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CANADIAN Journal of Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XIX.

TORONTO AND MONTREAL, MAY, 1902.

No. 5.

Every Dyer and Textile Manufacturer should know the principles of the Metric System of Weights and Measures. These are clearly explained in the Chart of the Metric System advertised on page 159.

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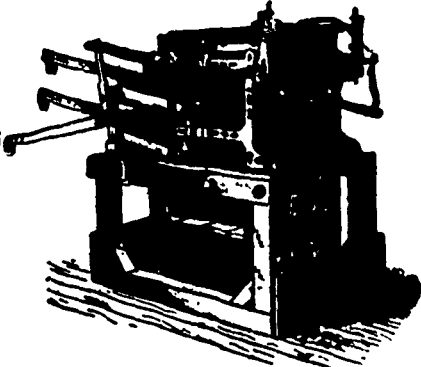
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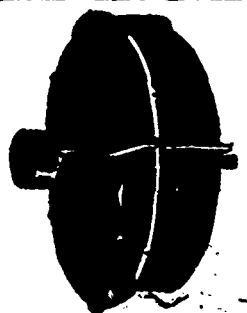
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TORONTO AND MONTREAL, MAY, 1902.

No. 5

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THE CANADIAN TEXTILE DIRECTORY

A Handbook of all the Cotton, Woolen and other Textile manufactures of Canada, with lists of manufacturers' agents and the wholesale and retail dry goods and kindred trades of the Dominion; to which is appended a vast amount of valuable statistics relating to these trades. Fourth edition. Price, \$3.00

BIGGAR, SAMUEL & CO., Publishers.

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THE UNITED STATES MANUFACTURERS "WOOL GATHERING."

Joseph Walworth, of Lawrence, Mass., in a communication to the National Association of Wool Manufacturers of the United States, deals with the qualities of territorial wools and compares them with Australian wools. Dealing with merino wool he says that the Montana product was some years ago at the top of all territory wool but it lost its place by deterioration, though now it is coming back again. It has been badly "put up," the earth-balls and dung locks being left in and there being many "wet skirts." "Two years ago" he says, "I was willing to give 90 cents

per lb. for scoured Geelong (Australian) 80s. and 90s. At the same time I would not give 65 cents for scoured territory of a fine sample. At that time we could make a cloth that would sell at a profit out of Geelong wool at 90c. per lb., but we could not sell a cloth made out of territory at 65c." He seems to think it a question whether merino wool can be grown in the American territories equal to Australian—while not all Australian wools are of the best class and while wools the United States manufacturers buy in the London market have to be picked out from selections of 10% of Australian, "still there is something in the best Australian merino wools that cannot be got from any other wools grown." Coming to crossbred wools, he says "Outside of the United States, the crossbreds, or long combing wools, are grown approximately as follows: 75 per cent. of all Canada wools, 90 per cent. of all English wools, 90 per cent. of all Irish wools, 10 per cent. of all Scotch wools, 80 per cent. of all New Zealand wools, a small per cent. of Victoria wools, and about 70 per cent. of all Argentine wools. Our American crossbred wool, when clean, is as good as any of the above, perhaps a little better, as most of it is touched with merino—enough to soften it and give it a close growth. I would take American crossbred wools at the same price clean, before any other. The next best would be Victoria crossbreds; there is not much of this, but it is beautiful. The next would be New Zealand splendid wool, well put up, and dry; it does not lose, but gains weight. It is the only country that for a thousand years and more has ever beaten England in raising the long combing wools. I should put Scotland after England for excellence of long combing wool, but they only raise these wools in about three counties, all the Highland wools being from black-faced sheep. Ireland comes after England, but not with one-fourth the variety of sheep that England has. Canada comes after Ireland, and very similar in her variety of sheep; they are both very limited in comparison with England. I would put 'Argentine' last, as to the nature of wool in crossbreds; but for several years past they have been buying the best English full-blooded long wool sheep, paying enormous prices therefor, in one case over \$5,000 for one sheep; and they are improving and have improved their crossbred wools very much indeed."

The writer shows that under the present tariff on raw wool it cost 12 cents to bring into the States a wool which he could use at Bradford for 8 cents, thus making the cost

20 cents, or 150 per cent. advance over the cost of the same wool to the English manufacturer; and his comment on this condition of affairs is:—

"O wad some power the gift gie us,
To see oursels as ithers see us!
It wad frae monie a blunder free us,
And foolish notion."

—Skirts, kissing, money and carpets have been declared by Dr. Henry A. Hopkins, the germ specialist, as the great distributors of consumption. Nevertheless, carpets are not any more likely to go out of fashion than kissing.

EXTRACTING DYE FROM COTTONSEED.

A process of extracting the coloring matter from the by-products derived from the manufacture of oil from cottonseed has recently been patented in America. The patentee states that his process is designed and adapted for the treatment of the hulls or bran and the cake or solid residuum after the oil has been expressed. By this process the natural insolubility of the coloring matter, caused by the presence in said seed and by-products of oils, fatty acids, and gums is first overcome. This is accomplished by treating the material with the vapor of a liquid hydrocarbon, such as naphtha, by placing the material either in bulk or, if bran in its original bales, in a suitable digester with which a hydrocarbon vapor generator is connected in a circulating cycle. The vapor as produced in the generator is conveyed by the pipes of the system to the upper end or part of the digester, whence it is forced downward and through the material, dissolving the oils, fatty acids, and gums, and being itself condensed into liquid. This liquid, as it passes through the material, carries with it the dissolved oils, fatty acids, and gums into the generator. Here the hydrocarbon is again vaporized, and again passed around through the digester, the operation being continued until all of the oils, fatty acids, and gums have been dissolved, and carried away from the solid material. The generator is then disconnected from the digester and hot air forced through the latter to free the material from all traces of the hydrocarbon.

The material is then removed from the digester and subjected to treatment for the dissolving and extracting of the color. This may be accomplished in various ways, but preference is given to the following method: The bran or cake is steeped in cold water for several hours until decomposition commences, accompanied by the generating of ammoniacal gas. The macerated material is then placed in a steam extractor and subjected to the action of steam under pressure as may be practicable or desirable, that is for about two and one-half hours, until the coloring matter is practically all dissolved and taken up by the water of condensation, constituting a water extract of the color, which may then be drained away from the solid matter. Instead of subjecting the macerated material to such treatment by steam in an extractor, it may be simply boiled in an open vessel to obtain the watery extract; but this is a less efficient and satisfactory process. This water extract may be used directly as a dye, but is preferably concentrated by evaporation so as to reduce its bulk for handling, transportation, and sale, it being diluted to the required degree when it is to be used. This process, as above described, involves no saponification, and relates solely to the treatment of cottonseed material, particularly the hulls or bran, as distinguished from the pods which envelop the seeds and fibre.—Indian Textile Journal.

THE ADVANTAGES OF ELECTRIC DRIVING IN FACTORIES.

In an article dealing with the growing use of electric power in American cotton mills, in Cassier's Magazine, W. B. Smith Whaley thus sums up the advantages of the electric drive:

"The convenience of distributing power in any direction by means of electric wires must appeal to those interested in the transmission of power, to say nothing of the absence in the sub-divisions of the mill itself of friction clutches and other devices for disconnecting continuous lines of shafting. The absence of weight in transmission, due to belts, or ropes, heavy receiving pulleys, large shafting, expensive head gearing, etc., is an advantage, as well as the decreased first cost, and the subsequent decreased power consumption due to the lessening of friction. The absence of dirt, dust, lint, and other flyings that are continually brought to the bearings of the engines and which often cause heating; the assurance that incompetent employees cannot put undue strains on the transmitting shafts by injudicious tightening of belts or ropes; and the entire absence of hygrometry on ropes and belts, which produce similar results, are factors of considerable saving in power. The transmitting wires have no moving weight, and consequently entail none of these detriments. There is no change in them except electric losses, and no necessity for belt way, belt guards, or safety devices.

"The motors, which are placed overhead, do not occupy any floor space, are absolutely out of reach, afford no danger to human life, and are so proportioned as to give, according to the number installed, the greatest flexibility to the plant as a whole. No special machinery is installed for lighting the plant, as the current is taken from the generator producing the power. Temporary power for any purpose, in any portion of the plant, is easily supplied by a portable motor, which is readily tapped on any power circuit in convenient reach. These and many other advantages, from a mechanical standpoint, have been demonstrated by actual experience.

"There is a saving in the friction alone of 20 per cent. The producing capacity of the machinery operated is, in actual practice, increased about 4 per cent., due to the steadiness of this method of driving over the usual method of ropes and belts, and the more uniform speed obtained throughout the plant."

THE EVOLUTION OF MACHINERY.

It cannot be said of any kind of machinery or machine tool that it has reached the point where improvement is impossible. New machinery and better tools are being constantly added to manufacturers' lists. They come and go with increasing persistence, and what is a time and labor saver to-day is being supplemented or supplanted, without any regard to dates. Inventive genius knows no halt, and is in unbroken movement round the orbit of industrial life. It cannot be boycotted, strangled, starved or sun dried. In speed, accuracy of work and simplicity of construction we have the ideal of inventive ambition. It is only by retrospect that we see the wide difference between the old and the new. No industry has been exempt from change or the spirit of progress that is brooding over everything. It presides at the loom and the forge, and in mine and mill. In cutting lumber and fashioning iron, in stamping dies and making spoons, and from the building of a bridge to the manufacture of a pill box, the use of improved machinery and tools is everywhere visible. The machinery industry is becom-

ing one of the great potentials of trade, and in the exchange of the old for the new, we have a business that is rounding out to large proportions. The manufacturer behind the times in the use of improved machinery travels a rocky road, not to fortune, but insolvency. Machinery is rapidly displacing hand labor, and it will go on doing so till the last spindle hums and the last wheel turns in the industrial world.

It would be well to remember in this connection, that as the man who handles a machine is the first to detect its shortcomings, in many cases he ought to be the best able to suggest improvements. What is wanted is more encouragement in this direction. Many machine users hold their peace in this matter, for the suspicion or knowledge they have that others would monopolize the benefits, some of which at least he would be justly entitled to. A more generous appreciation of practical suggestions would bring its own reward. In some instances this obligation is being recognized and with good results. It would be well for all concerned if this practice was more common than it is.—Age of Steel.

Foreign Textile Centres

Belfast.—This linen market is steady, with a moderate business. The spinning branch is unchanged, and there is a fairly strong demand for tows, orders being forthcoming to a considerable amount. No improvement is obtainable in prices, which keep unremunerative. Line yarns are quiet at unaltered rates. The manufacturing end does not show much briskness, but fresh business keeps coming forward regularly, and, added to the orders on hand, keeps looms fairly employed. White goods for home markets fully maintain their position, the tendency being in the direction of further improvement. The shipping trade is devoid of special features. The United States continue satisfactory buyers, but South Africa, Cuba, and the Continent are quiet. Colonial trade is fair.

Bradford.—This market is cheerful, with business on a firm footing, and so far as merinos are concerned topmakers are expecting a further advance at the approaching London sales. Topmakers are able to secure profits on wool bought at the last sales, and it is taken for granted that in view of this fact London prices will rise. There is no speculation, however, and the purchases only cover actual requirements, and it is a matter of complaint that it is not possible to command better rates. Cross-breeds are firm, but spinners assert that the trade cannot stand a further advance.

Dundee.—There is nothing new to report regarding the state of the linen trade. A fair amount of business, both home and export, is being put through, and prices are unaltered. The most marked thing is a sudden, brisk demand for sackings and baggings. The prices for these are very steady. Tarpaulins are also on the firm side, and makers are refusing to accept former prices. Jute is getting steadier, but prices cannot be quoted higher. Some small sales of natives have been made at £11 2s. 6d. to £11 5s. for April-May, to London, but spinners here are not inclined for business, even at reduced limits.

Kidderminster.—Business is still in a sluggish condition. Retailers of carpets are busy, and goods seem to be going into consumption fairly well, but manufacturers do not get any bulk of orders; in most instances they have enough from day to day to go on with, but such business is of a troublesome and not very profitable nature. In spite of a poor demand locally the spinning trade is firmer. Prices of carpet yarns are hardly tested, but in other branches there is more to do and a rather better price to be got.

Leicester.—In yarns there is a full average turnover, stocks are kept small, and buyers are placing new business with more confidence. The hosiery industry is active with larger deliveries and machinery is fully engaged.

Leeds.—The low class woollen trade continues to be depressed and a termination of the war is longed for to revive the export trade. Stocks of low-priced cotton warp goods are heavier than they ought to be, although production in many instances has been restricted. The better class trade continues prosperous. All kinds of worsteds are selling freely in the home markets; mixtures suitable for summer wear are selling largely, also close cut serges in black and blue. Vicunas of medium quality are in considerable request. The ordinary tweed trade is smaller in volume, owing to the favor being shown to the all-wool flannel tweeds and to lower-priced imitations. Of speculation there is very little, notwithstanding the expectation that the next London sales will show higher values, and manufacturers are obtaining advanced rates for the better qualities of worsteds and woollens. The claims of the producer are strictly based upon the increased cost of raw material, and there is no disposition to create a boom. The clothing factories are fully employed. An increasing trade in ready-mades is being done with the Cape. Rates in the local wool markets are very firm, but little more than a hand-to-mouth business is being done.

Manchester.—In the cotton trade the demand has been poorer than expected, and the efforts of the bulls to force prices upwards have attracted more attention than the actual movements of the market. The linen departments are doing fairly well, and for the States there is a brisker turnover than usual. In the linen section of the trade there has been an increase in the demand for the West. The New York enquiry for flax goods has been improving for some time past, and orders from the West have been growing rapidly.

Nottingham.—Business in the lace trade runs along as usual. While finishers of cotton fancy laces cannot get the goods fast enough, firms confining themselves more exclusively to the silk branches are by no means well employed. The run on valenciennes, torchon, and c'tuny laces, with nets and insertions to match, continues, and some other descriptions of cotton laces are also selling fairly well. There is, however, no expansion in the sale of silk millinery laces, and production has been curtailed. Good quantities of curtains are being disposed of, and there is a fair demand for other goods made on curtain frames, but this section of the trade cannot be described as healthy, competition being severe. A steady business is being done in plain nets at about recent prices. There is a good business being done in made-up fancy goods. The hosiery trade is without much change. There are fair orders on hand, but all manufacturers are not fully employed.

South of Scotland.—The cotton yarn market shows a hardening disposition, and indications seem in favor of higher values. For buyers the position is rather perplexing as foreign markets continue very irresponsive. The turnover in fancy departments still keeps well above the average, sales having increased considerably. Millinery displays in the shops are at their best, with all the newest spring and summer goods. Increased activity in the retail trade gives a more cheerful tone to the wholesale.

LITERARY NOTES.

"Practical Cotton Calculations" is a new treatise by Ernest Whitworth, late teacher of designing and cloth analysis at the New Bedford, Mass., Textile School. This little work treats of cotton yarn, the structure of cloth and calculations

relating to looms, etc., in cotton mills. It gives numerous tables, among them being one for numbering cotton yarn by the weight in grains per skein of 120 yds., the table ranging from 1 grain up to 140 grains per skein. It gives the systems of numbering yarns of various materials, rules for finding counts, length or weight of cotton yarns, beam and warp calculations, determining the weight of yarn on beams in the looms, warp and filling calculations; average counts of yarn in a cloth, calculations for check peg patterns, reed calculations; tables of the number of hanks of yarn, warp or filling in 100 yards of cloth; twist tables, showing the twists per inch for counts from 1 up to 140; tables of loom production and many others. There are 121 pages, size 4 x 6½-in., and the price is \$1. Published by Richard Boardman Fall River, Mass.

The American Society of Dyers has issued a very useful "Handbook of Information for Dyers," containing, besides the constitution and by-laws of the society, a dictionary of chemical formulas used by dyers, a comparative hydrometer scale, a table of comparison of Fahrenheit, Centigrade and Reaumur thermometers, with rules for reducing the degrees of one to degrees of either of the others; rules for finding the contents of cylinders, vats, tanks, etc.; the metric system of weights and measures, with other weights and measures; poisons and their antidotes, and notes on dyeing and bleaching. Published by the American Society of Dyers, 502 North 6th St., Philadelphia; 98 pages, 5 x 7½-in.

In the May Century Magazine there is a striking article by Wolf von Schierbrand, recording various "Conversations with the Four German Chancellors—Bismarck, Caprivi, Hohenlohe, and von Bulow—on the topic of American relations. Bismarck criticizes severely the declaration of war with Spain and the assertion of the Monroe Doctrine. In the Century's "Year of American Humor" are contributions by "Mr. Dooley" (on Books and Reading), by Carolyn Wells ("First Lessons in Humor"). There are two illustrated papers on popular science, both of information now first published—"Is the Moon a Dead Planet?" by Professor W. H. Pickering, of Harvard, and "How the Voice Looks," by Professor Scripture, of Yale—the latter with diagrams of the voices of Joseph Jefferson, Senator Depew, and others. The editor writes of missionaries and the temperance question, a topic of special interest to Canadians just now.

Those who study the drift of Canadian politics will do well to read an article on the "Folly of Railway Subsidies," by W. D. Gregory in the May Canadian Magazine. In the same publication F. C. Wade gives a talk on the Yukon, which our merchants and manufacturers will find well worth reading, for our own people do not realize what opportunities are slipping through our fingers in this region in the way of trade.

An interesting new feature in the Ladies' Home Journal for May is the beginning of Ernest Thompson Seton's department for boys, which is written and illustrated by the famous naturalist-author-artist. Helen Keller continues in this number the marvellous story of her life. Mr. Bok's editorial is a fine bit of sarcasm aimed at the wise New Yorkers, and there is plenty of helpful advice and interesting facts in the various departments.

The value of swimming as an exercise has been proved by some of the most famous athletes, and the mastery of this accomplishment, moreover, may some day mean the saving of human life. That boys and girls should be taught to swim admits of no argument. As it is, the majority of children fear the water, and much of this fear is due to the misguided anxiety of their parents. The trouble with beginners is that they make too much of the task; provided the effort is made, the slightest muscular exertion will suffice to keep one afloat.

How readily one may learn to swim is shown in the June Delineator, by an expert in the art, who describes the various strokes, floats, diving, costume, etc., in the simplest manner possible. Some striking pictures taken from life are shown.

Textile Design

WOOLEN COATING.



Complete Weave
Repeat 12 x 12.

Warp:—4,224 ends, 12 harness straight draw.

Reed:—16 x 4.

Dress:—

2 ends, 4-run woolen yarn, olive.
1 end, 8-run woolen yarn, twist, brown and fawn.
1 end, 4-run woolen yarn, blue.
2 ends, 4-run woolen yarn, olive.

6 ends repeat of pattern.

Filling:—64 picks per inch, all 3½ run, woolen yarn, brown.

Finish:—Fancy cassimere finish; 56 inches wide.

UNION TROUSERING.



Complete Weave
Repeat 16 x 8.

Warp:—5,670 ends, 16-harness, straight draw, all yarn, 2/32's worsted.

Reed:—15 x 6.

Dress:—

2 ends, dark blue.
1 end, lavender.
1 end, black.
1 end, lavender.
5 ends, black.
1 end, lavender.
1 end, black.
1 end, lavender.
2 ends, dark blue.
9 ends, black.

24 ends, repeat of pattern.

Filling:—60 picks per inch, all 5-run, black woolen yarn.

Finish:—56 inches finished width.

A HAT FACTORY FOR BROCKVILLE.

Brockville is looking forward to having an important new industry in the form of a hat factory, which Saultier, Decelles & Altman propose to move from St. Johns, Quebec, its present site, where it is known as the Union Hat Works. The town offers the following inducements: Nineteen thousand dollars bonus, payable as follows: \$5,000 on completion of the building, \$7,500 on the placing of the machinery, \$500 one year thereafter, and \$1,500 per year for four years thereafter; a suitable site—one of three named—containing one square acre; exemption from all taxes (except school taxes), for the term of ten years. The company undertakes to employ on an average one hundred hands, three-fourths of whom shall be men grown up, and to pay out in wages to hands (not including superintendents, but including foremen), at least \$30,000 per annum; to erect buildings suitable for the business of at least the following extent: One main brick building, 100 x 50 feet, three stories high, with a frame L one story high 75 x 35 feet. Suitable machinery to be installed therein. Security is to be

given on the buildings and machinery for observance of the conditions to the amount of \$20,000, and \$2,000 thereof to be released each year that the conditions are performed. The buildings and plant when ready for operation will cost between \$30,000 and \$35,000. As a rule the firm carries a stock of \$20,000. They are rated by Dun at \$20,000. Soft hats are made now, but they intend to go into the manufacture of hard goods. They now employ 75 hands, working 75 hours per week.

Mr. Saulnier, the head of the firm, was formerly of Truro, N.S., but desiring a more central location moved to St. Johns, five or six years ago. That town voted him a sufficient bonus to pay the cost of transporting and setting up his plant. Later on he wanted more capital with which to expand his business, and he made application for a loan of \$6,000 from the corporation, which was also granted him. Thereupon he bought the Bousquet brick mill, purchased new machinery, and has apparently since been doing a fair business. A St. Johns paper says no part of the loan, which is a first mortgage on the factory, has been repaid, and thinks it augenerous of the firm to remove. Brockville ratepayers will vote on the bonus by-law on June 4th.

ON DYEING COTTON WARPS.

This kind of dyeing is one of the most important branches of cotton dyeing, and demands special care, because on its proper execution depend the qualities of color of certain tissues. It is above all things necessary to obtain an even color, and the dye must penetrate fully into the interior of the yarn. For this reason the yarn must be conscientiously washed and freed from its impurities; in the case of light shades an additional careful washing is absolutely indispensable, but in the case of dark colors one may be a little less particular. The washing machine must not, as far as is possible, be used for any other purpose, and never for dyeing, and especially not for light colors, because it is easy to comprehend that not only its cleaning is difficult and involves a great loss of time, but it must also be remembered that the wood of the machine absorbs the dye in such a manner that even the most efficient means to remove it often remains powerless.

For a time the dye woods, cutch and basic dyestuffs, were exclusively used for dyeing cotton warps, but at present they are often replaced by the Diamine Dye Stuffs, which always give good results. The dye woods and cutch have a tendency to make the yarns mat together, which causes difficulties in weaving. The Diamine Dye Stuffs cost more to dye, but any increase which may take place with the dark colors is compensated for by the saving realized with the light shades, especially with baths of long standing; besides, these dyestuffs give more level shades. For dark shades, however, the bath cannot be so long retained as a standing bath.

A fast and cheap black can be obtained as follows: Fill the machine with just enough water to cover the bottom rollers, and add for each 50 pounds yarn 1 pound Diamine Azo Black, 3 pounds Glauber's salt, and 10 ounces Diamine Orange B. Run the yarn in this bath at the boil, then strengthen it with $\frac{1}{2}$ pound of the black dyestuff, 1 ounce orange, and $\frac{1}{2}$ pound Glauber's salt, while running the yarn in the bath, and strengthen a second time by the same additions. Then rinse lightly and diazotize in a bath, as cold as possible, with 2 pounds nitrite of soda and 4 pounds hydrochloric acid. Run the yarn in a cold bath containing 4 pounds hydrochloric acid for 12 gallons water. Finally run

in pure water, and develop in a strong bath of Phenylene Diamine and soda; one passage in this bath is enough.

The color thus produced is a deep black. A deep blue-black can likewise be obtained by using a developing bath of Phenylene Diamine dissolved in soda and betanaphthol dissolved in water with soda lye (70°). When the diazotizing bath is used for fresh lots, the addition made for replenishing the bath need not be more than one-third of the original quantity. The bath must always smell of nitrous acid, which is an indication of its being efficient. A bath that does not have this odor, either because it has been standing idle for several hours or over night, must not be used, but a fresh bath should be prepared. The quantity to be added to the developing bath for new goods to be dyed deep black should consist of $\frac{1}{4}$ pound Phenylene Diamine dissolved in 6 ounces soda and 2 ounces soda lye (70°). It is advisable to steep the warp thus developed for several hours in the bath before rinsing it, whereby the intensity of the color is heightened. After the lapse of a convenient time the material is passed in a soap bath of 1 pound soap and $\frac{1}{2}$ pound soda per 50 pounds warp, and then rinsed and dried. This black is good not only for warps of goods to be woven, but also for most tissues to be dyed.

A very handsome blue can be obtained, which is in no way inferior to indigo blue as regards fastness to washing and wearing—for light shades with Diaminogene Blue BB in a short bath. For a medium blue add to the bath 3 ounces Diaminogene Blue R or 6 ounces Diamine Azo Blue B, 6 ounces Glauber's salt, and 2 ounces soda. Give two dips, giving the second time the same quantities as above, rinse slightly, diazotize the same as for black, rinse in acidulated water, and develop with $1\frac{1}{2}$ pounds betanaphthol dissolved in $1\frac{1}{2}$ pounds soda lye (70°). When this bath is to be used again, replenish developing bath with one-third of above quantities. In this case likewise the material must be laid down upon the bath for several hours before rinsing. When a bright blue is wanted, pass in a fresh bath of about 2 ounces New Methylene Blue N or GG, and about $1\frac{1}{2}$ ounces alum to neutralize the action.

An excellent substitute for Catechu Brown is the use of Diamine Brown M. After dyeing, it is fixed in a fresh bath with 4 per cent. potassium bichromate. For the yellowish brown tones Diamine Cutch does good service. It is diazotized the same as black, but it is not rinsed after dyeing, but passed directly into a boiling soda bath, which at the same time fixes and develops the brown color; it is then rinsed and dried. This yellowish brown dye is fast to washing. For every other lighter color simple dyeing with the corresponding Diamine dyestuff will do very well, as these Diamines are sufficiently fast to washing and wearing without need of any after-treatment. The Immedial Blacks and Browns also merit some attention for dyeing warps in short baths. By developing them with potassium bichromate they give dyes of great fastness to washing, soap and light, and are perfectly suitable for warp dyeing. There are still some small difficulties in the way of dyeing with perfect success, but these are not insurmountable.—Le Moniteur de la Teinture.

SILK FROM COTTON.

Artificial silk, which is now being manufactured in Germany from chemically pure cotton, has all the appearance of the genuine article. Unlike artificial silk produced from nitro cellulose, it has properties which allow it to be dyed without losing any of its natural gloss, while it varies greatly in texture and substance from the finest to more common kinds.

To the touch it does not seem quite so soft and light as real silk. So great has been the demand for it that the two factories in G many now working have been found quite adequate to cope with the demand. As a consequence, a third factory is now in course of erection, which will produce about 500 kilos (10 cwts.) per day. The manufactured silk is used for design thread in silk stuff and cloth and for lace and embroideries.

THE PRAYER-RUG OF HIS FATHER.

The Journal man wandered idly through the streets of Cairo, at the Charleston Exposition, a week or so past, taking in the various sights of that indispensable institution of modern fairs. Before long he came across a booth, presided over by a dusky native of the East, who was selling, or trying to sell, some embroideries to a little throng of people who listened with awe-struck countenances to his vivid descriptions of his wares. The Journal representative decided to investigate.

It seemed a bad day for selling embroideries, and soon all but the journalist had wandered on, looking for some new attraction. The vendor of embroideries redoubled his efforts to effect a sale, his prices gradually growing lower and lower. But his listener wasn't there to buy.

Finally, with a paroxysm of grief that really would have done credit to the supreme effort of a great tragic actor, the Oriental dug down in a pile of his wares and drew forth a rug.

"Zis," said he, with tears of filial affection in his dark eyes, "iss ze prayer-rug of my father. He would weep if he know I sell him; but I must lif, and business ain't no good."

"How much?" was asked.

"Vell, I sell him to you for fifty dollars," he replied, after some calculation.



He evidently thought the Journal man was an easy mark. The rug wasn't even an imitation; it was an ordinary cheap velvet with a conventional Oriental pattern, and fifty dollars in good and lawful currency would have been a high price for a dozen such. The Oriental kept on, declaring, between sobs, that it wrung his young heart to part with his priceless heirloom, the rug upon which his venerable father had prayed, but that business was bad and he "must lif."

The journal man, much amused, finally told the wailing salesman that he knew the rug's value, in fact, that he knew where it was woven in Philadelphia. The tears dried up immediately, and the man changed his tone, asking the amused journalist not to breathe his knowledge to a living soul. And until now he has not.

AS TO CUTS.

A correspondent of Fibre and Fabric gives the following rule as to making cuts the same length: Take 1,600 yards of one run and it will weigh 7,000 grains. Divide it by 50 yards, and divide the quotient by 7,000 and you will have the number of grains in 50 yards of one run yarn, thus:

$$1,600 \div 50 = 32;$$

$$7,000 \div 32 = 218.75 \text{ grains.}$$

Then take 50 yards from your yarn and weigh it. We will say it weighs 35 grains. We will divide the 218.75 grains by 35, which is the weight of 50 yards of your yarn, thus:

$$218.75 \div 35 = 6.28. \text{ Answer, } 6\frac{1}{4} \text{ runs.}$$

TURKS WORSHIP GREEN.

Of the Turkish colors green is the most sacred, and for this reason a true follower of Mohammed will not permit it to be used in his rugs, for fear it may be profaned by being stepped on. Twenty-five or thirty years ago no Christian was allowed to wear even a vestige of green anywhere upon him while in Turkey, but this law is not now so rigidly enforced. If the Sultan or any of his family wear this color no objection is raised, as he and they are considered holy and exempt from the penalty.

—Lead the way with style and quality, and quantity will naturally develop. It is worth while to think it over; worth more than that to try it.

—The German colonial office is taking steps to establish cotton growing in Tongoland, East Africa, as a permanent native industry on a large scale. A commission of agricultural experts is to be sent to the United States to study conditions there and collect data.

G. R. Blyth & Sons, dry goods merchants, Ottawa, have assigned, with liabilities of over \$200,000. Toronto and Montreal houses are large creditors, and one large English house is creditor for a considerable amount.

—A correspondent sends us the following formula for washing wools: Dissolve 25 lbs. ammoniated potash, adding 1 quart liquid ammonia, in a barrel or tank holding 40 to 50 gallons of water, and feed into scouring machine with soap as necessary. The potash and ammonia will give the soap body, perfect saponification and heavy enduring lather, leaving the wool open, soft, lustrous and thoroughly clean. Finish the wool with a neutral soap.

—It is gratifying to note the success which attends the moistening of air in our textile mills. Until about twelve years ago the moistening of air in mills was done by vapor pots, and by sprinkling the floors two or three times a day with water. The results of the use of an air-moistening machine has been so satisfactory that at the present time no textile mill equipped in first-class shape will do without these air-moistening machines. There is not only a large increase in product, but a very much more comfortable atmosphere for the help employed in the different rooms is maintained.—Boston Journal of Commerce.

—"There is every prospect of a third party being formed in the House of Commons," said a prominent Canadian woolenman recently in a half serious tone, "and it may have far-reaching consequences. This party will be called the party of Transportation and Protection, and 'Canada for Canadians' will be its motto. All old ideas will be rooted out of its platform, and the lines followed by those old landmarks, Brown, Mackenzie and Dorion, et al., and Macdonald, Tupper, Cartier, et al., will be eliminated, and the new party will consider as its first and most important duty how to preserve the Canadian market for the Canadian people."—Dry Goods Review.

TESTING FOR FAST COLORS.

An old lady from the country went into a draper's establishment the other day and began examining some pieces of cheap calico. She pulled at one piece first this way, then that, wetted it, and rubbed it with her fingers to try if the colors were fast. Then she paused awhile, as if not yet satisfied. At last she cut off a piece with a pair of scissors, and, handing it to a gawky-looking girl of about 16, standing by her side, said:—"Here, 'Liza Jane, you chew that and see if it fades."

USEFUL TABLES.

(From the Handbook of the American Society of Dyers).

Rules for converting degrees of Fahrenheit, Centigrade and Reaumur thermometers.

- To reduce °C to °R, multiply by 4, divide by 5.
- To reduce °C to °F, multiply by 9, divide by 5, add 32.
- To reduce °R to °C, multiply by 5, divide by 4.
- To reduce °R to °F, multiply by 9, divide by 4, add 32.
- To reduce °F to °R, subtract 32, multiply by 4, divide by 9.
- To reduce °F to °C, subtract 32, multiply by 5, divide by 9.

The Dimensions of a Rectangular Vat Necessary to Hold a Given Number of Gallons.—Multiply the length in inches by the width in inches, and divide this into 231 times the number of gallon contents required. The result is the height of the vat in inches.

The Contents of a Cylindrical Vat.—Multiply the diameter in inches by itself, this by .7854, and then by the height in inches. Divide this amount by 231, and the result is the contents in gallons.

The Dimensions of a Cylindrical Vat Necessary to Hold a Given Number of Gallons.—Multiply the diameter in inches by itself, and then by .7854. Divide this into 231 times the number of gallon contents required. The result is the height of the vat in inches.

The Contents of a Rectangular Vat.—Multiply the length in inches by the breadth in inches; multiply this by the depth in inches, and divide by 231. The result is the volume in gallons.

TENSILE STRAIN OF BOLTS.

Diameter of Bolt in inches.	Area at bottom of Thread.	At 7,000 lbs per square inch.	At 10,000 lbs per square inch.	At 12,000 lbs per square inch.	At 15,000 lbs per square inch.	At 20,000 lbs per square inch.
½	.125	875	1,250	1,500	1,875	2,500
⅝	.196	1,372	1,960	2,350	2,940	3,920
¾	.3	2,100	3,000	3,600	4,500	6,000
7/8	.42	2,940	4,200	5,040	6,300	8,400
1	.55	3,850	5,500	6,600	8,250	11,000
1¼	.69	4,830	6,900	8,280	10,350	13,800
1½	.78	5,460	7,800	9,300	11,700	15,600
1¾	1.06	7,420	10,600	12,720	15,900	21,200
1½	1.28	8,960	12,800	15,360	19,200	25,600
1¾	1.53	10,710	15,300	18,360	22,950	30,600
1¾	1.76	12,320	17,600	21,120	26,400	35,200
1¾	2.03	14,210	20,300	24,360	30,450	40,600
2	2.3	16,100	23,000	27,600	34,500	46,000
2½	3.12	21,840	31,200	37,440	46,800	62,400
2½	3.7	25,900	37,000	44,400	55,500	74,000

The breaking strength of good bolt iron is usually taken at 50,000 pounds per square inch, with an elongation of 15 per cent. before breaking. It should not set under a strain of less than 25,000 pounds. The proof strain is 20,000 pounds per square inch, and beyond this amount iron should never be strained in practice.

FLOW OF WATER.

VELOCITY IN FEET PER MINUTE THROUGH PIPES, OF VARIOUS SIZES, FOR VARYING QUANTITIES OF FLOW.

Gals. per Min.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.
5	218	122½	78½	54½	30½	19½	13½	7¾
10	436	245	157	109	61	38	27	15½
15	653	367½	235½	163½	91½	58½	40½	23
20	872	490	314	218	122	78	54	30¾
25	1090	612½	392½	272½	152½	97½	67½	38½
30		735	451	327	183	117	81	46
35		857½	549½	381½	213½	136½	94½	53¾
40		980	628	436	244	156	108	61¾
45		1102½	706½	490½	274½	175½	121½	69
50			785	545	305	195	135	70¾
75			1177½	817½	457½	292½	202½	115
100				1090	610	380	270	153¾
125					762½	487½	337½	191¾
150					915	585	405	230
175					1067½	682½	472½	268½
200					1220	780	540	306¾

LOSS IN PRESSURE DUE TO FRICTION, IN POUNDS, PER SQUARE INCH, FOR PIPE 100 FEET LONG.

BY G. A. ELLIS, C.E.

Gals. Disch'd per Min.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.
5	3.3	0.84	0.31	0.12				
10	13	3.16	1.05	0.47	0.12			
15	28.7	6.98	2.38	0.97				
20	50.4	12.3	4.07	1.66	0.42			
25	78.0	19.0	6.40	2.62		0.21	0.10	
30		27.5	9.15	3.75	0.91			
35		37.0	12.4	5.05				
40		48.0	16.1	6.52	1.60			
45			20.2	8.15				
50			24.9	10.0	2.44	0.81	0.35	0.09
75			56.1	22.4	5.32	1.80	0.74	
100				39.0	9.46	3.20	1.31	0.33
125					14.9	4.89	1.99	
150					21.2	7.0	2.85	0.69
175					28.1	9.46	3.85	
200					37.5	12.47	5.02	1.22

New Lubricant.—An excellent lubricant, retaining at 1,800° C. all its lubricating properties, and keeping for an indefinite period, if kept out of contact of air, is obtained by mixing a fatty body, an alkali and water with a glycerine salt of potassium or soda. Any vegetable or animal oil, or fat, grease, olein or soap thus treated serves the same purpose.

Irish Carpets for the Royal Yacht.—It is stated that the carpet for the King's yacht, and also one for the private apartments of the Queen, are both of Donegal make. The King's is a fine effect in Wedgwood blue, with an Adam design in white. This was originally a ceiling pattern, but the result is very pleasing when thrown on a self-colored carpet. The Queen's carpet is pale green, with figures in a darker shade. It has a border in which bright prawn-pink roses are introduced.

HOW TO SEW CARPET.

In sewing carpet, says the Furniture Journal, it will be found convenient to stretch a rope tightly across the room at a convenient height from the floor and stretch a breadth of carpet on each side of the rope, with the edges, which are to be sewed together, just meeting above it. Fasten both breadths to the rope at one end by means of a small hand clamp, then stretch them as tight as possible and fasten with another clamp at the other end. This holds the carpet for you and leaves both hands free, and also prevents pulling one breadth more than the other and mismatching the figure.

THE COMING COLOR OF FASHION.

Fashion and society journals have predicted that royal red will be the color of the season, says a correspondent of The Leeds Mercury. At the great ceremony the peeresses of the realm will wear robes of scarlet and ermine, and in the coming spring and summer ladies of every rank and station will affect costumes of the royal hue. Queen Alexandra, we are told, has signified her intention of being robed in the produce of British looms, and it might be expected that the attendant princesses and peeresses would follow precedent. The Queen's example may have some effect in counteracting the prejudice which West End houses and ladies of fashion entertain against English dress materials or English dyes. Some of our manufacturers complain that they are handicapped by this prejudice; others, maintaining that it is no prejudice, complain of the shortcomings of the English dyer, whose shades, they assert, lack the bloom, the lustre, and the infinite variety of French dyed goods. The dyers retort that the blame rests with the manufacturers. There is no dye, or dyeing process (they say), known in France or Germany which is not known and practised here; but much of the cloth comes from the factory with the fibre permeated with oil and grease which no scouring agent can remove. For their own reputation, the leading dyers often resour the tissue before dyeing, but it is admitted that most manufacturers are now sending the cloth to the dyehouse in a fitter state to take on brilliant and pure shades than formerly. I do not profess to be an expert, but I am not colorblind; and after having inspected and compared a great variety of samples of French and Yorkshire dyed Amazons and other costume stuffs recently, I have failed to see the superiority of the French dyes, nor can I conceive how anyone—unless possibly the dyer himself—could tell the difference. Some very light French shades seem to be a questionable recommendation, for Yorkshire dyers have sometimes had forwarded to them stocks of French-dyed goods to be redyed in more salable and serviceable colors. If the Coronation is to inaugurate a season in royal red, Yorkshire scarlet dyers ought to benefit. The mere dyeing of the peeresses' robes, of course, would be a trivial matter. A couple of pieces—one day's work for a dyer—would suffice to clothe all these high-bred dames; but a prevalent fashion would produce a tremendous rush. After the death of Queen Victoria some of our dyeworks turned out an unusual amount of dark purple, but, so far, no feeling for an abnormal demand for scarlet and crimson has been perceptible, nor can the manufacturers, whose mind's eye would first discern coming events, report any sensible enquiry either for royal red or for that seeming myth coronation grey. Neither in reds nor in any other direction has the forthcoming pageant stimulated the cloth trade in a marked degree.

What, it may be asked, is royal red? No dyer seems to be very clear upon the point, and Yorkshire dyers have dyed reds, scarlets, and crimsons for Royalty and for the British Army for untold generations. Is it the family color of the House of Stuart? The old Stuart scarlet is supposed to have been kermes, or oak cochineal, a product of Candia and the Isles of Greece, a coloring material of unknown antiquity, but now merely of historical interest. It is said that no living English dyer would know kermes if he saw it, though a term derived from it is in daily use among Yorkshire dyers. Kermes, like cochineal, was an animal dye. The insects whence kermes, lac-dye, and cochineal were obtained were thought to be berries or grains, and the colors were said to be grained or engrained, the term applied to cochineal dyeing in Yorkshire to this day. Kermes was itself an Arabic corruption of vermes (little worms), and vermilion is a corruption of vermiculata. Vermilion is the name now given to red cinnabar, or sulphide of mercury. Was our royal red the famed vermilion of the old Byzantine artists, a pigment almost identical in color with cinnabar?

CORONATION CARPET.

To the city of Worcester has fallen the honor of manufacturing the carpet which is to be laid down in Westminster Abbey on the occasion of the Coronation, the order having been placed with Edward Webb & Sons, of that city. The carpet will be woven of mohair, and it is in consequence of the Webbs' proved skill in weaving that material that they have been honored by the order. A few figures will show what a considerable demand will be made upon the manufacturers. The carpet, or, rather, the carpets, for they will necessarily be in sections, will cover an area of no less than 725 square yards. The average weight per square yard will be 8 lb., so that the total weight will be two and a half tons. By the last week in May, Webb & Sons hope to complete their task. The preparation of the looms alone occupied nearly a month, for it was essential to reconstruct them in order to suit the particular method of weaving which has been adopted. It is an interesting fact that this method whereby the tufts are secured more firmly than has hitherto been possible, is the invention of the firm itself. It is an outcome of their anxiety to produce a Coronation carpet worthy of their reputation, and the process is deemed of such importance that it is being patented. Except for the spinning of the yarn, the whole of the work is being done on the firm's premises, where the weaving is busily going on.

The carpet is being manufactured in two widths of 36 inches each, with borders of 18 inches each. It will be handed over to the Office of Works to be made up and put down, and such is the care manifested in its production that corner squares are to be provided, so as to avoid the use of the mitre, which cuts into the pattern and throws it all askew.

The sketch design was supplied to the manufacturers by the Office of Works, and was prepared by James Greenwood, of Kidderminster, the designer of the carpet presented by the manufacturerers of that borough to Queen Victoria on the occasion of the Jubilee of 1887.

Letters patent have been granted incorporating the A. H. Sims Co., to acquire as a going concern the business of A. H. Sims & Co., shirt and collar manufacturers, of Montreal, and to carry on the business of merchants, manufacturerers and dealers in all kinds of cotton, linen, silk and other textile fabrics. Capital, \$350,000.

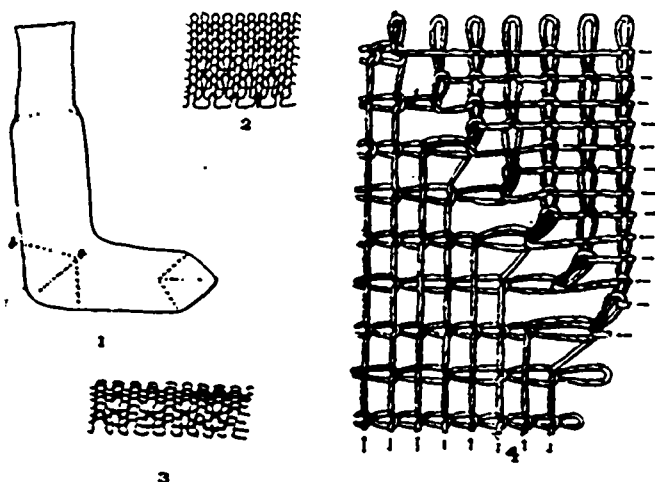
A PATENT STOCKING.

The accompanying diagrams illustrate a new method of knitting hosiery as described in *The Textile World*. Fig. 1 is a side elevation of a stocking with the cone-shaped toe and heel portions marked. Fig. 2 is an elongated view of the knitting-stitches used. Fig. 3 is a reversed view of the stitches, showing the appearance from the back of the fabric. Fig. 4 is a detail view, showing on an enlarged scale, the loops by which the triangular sections are joined to the adjacent fabric.

This invention is for the production of stockings which have heels and toes knitted in a different manner from the remainder of the fabric to produce a firm and well-wearing fabric at these points. The other portions of the stocking or sock, save the heel and toe, are made with a common flat or rib or other stitch; when the heel or toe is reached the stitch is changed to what is called the "lock-stitch," or one which is formed by knitting all the working needles in one direction and then working every alternate needle in the reverse direction until the heel or toe is completed.

In this way a very desirable and strongly knit heel or toe is made from a single thread, and one which, it is said, cannot feel uncomfortable to the wearer, as one surface will feel very much the same as another, the stitch forming a mock rib on one side of the fabric only and tightly-drawn wales on the other side.

As soon as the line, a, b, is reached and one-half of the knitting-needles have been thrown out of operation, the knitting the first triangular section of the heel is begun by knitting one way with all the active needles. When one course



has been completed every alternate needle is arranged so that it will not rise to release its loops from its latch and take fresh yarn. Thus every other needle will perform the knitting operation in this course.

The next course is knit with all the active needles in operation again, after which the full course will again be knit with every other needle. The courses will thus alternate until the whole conical fabric comprising the heel or toe has been completed. Because of the skipping of the stitches where the alternate needles have not operated and the reaching of the stitches in alternate courses across the long stitches, the fabric will be of a somewhat heavier and closer-woven texture than the remainder of the stocking, and will have a greater wearing quality than the ordinary plain stitch will afford. It is claimed that such a stitch in practice forms an ideal heel and toe for a stocking or sock, the loops being all

on the outside of the fabric, presenting mock ribs on the said outer side and wales on the inner side, drawn tight from alternate stitches.

It will be noticed that in using a tuck-stitch to form the triangular section constituting this heel, the portions of the strand of yarn used in knitting the course which is knitted with alternate needles only can be drawn tight, or they can be pulled down with the hooks of the inactive needles, thus forming bent-spanning portions. The inventor states that the heel made of straight or tightly-drawn portions is the strongest, and, as the conically-knitted heel gives the proper amount of space for the heel of the stocking, he prefers to draw these spanning portions of yarn tightly, which span alternate needles, thus forming a strong fabric with but little give.

MULES IN THE MILL.

A new and inexperienced inspector was recently sent to inspect a certain mill. Among the instructions given him was a caution to inspect the mules. He dutifully went through the buildings, and then enquired for the stables. The employee whom he questioned looked surprised, and remarked that there were no stables. "Then where do you keep the mules?" asked the green inspector.

A NEW CLOTH BOARD.

The difficulties with the ordinary cloth board are well known to every manufacturer of cloth. If made of green or partially dried stock the moisture is liable to injure the finish and cause mould spots on the tail end of the piece. If not covered with paper, the sawdust, chips and dirt adhering to the board get on the cloth, causing much trouble in removing them when the pieces are unrolled, and, what is worse, exciting a prejudice against the goods just as the purchaser or his examiner is about to inspect them. Covering the boards with paper is a remedy for these troubles, but this takes time, costs money, and if not done properly, is worse than not doing it at all. In every lot of solid cloth boards, there is apt to be a greater or less proportion of defective boards. Many of these are not strong enough to stand the strain in winding the cloth. The result is an immediate break up of the board as soon as the winding is begun, or a crack which is not discovered until the piece is partially or completely wound on the board, in which latter case the cloth must be unwound, a new board substituted and another start made.

Too many mill men fail to recognize the value of properly doing up the goods for market after they are finished. Clothes make the man, it is said, and so the cloth board, the cloth ticket, the winding and general appearance of the roll of cloth goes far to predispose the trade for or against the goods before the fabric has been shown. In many of the best mills these facts are recognized, and in one instance, that of a well known make of imported dress goods, a cloth board of such an attractive and distinctive character has been used so long for this line that the goods are recognized by nine out of ten buyers as soon as the board is seen.

Recognizing the defects of the ordinary board and the advantages to the mill of a board properly constructed, Chaffee Bros. & Co., Oxford, Mass., have designed and patented a cloth board which combines strength, lightness and an attractive appearance.

It consists of a wooden frame covered with strong paper. The construction of the frame brings the strain in winding lengthways of the grain instead of crossways as in the com-

mon board, thus greatly reducing the liability of breakage. It is very light owing to the fact that much less material is used. It needs no covering before use as the paper serves that purpose.

ARTIFICIAL SILK.

The high cost of natural silk has always been an incentive to inventors in their search for a substitute that would possess the strength and lustre of the natural product. The first patent for artificial silk was issued in 1885, and samples were exhibited at the Paris Exposition in 1889.

Many difficulties were met with at first. The highly explosive and inflammable character of the material was one of the greatest objections. This defect has been remedied by the process of treating the silk with a cupric ammonia solution and then in phosphate of ammonia. This process reduces the inflammability of artificial silk below that of cotton. Companies in both France and Germany are engaged in the manufacture of the artificial product, and as the price was much below that of natural silk, while the lustre was even higher, a ready market was found for all that could be produced.

To offset the advantages that we have named, artificial silk possesses certain defects. The dry artificial silk possesses less than half of the strength and considerably less elasticity than true silk. For this reason its use has been confined to the wear of goods with a warp of natural silk, mercerized cotton, or worsted. It is used extensively in the manufacture of the stuffs, novelty goods, decorations and passementerie. Still more objectionable is the lack of strength. The tendency of artificial silk when wet is to disintegrate like wet paper. For this reason great care is necessary in dyeing and washing the material. Experiments made to determine the effect of various solutions on artificial silk gave the following results:

(1) A sample of Chardonnet silk was boiled one hour in distilled water. Upon taking the sample out, it was found to be soft, and it parted when subjected to a slight tension.

(2) A sample of artificial silk was steeped one hour in a strong solution of acetic acid. The result was similar to that of No. 1 test. When dry the silk possessed the well-known quality called scroop caused by the acid. This scroop was, however, much less than is found in natural silk.

(3) A treatment in benzine for one hour caused no change other than the fibre appeared somewhat harsher after the benzine evaporated.

The following methods are employed for distinguishing Chardonnet artificial silk from natural silk:

(a) A yellow color is imparted to the liquor when the artificial product is dissolved in an alkaline solution. In the case of natural silk the liquor is colorless.

(b) Artificial silk burns quickly in a flame, and very little ash remains. True silk carbonizes when burnt.

(c) Artificial silk is reddened when treated first with sulphuric acid and afterwards with brucine; a small quantity of diphenylamine causes a blue color, since nitric acid is always present in the fibre.

(d) Natural silk is dissolved in a solution of 10 grams of sulphate of copper and 5 grams of glycerine in 100 cm. of water, to which sufficient alkali is added to dissolve the resulting deposit. Artificial silk is not soluble in this solution.

By far the largest part of artificial silk is at present manufactured by the Chardonnet process. Recently a new artificial silk called "glanzstoff," has been put on the market.

It is obtained by dissolving cellulose in cupric oxide of ammonia, and possesses considerable lustre and strength.

There was exhibited at the Paris Exposition in 1900 an artificial silk, called "viscoid," that possessed many good qualities; this silk has not yet been placed on the market; as its name indicates, it is obtained from viscose.

With the exception of Vandura silk, which is made by treating gelatine with formaldehyde, cellulose is the material from which artificial silk is made. Cotton is nearly chemically pure cellulose, and for this reason the action of dyestuffs and chemicals is much the same on both cotton and artificial silk.

The Chardonnet product, owing to the nitric acid in its manufacture, is much more susceptible to the action of most dyestuffs than is cotton. Thus artificial silk can be dyed with the basic dyes, all shades from the brightest to the darkest, without preparation with tannin and antimony salts. As brightness and lustre are more important than fastness in the dyeing of artificial silk, the basic dyes are specially adapted for this material. The dyeing process is simple and sure. Acetic acid is added to the bath and the material entered cold. This liquor is heated gradually, the fibre absorbs the liquor quickly, and the color develops very evenly. Although, as already observed, the wetting of artificial silk reduces its strength, there is not much danger in this respect if the material is handled carefully.

The substantive dyes rank next to basic dyestuffs for dyeing artificial silk. For the dark shades the material is entered cold in a soap bath containing common or Glauber salt. The artificial silk absorbs the substantive dyes more readily than does cotton, otherwise the action is the same. Owing to the reduction of the strength of artificial silk when wet, great care must be used in handling the material when in this state. Violent boiling should be avoided, and after rinsing it is best to extract the material with rubber rolls under light pressure. Sulphur colors are less used for coloring artificial silk, as the shades obtained are duller and the fastness of the substantive dyes answers every purpose. The use of mordant dyes is excluded, because all mordants injure the lustre of artificial silk.

The price of Chardonnet silk has hitherto averaged about \$2.20 per pound, and recently was advanced to \$2.30. The price will probably decline in the future, as many new establishments for producing artificial silk will doubtless play an important part in the textile industry.—Boston Journal of Commerce.

A NEW WATER PROOFING MATERIAL.

A leather substitute called Pegamoid has recently been placed on the market. Paper, textiles, asbestos, and other fabrics treated by this substance improve in appearance, and are rendered waterproof and practically indifferent to atmospheric action and putrefaction, remaining at the same time soft and pliable. Materials treated by this process may be dyed any desired color, take impressions well, and, considering their close resemblance to leather, and their durability, there is no reason why this product should not be utilized instead of leather, at least in the manufacture of wall-paper and in upholstering. In price it has the advantage over leather. Among the other advantages claimed are that it is not easily scratched, and therefore, being waterproof, may be washed or scrubbed even with hot water without the least injury to the surface or color of the article; secondly, that neither acids nor grease have the slightest effect on it; finally, being more pliable, it is more easily manipulated than leather.

It could also be utilized for impregnating documents, drawings, etc., with the solution. In this way they could be rendered practically everlasting. The materials to be impregnated undergo a certain treatment previous to the application of the solution, the consistency of which varies in accordance with the object in view. Castor oil, rubber solution, or similar substances are added to insure pliability, or resinous bodies to obtain greater hardness and gloss. If required, the goods thus treated are subsequently grained or have certain designs imparted by passing them under high pressure through rollers.

THE NEW MAIL TEXTILE SCHOOL.

As announced in a recent issue of this journal, the American Correspondence School of Textiles of New Bedford, Mass., C. P. Brooks, director, has become one of the many schools whose work is carried on under the general title of the International Correspondence Schools, Scranton, Pa. The institution developed from a Correspondence School of Mines founded in 1891 by T. J. Foster, president of the International Schools. As is well known, miners are required to pass examinations for license before they can act as mine foremen or superintendents, and the idea occurred to Mr. Foster that miners could be provided with the information necessary to pass these examinations, entirely by mail, if the instructions sent them were systematic and simple, and the correction of their work was fully and carefully attended to. His plan proved to be a practical one, but neither Mr. Foster nor anyone else had any conception of the wonderful system of training by mail that would be evolved from this little idea. The success of the Correspondence School of Mines was immediate. Over a thousand men accepted this opportunity for self-advancement, within the first year of its existence. A demand sprang up for other courses, and they were prepared. This demand has continued to grow and is growing. New courses have been added every year, and scarcely a month goes by but the International Correspondence School announces that its now famous system has been applied to the technics of some new trade or profession. Over 400,000 men, and women too, have enrolled in the schools during the last ten years, and, it is said that this number is increasing at the rate of 10,000 enrollments per month. These figures may appear exaggerated, but when we consider that the institution has enrollment offices in every city of any size in the United States and Canada; that it has a force of representatives numbering over 1,500, and that it is one of the largest advertisers in the world, their probability becomes apparent. Then again the institution takes particular pains to see that every student is so well satisfied with his connection with the schools and the results of his training, that he becomes a sort of solicitor for them. With such a force behind it, it is small wonder that the enrollment is increasing at the present rate. Some idea of the extent of the work carried on may be gained from the statement that the main building that we have illustrated is only one of some eighteen or twenty that the schools occupy in Scranton, where they have over a thousand employees, nearly 400 of whom are engaged entirely in instructing the students and correcting their work, and in writing and revising the textbooks that have made this institution so popular.

The position of the International Correspondence Schools in the educational field is unique. It provides special courses of training by mail for special positions or classes of work. For instance, if a man is working as a telephone wireman, and desires to qualify himself for advancement in his line of

work, it is not necessary for him to stop work and go to a technical school to study electrical engineering. He can keep right on with his work and take a course of training by mail from the International Schools, not in electrical engineering, but in telephone engineering. This illustration points out two strong reasons for the schools' success. First, that the training by mail is conducted entirely in spare time and does not interfere with the student's regular occupation, and second, that the student is taught only such facts, processes and principles as are necessary for his success in some particular occupation or position. This same rule applies to the schools' training for positions in textile manufacture and design. For instance, the schools offer a complete course in the manufacture and design of cotton fabrics, but the cotton mill man who wishes to become a boss carder need not take this complete course. The schools have a shorter and cheaper course that will give him all the technical training required for the position of boss carder, but no more or no less. Again, if a boss weaver desires to qualify as a designer of fabrics, he can obtain a course of training by mail in the technical principles of design. He can even choose between woolen and cotton designing. This system of specialization is carried out by the schools in all of the hundred or more courses offered, and it is an indication of the general trend of the times. The institution does not claim, or attempt, to give its students broad educational culture, but confines its attention strictly to qualifying him technically for the position he desires to obtain. It even has a department in effective operation that assists students in securing the promotions or new positions for which they are preparing. It makes no attempt to qualify a man practically for any class of work. The courses are not intended to make weavers out of dry goods clerks, or plumbers out of coachmen, but is intended to qualify those already at work, for advancement and better pay in their chosen trade or profession.

There are many correspondence schools, but none have developed or obtained the confidence of the public to the extent that this institution has. Its success has been founded on the success of its students, and their success has been due to the excellence of the text books or instruction papers, sent them for their home study without a teacher, the careful and conscientious correction of their work, and the assistance given them in overcoming the difficulties that are almost certain to arise in the path of the ambitious worker that has had few educational advantages. It is for the mutual interest of all engaged in textile manufactures, whether in the capacity of mill man or employer, to further any plan that aims to increase the efficiency of "the man behind the loom." Trained workers means better methods, better machines and better goods. It means the one essential that needs to be added to our commercial opportunities to give us the leading place in the world's textile manufacturing countries. We presume the International Correspondence Schools will readily forward a full description of their course in textile manufacture and design and a clearer statement of their system than could be given in these columns.

THE DRYING OF TEXTILES.

While improvements are constantly being made in many departments of textile manufacturing concerns, all tending to reduce as far as is practically possible the cost of manufacture, but little attention has been given to the proper distribution of suitable plant and apparatus for drying the goods from the raw state to the finished. Comparing the dyeing appliances with those set apart for drying, the former will be

found in almost every case to be much more efficient and economical.

Unlike many operations in the manufacture of textiles, that of drying cannot be attempted in an unscientific manner, if economical results are desired, for it must not be overlooked that the principle of economical drying depends upon the proper use of heat, and this latter, being obtained for the present purpose from coal or other combustible, represents money, every cent of which used for drying purposes must show proper equivalent in output of desiccated goods or material.

In all cases where the drying of textiles is attempted, two very important points must be considered. They are, first, heat, and second, air. Heat is necessary in order to so change the physical condition of the air that its capacity to absorb moisture may be increased, and, besides a constant supply of fresh air is necessary to replace that which has become charged with moisture, for moist air is a poor drying medium. Other considerations for proper drying are also to be taken into account, namely, the distribution of the heated and moving air through and around the material to be dried, and the amount of heat necessary to dry a given amount of material. These will be taken up and discussed further on.

Several systems are in practical use for drying textiles, the most extensive being that based upon the use of rooms (dry rooms) or chambers heated by direct steam radiation, or indirectly by air previously heated by passing over coils of pipes contained in a separate place. This system is largely employed for yarns, and in some mills for piece goods. Its chief advantage is low cost of original installation, but this does not compensate for the labor necessary to charge and empty the room, and the immense waste of heat.

Of course, where there is a great amount of heat going to waste in the form of exhaust steam, etc., as is sometimes met with in a few large plants, then this system is perhaps permissible, but even so the coal pile must eventually suffer.

During the recent years, automatic or continuous dryers for yarns have received marked attention from manufacturers, but not what they deserve, when their great economy is taken into consideration. Whether large or small, these machines are constructed upon sound principles, and although they may differ materially in internal construction, yet they are essentially the same in that the wet material enters at one end, and, after travelling over aprons or belts, etc., always in a constantly changing atmosphere, it emerges in a thoroughly dried condition. Most of these machines are constructed so that the speed can be altered to meet the condition of varying percentages of moisture contained in the different lots of goods.

This system of mechanical drying has so many advantages over the old "dry room" system that it is a wonder that any new mills are equipped otherwise. The operation is continuous and, as a rule, hardly more than a man and a boy are required to attend each machine, and who are quite able to take care of a much larger quantity of material in a given time than would be possible with the old system, which requires considerable space, and much time to hang and take down, to say nothing of the trouble with poles, etc.

Continuous drying of piece goods is gradually coming into favor, although many superintendents still adhere to the closet or room system, drawing the fabrics over poles, arranged parallel over a flat coil of steam pipe supported but one or two inches above the floor. At its best, the system is crude, as much time and heat are lost during the filling and emptying of the compartment.

By means of a suitably constructed chamber, arranged with carrying and guide rollers placed at the top and bottom, and with a separate heater combined with a fan, preferably operated by means of an electric motor, the highest efficiency will be secured. The heater may be constructed of brick or sheet steel, and enclosing a sufficient length of pipe, and designed to utilize either live or exhaust steam. This apparatus can be connected by means of suitable flues or ducts to the drying chamber, through which it forces a steady and uniform current of hot air, and at such a rate that the goods are rendered perfectly dry, and the spent or exhausted air is saturated (or nearly so) with moisture for its degree of temperature.

Many persons consider that air for drying purposes must be hot, that is heated to a temperature sufficient to boil water, and imagine that unless it is, proper drying will not occur. This is wrong, for it is well known that air at various temperatures is capable of absorbing varying quantities of moisture up to what is known as the point of saturation, or "dew point," at which moisture becomes visible. Thus, air at a temperature of 70 degrees F. is capable of absorbing and holding 8 grains of moisture per cubic foot, but if heated to 92 degrees F., it will hold just double that quantity, or 16 grains. If heated to 117 degrees F., it will hold 32 grains, and if the temperature is increased to 146 degrees F., the absorptive power is about 64 grains, consequently it is seen that the higher the temperature the greater the amount of moisture the air will retain. Now, in removing moisture from textiles, it is not so much a matter how high we heat the air to do the drying but rather what volume of air we force through the drying room, for it is actually the heated air in motion that is effective.

To make a practical experiment let us assume a room capable of handling at one time two breadths of 36 in. goods, the room being 8 feet wide, 7 feet high and 10 feet long, equivalent to 560 cubic feet, the total length of cloth averaging 100 yards, and carrying, say, 80 pounds of water with it from the whizzers. Let us now suppose that the blower is in operation, forcing air heated to 120 degrees F., which may contain about 15 grains of moisture per cubic foot. As air at 120 degrees F. is capable of holding 34 grains of moisture, and as it already contains 15 grains of moisture, the difference ($34 - 15 = 19$) is its unsaturated factor, which divided into 7,000 (the number of grains in 1 pound of water), gives the number of cubic feet (368) necessary to take up the vapor of 1 pound of water; but as we have 80 pounds of water to be absorbed, we must multiply 368 by 80, the product of which is 29,440 cubic feet, which will be the volume of heated air necessary to effectively dry the goods in question.—Textile Excelsior.

THE LOOM OF THE FUTURE.

A recent issue of *The Mill and Shop* contains the following article: The man who assumes that the constructive principle as embodied in the loom of to-day is good enough to follow up in making further improvements in that most important machine, so indispensable for producing cloths for the whole world, may have to change his mind in the near future, as a new loom, made on an entirely different principle, will soon be put on the market, adapted for making almost every kind of men's wear, woolen, worsted and cotton fabrics, all of which it can easily produce, in marketable condition, and three or four times faster than the best output of the common fancy loom of the present day. Not only can it pro-

duce such goods so much faster, but it can be run automatically all day long; and, having no shuttles to change, no warps to dress or beam, no yarns to "size" (before being used), no harnesses or heddles to bother the weaver, or add more weight to the loom—consequently requiring less power to drive—and, better yet, so easily manipulated by the weaver, that one hand can readily attend to four such machines, any one of which can easily produce a full cut of cloth 50 yards long, or heavy weight goods, within a working day. It will not require much figuring on the part of our readers to arrive at a fairly accurate conclusion as to the full value of such an invention, which is now in operation in a little unpretentious shop in New England.

To be more precise in our description, we will say that this new "loom of the future," which is meant for producing the greater part of the world's fabrics, in which (chiefly on account of its productive capacity) it will have no rival, is built in circular form, and—unlike all other circular machines, employs a regular warp as well as weft, or filling yarn. For its product, which may include plain cloths, twills, diagonals, with or without plush or heavy backs, astrachans of the best makes, overcoatings, heavy or medium weights, hair lines, checks or plaids, and many other patterns too numerous for us to now mention, there being no bar to the variety except in intricate weaving designs or "Jacquard patterns" which alone may be left to the much slower fancy loom of to-day.

When it is conceded that the foreign maker of such goods has an equal opportunity, with our own manufacturers, of purchasing his raw material at its lowest figures in the same market, it must be obvious to those who are interested in this problem that to offset his rival's advantages of cheap help, low rents, etc., the American manufacturer who seeks the same market for his productions must meet the situation more effectively in another way, viz., production.

To give our readers a practical idea of what can be done on one of these looms, let us say that on a 14-inch cylinder which is adapted for three-quarter goods, a full yard of good, marketable men's wear goods can be woven in seven minutes or about eight yards to the hour. And let us assure our readers this is no "fairy story," as can be readily proved.

On a 26-inch cylinder—meant for 6-4 goods, and running only at moderate speed—very turn of which can be made to put in and drive home 10 or more threads (or picks) of filling, the production is correspondingly great, against which the foreign rival will be helpless; and, let us add, that these are facts which can be safely vouched for by those who, like ourselves, have witnessed the loom in operation.

On account of the constant and even tension put on the warp, which (tension) is applied by springs, and no jerking motion needed, such as follows the rising and sinking of harnesses as on the present style of fancy loom the yarns needed for this rotary loom need not be of such good stock nor need it be so finely spun, as, if meant for any kind of fulled goods, the number of "holes of twist" applied in the spinning of such yarns can be reduced, thereby aiding that part of the process very materially. And, let us add, a few less turns will do equally well for the filling; both which can be spun more economically and the "fulled cloth" will thereby have the "softer feel," which will make it more desirable to handle as all experienced manufacturers are aware.

We think it a perfectly safe assumption to state that the power required to drive one fancy loom will be entirely sufficient to operate three of these circular looms; in fact, we should not hesitate to add that less rather than more power is needed to operate three such looms, the required floor space for such being about one-half that for the fancy loom.

While very few woolen weavers can attend to more than one fancy loom, especially so if on medium or low grade goods, one operator can as readily attend to four of these circular looms, which, with their even tension and regular automatic movements, will give less trouble to keep in operation; and as the production from each will not be less than three times more, the operator attending four such looms can readily run off two or three times more than can one weaver on a fancy loom, the respective productions from which cannot be told apart when in a finished condition. In fact, if there be any difference noticeable, it is in favor of the circular loom, the product from which will be noted for its more even texture throughout the whole piece.

While the inventor does not claim to be able to produce in exact duplicate every style of goods in the market, such as intricate face weaves or jacquard patterns, enough of the less intricate sort can be made more cheaply—for the markets of the world—to offset such special demand. At the same time it is claimed by the inventor that enough of such fancy patterns can be readily and quickly produced—by simply changing the stripping bobbins in the warp, and the feeding yarn in the weft or filling part of the fabric—to more than offset such an infrequent demand, as it is well known that very few manufacturers care to produce such intricate patterns, preferring rather to work on plainer goods, such as our market calls for to-day.

Should such necessity arise for special weaving effects, however, special new pattern wheel can be readily made up, so as to press the needles in or out, thereby making them "risers" or "sinkers," exactly as is done with warp threads drawn through the heddles of a harness, and the striking advantage of this mode of operating the warp threads is so obviously more economical for saving power, that once it is seen and understood it is thoroughly appreciated. In plainer terms the revolving pattern wheel is always ahead of the filling thread, pressing the upright needles to act as risers or sinkers for the warp threads in the fabric; a very simple duty which the needle cannot fail to perform when pressed outward, or "skipped" in turn by the pattern wheel, which is positive in its action.

In our opinion the manufacturer who will fit up his mill with such—which will not cost him (loom for loom) as much as he must pay for broad fancy looms—and who aims at producing such standard makes as twills, diagonals, chevots, overcoatings, striped or checked effects, hairlines, astrachans, etc., in either light or heavy weights (but in great quantities, for which this rotary loom is specially adapted) will soon find that he has his market in perfect control, especially so as against the slower and more laborious productions of the common broad looms of to-day. Of this fact he need have no doubt, as to look at the question from any other point of view is simply to invite more active competition from abroad.—Textile Excelsior.

A VENETIAN TAPESTRY.

At the exhibition of the Royal School for Art Needlework in London recently was an example of old Venetian tapestry work, and by connoisseurs it would no doubt be considered as worth a prince's ransom. For more than 250 years it draped the walls of a room in the old Venetian royal palace, and the six large and six small panels into which it is divided are estimated to have cost the working hours of many lives. The lustre of the silk is as soft and fresh to-day as when it left the workers' hands. Of a different order of richness are the

tapestries from Hardwick, which the school has been cleaning and restoring for the Duke of Devonshire. They are very fine, and, like the hangings sent from the same establishment to the Paris Exhibition to capture the gold medal, they are sure to attract general interest.

MILL DISCIPLINE.

The object of mill discipline is to secure the highest efficiency of each individual, and also the whole body of employees acting as a unit. When work is being done by one man for himself alone, the question of discipline is one of self-control. He decides what is best, and does it to the best of his ability. When the job becomes too large for him, and others are called in to assist, that something which we call discipline becomes necessary. The singleness of purpose and unity of action of the one man must be supplied to the number, and some means must at the same time be devised to make the knowledge, judgment and experience of each individual as available for the general good as was the knowledge, judgment, and experience of the one man for his own good. The complete attainment of these objects—in other words, the ideal discipline, is impossible. The best system is the one that comes nearest to it.

The unity of purpose and action must necessarily be supplied by giving one man authority to direct the work of the others. This is self-evident, and admits of no discussion. Converting the knowledge and skill of each individual into common property is more difficult, but not less important. It will readily be granted by all that no man should be placed in authority who is incompetent, either by lack of experience, training, or natural ability. It will also be generally admitted that this centralized authority should be given to but one man. Having secured the competent manager, and having given him the necessary authority, it only remains to hold him strictly responsible for results. He must be left free to act as he may think best for the interests of the mill.

So far, says *The Textile World*, we have made reference only to the one highest in authority. The management of industries employing a large number of hands in various processes means, however, that the head man in authority must employ subordinates to whom is given authority over certain departments. To these subordinates, whether called superintendents, overseers, second hands, or what, the same principles apply that we have mentioned in connection with the central authority, the only difference being that the sphere of action is smaller. This necessitates the limits of authority being exactly defined. When this is done, a competent man should receive full authority in his department, and be held responsible for results. So far, we think there will be slight dissent from our views. The difficulty is not in knowing what should be done; it is found in making practical application of the recognized principles. In actual practice, we find men holding positions of responsibility in our mills, but deprived of some or all of the essentials we have named. He may be competent, and lack authority. In that case, knowing what is right, he sees what is wrong without the power on his part to apply the remedy. Or his duties and responsibilities may be but vaguely defined—a condition in which either he comes in conflict with others in authority, or else some part of the work is neglected and left with no one in authority to look after it. Owing to the vast detail involved in textile manufacturing, the work is subject to numerous defects and difficulties that call for an immediate remedy as soon as discovered. Delay in correcting a fault often means heavy loss. In a properly disciplined mill, when the

work is subdivided among men who know their place, have the necessary knowledge and authority, and feel their responsibility, short work is made of most difficulties as they arise.

In such a mill there is peace of mind on the part of each competent employee who knows his place and what is expected of him, a condition most conducive to the realization of the second object of discipline—namely, making the knowledge and skill of each individual available for the general interests of the enterprise. Every textile manufacturer knows the value to the mill of the knowledge acquired by his subordinates in their daily contact with the processes of manufacture. He knows how much it would help production, quality and cost, if each employee did his best and gave his superiors in authority the benefit of his knowledge. To attain this result many schemes of profit sharing have been tried. Such schemes are open to objections under the most favorable conditions, and are totally ineffective if a business is unprofitable, and consequently in the greatest need of the best efforts of each employee. They fail to give each individual the reward of his own work.

Mill discipline should be such that each employee receives such reward in the way of promotion or recognition as his services merit. Praise, if deserved, should be administered as freely as deserved blame. No two persons are alike in capacity or disposition. It is for the employer or head manager to study the conditions in his own mill, and apply rigorously the correct principles of discipline. Engage competent men. Define their duties. Hold them strictly responsible. Use them rightly, and see that they use others the same way. If at fault, talk to the offender alone. Don't encourage insubordination by interfering with those under the authority of your overseers or superintendents. Let the work of hiring or discharging help be done by the one next in authority. Let your employees know what you want, and then leave them alone while they are trying to do it. Avoid anything that would lead an employee to think that he could safely disregard the orders of his immediate superior. See that no injustice is done to any one of high or low degree. Use common-sense, and, most of all, do not expect others to be nearer perfection than you are yourself.—*Textile Manufacturer*.

A JANUS-FACED FABRIC.

What man may become in the far and scientific future passes all calculation. It was suggested by an eminent medical authority not long ago that our descendants might lose all their teeth and get to gizzards—if, indeed, food extracts should not leave us altogether independent of digestion. Fresh conditions of life may affect other functions, and an inventive German has already set out to provide us with clothing that will make us proof against some climatic inconveniences. According to the only account we have as yet of the new material, it is founded on the fact that—"the sun ray is a compound agency, combining both heating and chemical energies, and that these different forms of energy in the sun ray can be 'split up,' and made to act independently." Well, our inventive Bavarian friend argues that the hot sun glare during summer months and in tropical regions acts injuriously on the human body, owing to its heating and chemical effects. To obviate this dual action he seeks to neutralize the different rays and arrives at his goal by making clothing of double-faced material. The outer surface is white, in order to deflect the heat rays; the inner black to absorb the mischievously

active chemical rays." It may be remembered that the late Captain Mayne Reid, of boyhood's fame, contended that the practice of wearing light-colored or white fabrics in hot weather is manifestly wrong, since Nature furnished the animals of the tropics—black men and brown bears for ready examples, with dark skins and furs; while white-skinned animals, bears and foxes, were found in the arctic circle. General experience runs counter to the good old romancer's ingenious theory, and affords another proof that natural analogies are not always safe to build up arguments upon. And while Herr R. J. von Schmaedel's new fabric may be accepted so far as heat deflection goes, there is not sufficient explanation of what injury he finds in the chemical solar rays, or proof as to the extent to which an inner black surface may neutralize them, for an opinion to be formed as to its merits in that respect. Many years ago a mild sensation was caused by the announcement that an automatically expanding and contracting fabric had been perfected, by which those who wore it would have changes of temperature at once, and without thought or trouble, regulated to suit comfort and health exactly. There is every reason to believe that it was either a neat hoax or a clever skit on underclothing vagaries. But there was unquestionably a double-surfaced fabric devised and put on the market a few years since, which was intended to utilize the different properties of two fibres in one material. Silk and wool was claimed as the most preferable combination—wool next the skin for absorption of moisture, and silk on the outer surface for heat retention; but to provide for the less wealthy classes, wool and fine Egyptian cotton were sanctioned. This wool-plated fabric was boldly designated "The Underclothing of the Future," and it was, of course, supported by a glowing description and strong recommendation from somebody with a medical degree. We must assume that Herr R. J. von Schmaedel is a substantial and veritable individual, and that he "means business," if he can get it, with his Facing-both-Ways fabric; but the fate of the material just mentioned does not offer him much encouragement, for beyond the first flourish of introductory trumpets, we believe that the Underclothing of the Future justified its title too completely. Whatever the excellence of the black-white fabric may be, the public will have to be educated up to appreciation of it, and that seems likely to be a tedious and probably a costly process.—Textile Mercury.

HOW MINERAL WOOL IS MADE.

In the modern industrial world waste of any kind is something to be avoided if possible. Costly manufacture has in almost every line been forced by competition to the very lowest point, while every possible by-product has to be utilized. These facts are what give an importance to the manufacture of insulating material, which has now become a necessity of modern industrial life. It has been estimated that a non-insulated steam pipe loses heat in the course of a working year to the value of 64¼ cents per lineal foot. This shows sufficiently the importance of insulating material as a means of keeping heat in. It is equally important for keeping heat out, and one of its widest functions is in the construction of refrigerators and refrigerating plants.

There are many insulating materials on the market, among which one of the most interesting is that commonly called mineral wool, rock cotton, or silicate cotton, which is used not only as an insulating material, but also for fire-proofing, sound deadening, filtration, etc.

The so-called mineral wool is usually made from the slag of blast furnaces, with limestone added, and

the rock wool or rock cotton from granite and limestone. The principles involved in the manufacture of this product, whether made from the slag or from granite, are alike, and in either case the operation is comparatively simple, depending, in the first place, upon intense heat, and then upon the high-pressure steam blast to blow the liquid slag or lava into shreds, or the fleecy clouds that one sees in the receiving chamber when the product is being made. The intensity of the heat required to fuse the material may be imagined when it is considered that iron melts at 1,992 degrees Fahrenheit, while the granite or slag will not fuse under 3,000 degrees Fahrenheit, 1,008 degrees hotter than molten iron in the blast furnace. The spray from the slag emitted from the volcano of Kilauea, Hawaiian Islands, during eruption is blown by the strong winds into fine glassy fibres, called the "hair of Pele," which is said to have the same nature and character as the slag wool or silicate cotton here described.

The following brief description of the process of manufacturing mineral wool, taken from The American Exporter, may be of interest. The first necessity after securing the rock for cotton or the slag for mineral wool is crushing the crude material. Special crushers are employed, capable of reducing 200 tons of granite per day to pieces not larger than marbles. For fusing a cylindrical furnace, twenty-five feet high and fifty-eight inches in diameter, is used. The crushed granite, mixed with small quantities of lime and coke, is fed into the furnace by men working in one-hour shifts on account of the heat at the furnace mouth. A special device for mixing the gases of combustion with the coke fed into the fires is employed. By this means the temperature in the furnace is soon raised to 3,000 degrees Fahrenheit, or over, and the rock fed in at the top flows out at the bottom in a molten mass of lava-like substance, as hot and as dangerous, if free, as that which overwhelmed Pompeii and Herculaneum 1,800 years ago. On account of the fierce heat required, the furnaces can be operated but three days continuously. At the end of that time the fire brick lining of the furnace is destroyed and must be replaced with fresh lining.

The melted rock flows through a trough in a stream half an inch in diameter directly in front of a powerful steam blow-pipe. As the stream of lava meets the terrific blast it is blown by it into a receiving chamber opposite, and after the blast is over the room is filled with the fleecy-like fibres, white and soft, which cling to the walls and fall to the floor like snow.

The chamber or cooling room into which it falls is 24 feet high, 40 feet long, and 25 feet wide. Its capacity is three tons, and it can be filled, it is stated, in three hours. The fibres, as they fall into the cooling room, the temperature of which, it is said, averages about 93 degrees Fahrenheit, are somewhat coarser than sheep's wool, but not so long; the greasy feeling of the latter is, however, entirely lacking. The rock cotton is there baled, and is ready for the market or for converting into various forms required for insulating material, such as pipe and boiler covering, fire-proofing material, wall insulation for cold storage houses, packing houses, breweries, dwellings, refrigerator cars, etc. The raw product is also exported to Europe, Australasia, the West Indies and South Africa, one recent consignment thither consisting of 300 tons of rock cotton in bales, said to have been the first shipment of American fibre to that market.—Textile Mercury.

No. 1 mill of the Rosamond Woolen Co. at Almonte closed down on May 2nd, to remain closed till the 14th, and perhaps longer.

AUSTRALIAN WOOL.

We have received the following circular from Eug. Troost & Co., Melbourne, dated 1st February, 1902, dealing with the wool trade of Australia for the season of 1901-1902: The last sales held in Melbourne, from the 28th to the 31st January, practically brought the Victorian buying season to a close. A large business has been transacted in this market, the quantity sold being 313,000 bales, and surpassing that of last season by 51,800 bales. After the issue of our circular of the 4th November last, prices on this side receded to the extent of five per cent., but they recovered in December owing to the revival of the Continental demand, which was particularly strong towards the end of the year. When the sales reopened in January, a further stiffening was noticeable, which culminated in an advance of 5 to 10 per cent. just prior to the opening of the London first series. The selection during the past month had considerably fallen off, and the few lines of good merino wools elicited the keenest competition from French and German buyers; whilst comebacks and cross-breeds considerably recovered from their low level, owing to an increased Yorkshire demand. Speaking generally, the English demand has been the most regular from the beginning of the season, the Continental section becoming prominent in November and December, whilst the American representatives operated freely as soon as their style of wool was catalogued, viz., from the middle of November to the end of December. The total business done in the Australian markets since the 1st July last is shown by the following figures:

	—1901-1902.—		—1900-1901.—	
	Offered.	Sold.	Offered.	Sold.
Sydney	433,600	416,000	295,000	266,500
Melbourne-Geelong	337,000	313,000	287,500	261,200
Adelaide	72,000	65,000	51,800	42,800
Brisbane	23,000	17,000	10,000	8,100
	865,600	811,000	644,300	578,600

Last year our season extended well into February. We estimate the distribution of this season's Colonial purchases (811,000 bales) to be as follows:

Continent of Europe	410,000 bales.
United Kingdom	290,000 bales
U. S. America and Canada	36,000 bales.
Japan and India	3,000 bales
Local manufacturers, scourers, speculators, etc..	72,000 bales.

811,000 bales.

A decrease in the production is expected in Queensland and South Australia, but Victoria will hardly show any change, and New South Wales will perhaps, have a small increase, so that the total production for season 1901-1902 may show a very insignificant, if any, augmentation over that of 1900-1901.

Freights—Steamer rates are 7-16d. and 9-16d. for greasy and scoured respectively; sailers quote 1-16d. less. Exchange on London is $\frac{7}{8}$ per cent., and $1\frac{1}{4}$ per cent. discount for 60 and 90 days' sight respectively.

SOME POINTS REGARDING THE WOOL CLIP.

Now that the wool clip season is about commencing a timely hint reminding sheep-owners how much the market price of wool is depreciated by carelessness and inattention to the following avoidable circumstances, prepared for the

Argentine growers, but equally applicable in Canada, will not be amiss:

1. When the fleece is damp, dirty or full of earthy or sandy matter—the result of gross negligence.

2. When the fleece is full of burs or other similar foreign and injurious substances.

3. When the fleece is soiled or matted with sheep droppings (clags), or bound up with such dirty locks and tailings.

4. When the fleeces are tied by string or other similar vegetable materials, which interfere with the dyeing of the wool, and not by wool bands.

5. When the fleece is chemically or mechanically injured by being marked with dyes or tar, which interferes with the washing, dyeing or manufacture of the wool. It is better to mark sheep on the horns, ears, or legs, where no harm can be done.

6. That the fleeces are so clean and thoroughly washed as to be free of any wash or dip that may have been employed for the cure of scab, or other parasites infesting the fleece of sheep, especially when the lime and sulphur dip (sulphite of lime), perchance has been applied, when it must be entirely removed by clear water before being washed in soap and water, or the wool will not take the dye well.

7. There are many other small details which it is necessary the flockmaster should observe. In England, after the sheep have been washed, they are turned into a clean croft or paddock for a short time before they are shorn. The wool must be quite dry before clipping, or the fibre becomes deteriorated, and has a tendency to rot. The shearing must be done on a clean floor, so that the wool cannot pick up any foreign matter. On the other hand, the clipping must not be too long delayed after washing, or it returns to its greasy condition. Washed wool should not be mixed up with greasy wool. When string or other like material has been employed in tying the fleece, it has been frequently observed that while it passes detection in the first instance, when the wool comes to be manufactured into cloth and dyed, then the hemp is detected, inasmuch as it, being vegetable matter, will not take the color the same as wool, and the manufactured cloth is spoiled in consequence.

Touching washing, the "suint" which is removed by these means forms about one-half the total weight of the raw fleece in the merino sheep; but in the ordinary sheep of the English downs it averages about 15 per cent., while the fatty matter in the washed fleece varies from 8 per cent. to 30 per cent. In some of the colonies the fleece is often washed after shearing, and the flocks of wool spread out and turned to dry, much like hay, on large, clean, wooden floors. While all these adverse circumstances which have been adverted to lower the value of wool materially, on the other hand there is nothing that appreciates a fleece more than cleanliness and good condition; or, in other words, when it is thoroughly and carefully handled, washed clean, has no extraneous matters, is free from all hurtful impurities, of a good color, properly got up, shown off and marketed to the greatest advantage, thus obtaining for itself a high character and the top price. As the value of the finer wools is once more on the rise, these matters for the nonce have a much greater importance for the wool grower than usual.

—A young man, who worked in a large cotton spinning factory at Stockport, and whose job consisted in opening the bales of raw cotton and feeding them into a machine in the first process, took small-pox, the contagion being conveyed in the cotton.

TEXTILE MANUFACTURING IN MAINE.

The water-power of Maine early attracted the attention of American manufacturers of cotton goods. One of the pioneer mills of the State was established at Brunswick in 1809, another at Wilton in 1810, and a third at Gardiner in 1811. Factories were erected at Saco in 1831, at Lewiston in 1844, and at Biddeford in 1845, while in later years Augusta and Waterville secured large plants. Lewiston is, however, the chief centre of industry, while the twin cities of Biddeford and Saco rank next in importance. At present the cotton mills of Maine are all west of the Kennebec river. They are located, without exception, at the falls of large rivers, and are worked by water-power. The manufacture of cotton goods is the most important industry in the State. The fifteen establishments reported in 1900 gave employment to 13,723 workers or 18.3 per cent. of the wage-earners in the State, and their products were valued at £2,926,217, or 11.5 per cent. of the total value of the products of the State. In 1890 there were twenty-three establishments with 13,912 wage-earners, and products valued at £3,063,381. The decrease in the value of products during the decade was £137,164, or 4.4 per cent.

Wool manufactures in Maine date back to a period some years before the introduction of cotton mills in the State, one of the earliest having been established in that year at Dexter in Penobscot County. Owing to the generally favorable conditions for its growth and development, the manufacture of woolen goods is now carried on in nearly every county in the State, water-power being used. The town of Sanford, in the south-western part of Maine, not far from the New Hampshire line, is the seat of an important branch of this industry, the manufacture of carriage robes, mohair plush, and horse blankets. Wool manufactures rank third among the industries of Maine, with 79 establishments, 7,155 wage earners, and products valued at £1,504,263. There is also one establishment reported for the manufacture of worsted goods, the statistics of which are not available for comparison, being included with those of "all other industries" to avoid disclosing operations of individual establishments. The increase in the value of products during the decade ending 1900 was £1,178,293.

HYDROCYANIC GAS AS AN INSECTICIDE.

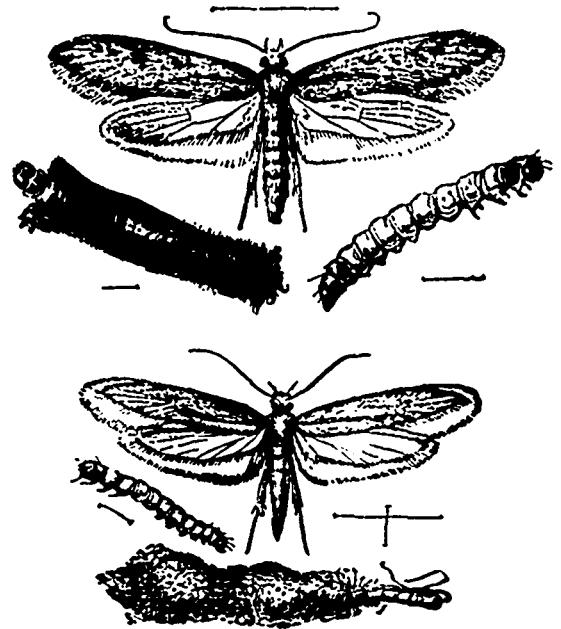
L. O. Howard, chief entomologist of the United States Agricultural Department, sends out a timely and interesting bulletin relating to household insects of all kinds, in which he says: "Good housekeepers throughout the whole United States have frequent occasion to consult entomologists as to the best means of ridding their houses of insects which, through the fact that they have succeeded in accommodating themselves to the conditions of civilization, have become known rather distinctively as insects of the househo'd. The problem is a much more serious one in the South than in the North, yet most of these insects occur in the Northern States as well as in the Southern. In the latter, however, they are apt to be more abundant. Their occurrence in the North is due to the fact that houses are artificially heated in the winter time, thus affording opportunity to breed throughout the entire season. Fleas, cockroaches, house centipedes, ants (especially the little red ant), "silver-fish" or "slickers," book-lice, clothes moths, the buffalo carpet beetle, the black carpet beetle, and the host of insects which affect stored products, and others found breeding in storerooms and pantries, which are carelessly kept by indifferent housekeepers, comprise the principal insects known as household insects."

After discussing the insect question generally, also the

use of rugs and carpets, and the extinction of insect life in the household and on trees and shrubs, Professor Howard asserts that hydrocyanic gas is to-day the most formidable foe of house pests and vermin of all kinds.

How to Use the Gas.

The latest development, says Professor Howard, in the use of the gas and the latest development in the warfare against household insects is the use of the gas in houses. Last summer Mr W. R. Beattie, of the Department of Agriculture, conducted certain experiments in a building used for laboratory purposes by the division of botany, which indicated that the dissolving of 0.1 gram of pure cyanide of potassium per cubic foot of space was perfectly satisfactory against cockroaches and other insects. Upon the evening of June 20th, 1901, such an experiment was tried and the gas allowed to remain in the building over night. The following morning the gas had not



entirely escaped, and the house flies, centipedes, spiders, cockroaches and mice were dead, with the exception of a few roaches that had secreted themselves between the sash and frame of a loosely fitting window, and had thus secured enough pure air to prevent them from being killed. Later in the summer, Mr. A. H. Kirkland, a well-known entomologist of Boston, conducted, independently and without knowing Mr. Beattie's results, two striking experiments of a similar nature. One was in a closed house, the inhabitants of which were absent at the seashore, and which was overrun with clothes moths, and the other was in a similar house, which had become infested with fleas, from the fact that flea eggs had been left there in the sleeping places of certain pet domestic animals. Mr. Kirkland used 1 ounce of pure cyanide of potassium to every 100 cubic feet space (a lesser amount is used in green-houses on account of the possible damage to plant foliage). He used ordinary porcelain wash-basins, and, beginning at the top of the house, dropped his cyanide in each basin, running down to the lower floors as rapidly as possible and closing the outer door behind him. Everything in the way of living insects was killed in both of these experiments, and it is interesting to note that in one of them, two English sparrows, which had alighted upon the ridge pole, were overcome by the slight exudation of the fumes from the shingled roof. The houses were opened up the next morning and thoroughly aired.

It seems to me, therefore, that in the use of hydrocyanic acid gas the whole problem of household insects is practically solved. When these insects are few in numbers fight them by the old-fashioned methods; but if they have increased to the point of desperation, vacate the house over night and try the cyanide method. The greatest care should be observed in the use of the gas, for the reason that it is destructive to all warm-blooded animals, including human beings, as well as to insects. The house may be quickly aired, however, and the odor of the gas is readily detected. The house should not be occupied until the odor has been entirely dissipated. The odor is that of peach kernels.

AMERICAN WOOLEN CO.

The following statement of the business of the American Woolen Co. will be of interest: In 1901 their net sales amounted to £6,967,938, an increase of £1,033,296. Net profits amounted to £415,551, a loss of £152,258 for 1900, probably due to the poor condition of the trade in the first seven months of 1901. After paying £280,000 on the preferred stock, the company's final surplus amounted to £556,681. In addition to the annual report, the following important statement has been made: Earnings since organization, March 29th, 1899, to January 4th, 1902, £1,520,197; less preferred dividends paid and accrued, £763,515; surplus, £756,681. Total quick assets over all liabilities, £2,320,431. No bonded indebtedness except £59,000 unmaturing on two properties which existed at time of purchase. While the company earned at the average rate of 4½ per cent. per annum on its common stock, the management, instead of declaring dividends, deemed it more to the advantage of its common shareholders to perfect facilities for economic production while increasing surplus. Therefore, in order to keep its plants and equipment up to the highest standards, thus securing a maximum output at a minimum cost, there had been expended on plants £701,530, in addition to cost of repairs and maintenance charged to expense account.

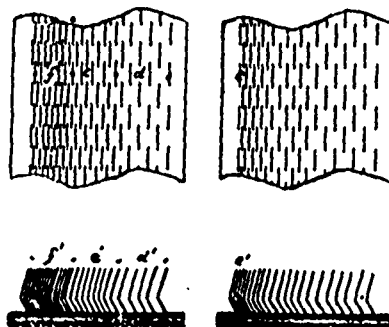
PAINTING IRON IN DYEWORKS AND BLEACHERIES

Iron in dyehouses, bleacheries, etc., which is constantly exposed to the action of steam and acid vapors, requires special protection. Although many excellent paints are made for the purpose, it is important to observe that even the best of them may give sometimes bad results, especially if they are applied to iron that is not perfectly clean and bright. The cleaning of the iron should always be effected by mechanical means, as scraping, sandpapering, etc., and it must be dry as well as clean, when the paint is put on, and again, no fresh coat must be applied before the preceding one is perfectly dry. The iron is best primed with hot drying linseed oil. This is followed, when dry, by a coat of red lead and boiled oil. When this is quite dry, any other color may be laid on. All coats, of course, must be in a workmanlike manner applied with a proper brush, and no bubbles or uncovered places left. If all these precautions are not taken, the painting is time and money wasted. All holes and cracks in the iron should be carefully stopped and levelled off with red lead made to a putty with boiled oil, as soon as the iron is clean and dry, and the fillings must be dry, when the priming is applied. The coats should never contain volatile solvents or driers. Another way of protecting iron in warm places exposed to steam is to paint the iron when cleaned and dry with a solution of 4.5-k, unbleached shellac and 1.36-k borax in 4.5-l boiling water, which is mixed just before using it with twice its volume of ordinary paint, of boiled oil and turpentine.

Graphite and boiled linseed oil make also a very good paint, the coats standing heat, cold and acids very well.—Westminster Zeitung.

AN ENGLISH IMPROVEMENT IN THE CONSTRUCTION OF CARD CLOTHING.

In the ordinary type of card clothing the wires are put in at an equal distance apart. In the card clothing as shown in the accompanying illustration a new method is employed, the object being to place the wires in the manner shown, so that the matted cotton first comes into contact with the wires



which are farthest apart and then passes to those which are close together, so that the working of the cotton is very gentle. In the illustration, in one method of fastening the wires into the backing, they are shown at one point *d, d'*, at a uniform distance apart, and at another point *e, e'*, at another and different distance apart, and again at *f, f'*, at still another distance apart.

RENDERING WOOL PROOF AGAINST THE COLORING ACTION OF DYES.

The following process for treating wool so that it will resist the coloring action of the dyeing liquor has been patented in Germany: 220 lbs. of woolen yarn is treated for one hour in a boiling bath of about 800 gallons of water and 55 lbs. of tannin. The yarn is then handled for half an hour at the boil in 800 gallons of water and 33 lbs. of tartar emetic; it is then rinsed in water to which has been added 6½ lbs. of chloride of tin. It is claimed that yarn so treated will not be colored by the ordinary processes of dyeing. This yarn can be used in connection with yarn not so treated in the manufacture of goods that are to be piece dyed, the result being that fancy effects are produced in the finished goods. The "Ost. Woll. und Lein. Ind." states that it has been known for years that this treatment would reduce the dye-absorbing power of silk, and adds that there is danger of the process injuring the spinning qualities of the wool. The wool so treated does not remain perfectly white when dyed, but the difference between the shade and that of wool not so treated is sufficient to give a contrast that can be utilized in the production of fancy effects.—Textile Mercury.

A NEW YARN TESTING MACHINE.

In the course of a lecture recently delivered by G. R. Smith, upon "Some Observations on the Testing of Cloth and Yarn" before the members of the Bradford Scientific Association, was exhibited and described an ingenious machine devised for testing yarns. About a yard of the yarn to be tested was fixed in the machine with a definite amount of tension upon it, one end

of it being fixed to an arm of a delicate balance, water being added automatically to the other arm of the balance, while the tension on the yarn was being increased. The tension was applied at the opposite end of the yarn, and gradually increased until the yarn broke, when the breaking stress was ascertained by weighing or measuring the water added. The amount of stretch, and the amount of twist put in or taken out of the yarn were observed at the opposite end of the machine. A special microscope was fixed to examine the yarn and measure its diameter before and while the tension was upon it. An arrangement might also be added whereby the yarn could be immersed in a mercerizing bath while being tested, and the effect of mercerizing on the strength of the yarn ascertained.

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 Galt Knitting Co. is to have a new brick chimney.

The Penman Manufacturing Co. is said to be contemplating a new mill at Brantford.

The storeroom at Amos Tipling's flax mill, Wingham, has been burned, with a quantity of tow. Loss, \$3,000.

The management of the Dominion cotton mill are looking for more weavers for their mill at Windsor, N.S.

W. J. Webster, of Westport, is having the machinery taken out of a woolen mill at Durham, Ont., for shipment to his new mill at Edmonton, Alberta.

A terrific wind storm, which visited Almonte on April 23, tore the sheeting off the roof of the Elmsdale flannel mill, and broke six dozen panes of glass in the Almonte Knitting Company's mill.

The Hawthorne mill, one of the two mills of the Canada Woolen Mills at Carleton Place, has been closed for some time undergoing repairs, and is being reroofed. It will soon be restarted.

A report that all the spinners at the Kingston cotton mill were on strike turned out to be incorrect. Four or five girls employed in the spinning department, not being satisfied with their wages, had quit work.

What we are told is the largest factory of its kind in Canada is being built this summer at Peterborough, by J. J. Turner & Co., manufacturers of sails, tents, awnings, etc. The building will be 132 by 45 feet, and have three stories and a basement.

Among the acts passed at the late session of the New Brunswick legislature was one to authorize the town council of the town of Milltown to fix the valuation of the property of the Canadian Colored Cotton Mills Company, Ltd., for the purpose of assessment of rates and taxes in the said town.

Labor difficulties which recently arose between the Canadian Woolen Mills Company at St. Hyacinthe, and the employees have been satisfactorily adjusted. At a meeting of a committee from the labor union and the managing directors it was decided that the employees whose pay was reduced five per cent. last September would receive the old wages and all others whose pay was cut more than five per cent. would receive one-half of the reduction that was made.

Hereafter no children under 15 will be allowed to work in Rhode Island mills, unless they have completed the eighth grade in school.

The Milneford woolen mills, of Don, have recently installed a new fulling mill, cloth washer, and hot air system cloth drier in their finishing room.

The Preston Woolen Mills are building an addition to be used for spinning purposes. They have bought two more mules which will be set up in the addition when finished.

Through the revival of the woolen industry by T. B. Caldwell at Appleton, the village is enjoying a boom. All buildings are occupied, and many new houses are to be erected.

Two large loads of blankets were shipped from T. B. Caldwell's woolen mill at Appleton, a few days ago, for the use of the men of the fourth contingent going to South Africa.

The bill authorizing the Dominion Cotton Mills Company to borrow to the extent of 75 per cent. of their immovable plant and buildings, valued at \$6,888,000, has been passed at Ottawa. The company will now be in a position to exchange the new debentures for the call loan due to the Bank of Montreal.

Several changes have taken place in the staff of the Canada Woolen Mills at Carleton Place. A. M. Morrison, the superintendent, retires, and is succeeded by W. R. Campbell; Geo. Ashman, the overseer of the dyeing department, has also retired, and goes to Appleton. Mr. Ashman is succeeded by Mr. Oliver, of Cornwall.

There has been a labor difficulty at the Imperial Cotton Co.'s factory, Hamilton. Some of the workers asked that a half holiday be given on Saturdays, the same as at the other cotton factories there. The request was not granted, and ten or fifteen of the men did not go to work on a recent Saturday afternoon. When they went to the factory on Monday morning they found their places filled. When asked about the matter the manager at the mill said they had no trouble. "We just discharged a few men, as we do occasionally," he said.

On the 23rd of April the employees of Cronkhite Bros.' woolen mill at Thessalon assembled at the residence of G. H. Cronkhite, and presented him with an address and an easy chair, as a mark of appreciation of the kindly manner in which he has always treated his employees. The address was signed by Emily Lewis, Bertha McCall, Lena Frechette, Philip Frost, Frank Boyce and Dennis Shoff. Mr. Cronkhite made a neat reply.

The Canada Woolen Mills, at Waterloo, Ont., are operating every department in full on cassimeres. They have 50 broad looms and eight sets of carding and spinning machinery. Martin Reidel is superintendent, and he has the following overseers: Samuel Brown, carder; Harry Kershaw, dyer; John Moyer, weaver; James Corrie, designer; Robert Cornish, finisher. The same company's mill at Hespeler is in full operation. Charles Stark is carder.

A serious fire broke out in the Anchor Knitting Company's storehouse at Almonte, about 10 o'clock on the night of April 24. The building was a wooden one, on the outskirts of the town, and was totally destroyed, together with most of the season's goods for spring shipment. The cause is unaccountable, no fire being used in the building at any time. The loss is estimated at about \$25,000, on which there was insurance to the extent of \$18,500. About a week later, friction in the machinery in the Anchor mill raised a smoke that created a stampede of the female operatives. There was no damage done.

A. F. Robb has been superintendent in the Galt Knitting Co.'s mills for eleven years.

The R. Forbes Co., Hespeler, are busy under the superintendency of Mr. Weaver. They make both woolens and worsteds.

The C. Turnbull Co., Galt, are about to increase their machinery by an additional set of carding and spinning machinery.

The Toronto Carpet Mfg. Co. have their yarn spinning plant in full operation. Wm. I. Rambo, formerly of Bridgeport, Pa., is superintendent.

It is stated that the Korean Government has decided to start a woolen factory in Seoul, to be carried on with the assistance of French experts.

John Carr Lequille, Annapolis Co., N.S., who operates a custom mill, expects to go into the manufacture of woolen yarns on a small scale.

The Anchor Knitting Co. and Almonte Knitting Co., at Almonte, are each adding a set of carding and spinning machinery to meet the increased demand for their products.

F. F. C. tells in *Fibre and Fabric* of having met a man who said he knew of a mill in Canada that was getting 3,000 pounds of yarn per day from a 60-inch set of cards on blankets.

The Berlin Felt Boot Co. now has a large factory devoted exclusively to making felt boots. They make both a knit and felted boot, and the demand keeps increasing each year. There is a large market for their goods in the North-West.

Lee & Taylor is a new firm in Almonte, which makes fine and medium wool shoddies, and do custom work. Mr. Lee was with the former proprietor of the plant for some years, and Mr. Taylor was carder for some years, with F. K. Stevens, of Chicago.

A local paper in Ontario recently made quite an important incident out of a woolen mill in the locality extending its buildings. In the face of the general condition of the woolen business, this looked curious. It was afterwards found out that the new building was a storehouse to hold the goods they could not sell.

The members of the North-east Lancashire Cotton Spinning and Manufacturers' Association of England, now on a visit to the United States, were greatly pleased with the Iron Work Mill at Fall River, the spinning room of which, with 82,000 ring spindles in operation, they declared to be the greatest spinning room in the world. The steadiness of the driving power and the sanitation and ventilation of American mills greatly impressed them.

M. Campbell has been transferred from the Kingston mill of the Dominion cotton mills to the mill at Magog. J. Cook, formerly of Brantford, has taken charge of the card room in the Kingston mill; he was carder there until the mill closed down. The spinning room at Magog is in charge of H. Shaw, with A. Lee as assistant. Mr. Gagnon is mule overseer, and Mr. Fernier is boss weaver; Fred Dougherty is second hand in card room, and has held the position for several years.

The L. S. Watson Mfg. Co., Leicester, Mass., are large manufacturers of wire heddles, heddle frames, having several valuable patents on these and other lines of textile mill supplies. They are also sole agents in the United States and Canada for Felten & Guillaume, the well-known German manufacturers of endless cast steel and tinned wire heddles. Among other specialties the firm are sole agents for the Smithurst patent roving and twist gears used by woolen and yarn mills.

The Galt Carpet Co. made its first shipment of carpet on April 12th. It consisted of about 4,000 yards.

The Almonte Knitting Co. in ten days filled an order for 120 dozen sweaters for the troops going to South Africa.

The Paton Woolen Manufacturing Co. have had trouble in the finishing department of their mill at Sherbrooke, when 90 employes struck for an advance of 10 per cent. in wages. The carders and weavers had an increase to that extent some time ago. The demand would simply restore the old scale which was lowered a year ago. The management say they cannot afford the increase, but offer to give a raise ranging from 5 to 10 per cent.

The plant of the Menzie Manufacturing Co., Toronto, recently damaged by fire, is again in full operation. The new tentering machine for the manufacture of their machine shade cloth is said to be the largest in America, being 107 feet 6 inches in length, and weighing nearly 25 tons. It is driven by a pair of automatic engines, and is operated separate from the rest of the plant. It will have a capacity of 10,000 yards of shade cloth per day. This machine was manufactured at Providence, R.I., in the remarkably short time of three weeks. The company has also installed a complete new drapery pin plant. The machines were built at Waterbury, Conn., and were also turned out very rapidly. An Ideal engine, built at Galt, furnishes motive power for the machinery.

FABRIC ITEMS.

H. Vineberg & Co., clothing manufacturers, Montreal, are moving into a larger factory.

Reports from all wholesale centres indicate great strength in the linen market, and prices are in some cases as much as 50 per cent. higher.

The American Dye Works, St. John, N.B., were recently broken into, and a quantity of postage stamps, some change and a money order carried off.

United States manufacturers of linoleum and oil cloth have advanced prices this month two cents a yard on higher grades and one cent on the cheaper lines.

Prices of furs in London are advancing. The Hudson Bay Company's sales for April show a higher range of values than was the case in January and March.

The ranges in the western states are dried up, and as a result sheep are dying by hundreds. This is lambing season, and the number of lambs that will be saved will be unusually small.

The Canadian Rubber Co. has filled a contract with the Montreal fire department for a supply of new hose. The hose, 5,000 feet, is of Keystone brand, and stood a test up to 500 pounds.

The William Wyndham Co., of Hamilton, has been incorporated, as hatters and furriers. Capital, \$70,000. Directors, W. Wyndham, Hamilton; Jesse App'egath, Toronto; S. L. Squire, Waterford.

The Textile Manufacturers' Journal is rather mixed in its Canadian geography when it announces that "the Almonte Knitting Company of Ottawa is shipping many sweaters to the British army in South Africa."

The Merchants' Union Co., of Toronto, has been incorporated, to manufacture whitewear and umbrellas. Capital, \$500,000. Directors, R. Millichamp, G. T. Irving, Wm. McCausland, W. Laidlaw and E. J. Coyle. The new company is an amalgamation of the Irving Umbrella Co., the Continental Costume Co., and the Crown Whitewear Co.

The Merchants' Dyeing and Finishing Co., of Toronto, are building a two-story brick and steel factory to replace the one recently destroyed by fire.

R. B. Hutchison & Co., woolen jobbers; Phillips & Wrinch, small wares, and the Merchants' Mantle Manufacturing Co., Toronto, have all moved into larger premises.

The H. S. Falls Co., of Simcoe, has been incorporated, to carry on a general dry goods and millinery business, with a capital of \$50,000. H. S. Falls, P. W. McGachie, and Anna E. Falls, of Simcoe, and John Northway and John A. Northway, of Toronto, constitute the company.

Tenders are asked by the Norwegian Naval Department for cloths, flannel, hair rugs, carpets, bleached cotton, linen oilcloth, etc. Foreigners have little chance, however, for in addition to the usual customs duties, a preference of from 10 to 15 per cent. is given to Norwegian tenders.

The silk waist factory of S. Greenshields, Son & Co., Montreal, known as the American Silk Waist Manufacturing Co., was badly damaged by fire a few days ago, both goods and machinery suffering severely. Loss about \$7,000. About 300 employees were thrown out of work for a few days.

There is a good demand for Canadian makes of woolen goods this spring, and stocks in jobbers hands are being rapidly depleted. Mills are busy and prices higher than when present stocks were secured by jobbers. Fine goods for women's wear are almost impossible to obtain on short notice.

Canadian manufacturers of binder twine find themselves handicapped by the United States customs arrangements regarding manila fibre. The Government now remits the duty on this fibre, which comes from its newly acquired dependency, the Philippine Islands, when the fibre is manufactured in the United States. As the duty amounts to \$7.50 per ton the Canadian manufacturers are handicapped to that extent, as twine enters Canada free. They are urging the Government to come to their relief.

A Kirkcaldy company is introducing an empire design which looks well in linoleum. The centre part of the design has a ground with a laurel wreath and the letters R. I. VII. conspicuous. The shamrock, thistle, leek and Tudor rose are also prominent in the pattern. The maple leaf representing the province of Canada, the ostrich representing Africa, the kangaroo representing Australia and the elephant representing India, are also shown in the design as emblems of the colonies.

A peculiar feature of the present United States trade is that while prices of all kinds of cotton fabrics are very stiff in the home market, yet in some lines of pattern goods such as Venice foulards, violet lawns, and ruby batistes, the manufacturers have cleared out large lots at almost half price to Canadian buyers who are willing to make a bid for large quantities. Their reason is that they prefer to make a dumping ground of Canada rather than spoil their home trade by reducing the price of pattern goods.

An Agra carpet was recently sold in New York, the third offered for many years. These Indian carpets are made by prisoners and under the laws of the United States they may no longer be imported. They are of dense body, though fine texture, and while the pile is harmoniously beautiful in the dexterous weaving of varied colors, which are the same throughout the carpet's depth, the wearing qualities are almost akin to those of the metal plates of a steamer's deck, so far as any one owner is concerned. This one measures 14 ft. 11 in. by 25 ft. 2 in., and was sold for \$150.

Telfer & Co., paper box manufacturers, are building a factory on the old Upper Canada College grounds, Toronto.

The dry goods stock of the Runians, Carson, McKee Co., of London, was damaged to the extent of \$2,000 by a leaky roof in a recent storm.

Supplementary letters patent have been issued reducing the capital stock of the Canada Woolen Mills, Limited, from \$2,000,000 to \$1,954,000.

The Canadian carpet trade is in a very healthy state, and cheap goods have given place to a better class, \$1 carpets out-selling 25-cent lines. Linoleums and oilcloths are also in much demand, as well as floor squares and hearth rugs, also lace curtains.

An Ontario charter has been granted to the Bird Woolen Mill Co., capital, \$50,000, to acquire and carry on the woolen mill business of Henry J. Bird, at Bracebridge. The incorporators are H. J. Bird, Sr. and Jr.; R. O. Bird, T. N. Bird, and Wm. Ross, all of Bracebridge.

As a sequel of the failure of M. Saxe & Sons, clothing manufacturers, Montreal, the two members of the firm and David Levi, a brother-in-law, have been arrested at the instance of the creditors, and are now undergoing prosecution on a charge of conspiracy to defraud to the extent of \$30,000. The wholesale stock was sold by auction at 68¼c. on the dollar and the retail at 49¼c. The case is attracting much interest.

The Alaska Feather & Down Co., of Montreal, at its first annual meeting since its amalgamation with the Canada Fibre Co., reported a prosperous year. It is over-crowded with orders, particularly in mattresses, in which department it is 3,000 mattresses behind. It has recently added about \$10,000 worth of new machinery, and 60 horse-power of electricity. Edgar McDougall is president; J. H. Sherrard, vice-president and managing director, and J. H. Parkhill, secretary.

A curious thing happened in Vancouver a while ago, says the Dry Goods Review, which says a good deal for the goods of a certain mill in Canada. A case of mercerized satens was shipped to a large Vancouver house via the C.P.R. from Valleyfield. As is well known, the freight rates are higher for silk than for cotton and other goods. All trans-continental railway companies have inspectors who examine the goods much in the same way as the customs officers do. The inspector in Vancouver claimed that a particular case from Valleyfield was silk goods, and it took nearly four days to make him understand what they really were.

A seizure case, which for some time has been before the Customs Department at Ottawa, has been decided adversely to two Toronto wholesale dry goods houses. They imported from Cincinnati consignments of shirts, the invoices for which were presented in the regular way, and the duty, amounting to about \$100, paid. When the goods were submitted to the appraiser, for examination, it was found that they were partly of prison manufacture, and they were seized, but not destroyed, as on presentation of the case at Ottawa permission was given to send them back. The United States firm thus got back their property, while the Toronto importers were out of pocket to the extent of the duty. The Department at Ottawa has declined to refund this duty.

Prospects seem to point to a higher price for raw cotton, and while an advance has already been made on cotton goods of certain classes, prices seem likely to go still higher if Canadian cotton mills are to make any money this year. The Dominion and Merchants' Cotton Companies have again advanced the price of duck cloth, corresponding to the rise in the raw cotton. The prices of cotton towels, of pillow cottons,

of denims, bleached and unbleached sheetings, have also been advanced by the mills, and a rise all around is not improbable. It is impossible for the mills to sell at the same rate as when raw cotton was 8 cents. It is now 10 cents, and it is predicted that July cotton will reach 12 cents. A line of flannelettes and one or two lines of apron gingham are, however, lower.

The end of the trouble over the failure of Mrs. Rachel Wolfe, furrier, Toronto, is not yet. Lucy Allen, a former employee, and one of the Crown witnesses in the case against Mrs. Wolfe for conspiracy to defraud creditors, was arrested at the instance of Mrs. Wolfe on a charge of theft, an article of fur, alleged to have been stolen; having been found in her room. After many adjournments she was acquitted. While the case was pending someone met Lucy Allen on the street and threw acid in her face. The conspiracy case is not yet disposed of.

The season is practically over for gloves, says the Shoe and Leather Journal. Manufacturers express themselves as well satisfied with the results, although there is considerable grumbling as to prices and terms. The perfection to which Canadian has been brought is not only displacing much of the foreign product, but is creating a demand that has hitherto not been known. During the past two or three years glove manufacturers have devoted more attention to country trade, which is considered a profitable branch of the business. Many boot and shoe merchants now have a glove department.

The cotton goods situation continues very firm; thousands of pieces of goods are said to have been shipped across the Atlantic to America, containing two ounces to the yard of chloride of zinc and sugar of lead. There is no question as to the injurious effects which must have resulted to the wearers of these fabrics. A recent investigation in England was made, when a dozen typical pieces of dress material were analyzed, with the result that it was discovered that chromium, zinc, iron, tin and magnesium enter into the composition of these goods, although it was satisfactory to find that the deadly poison arsenic could hardly be detected.

The Colonial Bleaching and Printing Company's report for the past year submitted at the annual meeting recently held at Montreal, shows a large increase in the business over the preceding year, and the future prospects of the company are considered highly satisfactory. The question of adding a cotton mill to the present converting plant will be submitted to the shareholders at an early date. The directors, who were re-elected, are as follows: H. S. Holt, C. R. Hosmer, Frank Paul, A. Racine, George F. Hartt, E. N. Heney and W. T. Whitehead. H. S. Holt was elected president, and A. Racine vice-president.

Speaking of the dividing line in the woolen industry the Maritime Merchant says: Few people outside of those closely identified with the woolen or dress goods trade realize how indistinct is the line that divides the men's wear and dress goods branches of the woolen industry. The change has occurred within five years and it is rapidly following the development of the ladies' skirt and suit trade. That so many fabrics made for men's wear are as suitable for ladies' also is no whim of fashion, for in some form the tailor made gown has always been fashionable. That the demand has become increased is due to the fact that the ready-made suit trade has brought the tailor made within the reach of many women who could not afford to pay the custom tailors' prices. It has already forced the reorganization of many dress goods mills, while many mills that were once exclusively employed on men's wear fabrics are now catering largely to the ladies' skirt and suit trade.

Personal.

Harry Calder, of Hamilton, has secured a position as Canadian traveling salesman for a New York company which deals in overalls, buttons, etc.

Wm. France, formerly employed in the woolen mill at Appleton, now boss carder in a mill at Marcelles, N.Y., has been visiting his old home at the former place.

James D. Findlay has resigned his position as manager of the Toronto Paper Co.'s Mills at Cornwall, and will take a trip to Scotland before engaging in any other business.

The staff of the Merchants' Dyeing and Finishing Company, Toronto, presented Chas. H. Passmore with a handsome clock on the occasion of his leaving to take a position in Montreal.

Frederick Wyld, president of the Wyld-Darling Company, wholesale dry goods merchants, has been unanimously elected vice-president of the Standard Bank of Canada, as successor to the late John Burns.

H. E. Maddock, of Newmarket, has sold his business to Hunter Bros. of Barre, and is removing to Toronto to become a member of the firm of Thorpe Co., wholesale manufacturers of ready-made clothing.

J. Wesley Ross, of N. E. Margerie, C.B., proprietor of the Margerie Woolen Mills, died of pneumonia in April. He was well and favorably known as an enterprising, public spirited gentleman, and will be much missed.

C. H. Bates, of Huddersfield, Eng. is visiting his brother, Arthur Bates, superintendent of the Stormont Cotton Mill. He will take a tour through Canada and the United States. Mr. Bates is engaged in the manufacture of worsteds.

Miss Sarah Fisher, who is leaving the Preston Glove Works to be married, was presented by her fellow-employees with an address and a handsome jardiniere stand and chair. The address was as follows: "Dear Miss Fisher,— We, the employees of the Preston Glove Factory, meet you to-day to bid you farewell and regret that you have severed your connection with us, and though you have only been amongst us a few months, we have in those few months learned to appreciate you, and we feel sorry that your stay was not a longer one. But you are, as we understand, going back home, not to toil any more with sewing machines and leather, but to take to yourself a partner in this life, so before we part, we desire to express to you the regret we feel at your leaving us, and we here stand as slight tokens of the warm regard we have for you, and at the same time wishing that you will long be spared to enjoy a happy and prosperous life in this world and a better one in that to come, we remain, yours sincerely, Employees Preston Glove Company.

SPINNER.—Young man, aged thirty, single, wants situation as spinner in a woolen mill. Has had experience in operation of a two-set mill. Address H. G., care of Canadian Journal of Fabrics, Toronto.

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- Loom Fixing; a handbook for loom fixers working on plain and fancy worsteds and woollens; containing chapters on shuttles and bobbins, and their management; head motion; putting in warps; filling; adjusting and starting new looms; chain building, etc.; 104 pages, by Albert Aitney\$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
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- Textile Calculations; a complete guide to calculations relating to the construction of all kinds of yarns and fabrics, the analysis of cloth, etc., by E. A. Posselt.. 2 00
- Wool Dyeing; an up-to-date book on the subject, by E. A. Posselt 2 00
- Worrall's Directory of Cotton Spinners, Manufacturers, Dyers, Calico-printers and Bleachers of Lancashire, giving the mills of the British cotton district, with number of looms and spindles, products of the mills, cable addresses, etc\$2 00

Worrall's Directory of the Textile Trades of Yorkshire, comprising the woolen, worsted, cotton, silk, linen, hemp, carpet, and all other textile mills, giving looms and spindles, and the various lines of goods manufactured, etc\$2 00

Worrall's Textile Directory of the Manufacturing Districts of Ireland, Scotland, Wales, and the counties of Chester, Derby, Gloucester, Leicester, Nottingham, Worcester, and other centres not included in preceding works, with capacity, products of mills, cable addresses 2 00

The Wool Carder's Vade-Mecum, by Bramwell; third edition, revised and enlarged: illustrated; 12mo..... 2 50

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- Alum 1 35 to 1 50
- Copperas 0 70 to 0 80
- Sulphur flour 1 70 to 2 00
- Sulphur roll 1 90 to 2 00
- Sulphate of copper 5 50 to 6 00
- White sugar of lead 0 07 to 0 08
- Bich. potash 0 08 to 0 09
- Suprac. Sicily, per ton 50 00 to 58 00
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THE WOOL MARKET.

Since the last auction sales on the London market there was a moderate enquiry for merinos and crossbred wools, but only a very small quantity changed hands at prices the same or slightly above those then ruling. The fourth series opened on May 6. The arrivals therefor amounted to 29,286 bales. The attendance was large. A good supply of scoured

sold readily at an advance of 10 per cent. Merinos were in active request at 10 per cent. above the March average. A good selection of crossbreds sold at extreme rates. Cape of Good Hope and Natal sold spiritedly, the offerings being in better condition. Some medium scoureds were bought in by holders at 1/2d. above bids. A small supply of Falkland Islands fine greasy crossbreds was in brisk demand at 1/4d to 1/2d. advance. Following are the sales in detail:

New South Wales, 2,600 bales, scoured, 6d. to 1s. 8d.; greasy, 3 3/4d. to 1s. 1/2d. Queensland, 1,200 bales, scoured, 1s. 4d. to 1s. 6d. Victoria, 3,100 bales, scoured, 7 1/4d. to 7 1/2d.; greasy, 4d. to 1s. 1d. South Australia, 1,400 bales, scoured, 11 1/2d. to 1s. 5 1/2d.; greasy, 3 3/4d. to 11 1/2d. West Australia, 700 bales, scoured, 8d. to 1s. 2 1/2d.; greasy, 6 1/4d. to 10d. Cape of Good Hope and Natal, 700 bales, greasy, 5 1/4d. to 8 1/2d. Falkland Islands, 600 bales, greasy, 3d. to 6d. North America, 35 bales, greasy, 7 1/2d. to 8 1/4d. New Zealand, 3,300 bales, scoured, 5 1/4d. to 7 1/4d.; greasy, 4d. to 10 1/2d.

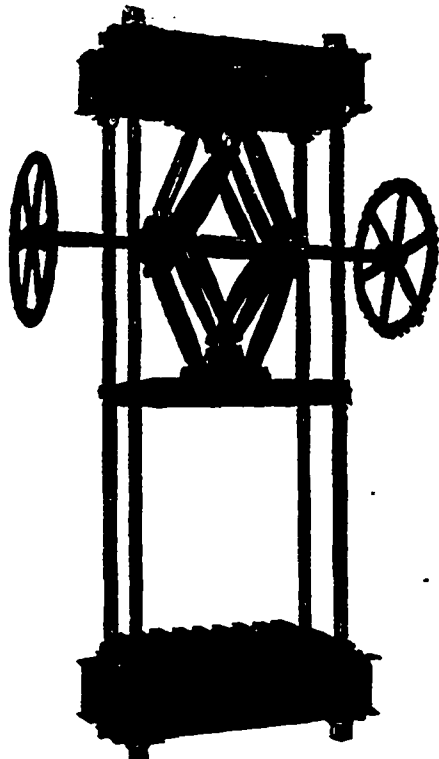
The sale is still going on. The home trade and continent are active buyers. American representatives take a few merinos and crossbreds at good rates.

The Boston market shows a little more activity. The sales for last week were 3,555,000 lbs. Prices ran as follows: Ohio xx, 27c.; Ohio x, 23 to 24c.; Ohio No. 1 washed, 26c.; Michigan x, 22c.; Ohio delaine, 28 1/2; unwashed Michigan delaine, 18 to 19c.; unwashed Ohio delaine, 21 to 22c.; fine unwashed and unmerch., 18 to 22c.; 1/4, 3/8 and 1/2-blood, 19 to 21c.; Texas, 16 to 19c.; California, 12 to 19c.; Territory, 13 to 18c.; pulled wools, 20 to 30c.; scoured wools, 25 to 57c.; odds and ends, 9 to 20c. As a rule the seaboard markets are dull. Dealers are, however, buying up the new clip at prices in advance of those paid last year.

In Toronto receipts are light. The new clip is in evidence only in small offerings of unwashed. Fleece is quoted at 12 1/2 to 13c., and unwashed at 7 to 7 1/2c. Pulled wool dull at 14 to 15c. for supers, and 18 to 19c. for extras. A telegram from Great Britain on the 8th says that merino wool has advanced 7 1/2 per cent., fine crossbreds 10 per cent., and coarse wools unchanged.

M. Markus, dealer and manufacturer in some textile lines, particularly umbrellas, Montreal, has been obliged to move to larger premises. His machines are now run by electricity.

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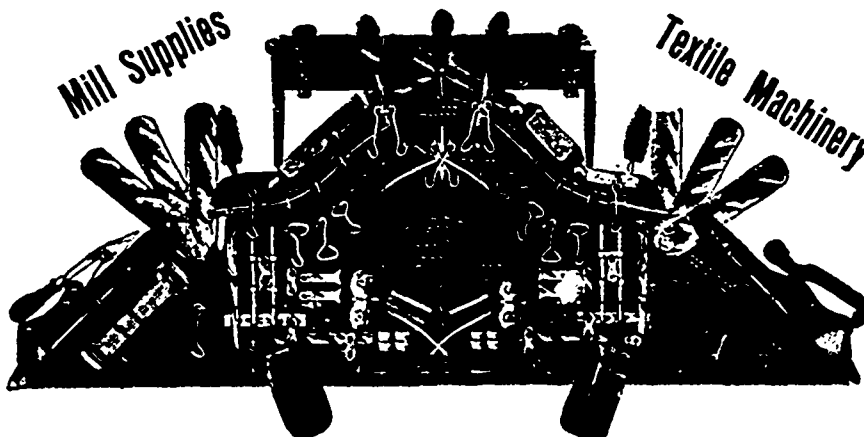
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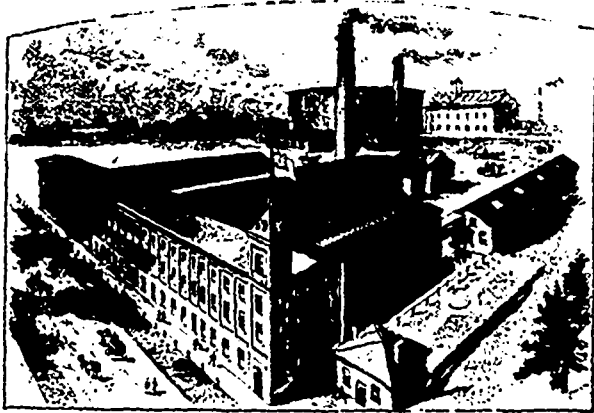
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A new sewing machine, called the single interlock, has been placed on the market. It is specially adapted to underwear and hosiery, and is designed for overedging, hemming and seaming. It gives an elastic seam, hem or edge finish.

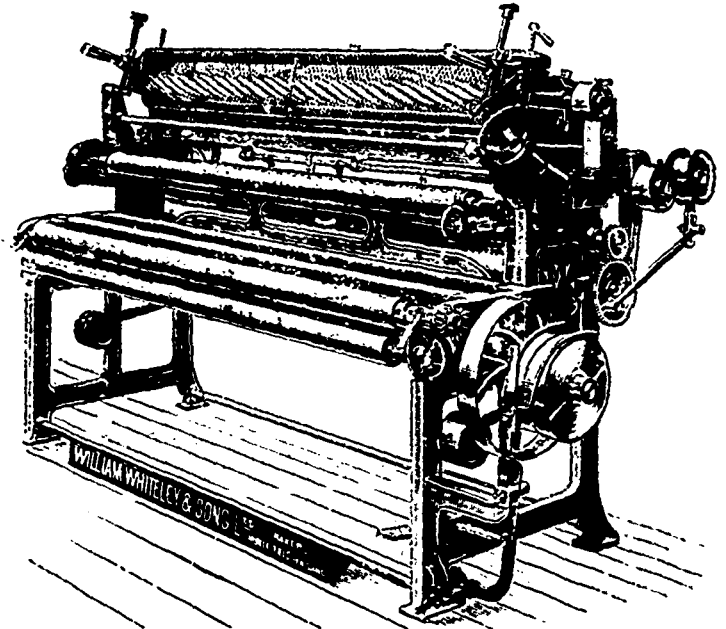
—A falling off of 39 per cent. in the Central Asian cotton crop last year is attributed to the partial use of native seed in preference to American. The crop amounted to 5,495,300 poods, as against 7,638,000 poods in 1900, although the area sown was 6.5 per cent. larger. Unfavorable weather also contributed to the unsatisfactory result.

The Agricultural Committee at Ottawa has recommended the installation of a plant in Kingston penitentiary to use the tow and fibre of Canadian flax. A resolution passed last session by which the government was directed to sell on July 1st by public tender all of the binder twine output that had not by that date been sold direct to the farmers, has not worked well, and the provision will accordingly be withdrawn.

The New England Cotton Manufacturers' Association held its annual meeting in Boston last month. Among the topics discussed were: "Methods of Cotton Textile Instruction," "The Supervision of Mills," "Bleaching," "Friction Due to Spindle Bands," "Weighting of Top Rolls," "Hydraulic Compression of Air," "Electric Driven Cotton Mills," "Flyers," "The Abuse of Oils in Cotton Mills," "A New Method of Incandescent Lighting," "Metallic Thread Boards for Spinning Frames."

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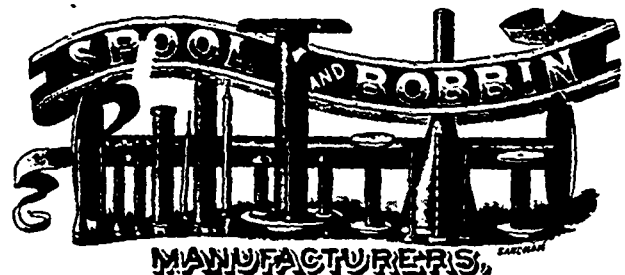
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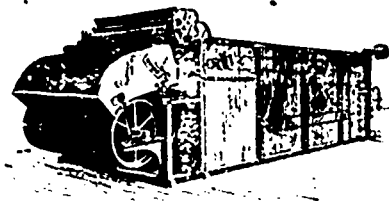
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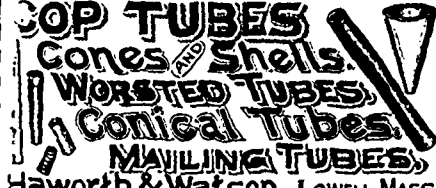
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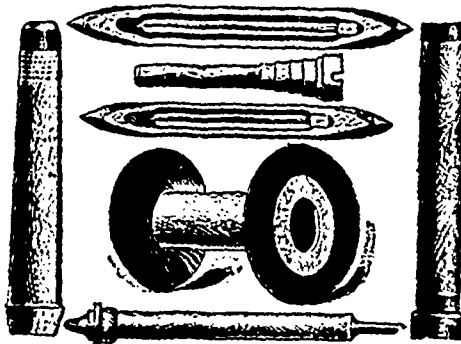
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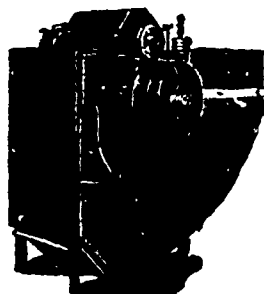
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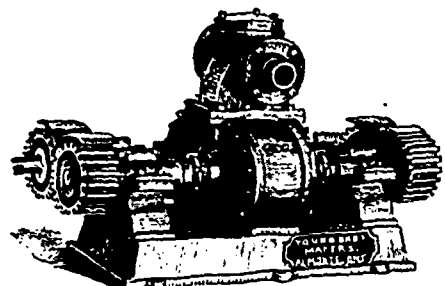
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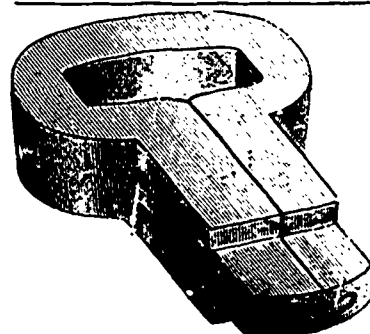
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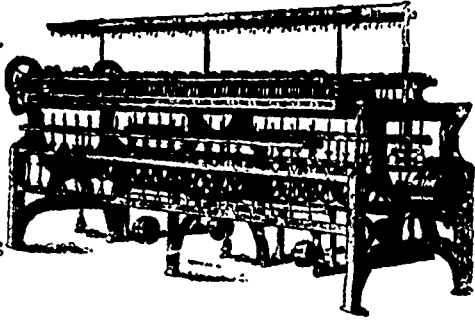
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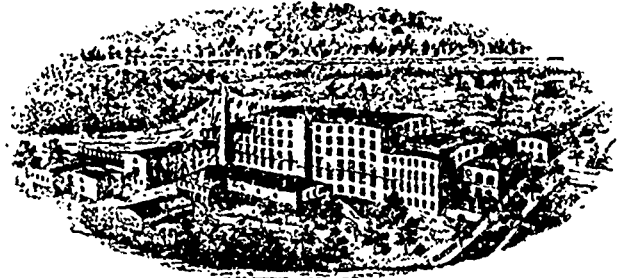
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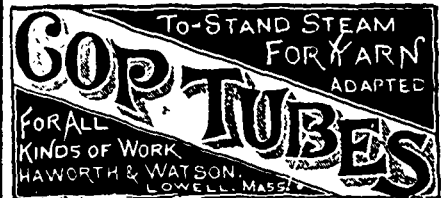
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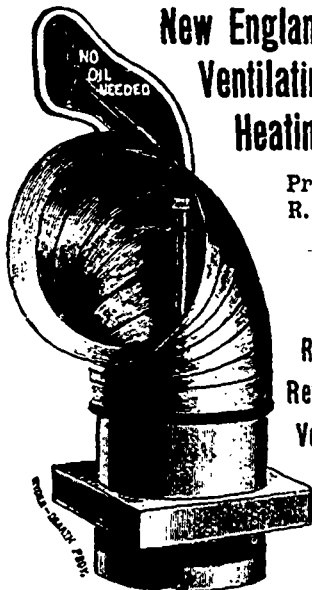
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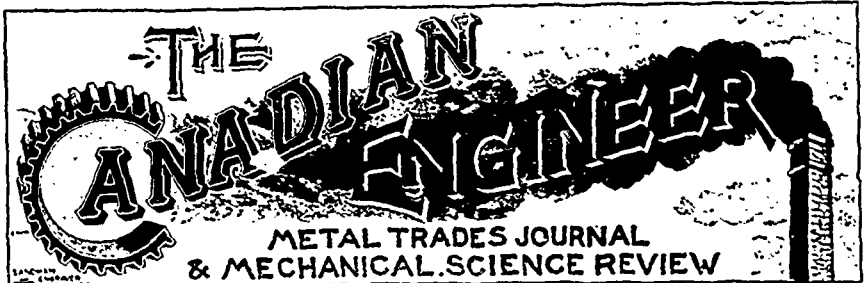
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I have very much pleasure in seeing you step to the aid of those pressing the Metric System to the front. I shall be glad to call the attention of teachers to your chart. The Metric System has for a number of years—since I came into office—been taught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

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

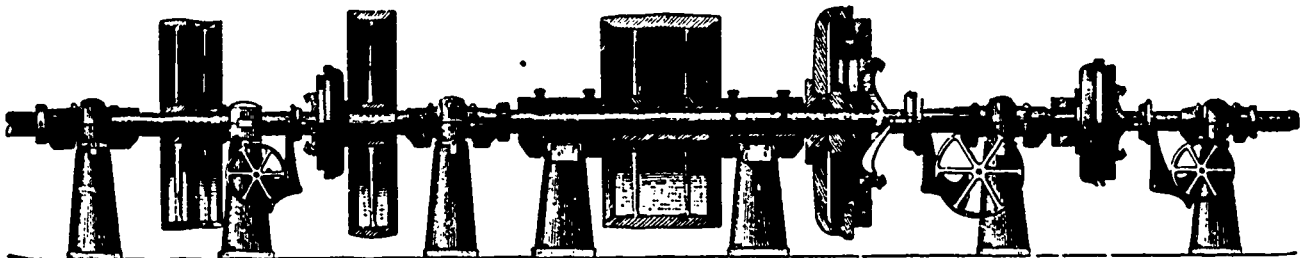
We see that you, too, advocate the general adoption of the Metric System of weights and measures, and we believe that as much as possible everywhere the same means should be employed to accomplish the desired aim. The widest possible distribution of your chart would no doubt be a good step forward. We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

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

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

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

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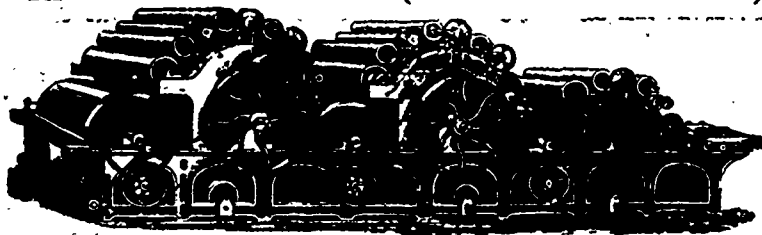
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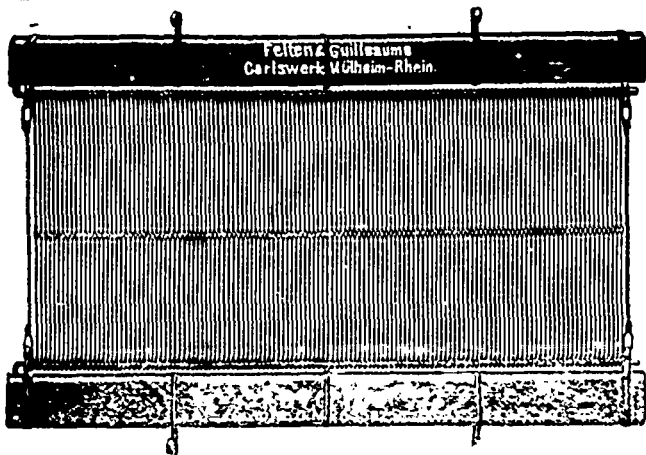
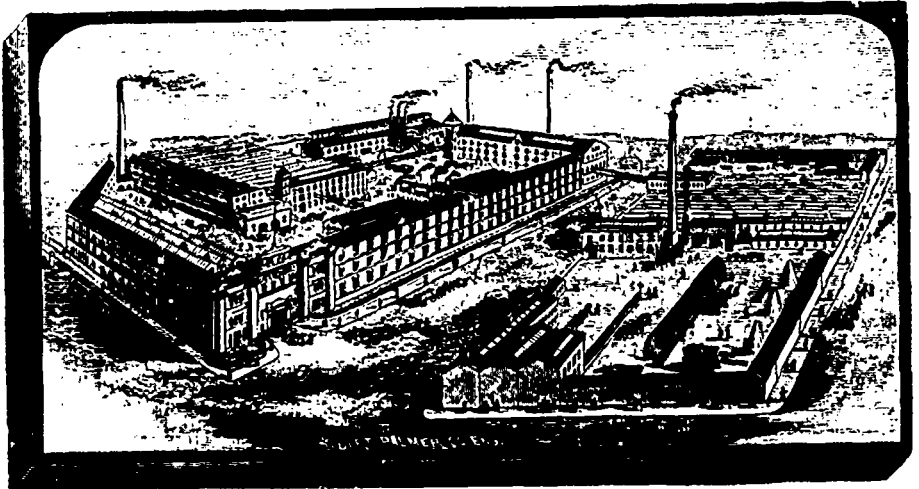
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 Paris, 1867, Prize Medal, Moscow, 1872; Diploma
 of Honor, Vienna, 1873; Highest Award, Phila-
 delphia, 1876; Gold Medal, Paris, 1873; Highest
 Award (Medal), Melbourne, 1880.



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