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CANADIAN Journal of Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XX.

TORONTO AND MONTREAL, FEBRUARY, 1903.

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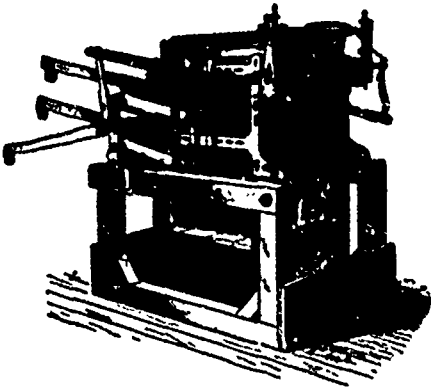
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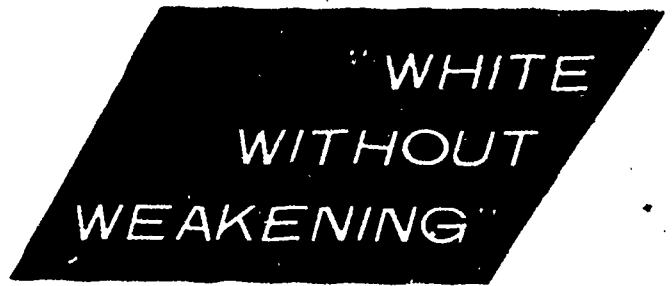
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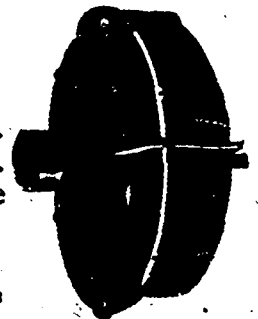
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THE CANADIAN JOURNAL OF Fabrics

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Vol. XX.

TORONTO AND MONTREAL, FEBRUARY, 1903.

No. 2

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CONTENTS OF THIS NUMBER.

PAGE	PAGE
Among the Mills..... 50	Fabric Items..... 37
Angora Goat..... 45	Flax—The Wax in it..... 64
Business Notes..... 39	Gear Wheels, Noisy..... 41
Cornwall and York Cotton Mills, St. John, N.B..... 38	Indigo, Some Notes on Natural and Artificial..... 47
Carding Machines, Combined Stop and Alarm Mechanism for..... 44	Lessons for Mill Hands..... 45
Cotton Supply, New Sources of..... 34	Mercerizing Process, New..... 41
Cotton, Canadian, Exports to China..... 35	Partly Colored Effects in Yarns..... 53
Cement..... 64	Picker Stick Connection, New..... 44
Color and Dyes..... 64	Printing Process..... 43
Electric Bleaching..... 43	Piece Goods, Leveling of..... 41
Fancy Weaving..... 49	Personal..... 53
Floats a Serious Fault in Weaving..... 50	Rubber, Reclaiming..... 43
Flash Boilers, Why They do not Scale..... 48	Science and Dyeing..... 49
French-Canadian Handicraft..... 47	Sulphur Dyes on Silk and Wool..... 50
Foreign Textile Centres..... 44	Strike, An Extensive..... 53
Fractions, Common, and their Decimal Equivalents..... 41	Textile Design..... 64
Flax Straw, Utilization of..... 35	Wool Market..... 54
	Woolen Manufacturing in Canada..... 48
	Woolen Manufacturing, The Outlook for..... 33

THE OUTLOOK FOR WOOLEN MANUFACTURING.

That the woolen manufacturers of Canada labor under exceptional disadvantages caused by the preferential tariff is now admitted, we believe, by the majority of public men on both sides of politics. Many who thought the preferential trade scheme an ideal one now also see that in some branches

of the textile trades the anticipated preference for British goods turns out in practice to be a "preference" in favor of German and other foreign goods which are brought over to Great Britain for more or less shadowy "finishing," and then shipped to Canada as British goods. We have gone into these matters at various times during the past three years, and we have shown that the Canadian woolen manufacturers bear a burden from which Canadian manufacturers in other lines are more or less free, while the benefit of the preferential rate on the British side is reaped, not by the nation at large, but by a favored trade exceptionally placed; while in other branches of the textile trades the "preference" is really reaped by foreigners. Having shown that this is the case we look to such legislation at the coming session of the Dominion Parliament as will give relief. When these grievances shall have been remedied there will still remain some things which the Canadian woolen manufacturer will himself have to do before his trade is adapted to modern conditions. There is too much antiquated machinery in use among our mills, and too much buying of second-hand English and United States machinery, which is only for sale because the sellers have discarded it for up-to-date equipment. These old machines are on the bargain counter just because the former owners found that they were losing money in competition with other mills equipped with machinery which will do three times the work in a given time, and do it better. Machines that are out of date are a poor investment at any price. The only chance for Canadian mills is to have the very best equipment in the market, because it is the only way by which the other advantages of highly skilled manufacturing nations like Great Britain, Germany, France, etc., can be offset. To lean on the tariff to help them out and save them from the consequences of their own lack of enterprise is to fail in the end. To get the best machinery, and to centralize and

specialize their industries should be the aim of those who control our large mills or contemplate the re-organization of existing ones. If all the big tweed and other cloth mills were in the county of Lanark, for example all the big knitting mills in another county, and the carpet mills in another centre, it would be the better for the future of each trade as a sort of hereditary skill is acquired and the problem of expert labor is greatly lessened. This centralization of special industries in certain districts of Great Britain and on the continent of Europe accounts for the remarkable success and prosperity of these manufacturing centres. Those who are promoting large new factories in these lines of trade make a mistake when they allow themselves to be tempted from a recognized centre of their trade to an out of the way village for the sake of a bonus or exemption from taxes. We speak, of course, of large concerns operated on the modern factory system. Small mills depending on local trade, and started to fill a local need, are of course on a different footing.

NEW SOURCES OF COTTON SUPPLY.

When one recalls the memorable cotton famine which marked the progress of the American Civil War, and which caused such deep distress throughout the cotton manufacturing districts of England, one can only wonder why British cotton mill owners have up till now remained so indifferent to the question of cotton cultivation in the British colonies and dependencies, especially when one considers the large area which is undoubtedly suited in a greater or less degree for cotton planting. It is true that cotton growing in India and Egypt has made great strides of recent years, and the latter country will still further increase its cotton fields upon the operation of the great irrigation works, radiating from the new dam on the Nile at Assouan, but vast stretches of lands adapted to cotton in South and Central Africa still lie fallow, and it has remained for the Emperor William of Germany to show Britons how the thing can be done. We mentioned recently how he sent over to Booker T. Washington's Industrial School in Alabama for a few negro students to go out to Togaland with implements and cotton seed to teach the nations how to grow it. It is gratifying to know that such practical demonstrations of what is being done by other nations are now having some effect on those in charge of the agricultural

departments of our own colonies. Good samples of cotton have been produced in Natal, the Transvaal, Uganda, Central Africa, and the West African settlements, British North Borneo and parts of the Australian continent. Sir Alfred Jones has communicated to the Liverpool Chamber of Commerce the fact that the experiments in West Africa have been successful, and anticipates a great future for the African Cotton fields. It is said that the quality of the fibre produced in West Africa excels that of the Indian plant, and that hopes are entertained for the production of a quality quite equal to Egyptian.

The Cotton Growing Association has also, through Mr. Chamberlain's influence, secured the free carriage of cotton on West African railways for two years, as well as the privilege of sending the cotton through shipping companies that will carry the first 1,000 tons in each bottom free of freight charges. A consignment of 26 bales grown in South Africa from seed supplied by the Chamber, has arrived at Liverpool, and been sold for 5½d. per pound, being three farthings higher than middling American. This cotton will be used as a substitute for rough Peruvian for mixing with wool. Some time must elapse before the African cotton fields can rival those of Egypt or America; but it is to be hoped that British and Canadian cotton manufacturers will now realize how important it is to their trade that the next great war in which the United States may engage shall not leave our mills helplessly dependent on the cotton growers of the Southern States. To do so would be to invite a worse calamity than the cotton famine of 1861-5. Sir Alfred Jones wants to grow cotton in the West Indies as well as in Africa, and hopes Lancashire will be weaving Jamaica-grown cotton before very long.

Cotton is like wool in one respect. That is, each country where cotton is grown produces a staple differing more or less in character from any other, so that each class of cotton is found to be particularly adapted to some special line of goods. Thus every new cotton growing area extends the uses of cotton fabrics and their adaptability to special needs in the arts and industries, and it should be to the manufacturers' interest to extend the area of cotton planting to every variety of soil and climate capable of producing it. Hitherto this object has not been appreciated by cotton manufacturers, who have been supinely indifferent to the agricultural end of their business.

CANADIAN COTTON EXPORTS TO CHINA.

The following figures give the shipments of Canadian and American cottons (so far as they go over the Canadian Pacific Railway) to China and Japan for the years 1901 and 1902, the figures being for the calendar years. Figures for previous years (1887 to 1900) have already appeared in The Journal of Fabrics:

	China.	Japan.
	Lbs.	Lbs.
1901.		
Cotton piece goods from Canada	375,627
Cotton duck from Yarmouth, N.S. ...	71,751	138,057
Cotton piece goods from United States	15,599,579
1902	Lbs.	
Canadian cottons	870,750	
Canadian cotton duck	161,112	
American cottons	19,381,102	

While these figures show a considerable increase in the exports from Canada over what they were in 1900, they still fall far short of what they were in the years 1890-1899. Now that the Boxer troubles are over it is to be hoped that the trade will again expand. It was a good thing for our factories and the C.P.R. Co.'s railways and steamships, and should be encouraged. Perhaps the Osaka exposition this year may be the means of helping it to grow.

UTILIZATION OF FLAX STRAW.

The Council of the Winnipeg Board of Trade has been looking into the question of the utilization of flax straw, a very important question in that province. In their report, presented recently at the annual meeting, the following is given as the result of their investigations so far as they have been carried:

"In view of the fact that flax in this country is grown exclusively for seed, and that the straw is not utilized, but, for the most part, is burned in the fields, the council appointed a committee in March last to secure such data as was possible on the use made of flax straw in Minnesota and Dakota, where the conditions of growth and market are much the same as in Manitoba. This committee has reported that, having ascertained that a number of small factories for the utilization of flax straw exist in Minnesota and Dakota, they corresponded with a number, and obtained information that the straw was used only for the making of tow for upholstery purposes, that the business had not been profitable, mainly owing to over-production, and that a number of the factories had been closed after heavy loss to the companies. The committee still have this matter under consideration. A communication was recently received from a firm in England, asking for flax straw to be delivered at

Liverpool or Hull, and the C.P.R. Company has been requested to quote the freight rates on flax straw in bales, from Winnipeg to Liverpool, and from Winnipeg to St. John, New Brunswick.

—The Canadian Almanac for 1903 makes a book of nearly 450 pages, with a new map of Toronto as a supplement. The political and commercial information, the lists of clergy of all denominations, the postoffice guide, and other information, are features that make the Canadian Almanac a necessity in every office.

—A night laundry has been started in a city of the United States. Shirts laundered while you sleep will be the principle on which it works. When the man with only one shirt goes to bed, he leaves that garment in some convenient place and finds it there clean for him in the morning. The charge will be fifteen cents, and five cents for each collar and pair of cuffs. By this means a man can get along with one shirt and be respectable.

—Our Western Empire, discussing the Canadian woolen industry, fully endorses the complaint that continental goods passing through England, without more than 5 per cent. of British labor being put into them, get a fraudulent preference, and characterizes the fact as abominable. It suggests that Mr. Chamberlain, on his return from Africa, should look into it, and provide a remedy. If this unfair competition was stopped there would not be so much said against a preferential tariff.

—The Lancashire cotton trade, after passing through a period of depression, is apparently on the point of several new developments. The Industrial Commission which lately returned from the United States reports that, notwithstanding the boasts which have been made of the new Northrop loom in the States, Lancashire is well able to hold its own against American competition. Several new English looms are being tried, which are expected to do even better than the American Northrop. The chief difficulty apprehended in Lancashire in the future is the scarcity of raw cotton, owing to America's increasing consumption of her own yield, and hence the need of exploiting to their utmost the cotton growing capabilities of the British colonies, as discussed elsewhere.

—We hope Canada will show up well at the National Industrial Exposition under the auspices of the Japanese Government which will be held at Osaka, from March 1 to July 31, 1903. W. Hutchison, the Canadian Commissioner, is on the ground, and Hon. Sydney Fisher is now on his way there. A novel feature is the establishment of a special building for samples of articles produced or manufactured in foreign countries. It is not concealed that the primary object is to afford Japanese manufacturers an opportunity to study the latest products of Western invention, with a view to the improvement of Japanese industries, but it is claimed that in return the establishment of the building offers to foreign manufacturers a rare opportunity for exploiting the rapidly developing markets of the far east, as the exposition is expected to attract immense crowds of visitors from the continental countries of Asia, in addition to the millions of Japanese. The Canadian cotton trade should specially benefit by this exposition.

—A deputation of the Canadian Manufacturers' Association waited upon the Government at Ottawa a few days ago to urge an increase in the tariff in certain respects. The conference was private, and partook of the nature of a discussion, for the Government, of course, would not indicate its intention before the budget speech. There are indications that some changes are contemplated in deference to opinions advanced from numerous directions. The woolen trade should certainly be considered. Representatives of the eleven binder twine and cordage factories in Canada also waited upon the Government and asked for a re-imposition of the duty on binder twine. They pointed out that the Philippine Islands having come under the jurisdiction of the United States the manufacturers of that country get their manila fibre three-eighths of a cent per pound cheaper than Canadians can obtain it, and that difference is sufficient to enable them to undersell Canadians in their own market. Whether the manufacturer who makes the twine or the farmer who uses it will prove the strongest factor in the situation remains to be seen. The pulpwood men are also asking for an export duty on pulp.

—The prospective establishment of several linen mills in Canada calls attention to the fact that this branch of manufacturing, in which Ireland has achieved a world-wide reputation, appears to be on

the decline in that country. The flax-growing acreage has fallen in 30 years from 200,000 acres to less than 50,000. There must be a cause for this, but the Textile Mercury acknowledges its inability to discover where it lies. The diminishing exports of linens from Belfast may be to some extent owing to the growing competition of cotton goods, which are being substituted for some purposes. This is especially the case as regards fabrics composed of mercerized cotton, which no doubt prove formidable where such exchange can be made. The quantity of the goods exported is also depreciating, according to the Times, a fact which is a consequence rather than a cause of diminishing exports. But this depreciation will soon become operative as a cause, because, people finding linen fabrics deteriorating, and unsatisfactory in use, they will resort to substitutes, the composition of which they think they know better, and the use of which may prove more satisfactory. Specialties in quality in the cotton trade have proved a valuable property in the past, such, for instance, as Horrocks' Long Cloths, and the Mercury suggests that some Belfast firm make a specialty of manufacturing only pure linen goods, the purity of which they would guarantee and advertise freely.

—For its courageous stand on the electric power question, The News, of Toronto, under the editorial direction of J. S. Willison, has at once made good its claim for public recognition as a journal of independent opinion—a claim which quite a number of daily papers set up now-a-days, but which few furnish proof of when the higher interests of the public are in the balance. The developments of the past few years have brought us to realize the fact that electrical power and electric light are public utilities which should be as far as possible under the control of municipalities for the public benefit, just as waterworks, gas works, parks, etc., are now held to be. As the distances to which electrical energy may be economically transmitted are still increasing with improved appliances, and as we in Canada are at last waking up to an appreciation of the enormous amount of unused electric power awaiting the service of the people on our unparalleled chain of waterways, the right way of disposing of this marvelous power is of supreme importance. When the first Niagara power company forfeited its lease from the Ontario Government, three or four years ago, the Canadian Engineer pointed out the unique opportunity the Provincial Government had of creating a

new source of public revenue, and at the same time serving the municipalities and the public to an extent that could not be looked for while these franchises were in private hands. The Government of the day made light of the question, and as the public was not alert on the matter, the opportunity was lost. What has been unwisely done cannot now be undone, but we have still the great unused power of the Canadian side of the Niagara, and the other great sources of power, and it is to be hoped the press and people will now bring such pressure to bear on the provincial governments of Canada as will save the remnant. To utilize our great water powers under honest Government control would make Canada the cheapest manufacturing country in the world, and private capital would then have all the opportunities it wanted of profitable employment in developing industries that would naturally arise out of such favorable conditions.

—We quite agree with Mr. Algic, whose instructive lecture on wool was reported in last issue, that the possibilities of textile manufacturing in Canada are great, and with fair treatment in regard to the tariff these prospects will be realized. The vast water powers of Canada are an important element in successful manufacturing whether in textiles or any other line; and there is contained within the boundaries of the Dominion between one-quarter and one-half of the total water power of the world. Canadians do not realize what an asset this is in estimating the industrial advantages of a country in this electrical age.

FABRIC ITEMS.

Cotton yarn has advanced from $\frac{1}{2}$ to 1 cent a pound in the Southern States.

Canadian makers of rubber hose have advanced their prices about 10 per cent.

It is predicted that there will be an advance in cotton wrapping twine, cotton clothes line and cotton rope.

A laundryman in Hamilton is being sued for \$12.10 by one of his patrons for the alleged spoiling of some linen in the laundry.

It is estimated that the total production of wool in Australia this year will fall short of last year by 300,000 bales, or nearly 20 per cent.

Arrivals at Edmonton and other places in the Northwest, indicate that the fur catch in the north this season will exceed that for many years.

The Hudson's Bay Company has been awarded the contract for furnishing the new additions to the C.P.R. hotels in the mountains with carpets, etc

Fralick & Co., who were the only tenderers, have been awarded the contract for police clothing for Hamilton, at a price 10 per cent. lower than last year.

The process known as French printing, which is something new on this side of the water, will be carried on at the extension of the Atlantic Mills, Providence, R.I.

It is not expected, according to Farm Implement News, that prices for binder twine will be fixed before some time in March. Meantime orders taken are without price.

The Northwest is taking increased quantities of cottons and woollens, and the outlook generally promises an increase in the business of the present year compared with 1902.

The SS. Tartar arrived at Vancouver recently with a cargo of raw and manufactured silk and sealskins, valued at \$1,500,000. The silk was consigned to mills in Eastern New York.

The London silk market is firm, although quiet. At Yokohama there is no particular change to report, prices still being high. At Shanghai only absolute necessities are filled. Canton is doing a small business.

A physician urges the wearing of stockings with white feet for those who have tender feet. New cotton hose, as well as all new cotton undergarments, should be washed before being worn, to take out the sizing used by manufacturers.

Cashmere hosiery is very strong, with an advancing tendency in prices. Ribbons are selling freely. The coming season promises to be a big one for ribbons, as they are being used in such a large variety of ways. Prices of ribbons are very firmly held.

Another instance of the mill being taken to the raw material is the establishment of a rope factory near Manila, in the Philippine Islands. American machinery has been installed, and a market will be found in the islands of Hong Kong and Singapore.

Wm. Mackenzie, of Mackenzie & Mann, confirms a report that his firm has obtained a concession in Venezuela, covering 11,000,000 acres, containing great groves of rubber trees, besides very rich deposits of gold, iron, copper and other minerals and asphalt.

The acreage under cultivation for indigo continues to decrease rapidly in India, owing to the headway made by the chemical substitute. This year's acreage is nearly 30 per cent. less than that of last year, and barely one-third of the area cultivated a decade ago.

Cotton goods from the cotton fields of the United States are now being shipped to the Holy Land. Three weeks ago the Columbus (Ga.), Manufacturing Company shipped two carloads of sheetings to Smyrna, and, at the same time, three carloads to Ontario, Canada.—Textile Mercury.

There is a dispute on between the members of the Rubber Clothing Workers' section of the United Garment Workers' International Union of America and a rubber firm in Montreal, who, it is alleged, has discriminated against some of its employees who are members of the local union.

Dr. H. E. Schunck, professor of scientific chemistry, who died recently near Manchester, England, was for a number of years engaged in calico printing, from which he retired and took up the study of chemistry. He was the author of numerous papers on the chemistry of organic coloring matters.

The Dominion Clothing Co., Montreal, has been granted permission by the Wholesale Clothing Cutters' Association to use the union label on all clothing manufactured by them. It was stated that the retail stores are being asked by their customers for label clothing, and it was necessary to meet the demand.

Chemnitz, the German hosiery and glove centre, is at present witnessing an enormous development in its industries.

due to increased demands all the world round for its manufactures. Especially has this been the case with gloves, in which department, ever since 1897, there has been a rapid growth.

Two samples of leggings are being tested at Kingston by the men of A Battery by request of the Militia Department. Both come up to the knee, one is of brown leather, the other of canvas. If found serviceable, one or other will be adopted, thus doing away with the use of top boots and effecting a saving.

Old Country prices for dress goods are steadily advancing, and jobbers say that almost every order they send over meets an advance in price. In some lines of wools, the advance amounts now to more than 30 per cent. over old prices. These changes are due to the growing scarcity of wool, caused by the Australian drouth.

At a meeting of the Wholesale Clothing Cutters' Association, in Montreal, the following officers were elected for the ensuing year: President, O. Aunais, vice-president, A. Regnier; English recording secretary, G. Brehan, French recording secretary, D. Malo; financier, A. Malo. Nine candidates were initiated. The president announced that trade conditions were good.

Stock-taking shows that the year 1902 has been unsatisfactory for British cotton trade. Eighty-five important cotton spinning companies show a net loss of \$7,180. The prospects for the current year are not encouraging, the spinners being handicapped by the fact that the spindles are increasing in number, while there is no development worth speaking of in the weaving department.

The Rubber Boot and Shoe Jobbers' Association of Canada, at their annual meeting adopted the price list submitted by the manufacturers. It shows a slight advance on all lines, and will go into effect on March 1st. In order to protect the public, it was decided that in future all damaged goods should be punched in the heel in order that it may be known that they are not first-class goods.

The Sanitary Gazette draws attention to the fact that silk thread is soaked in acetate of lead for the purpose of increasing its weight, and persons, who pass it through the mouth in threading needles and then bite off the end with their teeth, have suffered from lead poisoning. Cases of arsenical poisoning have also been developed from handling carpets in which poisonous dyes have been used.

The Cassella Color Co., American branch of Leopold Cassella & Co., who have a Canadian agency in Montreal, have issued the following samples: Immedial colors on cotton yarn; Azo Wool Blue B on piece goods and yarns; woolen goods with artificial silk effects, dyed in the piece, Immedial Indone R Conc.; discharging velveteens dyed with diamine colors. The samples are accompanied by directions.

A review of the silk industry for 1902, by the Silk Association of America, shows a fairly satisfactory condition. In England the demand was not quite satisfactory, and in Germany business was bad on account of industrial depression. As for the outlook, the goods market is on a conservative basis, orders being for immediate requirements only. The price of raw silk has, however, advanced since the opening of the new silk season in July.

Numerous seizures of fur for infraction of the game laws are being made at Ottawa. Edmund T. Loveday, warden for Ontario and Quebec, during ten days seized twelve beaver

from Wabigoon, 225 muskrats from Moon lake, and 30 rats and several otter also from Wabigoon, consigned to Pearce & Co., Montreal, besides a crate, marked frozen fish, which contained four large caribou skins, some meat and three or four frozen fish, likely put in as a conscience quieter.

A German patent protects a process for giving a stiff finish to cotton goods, to make them resemble linen. It consists of treating the cotton with bleaching powder to superficial disintegration of the fibre, and then mercerizing. The goods are boiled with a strong soap solution, after the action of the bleaching powder, and then mercerized loose, and rinsed and scoured under tension. A steaming process between the bleaching and the hot soap bath still further improves the effect.

Beaded yarns are obtained by running ordinary yarns through a solution of gelatine, which contains dyestuff, at such a high rate of velocity that the adhering liquid forms from distance to distance small drops, which evaporate and harden to beads. The bottom of the vessel containing the solution consists of a rubber plate with holes big enough to let the yarn pass in from below, but not to let the solution pass out. In order to get the beads at regular equal distances, the gelatine solution in the vessel must be kept always at the same level.

Cotton manufacturers in Canada are announcing an advance in price. The Canada Colored Cotton Company's advance has taken effect. The Montreal Cotton Company and the Dominion Cotton Company announce an advance of $\frac{1}{8}$ to $\frac{1}{2}$ cent per yard, which means $2\frac{1}{2}$ per cent. A similar increase has taken place in flannelette blankets and some other lines of flannelette goods. Scarcity of the raw material and the high price of fuel are given as the cause of this increase. It is predicted that this upward movement will spread to all lines of cotton and woolen goods.

With the exception of 1900, the year 1902 witnessed the largest receipts of manila hemp in the history of the trade. The total receipts for the year were 802,000 bales, as compared with 758,000 in 1901, and 921,000 in 1900. Direct shipments to the United States aggregated 399,000 bales, against 198,000 in 1901, and to the United Kingdom 374,000 bales, as compared with 651,000. Shipments to all other countries were substantially the same in both years. In direct shipments to the United States the year's traffic established a new record, as it was expected to do, when the provision was made for refunding the export tax on such shipments.

Strange as it may seem, Cuba knows absolutely nothing about cotton culture, notwithstanding the fact that the plant is indigenous to the island, where it grows wild, bearing fruit during between nine and ten months of the year. Since their deliverance from Spanish rule, the Cubans have turned their attention to an investigation of their country's agricultural possibilities, and it is likely that great progress will be made towards a fuller development. From recent experiments, it appears that long staple cotton could be cultivated at great profit, and on a very extensive scale. It is predicted that large fortunes will be made within the next few years growing sea island cotton on lands now idle or cultivated with slight profit.

There is a feeling in some quarters that the trade in prints is not as large as it formerly was; that, owing to the large increase in the sales of ready-made goods and the increase in the output of more showy but low-priced fabrics of a light texture, the sales of prints are getting smaller. This is not the case. This season the sales have been larger

for many lines than ever before experienced. Better value is offered in prints than ever before, with a great variety of patterns and colors. Canadian prints have attained a higher standard of quality than ever. The goods are of so fine a character that they have resulted in entirely keeping out of the Canadian markets all the low-grade prints which formerly were imported in large quantities.

A French process for treating fabrics, felt, wool, paper, cork, ropes and similar materials to render them impermeable to fluid consists in immersing the previously cleaned materials in a solution composed of a double sulphate of alumina, tannic acid, alcohol and water in specified proportions, after which they are allowed to dry. They are next dipped in a solution obtained by heating specified proportions of paraffin wax, vaseline and heavy mineral oil in a water bath. Stearine or a similar substance may be substituted, if desired, for the paraffin wax, and the mass obtained is dissolved on cooling in petroleum. The treated materials are then deprived of the excess of liquid in centrifuga' and dried. The objects may be simultaneously dyed by placing the desired pigments in the bath.

Business Notes.

Whalen & Co., milliners, Brockville, are in difficulties. A 25-cent compromise is proposed.

The corset factory at Peterboro was damaged by fire on the morning of January 30th.

J. E. Brown's wool and furniture warehouse, at Hamilton, was damaged by fire to the extent of \$10,000.

D. O. Brown and V. C. Stanley have purchased the men's clothing business of H. E. Beattie, at High River, Man.

The block owned by E. Champagne, dry goods merchant, at Ste. Cunegonde, a suburb of Montreal, was seriously damaged by fire.

Emerson & Hague, tent and awning manufacturers, Winnipeg, have moved into a commodious new brick and stone factory.

T. Armstrong & Brothers, furriers, Lindsay, have assigned. The liabilities are placed at \$9,000, with assets nominally the same.

J. Schwartz & Son, makers of cheap fur coats, at Montreal, have assigned. The senior is said to have been previously unsuccessful in Winnipeg.

John J. Keller & Co., incorporated in New York State, dealers in anilines, dye-stuffs, colors and chemicals, have been licensed to do business in Ontario.

A fire broke out in McLean & Ryan's clothing store at Petitcodiac, N.B., and spread to McFee's and Bleakney Bros' stores, doing \$30,000 damage.

The annual dinner of the J. D. Ivey Co., wholesale millinery, Toronto, took place recently, with J. D. Ivey in the chair, and was the most successful yet held.

F. D. Elkins, E. R. Parke, D. P. Brown, H. A. Ross Pringle, and A. C. Frith, of Winnipeg, are applying for incorporation as The Winnipeg Laundry Co., with a capital of \$5,000.

The dry goods store owned by Alderman P. J. Cote, at Quebec, was damaged by fire to the extent of \$15,000 on January 18th. The stock was valued at \$80,000, and was fully insured.

A demand of assignment has been made upon J. B. Large, doing business as Large & Co., hatter and furrier, Montreal. In 1893, he compromised at 65 cents on liabilities of \$11,000.

E. E. Lackie who conducted a men's furnishings establishment in Toronto, has made an assignment to J. A. Wright. The liabilities are placed at about \$5,000. He started in business about one year ago.

A Sorel clothier by the name of L. Mendelovitch, is reported insolvent, with liabilities of about \$6,000. He has been in Sorel since 1899, and had previously done business at L'Islet and at St. Pascal, Que.

The store occupied by A. W. Cressman, dealer in dry goods and men's furnishings, Peterboro, was badly damaged by fire on February 7th. The dry goods stock of R. Fair, next door, was also seriously damaged.

The building at Toronto, in which A. E. Rae & Co., skirt bindings, and Frank & Bryce, thread and silk merchants, have showrooms, was recently damaged by fire to the extent of \$5,000. The loss was covered by insurance.

Thomas Clearihue, glove manufacturer, of Brockville and Winnipeg, has made an assignment to Sheriff Dana. He was at one time in the employment of James Hall & Co., but several years ago launched out in business for himself.

J. H. Meir, carrying on a retail dry goods business, at Owen Sound, under the style of Meir & Co., with his wife as a special partner, has made an assignment. He has been in Owen Sound only since May last, but before that carried on business at other places.

The bankrupt stock of McFarland, Gray & Southgate, wholesale clothing and woollen goods, Toronto, valued at \$112,385, has been bought in privately by members of the firm at 63c. on the dollar, and is being jobbed off. In the assets is included 125 sewing machines.

The Norman L. Rogers Company, capital, \$30,000, has been incorporated to acquire and carry on the departmental store business of N. L. Rogers, at Newmarket, Ont., with F. S. Cane, Charles H. Lloyd, John E. Hughes, Alfred Webb, K. N. Robertson, and A. E. Coombs as provisional directors.

Last year the M. A. Furbush & Son Machine Co., of Camden, N.J., whose machinery is to be seen in many cotton mills in Canada, sold their loom business to the Crompton & Knowles Works, of Worcester, Mass. Now they have sold their remaining machinery and good-will to the Philadelphia Textile Machinery Co.

D. Cohen, of the firm of B. Cohen, manufacturers of waterproof, showerproof, and oilskin clothing, carriage rugs, etc., and a prominent citizen of Manchester, England, has been on a visit to Winnipeg, opening show rooms. The firm have a branch in Montreal. I. A. Solomon will have charge of the Winnipeg agency.

H. E. Bradley, of Bradley & Co., tailors, Peterboro, has gone to Chicago leaving debts of about \$10,000, with a stock worth about \$3,000. He formerly represented Dunlop, Cook & Co., furriers and tailors, of Amherst, N.S., and in March, 1900, succeeded to the business of A. Mercer & Co., Peterboro. The creditors are chiefly Toronto houses.

Louis Goldsmith and Isaac Walter Romaine, who carried on business as the New Process Cleaning and Pressing Co. in Toronto, quarreled, when the latter shot the former in three places with a revolver, inflicting wounds from which he subsequently died. Romaine is held on a charge of murder.

The annual meeting of the Merchant's Cotton Co. was held at Montreal, February 10th. The following were elected officers for the ensuing year: President, James Crathern; vice-president, W. G. Cheney; directors, R. B. Angus, A. A. Ayer, J. P. Cleghorn, Jonathan Hodgson, and Robert Mackay; secretary-treasurer, W. S. Barker.

A. L. Pentecost, who has carried on a dry goods business in Hamilton alone since August, 1899, being previously in the firm of Campbell & Pentecost, recently sold his stock to Edward Wilson, receiving \$2,000 cash, and notes for the balance, amounting to \$8,000, which he turned over to a firm of solicitors in Toronto for distribution among his creditors. A writ has been issued by a Montreal house to set aside the sale.

A bad failure is that of D. Komieny, clothier, of St. John, N.B., who is under arrest on a charge of obtaining goods by fraudulent representations. About the middle of November he went to Montreal, and is said to have bought from \$6,000 to \$7,000 worth of goods, claiming a surplus of several thousand dollars. He now offers his creditors 40 cents on the dollar, stating that he owes \$6,500, and has only a stock of \$2,500.

Judgment in the case of Dyer Hall, against the Merchants' Cotton Co. has just been given by the Superior Court at Montreal. It was an action for \$259.65 for arrears of salary, and for wrongful dismissal from a position as superintendent of the bleaching department. The company pleaded that plaintiff was not equal to his position, and offered him another appointment, but he refused to perform the duties assigned him, and so was dismissed. The court held that the plaintiff was not, under the circumstances, bound to accept the inferior position, and maintained his action.

The following are the new officers of the Rubber Boot and Shoe Jobbers' Association: President, W. S. Lounson, Montreal, vice-presidents, A. Congdon, D. Leckie, E. L. Rising, Albert Linton and Alex. McPherson, treasurer, Charles Bonnick, Toronto, secretary, J. A. Fullerton, Toronto, executive committee—Ontario, William Garside, Alex. McPherson, D. D. Hawthorne, Quebec, James Robertson, Albert Linton, J. Daoust, Maritime, E. L. Rising, W. A. Angus, L. Higgins, Northwest, A. Congdon, H. G. Middleton, A. Antliffe, British Columbia, D. Leckie, G. L. Allan, J. L. Beckwith.

The Colonial Securities Company is offering for subscription \$150,000 first mortgage 6 per cent. coupon bonds of the Cosmos Cotton Company, of Yarmouth, Nova Scotia. The bonds are offered at \$112.55 and interest, yielding 5 per cent. The entire issue of \$300,000, six per cent. bonds, of which the \$150,000 offered are a part, is a first preferential charge upon the buildings, plant machinery, and all other assets of the company, being further secured by the fact that under the trust deed the company is obliged to maintain an amount of insurance equal to or in excess of the total amount of the bonded indebtedness. The average net earnings of the company for the past three years to July 1st, 1912, were over \$68,000 per year. The interest on the entire bond issue

amounts to \$18,000 a year, with a sinking fund of \$15,000 per annum, making a total charge of \$33,000. It will thus be seen that the earnings are sufficient to guarantee the payment of all fixed charges, as well as assure dividends on the common stock. The Cosmos Cotton Company was incorporated in 1902 by special act of the Dominion Parliament, and purchased complete the long-established business of the Yarmouth, Duck & Yarn Company, the stockholders in the latter company taking stock and bonds in the new company in payment of their interests. The two mills purchased represent 10,112 spindles and 102 looms.

The following companies have been incorporated: Salem Company, capital, \$50,000; head office, Montreal; to manufacture shirts, waists, blouses, cloths, cottons, silks, woolens, clothing, dry goods of all kinds, gloves, ties and collars, and to do laundry work. Joseph Allen and G. Y. Allen, of Verdun, J. H. McKeown, A. H. McDowell, and C. E. Hyde, of Montréal.—Crescent Manufacturing Co., capital, \$500,000; head office, Montreal. To take over the business carried on under the name of the Crescent Manufacturing Company, by James Rodger, one of the present applicants, in behalf of Gault Bros. Company, and for the manufacture and sale of men and women's wear of all kinds.—Hewson Woolen Mills, capital, \$175,000; head office, Amherst, N.S. To manufacture wool, silk, cotton and worsted goods.—Canadian Dry Goods Jobbers, capital, \$40,000; head office, Toronto. To carry on a dry goods business, the provisional directors to be Maurice Bachrack, William Blackley, and Benjamin Bachrack.—The Freeman Woolen Company, capital, \$40,000; head office, Warton. To carry on the woolen mills of B. B. Freeman, the provisional directors to be B. B. Freeman, John W. Nash, Harvey C. Kennedy, Thomas E. Tanner and Daniel Miller.—The Danford Roche Company, capital, \$40,000; head office, Newmarket. To carry on a departmental store, the provisional directors to be Danford Roche, John Allan, James C. Brodie, John H. Brimson and H. A. Willett.—The Bates Felt Company, capital, \$40,000; head office, Dundas. To manufacture paper makers' felts. Provisional directors Charles W. Bates, Wm. B. Croy, C. E. Newberry and W. A. Stewart.—Boston Manufacturing Co., capital, \$40,000; head office, Toronto. To manufacture fancy goods, dress sundries, etc. Provisional directors, Malcolm Cameron, R. S. Wilson and G. H. Kilmer.—Imperial Underwear Company; capital, \$100,000; head office, Peterboro. To manufacture silk, linen, cotton, woolen, paper and other fibres and in underwear, hosiery and knitted wear and woven wear. Provisional directors, Albert Stratton, Adam Hall, R. H. Kells, F. J. Jameson and G. L. Hay.—The McElroy Manufacturing Company; capital, \$40,000; head office, Toronto. To manufacture ready-made clothing, etc. Provisional directors, John McElroy, R. A. Stapells, C. B. McNaught, William C. Harvey and C. C. Van Norman.—The George B. McNeil Co.; capital, \$3,300; head office, Winnipeg. To carry on a business as general merchant tailors. G. E. McNeil, John de Groat, G. W. Donald, F. C. Hubbard, R. R. Dalgleish and C. P. McNeil.—Victoria Clothing Company; capital, \$50,000; head office, Victoria, B.C. To carry on the manufacture of clothing of all kinds.—Imperial Paper Mills of Canada; capital, \$3,000,000; head office, Toronto. To acquire the rights of the Sturgeon Falls Pulp and Paper Co., and to carry on the business. L. G. McCarthy, C. W. Rantoul, jr., and G. C. Loveys, provisional directors.

NOISY GEAR WHEELS.

The difference between noisy gears and quiet gears is often so slight that an expert cannot decide, by mere inspection, to which class a given pair of gears belongs. Both kinds are not infrequently produced in the same lot, apparently under the same conditions. This is disquieting, and may lead to misunderstandings. The inspector has heard so many explanations as to how the bad work came about that he has become skeptical, and when he is told that the noisy gears were turned, cut and fitted to lace exactly like the quiet gears, his relief in narrative statements receives a further shock.

A pair of gears about an inch in diameter, at 10,000 to 15,000 revolutions per minute, will sometimes set up a distressing noise, approaching the shriek of a small steam whistle, which may come from motion of the air and not from faults of construction. And so a constructor of gears has a peculiar anxiety—he is not at all concerned as to the geometrical movements of his gearing so long as it will keep quiet. He has various devices, other than the correct shaping of the teeth, with which he hopes to avoid disagreeable sounds; if he has light power to transmit, he may choose a fine pitch for the teeth; he may make his gears of brass, sometimes of rawhide and again of compressed paper.

One of the details of construction that may cause noises is that the depth of the tooth spaces is not right. In this respect gears are oftener cut too deep than not deep enough, and it is worse to have the driver too deep than the driven gear. Another cause of noise may be that the cutting is not central. This may be shown by gears being noisy in one direction and quiet when running in the other direction. Again, the centre distance may not be right; if meshing too deep, the outer corners of the teeth of one gear may strike hard against the roots of the teeth of the other gear. Still another reason for noise, may be found in the fact that the frame carrying the gear shafts may be of such form and size as to give off sound vibrations.

NEW MERCERIZING PROCESS.

A machine has recently been patented which mercerizes cloth on one side only, thus preventing the fabric as a whole from shrinking. The fabric passes between two rollers, one of iron, the other of India rubber, the iron roller dipping into a trough containing the mercerizing lye. This is made very cold by a system of refrigerating pipes, while in the deepest part of the trough stirrers are placed, which move when the machine is in action, their object being to prevent the lye from freezing. The trough can be removed and replaced by another without interfering with the cooling arrangement. The inside of the iron roller is kept cold with refrigerated brine, and the India rubber roller is so arranged that its pressure on the iron roller can be regulated. The goods are prevented from shrinking by this nip between the rollers and afterwards being wrapped round the India-rubber rollers; they are then rinsed a short time before mercerization. At the temperature used (below zero C.) the process is very rapid, so that a single machine will mercerize up to 25,000 yards a day. The lustre got is said to be extremely fine; there is great economy of lye and the machine requires no special skill on the part of its attendant. The great difference between this and former processes of mercerizing at very low temperatures is that, with them, the cooling took place after the application of the lye, the goods being cooled while under tension and after impregnation with the caustic soda.—Textile Manufacturer.

COMMON FRACTIONS AND THEIR DECIMAL EQUIVALENTS.

Fraction.	Decimal.	Fraction.	Decimal.
1-64.....	.0156	33-64.....	.5150
1-32.....	.0313	17-32.....	.5313
3-64.....	.0469	35-64.....	.5469
1-16.....	.0625	9-16.....	.5625
5-64.....	.0781	37-64.....	.5781
3-32.....	.0938	19-32.....	.5938
7-64.....	.1094	39-64.....	.6094
1-8.....	.1250	5-8.....	.6250
9-64.....	.1406	41-64.....	.6406
5-32.....	.1563	21-32.....	.6563
11-64.....	.1719	43-64.....	.6719
3-16.....	.1875	11-16.....	.6875
13-64.....	.2031	45-64.....	.7031
7-32.....	.2188	23-32.....	.7188
15-64.....	.2344	47-64.....	.7344
1-4.....	.2500	3-4.....	.7500
17-64.....	.2656	49-64.....	.7656
9-32.....	.2813	25-32.....	.7813
19-64.....	.2969	51-64.....	.7969
5-16.....	.3125	13-16.....	.8125
21-64.....	.3281	53-64.....	.8281
11-32.....	.3438	27-32.....	.8438
23-64.....	.3594	55-64.....	.8594
3-8.....	.3750	7-8.....	.8750
25-64.....	.3906	57-64.....	.8906
13-32.....	.4063	29-32.....	.9063
27-64.....	.4219	59-64.....	.9219
7-16.....	.4375	15-16.....	.9375
29-64.....	.4531	61-64.....	.9531
15-32.....	.4688	31-32.....	.9688
31-64.....	.4844	63-64.....	.9844
1-2.....	.5000	1.....	1.0000

THE LEVELING OF PIECE GOODS.*

BY JOHANNES BEETZ, LANGENBIELAU.

Dyeing is no doubt a very difficult trade. Seldom has somebody in any other vocation so much to observe and to consider, and such great responsibility, as such an ever wanted boss dyer. Besides, as is known, at present the highest demands in every direction are expected from the dyer. How easy was it not formerly with the few mineral colors and the small number of artificial dyestuffs. When at that time a pattern was prescribed, only few dyestuffs or mostly only one could come into consideration for that color. To-day it is often difficult for the experienced dyer to determine with surety upon the fibre the dyestuffs employed for a pattern.

It is not easy, with the truly unaccountable great number of artificial dyestuffs at present in the market, to get and retain a complete knowledge. But the "able" dyer must not only know all dyestuffs, but must correctly estimate their properties of fastness and have to some extent the prices at his fingers' ends, so that he can from case to case select the correct thing for "cheap" dyeing is at present one of the main points; quick and sure matching of patterns is a matter of course. But not in the last place is the greatest "evenness" of the dyed goods demanded. But where is the dyer who on resampling the dry lots has not yet been near to a mild state of desperation.

Although one is conscious of having observed the great-

*Deutsche Faerber Verband.

est caution, the dyed pieces are perhaps two-colored and mottled, or wrinkled and full of folds, the dyed yarn streaky and specked, dyed loose wool white-tipped, and so forth. For weeks, or for years, perhaps, the same colors have turned out faultless upon the same material, even the expert dyer is then not always able to state the cause of such discrepancies with certainty. Nevertheless it is absolutely necessary to find out or with surety recognize the cause of the defects, if one wants to avoid them in future cases. The object of this writing is, therefore, to discuss the causes which often cause uneven dyeings in piece goods dyeing. As is known, by far the greatest quantities of material are dyed in the piece. This kind of dyeing is easy to carry on in the large style, and that without expensive plants, nor are particularly skilled workmen required for it. Piece dyeing belongs to the most remunerative occupations of the dyer, if in the preceding manufacturing processes, as washing, spinning, weaving and fulling, carbonizing and finishing, the tissue has been properly and correctly treated. The more unsatisfactory is, on the other hand, the dyeing of faultily prepared piece goods. Then it is in many cases positively impossible for the dyer to produce a uniform dye. For that reason is the piece dyer always ready, and that often justly, when uneven pieces turn up, to lay the fault at the finisher's door.

On the other hand, it may with certainty be expected that the finisher avers to have "treated the piece like all the rest," and consequently was the dyer to blame. For this reason exists in many cloth factories where not always everything goes on smoothly, and everywhere a snag is sometimes struck, a state of war between the dyer and finisher, and it is regrettable that for the same cause legal proceedings often occur between job dyers and manufacturers, which are mostly equally unpleasant for both parties.

In the first place, it must be emphasized that far better dyeings can only be obtained upon carefully cleaned material. Woolen and half-woolen pieces sometimes still contain unsaponified or unsaponifiable fats (mineral oils), remnants of soap, lime-soap, or other foreign substances which do not belong there. Such material has mostly a smeary, greasy or harsh feel and should be rejected by the dyer, or he should first clean them at the expense of the employer. The best plan is to pull all pieces before they go into the tub over a pole and carefully examine them. When any defect shows itself, it is recommendable to call the manufacturer's or finisher's attention to it. If then they observe, "that does not matter," such pieces can naturally only be dyed "without guarantee." Suspected places are practically marked by threads sewed in; by strict observance of this precaution much unpleasantness can be avoided.

By the carbonization likewise can goods in consequence of negligent working be influenced in such a manner that the dyer cannot produce an even or level color. If, for instance, the material after hydro-extracting from the carbonizing liquid is allowed to lie for some time, so that some places become dry, either by evaporation of the water at the exposed places, or by the action of direct sunlight, these places become by the subsequent drying weak and dye more intensely in consequence of chemical alteration. As particularly the folds and the top layer of the press-boarded cloths are exposed to drying, such defects of carbonization show themselves mostly at regular intervals in the form of bands running across the width of the pieces and at the ends.

For the carbonization of cloths are in practice principally sulphuric acid 4-6° Re. or a solution of aluminum chloride 6-8° Re employed. The carbonization with sulphuric acid requires greater attention in handling than that with aluminum

chloride, which latter less attacks the color. Ammonium chloride is in the carbonizing stove split into hydrochloric acid and chromium hydroxide, according to the chemical equation: $AlCl_3 + 3H_2O = Al(OH)_3 + 3HCl$. The hydrochloric acid liberated by the decomposition rots the vegetable matters, while the aluminum hydroxide, being difficultly soluble in water and weak alkalies, fixes itself upon the fibre, envelops it, and thus causes a harder feel of the material.

Cloths that have been carbonized with aluminum chloride are for this reason difficult to wet out; the dyeing of such pieces, therefore, requires the greatest caution. If they are dyed with well-equalizing acid dyestuffs in a strongly acid bath, there is no cause for apprehension. The aluminum hydroxide which is deposited upon the fibre is by the sulphuric acid contained in the dye bath transformed into soluble aluminum sulphate. The material becomes thereby again clean, and is able to uniformly absorb the dyestuff.

Different, however, is the case when mordant dyestuffs and other colors are used. It may in this place be specially remarked that carbonized and non-carbonized wools must never be worked up to woolen or half-woolen cloths that are to be dyed in the piece. Carbonized wool (and, therefore, art wool, too) possesses much greater affinity for all dyestuffs, and therefore dyes darker. After dyeing such pieces are liable to look mixed and gritty, and then can in most cases only be dyed black.

Another source of imperfectness as regards uniformity of the resulting dye is presented in the carelessly or not properly effected decatization of the pieces, whereby principally dark ends, dark selvages and the notorious "water stains" are produced, which mostly remain higher. After dyeing, such defects cannot be remedied. They are caused by too high tension or too wet steam during the decatizing operation, as by accidental wetting of some parts before decatization. Badly decatized piece goods are advantageously dyed black with logwood and iron salts, by which method of dyeing, according to experience, irregularities are best covered up.

By carelessness of the dyer can two-colored tissues, clouds, dark ends, dark selvages, dye-spots and heat-creases be produced. Whereas "clouds" and other unevennesses are not caused by uncleanness of the material and the above-mentioned defects in finishing, the origin is to be looked for in the careless or incorrect treatment during the dyeing process. Naturally, the evenness of the resulting dye depends also to a high degree upon the selection of the dyestuff to be used, and for that reason are the so-called equalizing dyestuffs, such as Patent Blue, Azofuchsine, Fast Yellow, etc., especially preferred in piece dyeing.

In the case of other less level equalizing dyestuffs, substantive and mordant dyestuffs, good wetting out previously to dyeing is the first condition; then the bath must not be entered too hot, and the temperature not raised too rapidly.

With quickly dyeing acid dyestuffs great discretion is necessary in adding acid to the dye bath. The best plan in that case is to dye in a bath of Glauber's salt with an addition of a little acetic acid from cold to boiling hot, or with an addition of ammonium acetate or sulphate. The salts of ammonia, as is known, are during the dyeing process slowly split into the volatile gaseous ammonia and acid. The acid required for the fixation of the dyestuff is, therefore, liberated very gradually, and correspondingly is the dyestuff likewise slowly and evenly fixed upon the fibre.

A piece-dyeing tub that is not practically constructed may also be the cause of uneven dyeings. The reel, for instance, must not run too slowly, and the material to be dyed must

be protected against contact with the steam pipe and direct steam; nor must the proportions of the steam coil be too large.

Again, more material must never be entered into one dyebath than has easily room in it, because otherwise the dyebath cannot uniformly penetrate the material that is too solidly pressed together.

Dark selvages can be produced, when mordanted or dyed material is so spread over horses that the selvages hang down. The bath, which in many cases still contains mordants or dyestuffs following the law of gravity, descends to the selvages that hang lower and can there cause a stronger mordanting or stronger color. For that reason the cloths are in piece dyehouses generally cooled upon large wooden platforms and rinsed or hydro-extracted immediately after being.

To the most dreaded manifestations in piece dyeing belong the so-called heat blows or crinkles, which are produced in woolen stuffs, when the material coming from the boiling bath is left to lie in laps or stand wound up in a rope upon the truck. To avoid them, the dyebath is chilled before winding up, or the dyed or mordanted piece is from the boiling bath directly reeled into another tub standing nearby, which contains clear cold water.

Very similar to the heat crinkles are creases which are formed when pieces "run hot" in fulling. The attentive dyer, however, mostly discovers this defect already on wetting the goods, and can easily obviate unjust accusations.

In cotton piece dyeing occur not by far so many defects. Ordinarily the dyer himself cleans his material by boiling out with solutions of alkalis; the pieces undergo, therefore, no complicated preparatory treatment like the woolen goods, and as is known, cotton is less sensitive to the various influences than wool.

RECLAIMING RUBBER.

In Buffalo, N.Y., there is a plant for the purpose of reclaiming old rubber. The company is constantly buying stocks of old rubber, which undergoes the following processes. When the rubber is received, it is conveyed to the sorting-room, where hundreds of men and boys prepare it for the process of conversion into crude rubber. Here all foreign substances are removed, as far as possible, and then the material is sent along to another department to be cooked and devulcanized. Finally, when it has been subjected to treatment which has reduced it nearly to its original state, it is sent to the rolling room to be flattened into large sheets for shipment and commercial use.

PRINTING PROCESS.

A late issue of the Textile Mercury contains a brief description of a new process of color printing, the invention of a Russian engineer. While as yet its use has been limited to paper and tin, there is every expectation of its application to calico and other fabrics. Each separate color requires a separate plate, which is fixed in absolute register with other plates round the circumference of a cylinder. Round this also are arranged inking rollers, and the mechanism attached to these is such that, as the cylinder revolves, the plates get inked each with its own color only: thus a red plate gets inked only by red ink, and is missed by the other inking rollers. From these plates the colors are transferred to composition transfer rollers; then, in turn, are transmitted to a printing surface proper, which is of a hard nature.

When all the colors are applied from the transfer rollers to this printing surface, the paper is brought into contact therewith, and the printing is effected by pressure in the usual way, the rate being from 1,200 to 1,400 impressions per hour. One feature is that only a light pressure is needed even for the heaviest colors, so that with one machine and at one time it is possible to print both light and full colored plates. By a little modification the Mercury thinks the process could be applied very readily to cloth.

ELECTROLYTIC BLEACHING.

The operation of bleaching textiles by means of the electric current is not at the present time an actual reality, says the Textile Record, but constant researches are always being made aiming to a practical solution of the problem, and no doubt, at some future date, the announcement will be made that some one process is a commercial success and in actual operation. It must not be understood, however, by electrolytic bleaching that the results are obtained directly by means of the current, for such is not the case. What the current of electricity does is to decompose or "electrolyze" a solution of some soluble chloride—for instance, magnesium chloride—the resulting solution containing as the final product a compound of chlorine, which is capable, in the presence of organic matter or fibres, to produce in a separate vessel the operation commonly called bleaching.

The serious drawback to the successful operation of bleaching with such electrolyzed solutions is the comparatively high cost of bleached yarn in comparison with yarn bleached with ordinary "chloride of lime" solutions.

Another weak feature about the electrolytic process is the extreme difficulty of producing sufficient volumes of active bleaching liquor containing more than 5 or 5.5 grams of chlorine per litre. When this condition is reached, then the process of cotton bleaching will become comparatively simple.

The ideal process for such work will consist of a supply tank or vat containing the alkaline chloride solution of proper strength and maintained at a suitable temperature, then the electrolyzing tank, wherein the solution will be subjected to the action of the electric current, and the bleaching tanks, where the active solution will be brought in contact with the goods or material to be bleached. Experiments made on a working scale have demonstrated that this is a practically working process and method of procedure, but up to the present time the details have not been improved so as to make the cost of operation come within practical working limits.

At present the proper means of electrolyzing the salt solution is the weak point, owing to the loss of current, but this will be eventually improved. Until this is done, the process cannot be regarded as perfect.

Cotton that has been bleached by this means possesses all the good qualities of the same material bleached by the ordinary process, but with none of its disadvantages, one of which is the absence of oxycellulose, a feature that will at once commend the process. This will also insure stronger yarns or piece goods.

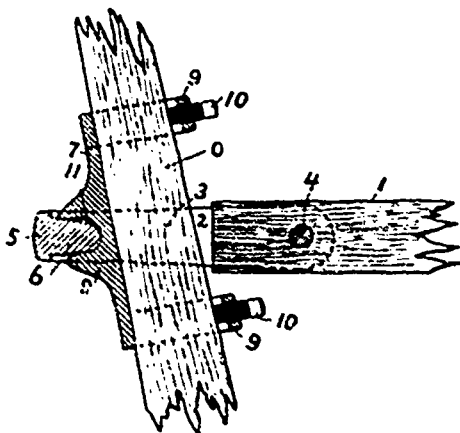
One of the features of the electrolytic process is that the impoverished solution is returned to the electrolyzer, replenished with a small quantity of fresh salt solution and the current turned on again and the whole cycle of events repeated. There is no doubt but that the bleaching process for cotton piece goods will be worked out so as to be continuous and the use of the well-known kiers done away with.

A COMBINED STOP AND ALARM MECHANISM FOR CARDING MACHINES.

A new stop motion for cards has been invented by an American manufacturer, which stops the machine when the form of the sliver—as, for instance, the thickness—varies to an extent which will produce an objectionable irregularity in the yarn. This object is accomplished by employing a controlling device supported by the sliver passing over the feed table and designed to effect the stoppage of the machine not only upon the breaking of the sliver, but also upon the delivery to the feed table of a sliver lacking in that uniformity of size and weight which is necessary to secure a corresponding uniformity of the yarn. The invention consists in the arrangement for disconnecting the power from the cards and controlled by a circuit-closer for operating the device. It will be seen that this device is supported and held out of its operating position, not by reason of the tension upon the sliver, but by the bulk, and is capable of being operated to stop the card when the sliver passing over the feed table does not possess proper uniformity, it being well understood that the irregularity of feed is frequently the cause of the imperfect operation of the self-feeder, which conveys the loose fibre from the hopper to the first breaker.

NEW PICKER-STICK CONNECTION.

A recent number of the Textile Record contains an illustration of a new picker-stick connection, which does away with the use of a sweep-strap, and seems to be possessed of merit. The accompanying illustration is a side elevation of the sweep-stick, together with the adjacent portion of the picker-stick, the two being united by the new connector, which is shown in section. Upon the outer end of the sweep-stick 1 is secured one member 2 of a connector, consisting of a substantially rigid loop, preferably of metal, formed with side bars 3, secured to each side of the sweep-stick by one or more bolts 4, and with a connecting end bar 5. Within the loop is a projection 6, shown as formed with a rounded end toward the picker-stick 7, the latter being surrounded



by the loop. The picker-stick carries the companion member 7 of the connector, consisting of a block 8 resting against the outer side of the stick and adjustably secured in place thereon by two bands, which encircle the picker-stick, being held in place thereon at the desired point by set-screws 10. The block 8 is provided with a transverse groove 11, adapted to receive the projection 6 on the loop, the bottom of said recess being preferably rounded to conform to the end of the projection. Since the groove 11 is of considerable depth, rebound of the picker-stick is permitted without the possibility

of the separation of the elements of the connector, obviating the danger of its breakage at the end of the stroke of the picker-stick. It will thus be seen that there is not much wear on the picker-stick or sweep-strap, and at the same time all danger of breakage is obviated.

Foreign Textile Centres

Belfast.—The market continues to show a fair amount of strength, but fresh business is not coming forward with much briskness. The rising tendency of the raw material will compel advances in manufactured goods, but it is doubtful if buyers will follow. Spinning is a shade quieter, but producers are well sold ahead and hold out for full prices. The manufacturing branch keeps fairly busy, and a moderate amount of buying is going on. White goods for the home markets are selling a trifle better, but without any briskness. The export trade is satisfactory on the whole, though Cuban prospects give some concern.

Leeds.—Manufacturers of winter goods report that the recent severe weather has brought them a considerable number of orders, thus enabling them to clear their stocks at the season's prices. To a large extent this business comes from the clothing factories, and as it is requisite that the increased demand should be met at once, prompt delivery is insisted upon. The spring trade continues satisfactory. Producers of the finer worsteds are doing a fair amount of export business, especially with the United States. The Continent is likewise placing orders of the same kind. The low-class woolen branch is participating more freely than of late in the shipping trade, and Japan and other markets in the Far East are taking considerable quantities of cheap goods. The men's ready-made trade is being somewhat inconvenienced by the late deliveries of tweeds. Hitherto these have been mainly produced for men's wear, but they are now being extensively cut up for the women's trade as well, and the production has apparently not been sufficient for both. Grays and black end white effects have the preference in both branches.

Leicester.—There has been considerable activity in home-grown wools, with a good turnover at steadily advancing rates. Spinners of fine cashmere yarns have had considerable offers made, but at prices that could not be accepted; consequently smaller contracts for early delivery have been placed at about market rates. Local spinners are fairly employed. Hosiery manufacturers find buyers are operating six or eight weeks earlier than usual, but, having to pay advances, orders are not heavy, even though merchants' stocks in many quarters are entirely cleared out.

Nottingham.—In the general condition of the lace trade no material change has occurred within the last month. Arrears of orders from the United States have been largely wiped off, and Continental business is not for the moment brisk. The prospects are good, however, in both markets, and although the home trade is quiet just now, an early improvement is anticipated with confidence. In the plain net branch more business could be done. Frillings and veerings are not very buoyant, and the silk departments are without animation. There is plenty for bleachers and dressers to do. Makers-up are well employed. The hosiery trade is not particularly active in any branch, but the outlook is considered encouraging.

Bradford.—Bradford has now a new Conditioning House. The institution has had twelve years' existence and has made itself indispensable to the Bradford trade, its certificate being accepted as an unimpeachable guarantee. From 400 to 700 packages, a great proportion being large bales of wool, are dealt with daily, and only an inconsiderable portion of the wool combed in Bradford passes through the institution. Increased accommodation had become necessary, and now it is provided.

Dundee.—The jute trade is in a rather better position. The demand for Hessians is better. Prices may not be quoted higher, but goods are wanted and sell more freely. Jute is also a shade firmer, especially good qualities. Buyers still hope for lower values, but realization of these, so far, appears unlikely. Heavies are quiet, but without change in values. In miscellaneous jute goods for the home trade there is more doing and all prices are stronger. Flax is still strong, but not dearer. It has risen, say, £3 a ton from the bottom, and at this price spinners show great reluctance to buy, as it is quite impossible for them to follow the rise, until there is a much greater demand for yarn. Tows are scarce and dearer. Fifehire continues to enjoy a good demand for damasks and fancy linen goods, chiefly for the American market. Brechin, Forfar and Arbroath are quiet, and it is difficult to keep all the looms going with heavy linens, which are the goods chiefly made.

Kidderminster.—Recent advances in the price of materials have given confidence to dealers and they show a better disposition to place orders. Some good orders are being sent in by travellers for all classes of carpets and rugs, and trade is brisk with a very buoyant tone. Spinners, too, are well employed. Prices all round remain firm.

Manchester.—There is no satisfactory evidence that the trade will soon see lower prices for raw cotton. The small crop and large crop advocates continue to advance mutually destructive arguments, leaving those who pay attention to them more bewildered than ever. In the general aspects of the market there is some improvement. Buyers seem to be gaining confidence in the future of the market, or otherwise find themselves unable to evade operations any longer. Spinners have improved their position during the past few weeks, and manufacturers are endeavoring to emulate their example. There is a fair amount of business in cloth, and prices are hardening. The tendency for yarns is distinctly upward. A much better tone prevails in the market generally.

Rochdale.—Business at the flannel market is quiet, although the spell of cold weather has considerably reduced the stocks of drapers. Flannel has advanced, and makers are in a strong position for new business. The Government is inviting tenders for 1,420,000 yards of flannel for the navy, which is slightly in excess of last year's contract.

THE ANGORA GOAT.

The coat of the Angora goat is not quite wool nor yet hair, but is used as wool for the manufacture of a lustrous material for women's dress, known as mohair. The hair is of a fine texture and lustrous appearance; the skin makes an excellent fine leather which is used for women's footwear. As the demand for Angora products is just now unusually active, and seems likely to remain so, this animal, which is attractive for its beauty, is getting considerable attention. As a meat-producing animal, it will no doubt take its place with cattle, sheep and hogs in feeding the ever-growing meat eating population of the world, but it will never affect the

beef, mutton or pork trade of this or any other country. When venison is scarcer and consequently dearer than it is to-day, Angora meat may take its place, as it closely resembles the flesh of the deer. Nor will it kill the wool industry of the world, for the warmth of the sheep's fleece will be always sought by all manner of people in the temperate and frigid zones. Its mission is to supply mohair for the manufacture of delicate fabrics and to clear the brush from off the land, for it has an eager appetite for coarse woody matter, such



\$1,050 Buck Pasha Columbia.

as the young sprouts which grow in newly-cleared lands and neglected fields and fence rows. The goat is naturally a browsing animal, as the deer is, and hence is quite serviceable to farmers who are troubled by undergrowth.

At a sale of Angora goats, recently held at Kansas City, the champion buck of the show was bought by Mrs. M. Armer, of Kingston, N.M., for the record-breaking price of \$1,050. He is a notably fine animal, and experts consider that he is worth the price. Our illustration shows this valuable animal.

LESSONS FOR MILL HANDS.

PREPARED BY A COMMITTEE OF THE CANADIAN ASSOCIATION OF STATIONARY ENGINEERS.

In our system of notation a unit of any order of units is ten times as great as a unit of the next lower order. We can also state the same fact, that a unit of any order is one-tenth of a unit of the next higher order. Fractions written in this way are called decimals. It is necessary to show where the unit is and where the fractional part begins. This we accomplish by means of a period, and call it a decimal point; always placing it directly after units, and preceding the decimal part of the number. A decimal is one whose denominator is always 10 or some power of 10, as 10, 100, 1000; but

its numerator may be any number, as $\frac{3}{10}$, $\frac{4}{100}$, $\frac{6}{1000}$, but to

write these decimal fractions correctly there should be as many figures in the numerator as there are ciphers in the denominator; if there is not as many they should be made so by writing ciphers to the left of the numerator, thus,

$\frac{3}{10}$ $\frac{04}{100}$ $\frac{006}{1000}$. The reading of a decimal number depends

on the number of decimal places in it, that is the number of figures to the right of the decimal point. This being the case the denominator can be done away with, and the decimal

fraction written with the decimal point before it; thus, — becomes .1 and its value is one-tenth of a whole number. and 3. — would be .3, our — would be .04 and the — would be 10 — would be .006. You will now see that one decimal place expresses tenths, two expresses hundredths, three expresses thousandths, and so on, and that the denominator is always 10, 100, 1000, etc., and that it is not expressed in figures. The number of decimal places tell us just what it is; thus,

$$\begin{aligned} \frac{6}{10} &= \frac{6}{10} = 6\text{-tenths.} \\ \frac{6}{100} &= \frac{6}{100} = 6\text{-hundredths.} \\ \frac{6}{1000} &= \frac{6}{1000} = 6\text{-thousandths.} \\ \frac{6}{10000} &= \frac{6}{10000} = 6\text{-ten-thousandths.} \\ \frac{6}{100000} &= \frac{6}{100000} = 6\text{-hundred-thousandths.} \end{aligned}$$

The place occupied by the last number of the decimal gives its name to the fraction. Inserting a cipher between a number and the decimal point divides that number by ten, while adding a cipher after a decimal number does not alter it in any way; thus, .6 = $\frac{6}{10}$, .60 = $\frac{60}{100}$, but $\frac{60}{100}$ (reduced to its lowest terms), is $\frac{6}{10}$, so you will see $\frac{6}{10}$ and $\frac{60}{100}$ are equal, consequently .6 and .60 are also equal.

To Bring a Decimal Fraction to a Vulgar Fraction.—It will be plain to you by the above that all we have to do is to put the given decimal down as a numerator, and for the denominator use the figure 1 with as many ciphers after it as there are in the given decimal, then reduce it to its lowest term. Thus, bring .25 to a vulgar fraction $\frac{25}{100} = \frac{5}{20} = \frac{1}{4}$. Another; bring .875 to a vulgar fraction, $\frac{875}{1000} = \frac{175}{200} = \frac{35}{40} = \frac{7}{8}$.

To bring any vulgar fraction to a decimal, attach any number of ciphers to the numerator and divide by the denominator, being sure to have a figure in the answer for each cipher attached.

$$\begin{array}{r} 4 \overline{) 1.00} \\ \underline{4} \\ 60 \\ \underline{60} \\ 00 \\ \underline{00} \\ 00 \\ \underline{00} \\ 00 \\ \underline{00} \\ 00 \end{array}$$

Thus bring $\frac{1}{4}$ to a decimal, .25

Or bring $\frac{15}{16}$ to a decimal,

$$\begin{array}{r} 4 \overline{) 15.0000} \\ \underline{16} \\ 16 \\ \underline{16} \\ 0000 \\ \underline{0000} \\ 0000 \\ \underline{0000} \\ 0000 \end{array}$$

.9375 Ans.

You may sometimes find it convenient to reduce a decimal to a particular vulgar fraction, as quarters, eighths, sixteenths or thirty-seconds, it is done as follows: Multiply the decimal by the denominator you want to bring it to and mark off as many figures from right to left as were in the given decimal, whatever number is to be left of the decimal point is the numerator.

How many sixteenths are there in .188 ?

$$.188 \times 16 = 3.008 \text{ or slightly more than } 3/16.$$

Addition of Decimals.—Place the quantities down with decimal points all in a vertical line, then add as simple addition, and put the decimal point result under the decimal points.

Subtraction of Decimals.—Place the decimal points in line as in addition. If one line has more decimal figures in it than the other, put ciphers at the end of the one that is deficient until they are equal then proceed as in simple subtraction. Place the decimal point in the remainder under the line of decimal points.

Multiplication of Decimals.—Multiply as in common multiplication, regardless of the decimals. Count the number of decimals in multiplier and multiplicand and point them off, from right to left, here place your decimal point and you have the answer.

Division.—When the divisor is a whole number, divide as in simple division. Upon reaching the decimal point place a point in the quotient to correspond with it. Example—divide 762.544 by 4.

$$\begin{array}{r} 4 \overline{) 762.544} \\ \underline{4} \\ 362 \\ \underline{36} \\ 254 \\ \underline{24} \\ 144 \\ \underline{144} \\ 000 \end{array}$$

When the number of decimal figures in the divisor is less than that in the dividend, divide without taking notice of the decimals; then subtract the number of the decimals in the divisor from those in the dividend. The remainder will be the number to mark off in the quotient. Thus, $.5 \overline{) 172.4025}$

$$\begin{array}{r} 344.805 \end{array}$$

Here we say one from four leaves three; we then have three decimals in the quotient. When the decimals in the divisor are more than in the dividend: First equalize by adding ciphers to that which is the least, then leave out the decimals and divide as in simple division. The quotient will be whole numbers. Thus, divide 1.1 by .275.

$$\begin{array}{r} 275 \overline{) 1100} \\ \underline{1100} \\ 0000 \end{array}$$

Answer—4, a whole number

To reduce inches to the decimal of a foot, add a cipher to the inches and divide by 12. Thus reduce 9 inches to the decimal of a foot,

$$\begin{array}{r} 12 \overline{) 900} \\ \underline{72} \\ 1800 \\ \underline{1800} \\ 000 \end{array}$$

The Use of Signs.

In order that students may read simple formula, it is absolutely necessary to become familiar with the signs used.

+ Is read plus, and means that the number after it is to be added to the one before it, viz., 4 + 3 are 7.

— Is read minus, and means the number after it is to be subtracted from the one before it, viz., 4 — 1 are 3.

× Is read multiplied by, and means that the number before it is to be multiplied by the one following it, thus, 9 × 3 are 27.

÷ Is read divided by, and means that the number before it is to be divided by the one following it, thus, 9 ÷ 3 are 3.

16.5
— Is read 16.5 divided by 5.5, and means the same as 5.5

16.5 ÷ 5.5 = 3.
= Is read equal to, and means that the quantity before it is of the same value as the quantity after it, thus, 5 + 6 = 11

7² Is read 7 squared, and means that 7 is to be multiplied by itself, thus 7 × 7 = 49, and 49 is called the square of 7, and 7³ reads 7 cubed = 7 × 7 × 7 = 343, and 7⁴ means 7 raised to the fourth power = 7 × 7 × 7 × 7 = 2401.

√49 means the square root of 49, and is that number which multiplied by itself will produce 49, as 7 × 7 = 49, hence 7 is the square root of 49.

— Is read the difference between, and means the lesser

number, whether before or after it is to be subtracted from the larger one, thus, $7 - 9 = 2$.

() are called brackets, and mean that all quantities between them are to be put together first, thus: $7(8-6+4 \times 3)$ means that 6 must be taken from $8 = 2$ and the $4 \times 3 = 12$ to this add the $2 = 14$ then 14 is to be multiplied by the 7, $14 \times 7 = 98$.

When no sign is placed between the number and the bracket it means the quantity within the bracket is to be multiplied by the number outside, thus, in the foregoing the quantity within the bracket $= 14$ and is to be multiplied by 7.

Members will please work out the following: A pump discharging 135 gallons per minute will fill a tank in 38 minutes; how long would it take a pump discharging 85 gallons per minute to fill it.

A piece of shafting 3.5 feet long weighs 37.45 lbs.; how much would a piece $6\frac{1}{4}$ feet long and of the same diameter weigh.

An engineer is allowed $4\frac{1}{2}$ per cent. on all coal saved in one year; what is the value to him if he has 95 tons left, the cost of the coal being \$3.87 per ton.

SOME NOTES ON NATURAL AND ARTIFICIAL INDIGO.

BY JOHN WADDELL, D.S.C. SCHOOL OF MINING, KINGSTON.

It will, perhaps, be some time before there will be unanimity of opinion in the trade, as to the comparative merits of artificial and natural indigo. The case is somewhat similar to that of cane sugar and beet sugar. As the sugar part in these latter is identical, so the indigo part in the two former is identical. It has exactly the same composition, the same chemical reaction, whatever its source. But as in the case of sugar, the imperfectly refined products contain different impurities; raw beet sugar differs from raw cane sugar, being, as a matter of fact, not nearly so palatable. Maple sugar owes its value to the pleasant character of the impurities, of which there are only small quantities, and these of an agreeable flavor, the sugar from the maple being identical with that from the beet and the cane. So it is not a priori impossible that natural indigo, in virtue of its very impurities, might be a better dyeing material than artificial indigo, which is a pure product. The subject is matter for experiment, not only by the dyer in the dyehouse, but by the chemist in the laboratory, and these two should cooperate. Natural indigo contains, in addition to indigo blue, or indigotin, three main impurities, namely, indigo gluten, indigo brown, and indigo red. These are present in small quantity. The question whether these impurities are useful or not does not arise merely in the contest between natural and artificial indigo, but it is a question between various kinds and grades of natural indigo. Some low grade African indigos contain eight per cent. of indigo red, whereas the best qualities of Java and Bengal indigo contain between two and three per cent. Moreover, pure indigotin may be extracted from natural indigo.

About sixty-five years ago, the effect of the three impurities was very carefully examined by Schwartzberg and Schwartz, and their conclusions seem to be very firmly established. They proved that indigo gluten and indigo brown have no influence, either beneficial or otherwise, taking no part at all in the dyeing process. The case with indigo red was different. It is a true dyestuff, being reduced along with indigo blue. But it was found that the beauty of the shade was lessened by the indigo red and the deterioration of the

color increased with the increase of the impurity. In the best dyeworks the indigo red is almost completely removed from the fabric in the acid and rinsing baths. Indigo red is, therefore, not fast, and it seems altogether improbable that its presence can make indigo blue more fast, as has been maintained by some advocates of natural indigo. The conclusions drawn by the two chemists mentioned above have been corroborated by several investigators since.

It has been argued that the presence of indigo red in the vat promotes the proper working of the vat itself. But indigo red is more difficult to reduce than indigo blue, because its reduction involves a greater decomposition of the molecule and probably the greater part of it remains undissolved in the vat sediment. A small part of the indigo red is changed under certain circumstances, noticeably in the dyeing of wool, into indigotin. Some of it is converted into a brownish material that is far from beneficial to the shade. It does not, therefore, appear likely that the presence of indigo red helps the operation. The use of indigo red alone, as dyeing material, does not give pleasing results. In ordinary cases, the shade is not so fast as in the case of pure indigo blue, though when indigo red is obtained perfectly pure, the dye is said to be permanent.

It is not probable that indigo red is useful, though it is not inconceivable that a certain small percentage might be useful. Sometimes a small quantity of an ingredient is useful though a large quantity is harmful. A remarkable example, illustrating the effect of impurities, is given by the ordinary gas mantles. These are made of thoria with a very small quantity of ceria. A mantle made of pure thoria is almost non-luminous, a mantle of pure ceria is also nearly non-luminous, but half a per cent. of ceria added to thoria makes a mantle giving a very brilliant illumination. The reason for this phenomenon is not known, though there is no doubt about the fact. Hence, in the absence of direct proof, it is not safe to say that the presence of indigo red may not help in the vating process. The matter could be settled by carrying out a series of experiments in dyeing, having the conditions the same in every case, except that varying quantities of indigo red, from nothing up to five per cent. or thereabouts, be added to pure indigo blue.

It is worthy of particular notice that a reddish shimmer on the surface of indigo does not indicate the presence of indigo red, but rather the opposite. The reddish, bronze-like shade is an optical effect due to the particular form of the crystals of indigotin. In impure indigo, the crystals are not so well developed and the sheen is not so pronounced. Any dyers who have affirmed the value of indigo red owing to the presence of the red tint in the material used, have really given their evidence in favor of pure indigo blue.

While it is perhaps too much to say that it has been absolutely proved that pure indigotin (and, therefore, the artificial product), is superior to natural indigo, which, as brought to the market, is impure, yet the balance of evidence is in that direction, and it is incumbent upon the advocates of natural indigo to make good their claim.

FRENCH-CANADIAN HANDICRAFT.

The Dry Goods Review recently called attention to some quaint, homespun cloth with a tufted surface at the Woman's Exhibition in New York. This homespun was woven by the French-Canadian women of the province of Quebec, and enquiry led to an interesting phase of women's work in handicrafts in Canada.

Miss Edith Watt, who has charge of the depot con-

ducted by the Montreal branch of the Canadian Woman's Art Association, has been studying the whole subject of handicrafts in the United States. The Canadian association, which has branches in every city of importance in the provinces is endeavoring to develop the native industries among the women, as the Deerfield and other industries have been developed in this country. The French-Canadian women make rag carpets and rugs and weave homespuns. Their only market for this is with the village storekeeper, who allows them credit for it, or an occasional piece to a summer tourist. The Woman's Art Association desires to furnish them with artistic designs and dyes, and eventually use a stamp for the best work, like that used by the Arts and Crafts Association. It also wants to provide a market for the work, very much on the plan of the woman's exchanges, retaining only enough of the proceeds to pay expenses. The depot in Montreal is run on this plan. The farmers' wives around the Bay of Chaleurs make the best things. They manufacture a pretty rag carpeting, which is sold for 45 cents a yard.

Besides the French women in Quebec, there are in the Northwest colonies of Galicians, who make a fine artistic cross stitch, something like the Bulgarian embroideries, and weave both cloth and linen. The men also make pottery, hammered copper and Russian lacquer work. Throughout Canada are the Indian women, who retain their primitive manufactures of baskets, moccasins, bead work and sometimes rugs. Indians are found within nine miles of Montreal, and from there all through the backwoods to the oceans. As soon as one gets up into the Hudson Bay country or elsewhere off the beaten tracks, he finds excellent Indian work, which degenerates as it comes in contact with civilization.

WOOLEN MANUFACTURING IN CANADA.

Industrial Canada breaks out into reminiscence in a recent issue, and refers to the early history of the woolen industry, as follows: Of all great Canadian factory industries, probably the manufacture of cheese most affects the farmers, but the woolen industry follows very closely. Both cheese making and woolen manufacture were formerly farmhouse industries in Canada, but the latter was the first to be transplanted. The first process transferred from the farmhouse to the factory was the carding of the wool. Carding mills were established at a very early period in the history of this country. In the year 1818, Smith Griffin, one of the United Empire Loyalists, had in full operation at Smithville, in Lincoln County, a flour mill, a saw mill and a carding and fulling mill. The stone dam he built to secure the power still remains in good condition, but the mills have long since passed away. The farmers brought their wool to the carding mill to have it carded, and then took it home to their wives to spin into yarn. It was then woven on farmhouse hand looms and taken back to the mill for the fulling, dyeing and finishing processes. Probably the first factory woolens made in Ontario were manufactured in a mill established by Hon. James Crooks, in West Flamboro, about the year 1827. In 1832, E. C. Griffin, a son of Smith Griffin, built a woolen mill at Waterdown, and in 1835 he was manufacturing there a variety of cloths, flannels, blankets and other woolen goods. George D. Griffin succeeded his father, E. C. Griffin, in the ownership of this factory, and it continued in operation until 1850, when it was destroyed by fire. About the same time that the Waterdown factory was built, Hon. Mr. Street established a woolen factory close to the sulphur springs between Niagara

Falls and Chippewa, using power from the Niagara river, and another factory was established about six miles south of St. Catharines by Russell Rich. Between 1835 and 1860, woolen mills were established in about fifty different towns and villages of Ontario, scattered throughout the province. The early history of the industry in the other provinces was much the same. From such small beginnings the manufacture of Canadian woolens has gradually developed so that there are now nearly 300 woolen factories in the Dominion giving direct employment to from 10,000 to 12,000 people, and the capital invested in the industry amounts to between 12 and 15 million dollars.

FLASH BOILERS—WHY THEY DO NOT SCALE.

When flash boilers were first proposed for motor cars the experts who had not tried them said the scale deposited in such narrow tubes would choke them in no time. When the boiler spirits found that they did not choke, at all the experts said the scale was blown off the inside wall of the tube by the rush of steam, or else cracked off by the heat of the tube. My theory, says J. Brown in the English Mechanic, is that scale never gets on. The experts were thinking simply that all boilers scaled, therefore this one would. They omitted to consider an essential difference. In ordinary boilers the water is in intimate contact with the iron, and the lime in solution, gradually depositing in crystalline form by evaporation of the solvent, fixes itself on the solid with which it is in contact. In the flash boiler the water is not in contact with the metal, but is separated from it by a layer of steam through which the heat passes to the water. Any solid deposited by evaporation is therefore isolated by this steam layer, and forms in small particles in the water. It has no chance to attach itself to the metal tube. The following very pretty and simple experiment illustrates this: Put into a clean silver spoon a few drops of lime water and evaporate to dryness by boiling over a spirit lamp. The lime is deposited on the silver in a rather tenacious coating. It may be cleaned instantly with a drop of dilute hydrochloric acid. After drying and polishing the spoon place it over the lamp and keep it hot while two or three drops of the lime water are allowed to fall into it. The liquid immediately assumes what used to be called the spheroidal state, i.e., it gathers up into a pretty head, which, supported on its layer of steam, runs about the bright bowl of the spoon. At first it is limpid, but soon becomes turbid by deposit in it of the lime in small particles. The motion of these indicates violent internal motion in the spheroid, and there is evidently evaporation, which rapidly reduces the size of the spheroid till the liquid, having all gone, there remains only a little heap of loose particles not adhering at all to the metallic surface of the spoon, which has not even been dimmed in the process.

CORNWALL AND YORK COTTON MILLS, ST. JOHN, N.B.

The annual meeting of the Cornwall & York Cotton Mills Company, St. John, N.B., was held on the 26th of January. The officers did not give out any financial statement for publication, beyond saying that no dividend was declared. J. B. Cudlip, the manager, speaking on the work of the year, said that the mills had been started and were going well. There were 550 hands now on the pay roll. It had been found hard to get help, but they were better off in this regard than six months ago. The goods had found very good sale with the wholesale trade, and the outlook was satisfactory for the com-

ing year. More machinery of improved style was being installed, replacing the old, the plant being gradually more and more modernized. A large shipment of new spinning machinery was due from England by the next Manchester boat, and other shipments were ordered. The company was spending considerable money in new machinery. The tendency of prices for their products was upward, owing to the greatly increased cost of manufacture. Raw material was dearer, labor cost more, and, in fact, higher prices ruled in all items. Last year saw these conditions more pronounced than the year before, and next year promised even more so. The cost of fuel greatly affected prices in Western Canada, but was not so much felt at St. John.

The company re-elected its old board of directors, as follows: George W. Jones, president; James F. Robertson, vice-president; R. Keltie Jones, James Manchester, W. H. Thorne, Thomas McAuity, and J. Morris Robinson, directors.

FANCY WEAVING.

The representation of natural objects was at a very early time one of the principal aims of the artist. The old cave dwellers drew the outlines of mastodons, lions, etc., on the walls of their residences, just as most people now nail up almanacs, and though the art of representing animals on textile fabrics is a somewhat difficult matter, it seems to have been one of the ambitions of the textile designer almost from the beginning. These designs were generally printed or painted upon the surface of a plain cloth, or took the form of tapestry, in which not only possible and impossible animal life was represented, but in which battles and other interesting events were more or less truthfully depicted. These tapestries, rugs, carpets, etc., being the labor of months and years, were very expensive, so that only the very wealthy possessed them, and being much sought after, only the most powerful could keep them. These circumstances, and the growing civilization of the masses, in time induced a more general demand for artistic textile fabrics, and competition among the producers has brought the cost of these cloths to a comparatively reasonable point. The encouragements given to the production of cheaper fabrics has however tended to the practical extinction of the original method of production, so that the only idea of hand spinning and hand loom weaving that people now get, is from a visit to some museum of antiquities.

Civilization commenced in the far east and has travelled slowly, one country at a time, towards the west, and the same can be said of the manufacture of textile fabrics. The various names and terms used in the cotton trade show its eastern origin, and to a certain extent its history can be traced from the names of the various fabrics. Cotton, cop, calico, muslin, and other words are Hindoostani in origin; dimity, chintz and damask are also eastern; fustian is Spanish; handkerchief is part French; twill, dobbie and spindle are Scotch; and heavy sizing is English. The old hand-loom method of weaving fancy cloths by the tying up of the healds to treadles and overhead levers was quickly discarded on the introduction of the dobbie or witch machine. This machine, though it did not at once greatly increase the amount of production from the loom, facilitated the labor by enabling the weaver to weave fancy patterns by means of one treadle instead of the eight or more formerly necessary. These dobbies also to a great extent dealt a severe blow to the craft of gaiters and tiers-up, who went about starting new warps, healds, etc. These witches were of the simplest

construction, made principally of wood, in fact, the whole weaving industry was at one time composed of little else than wood and cord or banding.

The introduction of steam power and the factory system has however, induced, if not compelled, the more general use of iron in the manufacturing trades, and wood is at a discount. In fact some of those parts of looms in which it is generally considered wood is necessary are frequently now of iron, such as sleys, box backs, and even picking pegs, shuttles, etc. The dobbie, as we have it now, is a much more useful machine than it was in its early days, and machinists are busily engaged in adding to its capabilities, speed and durability.

The term fancy weaving is one with various meanings. In some sheds three shaft drills are called fancies, and while in jacquard sheds, lenos and tappets are the only fabrics considered as fancy, the weaving of twill goods is generally accomplished by tappets, these being built in several degrees of strength and durability, according to character of the cloth to be woven. For the lighter cloths, an overhead tappet, or a spring top tappet, would be strong enough, these being known as negative or non-positive shedding motions; but in the case of heavy goods a side tappet, with top and bottom levers, working positively, is necessary. Sometimes very heavy twilled goods, such as army and navy serges, are woven by dobbies, but unless these dobbies are specially constructed, such as those of the positive type, this is a very objectionable practice.

The weaving of heavy-built cloths, in light-built looms, is not conducive to the making of a profit on the order. The sley, unless strengthened, will twist, the reed bend, sley cap break, extra friction on the tappets and bowls will soon wear them out, and the working parts of the tappet or dobbie will occupy more than the usual share of the overlooker's time. One would imagine that the changing from ordinary plain work to fancy weaving would be welcomed by weavers, as they should be paid extra for the extra skill and labor necessary, but this is seldom the case.

SCIENCE AND DYEING.

Since the introduction of the artificial coal-tar dyes with their modern methods of application, there has been much outcry against the fugitive character of these dyestuffs in general, as compared with the lasting and permanent qualities of the colors obtained by the older methods of dyeing, and there is a considerable show of reason for this protest. We must bear in mind, however, that the great demand of the age is cheapness and volume of product, and this is as true with respect to dyeing as with other industries. The chemist of the present day with the dyestuffs and processes of applying the same at his command, can obtain shades as fast as, nay, faster and of much greater beauty and range of color, than was possible to the old-time dyer, provided he is willing to give the same care, time, and expense to the work. The fast colors obtained for use in the Gobelins tapestries, which are regarded as of such a high standard of excellence, are not dyed in a couple of hours at the cost of a few pence per pound. The Gobelins dye-house probably dyes from 10 to 12 lbs. of good quality yarn per day, at a cost of about four shillings or more per lb. The dye-house of a large modern mill must turn out from five to ten thousand pounds of varying qualities of yarn at a cost of 1½d. to 3l. per lb. Herein lies the chief cause of the difference to be observed in the fastness of colors. Then, too, there is another factor in this question

The dyer of the last generation, and even of ten years ago, was not a chemist as a rule; he was an operative uneducated in scientific methods, working by rule-of-thumb formulæ. The scientific side of dyeing has had a forced development through the phenomenal growth of the dyestuff industry, and in order to follow it, the dyer must be a chemist, especially a good organic chemist, if he hopes to be thoroughly familiar with the technical intricacies of this subject, and, unfortunately, there are very few dyers, even at the present time, who know anything about chemistry.—Textile Mercury.

SULPHUR DYES ON SILK AND WOOL.

The direct dyeing sulphur dyes of the type of Immedial Black, Katigen Blue, etc., have so far found only application to the dyeing of cotton, because it is necessary to use sulphide of sodium in the dyebath, this being the best substance for bringing the dye into solution. Sulphide of sodium has, however, a destructive action on wool and silk, particularly so on the former. Messrs. Leopold Cassella & Co., the makers of the Immedial series of sulphur dyes, have ascertained that by the addition of glucose or tannin to the dye bath, this action of the sodium sulphide is prevented, while the presence of one or other of these organic substances does not prevent the dye from going on to the wool or silk.

A dyebath, which contains, in 1,000 parts of water, 5 parts Immedial Black V extra, 5 parts sulphide of sodium, 3 parts soda, 7 parts glucose, and 30 parts salt, used at 160 degrees F., will dye wool a full black. The same process is applicable to the dyeing of Immedial Blues, Immedial Browns, and other sulphur colors. The process will find most application in the dyeing of half-wool (cotton-wool) and half-silk (cotton and silk) fabrics, and it gives equal shades on both the fibres composing the fabric.—Textile Mercury.

FLOATS A SERIOUS FAULT IN WEAVING.

Floats are a serious fault in weaving, whether on plain or fancy work, as they cause a loss of time in picking out and generally leave a mark in the cloth unless care is exercised, says the American Wool and Cotton Reporter. It is an impossibility for a weaver to run a set of looms without floats at some time or another in weaving. When long knots or a thread break and become entangled with the adjoining thread in the shed, so that they are held in such a position that they do not separate positions in the shed, floats are formed. The entangled threads may move to the bottom or the top at every pick, allowing the filling to pass over or under a certain number of adjoining threads. As a consequence, the filling does not interlace with the warp threads at that point, but floats either above or below the warp threads.

When the floats are narrow and of a regular width, and not too wide, the weaver removes the warp threads that are not interlaced with the filling and with a fine steel tooth comb moves others into the empty space. This is called scratching up, and if the float is not over four or five splits wide, some weavers can do it so skillfully that it takes a sharp, experienced eye to detect the effect. Sometimes, when rushing, the weaver will scratch up a float six or more inches long and an inch or more wide, but it is a hard matter to hide such a one, as the great number of threads removed leaves the cloth thin at that place, as all the threads moved to fill in the empty place are a greater distance apart. On white or plain work the skillful weaver will use plenty of whiting or some other material to fill in the interstices, and a judicious damp-

ening of the cloth and the application of the shuttle point to smooth off the face carry it by the average cloth inspector. The defect is there and will show up in the finished goods. The only safe and sure way is to pick out the filling, with the aid of a comb, thread by thread. Even this way has its drawbacks. If the pickout is long the teeth of the comb knocks out the sizing and frays the fibres so that when started up the place is marked by a coat of fine fibres projecting from the face of the cloth. By dampening the cloth during picking out this may be largely prevented on some and entirely on other cloth.

The warp stop motion will prevent floats being made by broken threads, but all looms are not fitted with warp stop motions, and there are other causes of floats besides broken threads. Long knots will cause floats, as will imperfectly sized yarn. In passing through the rods and harnesses the imperfectly sized yarn becomes ragged and the loose fibres gather in balls behind the reed. These balls will entangle adjacent threads and floats will be formed unless they are removed.

Poor shedding will break the yarn and cause floats. When the shed is too large, the extra strain breaks the yarn and if the bottom shed rubs on the race way the yarn will become chafed and break. Anything that tends to increase the percentage of broken ends will increase the probability of floats and be detrimental to large production and perfect fabrics. Weaving the cloth too slack not only gives it a raw unfinished appearance, but also increases the tendency of long knots and broken threads to become entangled in the shed.

Among the Mills

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

The Almonte Knitting Mills have put in electric lights.

John Lewis intends starting a shoddy mill at Berlin, Ont., to employ 20 men. He will ask Berlin for a loan and water concessions.

The Truro, N.S., Knitting Mills Co. are making plans for the erection of a new mill, 250 feet in length, which will double their present capacity.

The erectors of the William Firth Co. are engaged erecting the Asa Lees mules ordered some time ago by the Hamilton Cotton Co., at Hamilton.

W. J. Webster, of Edmonton, N.W.T., has been back to his old home at Westport, Ont., on a business trip. He reports a very successful season for his new woolen mill at Edmonton.

B. B. Freeman is about to build a 1-set woolen mill for coarse wool blankets, at Warton, Ont. He is on the lookout for some second-hand machinery. T. E. Tanner will be foreman at the mill.

Alex. Cawthorn has taken action in the Superior Court, at Montreal, for \$500 damages against the Consumers' Cordage Company. He alleges that while working at a machine, called the "American breaker," in defendant's factory, his left hand was caught and crushed between two wheels, the result being that one of his fingers had to be partly amputated. He attributes the accident to the want of proper protection around the machinery.

B. N. Fraser has disposed of his interest in the woolen mills at Morden, Man., to F. Schneider.

There is a movement on foot to establish a rope manufactory in Kingston to compete with the combine. Influential financiers are behind the scheme.

The factory of the Imperial Underwear Co., recently organized at Peterboro to manufacture underwear and knitted goods, will be operated by electricity, generated by water power.

The Eclipse Whitewear Co. have plans out for a 60 by 185 feet, four-story and basement brick factory and warehouse, on the old Upper Canada College grounds, Toronto, to be completed by August 1st.

Hamilton citizens hope to have their city chosen as the location of a factory to produce tapestry carpets for the Canadian trade which a Kidderminster company proposes to establish on this continent.

The Adam Lomas & Son mill, at Sherbrooke, Que., has had installed 3,000 holders from the American Bobbin Holder Co., West Midway, Mass., who are also filling an order for the Dominion Carpet Co. at the same place.

Bracebridge ratepayers have carried the by-law to give a bonus and exemption to the proposed linen factory, and the mayor of the town announces that by the first of March steps will be taken to proceed with the factory.

The Brandon Binder Twine Company will increase its plant by adding a rope-making department. The management has also been authorized to spend money in experimenting with flax with a view to its use in making twine.

An offer has been made for the Brodie woolen mill, at Streetsville, but it has not yet been accepted. In the meantime the mill is standing idle. The mortgage on the mills amounts to about \$24,000, and there is little for the other creditors to realize upon.

The cotton industry in Canada is reported to be in a very healthy condition. Taking all the companies together, there are 792,496 spindles and 18,679 looms. There are two mills closed, one at Brantford, and one at Coaticook. These two have 22,264 spindles and 530 looms. Deducting these there are in the Dominion 770,322 spindles and 18,129 looms.

The Canadian Colored Cotton Mills Co. have been missing webs of cloth from their mill at Cornwall for some time. The matter having been put in the hands of the chief of police, and suspicion falling on a Syrian, named Albert Salbani, men were sent to lodge in his house and to examine his stock during the night when he and the family were asleep. Their report led to a search warrant being issued, when twenty-four webs of the stolen goods were found on the premises. The Syrian declared he had bought them from some young men, who said they had smuggled them from the United States. Further investigation led to the arrest of four men, one of whom confessed. The thieving had been going on for some time. Two of the men went to the mill at night on foot and two rowed up in a boat. They entered the storeroom, and the goods carried off were conveyed away in the boat to a rendezvous, where they were met with a rig and taken to the Syrian's house and sold to him. Twenty-one pieces, which he had sold in the country, were recovered. One of the men was released, on turning King's evidence; one, when released on bail, skipped out, and the other two pleading guilty, were allowed to go on suspended sentence.

Newcastle, N.B., is reaching out for new industries, among other things, a woolen mill.

The employees of the W. E. Sanford Manufacturing Company, at Hamilton, spent a very enjoyable evening at Washington's Hotel, Stoney Creek, recently. After a sumptuous repast, they adjourned to the upstairs hall, where a good programme was supplied by the talented young men of the firm, and where Sandy McGregor skirled his pipes till no one could keep his seat. Among the toasts were the firm, office staff, entry room, shipping room, stock rooms and workroom.

The knitting mills, at Hamilton, of which Jonathan Ellis, of Port Dover, is promoter, while commencing in a modest way, hope soon to employ 200 hands. A four-story brick building, 50 by 75 feet, has been secured, being that formerly occupied by the Howell Lithograph Co., which has had new floors and ceiling put in, and been painted throughout. Seven knitting machines have been installed, and more are on the way.

A change has been made in the office of superintendent at the cotton mill at Milltown, N.B. Mr. Sanborn, who has held the position for eight months, has resigned and is succeeded by J. Whidden Graham, a native and ex-mayor of Milltown. The policy of the former in displacing old overseers, and replacing them with men from the United States, had aroused considerable dissatisfaction and brought forth a remonstrance from the Milltown town council to the directors of the company at Montreal. Mr. Graham's appointment gives general satisfaction.

A flood, resulting from an ice jam, caused some inconvenience at the mill of the Canadian Colored Cotton Mills Co., at Cornwall, on February 9th, though of little moment compared with the big flood of 1887. The water rose till about 3 p.m., when it came into the basement, card-room and machine shop at the mill to such an extent that it had to close down. Shortly afterwards the water found its way into the boiler and finishing-rooms of the Stormont mill, owned by the same company, and it was also compelled to close. Little or no damage was done, however.

The Cornwall Freeholder republishes an item, which appeared in its columns in February, 1883, relating to the Canada Cotton Co., which had just erected an immense weave shed in that town. The item is of interest and was as follows: "The experiment of lighting the new weave shed of the Canada Cotton Company, by extensive skylights, promises to prove a costly and ruinous failure. The steam and moisture in the room during the night become congealed as soon as they come in contact with the cold skylights and form a crust of hoar frost, which in the daytime, under the influence of the sun's rays, melts, causing a regular downpour on the machinery. As a sort of a patent sprinkler, the skylight experiment is a success."

The Galt Reporter wants the town council to put up buildings, in which manufacturers may locate, and instances several factories which have gone elsewhere because they could not find suitable premises. One of the most important of these was Gordon, MacKay & Co., of Toronto. James Woods, a member of the firm, visited Galt several times in quest of a building in which his company could carry on the manufacture of woolen underwear. The carpet factory building would have answered but this could not be got. There was no time to wait for a building to be erected, and the company has now located in Toronto. After the carpet factory experience, it is not likely the town council feels disposed to furnish buildings for factories.

Steps have been taken to set aside the by-law passed by the town of Scarforth granting a loan of \$10,000 to John Dick, of Toronto, to reopen the Van Egmond woolen mills. The motion is made on technical grounds.

The woolen mill belonging to Jesse Gledhill, at Benmiller, near Goderich, has been overhauled, and after a stoppage of three months, is again in operation. The head has been increased by raising the dam, and 50 horsepower has been secured the year round. As this is more than is required for the woolen mill, it is suggested that the surplus should be used for generating electricity.

Judgment has been given in the suit of John Gilboy against the Canada Rubber Co. In January, 1901, Gilboy, while employed by the company, had his hand crushed by a roller. He sued for \$6,000 damages on the ground that the roller was broken. This was proved to be the case, but it was not shown that this had caused the accident, and the action was therefore dismissed at Montreal by Judge Doherty.

Some time ago F. B. Hayes, manager of the Toronto Carpet Mfg. Co., was fined \$50 and costs by the police magistrate of Toronto, for a contravention of the alien labor law, in having brought over a man named Derocher from the United States to work in the company's factory at the time of the strike. The facts were fully stated in the Journal of Fabrics at the time. Mr. Hayes appealed to the higher court, on a rule nisi to quash the conviction, and judgment has just been given setting aside the conviction with costs against the prosecutor, on two grounds, first, that to constitute an offence, the act must be done "knowingly," and second, that Derocher, though born in the United States, was a British subject, his parents being British subjects, and there being no evidence to show that they had ever become naturalized in the United States. The case has created much interest, as the prosecution of Mr. Hayes was undertaken by one of the labor organizations.

The following is a special despatch to the Globe from its Montreal correspondent: "Negotiations have just been completed for the consolidation of three big companies engaged in the manufacture of shirts and collars in this city. The companies are Tooke Bros., Limited, A. H. Sims & Co., and the Standard Shirt Co., Limited. With these companies are the Colonial Bleaching & Printing Co., Limited. The new company will establish a large factory at Shawinigan Falls, where it will manufacture its own cotton and prints. An issue of bonds and preferred stock will in a few days be made to the public. The proceeds of the sale of bonds and preferred stock will be used to a certain extent in the erection of the cotton factory. The firms interested in the new amalgamation would, it is said, accept common stock in payment for their interests. The factory would manufacture cottons, especially prints, not at present on the Canadian market, to supply them as raw material for use by the new company in the manufacture of its shirts and other lines. At present various lines of printed goods must of necessity be imported from the United States, for the simple reason that they are not manufactured in Canada. The installation of proper machinery and the saving of duties and other manufacturers' profits, it is calculated, would result in profits to the new company." A representative of the Journal of Fabrics was informed that the above despatch was not authorized, but it was not denied that a union of the shirt factories referred to was in process of formation. The question of establishing a cotton mill at Shawinigan Falls has been talked of for some time, that being a favorite proposition with the promoters of the Shawinigan electric power scheme.

The assets of F. O. Laplante, hosiery knitter, Montreal, have been sold.

The Colonial Bleaching and Printing Co., of St. Henri, Que., are now putting in another cloth printing machine, making the fourth printing machine in operation at this factory.

A Montreal man is enquiring, through the Canadian High Commissioner in London, for some English capitalists, who might wish to invest money in a cotton or woolen mill in Canada.

A suggestion for the establishment of cotton mills at Liverpool is at present before the Chamber of Commerce. Mr. Meyer, the author of the scheme, suggests a combination of the whole of the process of manufacture—spinning, weaving, dyeing, printing, etc., in one great establishment, thus avoiding a multiplication of expenses.

An interesting novelty has been got out by the Roessler & Harsbacher Chemical Co., manufacturers of dyestuffs and chemicals, 100 William St., New York, in the form of a calendar, printed on wood veneer, made from the Japanese tree called "Paulownia," (*Paulownia Imperialis*). This wood is used extensively in Japan for making small wooden boxes, and wooden ornaments. In this case the veneer is so thin and the printing so artistically done that it is difficult to tell whether the calendar is of wood or paper.

The Philadelphia tapestry mills, manufacturers of tapestry and light carpeting, two years ago decided to operate their plant throughout by electric power and for that purpose purchased a 150-kilowatt, Westinghouse, two-phase, engine-type alternator, together with from 12 to 15 type C induction motors. This plant has given such satisfaction that they have now decided to duplicate it. Induction motors of this type have been found especially valuable in work of this kind, since they are not affected by dust, lint, or dirt, and having no commutator nor brushes, do not give rise to danger from fire.

The case of McCaugherty against the Gutta Percha and Rubber Mfg. Co. of Ontario has just been argued before the Court of Appeal. Some time ago a verdict was given in favor of the plaintiff for \$2,000 damages, in an action tried at Toronto before Judge Street. The plaintiff claimed damages for injuries to his hands received while working at a machine called a calendar used by the defendants in their factory at Toronto. The following were the questions put to the jury and their answers: (1) Was plaintiff obeying the general orders given him by the foreman in working at this machine? Yes. (2) Was the machine a dangerous machine, assuming ordinary precaution on the part of the operator? Yes. (3) Were the rollers securely guarded so far as practicable, taking into consideration the use to which the machine was intended to be put? No. (4) Was the accident to plaintiff due to any defect in the condition or arrangement of the works of defendant? Yes. (5) If so, what was such defect? Want of proper seat, lack of guard, unevenness of the floor. (6) Could plaintiff, by the exercise of reasonable care, have avoided the accident? No. (7) Did defendants use reasonable care to furnish proper means of working at the machine so as to protect their servants working upon it against unnecessary risks? No, in that they did not provide a seat for operator, and did not guard the roll. The company contends that there was no evidence of negligence to go to the jury, as to matters found against them, and therefore appeal from the verdict. After hearing the argument, judgment was reserved. S. H. Blake appeared for the company, and W. Nesbitt and R. McKay for McCaugherty.

Maritz Boas, formerly of St. Hyacinthe, has been admitted a partner in the Knit-to-fit Mfg. Co., underwear manufacturers, of Montreal.

The Actien-Gesellschaft fur Anilin-Fabrektion (the Berlin Aniline Co.) are issuing, through their Canadian agents, McArthur, Corneille & Co., Montreal, some interesting literature on new dyeing processes. Among them is a valuable booklet on coloring matters for garment dyeing, and giving samples of dyeings, on wool and union goods, cotton, silk, half silk, and gloria fabrics.

The father of James F. Gordon, proprietor of the woolen mill, at Athens, Ont., died last month at Athens at the age of 82. He was born at Ogdensburg, N.Y., and came to Canada in 1850, engaging in the woolen manufacturing business, which he had always followed. Mr. Gordon must have been the pioneer woolen manufacturer of that part of the province between Kingston and Brockville.

The Ontario Felt. Co., of Dundas, Ont., of which J. F. Morley is manager, are getting into shape for work. The vacant building bought by the company has been refloored with maple, and the basement connected, and a Wheelock engine is being put in. The mill will start with two sets of cards and ten broad looms, and will for the present make blankets only. The kind of felts to be manufactured later is not announced. The part of the building not used by the company is rented to the Bates Felt Co., who are starting the manufacture of felt for pulp mills.

Bellhouse, Dillon & Co., Montreal, have moved their offices from St. Francois Xavier St. to the new Coristine Building, corner St. Paul and St. Nicholas streets. The new offices are admirably lighted and arranged, and are larger than the old premises. The "Alligator brand" of logwood, prepared by the West Indies Chemical Works, of Jamaica, for whom the firm are sole Canadian agents, is reported to be steadily increasing in popularity in Canada, as well as in the United States. This popularity is no doubt due to the fact that the manufacturers have made a special study of the conditions for getting the best results in preparing the logwood, and the users of this brand have found it remarkably uniform in quality. The trees are grown near the Rio Cobre and the works are situated on the ground, so that they can be treated at the season to get the greatest percentage of coloring matter

AN EXTENSIVE STRIKE.

A strike has been on among the garment cutters and trimmers in Toronto for some time. About 120 men went out from the establishments of W. R. Johnston & Co., Lailey, Watson & Co., W. E. Chalcraft and John Northway & Son, four of the largest manufacturing houses in the clothing business. The trouble dates from last fall, when the men asked for certain reforms, principally the reduction of one hour per day, or from 55 to 49 hours per week, and certain regulations regarding the hiring of apprentices. When the final request was made of the employers, the men consented to abandon everything but the hour per day. The men say that after a thorough canvass of the employers it was understood that each employer was willing to grant the reduction, but all the others were willing, but as a matter of fact a compromise of half an hour a day was offered, or 52 hours per week. These hours, it is pointed out by the employers compare very favorably with the hours across the line, being 52 in New York and 54 in Rochester. In Hamilton the men have recently accepted 52 hours—with delight, the employers

state—because their organization is not strong enough to fight, the men say. In Toronto, however, the half-hour compromise was rejected at a mass meeting, and the men thereupon decided to go out in the establishments named. All the cutters are not out in each place, ten being left in W. R. Johnston & Co.'s, consisting, according to the employers, of good, reliable men.

In reply to the assertion by the employers that the trouble would not have been brought about but for the visit of International Treasurer Bromley, of Utica, the men point out that the manufacturing houses engage designers from the United States to be foremen over those they now criticize for consulting a foreigner. They also deny that Mr. Bromley incited them to strike, declaring that their course had previously been decided upon and that the international treasurer used efforts to avert a strike. The services of Robt. Glocking, secretary of the Ontario Labor Bureau, have been invoked to try and secure a settlement. The strikers in W. E. Chalcraft's factory have gone back, the firm having agreed to submit the dispute to arbitration. The pressers have since come out rather than work on garments that have been cut out by non-union labor, and the operators may join them. So far as can be learned, only one of the establishments concerned has made an effort to hire outsiders.

A similar strike occurred recently in Vienna, where 2,500 garment workers and their assistants went on strike for an increase in pay and a reduction in their hours.

PARTLY COLORED EFFECTS ON YARNS.

Machinery for this purpose, patented by W. Rodger, of Wilkesbarre, consists of an apparatus for dropping dye liquid on to the yarns in various places, and is ingeniously contrived so as to enable the yarn to be spotted thickly or thinly and in any desired manner. This is done mostly by an arrangement of cams which actuate the levers that open the valves of the color receptacles, and so let the dye out or stop the flow of it, but there is also a separator for dividing the falling drops much finer if necessary. The cams are capable of arrangement in almost every possible way.—Dyer and Calico Printer.

Personal

Hon. A. T. Wood, who died recently at Hamilton, was the organizer of the Ontario Cotton Mills Company, and was for some years president.

J. A. Boland, spinner in the woolen mill, at Wakefield, Que., has taken to himself a wife in the person of Miss Lizzie J. Lyons, of Carleton Place.

Adam Doering, proprietor of the Waterloo Sun Laundry, was recently killed while attempting to board a moving Berlin and Waterloo electric car.

Duncan Fisher, proprietor of the woolen and other mills at Paisley, Ont., is dead. He was a native of Osgoode, Carleton Co., and went to Paisley in 1869.

Edward Smith, a foreman in the Kingston cotton mill, and a man of remarkable physique, died January 26th of typhoid fever, aged 36 years. He came to Kingston from Cornwall about ten months ago, and married Miss St. Thomas, of that town, about three weeks before his death.

James Sullivan, of the Fit Reform clothing store, Guelph, fell about 20 feet while shovelling snow and injured his spine.

Mr. Chassels, merchant tailor, Dundas, is giving up business, having accepted a position as cutter with Reid & Davis, clothing manufacturers.

It is feared that Wm. Robinson, traveller in the N.W.T. for Knox, Morgan & Co., of Hamilton, was lost in a recent storm between Saskatoon and Duck Lake.

Robert W. Watchorn, one of the proprietors of the Merrickville woolen mills, has been elected warden of Leeds and Grenville. He is the eldest son of the late Thos. Watchorn, who in 1874 established the mills.

Edward Mundle, an old and respected citizen of Prescott, died January 16th, aged 84 years. He went to Prescott about sixty years ago, and established the firm of Mundle & Co., tailors, which is still in existence.

The death is reported of John Holston Brown, of Castleton, North Dakota, who, about twenty years ago, was a prominent business man in the County of Oxford, Ont., owning flax mills at Beachville, Embro and Wolverton.

M. de Blowitz, for many years the Paris correspondent of the London Times, and one of the most famous in the world, whose death occurred recently, after he left the university in 1860 was engaged in the invention of a machine for wool carding by steam.

WOOL MARKET.

The first of the Colonial wool sales in London for 1903, which was to open January 20th, had to be postponed on account of fog. At the opening the following day there was a large attendance. A superior selection of fine scoured caused spirited competition between French and German buyers. Merinos were in demand. Crossbreds in moderate supply and sold very firm. A few lots of merinos were taken for America. A good selection of Cape and Natal was in keen demand. Snipes in good demand and firm. The sale closed on February 2nd. The tone was easier on all grades. When the series opened, the demand was good, but trading was not buoyant. Superior merinos sold well throughout and closed unchanged. Inferior and faulty merinos were unchanged to 5 per cent. lower. Fine cross-breds opened fully 10 per cent. higher, but relapsed, and closed unchanged. Slipes were 5 per cent. higher. Of the total available, 4,000 bales went to America, 68,000 to the home trade, 58,000 to the Continent, and 11,500 were held over. Closing prices were as follows: New South Wales, scoured, 1s. 3/4d. to 1s. 9d.; greasy, 5/4d. to 10 1/2d. Queensland, scoured, 1s. 1/4d. to 1s. 6d.; greasy, 8d. to 10 1/2d. Victoria, scoured, nil.; greasy, 6 1/4d. to 1s. South Australia, scoured, 1s. 6l.; greasy, 5d. to 10 1/2d. Western Australia, scoured, nil.; greasy, 6d. to 6 1/2d.; New Zealand, scoured, 6 1/2d. to 11d.; greasy, 4 1/2d. to 11 1/2d.;

Cape and Natal, scoured, 9 1/2d. to 1s. 4 1/2d.; greasy, 5 1/2d. to 9d. Punta Arenas, greasy, 6d. to 10d. The next series will open March 10th. Since the sale closed prices have been easing a little, there being a drop of about 1/2d. a pound, but a cable on February 13th to a Toronto house says they are again hardening.

In Boston the market is decidedly quiet. Stocks are light, and it would not require a very long continuance of a good demand to clean off what stock there is available. Prices, therefore, are steadily maintained. Some buyers are not willing to pay full prices, and therefore buyers and sellers are apart. A few fair-sized lines of territory have been moved, but the only other classes of stock which have shown any decided life have been pulled wools and Australians.

In Toronto the market is quiet, with prices a little better than reported in our last issue. In fleece offerings are light. Washed is quoted 16 to 17c.; unwashed, 8 1/2 to 10c. There is moderate enquiry for pulled from home mills. Extras are quoted 19 to 20c.; supers, 15 to 16c.

In Montreal, the market continues strong under a fair demand; but sales are small both of foreign and domestic wools owing to the small quantities offering. We quote prices as follows: Greasy, Cape wools, 17 to 17 1/2c.; B.A., 30 to 40c. unwashed. Canadian fleece, 9 to 10c.; washed fleece, 16 to 17c., pulled wool, 16 to 17c., and extra pulled, 20 to 21c.

Latest advices to London indicate the estimated official shortage of Australian wool at 300,000 bales. This is a direct consequence of the severe drought, and is likely to reach 350,000 bales when all returns are in. Good rains are reported throughout the principal sheep-bearing districts, and the outlook for the coming season is much improved, though prices are bound to rule high for a long time to come.

—Stanley, Mills & Co.'s departmental store at Hamilton was badly damaged by fire on January 9.

FOR SALE.—ONE SET WOOLEN MILL.—Sited in Nova Scotia. Good water power. One Broad, three Narrow Looms. Good trade established. Address, "S. O.," Canadian Journal of Fabrics, Toronto, Ont.

WANTED.—One Hundred Inch Broad Loom. State make and how long in use. Address, Valley Woollen Mill Company, Southampton, N.S.

DYESTUFF MANAGER WANTED.—A large firm of dyestuff dealers about to open a Canadian office. Desires an experienced salesman and office manager. Address, Box 78, New York City.

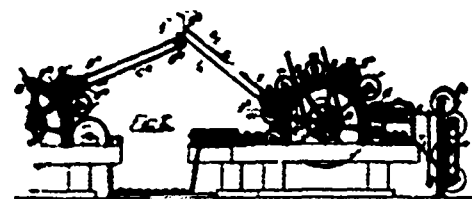
**Experienced Cloth Finisher
Wanted,** AT HEWSON WOOLEN MILLS,
AMHERST, N. S.

In applying, state experience, give age, mention references and wages expected.

NO MORE WASTE ENDS

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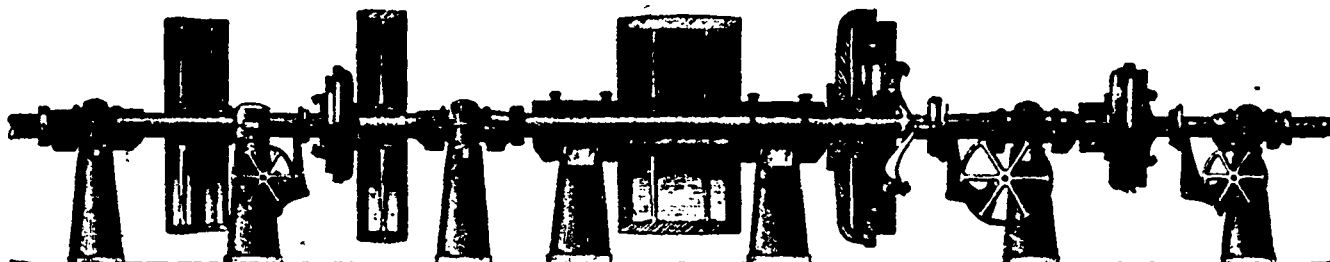
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Garnetting
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Machinery

Valuations made on
Application.

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When unloading the Oriental liner, Athenian, recently at Vancouver, it was discovered that owing to the springing of a plate in a rough sea, one hundred bales of raw silk in the forward part of the vessel had been damaged by water to the extent of probably \$50,000. The silk was sent on to New York where the damage will be appraised for settlement by the insurance companies.

The Dominion Sheep Breeders' Association recently held its annual meeting in Toronto. The president, in his annual address, noted that the market for lambs and mutton during the past year had been active and satisfactory. The following officers were elected: President, R. H. Harding, Thornedale; vice-president, J. M. Gardhouse, Highfield; secretary-treasurer, A. P. Westervelt, Toronto.

TEXTILE PUBLICATIONS.

In order to accommodate readers of 'The Canadian Journal of Fabrics,' the publishers will be pleased to mail any book in the following list on receipt of the publisher's price, duty free. Books on technical and practical subjects, not in this list, can be obtained and mailed at publisher's prices. In ordering, please give full address, written plainly:

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

- Worrall's Directory of the Textile Trades of Yorkshire, comprising the woolen, worsted, cotton, silk, linen, hemp, carpet, and all other textile mills, giving looms and spindles, and the various lines of goods manufactured, etc\$2 00
- Worrall's Textile Directory of the Manufacturing Districts of Ireland, Scotland, Wales, and the counties of Chester, Derby, Gloucester, Leicester, Nottingham, Worcester, and other centres not included in preceding works, with capacity, products of mills, cable addresses 2 00

CHEMICALS AND DYESTUFFS.

Business, as usual, is very quiet. There are few enquiries, which is usual at this season. No changes in prices.

- Bleaching Powder\$ 1 80 to \$ 2 00
- Bicarb. soda 2 00 to 2 05
- Sal. soda 0 85 to 0 90
- Carbolic acid, 1 lb. bottles 0 40 to 0 50
- Caustic soda, 60° 2 35 to 2 60
- Caustic soda, 70° 2 60 to 2 85
- Chlorate of potash 0 10 to 0 11
- Alum 1 35 to 1 50
- Copperas 0 70 to 0 80
- Sulphur flour 1 70 to 2 00
- Sulphur roll 1 90 to 2 00
- Sulphate of copper 5 50 to 6 00
- White sugar of lead 0 07 to 0 08
- Rich. potash 0 7½ to 0 08
- Sunac, Sicily, per ton 50 00 to 58 00
- Soda ash, 48° to 58° 1 30 to 1 40
- Chip logwood 1 90 to 2 00
- Castor oil 0 08 to 0 09
- Cocanut oil 0 10 to 0 11

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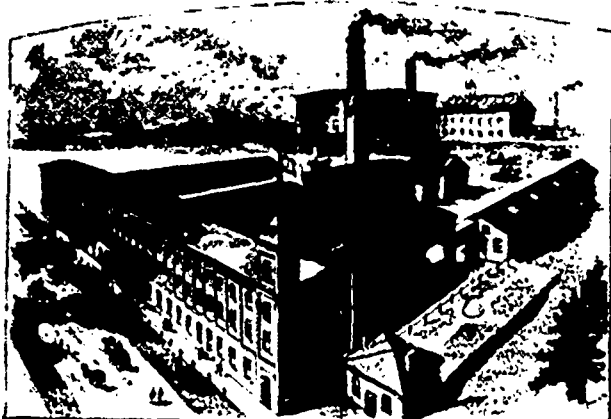
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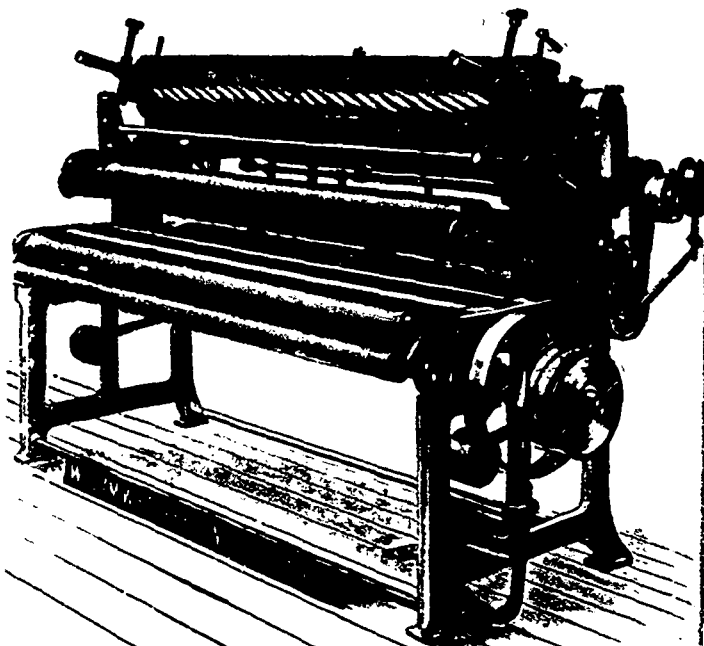
—Harry Casey who recently severed his connection with the Canada Woolen Mills Co., at Hespeler, was the recipient of a heavy initial gold ring from his fellow employees.

—Harris & Co., Rockwood, gave their annual At Home to the employees of their mill recently, in the warehouse adjoining the mill, which had been cleared of stock for the occasion.

—The Toronto Carpet Mfg. Co. have prepared plans for an extension to their mills nearly as large as the present extensive works. The new addition, which will be commenced as soon as frost is out of the ground, will be 200 feet long and several stories high. The new department will be devoted to a line of carpets not heretofore made to any extent in Canada, namely, Brussels carpets. The company is now installing 20 new looms for Smyrna rugs and have ordered 30 more.

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Complete Cloth Finishing Plants
Tentering and Drying Machines
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Mercerizing Machinery. Complete Plant for Aniline Black.
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—Dominion Linen Mills, capital \$250,000, head office, Toronto, to manufacture linens, damask, cotton, etc., provisional directors: Chas. McEachren, W. B. Hill, Geo. Stevenson, Alex. A. Hood, and Digby Grimson.

—George Dormer, of Massachusetts, has assumed charge of the winding and twisting department of the Canada Woolen Mills, at Hespeler, where he formerly lived.

—Four New York towns—Ogdensburg, Watertown, Gouverneur and Male—are rivals for the location of a large worsted goods mill, which will give employment to four hundred hands, increasing to 1,000 within two years.

—Herbert Barber, of the Minerva Manufacturing Co., Toronto, who is going to the North-West to farm, has been presented by the firm with a fine shot gun and equipment, and by his fellow employees with a set of Sir Walter Scott's works.

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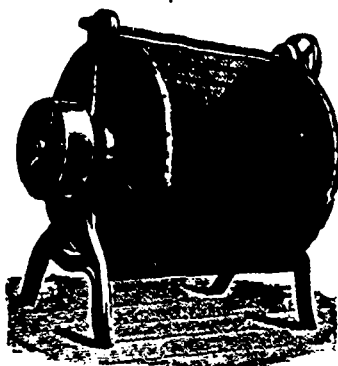
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And all the Principal Woolen
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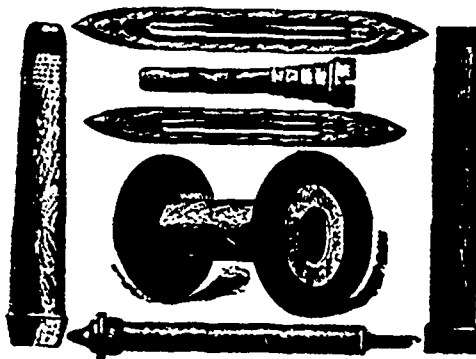
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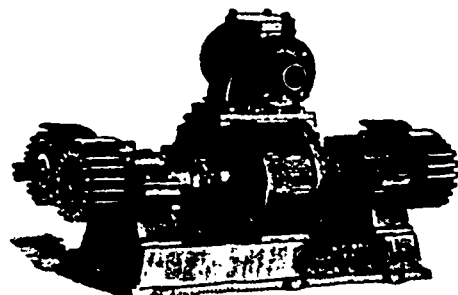
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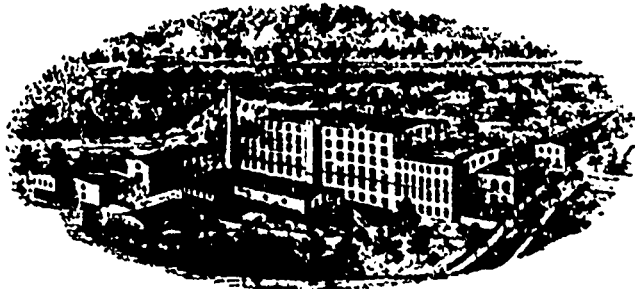
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 Equipment of mills of every kind.
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Another process for this purpose has been patented. It is of a somewhat complicated nature, as it consists in acting on cotton or cotton fabrics first with a solution of a tungstate, a salt of aluminium, and acetic or formic acid. The organic acid is then driven off by drying and steaming, and the cotton is further treated with sodium silicate of 25 deg. Tw. and magnesium sulphate of 26 deg. Tw., or with a solution of albumen or one of tannic acid. Another patent of the same patentees adds zinc salts to the list, the acetate, the sulphocyanide, and the sulphate used in solution of about 20 to 25 deg. Tw. The most essential ingredient, however, still remains the tungstate, which has been used for the purpose ever since its discovery.

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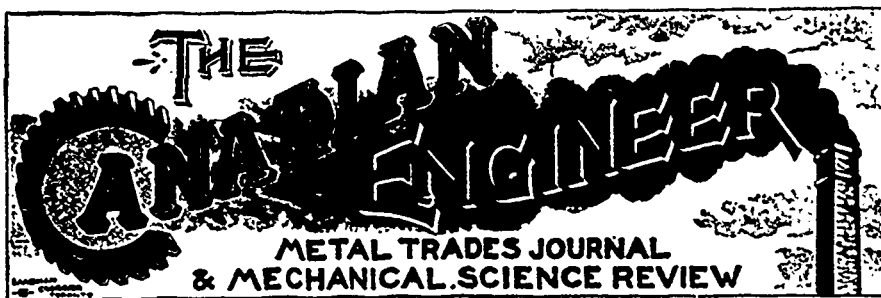
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For use where power is not available.

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—The Toronto Carpet Manufacturing Co. is likely to secure the services of Thos. Cowell, from Kidderminster, England, as superintendent, in place of Mr. Armitage, who has returned to Hartford.

—The production of a vegetable substitute for horsehair is reported as a thriving Algerian industry. The material is the fibre of leaves of a dwarf palm, and it is prepared for such uses as stuffing furniture, mattresses, etc. The advantages of the vegetable hair are its solidity, the readiness with which it can be dyed, and its low cost.

—Many dyers occasionally complain that this or that dyestuff "crops" or "rubs." With few exceptions, this defect can be traced to insufficient washing. One of the exceptions is para-nitraniline, which, owing to its peculiar nature, is not a true dye, but rather a finely divided and deposited red precipitate in and on the cotton fibres. Washing in the dye-house has more to do with whether any particular dye is successful. It stands to reason that unless a dyed material is well washed the extraneous dye liquor dries and the fine particles of color dust off, giving rise to crocking. A dyer who washes well must look elsewhere for his trouble, which, in woolens, will be found in imperfect scouring more than elsewhere.

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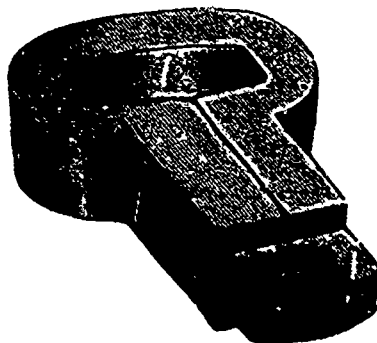
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FANCY PANTING.

3,120 threads in warp, 52 threads per inch, 13s reed, 4 in a reed, 50 picks per inch, 60 inches wide in loom, 54 inches finished width, 18 to 19 oz. finished weight

Warp—2-32s worsted, 12 threads black, 12 threads blue

Filling—18s skein black Angola.

Draft—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, repeat 1, 1, 12, 12, repeat five times more

PEG PLAN.

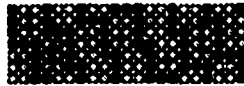


WORSTED COATING—CORKSCREW

22s reed, 6 threads in a reed. Face warp, 5,808 threads. Back warp, 2,904 threads, 2-48s white worsted, 60 inches wide in loom; 56 inches finished width, 22 oz. piece dyed black

Filling—2-36s white worsted, 84 picks per inch

Draft—1, 8, 2, 3, 9, 4, 5, 10, 6, 7, 11, 1, 2, 12, 3, 4, 13, 5, 7, 14, 7.



—American Wool and Cotton Reporter

CEMENT.

By melting carpenter's glue and adding commercial pitch a good cement is made for fastening cloth to iron

FLAX—THE WAX IN IT.

Flax contains an appreciable but variable quantity of a substance of a fatty or waxy nature, the amount in the best kinds ranging from 0.5 to 2 per cent. In waste flax and flax dust it is present in large proportions—some 6 to 8 per cent. It can be extracted by using such solvents as ether, benzol, etc. Flax wax varies with the grade of flax from which it is obtained and may be yellowish yellow, yellowish green or brownish green. It has a rather unpleasant odor, which recalls that of flax itself. The melting point is 61.5 C. (142° F.), and the specific gravity at 60° F. is 0.9083. The presence of this wax has some influence on the suppleness of the fibre, the more there is, the less supply of flax. G. Hoffmeister has examined this wax, and finds it to consist of 61.32 per cent. of unsaponifiable waxy matter and 38.68 per cent. of saponifiable oil. Of the latter, 54.49 per cent. is free fatty acid and it contains 0.31 per cent. of insoluble fatty acids. The waxy matter has a melting point of 68° C. (155° F.), and is apparently a mixture of two or three bodies. The principal one is a hydrocarbon, in appearance like ceresin, while there are also present ceryl alcohol and phylosterin. An examination of the saponifiable portion shows that it contains small quantities of soluble fat acids, like caproic acid, stearic acid, palmitic acid, oleic acid, linolic acid, linolenic acid, and isolinolenic acid.

COLOR AND DYES.

The particular coloring matters known as dyes are not only eminently endowed with the power of selective absorption in regard to light—a power which causes them to appear colored—but their particles or atoms possess a strong faculty for wandering into fibres and fabrics, and moreover, of becoming dissolved therein. This wandering power and solubility in solid materials, possessed to such a high degree by dyes, distinguish them sharply from ordinary colored substances. In the former case the particles travel into fibre and are actually soluble in it; in the latter case, although penetration proceeds, the actual solution of the color in the material is not affected. In short, a dyed fabric is nothing more than a solid solution of the dyestuff in the substance of a fibre.

The number of artificial coloring matters prepared since Perkin's discovery, now nearly fifty years ago, has been enormous. It is estimated that at the present day over 3,000,000 different individual dyestuffs are easily accessible to our industries, while at least 25,000 form the subject of patent specifications. The number of coloring matters furnished to natural agencies is comparatively small and those that do exist threaten soon to be ignored in favor of coal-tar derivatives. Perkin's great discovery has led to a complete revolution of the color output of the world and has placed at our disposal an infinite series of colors of every variety and shade.

—A woolen mill is to be established at Rapid City, Manitoba. Some years ago a mill was in operation at that place, but it was burned. A board of provisional directors has been selected by the company, consisting of J. G. Hindson, D. McNaught, J. A. Cowan, Thomas Houlding and H. C. Clay, all of Rapid City.

At the annual meeting of the Wholesale Dry Goods Section of the Toronto Board of Trade, the following officers were elected: J. W. Woods, chairman; H. J. Caulfield, vice-chairman, Paul Jarvis, secretary-treasurer; executive committee, Andrew Darling, Herbert Langlois, R. W. Pentecost, John K. Macdonald, C. B. Lowndes, E. J. Dignum, J. D. Ivey, J. D. Allan, and John Muldrew.

—Leather suits are worn for automobiling, as well as hunting, and for the latter the leather is colored for the purpose for which it is to be used. A pumpkin yellow for the rabbit shooting in pumpkin fields, a wild celery green or oxblood red for the season of autumn leaves. The coats are lined frequently with squirrel skin, and there are boots that lace up the sides, with leather trousers. All are oil-dressed and waterproof, and they do not harden with wear. One can get a hunting suit made especially for any purpose, from hunting alligators to shooting quail.

—A German paper gives the following formula for waterproofing leather: The skins are laid down at 107 deg. C. in a solution of one pint zinc-soap in one pint crude linseed oil, until it has got cold. Zinc-soap is prepared by stirring three pints zinc sulphate into the boiling solution of three pints in eight pints water, and purifying the zinc-soap, which separates out by remelting in boiling water. After scraping off the surplus of the zinc-soap dissolved in the linseed oil the leather is dried in the air and is then perfectly water proof, without having lost any of its pliability.

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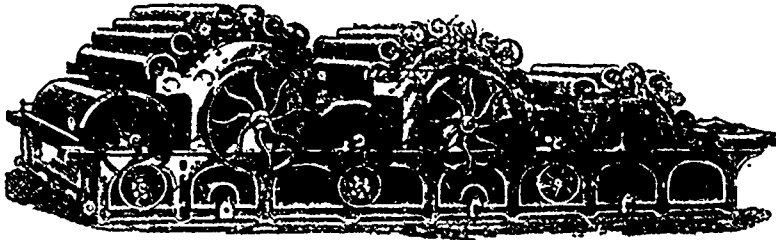
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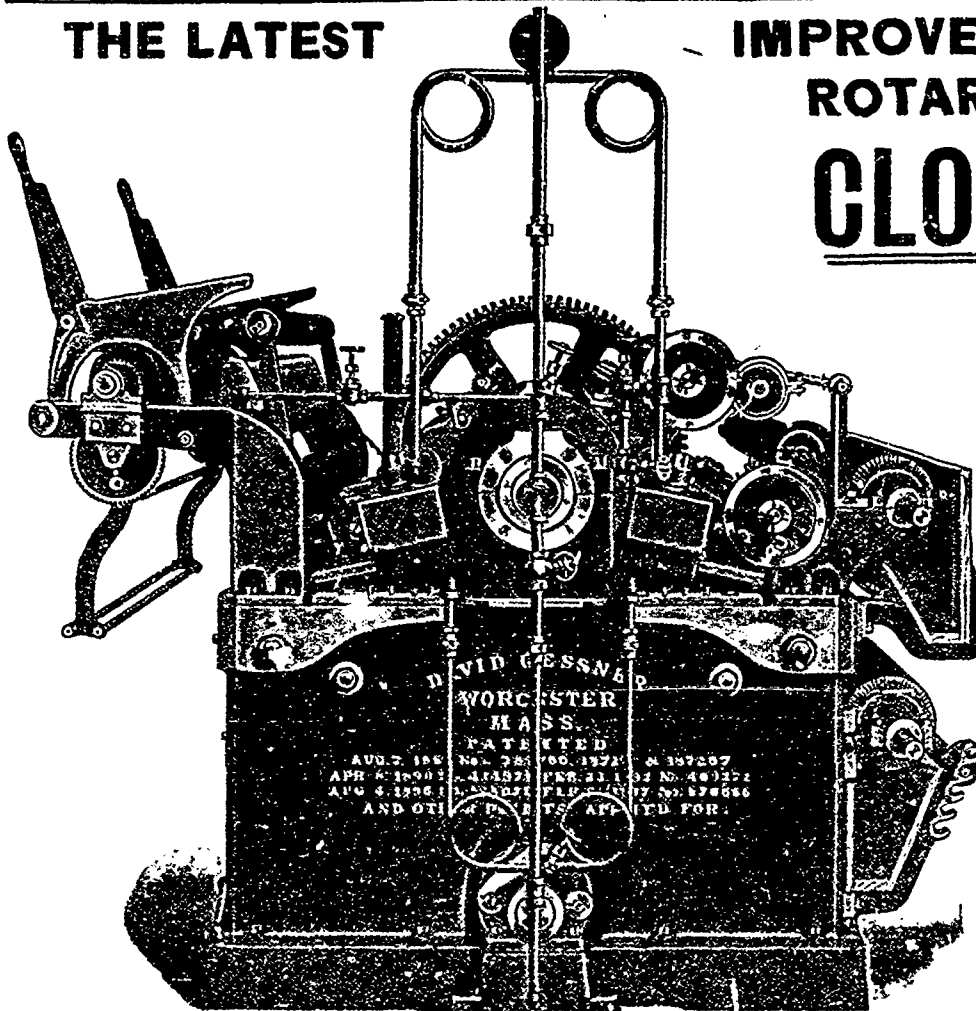
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The bed plates are self-adjusting, the levers that operate them being mounted upon sliding steel fulcrum bars within the frames. The trussing apparatus of the bed plates is so arranged as to permit not only a forcing of the centres of the bed plates in a forward direction, toward the cylinder, but also away from it, which is of the utmost importance if the bed plates should ever become sprung. Bed plates and cylinder after being cold finished, are ground absolutely true while heated by steam at 75 lbs. pressure, insuring perfectly straight and uniform pressing surfaces. Pressure is applied and removed instantaneously, and by power.

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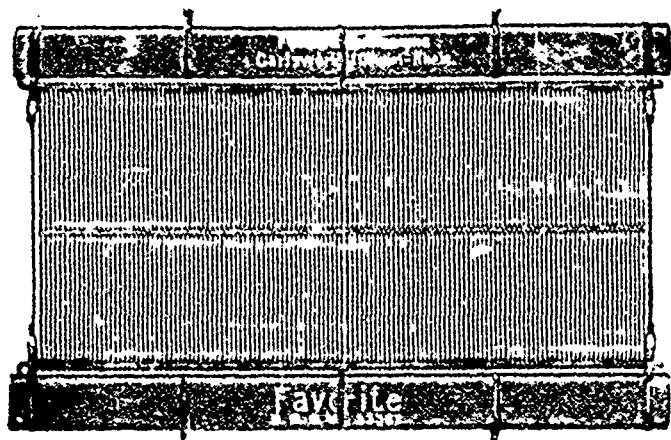
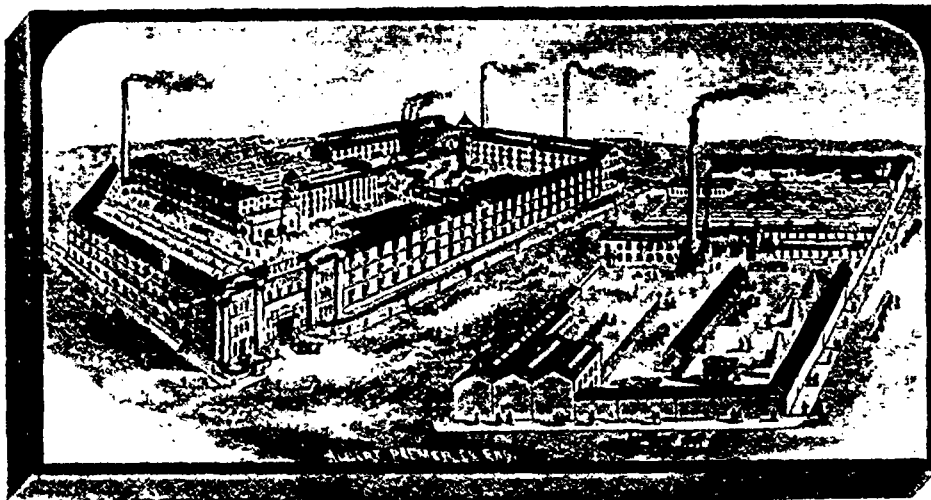
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