited by the demands of the market, and the extent to which they can induce farmers to go into flax raising.

The Canadian Linen Works, Ltd., of Halifax, N.S., was promoted by E. J. H. Pauley, a broker of Halifax. Mr. Pauley has no technical knowledge of linen manufacturing, and the shareholders and directors of the company who are chiefly Halifax men, will labor under a serious drawback in having their mills located at Orillia, about 6,000 miles from

their executive offices, and with no present supplies of raw material in the neighborhood—at least of a quality that would be fit for weaving purposes. The company—whose directors, besides Mr. Pauley, are A. W. Redden, boot and shoe merchant; W. N. Silver, of W. and C. Silver, dry goods merchants; Theo. S. Bowser, of G. M. Smith & Co., dry goods merchants, and Max Ungar, of Ungar's laundry, the last named being secretary—proposes, according to its prospectus, to manufacture linen, woolen and cotton yarns, clothing, and linseed oil cake and meal. To quote the exact words of the prospectus it is "linen, woolen, cotton yarns, clothing, linseed oil, linseed meal, linseed cake, and textile goods of every description." It is stated to be the purpose of the company "to erect a fully equipped linen mill with the latest and most modern machinery." The prospectus gives cuts of flax cleaning, preparing, spinning, and weaving machinery, and then says the company proposes to carry out an improved process for "degumming and bleaching the fibre." Apparently the enthusiastic compiler has got hold of a catalogue of ramie machinery, and got the process of flax and ramie manufacturing mixed. Another sentence is: "The Province of Manitoba alone for the year 1902 yielded 504,440 bushels of flax seed, but in addition to this seed there was the fibre, which was mostly destroyed, and which should have been marketed and manufactured into Canadian goods." The writer would be sorry to appear to throw cold water upon any endeavor to establish a new industry, but when it is proposed to make money out of the manufacture of linen fabric from the fibre out of a yield that is grown for seed as in Manitoba, it is well to suggest to the promoters that they look a little more closely into the facts and conditions they have to face when they get to work.

The other linen factory now getting into shape in Ontario is at Bracebridge. Its plans are different from the others in one important respect, and that is it will make no attempt, for some years at least, to spin yarn from Canadian flax, but will import its yarns from Ireland, and will confine its work to weaving. It will make table cloths, napkins, doylies, and sheetings of medium and fine grades. Yarns of this class may now be imported free for manufacturers' use, and under the tariff changes announced in June, weaving and other machinery for linen mills is also put on the free list. This reduces the cost of equipping a mill, and with free yarns, the net protection of the products of such a mill under the preferential tariff is 22 per cent. This advantage, it is needless to say, is entirely dependent on the stability of the tariff. One local advantage of the mill in Bracebridge is that the town will provide it with electric power at \$12.50 per horse-power per year, which is very cheap. The mill starts upon about 24 looms, but these are to be increased till 100 are installed. The finishing machinery will be for a capacity of 300 looms, and provision is made for such a possible increase. The directors of this company, known as the Dominion Mills, Ltd., are Reuben Millichamp, of Millichamp, Coyle & Co., (who will be the selling agents); W. Van Duzen, Toronto, of the Sun & Hastings Savings & Loan Co.; C. A. Johnson, of the J. D. King Co., Toronto; E. MacKenzie, of the Toronto Railway Co.; J. D. Shier, of the Shier Lumber Co., Bracebridge; Dr. Beattie Nesbitt, of Toronto, being president, and C. Kloefer, of Guelph, vice-president; C. McEachren is secretary, and Robt. Caldwell is manager. Mr. Caldwell is a practical linen manufacturer, and was formerly proprietor of the Millbrook Weaving & Bleaching Co., of Larne, near-Belfast. He is bringing out skilled weavers from Ulster, paying them an advance on the wages current in Ireland. The capital of the company is \$250,000. The town has guaranteed \$50,000 of the com-

pany's five per cent bonds, on condition that the promoters spend \$75,000 in buildings, machinery, etc. Mr. Caldwell is now at Bracebridge superintending the installation of machinery, and it is expected that samples of linen goods will be ready for the market this summer.

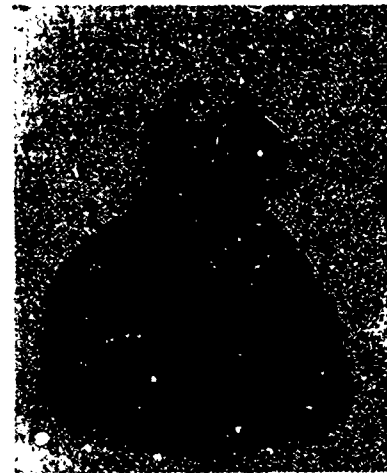
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### THE BIRTH OF THE BOTANY WOOL TRADE.

It is always interesting to know the history of the beginning of any great event, to be able to trace its relations and to mark out the lines of progress. When the Rev. Samuel Marsden brought over from Australia a few stones of merino wool packed in barrels, he little dreamt that it was like a stone dropped in the middle of a pond, creating a circle that is widening to this day. No other industry has so radically changed the outward appearance of mankind as the Botany wool trade. The essential features of the industry still exist and wool ranks as the second largest textile in the world.

It was indeed a day of small things when the reverend gentleman stepped aboard that old sailing vessel with a few old casks of wool as a part of his baggage, but out of it there has arisen an industry the importance of which it is difficult to exaggerate. I dare say the sailors who carried the barrels on deck thought Mr. Marsden was carrying home some very queer baggage. The novelty of carrying wool from Australia has long since worn off. Seldom does a vessel leave Australia now without having wool as a part of her cargo. The extraordinary has become the common place.

Fortunately Samuel Marsden had been reared within the sound of the shuttle and the stroke of the weaver's beam. He knew the importance of the woolen industry in the West Riding district of Yorkshire and no doubt saw great possibilities wrapped up in the industry of sheep breeding



Rev. Samuel Marsden.

and wool growing in Australia. Had a man from the south of England been the first missionary to Australia, and with no knowledge of the needs of manufacturers, it is not too much to say that sheep-breeding and wool growing would not have reached its present dimensions in the short space of one hundred years.

Samuel Marsden was not born with a silver spoon in his mouth, was not ennobled by birth or rank, or endowed by nature with great and distinguishing talents. Yet he was, in the truest sense possible, a great man, and belonged

to that true aristocracy of which we have far too few. He worked for the benefit of his brother man, and not until after his death were his self-denying efforts and his life work appreciated at their proper worth. Like many other great men he had to die to prove his real worth and it can be truly said that "his works do follow him."

Information regarding his early life is scanty, yet we know for a fact that his father was a small farmer living at Farsley in the ancient parish of Calverley, both his parents being known as persons of strict integrity and sound piety, a fact which no doubt impressed itself upon the young boy. He was born on the 28th of July, 1764. The house is still standing at Turner's Fold, Farsley. He received the scanty education which the village school afforded and was then sent to the free grammar school at Hull where he received instruction from the well-known Joseph Milner.

His schooling days over, young Marsden was sent to live with an uncle, a blacksmith at Horsforth, near Leeds, where he was apprenticed for a blacksmith. The Marsden family still continue the business at Horsforth and are proud to think that the honored seer once made the anvil ring in the very smithy which stands to-day. But Samuel Marsden was destined to fill a higher sphere in life than merely shoeing horses and mending farmers' implements. He had higher thoughts, and the clergyman at Rawdon seeing there was something "smart" about the lad, took him in hand. Ultimately he graduated at St. John's College, Cambridge, where he studied for the ministry of the Church of England. It was only fair to say that Elland Society was instrumental in getting him into this college.

By a Royal Commission bearing the date of January 1st, 1793, he was appointed as second chaplain to the settlement in New South Wales. He sailed from Hull for his new sphere of operations on Sunday, August 28th, 1793, in a convict transport, and left Cork on the 30th of September for Australia, arriving there on the 2nd of March following. A great change has since been witnessed in going to and from Australia. In those days the passage required between six and seven months; the time has been shortened now to one month.

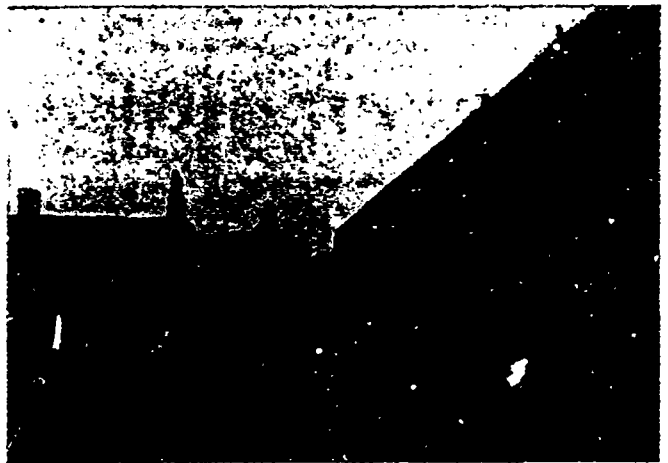
Mr Marsden went to the penal settlement in Botany Bay, a name associated with the wool trade of Australia, because from that spot the first Australian wool was brought to this country. It was at this place that he established what he used to call a "model farm," and it was here that he personally interested himself in the development of agriculture and particularly in the rearing of sheep. From the very beginning he was impressed with the possibilities of Australia as a sheep-breeding and wool-growing country.

He found but few sheep in the country, the settlers becoming possessed of their first flock in 1793 by the purchase of thirty head from the captain of a merchant vessel from Calcutta. These sheep were of Indian breed, but whatever their quality and character little is known to-day. His little flock was afterwards increased by importations from Cape of Good Hope and again later from England, but we are authoritatively told that he found that within three years his own stock without any care on his part (for his farm was entirely managed in his absence by a trusty bailiff who had been a convict) had upon an average been doubled in number and value. This shows how well suited Australia is as a sheep-breeding country.

Mr. Marsden visited England in 1808 after an absence of fourteen years, and brought with him a quantity of the wool that had been grown on the settlement. Wool had been so little appreciated in the Colony that it had been previously used to bed out cattle. On its arrival in England

Marsden seemed to be equally fast with his little consignment, for it is generally understood that he could find no one to buy it or give him any encouragement. It was so short and fine that several said it was worthless, and one record has it that it was "sent to his nephew, John Marsden, a hosier living in Briggage, Leeds." From subsequent events I am led to question very much the correctness of this statement.

Marsden naturally visited the scenes of his early youth, paying a visit to his relations at Horsforth, his parents now being dead. To have been to Australia and back was a big thing in those days. There were not many woolen factories then, but Rawdon could boast of two. It has long been disputed at which mill the first Australian wool was worked up, whether the Park Mills or the Low Mill, they being about a quarter of a mile apart. The Low Mill is the oldest and by a long way the most historical. However, we have to-day a letter written by the gentleman



The Park Mill at Rawdon where Australian Wool was First Worked.

through whose hands the first Australian wool passed, which settles once and for all at which mill the wool was worked up. It should be here said that Thompson's is an old Rawdon family, and they first manufactured at Low Mill, removing afterwards to Park Mill, and later on Larkfield Mill, hence arises the uncertainty. However, it is now settled beyond dispute at which mill the wool was first worked, the following being a letter written by William Thompson, one of the chief actors in the inception of this interesting romance of the wool trade:

"It was in the spring of 1808 when the Rev. Samuel Marsden returned to this country, and then brought the first wool with him that ever came from the colony. He came over from Horsforth to dine with my father as an old acquaintance, and after dinner we went down to Park Mill, then employed by my brother Jeremiah and myself, under the firm of J. & W. Thompson. On going over the premises he saw some Cheviot fleeces, and inquired their value, at the same time stating he had brought over a small quantity of wool from the colony, but did not know its value. He then offered the wool to me on condition that I would pay the carriage down from London, make a piece of black cloth from the finest (no admixture), and let him have a suit, which I agreed to. The wool was sent down, about ten or twelve stones, which was sorted, and about five stones of the finest sort made into a white cloth, then dyed black and finished, one-half of which, say about twenty yards, was sent to him in London.

The wool proved well, and made a cloth superior to his or my expectation; he had a suit made from it, and was so much pleased therewith as to visit King George III. in it, who admired it very much and expressed a wish to have a coat of the same cloth, which was at once readily granted.

His Majesty was so impressed with the importance of the wool of the colony that he gave orders for Mr. Marsden to have selected some of the best sheep from his flock of merinos at Windsor. They had a good deal of conversation about the colony, and His Majesty expressed a fear that they would not be able to make returns, when Mr. Marsden informed him that he thought wool would ultimately be a large return. A while after Messrs. Alexander Birnie & Company, wine and porter merchants, London, imported a large quantity of wool in casks, which I purchased from them, and a large proportion of it had evidently been buried in the earth. After this we received largely on consignment from the Rev. Samuel Marsden, Captain Edward Cox and others."

The number of sheep obtained from King George III. was five, though some say six. He himself says in a letter that he was successful in landing alive "four and two lambs." In 1811 the first consignment of wool reached this country which consisted of one hundred and sixty-seven pounds, and was sold by auction at Garraway's Coffee House in London, so that this year, 1811, marks the beginning of the Australian wool trade and the London Colonial wool sales.

In 1812 in another letter he says that at the settlement he possessed 20,000 cattle and 56,000 sheep. On the 25th of June, 1813, he writes, "I have sent home in the vessel more than 8,000 pounds." Elsewhere he said that his last wool "averaged 3s. 9d. per pound. What this will sell for I know not."

I give a photograph showing the Park Mill where the first Australian wool was consumed. The very building itself looks ancient. Our photograph shows only a portion of the mill, several additions having since been made. Park Mill is quite an historical spot, and a part of the oldest portion is now occupied by working men's cottages. The mill itself (the newest portion) is now used as a bleach works, but our photograph shows the very room in which Marsden's wool was worked out. Naturally the people of Farsley are very much interested in Marsden's great work, and have erected to his memory a monument in Farsley church-yard. In the church itself there has also been inserted a stained window in his memory.

This brief review of Samuel Marsden illustrates to what dimensions the wool trade has grown, not simply in Australia, but in other parts of the world. The more recent history of the Colonial wool trade is well known by the present generation of wool men, but the development from less than half a bale in 1808 to 1,969,000 in 1895 and 1,384,000 in 1903, is a record of no mean order in the annals of commerce. The career which began at the blacksmith's anvil at Horsforth, the busy life on the farm, the strenuous preaching and living of a practical Christianity, the national monument at Sydney, the more local one at Farsley, and the gigantic results which are traceable to this one man's work, are indeed historical facts which have in them all the interest of a romance. Such a life and work can never be extinguished.—S. B. Hollings in Textile World Record.

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—The only pin factory in Canada, that of the McGregor-Gourlay Company, in Galt, has been sold to the Montreal Smallwares Company. The factory will eventually be moved to Montreal.

COST OF TEXTILE MANUFACTURING IN EUROPE AND CANADA.

The present industrial conditions in Canada supply a striking object lesson of the necessity of protecting American wage-earners against the products of cheap labor in foreign countries. The Canadian woolen manufacturers are the chief sufferers from the lack of such protection, and are making vigorous appeals to the Government for relief from the flood of cheap English goods. They couple their requests with statements of facts proving that the economic conditions in America make it impossible to manufacture woolen goods at a profit without a high protective tariff on the imported product. Among the most convincing exhibits is a comparative statement of woolen mill wages in Canada, England and Germany, based on a mill employing 326 hands. This statement was recently submitted to the Canadian Manufacturers' Association by a prominent Canadian woolen manufacturer.

Woolen Mill Wages. Total Pay-roll per day

Employees.	Canada	England.	Germany
Men .....	95	\$ 99 75	\$ 71 25
Women .....	125	118 75	62 50
Girls .....	66	39 60	24 75
Boys .....	40	24 00	16 80
	326	\$339 10	\$246 50
Wages per year.....	\$101,730 00	\$73,950 00	\$52,590 00
Wages per capita per year .....	\$312 00	\$226 84	\$161 32

Thus, the yearly pay-roll of a Canadian woolen mill employing 326 hands is \$27,780 more than in the same mill in England, and \$49,140 more than in Germany. This alone would make it impossible for the Canadian manufacturer to compete in an open market with his English and German rivals, but in addition to labor every other item in the cost of woolen goods made in Canadian mills is materially higher than in England or Germany.

The difference between Canadian and English manufacturing conditions is illustrated in detail by the following statement, compiled by one of the leading woolen manufacturers in Canada, and recently submitted to Minister of Finance Fielding, who is the author of the present preferential tariff, popularly known as the Fielding tariff. This statement is based on conditions in the carpet industry, in which in Canada (as in the United States) wages are higher than in the rest of the woolen industry. The first exhibit relates to the cost of installing the plant:

Cost of a carpet mill plant. (Yearly product, \$150,000)

	Canada.	England.
Machinery .....	\$ 65,000 00	\$ 65,000 00
Duty .....	12,000 00	nil
Freight .....	4,000 00	nil
Packing, 10 per cent..	6,500 00	nil
Supplies .....	6,000 00	3,000 00
Carting, Hoisting and Setting up .....	2,000 00	700 00
Insurance .....	300 00	nil
	\$ 95,800 00	\$ 68,700 00
Land .....	15,000 00	15,000 00
Buildings .....	100,000 00	60,000 00
	\$210,800 00	\$143,700 00

The first cost of such a mill is thus \$67,000 more in Canada than in England. This extra cost entails an increase in fixed charges for interest, depreciation and in the risk of loss from unmeasurable causes. When the mill is started the Canadian manufacturer finds every item of his operating expenses far above the English level. This is shown by the second Exhibit. Cost per year:

	Canada.		England.
Labor .....	\$31,500		\$15,000
Coal, 1,500 tons at \$4.50..	6,750 at \$2		3,000
Depreciation: Plant, 10 per cent. ....	9,580	10%	6,870
Buildings, 2 per cent...	2,000	2%	1,200
Supplies per year.....	6,000		3,500
Designs .....	3,000		1,200
Selling, 5 per cent. on \$150,000 .....	7,500	2%	3,000
Bank Loans and Discounts .....		4% on	
6 per cent. on \$210,000..	7,200	\$60,000	4,400
Interest on Investment...		5% on	
7% on \$210,000.....	14,700	\$144,000	7,200
	\$88,230		\$43,370
Production Cost .....	58 per cent.		29 per cent.

The estimated value of the product is the same (\$150,000) in both cases. In Canada, however, the cost of manufacturing is 58 per cent. of the value of the product as compared with 29 per cent. in the English mill. In other words, the Canadian manufacturer operating this mill is forced to pay \$88,230 for what costs the English manufacturer but \$43,370.

The necessity for protection to the American product is so plain that words only weaken the eloquence and force of these exhibits. There are some things so clear that further explanation serves only to confuse the mind and obscure what otherwise stands out as clear as noonday. It is so with this question of protection to American industries. If one has doubts as to its necessity let him look at the facts and be convinced. If by reason of some peculiarity in his mental makeup he refuses to accept the evidence of his own senses, let him undertake to operate an American woolen mill under practically free trade. Canada offers the opportunity for such an experiment, which has never yet failed to carry conviction to the most pronounced free trade manufacturer. Our own recent history supplies some examples of such conversion.

We call attention to the conditions in Canada because they carry the same lesson to the people of both the United States and Canada. In both countries manufacturers must do business on the American basis of cost, which is far above that of the over-crowded countries of Europe and Asia. The difference is mainly due to the higher wages paid in America. The figures just given show how much higher the cost of manufacturing is in Canada than in Europe. That cost is still higher in the United States. According to the United States census for 1900 the average yearly wages per capita in the woolen industry amounted to \$364.11, or 12 per cent. above the Canadian rate.

From all this it is clear that the woolen industry can exist in America only under substantial protection. Our own experience in the past, as well as that of Canada at the present time, demonstrates that such protection can be obtained only by specific duties, and that the ad valorem duty is a delusion and a snare. Undervaluation and the dumping

of surplus stocks from foreign mills destroy the apparent protection of an ad valorem duty. On the other hand, the protection of the specific or "pound" rate is certain. The ad valorem tax shrinks as the value of the goods decreases, but the specific rate remains unchanged, a sure protection against the shoddy products of cheap labor.

A glance at the textile industry of the United States shows how important to us is the lesson that Canada is now learning in the school of experience. In 1900 textile manufacturing in the United States gave direct employment to 661,451 wage-earners, and thus contributed immensely to the general prosperity. The wages of these 661,451 operatives alone amounted to \$209,022,447 per year, of which \$57,933,817 was paid to 159,108 operatives in woolen mills. The annual product of our textile mills was valued at \$931,494,566, of which \$296,990,484 came from woolen mills.

Such are the magnificent proportions of an industry built up and maintained by a high specific duty on foreign goods. This, however, is but a part of the industrial structure which would crumble under a low tariff. In the United States in 1900 there were 5,370,814 wage-earners employed in all manufacturing industries, whose wages amounted to \$2,323,055,634, the value of their finished products amounting to \$13,058,652,917. What a picture of prosperity, of well-paid workmen, happy homes and contented people is presented by those cold and unsympathetic figures from the census. If anyone thinks this prosperity is not due to protection, let him look at Canada under the preferential tariff, with her markets flooded with the low-priced products of foreign labor.

Yorkshire grows fat by the preferential tariff while the Canadian manufacturer is left to gnaw on the knuckle-bone of the market at home. The contrast suggests its own impressive moral.—Textile World Record.



—The Indian Textile Journal records the death of Jansetjee Nusserwanji Tata, a prominent figure in the industrial community of Bombay, and in the textile industry of India. Mr. Tata opened the Empress mills at Nagpur, in 1877, with 30,000 spindles and 450 looms. The mills now have a capacity of 67,000 spindles and 1,400 looms, and are about to be enlarged. In 1886, Mr. Tata founded the Swadeshi mill in Pondicherry, which is still a successful concern. Mr. Tata was a strong believer in technical education and donated about \$1,000,000 for the establishment of a Post Graduate University of Research.



—A distinguished Italian silk manufacturer, Signor Stucchi, president of Como's Chamber of Commerce, is calling attention to the critical condition prevailing among silk mills abroad. He seems to think the silk industries of France, Italy, Switzerland, Germany and Austria are in danger. A savage competition has led to the production of a too cheap grade of goods. To accomplish this, the weight of the goods has been added to in the dyeing rather than in the weaving. The result is a vastly inferior product—one very deceptive, but of little value. The disgusted and deceived public have turned to substitutes, articles so similar to silk that it is hard to tell them from silk. Science has helped with its power to mercerize cotton and other textiles, giving them the appearance of silk. Only a radical change can effect a reform, thinks Signor Stucchi, but no one land will be able to accomplish it; there must be a united movement of all silk manufacturing countries. A movement is on foot for a congress or conference of the world's makers of silk.—From "Silk."

### OILING OF WOOL AND ITS INFLUENCE ON DYEING.

The question of the effects of oiling the wool upon the subsequent processes of mordanting and dyeing is one which has not received much attention in the technical press, and yet it is well worth notice.

Between the shearing the wool from the sheep's back and its appearance in the form of a finished fabric the wool has to pass through a series of operations which need not be given in detail here; the two preliminary treatments, and the final ones of dyeing and finishing, are all with which we are immediately concerned. The raw wool is first of all subjected to a washing treatment to remove from it dirt, fat, and impurities with which it is naturally associated, and after this it may or may not be carbonized. The wool fibre has essentially a scaly structure, and it is found that when cleansed it does not spin or weave easily, as the scaly structure enables the wool fibres to interlock too readily, and therefore they do not move over one another with the freedom that is essential in order to spin a thread to the greatest perfection or to weave a fabric uniformly. It is found that by oiling the wool before spinning it becomes lubricated, so to speak, and may then be spun into threads and woven into fabrics with the greatest ease.

For the purpose of oiling the wool a variety of oily bodies are used, all more or less costly, and each wool manufacturer has his own ideas as to the best for his purpose, being guided by the question of cost and by the consideration he gives as to the carrying out of the subsequent processes through which the wool must go. There are some manufacturers who take these subsequent processes into consideration, and who regulate their mode of working accordingly, but unfortunately there are others, however, who do not, and aim only at getting through what they have to do without any consideration of the subsequent treatment of the wool.

Fatty oils, like olive oil, lard oil, neatsfoot oil, etc., are used, and these are excellent for the purpose, but they are expensive. Such oils as rape oil, cotton oil, and linseed oil, have been used, but are objectionable, as they have been found to lead to spontaneous combustion of heaps of wool oiled with them. Another product is oleic acid, as it is called, cloth oil, a by-product in the candle making trade, which is somewhat less expensive than the oils above named. This is also good; and has been found to give satisfaction. Oleines, mostly obtained from crude or recovered greases by distillation, have also been used. These are of very variable composition, and are more or less complex mixtures of oleic acid, unchanged saponifiable oils and unsaponifiable oils. They are cheaper than either of the other two kinds of oily products. They are more or less satisfactory in use, but much depends upon their composition; the more oleic acid and saponifiable oil they contain the more valuable they are and the better do they work. Then there is the class of hydrocarbon oils derived from paraffin shale, and American or Russian petroleum—oils which have been found of considerable service in the lubrication of machinery. These are the cheapest of all oils capable of being used for oiling wool. As mere lubricants for the wool they are good, but, viewed from the standpoint of the woolen dyer, their use is most unsatisfactory, for reasons which will be seen presently.

Wool oils, as they are called, are offered by oil dealers to wool manufacturers which may be blends of the four classes of oils just described, and these are sold at prices

which may or may not bear some proportion to their real value.

Woolen yarns, as they come from the spinning frame, or woolen fabrics as they come from the loom, are, in consequence of the oiling operation, naturally oily. Now every dyer and colorist knows that oily wool yarns and piece goods will not dye properly; the oil acts as a resist to the dye liquors, and prevents the fabrics from taking the dye as they should, and moreover there is a great tendency to uneven dyeing, which is a great defect from the dyer's point of view. The grease or oil has therefore to be removed before dyeing, and this may be effected by the use of volatile solvents, such as benzol, benzine, carbon bisulphide, etc. Practically, while many attempts have been made to adopt such a process, at present probably one is not in use in the woolen mills of this country.

The next plan is to use an alkaline solvent for the oil, such as soda potash, or ammonia, and here the idea is to convert the oils into soaps or soapy emulsions, which can be washed away with water. The easiest of all the wool oil preparations to convert into soap is oleic acid, and hence this is the easiest to remove from the wool. The next are the oleines, which contain some 50 to 70 per cent of oleic acid, and the soap which is formed by the union of the oleic acid and the alkali helps by its emulsifying powers to remove the rest of the constituents of the oil from the wool. Oils like olive oil, lard oil, neatsfoot oil, are more difficult to saponify with the alkali that is used; in fact, only the small proportion of free fatty acid present in these oils is changed into soap. Soda and potash have no saponifying action on the oils themselves. If these alkalies contain traces of caustic soda or caustic potash, as is often the case, then the caustic alkalies will bring about the saponification of the oil, or part of the oil, in proportion to the amount present.

Ammonia has but little saponifying action on the oil. It, therefore, follows that there is always a risk that, when oils like olive oil, neatsfoot oil, or lard oil, are used in oiling the wool, the whole of the oil may not be removed from the wool, and, strange as it may seem, the purer the oil, and the better its quality, the greater the risk is. Now, the presence of this residue oil left in the goods must exert some influence on the dyeing of those goods, at the least it may retard the dyeing, and hence lengthen the time required to produce a given shade. In some cases, as, for instance, in dyeing with alizarine and mordant dyes, it may have a beneficial influence on the shade. It is well known that oils do brighten these colors, and they may assist in the mordanting process by bringing about an easier decomposition of the bichromate of potash. Much depends upon whether the oil is uniformly distributed over the wool or not as to whether the dyeing is done evenly or not. The probabilities are that the oil will be distributed in patches, and hence in the event of the oil not being completely extracted uneven dyeing is almost certain to result.

The hydro-carbon oils, or, as they are sometimes called, the mineral oils, are characterized by being unacted upon or unsaponified by alkalies, and, therefore, an alkaline treatment does not ensure complete removal from the wool. The removal of some of the oil is effected more by the emulsifying quality of the oils than by chemical action. Consequently, when these oils are used, scouring does not eliminate them sufficiently from the wool, and uneven dyeings are bound to result. For this reason this class of oils ought not to be used in oiling wool; even if they are mixed with a large proportion of oleic acid or a saponifiable oil. In this case the conditions for their full extraction are more

favorable, but there is always risk that some will be left in the wool, much to the detriment of its dyeing powers.

Many, if not all, of the so-called oleines used in the wool trade contain proportions of unsaponifiable oils varying from 15 to 40 per cent, and these, of course, resist the scouring operations, and remain in the wool, in which case they may, when the wool comes to be dyed, produce stains and streaks or other defects. From consideration of the facts concerning the scouring properties of wool oils one might infer that the best oil to use would be a mixture of oleic acid with olive oil, lard oil, or other similar saponifiable oil.—Dyer and Calico Printer



### THE PREPARATION AND DYEING OF WOOL-SILK FABRICS.

Fairly large quantities of fabrics are now produced woven from wool and silk. Some of these are plain fabrics, and while many are sold for what they are, others are intended to be a cheap imitation of silk. A great many are striped, checked and figured fabrics, in which the effect is produced by silk threads on a groundwork of wool, and these are very handsome dress fabrics much patronized by the ladies. These wool-silk goods naturally come into the hands of the dyer, who may be called upon to dye them in a single color, or, may be, in the case of figured goods, in two colors. The treatment these goods will undergo after they reach the dyer will vary according to circumstances, but most have to undergo preliminary preparations more or less extensive, before they are dyed, and these will be somewhat briefly discussed.

#### Preparation of Wool-Silk Fabrics.

1. **Singeing.**—This is not always required, much depending upon the character of the goods. If they have to imitate silk, as, for instance, in the case of many umbrella cloths, then it is necessary to singe. This operation is intended to remove the loose hairs that detract from the lustre of the fabric, and hence to make it smoother and thus more lustrous in appearance. The singeing can be done either over a hot copper cylinder or by a gas singeing machine, as may be most convenient. Care, of course, should be taken to insure level, uniform singeing of the goods, by seeing that the whole length of the hot roller is uniformly hot, that the goods are uniformly pressed on its surface from end to end, and that there are no folds or wrinkles in the pieces. If a gas singeing machine is used, then the flame should be of a uniform size all along its length, and burn with the pale, almost invisible, blue flame characteristic of the Bunsen burner. The goods must pass through at a uniform speed and perfectly open and level from side to side.

2. **Crabbing.**—Wool-silk goods are often crabbed, and this may be done on any convenient crabbing machine. When these goods are dyed, in boiling baths particularly, if the operation is somewhat prolonged, then there is an action on the wool fibre and the goods shrink and wrinkle in all directions, a defect to be avoided. It has been found that crabbing the goods before dyeing prevents this effect, because the operation so acts on the wool fibre as to cause it to set and resist the effect of heat and moisture afterwards.

3. **Steaming.**—Generally, following the crabbing, the goods are steamed when batched, on a perforated roller, with very dry steam, the operation taking from twenty to thirty minutes, or the goods may be hung in a steaming chamber, whichever method is most convenient.

4. **Boiling-out.**—It is desirable, when bright and pale

shades are to be dyed on the goods, to boil them out, which is best done in a soap bath at about 170° F. The object is to free the goods from dirt and grease and, so to speak, open out their pores and make them take up the dyes better and more evenly. The best plan of carrying out this boiling-out process is in a continuous open soaping machine, passing the goods through full width and seeing that they are not folded or wrinkled in any way. A boiling heat must be avoided from 170° to 180° F. is amply sufficient. After the soaping, the goods are washed.

5. **Bleaching.** If the goods are to be dyed in dark colors, then from the soaping machine, they may pass direct to the dye-bath, but if to be dyed in pale bright tints, then it will be necessary to bleach them, which is best effected by using either peroxide of hydrogen or peroxide of soda in the way which has been frequently described in these columns. For working the goods in the bleaching bath, one might recommend a hawking machine, by means of which the goods are kept below the surface of the bleach liquor and in constant circulation all the time, this tending to effect a uniform bleach on the goods, a great desideratum.

#### Dyeing of Wool-Silk Fabrics.

These goods may be dyed either on the wince dyebeck or on a jig dyeing machine. The latter insures, perhaps, a more level dyeing and is, by the tension it exerts on the fabric, great preventive of wrinkling, but the writer prefers for these goods the wince dye machine, taking due care to keep them as open as possible by means of suitable batching or guide rails.

In the dyeing of wool and silk fabrics, heat plays an important part in the fixation of the color on the fibre, and in the wince dyebeck the goods are more continuously in the hot liquor than in the case of the jig machine. It is rather important to keep the goods open full width, as that tends to promote levelness of dyeing and the prevention of wrinkling, so it is desirable not to use the old-fashioned half-round dyevats still to be met with in many dyehouses, for these goods.

The means of heating the dyeing machines must be adequate and so that the temperature can be carefully regulated, for changes of heat have some influence on the degree in which the two fibres take up the dye, as will be mentioned presently. These goods may be dyed either in one uniform color or in two colors, that is the silk in one and the wool in another color.

1. **Dyeing Self Colors.**—Generally speaking, the easily leveling acid dyeing colors will be found to give the best results on wool-silk goods, there being added to the bath either Glauber's salt and sulphuric acid, or Glauber's salt and acetic acid, or bisulphate of soda in the usual proportions. It is not easy to lay down hard and fast rules as to the exact conditions of carrying out the work, so much depends upon the dyestuff or dyestuffs used; some can be dyed well on to both the silk and the wool at 180° to 190° F. and as far as possible, such dyes should be used; while others need to be first worked at about 180° F. and then given a short boil, in order to become fixed on the wool. A little practical experience and observation with the particular dyestuffs favored by the dyer will soon show him which way to work. Among acid dyes which have been found to work well, the following may be named: Tropaeoline G. Indian Yellow, Orange Extra, Brilliant Croceine M, Cyanole Extra, Thioearmine R, Indigo Blue N, Fast Acid Green BN, Formyl Violets, Brilliant Orseille C, Acid Magenta, Alzarine Blacks, Anthracite Blacks, Gloria Blacks, Victoria Black B, Fast Red A, Metanil Reds, Cro-

eine Orange G, Fast Yellow G, Brilliant Acid Green 6B, Fast Green Bluish, Fast Light Green, Wool Blues, Azo Acid Violet R, Fast Acid Violet 10B, Victoria Violet 4BS, Acid Violets.

Many of the direct dyes of the Benzo, Diamine, etc., series dye very good level shades on to wool-silk goods from dye-baths which contain Glauber's salt and a little acetic acid. Among such dyes may be named Diamine Rose RD, Diamine Scarlets B and 3B, Diamine Red 5B, Diamine Bordeaux S, Diamine Fast Yellow B, Thioflavine S, Diamine Browns 3G and M, Diamine Catechine G, Diamine Catechine B, Diamine Blues, Diamine Dark Green N, Union Black S, Oxy-Diamine Black N, Diaminogene Congo Orange R, Pluto Orange G, Chloramine Yellow, Chrysophenine, Brilliant Benzo Green N, Benzo Dark Blues, Sulfon Cyanines, Chloramine Violet R, Direct Deep Blacks, Benzo Chrome Browns, Benzo Fast Scarlets, Benzo Rhoduline Red, Delta-purpurine, Geranine.

2. **Dyeing Two-Colored Effects.**—The dyeing of two-colored effects on wool-silk goods is certainly not so easy as dyeing of self colors. The operation depends upon the fact that under some conditions, certain dyes will dye the silk better than the wool, as, for instance, at low temperatures basic colors will go on to the silk very well but not on to the wool, while there are some acid dyes which will dye the wool but not the silk. In some cases, a single bath process may be used, while in others, a two bath process is adopted, dyeing the wool first and the silk last.

The one bath method consists in using a combination of acid and basic dyes in a single bath, along with acetic acid, the basic dye going on mostly to the silk. The goods are entered into the bath at 100° to 110° F., worked for about one-half hour, then the heat is slowly raised to 160° F to dye the silk; finally the heat is raised to the boil to dye the wool. If necessary, the silk may be topped with a basic dye to bring it up to shade; in this case, the bath must be allowed to cool down.

In the two bath process, the wool is first dyed in an acetic acid bath at the boil, and the following dyes leave the silk white under these conditions: Azo Cochineal, Azo Fuchsine, Azo Crimson, Azo Phloxine 2G, Cochineal Scarlet PS, Fast Red NS, Fast Yellow Extra, Naphtol Yellow S, Alizarine Saphirol B, Lanafuchsine, Brilliant Cochineal, Alizarine Lanacyl Blue, Naphtol Black.

After thus dyeing, the silk is dyed with basic colors in a bath at about 100° F. The wool may take up a little of the color. The following colors dye the silk at 80° to 100° F., without staining the wool very materially. Thioflavine T, Amaranth, Acid Green, Methyl Blue, Formyl Violet S4B, Milling Yellow, Brilliant Croceine, Brilliant Cochineal, Alizarine Lanacyl Violet B.—The Dyer and Calico Printer.

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### SULPHUR COLORS ON HOSIERY.

By far the most satisfactory of all the known dyeing processes for hosiery are those based upon the use of the so-called sulphur colors, when carefully and properly applied to the cotton fibre. In the early stages of their introduction there was much diversity of opinion as to the permanence of the black and the strength of the dyed material, but recent results, based upon tests covering several years, demonstrate conclusively that the sulphur blacks yield results that meet every technical and commercial requirement, and it is only a question of time as to when all hosiery-dyeing works will be equipped for this new process. By

the term "new process" we mean the several processes peculiar to the different types of sulphur colors; while each separate type of color is peculiar to itself, yet the broad principle underlying all is exactly the same.

The sulphur blacks have marked affinity for cotton in any form, and when applied to the fibre in a boiling bath, in the presence of the suitable accessory chemicals or salts, the results are remarkable. The color is fast to all influences. When properly washed after dyeing, it does not crock, rub or smut, and when properly dyed with suitable quantities of ingredients in the bath, the color will not fade under any influence, and will resist continued washing to the limit of endurance of the stocking itself. As to the bleeding of the black into adjacent white material, like any other similar color, this is only likely to occur when the washing is not thorough enough.

Some sulphur blacks are dyed in one operation and all completed when lifted from the dye-bath, washed and dried. Others require to be fixed; that is, in order to fix the color on the fibres, it is necessary to subject the dyed materials to the action of certain metallic salts of an oxidizing tendency, the most important being copper sulphate and dichromate of potash. Other salts answering the same purpose have been used in a few instances, but the cheapest and best results are secured with the two above mentioned.

Some sulphur colors require special precautions for dyeing, such as guarding against the action of the atmosphere, by keeping the hosiery totally immersed during the dyeing. Some blacks require the addition of sodium sulphide to the bath; others do not. Again, a few cannot be dyed without the presence of caustic soda. These are mere details and have a chemical bearing upon the process only, while the results may be exactly the same. The one essential point for all sulphur blacks, irrespective of details of making up the baths, is the absolute necessity of boiling during the dyeing operations; unless this is done, the resulting black will not possess the good qualities hoped for.

Hosiery manufacturers, especially those who do not have dyeing plants, should look carefully into the possibility of dyeing their own output with the sulphur blacks, as they will thereby be enabled to materially economize and incidentally reduce the yield of seconds. Hosiery dyed with any of the commercial marks of sulphur blacks, each of which has its own peculiar shade of black, however, will be found to have many excellent qualities, and will be in good condition to be finished in any way desired.

The wearing qualities of sulphur-black dyed hosiery compare favorably with hosiery dyed by the aniline black process, in that heels and toes do not wear out so easily. There is no doubt that the sulphur blacks are the blacks for hosiery of the future. The cost of installing a dyeing plant is much less than for any other process, while the dyeing estimates for equal lots or outputs for a definite time will show a much lower figure, not including known savings on seconds. For hosiery yarns the same points hold good, and as yarn-dyed hosiery is usually of a much higher grade than web-dyed material, the saving will be at once apparent. Yarns dyed with the sulphur colors are, as a rule, much stronger than those dyed with aniline black and consequently the delays are less numerous at the knitters. This effects a material saving in the general expense account of the mill.—Textile Mercury.

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# Textile Design

## PATTERNS IN COMPOUND COLORINGS.

By Roberts Beaumont, M.I. Mech. E., Professor of Textile Industries, Yorkshire College.

(From the Textile Recorder, Manchester.)

A Few Patterns in Compound Colorings.—By many designers, especially those who have not had much experience in pattern origination, the value of intricate orders of coloring, both in the warp and the weft, in the acquirement of novel effects, is not fully appreciated. Ingenuity in this respect frequently results in the construction of novelties not obtainable by any other methods. The weave elements may remain ordinary or be subjected to but slight modification, but such is the complicated character of the scheme of coloring that freshness of style is obtained. This is not necessarily due to the use of much diversity of color, but rather to the system of arranging two or three colors, or may be, two or three kinds of yarn, single and two or more fold in the warp and weft, in the cloth.

Figs. A, B and C are characteristic of the kind of woven design referred to. Fig. A is a check worked out in black and white; but black and grey, black and slate, or two shades of brown or any other two shades of the same hue, or one solid color and the other a twist yarn, might be used. The weave is Design A, but the pattern is a typical suiting check, and is also applicable in appropriate counts of yarn and color contrast to costumes, or even blouse materials. The scheme of manufacture is as follows:

### Face Warp.

		4 threads of 2/48's white worsted.		
4	}	4	"	black "
		4	"	white "
		2	"	black "
		2	"	blue "
4	}	4	"	white "
		4	"	black "
		4	"	white "
		3	"	black "
5	}	1 thread of	"	white "
		1	"	black "
		3 threads of	"	white "
		4	"	black "

### Backing Warp.

2/48's worsted, warped as face; 144 threads per inch.

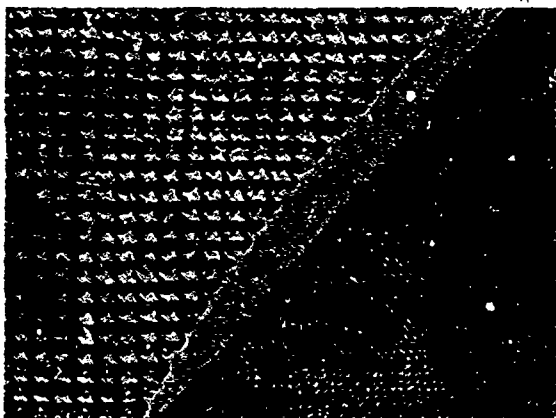


Fig. A

### Weft.

		4 picks of 2/48's white worsted.	
5	}	4	" " black "
		4	" " white "
		2	" " black "
		2	" " blue "
6	}	4	" " white "
		4	" " black "
		3	" " black "
		1	pick of " white "
4	}	1	" " black "
		3	picks of " white "
		4	" " black "
		64 picks per inch.	

Fig. B is a neat striped trousering, also backed in the warp, the weave (Design B) being a simple angled twill on the face. The warping is not so complicated, only occupying seven threads, whilst the design occupies 224. The repeat of the coloring and of the weave or pattern proper is about two inches in size. It has been woven as follows, giving a 17 oz. cloth:

### Face Warp.

2 threads of 3/48's lavender worsted.
1 thread of " grey "
2 threads of " lavender "
2 " " grey "

### Backing Warp.

2/48's worsted, warped as face; 150 threads per inch.

### Weft.

All 2/48's worsted weft; 84 picks per inch.

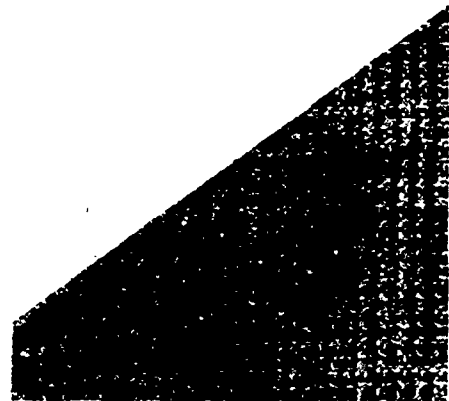
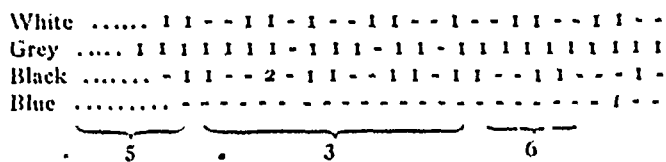


Fig. C

Fig. C is another check style, in this instance woven in the 4-end mat, backed with sateen (Design C). The warping is much more varied, and hence the diversity of detail in the texture. Applying other simple weaves, such as twilled mat, and broken 8-shaft weaves to the coloring, gives even more marked novelty of style. The method of weaving is as below:

### Face Warp

2/48's Worsted.



Backing Warp.

2/28's Worsted.

Black and white.....	6	6	—
Black .....	2	—	1
Blue .....	—	1	—
	—		
	20		

148 threads per inch.

Weft,

Same as warp; 72 picks per inch.

The settings are also interesting. In Fig. A there are more than twice the number of threads as picks; in Fig. B slightly more than half the number of picks as threads; in Fig. C the proportion of threads is higher than the picks on the face, and the weight of the cloth is 21 oz. per yard.



Design A.



7 times.                      7 times.

Design B.



Design C.



TECHNICAL EDUCATION IN BOMBAY.

In 1886 the Government of Lord Reay formulated a scheme for the technical education of Indian students and artisans. The scheme embodied various suggestions regarding the instruction to be imparted and was published in the form of a Government Resolution on September 15th of the same year. With regard to the immediate wants of the city of Bombay, it was pointed out that what was required was a technical institute located in the district where the mills were situated, and near the railway workshops, the instruction to be given being in such sciences as were necessary for the practical requirements of the managers and foremen on the one hand, and of the artisans and skilled operatives on the other. No time was lost in completing the details and within two years, with the active co-operation of the late Mr. N. N. Wadia, Lord Reay was able to establish the Victoria Jubilee Technical Institute, which in point of situation, space and equipment, left nothing to be desired. Work was commenced on September 1st, 1888, with the full complement of students, the course of instruction (which extended to three years) comprising mechanical

engineering and cotton manufacture with lectures and laboratory practice in physics, including sound, light, heat, electricity and magnetism.

This programme was evidently fixed upon in order that the students on passing out might find employment in the large number of ginning and pressing factories and cotton mills which were till then depending upon European supervisors and workshop-trained mechanics and foremen. The commencement was made under very encouraging circumstances, at least as regards the rush of boys for admission, and all seemed to go on as well as could be desired for a year or two, when the attendance of students began to fall off and it became evident that there was something wanting in the material that the teachers had to deal with, and the instruction that was being imparted. At any rate, the first three years' course was completed, and the students went through the final examinations with the result that ninety-one passed out through the engineering department, and eighteen from the textile section.

These results were considered satisfactory in themselves, but then came the anxious moment—would the boys be able to secure the employment for which they were trained? In this connection it will be appropriate to quote the concluding portions of the speech delivered by Lord Harris, who made the first presentation of awards to the successful students in January, 1892. While fully appreciating the work done by the principal and his staff, His Excellency remarked: "We must sincerely hope too, that that most important corollary to education such as this, namely, the employment at which they have been aiming may be found very speedily by the young men who have crossed this platform to-day, and that that employment may turn up at once and with lucrative terms. I am sure that if these young men find that there is employment waiting outside the walls of this Institute for them, and certainly our experience with regard to the Veterinary College has been that as the supply has been created, the demand has grown up, we may be perfectly certain the success of this Institute is assured. This is undoubtedly an anxious moment. We have got to see the practical results of these four years of labor and hard work. We believe from the reports of the examiners and from the care we know their instructors have given them, that these young men are worthy of employment. Now the anxious question is, is that employment waiting for them, and if it is, we hope and may fairly hope that it is, we may be perfectly certain that the demand for education of this kind will increase."

We will see, as we proceed, that the employment to which His Lordship referred, was waiting for the students in abundance, but unfortunately, with few exceptions, they did not prove worthy of it, and the Institute since then has not been able to turn out either the requisite quantity of students to meet the requirements of factory owners and other employers of skillful labor.

During the sixteen years that have elapsed since the establishment of the Institute, there has been a marvellous growth in the staple industry of India. Numerous new factories have been started, so that the field for the students of the College has been admittedly a very large one. We will first examine the extent of this industrial development, and then see what the Institute has been able to accomplish to meet the demand.

When the College was started in 1888, there were in all India 114 cotton mills, containing 2,488,850 spindles, 19,496 looms and employing 82,380 hands. Within three years, i.e., in 1901, when the first batch of students passed out, 20 more mills were added to the list. The next five years

continued similarly active; mills began to spring up in rapid succession, warranted by the demand for locally made yarn, so that by 1896 we had an increase of 41 mills. Bringing up the figures of this remarkable growth to the year 1903, we had 192 mills, containing 5,043,300 spindles, 44,090 looms, and employing 181,400 hands. Thus the actual increase in the number of spinning and weaving factories since the establishment of the Institute to 1903, works out to 78 new mills with 2,554,000 additional spindles and 24,600 additional looms. This increase in the spinning power of the country must necessarily insure a corresponding increase in the number of ginning and pressing factories and workshops, whose owners should be prepared to receive the passed students of the College. Taking the cotton spinning and weaving mills alone, the additional 78 factories found employment for nearly 100,000 hands, with the necessary superintending staff, including managers, engineers, carders, spinners, weavers and their assistants, while the additional ginning and pressing factories and workshops required a proportionate number of extra engineers and mechanics.

It will be interesting now to know what the Victoria Jubilee Technical Institute has been able to accomplish side by side with this remarkable growth of the cotton industry.

We will first examine the working of the Ripon Textile school, which has been established to meet the demand of the spinning and weaving mills for skilled supervisors. In 1891, when the first three years' course in cotton manufacture was completed, 18 students gained the Full Technological Certificates and passed out, to be followed, as may be expected, by a larger number each successive year to cope with the extra demand created by the increasing number of factories. There was, however, a distinct falling off the very next year, which turned out only four successful students, and this discouraging situation continued down to 1903—a period of thirteen years, during which the annual average of passed students did not exceed seven. In a similar way, from the Engineering Department of the Institute, in 1891, the first batch consisted of 91 successful students, and this number also dropped the second year, when only 22 passed out, this low average being maintained throughout the 13 years which followed.

Thus, during a period of great activity, while factories continued to increase all over the country with a corresponding demand for good and efficient hands, we have to record an average annual contribution by the Institute of only 23 engineers and 7 cotton masters, or a total of 32 certified young men from the commencement to 1903. During the same period the ginning factories, presses and cotton mills alone required the services of over 5,000 engineers, managers, mechanics, and other overlookers.

The College has so far turned out 92 students from the Ripon Textile School and 290 from the Engineering Department, and it has been stated by the Institute authorities that the average salary earned by the former comes to Rs. 100, and that earned by the latter to Rs. 80 per month. On the other hand, complaints have been made that a large proportion of the students has not been able to find employment, and as regards wages, the experience of many students has been disappointing. Doubts are being expressed in some quarters as to the prospects of the students, which do not prove as rosy as has been represented. We will, however, accept the official figures as correct, and see at what cost this technical instruction is being imparted.

In the year 1902-3 the Institute spent Rs. 46,600 upon the salary of the Principal, his staff and assistants, while the cost of the working of the plant and sundry other

expenses came to Rs. 17,800—making a total of a little over Rs. 64,400. If we add to this the scholarships and free studentships, the total expenditure during the year would come to nearly Rs. 70,000. Against this, the Institute turned out 23 engineers and 6 textile men with the prospect of earning a monthly salary of Rs. 80 and Rs. 100 respectively! It must be remembered that these 29 young men are not going to (nor are they intended to) develop the industrial resources of the country. They are sent out under the auspices of a kind Government to struggle and find out as best they can posts in a ginning or a pressing factory, or in a workshop, or perhaps in a cotton mill; and in order that they may earn a living among surroundings where more than half their college education will be forgotten or prove useless, we are keeping up the show of a technical institute at an annual cost of Rs. 70,000. I dare say that these 29 men would have been in a position, if trained in a mill or a factory, to earn the same wages, and more, without their education costing three-quarters of a lakh of rupees to the city. The average native mill jobber earns from Rs. 70 to 80 a month; and besides him there are hundreds and hundreds of mechanics, engineers and overlookers who earn these wages without ever being in a technical college.

For sixteen years we have had a well equipped Technical Institute with as many students as it could hold; we have spent annually more than Rs. 45,000 on the staff, and yet the management and supervision of our innumerable mills and factories continues to be entrusted, with but few exceptions, either to the more efficient Lancashire man or to the practically trained local mechanic and spinner.

The Honorary Secretary, Mr. N. N. Wadia, realized the situation as far back as 1895, and forwarded a statement to the Board pointing out that there was a considerable falling off in the attendance of students and the large sum (amounting to Rs. 50,000) expended yearly on the staff was out of all proportion to the work done. The Principal, Mr. J. P. Phythian, was asked to submit a report on the subject, and this was subsequently handed to a special committee for investigation and suggestions. About this time, however, action was suspended on account of the death of Mr. Phythian, which took place in July, 1896, and the Institute suffered a still heavier loss in the death of Mr. Wadia, the originator of the College, which occurred two years later.

Mr. Phythian was succeeded to the post in 1896 by the present Principal, Mr. Hugh Monie, who was employed as Cotton Master at the Institute, and who had, on a previous occasion, acted for Mr. Phythian during his temporary absence.

The progress of the Institute since this period may be described in the words of the Hon. Mr. S. Rebsch, who on the occasion of the distribution of awards to the successful students on March 23rd, 1904, gave a brief history of the Institute since its commencement, and referred to the work done by Mr. Monie as under:

"In 1896 there was a sort of stock-taking, which resulted in a thorough revision, under the direction of the present Principal, of the courses and system of work with the view of making it more practical and more acceptable to the employers of skilled labor than it had been before. Another outcome of the revision was the introduction of a series of popular lectures by the Principal and professors on the subjects of general interest not specially dealt with in their ordinary lectures. Several additions were subsequently made to the scope of the work, including metal working, enamelling and electrical engineering."

The outlay of these reforms amounte' to more than a half a lakh of rupees, not counting the additional annual expenditure, while the results stand as under,—total of successful students during six years previous to these reforms amounted to 224; total of successful students during the six years following when "the courses and system of work were made more practical and more acceptable to the employers of labor," amounted to 131.

On account of these dismal results the series of popular lectures had to be discontinued, Sheet Metal Stamping, the plant for which cost Rs. 45,000, was declared by the Board to be an unsatisfactory undertaking, while the Enamelling Department proved a failure from the very commencement.

During its sixteen years' existence the Institute has admitted in all over 2,600 students; of these only fourteen per cent. (or a total of 382) have been able to get through the examinations, while their education has cost us over ten lakhs of rupees. Are we justified in continuing to spend this large amount and carry on the work on the present lines?

We must not forget the warning Lord Reay gave at the opening of the Institute, vis.: "I think the only way in which Technical Education in India will prosper is to place such institutions under the guardianship of men who know the wants of the community and who are able to deal with these wants from close personal knowledge."

There is need for a Technical School in Bombay, but it must be differently managed.—Ex-Student in *The Indian Textile Journal*.

Note.—A lakh of rupees is Rs. 100,000, or about \$33,000.



## MOHAIR MANUFACTURES.

There is biblical authority for the statement that mohair was used in the days of Abraham, and it can hardly be doubted that in some countries (latterly in Turkey in Asia) it has been in use continuously since that time, else the Angora goat, in all probability would have become extinct. While mohair has been used to the full extent of its production since the English and French weavers learned of its worth—probably fifty years ago, when they purchased the entire Turkish clip, thus stopping all manufacture there—it has never become generally familiar to the people who have consumed the manufactured goods. It can only be conjectured why the people have thus been kept in ignorance. The reason probably is that the manufacturers have been fearful that the widespread prejudice against the goat would result in business disaster. And so, while mohair has been readily consumed by manufacturers, it has gone into goods that in name never suggested a sentiment of goat-hair. Thus we have cashmere shawls, alpaca shawls, camel's-hair goods, tibet furs, tibet boas, Astrachan, brilliantines, zibelines, etc., all good goods yet imitations of the real things; but it is true that the mohair from which these imitations are made is in many ways superior to the materials imitated, and in no particular inferior to them.

One of the most striking features of mohair goods is the lustre, which very much resembles silk. This lustre is not the result of manipulation, as many people suppose, but is a characteristic of the fleece as it grows upon the animal. There are some fleeces, it is true, that lack this lustre, but they are produced from sick animals or those that are in very poor condition; such fleeces are not numerous. This lustre is ever present in all processes of manufacture, and there is no method which will destroy it, even

if it were desirable to do so, and it continues during the life of the goods into which it enters. It is a very desirable characteristic.

Another feature of mohair of no less importance than lustre—possibly of more value—is its remarkable durability, which exceeds that of any other fibre. The statement is frequently made, and with much truth, that no one ever saw a worn-out piece of mohair cloth. This feature of durability, therefore, makes the use of mohair economical, even though the original price may appear to be high.

It is a difficult matter to name the various uses of mohair at this time, but it would be far more difficult to undertake to forecast the future of its uses, since it is suitable for so many articles in its pure state and may become a component part of so many others. The ways for using it are now limited only by the lack of supply.

The largest use for this fibre is in the manufacture of plushes for railway coaches and furniture. Only a few people are aware that when they ride in a sleeping-car parlor-car, chair-car, or day-coach, they rest upon the hair of the Angora goat. There was a time when a few of the sleeping-cars were furnished with wool-plush, but this did not prove satisfactory because, it lacked lustre to a large degree and also durability. One can imagine what the demand for mohair is when he thinks of the large number of cars that are constantly required. The fact is, that during last year, the plush mills of New England have been compelled to use all their supply for plush. One of these mills has been running sixty looms on plush alone.

For the manufacture of plush, a good quality of hair of long staple is required; but the mills receive a large amount of hair that is not suitable for this purpose, and this must be consumed in other ways. This reference is to the noils, which consist of short mohair and kemp; at this time a large percentage of noils is taken from the fleeces. Until recently these noils were mixed with wool and went into the manufacture of horse-blankets; but during the past two years it has been combined with wool and made into zibeline dress goods. These goods have been so popular that the mills have been unable to supply the demand for them, and next year will probably see this demand continued. These noils have also been used to a large extent in the manufacture of ladies' and girls' hats. Wool has entered largely into both the zibelines and the hats, as it was required to give the felting quality, for mohair will not felt.

The ever popular brilliantine dress goods may be either entirely of mohair or a mixture of mohair and wool. Mohair is largely used in combination with silk and the effect is strikingly beautiful. The artistic effects that may be produced with mohair are best seen in the rugs, couch-covers, sofa-pillow covers, carriage-ropes, etc.

No further attempt will be made here to name the kinds of goods that wholly or partially consist of mohair, but attention should be directed to the matter of coloring. No other fibre takes a fixed dye so well as mohair does. The dyes, no matter what the color may be, add to the lustre, and no amount of sunlight or dampness will fade it in the least.—George Fayette Thompson, in *Textile-American*.



## RAMIE.

A correspondent of the *Pall Mall Gazette* states that a Rochdale engineer named Tickel, with the assistance of a local silk weaver named Shore, claims to have conquered

the difficulties connected with the manufacture of textile fabrics from the Indian wild grass known as ramie. A Manchester company has, the correspondent says, paid £20,000 for the secret. The Textile Fabric Company, as the new combination is named, will establish its first mill in Rochdale, and intends to commence work on a large scale. Mr. Tickel, who will manage the new works, contends that he can deal with either cultivated or uncultivated ramie in such a manner as to leave the fibre absolutely pure and undamaged and ready for spinning. Of late years much has been heard about the use of ramie for manufacturing purposes, and many experiments have been made with a view to demonstrating its utility. The great difficulty has been the gummy nature of the plant which contained the fibre. How to separate the two constituents without injuring the quality of the fibre was the rock upon which most of the experiments were wrecked.

Ramie is a wild grass of the nettle species, which flourishes particularly in tropical countries. In India, for instance, there are great tracts of this grass, and the Indian Government has offered £5,000 to anyone who will perfect a process whereby it can be made suitable for industrial purposes. Some years ago a company was started to operate several mills for the manufacture of ramie in this country. Sir Augustus Harris and other well-known theatrical people were among the shareholders. The principal centre was in Rochdale, where the Sudden silk mills were taken. Great expectations were entertained as to the success of the enterprise, but it failed, owing to the practical difficulties above mentioned. The man who claims to have discovered a simple and inexpensive way of extracting the gum without injuring the fabric is Mr. James Tickel, of Falinge Park Lodge, Rochdale. Mr. Tickel is, and has been for some time, engineer for Messrs. Davey, Kenyon & Co., bleachers, dyers, raisers, etc., of Holmes Mill, Spotland Bridge. For the last two and a half years, assisted by Mr. Albert Shore, a silk operative of Brownhill House, he has been experimenting with ramie fibre, and after many disappointments and set-backs has evolved the idea which promises to revolutionize the industry.

He says he can deal with either cultivated or uncultivated ramie in such a manner as to leave the fibre absolutely pure and undamaged and ready for spinning. There is also little or no waste, an important consideration when it is remembered that in Germany, where extensive experiments have been conducted, the waste amounted to about 60 per cent, and so increased the cost of production as to make it too expensive for ordinary purposes. Mr. Tickel also avers that the by-product obtained in his process is likely to prove a valuable asset. A Manchester syndicate has lost no time in examining the merits of the new discovery, with the result that they have bought Mr. Tickel's secret and intend to develop it. A company has been incorporated, and he leaves his present employment, having been appointed manager for the new company. The discovery is being protected in the United States of America and on the Continent. Rochdale Observer.



Charles G. Taylor, formerly boss dyer for the Mattewan Manufacturing Company, Mattewan, N.Y., is now superintendent for the Perth Woolen Company, Perth, Ont., manufacturers of shoe felts, padding, and felts of all kinds. It is the intention of the management of the mills to add new lines of goods, and the services of a man of such experience as Mr. Taylor were necessary.

## 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.

H. Baker & Co.'s shoddy mill in Stratford started again about July 1st.

The sale of the Empire Carpet Company's plant was held August 4th, but no bid was made.

The Dominion Linen Mills, Limited, is making good progress in equipping their plant in Bracebridge.

The Ontario mill at Hamilton, has changed from steam to electric power. The mill is running full time.

William Owens has left the woolen mill at Streetsville to go to Sherbrooke, Que., as second hand of carding.

The Gibson Cotton Mills, Maryville, N.B., have shut down for a month. The mills employ about 700 hands.

The St. Croix Cotton Mill, Milltown, N.B., is running half time. It runs full time for two weeks and then closes down two weeks.

The Ontario Felt Company, Dundas, are adding more cards. When the installation is complete their plant will be thoroughly up-to-date.

The Canadian and Stormont Mills, the two big factories of the Colored Cotton Goods Company, which had been closed down for two weeks, have resumed operations and are now running full time.

The Breese woolen mills and saw mills at Forest Mills, were totally destroyed by fire on July 22nd. No insurance was carried on either stock or building. Loss about five or six thousand dollars.

J. J. Hodgson's woolen mill, Hudson, Que., was destroyed by fire on July 29th. With great difficulty the fire was prevented from spreading to adjoining buildings. Loss about \$10,000, partly covered by insurance. An overheated pulley is supposed to have caused the fire.

The Union Hat Works, Brockville, lately carried on by Saulnier & Decelles, went into liquidation, and were recently purchased by the Walthausen Hat Corporation, of South Norwalk, Conn. The Walthausen works in Norwalk were destroyed by fire about two months ago. The Brockville works are expected to be running in the course of a few days, and will probably be enlarged later. L. R. Bouton has charge of the works.

The Cornwall and York Cotton Mills, St. John, N.B., are running steadily. They make ticking, denim, cottonade, shirting, light cotton dress goods (figured and plain), besides various lines of flannelettes and blankets. The mills have been running steadily since the present company took them over, and new machinery has been, and is at present being installed in all departments. Orders are coming in regularly and the prospects are bright for the winter.

The Canadian Colored Cotton Mills Co. have purchased the property of the Cornwall Manufacturing Co., formerly operated as a woolen mill, and have made an agreement with the town of Cornwall to equip it as a cotton mill, and to employ at least 150 hands, paying \$50,000 annually in wages. The town is to exempt the property for ten years and give a fixed assessment of \$50,000 for school taxes. A by-law ratifying the agreement was voted on, and carried, on August 6th.

Mr. Syer, of the Canadian Carpet Company, Milton, has bought the pad manufacturing business of W. S. Morgan, Hamilton, and will remove the plant to Milton as soon as a suitable building can be obtained.

The Waterloo Woolen Mills have closed down. It will take the new company some time to commence business but it is hoped that the mills will be running to their full capacity by the beginning of November.

The Canada Linen Works, Limited, E. J. H. Pauley, president, arranged to locate in Orillia, but when the break-down occurred in the power dam, matters came to a stand-still pending the repairs of the break. Now that the steam plant is in operation the town has notified the company that power can be supplied, and has received the reply, that if Orillia residents will invest \$25,000 or \$30,000 in the business, the company will locate there. The company has several offers from other towns.

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BYWAYS OF LABOR.

Rev. J. E. W. Ditchfield, of London, has organized an industrial exhibition, illustrating the trades and handicrafts of Bethnal Green, where the people make anything from a match box to a motor car. Among the articles on show were: Rich silks and brocades, still woven there by the descendants of Huguenot refugees. The wonderful crimson and purple velvet which composed the coronation robes of the King and Queen was made in a little room in a mean little street of Bethnal Green; ladies' blouses, tucked and trimmed with lace insertion, were there—they are paid for at 2s. 1/4d. each, and shirts for which makers receive 1 1/4d. each were shown; frilled paper hats, paper flowers for which the makers get 3d. a dozen.

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INFLAMMABILITY OF WOOL.

Being animal matter, it is claimed by some that spontaneous combustion cannot occur in wool.

In this connection, a case which recently occupied the attention of a Kansas court is of decided interest as affecting the liability of insurance companies where wool is destroyed or damaged. The case referred to was a suit brought by the Western Woolen Mill Company against the Sun Insurance Company, which was tried in Topeka. The suit was to recover \$1,000 insurance: the loss of wool which was in the warehouse of the plaintiff at the time of the flood last year, and which the plaintiff alleged was destroyed by spontaneous combustion, caused by the water soaking the wool. There were four other insurance companies which were interested in the wool to the amount of \$1,000 each, and the outcome of the case in which the Sun Insurance Company was interested was to decide them all. The insurance company took the ground that spontaneous combustion could not occur in wool for the reason stated. They also claimed that there was no fire in the wool, and that they insured against fire and not against decomposition, which was what resulted from the water getting into the wool. Several chemists, of course, were called to testify in the case, but from their testimony it would be hard to determine whether the wool was on fire or simply became so hot that it charred. The wool introduced in evidence and the strings binding it had evidently become so hot that the string had charred, but there was no evidence to show that there had been a flame. The expert witnesses were asked if there could be a fire without a flame, and there was

a difference of opinion on this point. One of these witnesses stated that he would say there was a fire when he saw the flame, but the wool might be smoking and it might smell as though it was burning, and still not be on fire. Testimony from an expert chemist in Kansas City was to the same effect. It was brought out in the trial that nitro-glycerine and wool both contained the ingredients necessary to cause spontaneous combustion, and the experts held that there certainly would be fire when nitro-glycerine exploded. When the room in which the wool was stored was entered there was smoke in the room, and the smell of burning wool was strong. The case was decided in favor of the Western Woolen Mill Company, and the court overruled the motion of the Sun Insurance Company for a new trial.

It is difficult to destroy wool by fire, but it will take fire under proper conditions. Wool can be destroyed by fire, even if it does not burn. It may become so heated that it will become incinerated; by being soaked it will become so hot that it will melt away. A Boston wool merchant had a lot of California wool stored where the bottom of it had become saturated by an exceptionally high tide forcing the water into the warehouse. That part of the wool which was wet was removed and stored in a pile by itself. Not long afterward the owner of the wool found this pile so hot that it was being destroyed rapidly, although there was no flame, but there was combustion. Another party mentions a case of several thousand pounds of wool being stered in a room on the ground floor of a mill. In this portion of the building the shingles had become loosened so that the water in several places had dripped down into the wool. One of the men connected with the concern went into the room and smelled fire. Nothing could be discovered, however. Later, he went in there again, and the smell was stronger than ever. He again investigated, and found that in those places where the wetting had occurred the heat was so intense that the wool was being rapidly destroyed or incinerated. No flame was discernible, however, but that the wool was being thoroughly consumed there could be no question. If oxygen had been introduced there would doubtless have been some flame; but fire does not depend upon oxygen; flame does, however.—American Wool and Cotton Reporter.

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BRITISH EXPORTS TO CANADA.

The following table gives the value in sterling money of the British exports to Canada for the month of June this year and last year, and also for the first six months of each year:

	June.		Six Mos. to June.	
	1903.	1904.	1903.	1904.
Wool .....	£ 6,324	£ 1,066	£ 19,953	£ 16,993
Cotton piece-goods..	49,320	68,923	418,240	472,736
Woolen tissues ...	44,554	72,085	264,614	364,992
Worsted tissues ...	71,796	97,744	479,541	502,411
Carpets .....	14,153	15,611	193,557	188,608
Haberdashery .....	21,730	10,637	141,814	180,699
Jute piece-goods ...	19,834	23,988	108,176	114,249
Linen piece-goods...	13,417	22,911	102,182	116,166
Silk, lace .....	499	70	5,047	2,310
Silk, articles partly of .....	5,715	8,923	36,229	34,217
Apparel .....	21,117	23,575	178,970	169,893

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The annual clip of Australian wool has grown in forty years from 8,000,000 to 700,000,000 pounds.

**"WATCH CANADA."**

Under the above heading, the following recently appeared in The Irish Textile Journal, introducing an article on Canada's Resources and Prospects.

It is a long time now since we first drew attention to the wonderful strides that are being made by Canada, and we have over and over again urged shippers to pay special attention to the requirements of the Dominion. Its import trade, measured in pounds, shillings, and pence, is no doubt a mere bagatelle when compared with that of the States, for example; but we firmly believe that before another twenty or twenty-five years roll past it will be a toss up as to which is our best customer. The natural resources of Canada cannot be overestimated, agriculture and mining are at the present time only in short skirts, while as for manufacturing industries, they are only in swaddling clothes. Now is the time to cultivate a trade connection that hereafter will bear abundant fruit. Orders at present may not be large, they may not leave a fat profit; but assuredly they will form the foundation of a huge business in the near future.

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**NOBING MOTION FOR MULES.**

There is much waste when the mule cop is unwound, if the noses of the cops are not firmly wound and are spongy or soft. The most crucial point in the formation of the nose of the cop is when the carriage is completing its inward run and during the unlocking of the fallers. It is important that the yarn at this moment shall be controlled in a proper manner so that the effective winding may take place to the finish of the chase. There has been devised in England, by one of the leading machine shops of that country, a mechanism for controlling the winding so that the spindles receive a slow speed during the time the winder faller is rising. To accomplish this, a special arrangement of driving is employed in which two fast and two loose pulleys of different widths, mounted on the rim shaft, are brought into play, having separate strap guiders, and corresponding drums on the counter shaft. The mule is driven by the broad belt during the time it is making its outward run, the other fast pulley being employed to operate the new slow motion.—Textile American.

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**WATERPROOFING COMPOSITION.**

A composition suitable for treating calico for making what is known as oilclothing has recently been the subject of a patent. It is made up of 1½ gal. of boiled linseed oil, ½ gal. of castor oil, 2 oz. of sulphur, and 2 lb. of dryers used by painters. The ingredients are mixed together in a suitable vessel and boiled for from three to five minutes. The mixture is then allowed to cool slightly and a first coat of the composition applied to the material. This is then hung until dry, and if necessary is rubbed down with pumice to remove any roughness in the fibres of the material which may have worked up in the application of the composition, the object being to give the material when finished a smooth surface. A second coating of the composition is then applied in the same manner as the first, and the material again hung to dry, when a third coating of the composition is applied in the same manner as the first and second, and the material again hung up to dry, when it is ready for use. The proportions of the ingredients should vary according to the nature of the material used, and

the result desired to be obtained. For instance, the ingredient sulphur has the effect of stiffening the material, and therefore, if the waterproof material is to be extremely soft and flexible, the proportion of sulphur in the composition can be reduced to ¼ oz. Upon the other hand, if the waterproof material is desired to be stiff, the proportion of sulphur may be increased up to 3 oz. The castor oil in the composition has the effect of making the resulting material elastic and springy, and prevents the surfaces of the material from sticking together or cracking. The proportion stated (½ gal.) is found the best in practice, but it may be used in the proportion of from 1-6 to ¼ gal. If, however, more than ¼ gal. of castor oil is used (the quantities of the other ingredients remaining as above set forth) difficulty is experienced in drying the composition. The dryers in the composition can be reduced to 1 lb. or increased to 3 lb., the time occupied in drying depending to a very great extent upon the proportionate amount of dryers used. The proportion first mentioned gives the best results.—Textile Excelsior.

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**PERSONAL.**

J. L. Cockill, formerly manager of the Mississippi Woolen Mills, Appleton, Ont., is now in Liversedge, Yorkshire, in the leather business.

Mr. Larner, overseer of spinning in the St. Croix Cotton Mill, Milltown, N.B., has resigned, and is going to Augusta, Me., to work for the Edwards Company. No successor has yet been appointed.

W. A. Macdonald, who has been in the Western States for a few months, has returned to accept a position with the Canadian Colored Cotton Mills Co. as assistant superintendent of their mill at St. Croix, N.B.

Bennett Rosamond, M.P., president of the Rosamond Woolen Company, at Almonte, intends to retire from politics at the close of the present Parliament. A large and enthusiastic picnic was recently held in Almonte in the nature of a farewell.

Henry Kribs, chief engineer at the R. Forbes Company's Woolen Mills, at Hespeler, met with a fatal accident on July 25th. He was up on a ladder caulking a leaking elbow in the six-inch feed pipe which conveys steam from the boiler to the engine, when the elbow blew off. The steam at 120 pounds pressure struck Kribs in the chest, knocking him off the ladder and scalding him so seriously that he died three days later. A brother of Mr. Kribs was killed in the same mill a year ago. Deceased is a brother of W. A. Kribs, M.P.P.

Fred. W. Angus has taken over the agencies represented by the late W. M. Angus, and will carry on the business as heretofore under the firm name of W. M. Angus & Company, at 28-30 Wellington street West, Toronto. The firm represents Wm. Thoburn, Almonte, Ont.; Adam Lomas & Son, Sherbrooke, Que.; Magog Woolen Mills, Sherbrooke, Que.; Dufton & Sons, Stratford, Ont.; Charbonneau & Montfort, Galetta, Ont.; Waterhouse & Bradbury, Ingersoll, Ont.; J. G. Field, Tavistock, Ont.; Peter Purvis, Teeswater, Ont.; Logan Bros., Renfrew, Ont.; Dontigny & Hughton, Arnprior, Ont.; James McLean, Pembroke, Ont.; Blankeney Woolen Mills, Blankeney, Ont.

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—The jacquard machine was introduced into England about 1818 and came into general use from 1824 to 1832. It was introduced into Scotland in 1824.

## BRITISH TEXTILE CENTRES.

## Huddersfield.

The market has been almost without feature. Miscellaneous orders have been placed for summer goods of various descriptions, and a few repeats have reached the makers. A tendency in favor of checks was noted, which may lead ultimately to the displacement of the striped designs which have been so long in favor. Fine and fancy medium worsted cloths were not bought extensively, but tweeds of the Colne Valley type were sold fairly well. Manufacturers in that valley are fully occupied on orders, and a number of mills are being run night and day. The Canadian trade has recovered from the recent back-set, and South Africa is improving, while Australia maintains its satisfactory position. Less business is done with the Continent, but slightly more with the United States. Wools command advanced rates, but there is little business.

## Kidderminster.

Business has been slow, but not unusually so. Wholesale and shipping orders are providing work for a good many looms, but a number of others are only trying patterns. The yarn trade is again hardened by the London and country wool sales that have recently taken place. These point to still higher prices of yarn in the immediate future, but buying at present is done sparingly, and only to cover urgent wants.

## Leeds.

The depression in the staple textile trade has not been felt so acutely at this time of the year for several years past. New business is particularly difficult to obtain, and, except for the foreign orders which have recently arrived, many mills would be at a standstill. In those mills where business is chiefly done with the ready-made clothing houses looms are standing idle. For some time past manufacturers' travellers have been showing patterns for next spring, but so far very few confirmation orders have been received. Since the rush at Whitsuntide wholesale clothiers have been practically without orders, and their workpeople have largely been employed in making sample garments. Houses with bespoke departments have been better situated. The only goods which can be said to be in tolerably good demand are low-class makes. Manufacturers of these varieties have been busy, and in some instances orders for immediate delivery have had to be refused. With regard to the shipping trade, South Africa, though showing signs of improvement, is of little assistance to home woollen manufacturers. There is practically no new business with Australia, and Canada is quiet. A later report says.

Business generally in this market has improved, more particularly in the retail department, which has benefited largely through the fine weather. The home demand is chiefly for costume cloths and tweeds, and for medium and merchants' goods, while for suitings, twist effects in distinct styles are in fair request. In the worsted branches manufacturers are buying crossbred wools and yarns with great caution, and high priced wools are very difficult of sale. For tweeds and low fancies, in the production of which wool does not play an important part, there is a good demand, and several firms are decidedly busy, both on shipping and home account. Trade with Canada and with South Africa is expanding somewhat, but Australia is exceedingly quiet.

## Leicester.

The yarn market is improving, but trade is checked by unremunerative rates.

Hosiery is firm and stocks are being cleared. Autumn orders are coming forward with more freedom.

## Rochdale.

At Monday's flannel market the turnover was somewhat below the average, and manufacturers have now no hope of relief before the September sales. It is probable that, rather than stock goods, they will continue to curtail production. The outlook has not for a long time past been so unsatisfactory as at present.

## Kirkcaldy.

Linoleum and floorcloth manufacturers continue well employed, a good demand existing for certain descriptions of cloth.

Linen manufacturers in the town and generally throughout Fife are only doing a limited business, the price of the raw material and the general depression restricting the output. It is doubtful now if there will be any marked improvement until some time after the usual holiday period. A later report says there is a slight improvement in the linen trade of the district.

## Belfast.

Demand in all branches of the trade continues quiet, but fairly steady, and the dull season is passing over tolerably well. The flax crop should benefit by recent showers, as in some quarters it was getting rather stunted. The spinning end shows little change, demand is limited to sorting-up parcels, but producers are more or less independent of additional business at the moment. Prices are unchanged. In the manufacturing branch there is nothing of any importance doing. White goods for the home markets are slightly better, and the tendency is towards improvement. Shipping trade is quotably unaltered, though more is doing with Cuba and the colonies.

The Flax Supply Association, in their June circular, say The imports of flax show a decrease in quantities of 46.5 per cent, and of tow 48.4 per cent. From Russia alone the decrease is 59.9 per cent. in flax, and 53.7 per cent. in tow in quantities. Linen yarn imports exhibit a decrease of 7.6 per cent. and 1.9 per cent. in quantity and value respectively. The exports of linen yarn also show a decrease of 3.8 per cent. in the totals, but there are increases to the following countries: Germany 11.0 per cent. and Italy 319.3 per cent. The decrease to Holland is 28.5 per cent., and to Spain 32.6 per cent. Linen piece goods are slightly improved. The leading countries stand as follows. Increases. British East Indies, 23.2 per cent.; Germany, 35.8 per cent.; Australasia, 43.5 per cent., and Canada, 59.0 per cent. Decreases. United States, 3.8 per cent., Foreign West Indies, 16.8 per cent., and France, 50.1 per cent.

## Manchester.

Demand for home-trade American yarns has reached only moderate dimensions, holidays in certain weaving districts being partly responsible therefor. Spinners have not pressed sales to any marked extent, though here and there a tendency towards that sort of thing is noticeable. Some producers are said to be finding difficulty in moving their output, more especially in the coarser counts. Users as a body continue to operate quietly, though some very fair transactions have been noted in a few cases, both for early and later delivery. Occasionally manufacturers have come into the market with "covering" orders of not unimportant weight. In export yarns the demand is still meagre.



Numerous offers at low figures are about, but in many instances operators are quite too far apart for trade. Still, some sellers report more business, both for the Continent and India, as well as for China. Egyptian yarns are quiet and steady, without feature calling for particular remark. The supply of combed descriptions is the reverse of scarce.

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#### THE ANTI-DUMPING CLAUSE.

On this subject the New York Evening Post says editorially: The Canadian Finance Minister will have a better knowledge of Yankee ingenuity after he has experimented a while with his anti dumping policy. He says he will not let our goods be sold across the border for less than their market price in this country, but the Canadian manufacturers have not in the least ceased worrying over the situation. They have got wind of the fact that American firms are preparing to send their surplus goods into the Dominion at regular market invoices, and to employ salaried dealers there to sell them at slaughter prices. An Ottawa wholesale merchant, for instance, has just received four circular letters from manufacturers in the United States who intimate that they will invoice goods into Canada at our prices and pay him for handling them a salary equal to the return obtained by American dealers. If German or British manufacturers should attempt to get their goods into the United States in such ways as this, we should regard it as a dirty trick. But in the present case it is only an evidence of legitimate enterprise and national shrewdness.

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#### SPIDER WEB FABRIC.

If it were possible to make the same use of the web of the spider as we do of that of the silk worm, the worm would find a formidable rival in the spider. This would result not only from the novelty of the new fabric, but from the beautiful fabric the web would produce. Science, which has done so much for trade and human progress generally, may find an easy process to utilize the web. Indeed, some success has already been achieved in this direction, but the product can scarcely be said to have, as yet, a commercial value. The silk produced from a spider's web is described as more beautiful than the ordinary silk, and possesses a strange, glowing old-gold lustre in its natural state. Under the microscope the threads look more like fine gold wires than fibres. The price of the thread is still too high for use except by the very wealthy. While it may be possible to obtain the silk from the web of any spider, that used so far has been confined to the large Madagascar spider. A thread of 3,000 yards has been obtained. The discovery which led to the invention is due to a Catholic missionary in Madagascar, who made a little machine like a straight jacket for holding the spider while the precious thread or web is drawn from its glands. After this operation the spider is let loose, to be fed and cared for till the operation can be repeated.—Dry Goods Record.

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#### THE BRITISH SILK ASSOCIATION.

The British Silk Association recently visited the Bradford Exhibition as the guests of Lord Masham, the largest spun silk manufacturer in the United Kingdom. Bradford is now largely using silk in conjunction with worsted, which fact accounts for the visit of the Silk Association to the

centre of the worsted industry. Lord Masham made many early achievements as a worsted manufacturer and in connection with wool-combing machinery, but his great work has been his inventions for the utilization of silk waste. While other manufacturers occupied themselves solely in making silk from the cocoon, Lord Masham spent about £350,000 in experimental work, the success of which is said to effect one of the most wonderful economies of the present day.

At the luncheon tendered to the Silk Association, J. Boden, of Manchester, offered an explanation of the bad state in which the silk industry has been for some time. Some years ago a number of Manchester manufacturers were so prosperous and so sure they could beat the French and Swiss in making broad silks if only they would abandon Protection, that Mr. Cobden was sent to Paris to negotiate the French treaty. From that moment, the industry has been a destitute industry, and so he believed it would remain until there was some alteration. The yarn spinning branch had been successful, in spite of certain advantages possessed by Continental spinners in the way of cheap labor. In machinery, the English spinners could more than hold their own. Depression in the trade at present was not because of the inability of the English spinners to produce spun silk, but was owing to the scarcity of raw material caused by one or two bad crops. He fully believed that a more prosperous time was coming.

The Silk Association is trying to secure an alteration in the Carriers' Act, which was passed before the days of railways and steamships, and which classes silk with jewelry and precious stones.

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#### NEW WARP TWISTING MACHINES.

W. J. Pike, American Consul at Zittau, Germany, writes: "An invention has just been perfected that will, without doubt attract the attention of the textile manufacturing world. It is a warp twisting machine that fastens the ends of two warps by twisting the single threads together. It is designed to do away with the present method of twisting by hand, which is necessary in order to fasten the ends of the warp in the loom to those of the new warp without taking the former out of the shafts.

"The inventor is Mr. Gustav Hiller, of Zittau, a prominent manufacturer. The machine represents six years of patient labor, and has become an accomplished fact after repeated failures. I am informed by manufacturers and experts thoroughly conversant with this branch of manufacturing industry that there is at present no such machine in use, or at least none that has proved entirely practical. The history of many patents on machines designed to perform this work seems to be a history of failures.

"I have witnessed a demonstration of the workings of the machine in company with persons entirely competent to pass judgement, who declare it a complete success.

"This machine is applicable to all classes of yarns, be they cotton, wool, linen or silk. It is able to twist about 2,500 ends in an hour, whereas a good hour's work for an expert twister is 800 to 1,000.

"Considering that the machine does the work of about three experienced twisters and can be operated by an inexperienced workman, the advantage of its use is very perceptible, and it will no doubt quickly supersede the old method, especially where plain and dobby looms are largely used."

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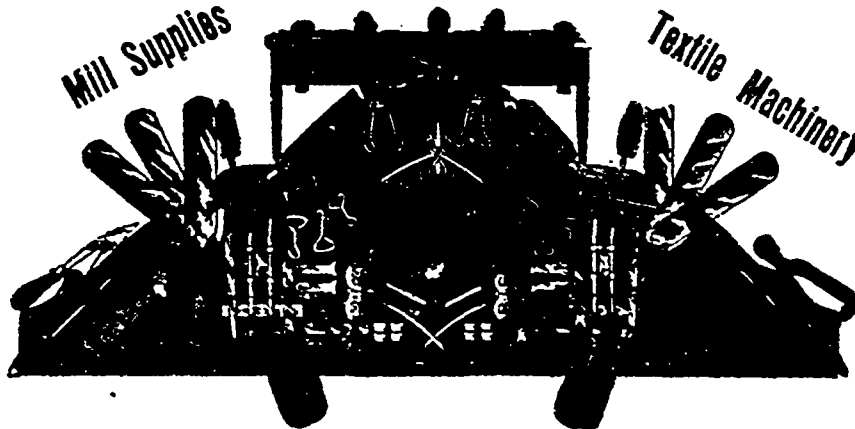
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supplying new mills and filling large orders.

Correspondence Solicited.

Orders Promptly Filled

A textile export agency in London is willing to deal with special enquiries from Canada for specific goods, the placing of orders, or to act generally for the convenience of buyers not represented in England. Further information may be had on application to the Canadian Government offices, Victoria Street, London, S.W.

The exhibit of Canadian handicrafts at St. Louis under the auspices of the Woman's Art Association is said to be attracting considerable attention. Doukhobor embroideries and Canadian Irish lace form an important part of the exhibit. Suitings and dress goods made by Canadian women on the hand loom also elicit much surprise.

THE NEW

## French Shoddy Picker Machine

SUPERIOR TO ALL OTHERS.

High Test Awarded at Paris Exposition, 1900.

OF SILK, WOOL, COTTON, WASTE, JUTE, etc., it will produce fifty per cent. more production than the Garnett Machine on one-half the power.—Has no rival on the market.

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BREDANNAZ, Manager.

Sole Agents for Canada and the United States.

Prices on Application.

Prices on Application

## PUBLICATIONS RECEIVED.

The Blue Book, Textile Directory, United States and Canada, 1904-5. Travellers' edition, \$3; office edition, \$4. Davidson Publishing Company, 401 Broadway N.Y.

The seventeenth annual edition of this work has been issued, and contains a full and up-to-date list of cotton, woolen, silk and other manufacturers, together with lists of dyers, commission merchants and dealers. As the book contains nearly 700 pages, the thumb index becomes very handy in referring to the divisions of the book. Manufacturers and dyers in Canada are grouped together, and are not entered under their respective heads, but one might wish that more prominence had been given to the Canadian section by giving it a special thumb index, rather than leaving the enquirer to grope for the list, inserted as it is between the dyers and the commission merchants. A general index and a "Canada Index" enables one to find any entry in the book by the firm name. The individual mill entries give information as to owners, capacity, power, railroad connections, number of employees, product, mode of selling, etc. Several pages of maps are included in the book. The use of thin paper and flexible covers makes the book very convenient for handling.

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## THE WORSTED INDUSTRY—A BIT OF HISTORY.

Editor Canadian Journal of Fabrics:

In 1867, when I started working for Randall, Farr & Company, at Hespeler, Ontario, they were making tweeds on seven looms, and the balance of their yarn (they made on four sets of 48 inch cards) was knitted into underwear, hosiery, and fancy goods. In 1869, the firm decided to enlarge the business, and Mr. Farr went to England and bought machinery to make worsted yarns. Twelve American high speed cotton looms were also purchased, to make ladies' dress goods such as Russell cord, Victoria cord, lustrés and alpacas. The goods were woven with a black cotton warp, and a white worsted filling, and then piece dyed. Later on, it was found that the American looms were not adapted to the class of goods wanted, and the firm imported high-speed Clipper looms from England, and these proved entirely satisfactory. In 1871, the firm, seeing that there was a market for worsted suitings and braids bought eight fancy Broad Crompton looms, and twelve braiding machines. Being crowded for room, they rented a building which had escaped the fire in Mr. J. Hespeler's woolen mills in January, 1869. At the same time Randall, Farr & Company built a weave room, and put in eighty-three English Clipper looms. In 1873, there was a change in the tariff, which restricted the market for the goods made by this firm, and it was decided to make a change in the way of obtaining a larger market. In the spring of 1874, part of the worsted machinery was packed up and removed to Holyoke, Mass., where the business has since grown enormously.

The plant at Hespeler with part of the machinery was sold to Jonathan Schofield & Company, of Hespeler, who started up the business again, part woolen weaving, and part worsted knitting. Mr. Forbes, of Guelph, was later taken in as a partner, and more capital was added, which put the business on a good footing. Some time afterward, Mr. Schofield sold out his share to Mr. Forbes, who since continued the business with marked success.

Waterloo, Ont.

M. Reidel.

## Fabric Items

Gordon, Mackay & Co., Toronto, are building a \$65,000 warehouse at Bay and Front Streets, and a factory on King Street, near Bathurst.

It is stated that the Dominion Government will shortly appoint a commission to investigate the question of further protection to the cotton industry.

Knitted Goods, Ltd., is the name of a new company formed in Toronto with a capital of \$40,000. The charter members are: T. Prest, of Toronto Junction; A. R. Moore, G. Banks, R. G. Hunter, H. H. Beasley, of Toronto.

Work has been started on the T. Eaton Co.'s new store in Winnipeg. The company have secured a valuable site, and propose erecting one of the finest retail blocks in Canada. There is said to have been quite a flurry in real estate when the land was purchased.

The monthly report of the chief of the Bureau on Statistics of the Department of Agriculture at Washington shows the average condition of cotton on July 25th to have been 91.6, as compared with 88 on June 25th, 1904; 79.7 on July 25th, 1903; 81.9 on July 25, 1902, and a ten-year average of 82.7.

A linen mill seems likely to be established at an early date in Edmonton, Alta. The quality of flax fibre produced in that locality is said to be particularly fine, superior even to Irish and Belgian fibre, and Old Country capitalists are taking the matter up. Mr. Dickson, of Edmonton, is acting for the company.

About 30,000 cotton operatives at Fall River, Mass., went out on strike on July 25th. Notice of a new wage scale involving a 12½ per cent. reduction had been issued. The State Board of Arbitration attempted to bring about a settlement of the difficulty on the 21st, but the representatives of the operatives refused to consider any proposition which did not include the repeal of the reduction notice. There are ninety-two mills in Fall River employing 31,682 operatives. Nearly all these mills are affected, besides mills at Central Falls, where about 500 employees are on strike. The strike will not affect the amount of business or cost of production at the New Brunswick mills, at least for some time.

If negotiations now pending are successfully carried through, some of the most extensive builders of textile machinery of Lancashire, England, may consolidate their interests. Recently the matter has been taken up by strong and influential men, and although textile combinations in England have not, as a rule, been successful, the concerns mentioned as being interested in the present proposition are the oldest and strongest in the business. The "London Post" reports: "Well-informed people state that the negotiations are proceeding very satisfactorily. The names freely mentioned are those of Messrs. Platt Brothers & Company, Oldham; Asa Lees & Company, Oldham; Howard & Bullough, Accrington, and Dobson & Barlow, of Bolton. All four firms are makers of general textile machinery, both cotton and woolen, cotton varieties predominating. Even excluding Dobson's, the total number of hands employed by the other three firms is about 21,000, and in normal times Messrs. Platt Brothers & Company, alone employ in their works and collieries fully 12,000 hands. There are, of course, several other Lancashire firms of textile machinists of less magnitude than those named. Some of them will doubtless sooner or later be included in the combination, that is, should the proposed arrangements be consummated."—Fibre and Fabric.

## BRITISH WOOL AND TEXTILE MARKETS.

(Correspondence of Canadian Journal of Fabrics.)

Bradford, July 27th, 1904.

Our report this month is not a bright one, from the users' point of view, as once more we had to report high prices. At all local wool fairs which have been held since our last report, advances had been asked and paid. We are told that the next sales, which will take place in September, are going to be the smallest of the year, and it is said that they will only take up about a week's time.

Reports from the continent represent the manufacturers as buying as little as possible, as they cannot obtain the advances for their manufactured goods.

During the last few days all eyes have been turned to the law suit which is taking place in London against the Yorkshire Wool-combers. This company was formed with the idea of amalgamating most of the principal topmakers and commission woolcombers, and such well-known firms as James Hill & Son, Thomas Speight, Francis Willey & Co. were amongst those who took part and became members of the combine. It is alleged now by the plaintiffs that the prospectus contained statements which were likely to mislead the shareholders, and they are claiming heavy damages respecting the same.

We hear that the Canadian tariff is likely to affect Bradford stuff houses very considerably, and that they are doing their utmost to get in all the goods they can before the end of August. It is thought on this side that the stuff trade will suffer much more than the cloth trade on account of the recent changes.

At the Liverpool auctions, at which, as your readers will

know, the principal wools sold are the lower qualities suitable for blanket and carpet manufacturing, considerable advances were paid, the largest proportion being taken presumably for those manufacturers who have contracts from the Far East.

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## WOOL MARKETS.

The demand for wool is as great as ever, and there appears to be an impression that at the coming series of sales in London the former prices will be fully maintained. This strength in the prices of raw material is being reflected in the prices of woolens. While the domestic mills have not, perhaps, the volume of orders in hand which they had three or four years ago, they are still very busy on direct stuff, and have orders for delivery far ahead. The demand for goods of low grade is not satisfactory. The demand is largely confined to pure wool goods, and in such goods Canadian manufacturers are excelling all previous efforts.

The Canadian clip is said by some to be only about one-third the usual quantity, and the scarcity of wool is felt severely. A dealer recently made this statement in regard to the situation for wool and yarns: "Prices of woolens are now estimated on a higher basis of yarn value than during the past two years. In 1892 wool was quoted in the British markets at 4½d., and yarns, say, at 20c. per pound. In 1903 wool was, say, 9d. per pound and yarns at 21½c. To-day wool is in the neighborhood of 10½d. and yarns at 40c. Thus you will see that while last year the price of wool was doubled compared with the price in 1892, yarns scored only

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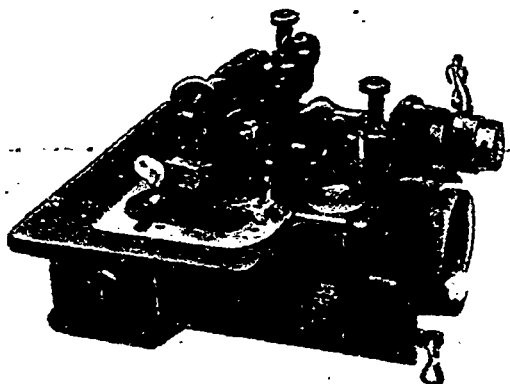
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## EXTRACT

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"The Overlock stitching device of Willcox & Gibbs has had a phenomenal success since the date of its introduction. . . ."

"The keen competition among manufacturers has necessitated its use, both as a matter of economy, and to improve the character of output for a discriminating market."

a nominal advance. The price of yarns to-day is double the price of yarns in 1892. This proves conclusively the absolute scarcity of wool. Even after wool had such a large advance since 1892, while the spinners had ample stocks on hand they were willing to sell their yarns at or near the former prices. While they had large stocks of wool they were disposing of their yarns at relatively lower prices than they would have had to pay for the raw material if they then had been compelled to go into the markets and replenish their supplies. The comparative price of wool at the present time is not very high. It will likely advance still further, and might do so without hurting anyone. In 1866, when the clip in this Province was many times larger than it is this year, the price was 60c. per pound. That was during the American War."

Competition was keen throughout the fourth series of the wool auction sales in London. Under the influence of large Japanese Government orders and light supplies, coarse descriptions advanced considerably. Compared with the May sales, the gains were: Merinos, 5 per cent.; medium greasy cross-breeds, 7½ to 10 per cent.; coarse cross-breeds, 10 to 15 per cent.; fine scoureds, 5 per cent.; coarse scoureds, 10 per cent. Greasy merinos of really good quality were in demand for home, continental and American spinners. Greasy cross-breeds were in good supply and sold well throughout.

CHEMICALS AND DYESTUFFS.

Market is dull and business generally is quiet.

Bleaching powder .....	\$ 1 40 to \$ 1 60
Bicarb. soda .....	1 75 to 2 00
Sal. soda .....	0 75 to 0 90
Carbolic acid, 1 lb. bottles .....	0 35 to 0 40
Caustic soda, 60° .....	2 75 to 3 25
Caustic soda, 70° .....	1 75 to 1 80
Chlorate of potash .....	0 07 to 0 08
Alum .....	1 75 to 1 95
Copperas .....	0 50 to 0 65
Sulphur flour .....	1 40 to 1 60
Sulphur rock .....	1 45 to 1 80
Sulphate of copper .....	0 06 to 0 06½
White sugar of lead.....	0 08 to 0 08¼
Sumac, Sicily, per ton .....	45 00 to 50 00
Rich. potash .....	— to 0 03¼
Soda ash, 48° to 58° .....	1 15 to 1 25
Chip logwood .....	1 50 to 1 75
Castor oil .....	0 07 to 0 08
Cocoonut oil .....	0 07 to 0 08

NEW BLACK FOR WOOL



Absolutely Fast **ONE DIP** Black

Unequaled for depth of shade. Users of black should investigate. Fastest Black on the market.

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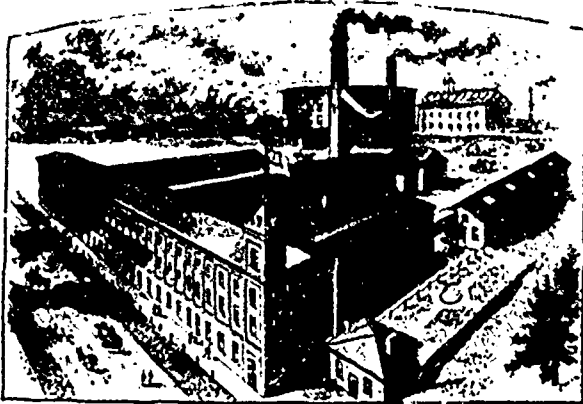
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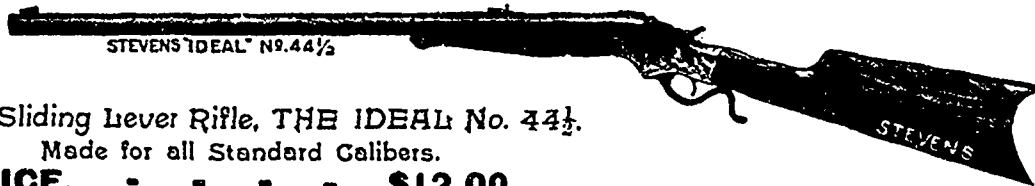
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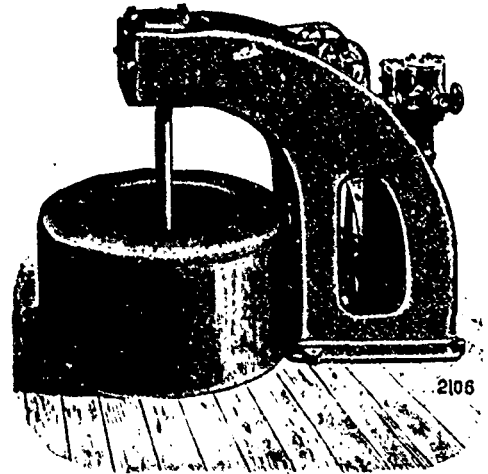
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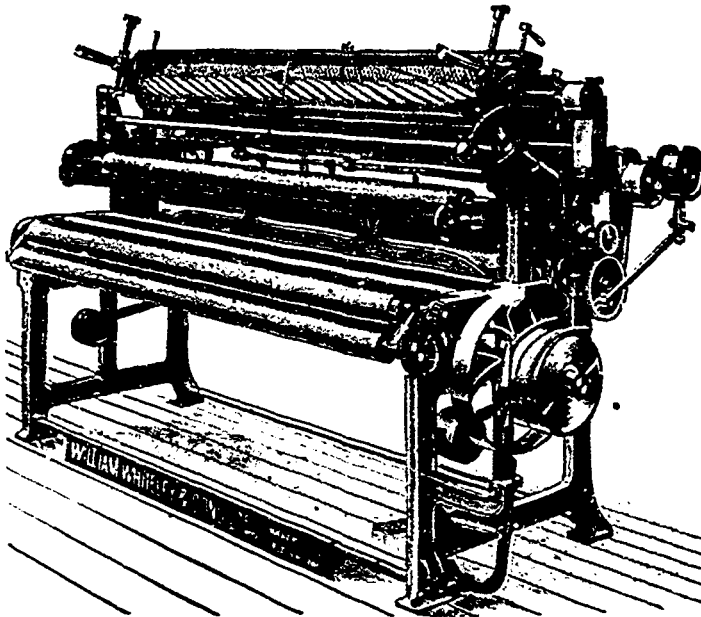
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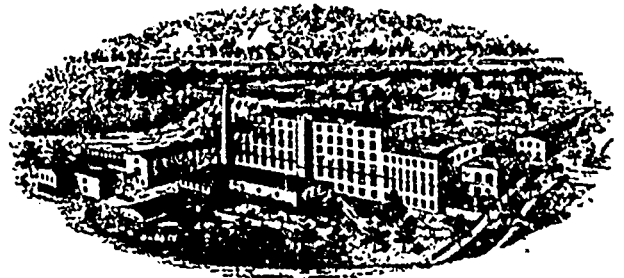
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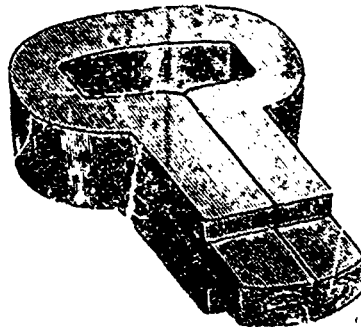
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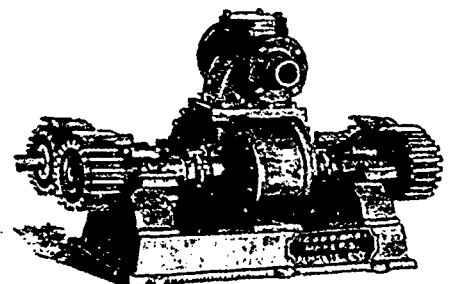
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**INDEX TO ADVERTISEMENTS**

American Dyewood Co. ....	1
Atteaux & Co., F. E. ....	4
Barlow, John W. . . . .	8
Bellhouse, Dillon & Co. ....	1
Benson & Co., W. T. ....	1
Bischoff & Co., C. ....	2
Brown, John E. ....	9
Canada Bobbin Co. ....	6
Carter, E. T. ....	9
Cassella Color Co. ....	1
Crabb & Co., William. ....	8
Cröwe W. M. ....	2
Dominion Dyewood & Chemical Co. ....	1
"    Guarantee Co. ....	8
"    Oil Cloth Co. ....	8
Dronsfield Bros. ....	11
Eickhoff, A. ....	9
Fairbairn, Lawson, Combe Barbour Ltd. ....	12
Felten & Guillaume. ....	12
Firth Co., William. ....	7
Forbes Co., The R. ....	9
Fraser, Robt. S. ....	2, 11
Garland Mfg. Co. ....	2
Geigy Aniline & Extract Co. ....	4
Gessner, David ....	11
Halton's Sons, Thomas ....	2
Hamilton Cotton Co. ....	6
Haverгал College ....	9
Jack & Co., Watson ....	1
Klipstein & Co., A. ....	4
Leigh, Evan Arthur ....	7
Leitch, A. W. ....	1
Levy & Co. ....	6
Linotype Co. ....	10
Long & Bisby. ....	9
Marcan's Successors, Lucien. ....	6
Mather & Platt ....	7
McArthur, Cornelle & Co. ....	1
McLaren, D. K. ....	5
"    Belting Co., J. C. ....	12
Mississippi Iron Works ....	8
Montreal Blanket Co. ....	8
Morton, Phillips & Co. ....	9

Pullack Bros. & C. ....	4
Rbid & Co., George ..	3
Riley & Co., C. E. ....	3
Roessler & Hasslachor Chemical Co. ....	2
Rosamond Woolen Co. ....	8
Sheldon & Sheldon. ....	2
Smith Woolstock Co. ....	8
Stevens Arms & Tool Co. ....	6
Stoddard, Haserick, Richards & Co. ....	10
Thompson & Co. ....	8
Toronto Woolen Machinery Co. ....	3
Turnball Co., The C. ....	8
Want Advertisements ....	6
Watson, Laidlaw & Co. ....	7
Watson Mfg. Co., L. S. ....	12
Whiteley & Sons, Limited, William. ....	7
Willcox & Gibbs Co. ....	185
Wilson Bros. ....	9
"    "    Bobbin Co. ....	11
"    "    Paterson & Co. ....	1
Young Bros. ....	8

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\*\*\*

—From the commercial agent for Canada at Kingston, Jamaica, we have received a prospectus of the Anglo-Canadian Commercial Museum, to be opened there in September. The intention is to make a permanent exhibition of food products and manufactures of Canada and the United Kingdom, which may serve both as a national and individual advertisement and as a sales agency. Jamaica's importations for the fiscal year ending March 31, 1903, were approximately \$10,000,000, of this, \$4,000,000 was drawn from the United States and but \$600,000 from the Dominion, while every item might have been supplied equally satisfactorily from Canadian sources. It is felt that the permanent exhibition will have a strong influence in diverting this trade to Canadian channels.

Full information may be had by applying to the manager, Anglo-Canadian Commercial Museum, Waterloo Buildings, Kingston, Jamaica.

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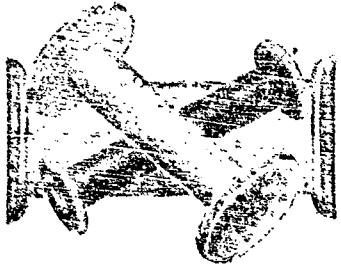
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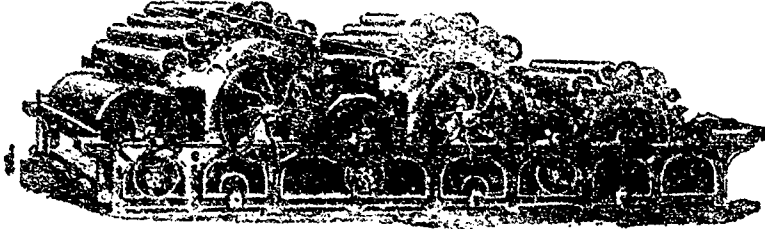
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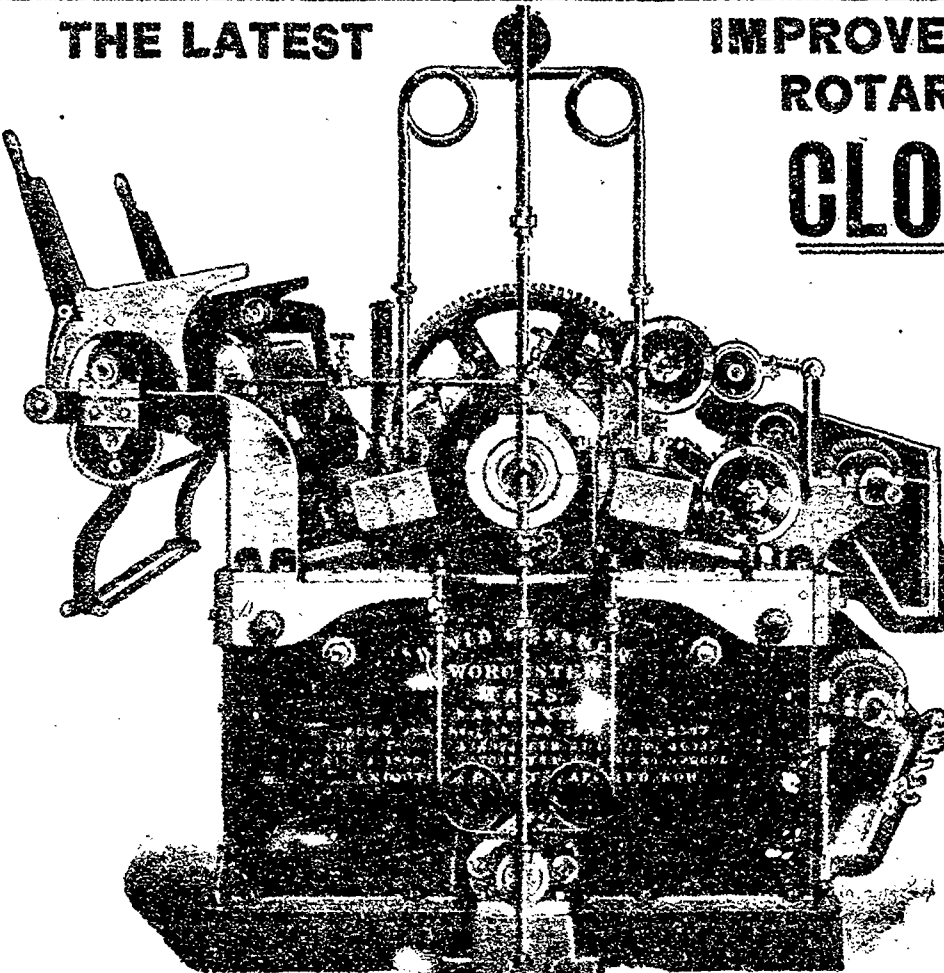
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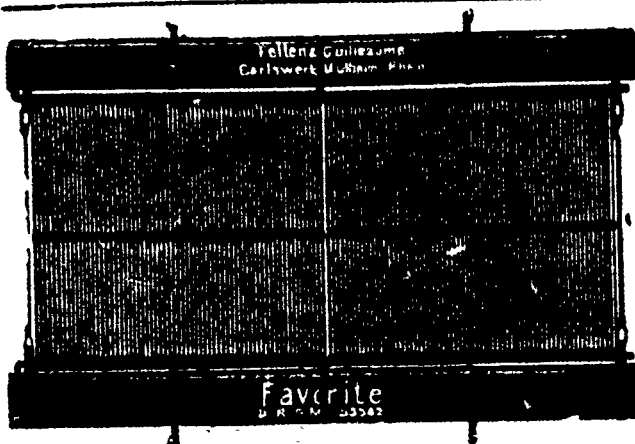
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