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CANADIAN Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XV.

TORONTO AND MONTREAL, MARCH, 1898.

No. 3.

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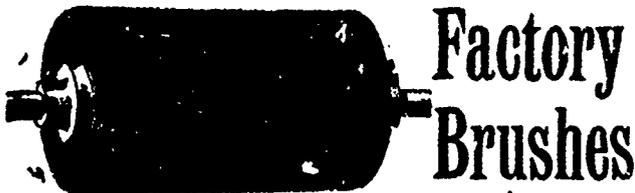
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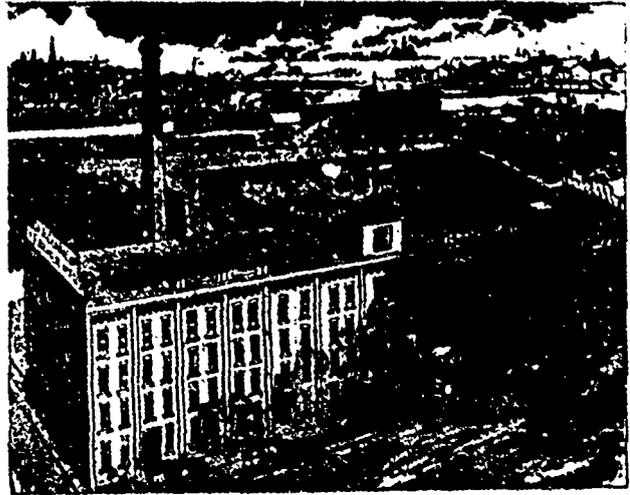
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Vol. XV.

TORONTO AND MONTREAL, MARCH, 1898.

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Editorial.

Selling Cheap. The manufacturer is often called upon to supply a cheap line of goods which are apparently the usual goods; but in reality can be sold "below cost" in a bargain sale, to the great advantage of the storekeeper. To manufacturers of knit goods especially, such requests are familiar, for not only are such requests made for stock-taking, but at other special seasons, as spring, autumn and summer sales. It may appear a splendid opportunity to clear any defective lots that may not be regular lines, this we do not doubt. But has not this system rather become one that is seriously

working to the disadvantage of legitimate trade. The abolition of this system is one of the means of benefiting the trade in the future. Manufacturers, in the course of ordinary business, have such accumulation that must necessarily be cleared out as special lines. It is not of these that we have anything to complain, but rather of the systematic demand that is being made for same. Deeming the request as above an advantage for increasing the output, a line is made up and sold at a trifle less than the ordinary prices, but the advantage proves quite the opposite when the regular line that these are similar to, is cancelled altogether, ordered for delivery when requested, or returned after being delivered for some imaginary defect. This system of the making of clearing lines does not increase the aggregate sale, it simply results in selling goods at a less price than is intended. To be plain, it means the selling of ordinary goods "cheap" as requested. Thus, the sooner "cheap clearing lines" are a system of the past, so soon may the ordinary trade system improve.

Cottons Come From. Cotton goods from the United States and Great Britain have always been the chief competitors for the Canadian market against the product of our own mills. However, the position taken by the alien manufacturers in our market is not now so considerable as formerly. In 1897, according to the United States Government returns, there was a considerable falling off in the exports of cotton goods from that country to Canada and Newfoundland. The exports of cotton to all countries increased by 5,000,000 yards, but the exports to British North America were only 14,378,247 yards, as against 35,519,380 yards in 1896. It must not, however, be supposed that the falling off in the United States trade with Canada is occasioned by the preferential tariff of 12½ per cent., which is levied upon goods in the United States. This of course does give an advantage, but the increase from Great Britain is very slight, being in 1897 £457,196, as against £455,678. When the discrimination against the United States and in favor of Great Britain is increased next July to 25 per cent., there must, of necessity, be a material increase in the imports of British goods. In the print trade the consequences will be watched with special interest. The patterns in both British and American textile centres, coming from a common source, Paris, are somewhat similar, and yet there is a marked difference in the fabrics of the two countries. The New England manufacturer has

established a reputation for fancy cloths that can be sold at low prices, while the mill owner of Old England puts his best efforts into the production of good plain cloths. The tastes of the Canadian and American people are very much alike, and if the British manufacturers desire to control this market they would do well to study the methods of their competitors on this side of the Atlantic. With the depression that exists in the India cloth markets, and being crowded as they are by the competition of Germany in foreign countries, the British manufacturers are paying more than ordinary attention, at present, to the trade of the colonies. Whatever goods we must import, let us import from Great Britain.

The New York Wool Auctions of the New York Wool Exchange, which according to schedule should have taken place on Wednesday, March 9, did not take place. The postponement appears to be indefinite, and not a few dealers in the local market express the opinion and the hope that the sale held February 9 will be the last. The last sale had a bad effect on the market and caused prospective buyers to become "scary"; dealers finding that while they could do a fair business previous to the last auction, since then they have been able to accomplish little. The Wool Exchange claims to have some 3,000,000 pounds of wool, which is being offered at private sale. The parcels of wool contained in the list plainly bear the earmarks of the lots offered at auction in the past, and which were undoubtedly bought in. If the system of selling wool by auction, which the promoters thought, says the *American Wool and Cotton Reporter*, would revolutionize the system of selling wool, "consists of putting up at auction and buying it back again, we fail to see its merits."

The Raw Cotton Market. Higher markets for spot cotton at the South, together with increased buying in Liverpool, has recently forced an advance in the raw cotton market in the United States. The improvement was well maintained and with few fluctuations, although a few points were lost on futures. The Liverpool price for Middling Uplands on the spot is 3 15-32d., against 3 7-16d., and July-August futures 3 25½-64d., against 3 24½-64d. Receipts continue to fall off, although still high compared with those of a year ago. Middling cotton at about this time in 1895 was 5½; in 1896, 7¼; in 1897, 7½; in 1898, 6¾.

HOW TO DESIGN A CLOTH.*

The general term "designing" as applied to textile fabrics is very often misunderstood. The general impression is that it consists in making the pattern and the necessary drafts for drawing the warp through the heads and the cards to operate them. In reality the design consists in determining the whole structure of the fabric—the counts of the warp, counts of weft, number of ends and picks per inch, weight of cloth, and a proper regard to the building of the cloth for the purpose to which it is to be applied

What art is there in building a plain cloth, and how can a plain cloth be ornamented? These are questions which may well be asked, yet in the answer lies the gem which determines the whole principle of cloth building, for all that applies to the building or ornamentation of plain cloth, applies equally to all others, with of course, the varying conditions dependent upon pattern. It will be the simplest way to take plain cloth and a simple twill or two, to illustrate how to approach the subject.

The designer must always keep two questions before him; first, to what purpose is this cloth to be put; second, what is the nature or character of the ornamentation to be?

If an architect is designing a building, his first consideration must be stability. Whatever the building is intended for it must be strong enough for its purpose, and whatever the nature of the ornamentation it must not interfere with that stability. Cloths made for different purposes have to bear strains in different directions, as well as friction. For instance, a pair of trousers has to bear more longitudinal than lateral strain, especially at the knees; that implies that there must be more strength in the direction of the warp than weft, or at least there must not be less. In a coat, if a man has to bend or lift weights, the greatest strain is lateral—between the shoulders, hence the warp must be held firmly on the weft. In the same way in ladies' dress goods the greatest strain is, usually, round the waist, it is not necessary to name any reason, and so in all other fabrics.

Then to take a perfectly plain cloth, where the warp and weft interweave alternately throughout, and where, if in the process of finishing, each is allowed to take its own course, both will be bent in some degree, forming a series of corrugations. Then both strength and stability will be the same in both directions. That is, neither warp nor weft will slip upon the other except in the same degree; and if there is sufficient number of threads according to their bulk, these will be a fine stable cloth. Now suppose it is desired to ornament this cloth by forming ribs or cords, either in the direction of the warp, lengthwise of the piece; or in the direction of the weft, or across the piece—the conditions of structure will be entirely altered. Instead of the warp and weft being of the same bulk, or counts, one must be increased and the other decreased; and just in the ratio in which this alteration is made in bulk, so must an alteration be made in the number of threads per inch.

Suppose for instance the cord is to run in the direction of the warp; then the warp threads must be made thick or a number put together as one, and the number per inch decreased, and the weft must be made finer and the number of picks per inch increased. The reason for this will be obvious after very little consideration. The cord, or rib, can only be accentuated by thick threads and correspondingly wide spaces between them, and those ribs can only be made to look clear and be well defined by having fine threads crossing them and lying very close together. Then here comes the first danger to stability.

There is no fear of displacing the thick threads, for the fine ones will hold them in position, for the simple

* Thos. R. Ashenhurst, in the *Textile World*.

reason that the bending takes place in the fine threads only, whilst the thick ones are laid as so many straight cylinders. But if the fine threads are not laid sufficiently close together, that is, as close as their diameters will permit without compression, they are liable to slip on the thick straight threads and so the stability of the cloth is gone. In many cases, more especially in heavy goods for men's wear, a binding thread must be introduced to check this tendency to slipping, otherwise the fabrics would be utterly unserviceable.

When the rib or cord runs across the piece, the conditions must be reversed, the warp being fine and the weft thick and straight. In the majority of cases these cloths are more dangerous to make than the others, on account of the lateral strain being more frequent than the longitudinal, consequently close attention must be paid to the building of fabrics of this class.

At this point what is termed the "balance of cloth" will come in as it often does, and frequently without reason. Then let the designer consider the closeness and fineness of one of the two sets of threads and set it against the bulk and openness of the other, and the balance of structure will be found to very soon adjust itself.

Then in passing from a plain cloth to a three-thread twill, a young designer may very naturally ask, what relations should the warp and weft bear to each other? A general answer to that can be given at once. The material which predominates on the surface, in the order of interweaving, should also predominate in actual quantity. But this actual quantity may be either in the form of a large number of fine threads or in thicker threads. In the case of the twill in question (2 and 1) a large number of fine threads, by preference, whether warp or weft, are on the face, but in some fancy twills bulky threads may be preferable. Here the purpose to which the cloth is to be applied, and the general character of the design, must be taken into account.

In dealing with common twills, where warp and weft come to the surface equally, good results are always obtained by having warp and weft equal, but there are many occasions where a special effect is to be produced when this is impossible. In the common four-thread twill, where the weft passes over and under two threads, there are infinite possibilities for building a variety of cloths, from the finest French merino, where the number of picks may be anywhere up to 300 per inch of fine wool, down to the commonest cotton trousering, where as many thick cotton threads are crowded in as possible without making the cloth too stiff. Here the same rules will apply as in making cords on a perfectly plain cloth. Whenever there is to be fine material in one direction and thick in the other, the relative quantities, or number of threads, must be regulated according to their diameters; but this difference must regulate the actual number. The thick threads must have space between them to permit the crossing of the fine threads, and at such an angle as not to cause crushing or crowding; and the fine threads must be laid as closely as possible together, so as to support each other, but not to be subjected to compression.

Then a general rule may be laid down that any cloth, plain or common, may be ornamented by altering the relative bulk and number of threads per inch of warp and weft respectively; but there are some patterns where the two sets of threads must of necessity bear different relations to each other.

So far, much that has been said is simply a reiteration of what appeared in my late article under the head of "Relation of Patterns to Structure," but it is necessary to have a clear understanding so as to follow the practical application.

Then to return to the plain cloth. It is desired to form a rib in the direction of the warp. As already pointed out, the warp should be thick, or a number of threads together, and with corresponding wide spaces between them. The weft should be fine and as close as possible. Then, where is the starting point? There may be one or two. First, determine the number of ribs per inch, or second, the counts of material you are about to work with. I will deal with both propositions, and on the general principles laid down in previous articles.

Suppose the cloth is to be made with cotton warp and worsted weft, and it is desired to have 48 cards per inch. Then it is necessary to find the counts of warp to give a good rib, and on the assumption that the space between the ribs is equal to their diameters, these would be 48 ribs and 48 spaces per inch, equal to 96 diameters of one thread, or a combination of threads forming the rib. Then following the rules, or rather reversing, already laid down, square the number 96. Thus, $96 \times 96 = 9216$, and this divided by the number of yards per hank ($9216 \div 840 = 11$ nearly). So that the counts of warp should be about 11s or 2-20s, or two threads of 2-40s would be as near as the ordinary commercial yarns would permit.

Then, to determine the counts of weft, the degree of fineness of the cloth will be an important factor, not only as to the number of picks per inch, but also as to a possible variation of the number of cards per inch. If the angle of curvature of the weft is to be one of 60 degrees with a vertical line, which I have demonstrated over and over again to be the best for a good cloth, is to be maintained, then all the dimensions must be taken into account. Then to determine the number of picks per inch, find the diameter of the weft thread by extracting the square root of the yards per pound. Suppose the weft to be 48s worsted, then $\sqrt{48 \times 560} = 163$. Therefore 163 threads would lie side by side in one inch, but obviously, to put that number of picks per inch in the cloth, would make it too solid. Then a general rule may be adopted, viz., half the number of the diameters that would lie side by side, plus ten per cent. for solidity, and a very stable cloth will be the result. For heavier cloths, this may be increased somewhat, and for lighter cloths decreased, but there is danger in going too far in either direction, as the cloth is liable to be uneven, either from overcrowding or insufficient material.

Now to take the second proposition, and deal with the same counts of warp, so as to make the matter clear and easy of comparison: 2-20's warp or two ends of 2-40's is

used, then the diameter of 2-20's is $\sqrt{840 \times 10} = 92$ ends (nearly) per inch, and $92 \div 2 = 46$ ends and 46 spaces per inch. There is a difference here between the 2-20's, or 1-10 and the 1-11's, which the first calculation gives; then the rest of the operation is as in the previous case. But there is another operation which should not be overlooked. The designer should know the weight of cloth he is going to produce, and should never put one into the loom without knowing it. Then all he has to do is to work in the usual manner, the weight of a square yard, or the weight of a yard of any given width, so that he can compare with any known cloth, and if too heavy or too light alter it to meet the requirements.

The weight of cloths may be altered in several ways; as by altering the number of picks or ends per inch, or a combination of the two; but in any of these methods the character of the cloth will be altered, probably, at the same time. In many cases that may be desirable for the development of some special feature, more especially in fancy goods, but there are cases where every characteristic of the original should be retained, and a complete knowledge of the method of changing weight and retaining the same character is of inestimable value in assisting in the development of some special feature.

It is obvious that any change in weight, where the same character of structure is to be maintained, must be governed by the relative diameters of the threads, and it is in this connection quite as much as in the first building of a cloth that the value of a knowledge of the diameters of threads, or a ready means of finding those diameters, comes in.

As pointed out in previous articles, the diameters of threads vary as the square roots of their counts; therefore it follows that the finer a cloth is the lighter it is in weight, and the coarser it is, the heavier in weight.

Take a rough comparison. Lay a number of bars of iron four inches in diameter at a distance of four inches apart to cover a given area. Lay another number of bars of two inches in diameter at a distance of two inches apart to cover the same area. The relations between the bars and the spaces which separate them will be the same in both cases, but the relative weights of the two sets of bars will be as two to one, simply because the relative weights of the two sets of bars respectively will be as the squares of the diameters. Thus $4^2 = 16$, and $2^2 = 4$, or as four to one, bar for bar. But the space between the bars being equal to their respective diameters, the relative weights in the aggregate is reduced to one-half, thus $\frac{1}{2} \div 2 = \frac{1}{4}$. Hence the relation of bulk and space being the same, the relative weights must be as 2 to 1.

The counts of yarn being indicated by the number of hanks to a given length per pound, or by the yards per pound, the higher the counts and the finer the thread—except in one or two systems of counting—these counts represent the relative weights, therefore their sectional areas will serve as a basis for their relative diameters, and this must be in the ratio of the square roots of their counts.

Now suppose a cloth has been designed, and it is too heavy or too light, and it is necessary to alter it so as to

bring it to a given weight, and yet retain every characteristic of the original. It is obvious that the relations between the diameters of the threads and the spaces between them must be maintained, and that the relations of warp and weft must also be maintained, otherwise there must be a change in the character of the cloth. Now suppose the warp to be 20's in any material, because so far as the principle is concerned, there is no difference in the treatment of the subject, and that there are 48 ends per inch, and the cloth is too heavy by, say, one-sixth. Then both the counts and the number of ends must be altered. If it must be reduced in weight one-sixth, there must be a finer yarn with a diameter one-sixth less than the original, or in the ratio of 6 to 7. Therefore the proposition will stand as $6 : 7 :: \sqrt{20} : \sqrt{x}$, or what is the same thing as $6^2 : 7^2 :: 20 : x$, which is a little over 27 as the required counts. But the ends per inch must be altered now to correspond with this, and this must follow on exactly the same lines, that is, the square roots of the relative counts. Then as $\sqrt{20} : \sqrt{27} :: 48 : x$, or in another form, as $20 : 27 :: 48^2 : x^2$, or reduced to its simplest form, as $6 : 7 :: 48 : 56$, so that 56 ends per inch of 27's will give a cloth of exactly the same character, but one-sixth less in weight than 48 ends of 20's will give.

If the cloth is to be made heavier, it requires to work in the opposite direction, lower counts and fewer threads, and the result must be correct, because it is based upon the strictest scientific principle.

THE VALUE OF IMPROVED MACHINERY IN WOOL CARDING.*

After a few words of an introductory nature expressive of the honor and pleasure he felt in meeting the club for the third successive year in the lecture course of the school, Mr. Bolger spoke as follows: "The carding department is to-day, more than ever before, the keystone of the arch upon the strength of which all woolen mills must depend for success, and, as time rolls by, the importance of this department becomes more manifest to all students of textile development, because the quality and character of the goods or yarns produced in every mill depends more upon the results in the card room and picker room combined than in any other department of the mill. But many manufacturers are not prone to recognize the truth or force of the above reasoning, and the result is, that while many woolen mills have thoroughly up-to-date weaving, finishing and dyeing equipment, yet their card rooms are neglected. To such manufacturers the fact should be plain enough, that while it is all right and proper to always have the above-named departments equipped in the best possible manner, with good men, methods and machinery, yet, if the carding department is out of date or repair, or if an incompetent man is in charge of it, the succeeding departments cannot obliterate the effects of the bad work coming from the card room, because if the yarn, which is the foundation of the fabric, that is laid in the picker and card rooms, is not satisfactory, the quality of

* Extracted from an illustrated lecture delivered before the Warp and Weft Club of the Philadelphia Textile School, Philadelphia, February 18th, by J. F. Bolger, representative of George S. Hatwood & Son, Boston, Mass.

the goods made from such imperfect yarn cannot be made right by the spinner, weaver or finisher. It is, therefore, self-evident that the best obtainable machinery and methods must be intelligently used in the picker room, so that the raw materials prepared therein will be delivered to the cards in a thoroughly uniform condition. The stock must be well cleaned, oiled and blended with the greatest care for uniformity. Hand oiling is out of date and crude, and no picker room is up to date where such an obsolete method is in use for performing such an important part of the work of yarn manufacturing as the uniform distribution of the oil or emulsion over all the stock delivered to the cards, so as to insure a uniform quantity of oil and fiber in each and every operation of the scales of the Bramwell feeder. This feeder has been the greatest success in its own special line of any feeder ever invented, and the builders of it have constructed about 9,500 Bramwell card feeders for this country alone, for handling all kinds of fibrous materials, vegetable, animal or mineral, and the results have been of the most satisfactory character. It is entirely safe for me to assume, however (and I think I am in a position to know), that not over three out of every ten Bramwell feeders in operation to-day are handled to the best possible advantage. In nearly every case where fault is to be found with carders' ideas in operating the Bramwell feed, it is in running them too fast for the amount of work the scales have to perform, and the result is that in many mills the spike apron is not in motion more than one-third or one-fourth of the time daily. The result of running a Bramwell feeder as slowly as possible, according to the quantity of stock it must weigh to the cards daily, is that the sensitiveness of the scales is better controlled when the stock is gently instead of violently dropped into the scale pans, which should be filled on all kinds of stock from two-thirds to level full. Many carders run a light feed on the feed table of the Bramwell feed, which produces an uneven side drawing. With a sufficiently heavy feed to suit the nature of stock being operated on, the result from the first breaker card will be much more uniform in every way. Therefore, every wool carder should adopt slow speeds on the Bramwell feeds, and keep the comb set level to the spike apron, using good judgment, and at all times being governed by the length of staple and the condition of stock he is handling, so that the scale pans will be filled evenly all across the feed, and thus insure a uniform use of and wear of the carding surfaces. He should run his spike and strip aprons together with gears, which not only saves wearing out of the strip apron when always in motion, but also makes the operation of the scales more uniform. The Bramwell worsted feeder differs in construction from the wool feeder chiefly in one prominent feature—the use of a “curved board” or comb, instead of a strip apron or cylinder, to deliver the fibers from the spike apron to the scale pans. As all worsted wools are generally fed either wet or at least damp, so as to give the fibers additional strength and prevent breakage of staple during the carding process, we know that when the stock is wet the tendency of the strip apron or cylinder would be to felt or “roll up” the stock, and cause a loss of “top”

by breaking the fibers at the feed rolls or between the carding points, all of which the curved board prevents by delivering the stock properly and straight to the scales in the same condition in which it is received from the spike apron. The Bramwell feeder deserves twice the care and attention it usually receives at the hands of wool and worsted or shoddy carders, because so much depends upon the result of its work, especially in these days of close margins and reduced profits. In some mills the only doubling of roving on a wool set of cards, consisting of a first and second breaker and finisher cards, is that contributed by the use of two Apperly feeders to each set of cards, which is the case of many of the most successful woolen mills in the country where up-to-date methods are employed. In proof of this assertion, I might refer you to nearly all the various mills in Pittsfield, Mass., and vicinity, where two Apperly feeds to each set of three cards are used by some of the best carders in the United States, with a great saving in labor cost. Uniform yarn is made in all these mills by careful, scientific handling of the Bramwell and Apperly feeders by the carder. The Apperly feeder has been so long before the manufacturers of the woolen world that it is hardly necessary for me to repeat to you its merits or how to apply it practically. It is sufficient for me to state that the carder should carefully handle his stock and use little or no twist, if possible, in the side drawing, so as to feed the stock soft to the feed rolls of the second breaker or finisher card, and will also use as small feed rolls and licker-in as possible, so as to get what carders term a “short bite” on the stock as it comes from between the feed rolls, and thereby prevent bunched or lumpy feeding. The carder must then lay the side drawings exactly parallel with each other on the table, and regulate his tension to the “traveler” on each end with the overhead rig, and speed the pike band on the long end of the Apperly, so as to take the side drawings up to the feed rolls and retain the original angle on the side drawings, as delivered from the traveler truck, and pack his feed as close as possible on the table, so as to get the best results; and the rest of the work is easy, being only a matter of adjustment of speeds or tension to get the roping right on the finisher card. Some carders get all the angle possible on the Apperly by re-adjusting the bridge and traveler on the regular Apperly, so as to have the side drawings fed as straight as possible to the feed rolls, but a special long end Apperly is built to meet the extreme views of carders in this direction. The matter of card clothing cannot be entered into this evening, as my time is too limited, and we will now begin with the mechanical operation of a modern set, with a first breaker card to commence with for wool carding, with a Bramwell feed attached. The Bramwell feeder must be operated, as heretofore explained, in order to obtain the best results, and the stock must be properly and uniformly prepared for the card, or the results will not be good. The feed rolls, burring cylinder and burr guards must be scientifically adjusted to avoid damage to staple or carding surfaces. The first worker next to feed rolls receives the stock in the shape of small locks or bunches, and should on that account be set off from the main cylinder a sixteenth

to an eighteenth of an inch, so that the fibers, when in a bunched condition, will not be broken and thus reduce the length of staple and strength of yarns to be made from it. The next worker should be set somewhat closer, and so on to the worker next to the fancy, which may be termed a graduate setting, with different gauging on each worker, so as to gradually comb or card out the stock, and thereby save damage to the fibers, which you can readily perceive will surely result where every worker is set as close as possible to the cylinder. Where a gradual setting down of the carding points is adopted, the results will be more satisfactory, not only in stronger yarn, but the carding surfaces will be preserved from excessive strain, and less grinding will be required also. The matter of speeds on the various cylinders of woolen cards must be left to the best judgment of the carder, and according to circumstances. The "fancy" should be set to the main cylinder with a fine gauge to insure a level setting on each side of the cards, and afterwards set into the cylinder to suit, and the doffers should be run fast enough to keep the main cylinder clear and save fiber and waste. The second breaker card is governed by the same rules as the first breaker, except that the fibered, having been carded out once, permits a closer setting of the various surfaces so as to gradually straighten out and parallel the fibers for the finisher card. The side drawings, whether made for the bank creel or ordinary creel, or spool stand system, should not be twisted hard, but must be handled in the same way as for the Apperly feeder.

THE DANGERS OF ASSUMED SUPERIORITY.

More damage is often done to a good cause by the too strong belief in its goodness on the part of its adherents than from the attacks of an enemy. That British trade is handicapped by the over confidence of the British trader, is recognized occasionally in Canada, and the following extract from the *London Drapers' Record* shows that it is, at last, recognized in Great Britain. "Where we are being beaten at all by foreign competitors it is in virtue of their greater perseverance in minor commercial well-doing. That is to say, British manufactures are not being ousted because of their innate inferiority, but because they are lacking in small particulars, and are not always placed upon the market in the right way. The German commercial traveler seems to exude obliging qualities from every pore in his skin, and in thus acting he is only following the instructions of his employers at home. He never adopts the attitude of 'take that and be satisfied.' If his wares are not precisely to the liking of his customers he will have others made that are. He contrives that his goods shall conform to the established tastes of those who are expected to buy them, while his British rival expects tastes to be altered to suit his manufactures. The German trader is careful that goods shall be packed as desired, sent as desired, and paid for as desired; the Englishman scorns to consider such trifles, and is rather indignant that any such thing should be expected of him. But what counts most of all, perhaps, is the German's willingness to accept the day of small

things, in the confident and often justified belief that a day of big things will follow. Most of our Australasian exporters are somewhat disposed to ignore little buyers as being more trouble than they are worth. This is only another example of our ordinarily large minded way of doing business abroad. Our familiar attitude is—'Here are our goods, excellent in style and quality (our style and quality), and you may take them or leave them, and our terms of payment are so-and-so, and cannot be varied, and we do not care to sell small parcels, it must be grosses or nothing.' Is it surprising that this attitude offends, especially when contrasted with the oily willingness to oblige in the smallest particular which characterizes the demeanor of the German bagman, and his energetic, painstaking, hard and long working employer at home."

A NEW THREAD COMBINE.

Papers have been filed in the office of the Secretary of State of New Jersey for the incorporation of the American Thread Company, with an authorized capital of \$12,000,000, half 6 per cent. preferred, and half common stock. This means the coalition of twelve to fifteen, and possibly more, of the principal sewing-thread companies in the United States, exclusive of Coats and the two Clarks. The names of the concerns thus co-operating are at present given as follows: The Willimantic Linen Company, Alexander King & Co., the Merrick Thread Company, the William Clark Company, the Barstow Thread Company, the Warren Thread Company, the National Thread Company, the Hadley Thread Company, the Kerr Thread Company, the Summit Thread Company, the New England Thread Company, the Ruddy Company, the Glasgow Thread Company, and the Glasgow Yarn Company.

The man engineering this big deal is J. R. Dos Passos, whose skill and experience as a negotiator has been shown in the formation of the Sugar Trust and other consolidations. The negotiations which have resulted in the present incorporation have been under way for many months past, says a writer in the *Dry Goods Economist*, New York, and their success will have the important result of completing the union of practically all the cotton-thread industries of Great Britain and America under three organizations, viz.: J. & P. Coats, Ltd., of Manchester, Glasgow and New York, owning the Coats concern, the O.N.T. and Mile-End Clarks, Brooks and Chadwick, with their American branches, the English Sewing Company, including fifteen other British thread makers, and now the American Thread Company, composed of about a like number of American concerns.

It is understood that all of these companies, while remaining independent, will work in harmony, and destructive competition will be avoided. It is strenuously denied that there is any intention to raise the prices of thread, it being intimated that the economies in manufacture and distribution resulting from combination will be quite satisfactory to the manufacturers.

The shares of the new company will be of the par value of \$5 each, following in this respect the lead of the Coats concern, whose shares are of £1 each. Some idea of the profit of the business may be obtained from the fact that while the Coats capitalization is £3,500,000, or about \$37,500,000, the aggregate quotation value of their various securities exceeds \$100,000,000, also from the fact that when the English Sewing Company opened its subscription books for the capital of £3,000,000, subscriptions were promptly received to the extent of £60,000,000. It is expected that the prospectus of the new American company will be ready within a month, and that a portion of the capital stock will shortly thereafter be offered to the public.

Foreign Textile Centres

MANCHESTER.—The fine spinning combination promises to be a success from all accounts. One cannot say much as to the dividend prospects of the amalgamation before the actual working is known, but it may be stated that the concerns referred to have practically a monopoly of certain counts, and rank in this respect with the firms composing the Central Agency. The idea is to capitalize the scheme with about £4,000,000, and I dare say it will go through successfully. It may also be added that prices are not likely to be forced upwards to a "trust" limit, no matter how successful the flotation may be. There is an abundance of capital ready to enter into the business, and, if necessary, textile machinists are always ready to help on new schemes of the kind. The proposed flax spinning combination is another matter altogether. There are between 800,000 and 900,000 spindles in the Irish flax mills, the average value being at first cost about £3 a spindle. A very simple sum in multiplication will, therefore, suffice to show the minimum capital necessary to work an amalgamation of the kind. There are, unfortunately, serious difficulties to face in connection with a combination of this kind, such as the existence of certain firms in Ireland who both spin and weave. It would be a difficult matter to dispose of the cloth manufactured by these concerns, who represent probably one-third of the looms in Ireland—31,400 in all, according to Mr. William Russell, who belongs to the Belfast house of Messrs. A. and S. Henry & Co., of Manchester. The principal houses, both weaving and spinning, are William Ewart & Sons, limited, the York Street Flax Spinning Co., the Bessbrook Spinning Co., the Ulster Spinning Co., the Smithfield Flax Spinning and Weaving Co., Lindsay, Thompson & Co., the Falls Flax Spinning Co., the Belfast Flax Spinning Co., the Brookfield Linen Co., and others. Some of the foregoing concerns could not be induced to join hands with the smaller houses any more than a large calico printing firm would work side by side with small establishments running five or six machines, and suffering from a chronic over-draft. The prospects of a successful flax spinning amalgamation are also adversely affected by the fact that, owing to the extended use of cotton warps, the output of linen yarns has in some quarters for many years been declining, Lancashire spinners having gained much of the advantage resulting from the recent increase in the power-loom output of the North of Ireland. In Fifeshire there has been a more steady adherence to the standard of purity as regards flax fabrics, and Dunfermline concerns have, as a rule, set themselves steadily against the use of cotton warps. The ever-present competition of Germany, Belgium, and France also acts as a powerful check against any attempted forcing upwards of prices. The idea of combining the jute industry has been referred to by an authority of importance, as follows: Dundee does not think the scheme will come to much. Two-thirds of the jute manufactured in Dundee is sent abroad, and a combination would not improve the position in face of the competition from Calcutta and the French and German jute mills. A union of jute factories would not enable the heads of the amalgamation to monopolize the market for raw material. There are too many competitors in the field for such a thing to be possible, and, more serious still, Dundee does not occupy the position towards jute that Liverpool holds regarding cotton. Then, again, the matter of linking firms making a profit with those whose returns show an annual loss requires to be considered. The union of spinning and weaving concerns also presents a difficulty, as is the case in the projected flax-spinning amalgamation. Then, again, the amalgamation of mills making the lower grades of cloth with those providing carpets, crumb cloths, and superior makes generally, requires to be considered. Dundee is at present undoubtedly suffering severely from the

competition of Calcutta. During the past year jute has been exceptionally cheap, two large crops in succession having helped the market. Stocks of the raw material in Dundee are now very large, and storage accommodation has had to be increased rapidly and on a cheap scale. Jute usually costing from £11 to £12 a-ton, has been bought for some time at £9 to £10, but a short crop will soon alter the position of affairs, and place Dundee manufacturers in an awkward position.

LEEDS.—Business is fully up to the average for this time of year, when it is spring requirements which keep the market active. In winter goods there is not enough doing to show whether prices have suffered, but manufacturers both on the spot and outside declare that they will stop the present production of ordinary overcoatings and suitings now that there are no large consignments via Canada to Alaska. Operations in spring fabrics indicate that there is little prospect of lower prices for such goods, and the tone of the market as regards the future is confident, both manufacturers and merchants being very positive that nothing can be gained by waiting for lower prices for raw material. Continental trade continues about the same in extent. French buyers are once more taking a somewhat active part in the purchase of fancy and worsted coatings. Silk warp worsteds, blue twills, fancy tweeds, and wool chevots are their principal selections. German and Dutch buyers are looking mostly after pattern parcels of worsted mantle cloths, wool vicunas, grey chevots, and best tweeds. Trade with the United States is scarcely more than nominal. Ready-made clothing firms are working steadily on new season's orders, and employment is plentiful. Each week seems to accentuate the previously reported improvement in the clothing trade, and factories are now in full work, and orders more plentiful. As retailers in many cases have a great part of their winter stocks left over, and their capital thus fastened up, remittances are only coming to hand badly. There is a better enquiry for heavy worsted coatings for the home trade, and neat fancies in these goods are being much more worn. The American and Canadian demand for worsteds is also rather better. In the heavy woolen districts business on the whole is still quiet, although a few makers of specialties for the clothing trade are well employed.

HUDDESFIELD.—The recently-noted improvement in the Huddersfield district continues, and is especially noticeable in the highest class of woolens and worsted coating. Blanket manufacturers are busy on shipping goods and Government work, but general home trade goods are in quiet demand.

BRADFORD.—The tone of the wool market here continues to be distinctly languid, and as users are avoiding all speculative purchases, and confining their operations to satisfying their immediate needs, there has been very little increase in the general turnover during the past week. From the consular returns it appears that some £57,000 of wool has been exported from Bradford during the month of February; and although in the same month of 1897 the figures were £184,000, it must be borne in mind that at that time the large speculative purchases had commenced, in order to avoid paying a duty when the McKinley duties on raw material were re-imposed. Fine merino wools and tops continue to harden in price, and although the rise is very gradual, as each week passes purchases can only be effected at advanced rates; and as the supplies of the finest colonial wools are not at all likely to exceed the low estimate of the clip, we are probably in for a term of still higher prices in these fine wools. Although the finer classes of colonial cross-bred wools share to some extent in the improvement in prices of pure merino wools, referred to above, the coarser classes of cross-bred wools and nearly all classes of non-lustrous English wools are only in slow demand. There is all the time, however, a steady business doing in lustre wools, both in home-grown descriptions and also in bright colonial cross-bred wools, which are being used largely, both at home and on

the Continent, for the making of dress goods. Although there is not much new business reported here in raw mohair, the prices both in Turkey and at the Cape keep very firm, at rates distinctly in advance of this market. There have been some considerable sales of alpaca reported recently, and both yarns and piece goods of the best quality are certainly worse to buy. The demand from the Continent for staple classes of two-fold worsted yarns is kept very unsatisfactory by the reselling of stocks on the other side at rates even lower than the extremely low prices which have been recently taken here, but I am told on good authority that the quantities of these stocks must now be getting comparatively small. There is not much new business offering in worsted coating yarns, and as the export of worsted coatings to the United States in February only amounted to £19,000, the expected improvement in this market can only be developing very slowly. In other textiles the amounts sent to the United States in February do not call for any special comment, but the amount of £55,000 consisted of an unusually large proportion of dress fabrics in distinction to linings, which are included also under the heading of stuffs. The amount of cotton Italians keeps about £30,000, and some small portion of this will be fancy metallic-printed Italians, and some will be coloured goods finished by the new mercerizing process. It is still too early to predict the prospects of the season in the American trade in dress fabrics, but the winter trade is always much less than that of the summer season, and the heavy weight duty increases the charges largely of European productions of this class. In the home trade I find that although the last few weeks have shown a distinct improvement, and the warehouses here are certainly sending out more goods than they were doing, the spring season has not, on the whole, opened out up to expectations. Some of the novelties in fancy goods into which mercerized yarns have been introduced are doing very well, and some of the leading makers of costume checks are also very busy, but with the exception of plain Bengalines, the supply of everything seems to be quite equal to the demand. In both alpacas and fine jacquards there appears to be a better demand, but the enquiry is altogether limited to the best and most silky makes.

ROCHDALE.—At the flannel market recently the business transacted was of the smallest possible dimensions and rather disappointing. A few merchants made preliminary enquiries with regard to the next season's business, but it will be some weeks before there is anything of moment done owing to the increase in the cost of the raw material. Manufacturers will require an advance for new business, and there will be the usual difficulty in arranging terms.

KIDDERMINSTER.—The carpet trade is now very fairly busy, and everything goes to show that a good deal of the season's trade has yet to come. The London trade in particular has been later than usual, with the consequence that many firms, without being busy generally, are pushed to get off specially urgent orders. Rather more is doing in yarns, but the bulk of the deliveries are still from old contracts. Here and there sales of stock are made at prices which bear no proportion to those of the wool, but, generally speaking, prices are steady. The level of prices of carpet yarns is such that not much of the local spinning machinery is employed upon them.

NOTTINGHAM.—Though some departments of our lace trade continue to complain of a lack of business, the improvement mentioned in my last communication has been well maintained. Fancy cotton millinery laces are going off in good quantities, both for home and export, and the week has seen the placing of numerous orders, which will assure steady work for some time ahead. Fair quantities of fashionable laces are going to the nearer continental markets. Old valenciennes, malines, duchesse and point d'esprit laces are most in favor in white, ivory and butter. Linen Maltese and torchon laces make up assortments with point de Paris, Brabant and guipure laces and

insertions. American, crochet and warp laces have received more attention, but orders are unequally distributed, and there is some machinery idle. The same applies to Irish crochet edgings, Swiss embroideries and everlasting trimmings, while silk laces are decidedly slow, though some excellent qualities have been offered. Fashions do not yet appear favorable to this branch of the trade, and foreign competitors are supplying both the home and shipping markets. The plain branches are as busy as ever. Fine bobbin nets, heavy mosquito nets, Mechlin, Brussels and zephyr tulles are all in full request, and goods are only produced to meet bona-fide orders placed in advance at the full current list prices. Spotted nets sell moderately well. Rice nets and other stiff foundation nets have met with rather more enquiry, and there is a fair demand for silk nets and tulles. Silk veilings and chenille goods have fallen off. There is much competition for obtainable orders in this branch and business is quiet. In curtains, window blinds and anti there is activity, which, however, does not promise to endure for long, so far as the first-named article is concerned. Save for Paris, which is always ready to take high-class novelties, the Continent is not interesting itself much at this moment in our laces. The appearance of a number of American and Canadian buyers has stirred things up considerably, and improved commercial conditions in Australasia have led to an improvement in demand from that section of the British Empire. From Manchester there is a steady enquiry for valenciennes, and Brussels appliques are well spoken of. Lace and embroidered allover combinations, with edgings and insertions to match, have been in fair request, and are among the goods to which special attention has been paid by foreign buyers of the better-class styles. In Paris cream cotton veils have been worn largely, and other markets have given them a considerable amount of support. The danger to the lace trade from the selling of passementerie and ribbons does not appear to be very great. Mousseline de soie is used for certain purposes, but largely for the cheaper costumes. Net tops in light-weight goods are being used for the millinery trade to a considerable extent, and the demand for light Chantilly is still noticeable. The condition of our silk lace branch is shown by the exports for January. The value was £15,226, against £16,853 and £21,887 in the corresponding months of 1897 and 1896, respectively. Cotton lace shipments, on the other hand, opened fairly well, the value amounting to £242,307, against £220,029 and £223,080. Of the silk lace total America accounts for £6,497, which compares with £7,187 for January, 1897, and £10,042 for January, 1896.

LEICESTER.—The yarn market is rather more active as regards immediate deliveries, but business is still very difficult to book unless at risky prices with open dates. Production is of moderate extent, and stocks are not allowed to accumulate. The hosiery industry revives slowly, but the deliveries of spring and summer goods are likely to be completed at an earlier date than usual. Export business for South Africa, Australia, and Canada is of fair average extent, but the South American trade is inactive. Elastic web specialties sell freely.

KIRKCALDY.—Linen manufacturers find business continues to improve, and a more hopeful view of the future is being taken. Floorcloth and linoleum manufacturers are still very busy, extra work in some cases being necessary to meet the demands. Very large extensions in this trade are at present in course of construction.

BELFAST.—The yarn market is steady, with enquiries fairly general. Yarns are only selling in a hand-to-mouth fashion. Tows meet with little or no support. Prices untested, and nominally unchanged. Weft lines quiet, but firm. Cloth—Demand exhibits no change. Manufacturers are firm, even where business is slow. Damasks tend to improve. Powerloom bleaching cloth and cloth for dyeing and Hollands keep in well-sustained demand. Unions generally continue brisk,

with sellers at full rates. Tow goods moving slowly. Bleached and finished linens for home consumption are quietly expanding, though not brisk. United States shipments continue of substantial volume, but the quality of goods is low.

CREVELD.—No material change has taken place in the Crevelde market, but the demand seems to increase, while the scarcity of goods is more intense. In every branch of the trade the lack of hands is unpleasantly felt. While at first weavers were principally sought, dyeing and finishing works are now unable to secure the necessary quota of help. In fact, the present activity surpasses anything witnessed in this market for a great many years. The greatest demand arises from the requirements of the cloak manufacturing trade. In this branch the inability of the mills to produce the desired quantity of goods is more keenly felt than in any other line. Black goods for outer materials, as well as necessary lining silks, are equally scarce, and the weekly deliveries of the mills, although larger than during recent years, appear altogether inadequate. Moires are very prominent among the desirable styles, particularly cotton-filled moire velours, which are very popular for skirts and costumes. Taffetas and merveilleux in plain, glace, plaids and checks, damas glace and damas moire, employ a great number of looms, and few if any orders have been filled within the stipulated time. Small brocaded effects on striped and checked grounds have increased in demand, and furnish work for many of the jacquard looms. The demand for plisse styles continues, this process being largely applied to fancy silks. The improvements introduced in producing novel effects have made these goods very popular. The velvet trade is fairly good, but no such activity exists in this branch as in silks. The hand-loom weavers are all busy, and there are more orders in the hands of makers of fine silk pile grades than for years. The entire production of these silk-pile velvets appears to be sold for the rest of the year. The quantity, however, appears insignificant compared with the amount of goods produced in Schappe pile grades by power-loom mills. These latter are moderately well employed, and an increased activity is expected when the Fall orders are received. The outlook for velvets is considered very good, and it is expected that the mills will soon have all the orders possible for them to fill. The ribbon trade continues quite satisfactory, but the demand for wide widths is falling off except lines suitable for sashes. The outlet for millinery purposes is better than anticipated, and for dry goods purposes the demand continues good. Velvet ribbons, especially blacks in narrow widths, have a very good sale.

LYONS.—The demand for silk goods was less active during the week under review. Paris houses in particular are very cautious and inclined to confine their purchases to pressing requirements. The political question which has caused such excitement throughout France appears to have created an unexpected amount of uneasiness, and, although no fears are entertained regarding the outcome, it has produced an injurious effect upon business. No decrease in the activity of the mills, however, is to be recorded, and all the hand looms are as busy as ever. Spring orders are far from being complete, and deliveries, although in many cases much overdue, are willingly being accepted by the buyers. There is little evidence of any repeat orders, due to a great extent to the impossibility of delivering additional goods in time. Especially is this true of hand-loom goods. The Fall ordering business is delayed. Several orders have been discussed, but only in a few cases could an agreement be reached. The higher level which the raw silk prices have attained since spring orders were placed, the increase in wages and other items inherent to the production of silk goods, necessitate in most cases a considerable advance which buyers object to pay. There is no doubt that with the present tendency of the market and the continuing strong demand for silks manufacturers will secure their prices. The styles which at present command most attention are piece-

dyed damas glaces and plisse goods. The latter especially have won wide popularity, and are being sought in a variety of fabrics. The demand for taffetas shows no diminution, and a scarcity continues to exist in all the different styles. Plains, changeables, plaids, checks and stripes are being eagerly sought. For pongees the demand is no longer as active, while mousseline and gauze keep well to the front. Moires are greatly favored, especially moire velours in wool-filled fabrics. The demand for satin quadrille has very much increased, but no stocks in these styles exist. Bayadere and barre effects are very popular and appear to be gradually supplanting plaid styles. Colored ottomans are more sought, especially in dark green, prune and bleuet. The velvet trade is fairly active, with a good demand for both silk-pile and Schappe-pile grades. Purchases of the latter goods are growing in volume for the home market as well as for exports. Dark green, prune, mouse color and orange are the shades most in demand. Fancy velvets are only moderately active, and are principally bought in the cheaper grades. Ribbons are in better demand than anticipated. Satin ribbons lead among the staple lines, but the demand is also strong for taffeta ribbons and fancies in stripes and checks. Open-work ribbons enjoy great favor.

ZURICH.—The raw silk market remains quiet. Purchases are confined to every-day requirements, mostly in special grades, and there is no inducement to abandon the reserve which has been the feature of the market for some time. Prices remain firm at the highest figures. It seems improbable that much activity will be witnessed in the raw silk trade before the ordering business for autumn goods develops. Difficulty is experienced in obtaining an adequate advance in prices on large orders on manufactured goods, and the mills are not disposed to accept unremunerative figures in view of the upward tendency of the raw silk market. Offers for autumn goods lately submitted were refused on this account. A difference of opinion appears to exist regarding the prices which will rule for the coming season. The demand for goods remains satisfactory, and stocks do not accumulate.

MILAN.—There has been a fairly active demand for export greges, especially in best grades. America appeared again in the market with a considerable number of orders, and bought as well for immediate shipment. Asiatic grades are quiet, and, with the exception of Cantons, which are evidently growing in favour, no important deals took place. The high prices of Japans and Shanghais have led European mills to give the preference to grades of European origin. There was a better demand for thrown silk and prices improved slightly, but not sufficiently to make throwing profitable. A number of the most important throwing plants have shut down, and are not likely to resume this season, in the hope that this action may force prices upward. Turin reports a better demand for weaving greges. Prices show no change, and the holders in every case realized full figures. Deals in organzines were difficult. Many transactions fail on account of the difference in price, the pretensions of the holders being from 50 centimes to 1 franc above the figure which would-be buyers are willing to pay. Prices for cocoons are too high and preclude the possibility of lower prices.

CHEMNITZ.—Although duplicate orders are not coming in very fast, business in fine gauge goods is good, and manufacturers have large orders booked for delivery this month. Prices on those goods are firm, and no reductions are expected for some time to come. Buyers in need of coarse gauge goods should place their orders now, as prices are very low, and an advance is sure to result before long. The demand for very heavy cotton goods is larger than usual, as these goods are used more than ever to replace the low-priced cashmere qualities. To enlarge the sales manufacturers have taken special care to produce the very best goods that can be made at popular prices.

In no previous season have they offered such values. Misses' flat goods are not selling well; but for ribbed styles the demand is quite equal to the production. Fancies are called for a good deal, and the old complaints are still coming about slow deliveries. The manufacturers do their very best to satisfy the trade, but are still unable to supply goods enough on dates wanted. They even increased wages of their help, thereby forfeiting their profits, but the production is limited and the making of fancy hosiery takes so much time that it is impossible to ship the goods on dates satisfactory to their customers. Orders for January delivery will not be ready before May. On fabric gloves, orders are coming in by every mail, but they are not as large as in former seasons. Fleeced cashmeres are bought freely, and also button gloves. Knit gloves in fancy patterns are also in good demand. In the neighboring town of Frankenberg trade on tie silks is very good, but the call for mufflers is very light.

CHEAP TEXTILES CONDEMNED.

At the twelfth annual dinner of the Yorkshire College Textile Society, Leeds, England, Professor Roberts Beaumont made some interesting remarks on the above subject. He said that one of the most important duties the society had to perform was the cultivation of the taste among its members for the higher classes of manufactures. In a report just alluded to there was a reference to the fact that in England the tendency was towards economy of production, whereas in Germany it was rather towards variety and originality of design. In some measure a statement of that kind might be disputed. He was ready to assert that it was not applicable to certain classes of woven productions made in England. There might be, he admitted, some branches of work in which they must allow that they were neither equal to the French nor to the Germans, but in the great bulk of woven manufactures, especially in those finer cloths which were made for apparel, the patterns of English designers, their coloring, the cloths which they invented, and the style and finish which they applied, were all imitated by both Germans and French. If concrete evidence was wanted of this fact they had it in the museum of the college. They had received a collection of the most finished styles of fabrics from French houses, and a Huddersfield designer had discovered that most of the patterns had originated in that district. Whilst they granted this, there was one thing they wanted to avoid—that was the tendency simply and purely towards economy of production. He meant that selfish pursuit of cheapness merely for cheapness. The foundation upon which their great industry had been erected had not been one of cheapness, but one, as far as possible, of excellence. Therefore, whilst they exercised in their textile arts the science of economies in mill management and in the materials which they applied, there should always be before them an ideal to attain the very best they could in color and in design. However much some manufacturers might be opposed to the views he was expressing, he was convinced that technical education could not benefit, and was not intended to benefit, the manufacture of those light classes of goods to which he had referred. They wanted no technical education in the production of these cheap goods. Returning to the subject of the Yorkshire College, Professor Beaumont urged that intelligent craftsmen should be more assisted in their studies by means of scholarships. What he asked was that the West Riding County Council should establish a scheme of scholarships that should reach the intelligent craftsmen, who had already had experience in the mills. The establishment of that class of scholarship would be far more beneficial to the community than those small scholarships which were awarded in local technical institutions to youths whose minds had not matured sufficiently for technical instruction. It had been said that the technical colleges were producing such a multitude of skilled men that there would soon be no places for them in the factories, but was this

possible? There was plenty of room for expansion in the industries. In the immediate future, if they had the trade rights settled with China, an immense field would be opened out for English industry. He was aware that the Chinese did not wear woolen costumes, but the same might have been said a few years ago of the Japanese, who now wore garments of European cut and European materials. There was hope for the future of the weaving industries: he was sanguine enough to believe and bold enough to prophesy that those who were trained in the technological colleges would be instrumental in opening out those markets in the East, and finding a field for the productions of England.

FINISHING CHEVIOTS.

No class of goods has been more in public favor than cheviots, although much of the fabric that passes under this name has no right to the designation. The name cheviot was originally given to stuffs made from short Australian wools, in imitation of goods made by Scotch manufacturers from their low-grade, home-grown cheviot wool, says a writer in the *Textile Manufacturers' Journal*. A light fulling, little or no teazeling, and indistinct designs all contributed to the peculiar appearance of the goods. But to-day what passes under the above name is frequently made from thick yarn and ordinary wool, and certainly ought no longer to be called cheviot, if it has undergone so much fulling that the threads are thoroughly felted together. A characteristic of the true cheviot is the looseness of manufacture. A piece-dyed material, but one otherwise produced after the cheviot principle, if it has cotton warp and woolen filling, can hardly be called a cheviot, because the real cheviot requires color mixture and design. Usage, however, allows in this case the manufacture from thick ordinary yarn, and a small amount of fulling to pass as a cheviot, and the cloth is spoken of as a "piece-dyed cheviot."

The finishing of cheviots does not require the great care demanded by other goods. Nevertheless, an attractive appearance must always be the principal aim. In finishing, the main point is to preserve the natural character of the goods, and if the cloth has woven-in designs, not to disarrange their essential features, but to bring out their full effect in the finished goods. Some qualities take finishing more readily than others, especially when the cloth is to be dyed a light and bright shade. Cheviots at present are finished in two styles: a so-called original finish which is the rougher and more hairy, and in which the original wool character predominates, and the plain close finish, by which it is sought to produce a smoother, more napped and cassimere-like surface. In either case too much fulling is undesirable: the cloth belongs to the class of more open soft weaves, and would lose much of its suppleness and pliable feel by an undue milling.

Pure soap of a stronger character than is used generally in the milling operation is absolutely necessary for cheviot, and is also the most economical, because it contributes essentially to a pleasing superfinish. The use of a pure strong soap renders any addition to the succeeding bath superfluous, because the quantity adhering to the cloth as it comes from the mill is sufficient, provided the washing operation is conducted rationally. The cloth, when dried, can then be sent clean into the shearing-room. After the piece has been shrunk sufficiently in length and breadth, the next process is the washing, for which operation only clean warm water is necessary, if the preceding rules are observed attentively. The first bath is to be employed, at most, only ten or fifteen minutes, in which time the particles of dirt will drop off. It is inexpedient to expose the cloth for any length of time to the dirty water. Let this water run off and replace it with a fresh supply of warm water. This bath may be used for a longer time, as it will not become dirty so quickly. Wash the cloth in it for 20 minutes, after which let it run off, and then finish, rinsing with running water. It

wool-dyed cloth is to be topped, this can be done with a washing machine. Let the dye run in a continuous stream, keep the machine in motion for 15 minutes, and then rinse for 20 or 25 minutes. To make the cloth as supple as possible and to counteract the hardening property of the dyestuff, add a little dissolved fuller's earth.

After washing, roll up carefully and allow the cloth to lie over night, or else put it in the hydro-extractor and then roll up. In the latter case also allow it to lie over night. The intention of this rolling is to avoid cockling. Some manufacturers dispense with this manipulation altogether. They use the hydro-extractor immediately after washing, and dry at once. This is perhaps the cheapest and shortest method for cheap goods. Cheviots containing part cotton must always be dried at once, and the quicker this is done the better the results.

The next operation is the shearing or clipping of the long fibers in the shearing machine, through which the cloth passes as many times as may be necessary to shorten only the longest fibers. For this reason the brushes must not dig up the nap as vigorously as is done with other goods. They should simply touch very lightly. In some cases it is best not to have the brushes work at all; this applies to the original finished cheviot. On the other hand, the close finish demands a repeated brushing up and shearing of the wool fibers, until the desired length is obtained. These cheviots are brushed before being pressed. With original finished cheviots this is dispensed with. After pressing, the piece is measured and rolled up and is then ready for sale.

A large percentage of the weight of the piece is lost by the operation of milling. Some manufacturers estimate this loss as from 25 to 30 per cent., but so great a loss is in all probability abnormal. The shearing flocks amount at the outside to 1½ per cent. The other part of the loss must therefore be placed to the account of wear and tear in the milling process, especially with woven designs, because the cloth is giggered. Another cause of loss is that the pieces usually contain much sizing, etc., from the loom, or much oil and grease from the scribbling and spinning rooms. Under normal conditions the waste amounts to 15 to 20 per cent. The loss in washing is easily ascertained by weighing the dry piece as it comes from the loom.

After this it is thoroughly scoured, rinsed, extracted and dried again, but be sure to weigh a piece when cold, as it will weigh less in a warm state. The difference between the two is of course due to the loss from scouring. The loss from milling can be found in the same manner. In a certain case where there was a loss of 30 per cent., the pieces measured 139 yards long. This is entirely too long for fulling, and such pieces ought never to be made, as the best results can never be obtained. If such pieces were put up in two ropes of 54 yards each, good results would be obtained, but as they are, it takes too long for every portion to be subjected to the working of the milling machine. The piece runs too long before a sufficiently high temperature for the promotion of the felting process is developed. The cloth must necessarily run for a longer time and consequently, will show signs of a longer wear.

COLORING OF HEAVY WEIGHTS.

Every manufacturer is aware that there is more or less difficulty always experienced in coloring a heavy woolen cloth. The conditions are present in every case, which must be overcome somehow, if the work is to be successful. If a dyer does not thoroughly understand his stock, that is, the stock to be colored, and if he does not thoroughly understand his dyestuffs, this difficulty of getting clean, bright, uniform and regular colors on heavy-weights is sure to make its appearance.

Piece dyeing under any conditions, writes "Color," in the *Textile Colorist*, is always open to numerous difficulties as to

right shades, uniform appearance, etc., but when the pieces are very heavy cloths, these difficulties are considerably multiplied. If the color is an indigo blue with the use of the hydrosulphite vat the difficulty is pretty sure to present itself at once. To avoid any trouble, or at least to avoid most of the trouble, it will do no good to alter the vat; the real source of the evil is in the lack of sufficient alkaline strength. If colors under the above conditions fail to enter well and thoroughly and uniformly into the heavy weights, it is best to add soda or ammonia at once, and then with the increased alkalinity the results will be far more satisfactory.

Another class of colors that enter with great difficulty into the body and interior of heavy-weight woolens is the alizarines. All the diazo dyes are similar in their action, and they are very hard to make take hold of the cloth as the dyer would wish. The diazo has a great liking for the animal fiber if certain well-known conditions are only fulfilled. For example, there must be an excessive amount of acid present, also a liberal heat will aid materially in their penetrating effects. Make a free and liberal use of sulphuric acid and the diazo color will enter the body of the heavy-weight without any trouble, but you could not arrive at this result with heat alone. It seems that in the wool fiber there are certain amide combinations which throw off or resist the color in the dyeing operation. Now, if an excess of sulphuric acid is added it will deaden the effect of these amide substances and put the wool fiber in such condition that it will not resist the color action. If we were to boil our heavy-weight woolen in a water solution of the diazo there would be little or no color imparted, even though the boiling were long continued. But if an acid is used the color would be taken up and the process will be more thorough and complete. But better results even may be brought about than by the above method. First add a little sulphuric acid to set free the color acid, and then put the heavy-weight in at a boil. The freed color acid will act on the amide in the wool fiber and the color can gradually settle and fix on the fiber. Add now and again at certain intervals further amounts of the acid, and the setting of the color becomes more and more complete. Care in this will dye the heavy-weight through and through with as much thoroughness as the light-weight ever attains.

It must be said in this connection that if these dyes are to be employed it is best, safest and most satisfactory to use them in concentration. It is absolutely impossible to determine with exactness or accuracy just what proportion of the acid is needed with any and every color, because each color will vary from each other. If a concentrated bath is employed, then the acid will force the color at once into the heart and body of the piece, before the process has gone very far. The goods are placed in the dye bath while boiling, and boiling is continued for half an hour, when diluting and acidulation may gradually take place. Care is necessary in the use of an acid, and if the dyer prefers not to use sulphuric acid, which, in fact, is in many cases and for obvious reasons open to various criticism, he may employ instead the bisulphate of soda. Purified tartar is an agent that would act very well in setting free the color acid, but unfortunately it has some disadvantages which preclude it from practical use. Any substance which precipitates the diazo dye as a lime salt upon the fiber is not a safe substance to use for this purpose, and this is the effect of the tartar. But it is possible to prevent this precipitation if it is desired so to do, and when this is done, then the freed color acid can penetrate the body of the cloth as intended. To accomplish this, acetic acid is added in the presence of glauher salt. The acetic acid neutralizes the amide combinations in the wool fiber and sets free the color acids at the same time, and thus the acids may penetrate the fiber. At the close of the process a little addition of sulphuric acid will serve to settle and fix the color.

Alizarine colors, as above stated, give more or less trouble in this particular of fiber penetration on heavy-weights. Take.

for example, alizarine blue, and to make a successful color the goods must be perfectly washed, then mordanted with three per cent. bichromate of potassium and $2\frac{1}{2}$ tartar, the latter being completely free from lime. In this mordant the goods are boiled from one to one and a half hours, washed at once and dyed. Fill the vat half full of water and add the alizarine blue after it has been stirred and strained. The dye bath must stand at about 122 deg. F. when the goods are immersed. Acetic acid is added, and in the bath the cloth runs for forty-five minutes, while the heat is gradually raised thirty or forty degrees higher. After this, fill up the vat with water and slowly raise the whole to a boil. In this the color will be increased as to its beauty and brilliancy. There is no process more than that of finishing which is interested in this thorough coloring of heavy-weights. If there is any tendency whatever to carelessness or deadness, or dullness of color, it must show itself after the finishing is done, because finish can never impart color that was never in the body of the goods.

FIRES IN TEXTILE MILLS.

Recently Edward Atkinson delivered a lecture before the students of the Lowell Textile School upon the subject of fire prevention in textile factories. In opening, Mr. Atkinson dwelt briefly on the textile conditions in Russia, and the development of some of the countries of Southern Asia by the establishment of textile mills. He next reviewed the conditions of manufacturing interests in 1842, the time when his attention was first attracted to them. He remembered the long hours worked by the operatives, the poor pay and the defective workshops. The average wages are a good deal more than double what they were then, per hour and per day.

All conditions have changed for the better, and the rule of progress rushes on in a relentless manner and develops itself on the line of true progress. Yet our mills have only reached the half-way point. They are only ramshackle affairs. How noisy the loom is compared with the knitting frame! The time will come when the loom will be forced to give way to a circular machine or some other kind of a machine which will be noiseless and will be operated with less labor and with one-half the power. Here the speaker contrasted the old-fashioned saw gin with the roller gin. With the former the operation murders the cotton from the outset. The result is a waste that cannot at present be helped. By-and-bye some one will add another patent for a substitute for the leather cop roll which will add 10 per cent. to every spindle in the world. The time will come when the product will be 50,000 yards a year. I tried to invent the necessary improvement, but had to give it up.

Coming down to the real subject of the evening, Mr. Atkinson said: The prevention of fire by precautionary measures begins in the cotton field. The more they improve the saw gin the more damage will come to the staple. The roller gin cylinder bale was the only Southern invention that I knew of, and it did away with one of the great causes of fire in the early stages of the staple. It showed that when the pressure was taken off the cotton it expanded and caught fire from the stored-up air by spontaneous combustion.

With the roller gin the cotton is taken from the seed in flat sections, so that there is no chance for the air to penetrate. The saw gin mixes the sections up. This is a most important change. We will have an invention some day which will get the dirt out of the cotton without altering the parallelism of the fibers, and then you will save one-half of the strength of the fiber. We now proceed to prevent fire by dealing with cotton fiber on the logic of its own construction. That is what the young men all want to remember. The speaker here told of his partially successful efforts to convince the Southerners that their methods were decidedly faulty in the handling of cotton, and he told of the part that the cur dog of the South has always taken in the failure of the mill people there

to get the results that they ought to get. He told of compelling the Standard Oil Company to improve the quality of their oil, thus lessening to a very great degree the danger by fire. He also told of the danger of the presence of cotton-seed oil.

Before closing his lecture, Mr. Atkinson showed many pictures of cotton mills, including the new and old types, and explained the advantages of the low mills over the high ones. He said the truly modern mill should not exceed two or three stories for carding and spinning and one for weaving. He pronounced the Mansard roof an abomination to mills, and cited a case where it cost \$10,000 to get rid of one of these fancy roofs which had been put on by a professional architect. He explained why granite crumbles, and mentioned a warning that he gave to the Mayor of Boston that the Brown-Durrell building would one day cause trouble. The trouble did come within a few years. He endorsed the laying of basement planking in asphalt in preference to cement, for the one will last forever and the other not more than three years.

TEXTILE SPINNING FIBERS.*

There is one property that textile fibers must possess to enable them to be made into a yarn of any kind, namely, cohesiveness or the power of holding on to each other during manipulation and after completion. This power in smooth fibers, whether comparatively round as in silk, or angular as in hemp, jute and other fibers of this class, requires length of fiber, which is a necessity. Cotton fiber possesses this property of holding together during the preparing process, owing to the fact that every full-grown and perfectly developed fiber has a natural convolution or twist which gives it considerable adhesiveness. But it is in the wool fiber that we have this power of adherence best illustrated, which will be shown in any magnified view.

It may not be out of place to mention here, for the benefit of the younger portion of students, that the animal, vegetable and mineral kingdoms all contribute to our supply of textile fibers, and all possess the above cohesive power in a greater or less degree. There is one class, however, supplied us by the mineral kingdom, which has but a very limited power of holding together during manipulation, the tender and slippery nature of the fiber rendering it necessary to avail ourselves of the processes that are used in dealing with the shortest of fibers in cotton and wool. Very little asbestos (which is the fiber I am alluding to) can be made into yarn by the usual processes of attenuation by drawing rollers, as in cotton spinning; hence much of the yarn is prepared on the condensing carding engine. It is then twisted afterwards without drawing, as in the treatment of the shortest of wool and cotton fibers. Notwithstanding the difficulties attending the manufacture of asbestos, mill managers and engineers know the value of it for mill purposes. Asbestos being one of the textile fibers, the lecture would hardly have been complete without some notice of it.

I must here recall your attention to my opening sentence namely, the necessity of some cohesive capacity in all textile fibers. Silk and the long combing wools possess this holding power by reason of their length, as before remarked. It is so also in regard to flax, China grass, hemp and jute, but in the short wools and cottons cohesion is dependent on the structural contour of the outside of each fiber. These remarks may lead some to think that when textile fibers get so short that they lose their necessary adhesion to one another they are useless; and so they would be were it not that artificial means are introduced to give them some cohesive power. I recollect very distinctly that during the American cotton famine I sprinkled my mixings of short East Indian cotton with a solution of castile soap to impart some adhesive power to the fiber. This was one reason, but another was to prevent the heavy loss in

*A Lecture delivered at Shaw, by John Butterworth F R M S

the opening and carding processes. Yet the chief reason was to meet the former difficulty, and this plan of giving adhesiveness to short cotton fibers was in vogue some years ago in dealing with some of the low classes of broken-up cop bottom waste, and may possibly be so still. Such waste as the above is used for candle wicking, wicks for wax matches, lighting-up tapers and for manufacturing into cotton bedsheets, etc. When the American cotton famine overtook us it found the bulk of Lancashire cotton spinners with machinery only prepared for dealing with American cotton and the longer grades of East Indian, so there need be no wonder that recourse was had to sprinkling such short cotton as had to be used at that time with either castile soap or any other solution to add a little adhesive power.

In the spinning of very short wools such as are extracted from broken-up woolen rags, a different method is adopted, still it may be called an artificial one. In this case advantage is taken of the scales that cover the outside of all wool fibers in a greater or less degree, and by mixing a small percentage of longer wool the short fibers attach themselves to the long fibers, and are carried forward and formed into a thread. The same plan is adopted in dealing with very short cotton fibers to form into candle wicks, etc., but in the case of these the object of blending a certain percentage of long fibers with the short is two-fold, namely, to give strength to the yarn as well as to hold the short fibers together. It is the same in dealing with mixed lengths of wool fibers, but not to the same extent as in cotton. No method has yet been discovered by which the shortest of fibers of either wool or cotton can be spun, except by the judicious admixture of a number of long fibers among the very short wools, or of long stapled cottons among the very short cottons; and in each case they carry the short forward and wrap it up to form a thread, as no other method than the condensing system of wool spinning can do; and I think there are few outside those who are engaged in spinning on the woolen system who really are aware what a power we have in this system of using the very shortest of fiber in both wool and cotton, for goods that possess no mean appearance in the finished state. It may, however, be said that strength as well as artistic show is usually required in all kinds of cloth, so it is, but in these days of rush everything has to give way to the cheapening of the cost of production, and lowering the selling price of the finished article. Even moral principles are sometimes set aside to accomplish this end. Happily the system of manufacture we are discussing is capable of contributing both strength and artistic merit to the goods that can be produced by it. I am sorry to say that this system, as far as cotton is concerned, is nearly lost to us. We have let the Germans and Belgians appropriate it, and practically all our cotton waste now goes to the Continent to be made into such goods as bombazines, cotton flannels of the heavier kinds, cotton bedsheets, horse blankets, with several other kinds of cloth of no mean appearance and use. I have been induced to dwell on this system of manufacture because the Germans have made a good thing out of this trade. Had we kept it when we had it, which we could have done, it would now have absorbed some of the unemployed labor we now have on our hands.

Before leaving this part of the subject, however, I wish to draw your attention to a principle underlying both this and other branches of spinning textile fibers, namely, that all the longest fibers which contribute to form a thread of yarn work their way to the centre of it, the shorter fibers forming the outside being more or less loosely compacted. This phenomenon takes place in all yarns unless the fibers could be guaranteed of uniform length. When a yarn is made of mixed lengths of staple, even if you adopt the woolen system of spinning, the strength of the yarn is only equal to the strength of whatever number of fibers form the centre or core of the thread, unless an excess of twist is put in to draw the short fibers together and

thus to form a closer body of thread or yarn. There is one thing I have noticed in studying this most interesting subject, and it is a surprising one, namely, what an amount of short cotton fiber can be made to adhere to a few long fibers when they are spun on the woolen system of stretching and twisting. It is also most interesting to see how the long fibers will wriggle their way to the centre of the thread during its attenuation, forming themselves into a core. I may remind you, however, that although the mixing of long and short fibers is admissible in spinning cotton on the woolen system, it is not so under the usual system of drawing by rollers. In the attenuation of a sliver by drawing rollers, if all the fibers are not of the same length, those that are longest are sure to get to the front, and to leave the short to take care of themselves. But in spinning on the woolen system, while the long fibers still keep to the front, they do not lose hold of the short, which should form the bulk of the thread. I think it is well understood that if extremes of length of staple are mixed in spinning by draft rollers, twists are sure to result; but it may not be generally known that if extremes of hard and soft cottons are mixed together a similar result will occur, but in a worse form.

(To be continued.)

CO-OPERATION IN TEXTILE EDUCATION.

A new movement looking towards an extension of the facilities for textile education at Fall River, is described in a recent issue of the *American Wool and Cotton Reporter*. It is a movement on foot among the members of the Loom Fixers' Association, which will very soon materialize into a school for instruction in loom fixing and weaving. The project is being carried forward on a very moderate scale, but it is one which has within it the possibilities of great results. The members of this association desire to increase their skill and proficiency. Two or three years ago a movement was started among certain manufacturers and prominent citizens in Fall River, looking to the establishment of a textile school, in accordance with the provisions of a bill passed by the Legislature a few years ago, which provided that the State would give \$25,000 to any city having the requisite number of spindles, which would itself raise \$25,000 for that purpose. This movement, however, dragged along so slowly, that these loom fixers became tired of delay, and made up their minds that the surest and quickest way for them to secure the desired training and education was to go ahead and establish a school themselves. Last year they took decided steps. It was ascertained by personal interviews with the operatives themselves that if such a movement were started, it would be encouraged. Mr. Lincoln, of the firm of Kilburn, Lincoln & Co., when he learned of it, generously donated a loom. Simeon Chace, of the King Philip mills, said that he would give them a lappet loom. Mr. Hamilton, of the Hargraves mill, stated that whenever they were ready to start up, he would have a Scotch lappet loom ready for them.

As showing the determination of these men to improve their condition, for some time previous to their decision to start the school, they had purchased text books on weaving, loom fixing and designing for such members as desired them, at reduced rates, which the publishers were very willing to make. The association moved into new quarters in the Vermont block on Pocasset street, last December. Here is a reading-room which opens into a hall, possibly 60 or 70 feet square, and it is in this hall that the school will be established. It was decided to raise funds, if possible, for the starting of the school, aside from the funds of the association itself, so that the latter would not be crippled in any way by the financial requirements for the new project. For this purpose, the association started a fair, which was well patronized, and which netted a profit of \$800. Their ardor was somewhat dampened on the very opening night of the fair by the announcement that their pay was to be reduced 11 per cent., but this did not daunt

them. They decided to go ahead. A committee on textile education was appointed to make preliminary arrangements for the starting of the school, and this committee will report, it is expected, at a meeting of the association to be held at an early date. The committee state that all that they now need to enable them to place their looms in position and begin operations is the sanction of the association.

It is the present intention to put in four or six looms, and they will be placed on one side of the hall, from which they will be separated by a railing and draw curtains, so that they will be out of sight in case the association should have occasion to let the hall for any purpose, which it hopes to be able to do occasionally to help meet expenses. Lectures will probably be delivered here, in which case the curtains may be drawn aside and the looms used to illustrate the points made by the lecturer.

It is understood that already more than 100 members of the association have expressed their desire to enter the school as pupils as soon as it begins. A nominal sum will be charged the pupils, just sufficient to defray expenses, which are not expected to be very heavy. The instruction given will be *thoroughly of a first-class and practical character, and will be given evenings*. A portion of this instruction will be given by members of the association themselves, and the remainder by competent instructors from outside. The members of this association realize that manufacturers have been running fancy goods and specialties of late years more and more, and will doubtless continue to do so. As one member of the association remarked to a *Reporter* representative: "What is needed in Fall River is an increased variety of products, but we have had no opportunity to educate ourselves on the new processes required for the manufacture of these goods, and we wish to show what our mill men can gain by having an educated class of workmen, and we want to perfect ourselves so that we shall be ready to make any class of goods called for, which, we hope, will be of advantage to ourselves, as well as to our employers."

It is the intention of the management of the school to begin instruction on the plain loom. The pupil will be taught in a thorough and practical way how to take down and put together a loom. He will be taught the quickest and most effective method. This plain loom will have cams, with 3, 4 and 5 harnesses. On the second loom, he will be taught how to change from plain to twill weaving. On the third he will be given practice on fancy heads, and will be taught how to start them up, etc. After he has done with this loom, he is supposed to be perfectly qualified to draft his own pattern, and he will be given a card or diploma from the association testifying that he is competent to do this kind of work. On the fourth loom he will learn leno work. He will be taught the movements of easing bars and dupes. On the fifth loom he will be instructed and well grounded in leno lappets. On the sixth he will be taught jacquard work and will be rendered thoroughly competent in his line of weaving. The secretary of the association stated that it might require three years for a pupil to take the course of instruction which would be given on these six looms

MERCERIZATION.

E. Hanausek contributes to *Dingler's Polytechnische Journal* an account of the microscopical and micro-chemical characters of cotton after mercerization by the process of Thomas & Prevost, who, by the way, says the *Dyer and Calico Printer*, have formed their business at Crefeld into a company, with a capital of 750,000 marks or about £37,000.

The microscopical appearance of mercerized cotton is quite different from that of the raw fiber, especially when polarized light is used, but the information would be of little use to any but a practiced microscopist. Particulars of the French and Austrian patents relating to the mercerization of cotton taken out by J. Kleinewefel's Sons, of Crefeld, appear in the *Berlin Farber Zeitung*. The cotton is laid in the form of yarn over

the drum of a horizontal or vertical centrifugal machine, which may be arranged in various ways, and admitting of the introduction of either mercerized solution or of water for rinsing. When the centrifugal force has driven the mercerized solution through the cotton, the former is collected for use again, and the cotton is rinsed and wrung in the same way without interrupting the rotation of the machine. When the mercerizing is done in this way it is claimed that no shrinkage worth mentioning takes place, and there is no necessity for the caustic lye coming into contact with anybody's skin, and these are two advantages of which the importance can hardly be overrated. Another is that no stretching is required, so that risk of breaking the threads is avoided.

It may be remarked that no stretching is contemplated by the Thomas & Prevost process, which also avoids any shrinking of the threads, and it will be a matter for the German patent office to decide how far the patents are in conflict. It is well known that Thomas & Prevost's English patent has been nullified, and as the three old patents whose existence have caused this may have had an important influence or the fate of foreign patenting in the same direction, we will name them, and quote the main features of the specifications. The first was taken out by Lightoller & Longhan in 1881 (No. 5,713), and directs that by means of a suitable apparatus the cotton is to be drawn through sulphuric acid or through a solution of chloride of zinc thereby increasing its tenacity. The second is H. A. Lowe's first patent, taken out in 1889 (No. 20,314). This describes the use of soda lye or potash lye, or a combination of soda lye with zinc oxide, the cotton being subsequently washed with water. This treatment makes the cotton stronger and more receptive of dyes than ordinary cotton, and imparts to it a silky lustre. Lowe's second patent, taken out in 1890 (No. 4,452) is the third. This directs the mechanical stretching of the cotton either during or immediately after mercerization, to prevent shrinkage. "In the process as described in the specification of patent 20,314, the material is impregnated with a strong solution of an alkaline hydrate, preferably sodium hydrate, which combines with the constituent cellulose, producing a transparent, elastic material, but, at the same time, in the case of spun and woven fabrics, great shrinkage occurs, and this shrinkage I eliminate by keeping the material mechanically stretched while subjected to the action of or treatment by the sodium hydrate, or by subjecting it to a stretching process or operation after the sodium hydrate bath, but necessarily before the fabric has lost its temporarily pliable condition."

"This modified material possesses the advantages of being considerably stronger, of having greater capacity of absorbing natural moisture, of having a more regular close and glossy appearance, together with the property of attaining a deeper shade with the use of the same quantity of dye, and of attaining depth and quality of color hitherto unattainable with certain dyes, the colors so dyed being faster to both chemical and actinic destruction."

Lowe does not appear to have realized the great commercial value of his invention, and in any case, in the opinion of our Germany contemporary, Thomas & Prevost have the credit of being the first to initiate the employment on a large scale of one of the greatest improvements in the use of cotton ever known.

THE MANUFACTURE OF MOUSSELINE DE LAINE IN FRANCE.

An industry which is rapidly advancing in France at present is the manufacture of mousseline de laine. This article, which is one of the most staple, began to take importance some fifteen years ago, advancing continually in favor from season to season, until its importance has reached a point where to-day mousseline de laine enters largely into the exports of French woollens, says a writer in the *Textile Mercury*, Manchester. The French

market for these goods is Japan: by the official statistics one-fourth of the importations into Japan from France consisting of mousseline de laine. In spite of their imitative powers the Japanese have never been able to make an exact copy of these goods, nor have the German and American manufacturers succeeded in producing the fabric at the low price made by the French manufacturer. Hence in this article France holds the market for the world. Her best customers, after Japan, are England, the extreme Orient, Turkey, Spain, and South America. Mousseline de laine is manufactured in that part of Northern France known as Cambresis, and the process of manufacture is still very primitive. Each peasant, whether poor or in comfortable circumstances, has in his home one or two looms, according to his means, and in the evening and in his hours of leisure he works at the production of the cloth. During the day, if he is occupied in field work, his wife or one of his children takes his place at the loom, so that there is never a minute lost. The warps are furnished by overseers, who receive orders from the middlemen, and put the warps in work on their behalf. It often happens that a middleman contracts for all the production of a village or of a district for a whole year, and it is for these reasons that the producers of mousseline de laine can defy competition, for the actual manufacturer, the man who works at the loom, is only too poorly remunerated for his work. In the district of Cambresis, but in the direction of Picardie, are manufactured in the same way as mousselines, the dress fabrics known the world over under the name of "Picardie high novelties." Here, as in the case of mousselines, the weaver is very poorly paid when the importance of his work is considered, and a middleman in Paris generally controls the production of the district. But if his profits are very large the risks of the middleman also are very great, for the high novelty is a dangerous article. The middleman is always required to have a certain quantity of the goods in stock, the value of which depreciates day by day, according as the article becomes less and less a novelty, hence he must have a profit large enough to cover such losses. An industry which has made great progress in the vicinity of Roubaix is that of producing men's wear woolens. Only a few years ago Roubaix left the exportation of such goods to England and Germany, but to-day the Roubaix product may be found in all the markets of the world. Cheviots, coatings, and diagonals of Roubaix make now enjoy great popularity in all the markets of the extreme East. While their price differs very little from the English and German goods, the Roubaix article is regarded everywhere as more carefully made and more durable. Up to last year hope was entertained that Roubaix might compete in the American market with the German and English goods, but the Dingley tariff has knocked all such anticipations on the head. All the large dyers have in recent years directed their efforts to so improving the methods of dyeing as to reach results equal to those of their English competitors, and there is no doubt that enormous progress has been made in this direction. At present the manufacture of men's woolens employs several thousand operatives in the dyeing branch, at least one-third of the operatives of the dye works in Roubaix now being employed on men's goods. The dyeing industry, so far as it applies to dress goods, is now passing through a very pronounced crisis for lack of orders from the manufacturers, and should this condition continue the present season will be counted as one of the worst.

WEIGHT OF YARN.

Below is a method for ascertaining the weight of yarn in a case:

First, weigh out five pounds, and take the quantity of cops required to make this weight: divide the gross weight of yarn and cops by 5; the result when multiplied by the number of cops in the five pounds, gives number of cops in total weight.

Second weigh first one-half pound of empty tubes, and

divide the total tubes in case by the number of tubes in one-half pound, and the weight of tubes results.

Example 1: Gross weight of yarn and tubes equals, say, 300 pounds, and 5 pounds equals 50 tubes. Then $300 \div 5 = 60 \times 50 = 3,000$ tubes in case.

Example 2: One-half pound of empty tubes contains 175 tubes. Now, $3,000 \div 175 =$ number of one-half pounds of empty tubes, which can be brought to ounces, as $3,000 \div 175 = 17 \frac{1}{7} = 8$ pounds, nine ounces.—*Ex.*

Textile Design

HEAVY-WEIGHT COTTON WORSTED SILK MIXTURE.

Yarns dyed in skein and stock.

Weight finished, 21 to 22 ozs. for 56-inch width.

DRESSED.

6,912 ends, 6 4 warp.

3,456 ends, 2 50 worsted.

3,456 ends, 2-40 cotton.

Woven—90 picks to inch.

60 picks, 2-40 cotton fill

30 picks, 2-run woolen fill.

Chain Draft.



Straight draw on 16 harnesses; 13 reed, 8 in dent.

Twill to right.

3,456 ends, 2-50 worsted equals $4\frac{1}{2}$

3,456 ends, 2-40 cotton " 4

60 picks " " " $4\frac{1}{4}$

30 " 2-run woolen " $12\frac{1}{4}$

Flannel, 6-4 yard equals 25 ozs.

$4\frac{1}{2}$ ozs. wors. shrink 10 p.c. equals 5.

$8\frac{1}{4}$ " cotton " 5 p.c. " 87

$12\frac{1}{4}$ " woolen " $12\frac{1}{2}$ p.c. " 14.

Stock, 6-4 yard equals 27 ozs.

5 oz 2-50 worsted at \$1 per lb, equals..... \$ 31

87 " 2-40 cotton at 23c. " " " " .125

125 " 2-run woolen at 20c. " " " " 156

Total cost of stock (outside silk) for 6-4 yard.... \$ 5.1

Total cost of manufacturing for 6-4 yard..... .50

Total cost at mill (outside silk) for 6-4 yard \$1.09

Silk will add to total cost per yard from 5c. to 10c. per yard, according to amount used.

Backing fill mixture.

20 per cent. wool	at 48c	} = 20c. round Nos.
45 " shoddy	" 16c.	
20 " cotton	" 10c.	
15 " cot. waste	" 10c.	

Italian organzine silk used; twisted around 2-50 slack twist worsted for warp, and round 2-40 slack twist cotton for filling. This fabric is shown in plain black, blue and dark brown silk effects. Also in checks (fancy colors worsted) with silk intertwined.—A. W. & C. R.

DYEING FAST SHADES ON COTTON.

The coupling process introduced by Leopold Cassella & Co., W. J. Matheson & Co., Ltd., agents, promises to become one of considerable importance to the cotton dyer. It is simple and easy of application, while the results are good, the shades obtained being very fast to washing, etc. The following recipes will show some applications of this process. (All are for 100 lb. cotton):—

Gold Yellow.—First a dyebath made from 4 lbs. primuline, 2 lbs. soda, and 20 lbs. Glauber's salt, working for one hour. Second, a developing bath containing 5 lbs. Nitrazol C.

Dark Green.—Dyebath: 2 lbs. diamine blue R, $1\frac{1}{2}$ lbs. primuline, $\frac{1}{4}$ lb. diamine steel blue L, 2 lbs. soda, and 20 lbs. Glauber's salt Developing bath: 5 lbs. Nitrazol C.

Pale Sage—Dyebath 1 lb diamine jet black OO, 3 lbs. primuline, 2 lbs soda, and 20 lbs Glauber's salt Developing bath 1 lb. paranitraniline

Chestnut Brown—Dyebath 2 lbs. cotton brown N, 2 lbs. primuline, 2 lbs soda, and 20 lbs Glauber's salt Developing bath .5 lbs. Nitrazol C A similar shade may be got by making the dyebath from 2-lbs. cotton brown N, 18 ozs diamine orange D, 2 lbs. soda, and 20 lbs Glauber's salt, developing with 1 lb paranitraniline

Dark Chestnut—Dyebath 1½ lbs. cotton brown N, ½ lb. diamine jet black Cr, ¼ lb diamine fast yellow A, 2 lbs soda, and 20 lbs. Glauber's salt Developing bath 5 lbs. Nitrazol C

Dark Brown—Dyebath 2 lbs. cotton brown N, 2 lbs diamine jet black Cr, 2 lbs soda, and 20 lbs Glauber's salt. Developing bath 7 lbs Nitrazol C, or 1½ lbs. paranitraniline

Dark Walnut Brown, Reddish tone.—Dyebath 3 lbs. cotton brown N, 1 lb diamine brown V, 2 lbs. soda, and 20 lbs. Glauber's salt Developing bath 7 lbs. Nitrazol C.

Sage Yellow—Dyebath 4 lbs primuline, ½ lb diamine bronze G, 3 ozs cotton brown N, 2 lbs. soda, and 20 lbs. Glauber's salt. Developing bath 5 lbs. Nitrazol C

Black Brown—Dyebath 4 lbs diamine jet black Cr, 2 lbs. primuline, 2 lbs soda, and 20 lbs Glauber's salt. Developing bath 1¼ lbs. paranitraniline C.

Invisible Green—Dyebath 3¼ lbs. diamine blue black E, 2 lbs. primuline 2 lbs. soda, and 20 lbs Glauber's salt. Developing bath 6 lbs. Nitrazol C

Dark Brown—Dyebath 4 lbs diamine jet black Cr, 2 lbs soda, and 20 lbs Glauber's salt Developing bath 2 lbs. paranitraniline

Blue Black—Dyebath 3 lbs diamine Nitrazol black B, 2 lbs soda, and 20 lbs Glauber's salt Developing bath 6 lbs Nitrazol C and ¼ lb each new methylene blues R and N

Black—Dyebath 4¼ lbs diamine Nitrazol black B, 2 lbs soda, and 20 lbs Glauber's salt Developing bath 6 lbs Nitrazol C and ½ lb new methylene blue N

Sage Brown.—Dyebath 3 lbs. diamine bronze G, 2 lbs soda, and 20 lbs Glauber's salt. Developing bath 1¼ lbs paranitraniline

Brown.—Dyebath 2 lbs. diamine jet black Cr, 2 lbs soda, and 20 lbs Glauber's salt Developing bath 1¼ lbs paranitraniline.

Pale Sage Green.—Dyebath 3 lbs primuline, 1 lb. diamine bronze G, 2 lbs soda, and 20 lbs. Glauber's salt Developing bath: 5 lbs. Nitrazol C.

The dyeing operation is carried on (as is customary with direct dyes) at the boil. After dyeing, the cotton is rinsed and allowed to become quite cold before it is put into the developing bath. When Nitrazol C is used as the developer or coupler it only requires to be dissolved in water, and a little soda and acetate of soda added, as has been given before.

When paranitraniline is employed as a developer it is first dissolved in hydrochloric acid and then diazotised with sodium nitrite in the usual way; this bath is used cold

MERINO SHEEP BREEDING.*

The following is a portion of an address delivered by John S Beecher, president of the Standard American Merino Association, at its last meeting held at Rochester, N. Y., Jan. 18th:

The great influx of the foreign mutton breeds was the natural result of a disposition upon the part of our sheep men to take up something new and untried as a cure for the evils of a mistaken national economic policy. The lessons of experience that came to the party exploiting the policy will scarcely need repeating during this generation, and the men who sacrificed their merino flocks will want some of the blood again, and that from now on. Fortunate the man who has the material with which to recoup his fortunes, and thrice fortunate the man who stayed to the front through the thickest of the breed's struggle and maintained the number and improved the quality.

The facts demonstrated by the experience of the last few years is that well-fatted Merino mutton is as good eating as the best of the so-called mutton breeds, second that a Merino ewe taken the year

* Address by President John S. Beecher, at the meeting of the Standard American Merino Association, at Rochester.

around, keep and care considered, is the most satisfactory of all sheep mothers. She will yield the heaviest and most valuable fleece of wool, and when bred to a Southdown ram, will produce an up-to-date mutton lamb, satisfactory alike to both feeder and butcher. What type of Merino will meet future demands? We are living in a wonderful age, a period of marvelous development, invention and discovery, and never before was competition so sharp and persistent, making necessary strict economy and best of methods if success is to be attained in any business or calling, and the breeding of domestic animals is no exception. In this field, the expense of care and keep on the one hand, and the capabilities of the animal or race on the other, are elements for consideration and turn the scale for good or otherwise. The day for careless and slipshod methods in growing and feeding crops to inferior and scrub stock have passed into history, more especially the scrub animal. Every industry must supply a need of mankind somewhere. All through the vast sheep walks of Argentina, Australia and the Transvaal are numerous bands of almost countless numbers of sheep, substantially Merino blood, kept with wool production as the paramount object in view, and necessarily from the very order of things, inferior in type to the improved flocks, limited in numbers, in the hands of the world's great breeders. With the upward movement of wool in the American markets, these same conditions will prevail again in the vast plains of our country west and southwest. To furnish the material for the improvement of the fleece qualities of these sheep will, in the future, as in the past, be the mission of the stud flocks of American Merinos.

Four years more and we reach the century mile-stone of American experience in the culture and development of Spanish Merino blood, a period that has witnessed greater improvement in this race of animals than can be found in any other branch of the domestic animal industry. Are the lessons of experience replete or are there new routes to success yet untraveled and new principles in breeding yet to be evolved, or did Hammond, Sanford, Stowell and Burness blaze the way along the route which all must travel if they reach the hill-tops of success? Who since their day has made footprints more plain or marked, or discovered a new pathway to better results? True it is that many better sheep have been bred than their eyes ever looked upon, or their hands handled, yet it was done by men on whom their mantles fell, and by their methods and practices. The secret of the success of these men was the recognition of and the putting into practice of a few well-established principles in sheep breeding. First that like begets like; second, that the male is the potent influence in improvement; third, that the male must be in every way superior to the female if advancement is to be made; fourth, that oil in the ram's fleece was as indispensable as wool, if fleeciness and quality was to be expected in the progeny; fifth, that wrinkles was the channel through which covering and density of fleece was to be secured.

Now let us briefly outline the course pursued by these men. Mr. Hammond commenced his operations in 1844 with Atwood sheep, the females of which would shear four pounds washed wool. One of his first moves was to secure an interest in the Atwood ram, "Old Black," the first ram of this blood to shear as much as 14 pounds. The next upward step was his son "Wooster," that clipped 19½ pounds, who, in turn, gave place to his sons "Old Greasy" and "Young Matchless," whose fleeces weighed 22 and 23 pounds respectively. Then came "Old Wrinkly," son of "Old Greasy," described as heavily wrinkled over and under neck, and also about elbows, tail and flank. Flank deep and tail broad; fleece 23 pounds; then in time came his two sons, "Little Wrinkly," who got "Sweepstakes," Mr. Hammond's crowning success that clipped 27 pounds, and the Lawrence ram who was scarcely less wrinkly than his sire, who clipped 24 pounds. As a result of his course, he had carried his flock of 200 (early in the sixties) up to an average of 10 pound fleeces, while in carcass and covering, the improvement was no less marked.

Mr. Stowell commenced his flock with Atwood ewes purchased of Mr. Hammond and bred to the McFarland ram "Peerless," whom some of us recall as being one of the very wrinkliest rams of his day. "Peerless's" son, Stowell's "Sweepstakes," got the great ram "Golden Fleece," that many think was the greatest ram of his generation.

One of Mr. Burnell's first moves was to breed to the ram "Bona-

parte," that was a very shiny and excessively folded ram. "Silver Horn," a son of this ram, in his lamb form got the great rams of history, "Bismarck," "Stubs," and "Eureka 3rd." Bismarck was the great ram of this flock, and was without a rival in his day. At this point let us note one fact, that "Sweepstakes" was a grandson of "Old Wrinkly," "Golden Fleece," a grandson of "Peerless," and "Bismarck," a grandson of "Bonaparte." Now who, of our day, ever saw a great show ram or sire which did not lie very close in the male line to something away above the ordinary showiness. The course of these involved line breeding, in-and-in breeding, and type breeding. Each of these men reached a climax of success before his life work was done, and each made the same mistake. Line breeding, we understand to consist in keeping within a certain line of blood on the male side of descent. All of Mr. Hammond's rams belonged to "Old Black's" family. Mr. Stowell's, to "Sweepstakes," through his son, "Peerless," and Mr. Burnell's, to "Eureka," through his great grandson "Bonaparte."

In-and-in breeding we understand to consist in mating blood lines related to each other. All these men were in-and-in breeders, each mated sire and daughter, rams and ewes by the same sire, and the produce of half brothers to each other. Type breeding we understand to consist in a persistent and continuous effort to produce animals of similar points as to conformation and characteristics, each sire of the same general make-up of his predecessor in heading the flock. What of the principles and practices in breeding herein involved: are they correct and safe ones to follow? Of line breeding and type breeding, we say yes. Of in-and-in breeding, yes, with limitations. When a feeder has produced a male animal that is the greatest of his day, and whose blood has improved his breed, he should be ambitious to perpetuate his line and establish a tribe that should bear his name as a family. How is this to be done? Not by indiscriminate and close in-and-in breeding, but the rather by selecting outside ewes of remote blood of similar type to produce his successor in the flock. Of type breeding, let it be said that individuality by which we gauge value and superiority, centres in the type, and that a male animal will prove impressive and prepotent as a breeder, begetting in his own likeness, according as he is type bred.

How far is it safe to go with in-and-in breeding? I would draw the line right here. I would never mate a sire with his daughter, a mother with her son, or a full brother and sister. I would mate half brother and sister by the same sire when their dams were not too closely related, and I would do the same with the progeny of two half brothers by the same sire; that is, mate the progeny of each with the other. I would also mate the daughters of a sire with his grandson in the male line, whose dam was remote blood.

I advocate the wrinkly, dense-fleeced, well-covered, vigorous, large-carcased, heavy-fleeced, up-to-date Merino, because they represent the improved type of the American Merino that holds and maintains its fleece qualities when well in years, and because experience has demonstrated that this type is best of all as an improver of lower grades of sheep. This is an established fact in our own country, and holds equally so in Australia, the Transvaal and Argentina. Said the late Gideon Pitts, whose experience covered the stretch away of more than half a century. "My observation has been that the man who bred the largest and heaviest shearing sheep was the man who made the most money in the business."

TAPESTRY CARPET YARNS.*

Carpet yarns when they are received from the spinner still retain the oils which have been added during the spinning operations; and in this state they are technically known as "in the grease." In this oily condition, the yarn is quite unsuited either for dyeing or color printing, as the oily surface of the fiber prevents the proper absorption of the coloring matter. The removal of this "grease" or spinner's oil necessitates the operation of scouring with soap and weak carbonated alkalis. The weight of the oil present in carpet yarns varies according to the quality of the wool: but it is generally understood that from 10 to 12 or even 15 per cent. is a very fair amount. Should it, however, exceed 15 per cent. it may be considered as

unduly weighted with oil. This excess or undue weighting of yarns with oil is a great objection, and forms an important feature in the selection of a yarn. It causes an unnecessary increase in the expenditure of soap and scouring liquid, in order to effect its complete removal. Hence arises the necessity for all carpet manufacturers to make a preliminary test always before buying a yarn "in the grease," in order to see that it is not overweighted with oil. From the loss in weight of the wool, after careful scouring and drying, it is easy to calculate the percentage of loss, which represents the amount of oil which was present in the yarn. In practice it is found that some yarns scour much easier than others, owing to the nature and quantity of the oil used in their spinning. If the oil used be a glyceride, such as olive oil, saponification is easily accomplished, but if it belongs to the hydro-carbon or mineral series of oils, as sometimes employed in the lower class yarns, saponification is rendered more difficult, according to the proportion of mineral oil present. The exact quantities of the scouring agents required for the complete cleansing of a yarn is therefore only gained after a few experimental trials. The employment of an emulsion or a neutralized solution of sulphated castor oil for the spinning of yarns has been in use for some time, both in this country and on the continent. Yarns spun with this emulsion, or soluble oil, have the great advantage of requiring little soap for their cleansing, in some cases a wash in clean, warm water being sufficient to remove all impurities. It is readily seen that a considerable saving in scouring materials would be effected if this soluble oil or emulsion spinning became more general. The thorough cleansing of a yarn in scouring is of as much importance in tapestry carpet making as in dyeing. If this be not properly performed, either from an insufficient quantity of soap or too hasty manipulation, the colors in the printing do not fix equally on the fiber, and blotchy, uneven work is produced. The colors of an important pattern may receive the careful attention of the print master during the printing process, and every care be taken to have them level in tone, yet the pattern may turn out uneven and "stripy" in color from this insufficient scouring. It is difficult to lay down hard and fast rules regarding the scouring of carpet yarns, as they differ so widely in quality of fiber and percentage and nature of oil present. The proportions of scouring materials have accordingly to be altered to suit the requirements of the particular yarns.

Scouring Soaps—The quality of the scouring soap employed in cleansing the yarns is a question of much importance. With the finest qualities of wool a mild potash, Marseilles or Castile soap (which is an olive oil soda soap) or oleic soap are perhaps the most suitable, with the addition of a little ammonia to the bath, if necessary, to improve their detergent effect. With the heavier and coarser yarns, such as generally used in tapestry carpets, a good soda soap is excellent; assisted with the addition of a little pure carbonate of soda. This is required in order to cleanse them thoroughly. Good scouring soaps are made from tallow, olive oil, palm and cotton seed oils, and to be neutral should have ten times the amount of fatty acids to that of combined alkali. A cocoanut oil soap is more caustic than ordinary white or yellow soaps, and contains an excessive amount of water, generally 73 per cent., or nearly three-quarters of its weight of water. The presence of adulterations, such as potato flour, silicate of soda, china clay, resin, etc., must be guarded against. Resin in scouring soaps has now been found to be a fruitful source of uneven dyeing and color printing; and as it is about a quarter of the price of tallow its presence greatly lowers the commercial value of the soap.

The following analyses may be taken as examples of good scouring soaps:

	Good white soap.	Olive oil soap.	Cotton seed oil soap.
Fatty acid	60.00	64.00	68.34
Combined soda	6.40	6.94	6.23
Water	33.60	24.40	22.48
Sodium chloride and sulphate, etc.	4.66	2.95
	100.00	100.00	100.00

Carbonate of Soda.—For scouring carpet yarns a pure carbonate of soda, such as found in "refined" or "patent alkali," containing 98 per cent. pure sodium carbonate, Na₂CO₃, has met with marked success among woolen manufacturers and scourers. It is absolutely free

* David Peterson, F.C.S., in the *Dyer and Calico Printer*.

from any caustic soda or lime, which is a feature of much importance in wool scouring. Carpet yarns scoured with this pure carbonate of soda feel soft and keep their lustre better than when inferior carbonates are used. It may be considered three times stronger than soda crystals, $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

Scouring Compositions.—Many patent scouring compositions are often found in the market and sold under various names. They are all composed more or less of a mixture of carbonates of potash or soda, with soap; all good enough in themselves, but they could be manufactured by the consumers themselves at a much lower cost.

Potash Soaps—It is generally admitted by the best authorities on wool scouring that potash, either in the form of a potash or soft soap, or carbonate of potash, K_2CO_3 , has a milder effect on the wool fiber than soda. Hence for the fine wools a potash soap is to be preferred to a soda one for scouring. This would seem to be indicated by nature, as from the analyses by Chevreul and others of the wool fat or "yolk" present in the raw wool it is seen to contain a very large percentage of potash salts, with only a trace of soda.

The following is an analysis of "yolk" ash—

Potassium carbonate	86.78
Potassium chlorides and sulphate	9.01
Soda, lime, iron, magnesia, etc.	4.21

100.00

Scouring Machine—The scouring of the yarn may be done solely by the hand, by shaking the hanks to and fro several times in the soapy liquid; or it may be better and quicker performed by a scouring machine, either in the loose hank method or in the continuous chain. The scouring machine consists of a rectangular box or tank fitted with a series of rapidly revolving reels or racers, on which the hanks of yarn are suspended into the scouring liquid.

Temperature of Scouring Bath.—The temperature of the scouring bath is an important consideration. It should be about 100° to 110° F., or not too warm but the hand can be held comfortably in it. A higher heat than this hurts the lustre of the wool, and renders the yarn liable to become "felted." This felting of the yarn in carpet making is a serious danger; causing much trouble in the various operations it has yet to go through. For quick scouring a higher heat is necessary, but such a method is not to be recommended, as it only saves a little time at the expense of the "feel" and lustre of the wool. In wool scouring it is well to remember that the lower the temperature at which the scouring bath can be used, consistent with thorough and efficient cleansing, the better for the lustre and "feel" of the yarn.

Methods of Scouring—The yarn is usually scoured in batches of 100 pounds each, each hank being treated individually on the swifts or reels of the scouring machine; or they may be scoured by the chain method.

Chain Scouring.—Instead of treating each hank individually, they are linked together by means of pieces of cord, one hank being tied to another, in chain fashion. This chain of hanks is then scoured by running continuously through the scouring trough. What is rather an objection to this method is that at those points where the hanks are attached to each other by the cord, the yarn is apt to become tight and compressed. This has a tendency to prevent the scouring liquid from acting so freely at those points of contact as in the body of the hank where the yarn is free. The scouring has a chance of not being so well performed as when each hank is loose and receives individual treatment.

For the finer classes of wools the following proportions may be given for scouring 100 pounds of yarn:

- 2 lbs. mild potash or Marseilles soap.
- $2\frac{1}{2}$ -3 lbs. carbonate of potash K_2CO_3 .

This forms the first bath, and after it has been treated sufficiently long, it is passed into scouring bath No. 2, which consists of soft warm water, and just sufficient ammonia to smell plainly of it. After treatment in this second bath, the finer yarns are sufficiently cleansed.

Where a potash soap is used, it is always considered better to use carbonate of potash or pearl ash (K_2CO_3), instead of carbonate of soda, when such alkalies are required.

In scouring with the heavier carpet yarns, a good soda soap made

from olive or cotton seed oil or tallow gives very satisfactory results at about the rate of—

- 2 to $2\frac{1}{2}$ lbs. hard soap,
- 6 lbs. soda crystals, or
- 2 lbs. patent alkali, 98 per cent,
- 50 gallons water,

for 100 lbs. of yarn.

(To be continued).

COLORINGS AND FABRICS.

In men's wear for the spring of '99 gray will be the principal color, especially in those fabrics whose foundation is blue and whose lighter effects consist of dull gray. The most fashionable shade will be pigeon gray. This color may be produced with either a red or a gray hue. Other good shades are tea green and a mixture of green and shining silver. The latter makes a very desirable effect. Another taking mixture will be green with a light drab, also olive with a light silver. Of the louder effects an assortment of browns and greens will be shown, also dark browns with Paris green. Other mixtures to be given prominence will be red browns, bronzes and Nile greens, also olive drab with bronze. Of late it has become more and more evident that dark navy blue tones will not be renewed, as they have not taken well. Blues in lighter colors will not take as well as drab and pigeon grays. The whole tendency seems to be away from loud colors and toward more sedate and invisible effects; but in no instance is the silver gray here omitted—it appears in almost everything up to white.

The piece dyes and Clays will be in very small demand, the trend of fashion being toward mixtures with small effects and little squares. In the manufacture of goods there seems to be a desire to use coarser numbers of yarns than previously, as goods out of very fine yarns need more careful and exact treatment. Manufacturers have found out the advantages and it is likely that their use will be increased. The use of cheviots and cassimeres is more and more dying out. They will be made during the coming season only in the very cheapest goods. Worsted fabrics seem to be monopolizing the market, and in all probability will maintain their reign for several seasons to come.

In ladies' wear for the fall of 1898-99 combination and traverse effects will be largely developed and there is no doubt that they will play a very important part during the winter. This is also true of zigzag or snake effects, combined with small figures, circles for example. One thing to be looked out for in traverse effects is that they do not run stiffly or harshly alongside each other, but that carefully arranged designs are spread over the whole fabric. It is advisable that traverse figures should be a little darker than the foundation of the goods. The tendency of colors is toward dull, dead shades, this dark hue being observable in every variety of fabric. There is more plausibility for the prevalence of stripe and traverse effects, as the fashion will be on the order of tailor-made garments, and this stripe effect will be the very thing for such a costume.—*Translated from the German.*

THE LONDON FUR SALES.

- Results at the Hudson's Bay Company's sale:
- Beaver, $7\frac{1}{2}$ per cent. lower than January, 1897.
 - Muskrat, spring, 15 per cent. lower than January, 1897.
 - Muskrat, winter, same as January, 1897.
 - Rabbit, 5 per cent. higher than January, 1897.
 - Salted fur seal skins, N.W.C., same as at Messrs. C. M. Lampson & Co.'s sale on December 9th; 5,700 skins were withdrawn.
- Results at Messrs. C. M. Lampson & Co.'s sale:
- Beaver, same as January, 1897.
 - Muskrat, spring, 20 per cent. lower than January, 1897.
 - Muskrat, fall, 20 per cent. higher than January, 1897.
 - Muskrat, winter, same as January, 1897.
 - Black muskrat, 15 per cent. higher than January, 1897.
 - Raccoon, northern, same as March, 1897.
 - Raccoon, western, 10 per cent. higher than March, 1897.
 - Raccoon, southwestern, and all thirds and fourths, 25 per cent. higher than March, 1897.
 - Skunk, $12\frac{1}{2}$ per cent. higher than March, 1897.
 - Opossum, same as March, 1897.

Mink, last year's, same as March, 1897.
 Mink, fresh, 20 per cent. higher than March, 1897.
 Marten, 10 per cent. higher than March, 1897.
 Russian sable, Yakustsky, same as March, 1897.
 Russian sable, Nikolalewsky, same as March, 1897.
 Russian sable, Amoorisky, 10 per cent. lower than March, 1897.
 Red fox, 12½ per cent. higher than March, 1897.
 Gray fox, 15 per cent. higher than March, 1897.
 Kitt fox, same as March, 1897.
 White fox, 15 per cent. higher than March, 1897.
 Black bear, 25 per cent. higher than March, 1897.
 Brown bear, 5 per cent. lower than March, 1897.
 Grizzly bear, same as March, 1897.
 White bear, same as March, 1897.
 Russian grizzly bear, 10 per cent. lower than March, 1897.
 Lynx, same as March, 1897.
 Otter, 10 per cent. higher than March, 1897.
 Otter, Labrador, same as March, 1897.
 Wolf, 70 per cent. higher than March, 1897.
 Wolverine, 10 per cent. higher than March, 1897.
 Wild cat, 40 per cent. higher than March, 1897.
 Badger, 40 per cent. higher than March, 1897.
 Grebe, 20 per cent. lower than October, 1897.
 Real chinchilla, 10 per cent. lower than October, 1897.
 Bastard chinchilla, 30 per cent. higher than October, 1897.
 Tibet lamb, same as October, 1897.
 Australian opossum, 7½ per cent. higher than October, 1897.
 Wallaby, 15 per cent. higher than October, 1897.
 Wombat, 25 per cent. higher than October, 1897.

A PROCESS TO PRODUCE INDIGO FROM COAL TAR.

A few weeks ago the German chemical industry was able to record another great success in which science and industry take equal shares, writes Dr. R. in *Technische Rundschau*. The aniline and soda manufactory of Baden, at Ludwigshafen on the Rhine, has, after years of strenuous endeavors and hard labor, succeeded in discovering a process to produce indigo—the most beautiful and most important of all dyestuffs—from coal tar, in any quantity and at such a low price that it can enter into competition in the world's markets with the natural product. Two figures will suffice to indicate the importance of this invention. Into Germany alone close on to 2,000,000 kilos of indigo were imported in 1896, for which more than 20,000,000 marks were paid to other countries. These figures will explain why chemists have toiled for decades to invent an artificial production of this precious substance, not allowing themselves to become disheartened by the great difficulties or any of the many failures in their work. These statements will justify a closer description of the characteristics of this substance and the conditions under which it is afforded us in nature.

Contained in the sap of various plants is a body called "glycoside," which splits into two others under the action of various agents, such as diluted acids, or by fermentation, viz.: into a sugar and into indigo white, which in its turn passes into indigo blue, through absorption of oxygen from the air. While indigo white is rather readily soluble in alkaline fluids, the indigo proper is totally insoluble therein, as well as in most other liquids. On these facts its production, as well as its employment, are based. Of the plants which contain indigo, only woad is indigenous in our latitudes, whose dried leaves were of great importance in former centuries for blue dyeing. But when in the sixteenth century the importation of indigo from the Orient commenced, it was slowly crowded out, in spite of the resistance of the woad farmers, and even imperial edicts could not save the German woad plantations from decay.

The largest amount of indigo is furnished by East India, where the most important indigo plant, *Indigofera tinctoria*, is indigenous, but to-day it is also grown in certain parts of Africa and America. In East India the production of indigo and its use in dyeing has been known since the oldest times, and up to the present both have only been changed very little.

Indigofera tinctoria is a herbaceous plant which is annually grown from seed. Before flowering the plant is cut off and steeped, fresh or

dried, in water to which a certain amount of lime is added. After some time the liquid starts to ferment; the indigo white, after the splitting of the glycoside, passes into solution, and under the action of the air the insoluble indigo separates from the decanted liquid in the form of a fine blue powder and settles to the bottom. After discharging the supernatant liquid the moist mass is passed in molds, mostly die-shaped, and dried and is thus placed on the market. It is obvious that no pure product can be obtained in this manner, as the impurities of the original liquid yet into the precipitate. These impurities are not even always accidental, but are frequently added for adulteration. A further curtailment of the percentage of production of indigo in the mass is occasioned by the fact that other dyestuffs are contained in the plant, besides the indigo, which precipitate in a like manner. These will cause an alteration of the shade in dyeing, thus causing more difficulties for the dyer. As a matter of fact, a product is frequently found on the market which contains more impurities than dyestuff. Only an accurate chemical analysis can decide the value of a commercial variety, but since a reliable method was lacking up to a short time ago, and as an examination is even to-day very laborious and consequently expensive, dyers have become accustomed to judge in buying by the outward looks and certain marks, only to become frequently convinced afterward, to their great detriment, that such marks are very deceptive. In order to avoid this necessity, one has begun to refine the crude indigo by passing it back into solution as indigo white and precipitating it, after the impurities have settled from the decanted clear solution, by a supply of oxygen. By this process, it is possible to remove the larger part of the admixtures and to obtain a pretty uniform product; but by this refinement the price of the dyestuff is considerably raised, and therefore it has not gained much favor.

Like the production of indigo, the process of dyeing with it has remained unchanged in its many points for centuries. The indigo is ground to a dustlike powder in special mills, and passed into solution as indigo white, by reducing admixtures in a large vat of metal or cement. The solutions of the indigo white are called "vats." Besides the "green vitriol vats" there are still others, according to the reducing agent employed, for the conversion of indigo blue into indigo white. The most suitable is the "hydrosulphite vat," used only of late, which is founded on the action of sodium hydrosulphite, and dissolves the indigo promptly after a little stirring.

For cotton, green vitriol is used, which reduces the dyestuff in the cold, i.e., absorbs its oxygen; for wool, the reduction by fermentation, which is obtained by bran and syrup, etc., and by maintaining a uniform temperature of about 30° (C?), has been found more suitable. In both cases an addition of lime is necessary to keep the indigo white formed in solution. In this solution the loose material, yarn or fabric, is moved about until it is completely saturated with it. On being taken out it is, of course, little dyed, but it becomes blue as soon as exposed to the air. The saturation and exposure to air are repeated until the desired shade is obtained. When the vat is exhausted it is refreshed by new additions of dyestuff and lime, etc. It is discharged only when it has become so muddy that sufficiently clear shades can no longer be obtained with it. This, of course, entails a certain loss of indigo each time, and the dyer strives to defer the discharging as long as possible, which is more practicable the purer the added materials are. The above will explain why a uniform, warranted pure product must be the ardent desire of all dyers. But it has taken a long time till this end was reached.

Above all, it was necessary to throw light upon the intimate structure of this dyestuff. This problem was already solved by the Munich chemist, Professor Bayer, and in 1881 he succeeded in producing the first artificial indigo. A little later Haumann reached the same result, but in a different manner. From there, however, to a wholesale production in industry was still a wide step. It is true several German manufacturers, in union with the said scientist, were successful in inventing methods which admitted, at least in a limited degree, the use of an artificial indigo in industry. In 1881 the Aniline and Soda Manufactory, of Baden, placed upon the market a product, the so called propiolic acid, from which indigo was produced on the fiber in calico printing. A similar product is the indigo salt, of the firm of Kalle & Co., at Bieberich on the Rhine. But, outside the expensiveness, the prints produced with it showed such defects—one of the substances

employed had a very unpleasant odor, which could not be removed from the ready product—that a further dissemination was excluded. These drawbacks were finally overcome in 1895 by the Aniline and Soda Manufactory in their "Indophor," and also by the Hoechst dye works, but the improved product was confined to calico printing. An artificial indigo which could compete on the foreign markets with the natural product in all its uses still remained uninvited. As late as 1896 the factory admitted in one of its pamphlets that although considerable progress had been made, the end of the laborious path was not yet in sight. The "How?" is, of course, a secret, guarded by the concern, and it is only known that the new indigo is a tar product.

THE WOOLEN INDUSTRY.

A subscriber asks how many woollen mills there are in Canada and how much capital they represent

In 1891 there were 377 establishments conducting some kind of wool manufacture. Of these, 128 had less than \$2,000 per annum output. For the total number of 377, the figures are:

Capital, working	\$4,101,948
" Invested in tools and machinery	3,088,183
" " buildings	1,531,077
" " land.....	636,450
	\$9,357,658

Of these mills 42 had an output of over \$50,000 per annum; 23 an output of between \$25,000 and \$50,000; 56 an output of between \$2,000 and \$25,000; 128 an output of between \$2,000 and \$12,000 and 128 with an output of less than \$2,000. At the present time there are 382 woollen mills manufacturing for the general market, and about 463 which do a local custom trade; making a total of 845 established where some wool manufacture is carried on. Until the next census is taken, the amount of capital invested will remain a matter of inference. Our own observations lead us to believe that the capital invested has increased at a somewhat greater ratio than the number of mills, taking the last census as a basis

THE CHINA COTTON TRADE.

The following gives the amount of shipments of Canadian and American cottons (so far as they go over the Canadian Pacific) to China, the figures being for the calendar and not the fiscal year. These cottons run about 3¼ to 3½ yards to the pound:—

	Can Cottons, Lbs.	Am. Cottons, Lbs.	Totals Lbs
1887.....	1,742,205	4,055,970	5,798,175
1888.....	2,009,974	6,816,798	8,826,772
1889.....	886,322	12,245,150	13,131,472
1890.....	2,279,150	17,079,730	19,358,880
1891.....	2,466,944	7,413,167	9,880,111
1892.....	1,825,259	4,322,452	6,147,711
1893.....	1,742,312	9,321,205	11,063,517
1894.....	3,779,343	4,303,701	7,074,044
1895.....	3,521,004	5,208,654	8,730,158
1896.....	3,392,042	11,834,372	15,226,414
1897.....	*2,471,278	4,898,470	7,369,748

*The above figures do not include 31,777 lbs. of cotton duck shipped to China and 208,349 lbs. shipped to Japan from Canada

HOW MUCH?

We invite correspondence on the topics suggested by the queries contained in the following paragraphs:

1. How much wool should a two-set mill, 40-inch cards and 168 spindle jacks, use per day of ten hours?
2. For making and finishing all-wool cloth, 12 ozs. to the yard, 75 to 85 mix, what relation should wages bear to each pound of wool used?
3. How much 2¼ to 2½-run yarn should be spun on mule, 168 spindles, that is, how many pounds per day, what would be a fair price per pound piece-work?
4. With wool at 20c per pound (tub-washed country) what should be the cost of producing 2¼-run black yarn, doubled in the grease, put up in four knot skeins and in spindles of twenty skeins each?

TEXTILE IMPORTS FROM GREAT BRITAIN.

The textile imports from Great Britain for January, 1897 and 1898, are valued as follows, sterling:—

	Month of January.	
	1897.	1898.
Wool	£2,039	£8,617
Cotton piece-goods ..	59,346	66,852
Jute piece-goods	10,314	10,546
Linen piece-goods	16,940	19,971
Silk, lace.....	176	1,954
" articles partly of	1,462	1,926
Woolen fabrics	21,018	23,037
Worsted fabrics.....	79,805	82,165
Carpets	14,420	17,878
Apparel and slops	23,655	24,039
Haberdashery	13,781	13,518

THE LATE J. D. ALLEN.

The many friends of J. D. Allen, of Montreal, will regret to hear of his death, which took place, March 8, at Colorado Springs, Col. Mr. Allen was the son of Joseph Allen, manager of the British American Dyeing Company. Being in ill-health, the deceased was advised to go to the springs, and he started about three weeks before his death.

The deceased was born on June 4, 1866, and grew up a very clever young man. He studied analytic chemistry as applied to dyeing under Prof J T Donald, studying chemistry also at Bishop's College, after which he took a full course at Yorkshire College, Leeds, England, on the chemistry and technology of dyeing, winning the first prize at the college, and also first prize and medal at the City and Guilds of London Institute in 1887, the first such medal ever taken from the British Isles. A biographical sketch of Mr. Allen appeared in THE CANADIAN JOURNAL OF FABRICS in September, 1896. He was latterly manager of the chemical department of Jack & Robertson, St. Helen street, Montreal.

The funeral took place from his father's residence in Montreal, and was very largely attended. The chief mourners included Joseph Allen, father of the deceased; W. R. Allen, G. G. Allen, C. M. Allen, and D. A. Allen, brothers; H. O. Wilson, E. C. Landon, and S. R. Martin, brothers-in-law, Francis Martin, father-in-law, and P. Heaslip, uncle, police magistrate of Gananoque, Ont. The pall-bearers, who were six in number, consisted of three members from deceased's Masonic lodge and three from the Oddfellows, namely, W. T. Anderson, J. W. Brayley and C A Smart, Masons, and G W. Hardisty, James McNicoll and Elkin Smith, Oddfellows.

THE WOOL MARKET.

MONTREAL.—Several large parcels of Cape wools have been sold recently at fall prices, viz: 14¼ to 16¼c. Foreign markets are advancing so that stocks in hands of Canadian dealers cannot be replaced except at higher prices. Most of the mills are working overtime, but the grade of goods being produced is low—too much shoddy and cotton are being worked up. There is, however, a strong feeling that a better class of goods will be in demand in the near future. At the London sales, which opened 15th inst., there was an advance of 5 to 7½ per cent. on closing prices at last sale. We quote: Natal, 16¼ to 18¼c.; B.A. pulled, 25 to 34c.

TORONTO.—There is practically nothing doing on the Toronto market in fleece wools. Pulled and foreign wools are in fair demand and prices steady. We quote: Pure wool, from 20 to 22c.; supers, 19 to 21c.; extras, from 21 to 22c.; B.A., 28 to 32c.

—The April Century is to contain a number of articles on Pennsylvania coal mining, one of them by Jay Hambidge, the artist, who contributes "An Artist's Impressions of the Colliery Region." The illustrations include views in Lattimer, where the recent strikes occurred, and Mr. Hambidge has made a great number of interesting sketches of the many types of people that he found in the collieries. The Italians are called "Hikes," and the other foreigners—Slovaks, Polacks, etc.—are grouped under the name of "Hunks."

FABRIC ITEMS.

Rubber goods were advanced to per cent. on March 1st.

The Kennedy Company, capital \$100,000, headquarters Montreal, applies for incorporation to do business in hats, clothing and so forth, J. A. Richard, Winnipeg, and J. E. Kennedy are among the applicants.

James Hutcheson, a prominent dry goods merchant of Victoria, B. C., died recently at the General Hospital, Toronto, from pneumonia. He came east to purchase spring and summer goods, and was taken ill in Ottawa.

H. J. Caulfield, of H. J. Caulfield & Co., wholesale men's furnishings, Toronto, has taken into partnership Dugald Henderson and Robert E. Burns. The style of the new firm will be Caulfield, Henderson & Burns.

The suspension is announced of Taylor & Co., dry goods merchants, Kingston, Ont. Ida L. Taylor, wife of A. D. Taylor, has been the legal owner of the business of late years, owing to previous troubles of her husband.

The Robert Simpson Company, departmental store, Toronto, has changed hands, and is now owned by H. H. Fudger, J. W. Flavell, A. E. Ames, J. B. Campbell, and A. R. Parsons. H. H. Fudger is managing director of the new company.

The C.P.R. last month broke the world's record for a transcontinental freight run. On February 11 a large quantity of silk was landed at Vancouver by the steamship "Empress of China," and on the 18th it was landed in New York, the trip occupying seven days. There were four carloads, valued at \$200,000 each.

The pendulum of fashion in upholstery coverings gives every indication of again swinging toward mohair plushes, and, as in the past, the experience of the trade will doubtless be that after going to the extreme in the use of cheap fabrics the public will turn again to an article that has been thoroughly tried and not found wanting in good wearing qualities.

At a meeting of the creditors of J. H. Doherty, insolvent dry goods merchant, Ottawa, held in Montreal, a statement was presented showing a deficit of \$7,439.55 on total liabilities of \$29,485. The assets are as follows: \$11,468.62; surplus over advances made on \$8,000 worth of hypothecated goods by T. H. Pratt, Hamilton, \$3,700; furniture, \$334.50. Book debts, good, \$755.68; doubtful, \$744.35; bad, \$1,183.33. The stock was sold to Danford Roche & Co., Toronto, at 59 cents on the dollar.

J. H. Blumenthal & Sons, Montreal, who assigned some time ago with liabilities of \$143,000, recently made an offer of 35 cents cash and five cents in 12 months for the stock. Some of the creditors were of the opinion that it should be accepted. The inspectors thought different, however, and the sale will go on. The statement shows the total assets of the firm to be \$98,000, of which sum \$24,000 is goods in bond, transferred to M. Vineberg & Company. The stocks at the different stores inventoried as follows: St. Catherine street, east, \$32,000; Craig street, \$22,000; St. Catherine street, west, \$18,000. Book debts total up to \$1,198.

Charles Hutchison, the well-known commercial traveler, died March 15th at his home on Kent street, Ottawa. He had been suffering for some time with creeping paralysis. He was 54 years of age, and for 25 years was one of the best known commercial men on the road, having represented such houses as Mackay Brothers and Gault Brothers of Montreal. When a young man he was noted as an athlete, and was subsequently prominent as one of the celebrated "Hutchison Brothers" team of curlers. The deceased was a brother of Dr. Hutchison, Montreal, and leaves a widow, two sons and two daughters.

The Minister of Finance was waited upon at Ottawa a short time ago by a deputation representing the leading manufacturers of ready-made clothing in Canada regarding inequalities in the tariff that it is claimed place them at a disadvantage with competitors abroad. The members of the deputation were W. E. Sanford, Hamilton; R. Green, London; W. R. Johnston, T. O. Anderson, S. F. McKinnon, and J. Watson, Toronto; S. O. Shorey, E. A. Small, W. H. Douall, and H.

Horsfall, Montreal. The interview was private, but it is understood that the manufacturers urged that the old differential of five per cent. between the duty on raw material and finished goods should be restored. At present the tariff provides for the same rate of duty on raw material of the clothing manufacturer, that is to say, cloths, trimmings, etc., as on made-up clothing coming into the country. The manufacturers desire at least five per cent. in favor of raw material. Another point discussed at some length was the probable effect of the British preferential tariff to be put fully into force in July next upon the trade. The manufacturers draw considerable portions of their supplies, such as buttons, cloths, trimmings, etc., from Germany and other continental countries. After July the preferential clauses of the tariff will no longer apply to imports from these countries, and the full duty of thirty-five per cent. will be collected. While this duty must be paid on such raw materials as are imported from countries other than Great Britain, it is claimed that under the present construction of the law the same raw materials imported from Germany into Great Britain and manufactured there for export to Canada would be entitled to come into Canada under the preferential clause of twenty-six and a half per cent., and there would be serious difficulty in establishing that the goods are not entitled to the reduced rate.

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.

Smith Bros., Johnstown, N.Y., will start a glove factory in Dundas, Ont., to employ 15 hands.

C. A. Meincke, dealer in chemicals, Montreal, has removed his office to No. 97 St. James Street, Montreal.

The Toronto Carpet Manufacturing Co. has, it states, given up the idea of removing the plant from Toronto.

There is a movement in Granby, Que., to induce the Waterloo knitting mills to remove to the former town.

Negotiations are on foot for the opening up of the Garden Hill, Ont., woolen mill. There is every prospect of the mill's running full shortly.

The Penman Mfg. Co. is receiving large orders daily for Klondyke outfits from all points in British Columbia, to be filled from the mill at Merritton, Ont.

The Barnston Woolen Mill Company have decided at last to re-build the factory at Way's Mills, Que., which was destroyed by fire some little time ago.

Alexander Macpherson, secretary-treasurer of the Alpha Rubber Co., Montreal, has resigned to accept the position of Toronto manager of the Canadian Rubber Co.

On February 18 the employees of the Standard Shirt Co., Toronto, held their annual ball. Nearly two hundred couples were present, and dancing was kept up until the early morning hours.

Harry Atwell, of the W. E. Sanford Manufacturing Company, Hamilton, who is going to Klondyke, was given \$50 in gold by his fellow-employees, who wished him success in his new venture.

Mrs. Holden, of Parkdale, Toronto, has recovered \$3,000 from the Toronto Gutta Percha Company for the loss of her two sons, George and Percy, who died from injuries sustained by the explosion of naphtha in the company's works.

Fred Nolinski, an employee of the Berlin, Ont., Felt Boot Works, while returning home from work on the G.T.R. tracks was struck in the back by a shunting car and fatally injured. He fell between the rails, escaping the car wheels by an inch or two.

Cronkheit Bros., of the Wasa River Woolen Mills, Wisawasa, Ont., Telford Bros., Clarksburg, Ont., and J. Walshaw, Bolton, Ont., have ordered the renewal of portions of their plant this month. The Geo. Reid Co., Toronto, has the contract in each case.

B. Jackson, an employee of the Felt Boot Co., Berlin, Ont., was married to an Elmira lady in that village recently.

J. L. Goodhue & Co., belt manufacturers, Danville, Que., are completing a number of large belts for a new mill on the Pacific coast.

During a heavy wind storm recently the iron smoke stack of the Elmsdale Flannel Mill, Almonte, Ont., was blown down, and one of the buildings unroofed.

Casper Mayer, engineer at Reiner's woolen mills, Wellesley, Ont., was seriously hurt by coming in contact with machinery recently. He only received severe bruises but had a narrow escape.

A joint stock company with a capital of about \$6,000, has been formed at Wellesley, Ont., for the purpose of running the flax mills next summer. It is understood the mills have been rented for \$200 a year.

One hears of Klondyke orders wherever he goes. The Brown & Wigle Company, of Kingsville, Ont., shipped ten bales, of 100 lbs., of Klondyke blankets to Dawson City the other day, put up in paper and canvas waterproof lined.

The Standard Woolen Co., Toronto, has installed a fancy blanket napping machine, which was supplied by Ernest Gessner, Ave. Sanden, Germany, through the Toronto agent, the Geo. Reid Co., 118 Duke Street, Toronto.

Zoel Decoteau, who has been engaged with the Cornwall Manufacturing Co. for the past eleven years, has gone to Lowell, Mass., where he has secured a lucrative position. Mr. Decoteau was held in high esteem in Cornwall, and was one of the officers of the St. Columban's Court, Catholic Order of Foresters.

Thos. Waterhouse, of Palmerston, Ont., has entered the firm of Bradbury & Co., and the firm now controlling the Ingersoll, Ont., woolen mills, is Waterhouse & Bradbury. The mill has been thoroughly overhauled, and a number of new broad looms put in, which were supplied by the George Reid Co., Toronto.

Among the new companies gazetted is the Hamilton Tar Distilling Co., capital, \$10,000, and these directors: I. Butler, Lily Catherine Butler, W. Magee and J. Chisholm, Hamilton, and T. W. Butler, Toronto. The company will get its raw material from the Gas Company, and will manufacture the tar by-products.

Horn Bros., Lindsay, Ont., are having an addition built to their factory, 35 x 40 feet in size, and two stories high, which occupies the site of the former power house, which was torn down to make room for the new erection. The lower flat will contain the power machinery and the pickers, while the upper flat will give needed room for several new machines, the purchase of which is necessitated by the firm's rapidly growing trade.

A public meeting has been called in Campbellford, Ont., to consider the establishment of a carpet factory in that town. Dodds & MacPherson have offered to take over the John Routh Tollen Mill and convert it into a carpet factory if the municipality make them a loan of \$20,000 at two per cent per annum. The matter will be very shortly decided, and the chances seem to be in favor of the loan being made.

While working at a spooling machine in the twine mills in Doon, Ont., recently, Miss Susan Donneworth met with a painful accident. She was engaged putting yarn on the spooler when she stepped back for some purpose and in doing so the yarn caught on the revolving shaft of another machine. In an instant the yarn wound around the shaft and jerked the young woman upon the machine, breaking her arm in three places. Had it not been for prompt action on the part of Mr. Hardy, the foreman, he stopping the machine at once, her injury would have been more serious.

The Dominion Cotton Mills Company is contemplating an extension of its plant, and has requested the St. Henri, Que., council to consider an application for the purchase of 32,190 square feet of land, 20,000 of which it now holds under lease from them.

George H. C. Lang, of the Lang Tanning Company, Berlin, Ont., states that the company will shortly begin the erection of a tannery in Berlin, which will be the largest in Canada, and probably the most extensive on the continent. Three hundred hands will be employed.

The Galicians who have recently settled in Manitoba are nearly all expert spinners and weavers, and it is expected that a more or less extensive industry will spring up among them, as has been the case, for example, in the county of Lanark, Ont., where similar conditions prevailed among the early settlers.

Markham, Ont., is shortly to have a new industry. The old carpet factory, formerly belonging to A. Campbell, is being fitted up as a boot and shoe factory by Reeve Underhill, who has ordered the necessary machinery. The factory will employ about 50 hands, to be increased later on.

The Fraser Knitting Mill, Almonte, Ont., is now humming, as the new company, under the management of L. H. Lemoine, formerly of Pembroke, Ont., is getting out samples for their travelers. The hosiery plant has been brought from Pembroke, and this branch is likely to be added to the output of the mill.

George A. Woods, Louis Cleghorn, William Hocking and Alf. G. Peacy, of the Minerva Manufacturing Company, Toronto, were voted a bonus recently of \$30,000 to put up their new factory for the manufacture of ladies' and children's whitewear and blouses, to employ a hundred and fifty hands in Ste. Therese, Que.

For the purpose of encouraging the women in the district of Balmoral to learn spinning, the Queen has given Mr. Forbes, her commissioner, orders to buy up a number of small spinning wheels. Her Majesty says that she at one time was very fond of spinning, and spun a good deal. Now, however, through frequent attacks of rheumatism, she is unable to work the treadle. On account of so much oil being used in preparing wool for spinning, the Queen preferred to spin flax, as it is so much cleaner.—Ex.

The Hons. Fielding and Paterson gave a hearing recently to a deputation of cotton spinners who came to talk tariff questions. Lately Messrs. Tooke and Greene, representing the shirtmakers of the Dominion, waited on the Government and asked for certain reductions of duty on cottons imported for the shirt manufacturing trade. The cotton spinners laid their views before the Ministers in regard to this, and strongly opposed any change in the existing conditions.

W. H. Storey, the founder of the Canada Glove Works, Acton, Ont., died March 6th. Mr. Storey came to Acton about 40 years ago, and in 1868 established the Canada Glove Works, which, under his skillful management, have become one of the largest in the Dominion. When the village of Acton was incorporated in 1874, Mr. Storey was elected its first Reeve, and frequently afterwards filled the same position, holding that office at the time of his death. He was at one time president of the Manufacturers' Association, and was a director of the Manufacturers' Life Assurance Company and of the Wellington Mutual Fire Insurance Company, and occupied important positions in other commercial institutions.

The Publishers of the "Canadian Journal of Fabrics" will give one year's subscription FREE to the first three subscribers who forward to the Toronto office, 62 Church Street, perfect copies of the issue of January, 1897.

Wool Washers
Dryers and Carbonizers

KITSON - - -
MACHINE CO.
LOWELL, MASS.

At the mortgage sale of the Ferguslea, Ont., woolen mills, February 24th, the property was bought by George Ferguson.

The engine at the Perth, Ont., woolen mills broke recently, and the employees were laid off for a few days in consequence.

Metropolitan Dyeing and Cleaning Co. has registered its partnership in Montreal. The proprietors are Leah Hart, wife of Morris Ryan, and Alexander Yaphe.

A. D. Disher, who has been employed for three years by J. & G. Black, Thurso, Que., has accepted a situation as manager of the McLaren woolen mill at Wakefield, Que.

Work at the chenille works of the New Hamburg, Ont., Curtain and Rug Co., under the new management, is steadily increasing: the works are being run overtime right along.

Alex. White, employed in Wm. Thoburn's mill, Almonte, Ont., got his hand caught in a gear recently and had it crushed in such a way that it became necessary to remove a portion of the bone.

D. O. Allport, who has been superintendent of the Gilmour mill, Joliette, Que., for the past three years, has leased the woolen mill at Burritts Rapids, Ont., for a term of five years and is now running it.

We have received a neat little calendar from the McLaren Belting Co., of Montreal and Toronto, accompanied by a handy price list of belting, card clothing, studs, pulleys, and the various other articles they deal in.

Mrs. C. R. Smith, who for the past two months has been connected with the Kingston knitting mill, has returned to Almonte, and resumed her old position as superintendent of the finishing department in the Fraser mill.

Parties manufacturing felt goods for the Klondyke trade, or desiring to take up this branch, will find it to their interests to communicate with the Lancaster Machine Works, Lancaster, Ont., who have a felt plant for sale.

The waters of the Speed river were very high about the middle of March. The river has swollen to many times its size, and several departments in the Brodie Woolen Mills, Hespeler, Speedsville Woolen Mills and Ferguson & Pettinson Woolen Mills, at Preston, Ont., were closed on account of the flood.

The Globe Woolen Mills, in future to be known as the Excelsior Woolen Mills, have been purchased by A. F. Gault, Montreal, the plant and product remain the same as before, and A. S. Robertson is the treasurer as before. C. F. Crowther, the new superintendent, brings to the Montreal mill a wealth of experience gained in Bradford, England. He came out last year, and after some months in the United States, arrived in Montreal, where we hope he will both confer and derive substantial benefit.

A proposition has been made for the formation of a joint stock company, to take over the Livingston flax mills, in Listowel, Ont. Jas. Livingston of Baden, is promoting the matter. The value placed upon the farm, and mills by the Livingstons is \$9,000, and they will take in payment therefor \$3,750 in cash and \$5,250 in stock in the proposed company. It is estimated that the company can be floated with a capital of \$12,000, with paid-up stock, from the neighborhood, of about \$8,000 or \$9,000.

It is reported that a linen factory, with a capital of ten thousand dollars is about to be started at Bay St. Paul, below Quebec.

W. Strachan, W. C. Strachan, T. Cushing, J. S. Stanley, F. G. Bush, Montreal, are applying for a Dominion charter as the William Strachan Company, Ltd., to carry on the soap business of W. Strachan & Co., Montreal; capital, \$200,000.

One hundred and five hands are now employed at the Tay Knitting Mills, Perth, Ont. The buildings will shortly be extended, as T. A. Code, the proprietor, will erect a new wool house in the spring. The present one will be utilized for other purposes.

Miss Jennie Lamb, for thirteen years past head of the finishing department in the Almonte Knitting Co.'s mill, has severed her connection with that institution and left for a new scene of labor. She was given a token of esteem by the operatives prior to her departure. Her successor is Guli Lodge.

At the annual meeting of the Canada Paper Company the following gentlemen were elected directors for the present year: Andrew Allan, vice-president; John MacFarlane, president; Hugh McLennan, H. Montagu Allan, Hugh A. Allan, W. D. Gillean (assistant managing director), and Chas. R. Hosmer.

An effort is being made to raise \$35,000 to establish a carpet factory in Galt, Ont., by removing the Elora, Ont., factory to that town. The promoters are Messrs. Talbot, of Elora, and Dussar, of Sherbrook, Que. Messrs. Shurly and Dietrich will subscribe \$5,000 of the amount of stock required.

We regret to learn that A. M. Morrison, superintendent in the Hawthorne Woolen Mills, is about to sever his connection with the company and go west again. Mr. Morrison, during his sojourn in Carleton Place, has become one of us, and is one of those sterling citizens with whom we are loath to part. In the mill Mr. Morrison is also highly esteemed, and his departure is much felt. Mr. Morrison will be succeeded by Mr. Grierson, of Waterloo.—*Carleton Place, Ont., Herald.*

The Norfolk Knitting Mills are putting in about half a dozen new knitting machines to meet the demands of their increasing business. The mills are getting some of the new business of the Klondyke region, a very fair order having been received from the Alaska Development Company of San Francisco, Cal., which decided to spend \$500,000 in Canada in supplies, provided no additional duty was charged on the goods on account of their not being able to ship them from Vancouver, as intended.—*Simcoe Reformer.*

One of the important reforms that the retail trade has long demanded of the manufacturers is a decrease in the number of yards contained in dress goods pieces. In the wide widths it has been usual to put 60 yards of goods in a piece, which is far too much of a single pattern for the average retailer to handle. The department store and the large dry goods houses of the cities and towns have had an unfair advantage over the merchants of the villages and small towns in this matter. It is pleasing to note that the autumn goods will show some improvement, a reduction of about ten yards having been made by manufacturers in the wide widths, where the evil was most burdensome to retailers.—*Monetary Times.*

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W. F. Lowe, overseer in the carding department of the Rosamon Woolen Company's mills, Almonte, Ont., slipped recently and sprained his ankle, so that he was confined to his house for some days.

There were some rather extensive drops in the prices of Canadian cottons announced on March 1. The Dominion Cotton Company dropped the price of canton flannels to meet the competition in these goods recently inaugurated by the Canadian Colored Cotton Company. In the lower numbers the drop is as much as ten per cent. The prices of the medium numbers are from 5 to 7½ per cent. lower. In No. 10 and higher numbers, there is no change in price. A large cut was also announced by the Dominion Cotton Company in pillow cottons, amounting to 12½ per cent in some cases. In the higher lines the drop is 10 per cent. all round. This is understood to be due to the competing prices of the Merchants' Cotton Company in these goods. In sheetings, also, some cuts in prices have been made. The Dominion Cotton Company have lowered the price of some of the lower lines of bleached sheetings ½c. to ¾c. per yard. In unbleached sheeting, some of the lines are down from 12½ to 15 per cent. in price. These reductions are likewise due to the price list of the Merchants' Cotton Company.

NECESSITY FOR A CHANGE.

Experience and necessity forces changes in methods that would not occur but for the failure to secure a profit, where no difficulty otherwise existed. In England, where the system of manufacturing is carried on, on an extensive plan, they are discovering that manufacturing, by their own make and devices of knitting machinery, is not the most profitable; as more labor is required to operate such, and the production is not as easily obtained as on American machines.

Manufacturers of the present day need no reminder that the days of cheap labor and little competition no longer exist, says a writer in the *Textile World*. There is a struggle to outdo one another in a reduction in cost and excellence of manufacture. There is a necessity for a change: many of the mills that went under in the fall of 1896 and the spring of 1897, could not compete with the modern style of machinery. For a proof of this, look at the prices many plants brought when sold at auction. Many did not bring over 20 to 25 per cent. of their original cost, and some brought less. It is marvelous to note how many of the textile fabrics of all styles and qualities, and for every conceivable purpose, that are now placed on the markets of the industrial world are found to be the production of the knitting machine. Of late, a new machine has been invented, known as a warp weaving and knitting loom, producing a stitch similar to the flat frame, but with greater facility for designs, upon which excellent styles of both plain and fancy goods are being made. There are circular frames having additional mechanism attached for the production of pile fabrics, which are often called plushes; while the double rib warp knitting loom has a capacity for a wide range of thick fabrics of like description. The former, if made on a fine gauge frame, from 24 up, with a very heavy pile, and cut fine, resembles velvet made on a weaving loom.

To such an advanced stage has the production of knitting machinery arrived, that, as already stated, it would be difficult to find a fabric that could not be very closely imitated. It is important for all those interested to watch with a careful eye, the successive improvements as they keep coming along, and make the most of those best suited to their different wants, and not linger in the old ruts of 10, 12 or 20 years ago. It will not do to try to manufacture with machinery that is not modern; for never before did knitted underwear, etc., appear in such bewildering variety. The invention and more general utilization of automatic machinery is leading to greater diversity in style, quality and character of knitted goods; and, in this sense, they tend not only to prevent over-production in general lines, but also to create new or original applications of the knitted fabrics. However, with all this, there is a manifest tendency, on the part of domestic manufacturers, to produce better grades

and styles; and the constant improvements being made in knitting machines are not only an evidence of progress in this direction, but the goods made on them speak in their favor. Manufacturers of knit goods, in order to save themselves from ruin, in contending with the forces that surround them, must see to it, and get up and out of the old ways so many of them are in.

—Geo. Bertram, M.P., Toronto, has introduced into the Dominion House, a bill to amend the Trade Mark and Design Act, which enacts that "all marks, names, brands, labels, packages or other business devices which are adopted for use by any association or union of workmen in its trade, business, occupation or calling, for the purpose of distinguishing any manufacture, product or article of any description, manufactured, produced, compounded or packed by or through the labor of any of the members of such association or union of workmen, and applied in any manner either to such manufacture, product or article, or to any package, parcel, case, box or other vessel or receptacle of any description containing it, shall for the purposes of this Act, be considered and known as trade marks, and may be registered for the exclusive use of the association or union of workmen registering it in the manner herein provided, and of the members of such association or union; and thereafter such association or union of workmen and its members shall have the exclusive right to use such trade mark to designate articles manufactured by or through the labor of the members of such association or union of workmen, which, for the purposes of this Act, shall be considered the proprietor of such trade mark."

CHEMICALS AND DYESTUFFS.

The following are current quotations in Montreal in the chemical and dyestuffs market:—

Bleaching powder	\$ 2 00	to \$ 2 10
Bicarb. soda	2 15	" 2 20
Sal soda	0 70	" 0 75
Carbolic acid, 1 lb. bottles	0 35	" 0 37
Caustic soda, 60°	1 75	" 1 80
Caustic soda, 70°	2 25	" 2 35
Chlorate of potash	0 12	" 0 15
Alum	1 35	" 1 50
Copperas	0 70	" 0 75
Sulphur flour	1 75	" 2 00
Sulphur roll	1 75	" 2 00
Sulphate of copper	5 00	" 6 00
White sugar of lead	0 07	" 0 08
Bich. potash	0 09	" 0 10
Sumac, Sicily, per ton	50 00	" 55 00
Soda ash, 48° to 58°	1 25	" 1 50
Chip logwood	1 90	" 2 00
Castor oil	0 09½	" 0 10
Cocoon oil	0 06½	" 0 07

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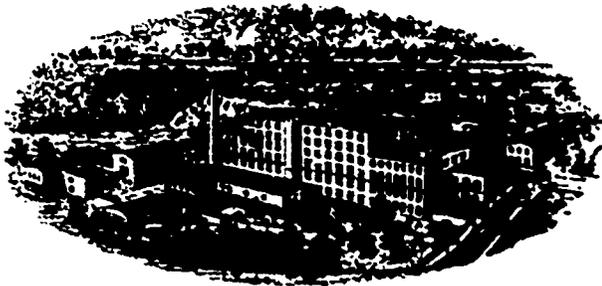
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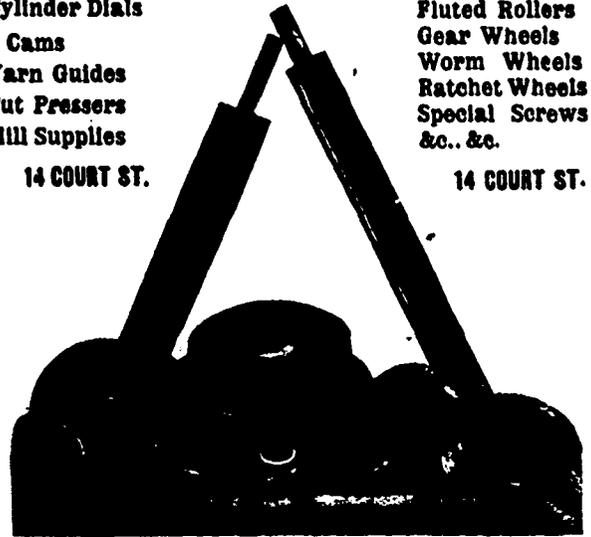
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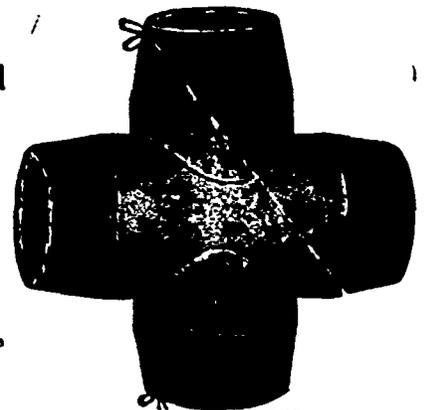


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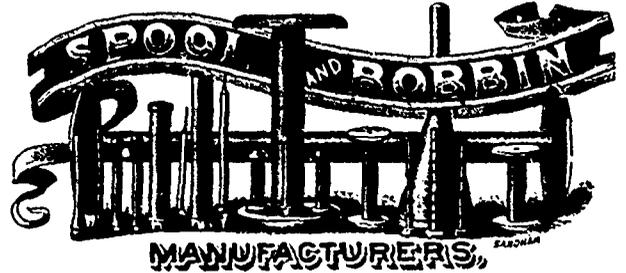
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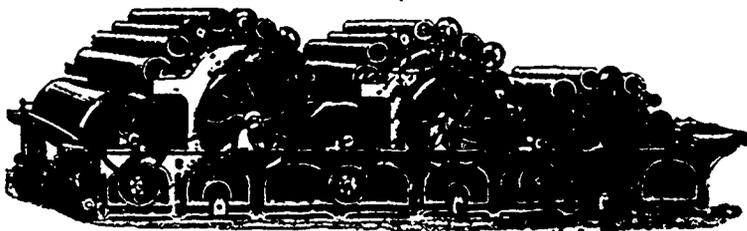
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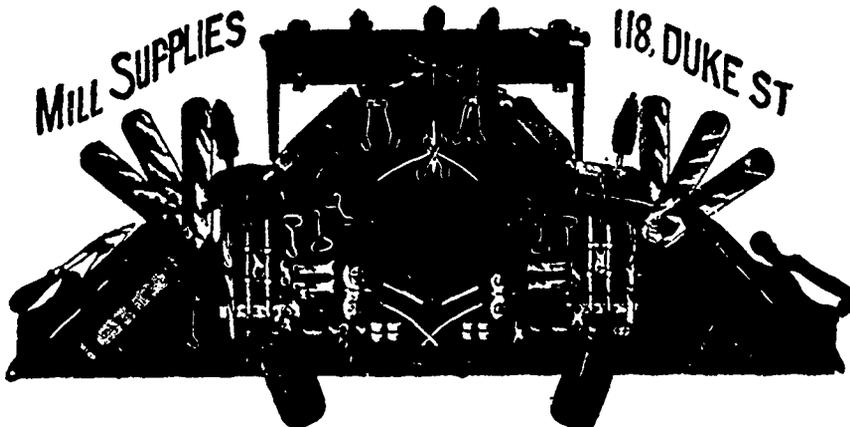
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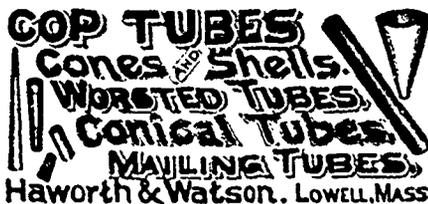
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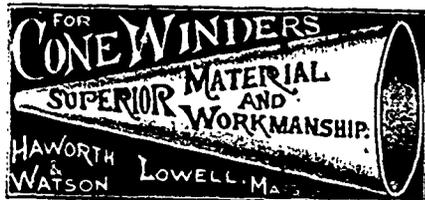
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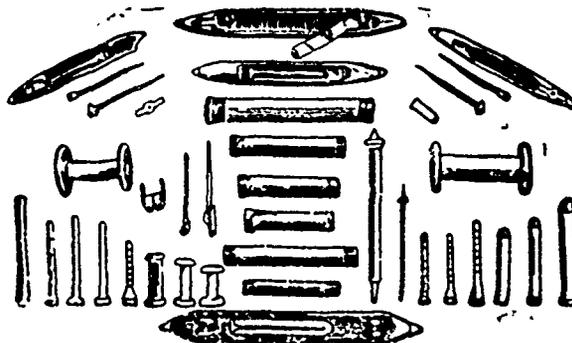


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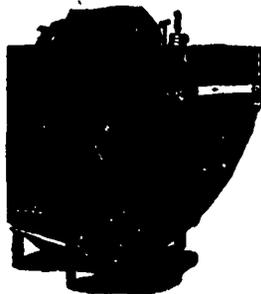
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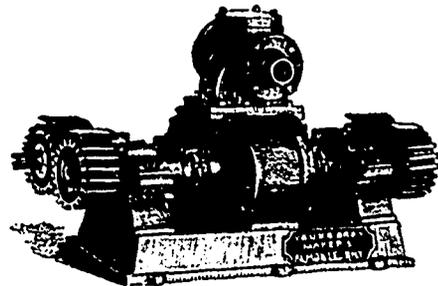
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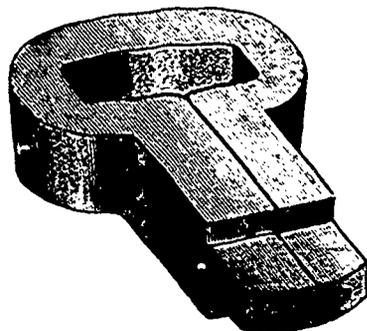
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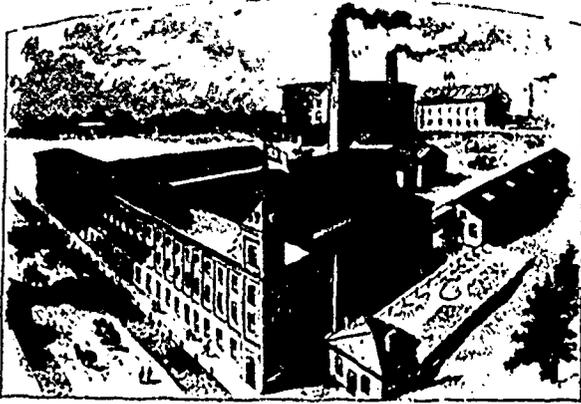


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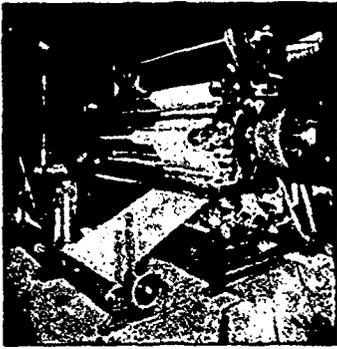
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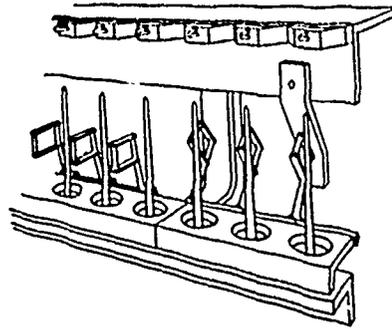
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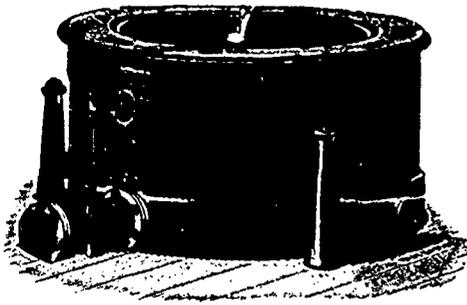
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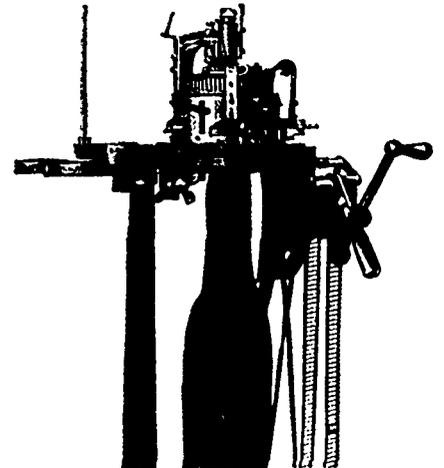
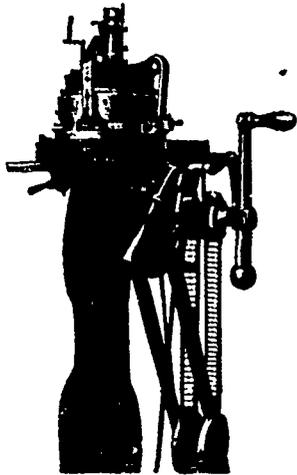
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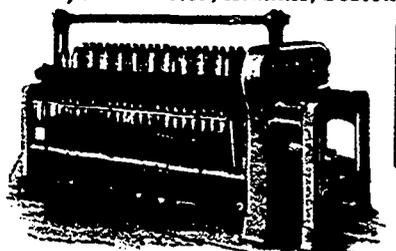
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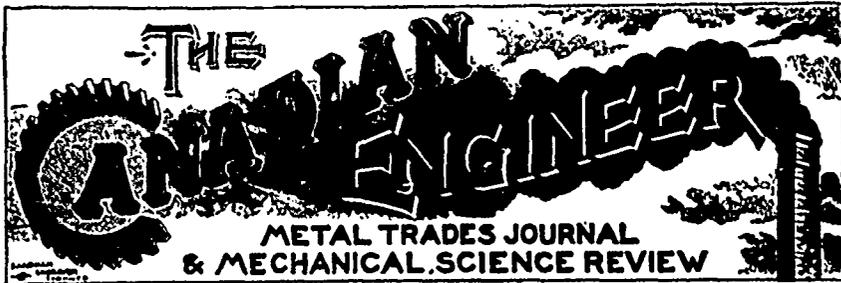
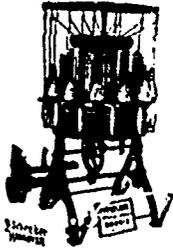
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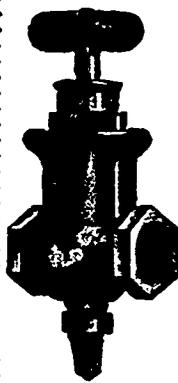
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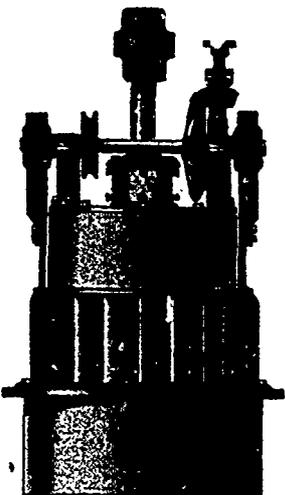
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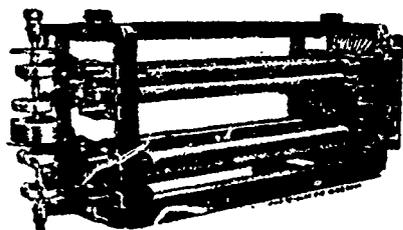
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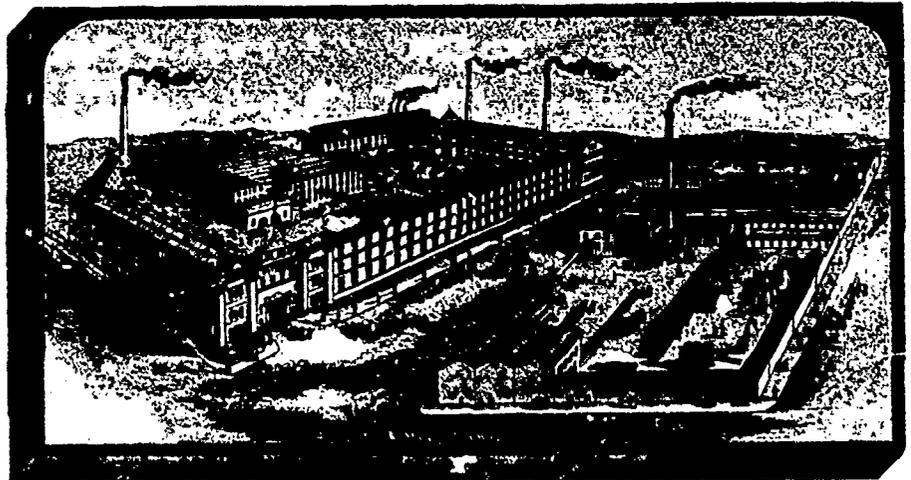
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