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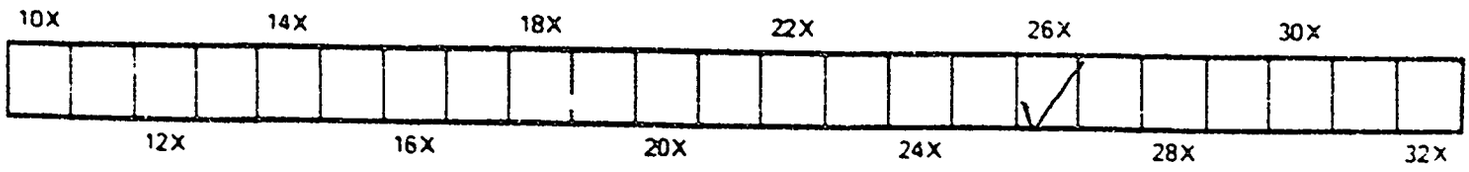

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THE JOURNAL OF THE Textile Trades of Canada.

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Editorial.

CANADA'S FIRST LINEN FACTORY.

Some years ago we gave an account of the first attempt at manufacturing linen cloth on power looms in Canada. This was during the American Civil War, when owing to the cotton famine, the price of linen fabrics went up to such a pitch that the industry seemed to offer a splendid field in Canada. Had the war continued long enough to enable the industry to obtain a good footing in this country, it is possible that linen manufacturing might have been one of the staple industries of Canada to-day, as our climate produces an excellent staple of flax, but the war closed just as the factory got fairly started and prices of both linen and cotton went so low that not only was the business in Canada ruined, but great injury was inflicted on the industry in Ireland itself, where linen manufacturing had been acclimatized for generations. Those who read our former sketch of this industry will remember that one of the promoters was George Stephen of Montreal, (now Lord Mount-Stephen) and that the factory building is still in existence as part of the woolen mills of Ferguson & Pattinson, Preston, Ont. Lord Mount-Stephen and his old secretary, John Turnbull of Montreal, have been kind enough to procure through Adam Warnock, of Galt, and John Homuth of Preston, some further particulars regarding this interesting venture. Mr. Turnbull is under the impression that the linseed oil machine referred to in the correspondence was sold to parties in Montreal, and after being worked in that city for several years, found its way to one of James Livingston's mills in Ontario. Mr. Homuth was employed by Hunt & Elliott, as woolen manufacturer till they were burnt out and then by Elliott, Hunt & Stephen as flax manufacturer. The following are the letters referred to:

It has taken me a long time to answer your letter of the 4th, re Flax Industry. I put the inquiry into the hands of an old Preston employee of the late Andrew Elliott & Co., and you will see what he has written, and which no doubt is correct. I have added a little information which may be of interest "When I was a very young lad in the early 30's (65 years ago), I remember seeing these old Dutch men and women clad in their home spuns, dyed with butternut and hickory bark, a good lasting color. Their clothes were made by themselves and from an artistic point of view would hardly pass muster with our people to-day." Yours very truly,

A. WARNOCK.
Preston, March 21st, 1898.

The formation of the company for the manufacture of linen goods in Preston, Ont., took place in the year 1864. The principal promoters were Messrs. Andrew Elliott, James Hunt and Calvin Claflin, of Preston, and George Stephen, of Montreal They began operations in the fall of the same year after the mill was rebuilt, after the woolen mill had been destroyed by fire on January 18th 1864 The mill was in operation three and a half years. The machinery was purchased in the United States and England. After the mill closed the machinery was sold, when it was in first class running order at less than half its cost price" Most of the linen machinery was sold to parties from the United States The linseed oil machinery was

taken to Montreal and sold to James Livingston, of Baden, Ont. The capacity of the oil mill was about ten barrels per day. About 26 looms were in operation and six spinning frames. Two wet spinning frames were bought at $550 each, which were of no use and were sold as old iron. Water power was used to run the mill. The raw material was obtained in the surrounding country, Plattsville, Berlin, Preston, and Waterloo townships and other places. The fabrics produced were seamless bags, toweling and canvas for large sacks, ropes, twine, etc. The cause leading to the decline of the industry was: After the American war when everything in the Southern States was in order again, and cotton plantations were again attended to, the price of cotton caused the flax business to decline. The reason of the flax business starting here was. The promoters thought that through the war cotton would be too expensive and that linen would take its place, which it did as long as the war lasted. The oil department paid well, but the linen department did not pay, in fact, was a big loss. The flax factory in Doon, Ont., was in operation before the one in Preston; it was carried on by M. B. Perine.

Mr. Warnock adds: Mr. Perine scutched the flax and shipped it to the United States, and later on John Hemuth made twines, which they continue to make, employing some 120 hands. Livingston Bros., of Baden, have made a great success of the flax business, also the linseed oil business. Flax is grown by them in Ontario, Manitoba and the United States. They employ hundreds of people in Canada, and in one factory in New England they are said to employ 600 hands. The growth of flax was first introduced into Canada, I believe, by the early settlers from Pennsylvania, who came to Waterloo township along in 1794, and the early part of this century. They made the flax into clothing, doing the scutching, spinning, dyeing and weaving in their own homes. The material was woven into small checks, using butternut bark and indigo mostly for colors. The garment was durable, all right for summer, but unsuitable for winter, but in those days (60 to 80 years ago) we had no Canadian tweeds.

DEPRECIATION.

One of the vexed questions which arise in the conduct of all industrial businesses is that of the amount which should be annually set aside for depreciation. We are not going into the controversy as to the relative merits of deducting a sum for this purpose from the original value of the thing depreciated or from its annual depreciated value. A good deal can be said on this, but it really forms part of the greater question as to what is ample depreciation, says The Textile Recorder. As a matter of fact, no general rule can be laid down, and instances are known of widely diverse practices being perfectly sound under their relative conditions. For instance one man wisely keeps his plant in a perfect state, and expends annually a large sum out of revenue in maintaining the whole of his plant in a condition which is practically that of new machinery. Another, on the contrary, takes only ordinary precautions, and if he does make any considerable repairs, adds the cost to the depreciated value of the plant. It is obvious that the sum which forms an adequate allowance in the one case is very inadequate in the other. The factor which really determines the amount is the life of the machine.

The generation which is now living has seen in almost every direction an enormous extension of the work of invention and construction. Even in industries in which invention has been slight, the work of the constructor has been far-reaching, and although machines may be in their essence alike, their details will be found to be far different if constructed at reasonable intervals apart. We need hardly remind our readers of this, for it has become so familiar as to be trite. Yet, we are afraid that, axiomatic as it is, the statement wants pressing home. Depreciation is affected, not only by the life of the machine as controlled by the wear of the parts, but also by its life as determined by its relative value at some future date. In other words, a machine may be rendered obsolete by the advance in constructional art during a given period as well as by its deterioration by work. It is thus necessary to keep in view both factors, and if this be done it will be seen that the controversy which we indicated in our opening sentences is very simply resolved. If the life of a machine, owing to the advance in construction, is shortened, then any addition to its value by reason of extensive repairs or any diminution in the sum set aside for depreciation annually, involves an increase of that sum in accordance with the conditions. The plant which, without placing to capital the sum expended in repairs, however great, is steadily written off, can be annually charged with a much lower sum than one which is treated in a different fashion. In either case such a sum is needed as will enable the value to be brought down to breaking up price in such a term of years as renders the machine obsolete. It is obvious that given an equal value to begin with, the annual sum chargeable can be much less in one case than in the other. This, it seems to us, is under modern conditions, the determining factor, and it is one of which it is worth while remembering the existence.

There is yet another feature arising out of present day company practice which ought to be steadily kept in mind. When old and successful industrial enterprises are brought within the scope of the Limited Liability Acts as now interpreted, it is the custom to charge to capital a large sum for which there are no assets. In some cases this extra sum is many times the value of the plant, and there is some hesitation as to what the right course is to take under such circumstances. There is no doubt that in many instances the true policy is to set aside out of profits (if made) a substantial sum as a reserve which can eventually be used to reduce the additional charge. As shareholders sometimes grow restive under this course, it may be prudent to resort to the charge for depreciation to attain the same end, and by doing this less notice is taken while there is a gradual accumulation of assets. It must not be forgotten that although the things represented by large sums cannot be said to be tangible, nor can they be brought to the hammer, they may represent the one factor by which profits are made. Thus, a monopoly of manufacture may be acquired in a single article which possesses a larger value—greater probably than that of the

plant needed to produce it, and from which the profits of the enterprise arise. It is clear that you cannot depreciate a thing which is non-existent tangibly, while it yet has a clear and enormous value. The right course is obviously to set aside a sum for reserve, but, on the other hand, it furnishes a valid and cogent reason for increasing the sum set aside for depreciation. The tangible assets are thus enhanced in value, because they are brought down to a figure which permits them always to be realizable, while at the same time they have been paid for out of the revenue during the prosperous days of the concern.

OLD STYLE CARDING v. NEW STYLE CARDING.*

In considering the difference between the old style and new style of carding, I shall not mention the difference in the cost or the number of hands required in either system, as this varies greatly in different mills, but shall confine myself strictly to the difference in the carding as I have found it by personal experience. The improvements made in the picker machinery, by attaching the feeder to the open picker, mixes the cotton better than was ever done when feeding by hand, providing we give the same attention to mixing the cotton when the bales are opened and the cotton pulled, and that we use the cotton the same way as we did when feeding by hand, that is, from the top to the bottom of the pile.

Under the old system the laps of the finisher picker were weighed two or three times a day, that is, we unrolled a lap and measured off one square yard of it, and weighed it, and that was considered the weight of the lap. There was nothing very particular about it, as the doublings of the railway head and the evener of the head were supposed to even up whatever variation there might be. But under the new system one of the most particular places in the carding department is the picker room, and the man in charge here must be trustworthy, for here, and only here, can you do anything towards getting even work, for as the laps go from the picker room to the cards, so the roving and yarn will be, for there is nothing to even the work except what little the doublings may do. So if there is a great variation in the weight of the laps from the finisher picker, there will also be a great variation in the roving and yarn, and it will be found hard work to keep the numbers right. Consequently the picker room becomes, under the new style carding, one of the most important places of the mill, and, therefore, the overseer of the carding room should see to it that special attention is given to this department.

When I was overseeing I had my "boss" of the picker room weigh every lap as they were taken off the finisher pickers, and any that weighed over one-half of a pound heavier than the standard weight that I had for my laps, I had him put back and run over again, and any laps that weighed one-half of a pound lighter than the standard weight were served the same way. This is not as much work, and does not take as much time as a person would imagine, for I had all my finisher pickers so they knocked off at the same time, and the boss of the picker room would push his scales to the first picker, and as the picker tender sprung out the lap he placed it on the scales and started the picker, while the "boss" weighed the lap, and either put it into the pile ready for the cards or left it standing (for the tender to run over again), and was ready for the next lap by the time it was sprung out; and so on, until all were weighed and put where they belonged, it requiring only a few minutes to do the weighing.

To make sure that he did this, and that he might not get careless, I would often go into the picker room and call my "boss" of the picker room up, and have him weigh such laps as I would pick out of the pile of laps that were ready for the card room, and in this way I was always sure of the weight of my finisher laps, and that no lap was put on a card over or under a certain weight. I also had the "boss" weigh the breaker and intermediate laps about twice a day, and regulate them as near a certain weight as possible, doing which made the eveners on my finisher pickers have less work to do than they would have had to do had I paid no attention to the weight of my laps on the breaker and intermediate pickers. This, I believe, is the only way (unless you have railway heads), in which you can secure anywhere near even roving and yarn by the new style carding, and therefore should have the constant attention of the overseer of the carding room.

The next difference between the old and the new systems is the cards. Under the old system of the wooden top flat card, there was not the amount of carding surface that there is on the revolving flat card. Again, the cylinder on the old style card tore the lap as it passed between the feed rolls, with an upward pull, which had a tendency to pull back or straighten the wire on the cylinder, making the cylinder do work that it was never intended to do, besides carrying all the leaf and dirt that may happen to be in the lap up by the tops, and what was not deposited on the doffer with the cotton was dropped between the cylinder and doffer, for if you look at the fly that is taken from under the old style card, you will notice that all the dirt is from under the doffer, while on the revolving flat card, the saw tooth licker in strikes the cotton as it passes by the feed plate with a downward blow, knocking the leaf and dirt out of the cotton and depositing it on the floor under the licker-in, and carrying the cotton to the cylinder, thus saving the cylinder the extra work of pulling the cotton to pieces and not pulling back the wire on the cylinder, as on the old style, and yet cleaning the cotton of leaf and dirt better than under the old style, and doing it before the cylinder received it. Every overseer of a card room knows that under the old sys-

*A paper read by John R. Mason, Fall River, Mass., before the New England Cotton Manufacturers Association.

tem, when the self-stripper on the card raised the top to strip it, a lot of fly would gather in the open space caused by the top being raised, which (when the top was again dropped into its place), was blown on to the cylinder, causing a thick streak across the sliver, besides letting dirt from the stripper get on to the cylinder. A great many overseers have tried to prevent this in one way and another. Someone suggested having a stripper made which would traverse very slowly from one top to another, but which would raise the top strip and lower it again with increased speed, so as not to have it raised from the cylinder long enough for much fly to gather in the open space.

Now, on the revolving flat card, the nats are constantly moving forward, carrying whatever dirt may have collected in them to the comb, where they are stripped without a flat being raised from the cylinder, and consequently there are no streaks in the sliver, and no dirt getting on to the cylinder on account of the flats being raised from the cylinder. Then as the settings on the old top cards were anywhere from 1-32 of an inch to 1-16 of an inch from the cylinder, it depended altogether on the condition that the clothing was in. If that was in good condition, the settings were closer than they were if the clothing was a little soft; and again, as the cylinders were not perfectly true, the settings could not be close, while on the revolving flat cards the cylinders being very nearly true, we set a great deal closer than on the top cards, our settings being 5-1,000 of an inch to 9-1,000 of an inch, in consequence of which we get a great deal better quality of work from the new system than we ever did from the old system.

The question has often been asked, why is it that some men who have been very successful running the old style carding fail when they try the new style carding? I think from what I have observed that the reason is that they do not realize the difference between the two systems, and therefore are unable to overcome the difficulties. For instance, I have a case in mind of an overseer over the old style carding, whom the superintendent thought was the best or one of the best carders in the world, he did so well. After a while that superintendent went to another mill and took his overseer with him to start up a room with new revolving flat cards. In less than ten months these cards were making such bad work that there was talk of throwing out the cards and putting in a new make, as the cards were poor. Just at this time, and before anything was decided on, that overseer left to take charge of a larger room, and a man was hired to take his place, who, realizing what was needed, went to work on those cards, and the consequence was that in less than a year those cards were doing as good work as any in that city, and that corporation has since bought over 70 cards of the same make, showing that the fault was not because the card was poor, but that the overseer did not realize the difference between the old and the new style carding. For while a good overseer may get good work from a poor card, yet a poor overseer may get poor work from a good card.

There are at least three things that should be required of an overseer of the new style carding. First, he must understand the cards in his room. This he can soon do by being among the cards a part of the time. Second, he must know when certain things should be seen to, and, third, he should know that those things are attended to at the time they ought to be. For the new style carding requires the constant attention of the overseer to the grinding, setting, stripping and cleaning of the cards. The overseer who gives these things his personal attention, and has a regular system for his work, so that one thing follows another and the grinder and strippers know just what to do at certain times in the day, and therefore has everything kept in order, will not be the overseer who will make a failure of the new system, but will be successful.

Another thing we have on the new system that we did not have on the old is the combination draft on the fine roving frames. By this draft we can change 1-10 of a tooth or 5-100 of an inch of draft and should therefore (with the attention given to weight of laps), be able to keep our numbers quite even. Another difference between the old and new style carding is the general appearance of the cloth. Under the new system the cloth, by reason of the better carding (caused by closer settings on the cards and more dirt being taken out of the cotton, presents a cleaner and smoother appearance than it did under the old style of carding.

SOME OF THE ECONOMIC AND PRACTICAL ASPECTS OF ELECTRICAL POWER DISTRIBUTION IN FACTORIES.*

By Henry A. Mavor, London, Eng.

During the two past years there has been in this country a decided awakening of interest in the possibilities of electric distribution of power in factories. Long-distance transmission is less interesting to us because of our local conditions. Proposals have been from time to time made to turn to account such sources of power as exist, for example, at the Falls of Clyde, or even to use the tides for the production of electric energy for transmission to distant points. The fact that fuel is cheap and the cost of transport small will probably militate against the realization in the near future of such dreams. For such power using centres as we propose to discuss in the present paper, it may be taken for granted that, under existing conditions, the power can be produced at or near the point at which it is to be used so cheaply as to preclude any consideration of means for transmitting it from a distance.

A very interesting scheme is on foot in the Midland Counties of England to generate electricity at the pit head, and to transmit it to power using centres in the form of high tension alternating currents. It is antici-

*A paper read before the Institute of Engineers and Shipbuilders in Scotland

pated that many users of power, who are at present working under uneconomical conditions, will find it advantageous to avail themselves of this supply, which is expected to be available at a price something like one penny per horse power per hour. It seems probable that the operation of such a scheme would only be commercially practicable in districts where the local authority does not control electric supply, because when the local authority has to be dealt with the price obtainable from that authority would not probably exceed the rate at which they could themselves produce the power, without any allowance for profit. As the local authority could, and doubtless would, avail itself of the most efficient means of power production, the only item to set off as a possible profit to the supply company would be the railway carriage in the coal. Unless under very exceptional circumstances, it is hardly conceivable that this margin would be sufficient to cover the very heavy capital cost of the generating plant. On the other hand, undoubtedly there is an enormous field for the electric motor among small users of power who can obtain the electric current at a moderate rate from supply companies or local authorities. This class of consumers form an important group by themselves.

I propose in this paper to confine attention to those factories where the total power required is upwards of 50 horse power, and where the power is produced on the consumer's premises. To what extent and in what manner in such factories can electric power transmission be advantageously used? The conditions as to requirement of the work to be done, and the present methods of doing it, are so various that it is difficult to enter upon a useful discussion on general lines.

Two typical groups may be chosen for discussion:

Group I.—Factories where the power is delivered from one main engine through gearing, belting, or ropes to line shafting, which is in turn belted or geared to machinery closely grouped round the source of power. This includes most factories where the machinery runs at a constant speed on a fairly steady load, as in spinning and weaving factories.

Group II.—Where the nature of the work is such that the power must or ought to be delivered direct from the prime mover at the point where it is applied to the work. This includes factories where the machines to be driven are widely divergent in character, are widely spaced, and run at different and varying loads and speeds, as in paper mills, printfields, chemical works, steel works, foundries, shipyards, and many engineering establishments where work of a varying character has to be accomplished. This group affords by far the most promising field for the electrical engineer.

In the first group advantage can, to a large extent, without the use of electrical transmission, be taken of the direct economies to be gained by the centralization of power production, and the electrical engineer must, as a rule, base his argument in favor of the adoption of electrical transmission rather on such points as saving of space and cost of construction, absence of noise, and additional convenience, than on any claim for direct economy in coal consumption. Of course there are very many cases where an enormous saving could be accomplished, even in such factories, by the introduction of a good modern electric equipment, but, generally speaking, an equivalent saving could be gained by more direct means. There are, however, important advantages gained where electric motors can be applied directly to the working of machinery of production. No matter how well engineered the arrangements may be in the first instance, all systems of transmission by rope or belt are subject to increasing and varying slip; and, apart altogether from the loss of power arising from this cause, this has the very serious result of reduction in speed of the machinery of production. Thus, a slip in the belt or rope driving a machine or group of machines reduces the output in direct proportion to that slip, while the total expense of production remains the same. It is quite certain that this is the frequent source of loss even in the best managed factories. The electric motor can be arranged to run at constant speed if the electric pressure be maintained constant, and this can be and is easily regulated, observed, and recorded automatically if necessary, and the speed may be maintained constant within any desired range. While, as a general rule, in such factories it appears that the case for electricity is not strong enough to warrant any very great capital expenditure, with a view to direct economy in fuel, it by no means follows that there may not be exceptions to the rule. Such exceptions would probably be found in factories where the nature of the machinery and transmission is such that, after the best that gearing and straps can do has been done, there remains a loss between the prime mover and the producing machinery of more than 25 per cent., or in factories where the machinery is used in an intermittent manner, and where a saving could be made by stopping the shafting along with the machines. There are very many such cases.

Looking at the matter from the standpoint of comparing the best that can be done by shafting with the best that can be done with electric transmission, it may be taken that where there are more than five steps between the shaft and the prime mover and the point of final application of the power, it is possible to gain a higher efficiency by electric than by mechanical transmission. For example, starting from the engine shaft, a belt or rope is taken to a main shaft –step one, to a counter-shaft on another floor– step two, across a room —step three; to the machine countershaft step four, to the machine itself—step five. The total loss in transmission under favorable circumstances would probably be not less than 5 per cent. for each step, or say 25 per cent. in all. The loss by electric transmission would certainly be reduced below this amount, and economy in working expense would result, even where the machinery is in constant use in both cases. Any irregularity in or interruption to the use of the power at the point of ap

plication would tell in favor of electric transmission, because the loss is nearly proportional to the load in the electric, while in the mechanical transmission it is approximately constant and independent of the load. On the other hand, the capital loss of electrical transmission in factories of this class is usually greater than that of mechanical transmission. The problem of calculating for any special case is a comparatively simple one, because where the power is centralized it is not difficult to arrive at any required data for calculation. The power required is easily ascertained, and the loss in transmission is easily estimated. The best proof of the value of electric transmission in factories of this class is the fact that growing experience of its use is leading to its enormous extension, notwithstanding its greater first cost. The electrical engineer's best argument is appeal to experience of convenience, which cannot be directly valued in figures.

Group II. differs in many essential respects from Group I.

In nearly all such cases electric transmission compares favorably in first cost, and still more favorably in working cost, with any other system of transmission. Its only serious competitor in some cases is hydraulic transmission, and this generally is more of a useful coadjutor than a rival In this group, however, the whole question of comparison bristles with difficulty. In the first place, it is extremely difficult to arrive at any approximation to accuracy in determining the amount of power actually required to perform the various operations usually performed by steam engines As a general rule such factories as those instanced in Group II. use steam engines worked with low-pressure steam. These engines are rarely kept in perfect repair, and the indicator diagram gives little information as to the effective power. It is not usual to make provision for indicating such engines, and there are many gate-ways for the escape of heat. The best way to arrive at the actual power is to apply an electric motor to the work, and record the measurement of power thus obtained. While in many cases such results accord very closely with skilled guesses at the actual power, there are many surprising differences. Another very important element is the fact that in many such factories—for example, in paper mills, calico printfields, chemical works and dye houses—there is a large quantity of steam required for heating purposes, and this has a most important bearing on any proposal to substitute electric motors for the small steam engines. Not only does such substitution involve the use of a steam distribution independent of the power distribution, but it complicates the calculation of efficiency; because, in the case of a paper machine, for example, if the whole of the exhaust steam from the driving engine be used for heating the rolls, then the efficiency of the engine ceases to be of any importance whatever. The engine will exhibit its inefficiency by rejecting heat which is afterwards profitably utilized elsewhere. Hence arises the custom so puzzling to one who wishes to compare the power efficiency of factories of different kinds, of checking the efficiency by equating the coal consumption to the output of the manufactured product. This after all is the real test as between one factory and another, but it altogether conceals the factors in the calculation which enable one to localize the losses. Even in the case where this complication of heating does not exist, there is usually in such factories so constant a variation of load that it is almost impossible to arrive at accurate data of the actual power used. Notwithstanding these difficulties, the case is so good for electric transmission of power, under such conditions, that it is not difficult to prove its superior economy in nearly every case falling under the description of Group II.

Even in cases where the whole of the exhaust steam is profitably used, and the efficiency of the engines themselves is of no importance, there is a serious loss of heat between the boiler and the engine. Every gallon of water sent to waste through the steam traps and drain cocks represents a pound of coal uselessly burnt. Even when the pipes are well covered and perfectly steam-tight this loss is considerable. Last year, in response to questions addressed to users of power in England, Scotland, and Ireland, the answers which have been compiled in tables, were obtained by the courtesy of about twenty out of one hundred factory owners. While, of course, it is impossible that these results as a whole can be quantitatively correct for scientific purposes, they possess a great value as a qualitative analysis of this important element of manufacturing cost. These tables show very clearly that in all cases where there are many small engines the cost of power is a maximum. There is a decided tendency to exaggerate the power of small engines, and if this be taken into consideration in addition to their well-known inefficiency, the result comes out much more seriously against them than is indicated by the figures in the tables.

(To be continued.)

CLOTHS REQUIRING UNEVEN LIFTS IN SHEDDING.

The production of some kinds of cloth ornamentation depends on the working of a number of threads which interweave in the same order when forming the body of the cloth. It will be evident that any figure on an extensive scale, which requires a number of figuring shafts, would of necessity create an unequal shedding plan, some lifts being very light while others are very heavy. The uneven lifting is noticeable in some patterns requiring a large number of shafts of healds. If the size of the spot was increased, or the spots placed farther asunder, the unevenness of lift would be increased. The fact that in double-lift dobby machines the descending healds or shed aid in pulling up the ascending healds is generally acknowledged, and where the number of healds raised for each shed are nearly equal, the working of the loom is regular. In accordance with the pegging plan given, the seven healds with

their springs will pull up the three healds and springs quite easily, but if the three are required to pull up the seven a jerking of the loom may be perceived, says a writer in the Textile Recorder. The jerking is caused by the extra power exerted in raising the seven healds without a similar counterbalancing pull. This inequality of lifting the healds is often demonstrated in designing, and deters the production of many good patterns, which are discarded rather than put the loom to the continued strain of weaving them. The same inconvenience is experienced when producing vestings or other goods woven on the double cloth principle, where the face warp and a portion of the back warp is lifted in order to put the weft into the back cloth. When the whole capacity of the dobby is not required for these cloths, some attempt to equalize the lift is often made by attaching the surplus jacks direct to strings, and lifting them up for those picks where very few healds are raised.

Positive shedding motions are not subject to this jerking, and are better adapted for this class of work than machines which require the aid of springs. Many attempts have been made to lessen the evil of non-positive shedding by relieving the spring of its full extension. Sufficient spring power is required to keep the healds to the bottom of the shed, and all further extension is better avoided, if possible. Spring relieving motions of the past have been made on the quadrant principle, or by the intervention of an eccentric, which is turned round to its least diameter as the heald rises, and thereby relieves the connecting band instead of extending the spring. A new plan, which is showing some signs of a more general introduction, is "Dawson and Lloyd's Patent." In using this method, when the shed is formed the spring is extended about half the distance of a direct spring, but its power on the heaid is not increased in this ratio because of the decrease caused by its position on the lever. The springs in this motion are always acting on the healds to some extent, being in position to pull them down when fully extended. The difficulty with some quadrant motions is the tendency to pull against a dead centre when the heald is at its highest position. Some method of satisfactorily effecting the results which are claimed for this machine is required, not particularly as a saving of power in working the loom, which would not be a great matter where the even lifts were adhered to, but for increasing the scope of the dobby in cloths requiring uneven lifts, and also taking the strain from the healds, which will, doubtless, last much longer. Many manufacturers of fancy figured cloths do not provide healds which are knit according to the pattern of draft, but choice must be made from a variety of counts of evenly-knit healds. In these cases the threads do not go perfectly straight from front to back. Perhaps one stripe will be drawn on the back shafts, being one-quarter of an inch in the healds and one-eighth of an inch in the reed. The opening left in the front healds for these threads to pass through is practically nil, and the more rigid the healds are held the greater will be the friction on the yarn when shedding.

Attempts have been made to relieve the healds of their rigidity in the ordinary dobby, and at the same time to avoid the objectionable jerking motion of the loom when not more than half the dobby capacity was required, by pegging the lattice which works the back jacks in the opposite manner from the front and connecting them by cords round pulleys to the bottom of the healds. The springs are dispensed with in this way, and a positive motion effected; but the liability of the hooks to miss or catch incorrectly makes the method a practical failure, causing the cords to break or the sheds not to be formed. The spring-relieving motion is also arranged with one row of levers, and a suitable frame for securing it to the top rail of the loom, when it may be applied as a top motion for under tappets, or it may be used in connection with side tappets instead of top jacks, but this is of no advantage beyond allowing a dobby loom to use side tappets without removing the dobby in such cases as when sateens or similar work is more in demand than dobby-figured cloth, as appears to be the case at the present time.

SCOURING WOOL.

A point of special importance concerning the scouring of wool is the water to be used. Good machinery and soaps may be bought, but if the water is bad the results will be unsatisfactory. Some waters have to be distilled before they are suitable for washing wool, while other kinds need only softening, but in any case the water should be soft. The average mill has access to rain, river and well waters, but the principal source of these is rain. Rain water, from the absence of earthy salts, is very soft, and on that account is preferable to any hard water. Rain, after it reaches the earth, soaks down into it, and during its passage through various strata, dissolves certain salts, etc., the quantity and quality of which vary with the nature of the strata with which it comes in contact. River water usually contains from 10 to 25 grains of solid matter per imperial gallon of 70,000 grains. The quantity varies with the time of the year and the dryness of the season. But in any case soft water always gives the best results, and should be used in wool scouring, if at all procurable.

In considering the ingredients used in wool scouring, urine is often used. The urine is usually stale before using, and consequently contains not only ammonia, but a large amount of potash. The potash causes the whiteness, and the ammonia will saponify the animal grease, and when thrown into the scouring bath in a warm state the grease will easily wash off. The sheep feed upon vegetation which contains potash more or less, and that will be absorbed in the blood, and so reaches the wool upon the skin. The potash is a property which the wool necessarily contains. Potash is, therefore, required in some form or other to whiten the wool, and this is supplied in the soap.

It is a well-known fact that wool when growing is preserved by nature with an oily substance called "yolk," containing a large quantity of potash, and usually termed grease. The proportion of grease in unwashed wool varies from 60 to 70 per cent., which has to be removed before the wool fibers are ready for manufacture. In enabling the manufacturer, where scouring is attempted, to get the best possible results, I propose, says the Bradford correspondent of the Indian Textile Journal, to give the best method known in wool scouring so far as cleaning agents are concerned, so that the delicate fibers of the wool shall not be injured, and its natural brightness be left unimpaired.

The experience of woolen and worsted manufacturers whose products are standard in the trade, point to the fact that the best agent for scouring is a good potash soap, which, while leaving the actual weight of the real wool undiminished, gives a soft, silky handle obtained by no other treatment, and which is so much appreciated by wool buyers.

If soda soap is used in scouring, the wool, besides turning yellow, will become harsh and brittle, while, on the other hand, potash (which is natural to the wool) made with tallow into a neutral soap in the manner described further on, will be found to be the best in every way.

The materials and proportions for three tons of the best potash soap are as follows:

	£.	s.	d.
Half ton caustic potash at £25 per ton.....	12	10	0
Half ton soft water.....	0	0	0
Two tons tallow at £20 per ton (English price) .	40	0	0
Total cost	52	10	0

Costing £17 10s. per ton, or 17¾d per pound.

To make the finest potash soap for wool scouring, washing woolen flannel goods, etc., take 20 pounds of caustic potash, and put the contents into an iron or earthenware vessel with an equal quantity (20 pounds) of water, as the potash dissolves, the mixture (or lye as it is called) will become heated, but it must not be used until it has become only warm, or about 90 degrees F. In a sufficiently large iron pan, melt 80 pounds of tallow free from salt until the whole is liquid: the heat of this, though warmer than the lye, must only be about 120 degrees F. Now pour the potash lye in a gentle stream into the melted tallow (not the tallow into the lye), stirring it with a wooden stirrer all the time, and continue to stir until the whole appears to be perfectly smooth and combined, which will be in a few minutes. This mixing may either be done in the melting pan after withdrawing the fire, or in a wooden barrel, as may be convenient. Now pour the mixture into any suitable square box, lining it with damp calico to prevent it sticking to the sides, wrap the box up with flannel, sheepskins or something of a warm nature to retain the heat, and put it in a warm place for a week (during this time a chemical reaction takes place, resulting in its slowly changing into 120 pounds of the best hard potash soap), after this it may be cut into bars, and though ready for use it has the merit of improving the longer it is kept.

A method of wool washing which is coming into use in Germany is that by means of water glass (silicate of soda), which is rapidly taking the place of the old method. The greasy wool is placed in a large receptacle containing water rendered slightly alkaline. This fluid is either a mixture of soft water and urine or a solution of white curd soap in soft water of a diluted solution of soda ash. The scoured wool is withdrawn and put into a receptacle with clear water, in which it is rinsed until the wash water escapes clear. After the wool has been washed it must be whizzed and dried in a place shaded from the sunlight, which has a tendency to turn the material sometimes yellow. In the water-glass process care must be taken not to have the temperature either of the water or of the water-glass higher than that of the soap and soda bath. When washing in the "Leviathan," add water-glass only, but no soda or soap to the first bath in which the wool is steeped. Into the second bath put one-half soda and one-half water-glass. It is advisable to previously squeeze out the liquor before the wool is treated cold in the washing machine, because by keeping this wash liquid warm it can be used twice as long as soda or soap liquor. Wool washed with water-glass always appears whiter and more open than with the ordinary process. It is also softer to the feel when it is squeezed out well before being washed cold.

The following method is also very popular in German mills: The wool is steeped in a receptacle provided with two compartments. When one portion of the wool has been steeped sufficiently (often three hours), it is placed in the washing machine and passed through two compartments filled with water of a successively higher temperature until the wool reaches another receptacle filled with cold water, in which it is rinsed. When rinsed clean, the wool is caught up by an apparatus raising it from the water, and it is passed between two rollers which squeeze out the water. It is then often taken and whizzed in a hydro-extractor and finally dried in a strongly-heated and well-ventilated room or chamber.

—The number of sheep in the Province of Ontario sold or slaughtered according to the report of the Department of Agriculture was in 1897, 732,872, and in 1896, 766,896, the wool clip in 1897 was 5,139,984 pounds as compared with 5,581,387 pounds in 1896. In Manitoba the number of sheep, from the assessment roll, was 36,680 in 1897 and 33,812 in 1896. The number of sheep in the United States is not at present increasing. In 1893 there were in the United States 47,273,553 sheep, valued at $125,909,264, in 1895 there were 42,294,096 sheep valued at $66,625,767, and in 1898 there were estimated to be 37,056,960 sheep valued at $92,721,133.

FLAX CULTURE AND THE MANUFACTURE OF LINENS TO TAKE THE PLACE OF COARSER COTTONS IN NEW ENGLAND.*

It may be of interest to refer briefly to the history of the flax industry in this country. The art of raising flax and spinning it by hand was brought to this country by the earliest colonists. In 1629 the English Parliament directed that flax should be cultivated for fiber in Massachusetts. As early as 1648 the plant was cultivated in Virginia by Captain Matthews. Almost every housewife in the colonies wove linens by hand. In 1790 the Secretary of the Treasury reported that the manufacture of linen goods in a household way had become an established industry. It will be remembered, in this same year (1790), the first cotton mill was inspected by George Washington. Thus linen manufacture antedates that of cotton in this country by nearly 150 years. It may be said, in reply to this statement, that the linen industry was of little consequence at this early date. But thirty years before the erection of the first cotton mill, Massachusetts and Rhode Island in a single year reported nearly 30,000 yards of linen fabrics made in families. All the records in New England show a disposition to encourage the growth and manufacture of flax. A half century before the manufacture of cotton, Pennsylvania, Rhode Island, and New York also offered special inducements for the manufacture of certain kinds of linen goods. In 1810, over 20,000,000 yards of linen fabrics were made in this country in families. In addition to this, nearly 25,000,000 yards of linens of coarser quality were made. Water and steam power as well as labor-saving machinery had been introduced previous to this, which resulted in a considerable extension of the industry. But it was still largely a wholesale industry. The following statistics, taken from report No. 9 of "The Fiber Investigations of the United States Department of Agriculture," by Mr. Charles Richards Dodge, special agent of the Government, will be of interest. In 1849, 562,312 bushels of flax seed were harvested in the United States, and 7,709,676 lbs. of fiber were produced. In 1859, 566,867 bushels of seed were harvested, and 4,720,145 lbs. of fiber produced. In 1869, the production of seed had risen to 1,730,444 bushels, while the fiber in this year rose to the phenomenal total of 27,133,034 lbs., an amount never approached since. In 1879, the production of seed was nearly four times the quantity for the year 1869, while the production of fiber fell to the comparatively insignificant quantity of 1,665,546 lbs. In 1889, 12,250,410 bushels of seed were harvested. The production of fiber had fallen steadily during this period, until it reached 241,389 lbs. in that year.

The reason for the falling off in the production of fiber since 1869, while the acreage of flax and the production of seed were rapidly increasing, is not far to seek. The impetus given to cotton manufacturing by the invention of the cotton gin and subsequent mechanical improvements, soon brought down the price of cotton fabrics through the sharp competition among manufacturers which followed on the rapid expansion of the industry. Little by little the cheaper cottons have found their way into the homes, silencing the spinning wheels and almost all the looms engaged in the manufacture of finer linens. In spite of the decline of the linen industry the culture of flax has steadily increased in this country. At the present time it is grown almost exclusively for seed. The straw is of no value except in making certain coarse qualities of bagging and of paper. Since 1889 the acreage of flax sown has fluctuated somewhat. This is due, doubtless, to fluctuation in the price of flaxseed oil and flaxseed cake during this period. The acreage sown has been affected somewhat, no doubt, by the very general impression that flax is an exhausting crop. At the present time the annual production of flax seed and straw is approximately 12,000,000 bushels of seed and 300,000 tons of fiber. It is doubtful, however, if our farmers can continue to grow flax indefinitely for the seed alone. Unless some use can be made of the fiber this great agricultural industry will doubtless suffer a considerable decline during the next decade. Is it not possible that the manufacturers of this country may prevent this decline? Manifestly, the surest and easiest way to do this is to find some use for this nearly half a million tons of flax straw produced annually in this country.

Let us, then, ask and attempt to answer two important questions about this matter. First, if the use of this enormous quantity of flax-fiber is possible to us, will it pay? Second, what considerations enter into the production of flax in this country that favor the use of the fiber in the manufacture of linen goods? First, then, will the manufacture of linen goods pay? It is conceded that next to cotton, flax is the most useful and valuable of all commercial fiber. It was thought at one time that cotton goods, on account of improved methods of manufacture, might eventually almost entirely take the place of linen goods. But plainly, this is not to be. More and more flax is coming to be again what it was from the time of the earliest Pharaohs of Egypt, to the beginning of the present century, the fiber of luxury, while cotton fiber is taking its place as the fiber of the masses. We are importing annually from foreign countries over $30,000,000 worth of linens—more than one-tenth of our total output of manufactured cottons. It has been estimated that the world's consumption of linen goods is not far from one-third the consumption of cotton goods in money valuation. It must be evident that any country that pretends to lead in the manufactures of the world can ill afford to have no part in this important branch of human industry. One need only to visit the great centres of linen manufacturing in Ireland and on the Continent to be convinced that next to the manufacture of cotton goods

*Extract paper read before the New England Manufacturers' Association, at Boston, April 27th, 1893.

this is the most remunerative of the fiber industries. A study of the comparative consumption of linens and cottons shows that with the steady rise in the standard of living of the masses in civilized countries, the percentage of linen goods used is steadily increasing. To one in possession of the facts about this great industry, and especially about its early establishment in this country, it must be a matter of great surprise that this enterprising nation has allowed this industry to slip from its control.

Charles Richards Dodge, one of whose reports was referred to earlier in this paper, has urged upon our Government and upon our manufacturers the great importance of the reinstatement of linen manufacturing on a large scale into this country. He has expressed the opinion that if we go about the matter intelligently, moving only so fast and so far as we can see our way clearly, the industry may come in a few years to rank among the first in the country. He has made a most careful and exhaustive study of flax culture and the manufacture of linens in Ireland, in Belgium, in Russia, and elsewhere upon the Continent, and is prepared to speak with authority. For nearly ten years he has been the special agent of the Department of Agriculture in their investigations into the culture and manufacture of fibers and fiber fabrics. He has repeatedly urged in the United States and abroad, that it would be profitable for the United States to engage largely in the manufacture of linen goods. We come now to our second question, what conditions or considerations enter into the production of flax in this country that are favorable to the use of fiber for the manufacture of linen goods? Certain agricultural conditions have been referred to briefly. The most important of these is the cheapness of lands compared with values in Ireland and on the Continent, where flax is now most largely produced. Next to this in importance is the greater native fertility of our soils. A yet further condition in our favor, especially in New England, is the fact that thousands of our best farms have been abandoned and ten thousands of acres of land, of much higher native fertility than those under cultivation in Europe, now lie in idleness or practically so. These conditions, joined with the proverbial skill and enterprise of the American farmers, should give us a decided advantage in this enterprise over European competitors. We need only learn their methods of close and intense farming to surpass them easily in the growth of flax; at least to the extent of providing fiber for the production of linen fabrics for home consumption. During the last few years the United States Department of Agriculture, through the various state experiment stations, has made extensive experiments in the growth of flax, and these experiments have demonstrated that flax can be successfully grown for fiber in almost all the states in the Northern half of the United States. During this period of investigation, and for many years previous, sufficient flax had been grown in certain parts of this section of our country to furnish fiber for the manufacture of very much more linen goods than were consumed in our country during the period in question. To be sure, the flax grown has not been of the kind that yields the finer fibers, but the experiments of the Department of Agriculture have shown that the variety of flax producing the finer fibers can be successfully produced over the whole flax-producing area mentioned above. So far then, as purely agricultural conditions are concerned, the United States has many and important advantages over other countries now producing flax for fiber. It would seem that all that is needed to introduce the cultivation of flax into this country on an extensive scale is the producing of a market for the fiber.

(To be Continued.)

CANADA AND THE UNITED STATES IN TRADE.

The approaching conference of international commissioners at Quebec is attracting more attention to this country on the part of the people of the United States than anything that has occurred for years. The American Government has busied itself lately in attempting to gain special trade privileges for American manufactures in foreign countries. The South American Republics have been visited by commissions and encouraged to send representatives back to the United States. Efforts have been made to increase exports to Europe, Australia and the Orient. But while all the successes in these directions have been loudly heralded, one of the most satisfactory foreign trades a nation could wish for has been carried on with Canada. According to the United States Bureau of Statistics Canada's imports from the United States in the five years from 1893 to 1897 were 50.9 per cent. of all she imported, from Great Britain, 31.2 per cent. Exports to the United States were 35.3 per cent., and to Great Britain, 55.6 per cent. Of her total foreign trade in the period mentioned, 42.8 per cent. was with the United States and 43.9 per cent. with Great Britain. The Dominion collected annually on the average $7,481,898 of duties on goods from the United States and $7,663,030 from Great Britain. There is little we can blame the American Government with in their treatment of Canada. They have proceeded entirely upon business principles, and were not disposed to offer Canadians any special inducements in their markets so long as we were willing to buy American products without them. Congress was quite willing to let well enough alone and give its attention to other countries. When the idea of a British preference was proposed matters assumed a different aspect. Although it yet remains to be seen what effect the deduction of 25 per cent off the schedule of duties in favor of British goods may have upon United States trade with Canada, it was evident that the Canadian Government was about to assume a new attitude in its international relations, and a new policy might have to be adopted to meet it.

The exact relative importance of Great Britain and the United States as exporters of textiles to Canada is so little understood that we append a statement showing the description and value of the dry goods imported into the Dominion of Canada from Great Britain and the United States, together with the amounts of customs duties collected thereon respectively during the fiscal year ended June 30, 1897, compiled from the Dominion trade and navigation returns:

	Great Britain.	
Description of merchandise—m'f'rs.	Value.	Duty.
Dry goods—woolens	$5,576,859	$1,771,041
Cottons	2,693,114	766,439
Silk	1,396,015	425,220
Linen and jute	1,158,809	262,672
Hats, caps, gloves and furs	1,108,493	316,384
Gutta percha and India rubber	191,520	48,411
Miscellaneous and fancy	1,694,570	508,362
All kinds, free of duty	764,482	.....
Totals	$14,583,862	$4,098,529

	United States.	
Description of merchandise—m'f'rs.	Value.	Duty.
Dry goods—Woolens	$218,396	$68,073
Cottons	1,119,147	324,726
Silk	150,774	45,501
Linen and jute	55,042	12,022
Hats, caps, gloves and furs	539,352	158,258
Gutta percha and India rubber	1,401,103	289,391
Miscellaneous and fancy	541,112	155,579
All kinds, free of duty	566,530	.....
Totals	$4,591,356	$1,053,556

Cotton goods are the only staple dry goods which we import in quantity from the United States, if we omit from the list gutta percha and India rubber, which should scarcely be included in it, and of these, in spite of the great advantage in raw materials, American manufacturers sell in Canada less than half as much as their British competitors. Our imports of American woolens and linen are insignificant, and while imports of silks, hats and caps are relatively much more important, the trade is not of large dimensions. It is worthy of note that while Great Britain pays four million dollars to the Dominion treasury in duties and the United States one million dollars, from the former country $764,482 worth of goods was entered free of duty, while goods to the value of $566,530 were entered by the United States.

WORSTED SPINNING.*

BY M. M. BUCKLEY.

(Lecturer in Wool and Worsted Spinning at Halifax, Wakefield, and Elland Technical Schools).

The Holden system of combing approaches more closely to the ideal treatment than the Noble, though by many combers it is held that the fibers are dealt with too harshly. The circle is made with two or three rows of pins that on the outside are much more finely set than the others, in order to arrest the small neps and impurities as the combed fibers are drawn off. As in other machines, the circle rests upon a steamchest to facilitate the working of the wool. This seems to be a fundamental necessity for successful combing, since as the fibers get heated they lose their cohesiveness and repel each other, thus lying more lightly in the pins, from which they may be removed in a much cleaner condition, with less injury to their surface.

The partially combed wool, as it is carried forward by the revolving circle, next comes to the square motion, one of the chief features of the machine. This consists of a series of fallers accurately curved so as to correspond exactly with the periphery of the circle, which works in conjunction with a double pressing plate to hold the wool in the pins of the circle. The requirements of the motion are to thoroughly comb and clear as much as possible of the projecting fringe; consequently the pins are set very fine, and in order to ensure their proper penetration a rocking brush is used to assist their action.

Like the circle, the fallers are heated as hot as possible by means of two steamchests placed respectively under the upper and lower races. They work in frames, and by a combination of slides, levers and eccentrics, are pushed very quickly away from the circle. A motion of this description is necessary, because if any lingering takes place owing to the movement of the circle, the arrangement of the fibers will be disturbed, and have a tendency to cross each other instead of remaining parallel. To prevent the fallers carrying away the long fibers, and also to enable the neps, etc, to be removed, the double-flanged press-plate works upon each side of the front row of pins, and is pressed tightly against the brass foundation by a tappet or eccentric motion. If it was stationary it would have a tendency to cut the fibers as they were drawn under it, so it is made to travel with the circle for a short distance.

The fallers of the square motion are made as narrow as possible, so as to enable them to get close to the circle. It will be seen, however, that a small portion of the fibers still remain uncombed between the circle and the first faller, somewhat similar to what occurs in the Noble comb between the circles. Here, however, means are provided for effectively dealing with it, so that the fiber is combed throughout its length. Passing forward to the drawing-off roller, here a series of short intersecting combs are employed, the pins of which all point downwards. They run for about three parts the distance round the circle upon an elevated slide, and as they approach the drawing-off rollers they descend an incline, so that the pins are placed between the circle and the rollers. The wool which is now lying in the bottom of the circle is pushed up into the pins of the intersecting comb, through which it is pulled as it is being drawn off. After passing the rollers, the intersecting comb rises on to the elevated slide, which also possesses a steamchest, and passes round the comb until its turn comes to descend again.

The chief objection against the square motion comb is the multiplicity of complicated motions which are necessary, and which are continually requiring attention and repair, necessitating both loss of time and expense. There

*Republished from the Textile Manufacturer.

is every indication that it is being gradually supplanted by the more useful Noble's comb, even in the sheds of those who have been its greatest supporters. It is practically only suitable for one class of wool, its application being thereby limited, whereas the Noble comb can be used for all varieties of wool, both long and short, while in add tion it is more easy to manage and costs less for repairs.

Another comb which must be mentioned is that of Little and Eastwood, made by Messrs. Platt Brothers. Like the previous machine, it is only capable of dealing with short-fibered wools. In this case the uncombed wool is made up into rolls or balls, three of these being placed upon a traveling lattice. The ends of the bobbin are held in slots, so that the slivers are gradually unwound by the motion of the apron, and then pass through the feed rollers and into the fallers, which are curved so as to correspond with the nips and periphery of the circle. The nips, usually about six in number, are arranged circularly around a barrel. Then the feed rollers, fallers and nips are all placed inside the circle, and as the tuft is brought forward and seized by the jaws the delivery head recedes, thus drawing the fibers through the pins, the noil, etc., being in the nip. As the barrel revolves the fibers are placed in the circle (which only has two rows of pins), the combed portion on the outside. These are drawn off by he rollers and pass into the can. Precisely the same objections apply to this machine as those we have noted with regard to the Holden.

The combed slivers are put through two or three gill boxes, termed finishers, in order to secure a thorough mixing of the fibers, and also to obtain a regular end of definite weight. A large number of doublings are therefore given at the first machine, which is used for a weigh box as well. The baller is the last of the series, and here, by a similar arrangement to that described in connection with the carder, the ball or top is made. At this box the wool is generally conditioned—*i.e.*, supplied with the requisite quantity of moisture to impart the natural cohesiveness and elasticity which are essential for successful manipulation. Owing to the great difference which exists in the capacity of the various wools for absorbing and retaining moisture, and the tendency which is sometimes manifested to get as much as is conveniently possible without detection into the wool, it has become necessary to adopt a standard allowance as well as a recognized method of testing, so that the nature of transactions may be ascertained.

The standard allowance and regain per cent. are as follows:—

Tops combed with oil for moisture, 2 ozs. 9 drs. per lb., or a regain of 19 per cent.

Tops combed without oil for moisture, 2 ozs. 7½ drs. per lb., or a regain of 18¼ per cent.

Noils for moisture, 1 oz. 15½ drs., or a regain of 14 per cent.

Under these circumstances it is necessary that the spinner should be able to ascertain for himself in what condition the tops are which he buys, especially seeing that the apparatus required for making safe and reliable tests is simple and inexpensive. It consists of a pair of scales, accurately adjusted so as to turn readily with one-tenth of a dram, for weighing the samples; a reel for tops, which may also be used for yarns; an oven of cylindrical shape, constructed with an inner and outer case, a convenient size being 40 inches high and 30 inches diameter outside measurement. A space of 1½ inches is allowed between the two cases to allow the heated air to circulate freely all round.

Several systems have been devised for ensuring an equal degree of heat in all parts of the oven; but the one introduced by Mr. W. Townend, manager of the Bradford Conditioning House, is the best, securing this essential feature at a small cost, and which, moreover, reduces the time necessary to make a test to nearly one-half of that required by other ovens. In this a pair of scales, adjusted to turn at one-tenth of a dram, are fixed firmly to the oven in such a position that one extreme end of the beam is exactly over the centre of the oven. From this is suspended the reel containing the sample, the reel corresponding in weight with the pan and chains at the other end of the beam. A thermometer is also used, ranging from 10 to 400° F., the bulb of which descends half-way down the oven; and a Bunsen's gas burner, burning 75 per cent. of air and lighting eighty jets, is arranged in a circle underneath the inner case.

With the above anyone can readily list tops to ascertain that they are right, but care must be taken to obtain a representative series of samples and results. The following points should be observed. The oven must be heated up to 220° F., or taking the extremes of 212 to 230° F., any lower degree will not abstract all the moisture, and any higher will discolor the sample, owing to its beginning to decompose, while some of the water which enters into the composition of the fiber is liberated, so that the results are not reliable.

In dealing with tops, the samples must be drawn from the middle and the outside and weighed immediately, great care being taken to have the exact weight required and perfectly balanced. The top sample is then wound round the reel and put in the oven suspended to the scale. No specific time is fixed, nor can be fixed, for expelling all the moisture, as the different qualities, age and condition of tops materially affect the time required. Absolutely dry weight is only obtained when the sample in the heated oven ceases to lose weight, and the needle of the scale, after balancing, remains stationary for, say, five minutes. There is a small cup above the rod of the reel, near the end of the scale, upon which the small weights are put, representing the loss of weight caused by the drying process, and the original weight of the sample is thus left in the pan at the opposite end of the scale. The small weights representing the exact loss of moisture are read off, and, by referring to the "table of results," the percentage of dry weight and of the loss in moisture is

Elaborate experiments extending over many years, and the experience of practical men, have shown that textile goods in an absolutely dry state will regain on exposure to the open air or in a warehouse a certain per-

centage of moisture, and these regains have been fixed and acknowledged as "official standard allowances" for moisture. Thus if a top loses in moisture 2 ozs. 9 drs. per lb., there remains 13 ozs 7 drs. of dry top—that is to say, 16 per cent. direct loss of moisture and 84 per cent. of top. Then, if the standard allowance of regain is 19 per cent., the amount of 19 per cent. of 84 is 15.96, and this is added to the dry weight, giving a total of 99.96 per cent. (practically 100), so that this particular top would be proved to be up to the standard, and show no appreciable loss or gain at 2 ozs. 9 drs. per lb. For the above information, in order that it should be reliable, I am indebted to Mr. W. Townend for his courtesy and kindness in allowing me to make extracts from his "Official Results."

In addition to water, some top makers and merchants endeavor to gain an advantage by saturating the wool with mineral salts, sugar of lead being the one mostly used. It may be readily detected by first washing the wool and then adding hydrochloric acid to the solution, which produces a dense white precipitate.

The tops are bought and sold just as other commercial commodities, their price being influenced by the laws of supply and demand. Their making is really a part of the spinning industry which has been separated and specialized. It has called into existence a large number of commission combers, who merely cleanse and comb the wool for the merchants. The tops are graded according to the fineness of the fiber, and are known as 60's, 70's, 50's, 32's, etc., representing the spinning qualities of the wool. They vary in price according to the degree in which they manifest certain essential features. A primary consideration, so far as the spinner is concerned, is the fineness of the hair; and other things being equal, those tops with the finest fibers are the most valuable. This determines the extent to which it can be spun, and in addition produces a stronger yarn, because we get considerably more fibers in cross section, and consequently the strain which is placed on the yarn is distributed over a greater number of points. Further, since the successful drawing and spinning of the tops is determined by the surface resistance exercised by the wool as it is being drafted, it follows that the greater the number of fibers present the more will they hold each other, and so prevent irregular places. Careful observations and records should be kept of the behavior of the tops and the results obtained, because it is found that in some cases what appears to be a good top works up rough as it is gradually reduced in thickness, and the yarn "stares" too much—that is, it presents a rough, wild appearance owing to the large numbers of free ends of fibers which project, and consequently reduces its value. In conjunction with fineness, length is another essential requirement. The importance of this will be readily understood when it is borne in mind that at every process a certain amount of breakage takes place. Proof of this is easily seen in the amount of short fibers which are thrown off at each operation. During combing the short is removed and forms the noil, but we always find that the rubbers and brushes collect a considerable quantity in the after-processes. Probably much of this arises through the rollers not being properly set, or the ends having too much twine in; but still, most of it is the result of the continuous drafting and doubling which is adopted, together with the great pressure to which the fibers are subject in passing through the drafting rollers. It follows, therefore, that the longer the top is to begin with, allowing for the breakage, the fibers available for building the yarn will be more suitable, since the longer the wool the stronger the yarn will be. That this is so may be easily proved by testing the breaking strain of two yarns, one made from a short top and the other from a longer, in each case putting in the same number of turns. The greater the number of times a fiber is twisted around the others, the more force it requires to withdraw it. Another factor to be considered is the amount of sinkage which takes place in passing through the drawing. Where a large proportion of short is present, it is continually thrown out as it leaves the nip of the front rollers and collects upon the wings of the flyers and different parts of the boxes. Extreme lengths must be avoided in one top, since better results can always be obtained by a judicious system of blending.

(To be continued.)

SCOURING.

Having woven the goods, we are ready to scour, piece, dye, full, gig, shear and finish them. These operations must be taken separately. Scouring is the first; and before wetting the goods, they are perched. The inspector will do this, and he will detect imperfections, mark them and dictate what line of work is necessary to prepare the goods for washing. The treatment of cloth containing an undesirable proportion of shives, or burrs, usually consists in removing the latter with burling irons. Some pieces may contain so many specks of a vegetable nature that it will be best to carbonize the goods in a bath of sulphuric acid 4 degrees strength, and dry in a hot room at 230 degrees, then run dry in a heated fulling mill. The vegetable matter will come out, except such as may be inside the body of the cloth. Any attempt to brush out pieces of foreign, beyond a certain point, would inevitably spoil the main bulk of material and lower its value, says a writer in The American Wool and Cotton Reporter. The severe treatment necessary would tend to tear the fiber. A good deal, however, depends on the nature of the shives. Short, chippy pieces will remove far more readily than longer, slender fibers, and it is probable that under certain conditions, an arrangement for a preliminary separation of coarse stuff by brushing might be of some service.

Holes, tears, etc., in the cloth must be closed up. Use thread of same color as the goods. It is necessary to start the thread at least three-eighths of an inch back of the hole, so that it will have a good purchase in the original fabric, and will consequently be less liable to pull through, inasmuch as if the sewer takes her stitch about one-eighth of an inch from the hole the strain under the fulling pressure is very apt to pull through, and then the repair would not hold any great length of time. Be sure that the threads of the patch are directly in the centre of the hole, so as to insure the hole and stitches being properly and evenly covered on the inside; press it down firmly with the fingers. A hole caused by the goods having caught on a nail, or by being cut, cannot be sewed up. Such holes are marked with a red tape and the goods are passed with the understanding that there is an imperfection in them.

Wool in its natural state is impregnated with a fatty matter called "suint" or "yolk." M. Chevreul gives the following as the average:

Suint	32.74
Earthy matters	26.00
Greasy matters	8.57
Earthy matters fixed by grease	1.46
Clean wool	31.23
	100.00

When the goods get as far along as the scouring process, all but the residue of the above matters is removed. In their place are oils used during the carding, loose dyestuffs, and general collections of dirt and dust from the machinery. These impurities must be washed out. The requirements are a good machine, proper soaps and water. The modern patterns of scouring machines are as near perfect as one could desire. The trouble is that they are not always managed right. In one case that came to the writer's notice, oil spots were thrown upon the goods from a loose pulley which had been put up by the mill machinist. It requires but very little oil to keep a loose pulley lubricated if the lubricant is properly applied. In the present instance, the oil was not properly applied and the spotting of the goods was blamed to the scouring machine. We fixed this by first drilling a ½-inch hole in the end of shaft, two-thirds of the way through the loose pulley. Then the centre of the pulley was marked on the shaft, and a 3-16-inch hole was drilled clear through, at right angles to each other. This made four openings from the oil chamber to the surface of the shaft. Then we took some candle wick and doubled it until the thickness required to fill the 3-16-inch hole tight was obtained, pulled through and pared off flush on the outside of shaft. This conducts the oil to the surface of shaft sufficiently to lubricate the loose pulley, and at the same time prevent the oil from leaking out and spotting the goods. If the hub of the pulley should exceed eight inches, three or four holes may be drilled through the shaft. The end of the shaft should be tapped for a ¼-inch street "L," which makes it very convenient for filling with oil. A good quality of oil should be used and the plug screwed in tight to prevent any leakage. A loose pulley fitted up in this manner, will run for a week without refilling.

Hard water, if used for scouring, tends to decompose the soap and cause the formation of lime and magnesia soaps which are deposited upon the texture of the goods nearly insoluble and give it a rough feeling. We always wash off our piece-dyed cloth in Fuller's earth with a little ammonia; that clears up the color, softens the goods and washes out all the loose dyestuff. While it is unnecessary to bestow as much care upon this class as would be necessary on close-finished goods, still they require a pretty thorough treatment. If a comparatively small quantity of water is required, it is recommended for the production of a soft touch, that condensed water be used for scouring. In some factories it is customary to filter the scouring water. In the filter apparatus the unfiltered water enters through a valve and pipe in the centre, passes up into a filter tank, then percolates downward through a filter bed of sand, passing up through a pipe. When the bed becomes choked with dirt, it is cleaned.

Smutting can be caused by the very smallest amount of alumina, in fact even the very thinnest covering of the solution which is left on the goods will produce the above defect. Streaks, stains, etc., are caused by the goods getting in contact with the rolls in such a way that the cloth is not evenly scoured. Doubling up, knotting and twisting are among these troubles. If the goods are guided through eyes, and if these are splintered, set uneven, crossed, or are out of position, there will be irregularities produced in the cloth, such as off colors, shaded places, clouds, etc. Uneven ruts or worn grooves in the rollers, dirty suds, soiled liquors, greasy sides, etc., will also cause defects. If slatty places show, they are probably due to uneven weaving. There is no handier way to increase the ease of weaving and to lengthen the amount of cloth that can be done in a given time, than by tampering with the number of picks. Where this cannot be done all through a cut, it can sometimes be worked in here and there through a cut, and these heavy and light places show in the form of slats at the scouring.

A prolific source of poor scouring is due to cheap and inferior soaps. The cheap soaps will grease the goods, make the colors run, hurt the fiber, and be productive of other imperfect work. The suds will fall back upon the goods and stain them. For the determination of the quantity of fatty acids in soaps, take four grammes of the soap, weigh this out and dissolve in hot water, and when the limpid solution is obtained it should be decomposed with dilute sulphuric acid. The whole is then washed in a funnel with hot water. The fatty acid remains in the funnel. On cooling, the fatty acids are gathered by means of ether. The watery parts are then separated, and the fatty acids already dissolved in ether are washed with water. This solution is evaporated and the residue weighed. This residue represents the quantity of fatty acids in the soaps.

It is essential that an effective system of steam heating be used for heating the scouring liquor. There are three systems in use. These are the overhead system, in which the main flow pipe is carried to the highest point first and divided into several drop lines for the various machines which require steam. The second is the one pipe main system, which consists of a single continuous main, from which are taken both the feed and return to the coils in the department. The third is the two-pipe main rising system, which consists of flow and return mains (which are duplicates of one another) and from them are taken the feed and return to each coil. The drop or overhead system is specially adapted to departments in which are several machines using steam. The one-pipe main system, as a rule, is best used when few machines are operated. A good installation of piping should not be spoiled by giving opportunity for water to collect in depressions, and thus trap the steam which should flow through the pipe. See that the globe valves are not so placed that they trap the pipes. A globe valve right side up must necessarily form a trap to a certain extent. Turn the valve on its side and the trapping is done away with. Also see that there are openings for cleaning and blowing off the connections, and that valves are provided to control such openings. There is no other way to get good, clear steam service. A defective steam supply will spoil cloth by the yard, as all finishers know.

We dwell on this subject of piping for water and steam because the same regulations are applicable to the dyeing, fulling and steam finishing departments. In the present day with all the appliances there are at hand it is not necessary to erect an unsightly apparatus such as is the case if big cast-iron pipes are used, and long coils run from room to room, making great ugly holes in the wall between each room. With the use of small wrought iron pipe, small and good appearing union valves, and union elbows, neat air valves and carefully arranged main risers, etc., etc., a very neat system for both water, steam and heating can be placed in any mill.

The water supply for scouring, etc., is handiest if the feed pipe is placed as near on the water line as possible, and all the length of pipe possible inside. A stop valve should be put in the feed pipe as close to the tank as it can be located, and then a check valve, and another stop valve. The former valve may only be used when necessary to open the check, the other stop valve being used for the ordinary stopping of the feed water. With waters charged with mineral impurities there is a loss occasioned by the frequent blowing out which is necessary. The loss is further accentuated when oil or grease is present in the water, as these, combined with the particles of lime in suspension, still further interfere with the free passage of the

water currents. The thickening of the water is due to the particles of precipitated lime suspended in it, retarding circulation and interfering with the scouring operation. When the water is pure and soft, the process of scouring is not only made much easier and more effective, but less water and fewer soaps are required. Some waters leave the goods harsh and yellow, which makes the dyeing of bright colors difficult and adds to the difficulties in the dyehouse, which is the next department we will describe.

Foreign Textile Centres

MANCHESTER.—In the cotton trade the general feeling is that we are in for a season of comparatively low prices. Buyers of grays and other staples are not disposed to operate ahead, satisfied, apparently, that there is no risk of a serious upward movement. Yarn cannot be dear, seeing that so many new mills are about to be constructed, with no corresponding increase in weaving capacity. There are five spinning mills almost completed, and several projected, the total representing over a million spindles. It is a bad thing for the spinning industry that so many new projects are on foot, as it will be impossible to maintain the profits now earned for any length of time. The mill floater, however, does not care about that, and the machinery maker helps him a good deal. The cotton industry in many cases furnishes examples of the tied-house system as far as machinery is concerned. The evil exists also in the wholesale drapery trade, although in response to a question of mine the other day the assertion was made by a high authority that the practice is not now so common as previously I very much doubt whether the statement is correct, for it is about as difficult to get rid of the evil, once established, as to rid one's garden of convolvulus—known in some districts as the "Knutsford devil." The favorable report of the Agricultural Bureau is taken to indicate the possibilities of a large yield, and careful operators are deterred from committing themselves owing to the nature of the outlook. The result is that the market generally has been depressed to an extent not really indicative of the actual state of business. The demand from Calcutta has improved during the past few days, heavier shipments going out by the Clyde and Mersey boats. A few looms are waiting for warps in the Burnley district, but their proportion to the total is certainly not large.

LEEDS.—In Leeds, although the summer season's trade has kept on fully as late in the year as usual, some of the factories are now getting quieter, as the winter season's business has not, so far, opened out well. The stocks in the hands of retailers, left over on account of the mildness of the last winter season, were larger than usual, and so the orders given to travelers on their first journey are correspondingly small. However, a short spell of cold weather in the autumn would soon improve matters. In the heavy woolen districts the state of trade is still generally unsatisfactory, and only a very few firms are well supplied with orders, and it is reported that one old-established firm are about to permanently close their works. In the Morley district, where special attention is given to the production of cheap light-weight cloths for ladies' wear, those makers who have adhered solely to the production of the old-fashioned Melton cloths are quiet, but a few makers who have introduced more up-to-date costume cloths are very well employed.

HUDDERSFIELD.—In Huddersfield there is still a very good demand for the best class of fancy woolens and worsteds, and the leading firms in this trade are very busy. There is also an improved demand for cheap medium-weight vicunas, principally in blacks, which are being used largely, both for ladies' wear and in the clothing trade.

BRADFORD.—From the beginning of the colonial wool sales in London to the conclusion the improved prices of merino wools have been fully sustained, and the competition from all sections of buyers has been extremely keen. Although this demand for fine colonial wools can, to a large extent, be accounted for from the shortage in the supply arising from the poor clip, and the discontinuance on the part of many of the Australian flockmasters to pay the same amount of attention to the growing of fine merinos, there is also distinctly discernible in all manufacturing centres a tendency in the direction of the greater use of plain dress fabrics of a soft fine texture which can only be produced from these fine merino wools. Given, therefore, a smaller supply and an improving demand, the improvement in price was a natural consequence, and there is every reason to expect that this hardening tendency will continue quite up to the end of the year. Although consumers in Bradford have been somewhat slow to follow this upward movement in London, they are, from the conditions of the situation, being gradually forced to accept the higher level of prices established at the sales, and topmakers and spinners are insisting on revised prices on the higher scale. Crossbred wools, with the exception of the very finest qualities nearly approaching to merino in character, have, however, only been affected to the very smallest extent by the improvement noted above in the finer colonials; and, in fact, the inferior and coarser classes of crossbred wools, which have been in very large supply in London, have been a very slow sale throughout the series, and the tops produced from these wools could be procured in Bradford for slightly less money than at the beginning of the month. In sympathy with the lower crossbreds which come most into competition with them, all classes of deep-grown non-lustrous English wools continue in very poor demand, and there has been no improvement in prices. There has been a considerable amount of speculative purchasing of pure lustre wools, some of it coming from outside the ordinary channels of the trade, and as this has been of sufficient moment to affect local stocks, really bright wools are distinctly dearer. The prices of both mohair and alpaca are extremely firm, and although no recent sales of moment are reported, the holders of the sources of supply are so confident of the strength of their position that prices are not likely to recede at present. Spinners of mohair yarn are well employed and under contract for some time to come, either on home account or for the continent, but the trade in ordinary two-fold worsted yarns is still most unsatisfactory, as not only is the trade in both bundle and warp unusually small, but prices are also distinctly lower than ever before known. Representatives from the continental manufacturing centres have been very much in evidence with their collections for the next spring season, but, as far as I can learn, have not met with much success, except in plain goods of the bengaline and cashmere order, in which fabrics they seem to be still somewhat ahead of Bradford makers or dyers, or both. Bradford manufacturers are not yet ready with their new season's ranges, but some of the earliest of them are showing some very handsome novelties in black mercerised crepons, and the result of the experience of the past few seasons in the manipulation of the mohair yarns has enabled them to produce some most stylish effects. There is every appearance of tailor-made coat and skirt costumes being as much worn as ever, both in the coming autumn and spring seasons, and the unfilled and shower-proofed Bradford-made cloths have been so satisfactory in wear, that they are sure to be again in good demand. The end of the half-year seems to have resulted in several changes in the dress goods departments of the London houses, and there is also talk of changes and the discontinuance of certain departments in some of the provincial houses.

KIDDERMINSTER.—The local carpet trade has now reached the quiet period. The most satisfactory feature is that a consid

erable number of repeats come to hand. Very soon manufacturers will be turning their attention to the patterns for the next season. We hear that trade in Scotland keeps very good, especially in tapestries. Local spinners are moderately well employed, but the orders received are just now of a hand-to-mouth character. One point is certain—the spinning trade here, bad as some people regard it, is just now better than it is in Yorkshire.

NOTTINGHAM.—The condition of the lace industry continues dull and unsatisfactory, and the past few days more machinery has been stopped; this time in the fancy millinery branches. A few lines in Valenciennes and Oriental goods are selling, but the demand is only for specialties, and even for these it is not strikingly manifest. Novelties are being withheld for the present. Buyers are watching the tendency of fashions; they profess to see evidences of a decided improvement for the autumn trade. There is little doing in silk laces. A few small orders have been placed, but production has rather decreased than otherwise. Silk veilings are selling rather more freely, but neither manufacturers nor chemillers are fully occupied. The depression in other branches has not influenced prices in the bobbinet, light tulle or spotted net branches. Orders are less plentiful, but the machinery is employed, and the market is free from heavy stocks. Stiff foundation nets are selling slowly, and there is a moderate demand for Bretonne, Mechlin and point d'esprit nets for millinery purposes. Lace curtains, window blinds, furniture lace, and toilets are steady, but machines are not all employed, current prices being too low to allow an adequate profit upon goods produced from second or third rate machines.

SOUTH OF SCOTLAND.—Depressing reports are to hand from the South of Scotland tweed districts. By all accounts this important industry is in a bad way. Orders are very scarce, and travelers state they are difficult to get. There is still a steady demand for worsteds and the better qualities of cheviots, but many of the looms not working these goods are idle. Although wool has advanced in price, there has been no corresponding improvement in the manufacturing business. Hosiery makers report that they are well employed.

KIRKCALDY.—The Kirkcaldy linen trade is not exactly brisk just now, and prospects are not so promising as makers would like. Any deficiency in this industry is made up by the floor-cloth and linoleum one, which continues in a most active state. One is almost inclined to wonder where the goods are to go, so great is the output at the Kirkcaldy factories.

BELFAST.—The holidays reduced the volume of trade in the linen market to small dimensions, but the tone of the market all round is of a more hopeful character. The weather has been good for the flax crop, and although the area sown is considerably below that of last year, which was very much less than its predecessors, there will likely be a good yield. More attention is being given to the manipulation and scutching of the flax, so that quality as well as yield and consequently prices, will likely be higher than of late years. There is little animation in the brown cloth market. A steady trade has been passing in 38 inch powerloom linens for bleaching, both green yarn and boiled yarn qualities being in fair demand at late rates. For town-made goods there is a moderate inquiry. Unions are selling with considerable freedom, but cloth for dyeing and hollands is in dull request. With the approaching termination of the war between the United States and Spain, which is thought now to be within measurable distance, there is somewhat more activity in business with that country.

LYONS.—The Lyons market shows no change. A few buyers were present, but little business resulted, however, on account of the difference of opinion regarding prices. Several orders were submitted, but manufacturers declined to accept them at the prices at which they were offered as the firm tone of the raw silk market renders it unadvisable to sell at reduced prices. The Spanish-American war has not produced the effect which was feared at its beginning, for although the volume of trade has decreased, prices have ruled firm. Work in the mills remains about the same as last reported. In the country a considerable number of looms are idle, but it is a regular lull, as many weavers are busy in the field. With regard to styles no change has taken place. Plain taffetas are continually sought, but mostly in grades and at prices which leave little profits. The demand for finished pongees has rather increased, and there are no stocks in the market. Small brocaded figures are coming more to the front, and small broche flowers in two and three colored effects are being liberally sampled. Looms for these styles are much sought, but only a limited number can be found. A better demand is experienced for plain cotton filled fabrics, principally satins, of which considerable quantities were bought in colored grades, the low priced qualities receiving the preference. The favorable outlook for velvets continues, and it is thought that the activity in this brand will still further increase. Good orders were placed for plain velvets in blacks and colors. The millinery trade has declared itself decidedly in favor of velvets, and will use large quantities, and with regard to dress trimmings the outlook is also much more favorable. Fancy velvets are much sought, but it is noticed that Paris shows some hesitancy in taking them up. The orders received are mostly from abroad, England being conspicuous as a buyer. The styles are mostly in ombre, raye or quadrille, while brocaded effects do not receive much attention. While in plain velvets blacks sell best, colored effects in fancies are principally sought. The demand for ribbons is daily increasing. Satin ribbons in good qualities sell very freely, and among the fancies stripes lead, while faconne styles are neglected. The demand for velvet ribbons continues heavy, both in blacks and colors, and some velvet ribbons with broche effects find buyers. The demand for mousseline ribbons has fallen off.

CREFELD.—This market has been very quiet; no buyers have been present lately and mail orders are insignificant. More activity will manifest itself when the travelers start next month for fall orders. The position of the mills has changed somewhat and is unsatisfactory. Many old orders have been completed, without the receipt of a sufficient number of new ones to supply the necessary work. The decline in activity has been very gradual, and at first failed to attract attention, but the feeling of cheerfulness has now to a large extent departed. Staple lines, which form the most important part of the work for the mills no longer find the liberal outlet and the mills are consequently forced to curtail production. Manufacturers making specialties continue busy, but they only employ a small number of hands. The best demand continues to come from the manufacturing trade. Lining silks continue in good demand, but materials for blouses are less sought, although there are no indications that these garments will be less popular than they have been. The principal fabrics are naturally taffetas, plain and fancy, which will continue to hold the lead for some time to come. There is, however, a change with regard to styles, and most of those in favor during the spring have disappeared.

For the present stripes and checks in new designs are sought exclusively, and opinions are divided as to the relative popularity of these goods. Brocaded figures are being more freely sampled. However, the old flower designs have been succeeded by small motives. Fashion seems to favor very small effects irregularly arranged over plain grounds. The good opinions of moires continues, and orders for moire velours, although at rather low prices, still figure prominently among silks secured for fall. The velvet trade has steadily improved. A great many orders have been received on plain goods, which will keep the mills busy during the greater part of the season.

It is, however, noticed that manufacturers producing low grades, especially those in the country, have met with better success than the houses making fine grades. But these latter have no reason to complain, and there is no longer any doubt that the velvet trade during the coming season will be decidedly better than during recent years. Orders for fancy velvets are quite numerous, especially from England and the home market, but some disappointment is felt that dealings have been almost exclusively confined to lowest grades. For this reason it is feared that the fancy velvet fashion will be of short duration.

ZURICH.—The deals in raw silk showed a marked falling off during the week under review, on account of the too rapid rise in prices, which local mills are not willing or in a position to follow. Lower prices had been expected with the appearance of the new silk, and some purchases had been delayed in this expectation. Present prices, therefore, are viewed with little favor, and hopes are entertained that a more favorable moment may present itself later on. The market is no doubt benefited by this attitude, as the requirements may soon become pressing *No nervousness is, however, displayed by the mills*, the majority of which are provided for some little time. With regard to the work in the mills, no complaints are heard; on the contrary, there appears to be abundant work for the rest of the year, and it is only with regard to prices that business is not quite satisfactory. From Bale come favorable reports, there being a good demand for the different staple lines of ribbons. Better grades, however, appear neglected and orders for fancy ribbons are not up to expectations Broche styles in particular have not met with the expected demand.

CHEMNITZ.—Chemnitz is at present a pretty busy town Although the shipments of goods are not very large, manufacturers have all the work they can do to get sample lines ready for the buyers who will not come across this season. During the last few weeks a good many orders for staple goods have been taken, and it looks as if the business would pick up quickly If a large demand for staple goods should result, an advance of prices would very likely take place, as a good many machines have been changed to make fancy hosiery. As long as the mills can secure work of this kind they will not return to staple lines, as changing machines costs money and time, besides many working people have turned to other industries and help would be scarce. On drop-stitch and Richelieu ribbed goods, in fact, on all similar goods, longer deliveries will be called for, as the manufacturers cannot turn out enough of these. Herringbone soles will be one of the leading articles for the coming season, and heavy orders have been placed for the goods, buyers thereby providing for prompt deliveries. Maco foot hose will also be called for a good deal. In fancies an almost endless variety of styles is shown. Plaids are in only light demand, but the veftical embroidered stripes are still used for making the woven patterns more effective. Ombres and Roman stripes will also sell well, as will printed and embroidered goods. Lace hosiery, too, promises to play a prominent part in next season's business. For men's wear, herringbone soles will be in good demand, and lines of these goods at all popular prices can be found in the market. In fancy half-hose the more modest styles will be preferred. The contrary is true of ladies' goods, in which loud patterns find ready sale. Trade in silk-plated goods is very light, but finer grades of lisle hosiery are selling much better. In gloves business is fair. Buttons and clasps are called for mostly. Silk gloves are only selling in the better qualities, but taffetas are taking well in all grades; also taffeta imitations in lower-priced goods, where they will give much better satisfaction to the consumer than a poor silk taffeta costing the same price. For children's wear, button gloves will also be largely used, while for ladies' wear the larger percentage of goods ordered is for black. Misses' gloves are taken mostly in navy and seal. Bicycle and other sporting gloves are shown this season in a large variety.

HOW ODD LOTS OF YARN CAN BE UTILIZED.

A colored goods manufacturing concern, to be worked on a satisfactory remunerative scale, must have all details carried out with a view to the strictest economy, writes "Pick" in The Recorder.

The yarn room and the warping room of a mill are often the scenes of laxity, and accumulations of varied lots or small quantities of disused counts and colors are found to be of considerable dimensions in a short space of time. The accumulations may be the leavings of completed orders, occasional miscalculations, or the yarn may come from the dyers in a state not satisfactory for the particular work for which it was intended, and a second supply correctly dyed leaves the first quantity on hand. This first quantity is often returned to the dyer, and the price taken off his account, but in other cases the yarn is left on hand to be used at the mill. A few manufacturers rid themselves of these accumulations by making a warp from the oddments of warp yarn, and picking it with the oddments of weft. This cloth, with its often objectionable combination of colors, is sold to the female employees, who wear it over their aprons; but any intervention of this kind tends to create a loose, slovenly disposition, which should be studiously avoided in manufactories where neatness of work is essential. Also, this method of using up the odd yarns detracts from their selling price as compared to their use in marketable cloth. Striped goods allow of the introduction of a considerable quantity of threads of odd yarns at the edges of the colored stripes Threads of indigo much lighter in shade than the body of the stripe would pass muster if placed at the edge of a blue stripe at the positions where it borders on to a stripe of white. Threads of from two to four counts finer than the body counts are used in these positions, also blue stripes edged with dark green may be inserted without any conspicuous results.

When cloths are built with a preponderate amount of weft, colors of even greater distinction may be safely introduced in the warp. The alien threads should be placed at regular intervals across the cloth, and not used lavishly at the commencement of a warp, compelling the use of another kind at the finish, as any irregularity serves to make their introduction more conspicuous. The Oxford weave of cloth allows of the introduction of these threads if heavily wefted, but if only lightly wefted it is dangerous to venture far, because the two working together occasionally change positions, and a thread which is light and intended to edge the white stripe may occasionally come second in position, and appear rather prominently. Sateens and similar warp-faced cloths should be treated cautiously, as they show up the imperfections of the warp so clearly; but designs containing narrow stripes of two or more threads may be treated in so far as these stripes allow.

Matting stitches and corded stripes are found very accommodating, as fewer threads of a coarser count, or more threads of a finer count, can be inserted without the least fear of detection. Very coarse counts may be used in place of two threads in the Oxford cloth, or a moderately coarse thread and a fine thread may be run together to substitute two threads of medium counts. For example: If an Oxford cloth be made from 32's counts of warp, and it contained a stripe the color of which was similar to that of some 24's, the 24's might be utilized by placing a thread of 40's as its fellow thread; the coarseness of these combined is so near that of two threads of 32's as to be unobserved.

In figured fabrics the weave of the cloth must be taken into account when introducing alien threads, because the weave has considerable influence in covering or disclosing the variations In some weaves the edges of the stripes are thrown up very prominently, while in others they are subdued more than in the plainer weaves.

It is of great advantage to the management of the preparation department if the person in charge has some knowledge

and experience of the woven cloth, because, in addition to the placing of odd threads in positions least inclined to show them, any tendered or soft-sized yarns might be placed in positions the least likely to carry the strain of the warp, or be subject to an undue amount of friction in weaving. In the dobby Harvard shirting the figured stripe is often principally composed of the calico order of weave and requires a well sized and strong thread, because the figured stripe threads interweave frequently, and, as a natural consequence, take up more yarn than the ground portion, and bear all the strain in pulling round the weaver's beam. Another design may have a figured stripe working four picks up and four picks down, this stripe would work slack and take a more tender or soft sized yarn, or if a four end matting is used a tender thread would be easily carried through its work along with three threads of ordinary strength.

The accumulations of weft yarns also require vigilant attention, especially in cases where self-colored cloths are manufactured. Spotted hanks or weft yarn, not even in color, would show their imperfections very clearly if woven into self-colored cloth, but these can be used in many small checked patterns without risk of injury to the cloth. If the weft is too fine for a suitable checked cloth, another thread (the counts of which will bring up the imperfectly dyed yarn to the required counts) may be doubled with the fine counts. A twill checked cloth is often treated with odd weft in this way, as it is fairly well covered with the warp. The advantage of using oddments of weft is the safety with which they may be used, because a few picks may be inserted as a trial before proceeding to weave a quantity. Dark green and indigo, prune and indigo, and other mixtures have been inserted (instead of a coarse indigo weft) in a twill cloth, and still the difference in appearance is very slight.

A novel mode of using very coarse indigo weft in a twill cloth is to place one pick in a bar instead of two, as originally intended. This is done in an ordinary check loom, provided with a dobby, by placing one pick in the cloth and the return pick on the top; all the healds are depressed, in order to allow this to take place. When the next bar of indigo is required, the first pick is sent over the warp, and the second pick is inserted in the cloth. The shuttle is arranged to put a quantity of drag on the coarse weft, sufficient to take up the loose weft on its second return; also, the temples require to be set a good distance back, to prevent them gripping the loose weft.

Soiled white wefts are often used in the small white bars of a checked pattern, an extra shuttle being employed for this purpose. The designer may be of great service if he is in touch with the practical work of the mill; because, when arranging new cloths, he can keep an eye to the introduction of those colors and counts of weft which are likely to accumulate from other cloths in course of manufacture, and especially when these are of solid color, as previously mentioned, the accumulations are generally large when the best results are acquired. In order to double the yarns (which are required to be used instead of a coarser yarn), one of the winder's pirns may be arranged to wind the weft from two pirns placed in a vertical position, a little tension being placed on the threads in their course. These threads will require very little attention, as the weft is very unlikely to break during the unwinding from the pirns. The system described necessitates twice winding of the thread, but the extra expense is more than recouped by using the weft to greater advantage.

If persistent advantage were taken of every opportunity for using up the accumulations of odd warp and weft yarns, and every attempt was made to keep down the causes of accumulations, the yarn room of many manufacturing concerns would be less crowded, and better order, system and economy obtained.

SOAP.

A MOST IMPORTANT ARTICLE IN TEXTILE BLEACHING AND COLORING.

Soap is a most important article in the textile bleaching and coloring trades, seeing that it is used in so many branches remarks the Dyer and Calico Printer. Essentially it is a combination of fat and alkali, soda in the case of hard soaps potash in the case of soft soaps. The fat varies in different kinds of soaps, but in the best makes is usually tallow, palm oil olive oil, cocoanut oil, cotton oil, or linseed oil. The value of soap depends upon the oil or fatty matter used in making it An olive oil soap is worth more than a tallow soap, and the latter more than a linseed oil soap. Cheap soaps are made from low-class oils and fats, while to cheapen them there is often used resin in place of the fats, while filling agents like starch and silicate of soda are often added The bleacher and textile colorist wants a pure soap made without any of these fillings; in particular the calico printer requires that his soap shall be free from resin

An analysis of a sample of soap will comprise the determination of the following constituents—fatty matter, alkali and water. The fatty matter may be present in two conditions, one as free fat, the other in combination (the combined fat) with the alkali to form the soap, the less free fat there is the more complete has been the saponification of the fat and the more perfect the soap. The alkali may also be present in two forms --free, which represents an excess of alkali used in making the soap; combined, that in union with the fat in the soap. The water is best determined by taking an evaporating basin, then placing in this 10 grammes of the soap in the form of fine shavings, placing the basin with its contents in a hot-air oven and kept at a temperature of about 220 deg. F until it ceases to lose weight. The loss of weight represents the water present in the soap; the average quantity in a good hard soap is 25 per cent. some makes reach 30 per cent.; soft soaps contain more, usually about 50 per cent. The alkali and the total fat may be determined by the following series of operations: Ten grammes of the soap are dissolved by boiling with water; when a clear solution is obtained one or two cubic centimeters of an alcoholic solution of phenol phthalein is added, when if there be any free alkali present the soap solution will turn red; from a burette a standard solution of sulphuric acid is run in until the red color is destroyed, when the volume of acid solution used is noted; this, multiplied by 0.04, and then by 10, gives the percentage of free alkali present in the soap. To the same soap solution a little methyl orange solution is added, and the standard sulphuric acid solution run in until the color turns from yellow to pink. While doing this test, the soap solution should be kept hot. The volume of acid solution used, multiplied first by 0.023, and then by 10, gives the percentage of combined alkali (as the metal sodium) present in the soap. The less free alkali and the more combined alkali the better. There is then added to the soap solution a little more acid, so as to have an excess of acid present; the fatty matter of the soap is thrown up in the form of opaque curdy masses; there is then added a quantity of petroleum ether, which dissolves all the fatty matter; the mixture is now poured into a separating funnel, and the glass rinsed out into the funnel by using some petroleum ether. The contents of the funnel separate themselves into two layers, the lower one an aqueous one, the upper one an ethereal layer containing the fatty matter of the soap. By turning on the tap of the funnel all the aqueous layer can be run away.

Clean warm water is poured into the funnel to wash the other layer; the water is ran off and the ethereal layer run into a weighed glass; this is placed first in a water bath and then in an air bath, and the ether driven off by heat, leaving the fatty matter behind; this is weighed, and the weight multiplied by

to gives the percentage of total fat present. A good soap will contain 60 to 64 per cent. of fatty matter. The free fat, if there be any present, can be ascertained by taking the dried shavings of soap from the water determination, placing them in a Soxhlett fat extraction apparatus, and extracting for an hour to an hour and a half with petroleum ether; on evaporating off the ether in a weighed glass the free fat in the soap is left behind and can be weighed. In a good soap the whole of these constituents, as thus determined, should add up to 100, or even slightly above that number.

It would take up too much room to discuss the bearing of all the figures to be obtained on the quality of the soap for use, because the requirements vary in the different branches of the trade; the calico printer requires a more neutral soap than the wool scourer, while the fuller must use a neutral and non-fatty soap. One more point remains, and that is the question whether resin has been used. This is, perhaps, most conveniently determined by means of Gladding's test carried out in the following manner: Four grammes of the soap are dissolved in methylated spirit and boiled for a short time with the object of completing the saponification of any free fat that the soap contains; then a quantity of ether is added and a little powdered silver nitrate, the mixture is left for an hour, shaking at intervals; then it is filtered, the filtrate is put into a separating funnel with water and a little sulphuric acid, the aqueous layer is run off while the other layer is run into a weighted glass, and, on evaporating off the ether, the resin is left behind.

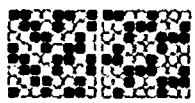
Soap should always be bought on a guarantee of containing a fixed percentage of fatty matter, free from resin or filling matter.

Textile Design

FANCY WOOLENS.

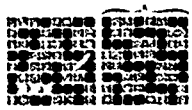
A few simple weaves useful for fancy woolens are supplied in Designs one to four. They may be successfully employed in either cheviot or Saxony yarns. Design 6 requires special treatment in the warp coloring. During the fifties fancy wool and silk twists were pretty extensively introduced into the better class of all-wool fabrics, and this is a design which, if used in woolens, should be developed on these lines. The four ends of upright twill ought to be fine twist yarn, preferably wool and silk or worsted and silk. In this way a smart and bright tone is given to the combination of the whole.

DESIGN 1.

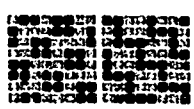


DESIGN 2.

24



DESIGN 3.



DESIGN 4.

—Roberts Beaumont in the Textile Recorder.

ARSENIC IN WOOL.

The following letter from J. H. Pearse, president of the Kidderminster Chamber of Commerce, appears in The Lancet of June 9th:

To the Editors of The Lancet:

Dear Sirs,—Can you spare space in your valuable journal to ventilate the question of disadvantage or injury likely to arise or not from woolen apparel and other goods containing traces of arsenic? In Sweden there is a law against the sale of material containing arsenic in any way over a minute trace. Thus, yarn is not allowed to be sold in that country if it contains 0.0009 per cent. of arsenic—or 20 cwt. of yarn may contain up to 9 grammes of arsenic—but if it contains more it will be condemned and not allowed to be sold. It is known that the Swedish Government have condemned a heavy carpet because it contained one thousandth part of a grain of arsenic in 16 square inches—that is, one grain (possibly in a completely non-volatile form) in a piece of carpet 10 feet. The Swedish law is a source of great trouble and annoyance to our manufacturers and merchants who do business in Sweden in the wool branches of the textile trade.

I believe it is nearly if not quite impossible to buy any sheep's wool (Home or Foreign grown) that does not contain arsenic in larger quantity than that allowed by the Swedish Government. This arises from the fact that all sheep growers are obliged at certain seasons to dip their sheep in a special chemical preparation to keep the animals healthy and in good order, and it is admitted that all effective sheep dips contain arsenic. Cooper and Nephew, of Berkhamstead, large manufacturers of arsenical sheep dip, state that they supply dip sufficient each year for one-fourth the sheep in the entire world, and they have proved by experience that their dip improves the fleece, and I understand that it is their opinion that one half the woolen fabrics worn in England are made with Cooper dipped (that is arsenical dipped) wools.

The arsenic from the dip clings so tenaciously to the wool fiber, that even the two or three scourings with hot water soap and alkali, together with the various other treatments and manipulations of carding, cobbing, spinning, dyeing and weaving, which the wool or yarn goes through before it becomes finished cloth, fail to destroy or get rid of the drug. It has been suggested to me that some of the readers of The Lancet may be in a position and willing to help the home trade, by giving information as to the injury or otherwise likely to arise from materials made from the wool treated as above named, and as to the maximum quantity of arsenic that might be allowed without injury to health, in a given weight or size of cloth. Such information would I think be very valuable to all spinners and manufacturers engaged in the wool branches of the textile trades. I think it is well to add that the Swedish way of analysing for arsenic is described in The Chemische Zietung of 1892, page 420. So far I have in a sense appealed to your readers only, but I am in hopes that you, Sirs, may also be induced to favor all interested in the matter with your opinions, which I am sure will be of considerable value. I am, Sirs, yours faithfully,

JOHN H. PEARSE.

President Kidderminster Chamber of Commerce.

THE CAUSES OF UNEVEN COLORS ON COTTON YARNS.

Although the causes of uneven shades on cotton yarns are legion, they may be discussed under three general heads, viz., the imperfect preparation of the yarn before dyeing, an improper condition of the dye bath, and insufficient or careless working. To the first of these heads may be referred over one half of the cases which perplex the dyer. As the first step in the production of an even color, the yarn must be thoroughly wetted out, which is done by boiling in clean water from two to four hours. No amount of care in the after processes can compensate for insufficient wetting out. The yarn should next be rinsed in the kier with several cold waters, and if not for black or very heavy shades, should be undone from the bundle and washed head by head in cold water. If the outer parts of the heads are allowed to dry before dyeing, says a writer in an English paper, they will show up much lighter at the last, for while they are being re-wet in the dye bath the rest of the head is busily absorbing color. Where yarn has to be previously mordanted with sumac or some other form of tannic acid, great pains should be taken to secure a perfectly even preparation, as an uneven preparation will invariably produce an uneven shade. Then in the subsequent "fixing" with salts of tin or antimony.

if an insufficient amount of the "fixing" substance be used, some of the tannin remaining loose on the yarn will "bleed" into the dye-bath, producing therein the insoluble precipitate which should be ingrained in the fiber, which not only tends to unevenness but wastes dye-stuff. If the yarn be given a heavier preparation than the shade needs on entering the dye-bath, the greater part of the color goes on one end, and the yarn appears "belted." If, after preparation the yarn is wrung for dyeing instead of extracted, care should be taken to wring evenly, as a "pinched" spot comes out light when dried. The bleaching of yarn for light shades is a prolific source of unevenness. If the bleaching liquor is not thoroughly washed out, or if the yarn is not properly scoured, or is not well washed after the scouring, the dyer will know of it later. Especially should the acid be washed out if the yarn is to be subsequently softened with soap, as any remaining acid would unite with the alkali of the soap, and the fatty acid thus liberated would form a "resist" on the yarn. So, too, if alum is to be used in the dye-bath, as with the cotton blues, the soap should be rinsed out with at least two warm waters, or the sulphuric acid of the alum will produce the same effect as the free acid of the scouring bath. As perfect evenness of the yarn is essential to an even color, so, too, is perfect evenness of the dye-bath. Spots, as distinguished from streaks, are generally caused by particles of undissolved color, by the insoluble tarry matter of some dye-stuffs, or by the scum which gathers on the surface of "standing" boxes. Careful dissolving of the dye-stuff, with stirring and subsequent straining of the solution through a cloth, will prevent any trouble from the first and second causes, and as for the last, the first step toward the use of a "standing" box should be the careful removal of all scum from the surface. It ought not to be necessary to say that a dye-bath should be thoroughly raked and stirred up at the start, and after each addition of color; but a workman's carelessness or negligence in this may work much mischief. Many colors which work very unevenly at a high temperature may be got perfectly in a cold or tepid bath. The proper heat is only to be determined by experiment, but it is always safe to begin with a cold bath. If proper care is exercised in the preparation of the yarn and of the dye-bath, careful work alone is necessary to produce an even color. On entering the dye-bath the yarn should always be worked rapidly for a few minutes, and the same after each addition of color. If the yarn is to be washed, the washing should not be postponed until the dye-liquor has drained into the lower part of the yarn, but should be done immediately, and with proper care in extracting and spreading on the drying poles there is no reason why the finished product should not be perfectly even and level. Thus it is seen that constant care is necessary in all the stages of the work, for carelessness, in one form or another, is the only cause of uneven colors on cotton yarns.

TEXTILE IMPORTS FROM GREAT BRITAIN.

The following are the sterling values of the textile imports into Canada from Great Britain for June and the six months to June, 1897-1898.

	Month of June		Six months ending June.	
	1897.	1898.	1897.	1898.
Wool	£3,877	£ 1,841	£11,991	£22,953
Cotton piece-goods	18,299	26,335	200,720	238,565
Jute piece-goods	14,327	12,998	54,087	67,977
Linen piece-goods	8,735	8,892	58,077	67,697
Silk, lace	277	232	2,922	4,181
" articles partly of	655	1,327	8,302	11,081
Woolen fabrics	15,881	18,218	102,429	109,426
Worsted fabrics	47,225	31,202	275,417	282,824
Carpets	4,244	6,962	81,632	99,288
Apparel and slops	14,029	16,284	132,110	154,892
Haberdashery	4,764	3,665	75,901	76,988

FABRIC ITEMS.

T. H. Reid, formerly traveler for Murdoch's Nephews, Halifax, N. S., has taken a position on the road for J. Vassie & Co St. John, N. B.

The John D. Ivey Company, Ltd., Toronto, incorporated by Ontario letters patent, will do business in Montreal with *John D. Barry and Company* as agents.

Ferdinand Cloutier, the Winnipeg merchant who was brought to Montreal in June for trial on a charge of obtaining $10,000 worth of goods from Montreal firms under false pretences, has been acquitted.

Z. Paquet, the great St. Rochs dry goods dealer, has retired, upon a fortune said to considerably exceed a million dollars. His extensive business will be continued under the same style by his son, the new senator, the Hon. J. A. Paquet.

A shocking bicycle accident occurred in Montreal, July 30th, by which Harold Wright, a young man in the employ of Horsfall Bros., clothing merchants, of 1851 Notre Dame street, lost his life, being crushed beneath a street car. The deceased was the son of David Wright, the cashier of the Canada Life Insurance Company, Montreal.

Upon the demand of the Central Thread Agency, an assignment has been made by Tanguay & Beland, jobbers in fancy goods, Quebec city. The firm has been in existence only since January, 1897, when they succeeded to Beland & Vezina, who failed just previously. Mr. Tanguay had been in the retail dry goods business unsuccessfully.

The wholesale millinery firm of Reid, Taylor & Bayne, Toronto, is under a cataclysm of law suits, there being no less than five suits in progress. Three actions are by members of the firm against each other, and two are by the Quebec Bank against the firm. The firm was established in 1886, and at the time of its legal difficulties its assets were valued at $200,000.

Judge Falconbridge reserved judgment in the action brought by the Quebec Bank to have a receiver appointed for the interest of Hugo Block in the estate of Reid, Taylor & Bayne, and for the immediate realization on the assets. The petitioners applied for a receiver on the ground that there were inward dissensions in the firm, and that the partnership would soon be dissolved. Ample evidence was put in to show that these allegations were untrue, as the assets of the firm were $102,000, while the liabilities were but $35,000. Messrs. Taylor and Bayne opposed the sale of the assets at the present time, as they would not realize their full value. John Rennie, another creditor of Mr. Block, opposed the sale for the same reason.

The *Montreal Gazette* says: The perfect understanding and good feeling that has existed for many years past between the French-Canadian residents along the Lower St. Lawrence and their English-speaking friends who pass the summer season at the different Canadian watering places, received a splendid exemplification the other day at Notre Dame du Portage. Mr. and Mrs. Charles S. J. Phillips, of this city, who have had their summer cottage amongst these worthy people for over twenty years, have just celebrated their silver wedding, and one of the most welcome and touching expressions of good will received upon the occasion of this happy anniversary was an address from Madame Nadeau (a near neighbor), her family, and other friends. The Phillips family belong to the Baptist communion, yet this fact did not prevent the beautifully-worded address from being composed by a member of the French Catholic clergy. The above incident refers to Mr. Phillips of the well-known stationery firm of Morton, Phillips & Co.

In connection with the failure of the W. E. Gillespie Co., limited, of Penetanguishene, W. E. Gillespie, who was arrested on a charge of false pretences in obtaining goods from Thibaudeau Bros. & Co., Montreal, applied for a writ to obtain his release, but the application was refused, and he remains in jail. A short time ago he claimed a surplus of $6,000, but when the assignment was made the liabilities were found to be $17,710 with assets about $2,700. Among the dry goods creditors are, from Montreal, Thibaudeau & Co., $7,000, M. L. Schloman, $324.22; W. Agnew & Co., $273.05; James Coristine & Co., $172.07; John Horsfall & Sons, $120. From Hamilton, Knox, Morgan & Co., $495.53. From Toronto, S. F. McKinnon & Co., $1,500; Lailey, Watson & Co., $833.29; W. E. Chalcraft & Co., $277.70; A. A. Allan & Co., $261.13; H. Bradshaw & Sons, $225.33; E. J. Dignum & Co., $133.86; E. Boisseau & Co., $106.90.

SHEEP WITHOUT WOOL.

The principal kind of meat consumed by the people of Arabia, both native and foreign, is the mutton of the Somali, or black-head sheep, and, no matter by whom eaten, all pronounce it the best mutton ever tasted. This sheep, as its name indicates, is from the Somali country, on the African coast. These sheep have no wool, but short, fine hair, similar to that of the dog. The most peculiar thing about them is that they have a large lump of pure fat growing right at the root of the tail, and this fat varies in size and weight according to the condition of the sheep. A medium-sized lump of this fat weighs about four pounds. Such a sheep, which weighs from 35 to 40 pounds, is sold at from 4 to 5 rupees (85 cents to $1.05). The skin, when sun dried, is exported, and large quantities of them go every year to the New York market, where they are known as "Mocha skins," but like the "Mocha coffee" of commerce, this is merely a term and nothing else. In 1897 these skins were imported into New York to the value of $628,226.

LITERARY NOTES.

The midsummer number of the Canadian Magazine is one of more than usual interest. Much of it is Canadian, and the things Canadian are not those matters of every day whose description, unless done by a master hand, is a weariness, but are bright pictures of things so unusual as to be fascinating, or else having the charm of long ago about them. Of these the most pleasing are by Wm. McLennan and W. A. Fraser.

We have before called attention to the excellent work done for the United States Government by Charles Richards Dodge, special agent in charge of investigations relating to fiber plants. Mr. Dodge has reported on the possibilities of developing in the United States the culture of ramie, manilla, sisal, and other plants of the hemp character, and in a pamphlet of 80 pages, he now gives us an instructive account of the growth and manufacture of flax as carried out in the United States and in Ireland and Holland. Comparisons are made from a purely agricultural standpoint of the value of flax as against other grain crops, and an account is given of the methods of cultivation adopted in the northwestern states and in the State of Washington on the Pacific Coast. The subject is illustrated with several photo-engravings, depicting flax farming in Minnesota and other places. Mr. Dodge's excellent reports are an example to our Canadian Department of Agriculture.

The August number of The Century has a number of features of special timeliness, notwithstanding which the endeavor has been made to keep up The Century's standard in engraving and printing. Mrs. Mary Bradford Crowninshield writes a striking romance of a Spanish-American dictator, the title of her story being "Sangre de Cristo." Frederick A. Ober, late commissioner in Porto Rico for the Columbian Exposition, contributes a paper on "The Island of Porto Rico," in which he describes the characteristics of the land and the people, and tells of the vast resources of the island. Osgood Welsh, an American sugar-grower, brings out new facts in "Cuba as Seen from the Inside." Both of these articles are fully illustrated. Walter Russell gives the impressions of "An Artist with Admiral Sampson's Fleet," with sketches from nature of bombardments and the capture of prizes. Surgeon-General George M. Sternberg, of the United States Army, discusses "The Sanitary Regeneration of Havana." Dr. Sternberg believes that it is possible to stamp out yellow fever and other epidemic diseases, but that the task will be one of great magnitude and expense. Hon. Frank A. Vanderlip, assistant secretary of the treasury, presents "Facts About the Philippines, with a Discussion of Pending Problems." Wallace Cumming, an American business man, pictures "Life in Manila," and there is reprinted from one of the first numbers of The Century an amusing article called "A Middy in Manila," written by Frederick H. Paine. The destruction of the Spanish fleet in Manila Bay is described by three eye-witnesses, there being narratives by Col. George A. Loud, Dr. Charles P. Kindleberger, junior surgeon of the "Olympia," and Joel C. Evans, gunner of the "Boston." There is also given Col. Loud's diary, written during the battle. The series of papers on Confederate Commerce Destroyers is brought to an end with accounts of the cruise of the "Georgia," by James Morris Morgan, and of the "Shenandoah," by John Thomson Mason. Gustav Kobbe tells of "The Trumpet in Camp and Battle." A second paper by Herbert D. Ward on "Heroes of the Deep," is illustrated by Varian. Andre Castaigne pictures two more Wonders of the World, the statue of Zeus and the Mausoleum. Timothy Cole engraves one of Sir William Beechey's pictures, and there is a fine reproduction of one of Gilbert Stuart's portraits. "Mark Twain" is represented by a characteristic article, "The Austrian Edison Keeping School Again." E. Kay Robinson tells "How India has Saved her Forests."

CANADIAN TEXTILE PATENTS.

The following Canadian patents of textile interest have been recently granted:

No. 59,475.—Garment support; Geo. McKnight, Toronto.

No. 59,479.—Improved corset; Franklin Kellogg Hicock, New Haven, Conn.

No. 50,547.—Art of waterproofing fabrics; Lyman Prentice Converse, Chicago, Ill.

No. 59,587.—Waterproofing composition; Chas. James Grist, London, Eng.

No. 59,714.—Improved loom; William Weaver, Norwalk, Conn.

No. 59,715.—Improved loom; William Weaver, Norwalk, Conn.

No. 59,806.—Fabric cutting tool and method; Charles William Cohn, New York, N. Y.

No. 59,832.—Stiffening fabric; Edward Kirk Warren, Three Oaks, Mich.

THE WOOL MARKET.

Montreal.—All fine merino wools are advancing. Fine qualities Cape and B. A. pulled are 7½ to 10 per cent. advance but the manufacturers are all buying sparingly, as they say they cannot get any advance on their manufactured goods. Since the war was at an end a firmer tone prevails in the States markets. The advance in London and France is quite 10 to 15 per cent. on all merino wools.

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.

L. H. Lemoine is travelling for the Anchor Knitting Co., Almonte, Ont.

The Brantford, Ont., cordage works, closed for the season, July 25th, throwing 50 hands out of work.

W. Andrews & Co.'s woolen mill, Thornbury, Ont., was burnt down some time ago; loss over insurance was $5,000.

The Middleton, N. S., Clothing Co., Ltd., has been incorporated to manufacture and deal in clothing; capital, $5,000.

The carpet machinery and stock of Ward & Co., Elora, Ont., is still for sale in the hands of Henry Barber, Toronto.

The Berlin, Ont., Brush Co. has assigned to C. S. Scott, Hamilton, Ont., as the result of the losses from the recent fire.

A joint stock company is being organized to do a provision packing business in the buildings of the Weston, Ont., woolen mills.

The Sherbrooke Yarn Mills Co., burnt out June 15th, is selling off the machinery saved from the fire, and will not resume business

The St Croix Woolen Manufacturing Co., of Newport Station N S whose mill is at present closed, may succeed in re-organizing

Telfer Bros., Collingwood, Ont., lost about $500 in a small fire in the bleaching house of their Clarksburg, Ont., woolen mill, July 15th

The name of the company owning the St. Croix Paper Mills, has been changed to the St. Croix Paper Mill Co., Ltd., H McC Hart, manager

The International Tent Manufacturing Co., Ottawa, is said to be doing quite an extensive business in various cities in the United States in British flags

M. B. Perine & Co., Doon, Ont., have this year manufactured a large quantity of binder twine from flax owing to the scarcity of manilla and sisal.

The St. Lawrence Blanket Co., Gananoque, Ont., organized less than a year ago to manufacture blankets for the Klondyke trade, is now winding up business.

The John Routh Woolen Mill at Campbellford, Ont., is for sale by Geo Reid & Co., Toronto. The water power on this property develops 75 horse-power.

John Houston, who has filled the position of watchman in the Mississippi Woolen mills, Appleton, Ont., for a score of years has been succeeded by John Hall.

John Moore, rubber manufacturer, died suddenly a short time ago at the residence of his son, J. B. Moore, Boston, Mass He was formerly a resident of Toronto.

Dick, Kidout & Co are now running their bag mill at Cobourg, Ont., in a new brick building erected during the past month The woolen mills will be running by October 1st.

Nathan Uttley, who has been for seventeen years engineer of the Waterloo woolen mills, and ranks, with his wife, among Waterloo's most highly esteemed citizens, celebrated his silver wedding recently.

J. Moore, W. A. Magor, L. H. Gault, W. C. Finley and C. A. Duclos, Montreal, have applied for a Dominion charter as the Moore Patent Pocket Co., Ltd., to manufacture clothing and tailors' devices.

The Glen Tay, Ont., woolen mills are for sale, and have been placed in the hands of Geo. Reid & Co., Duke street, Toronto. This property has a water power which develops 200 horse-power.

Quite a stirring industry is furnishing employment to a lot of people over in Yarmouth, N. S., caused by the drying up and shipping of eel grass. It is used for making certain classes of paper and for sheathing purposes.—Fredericton Reporter.

The Hope woolen mill, Garden Hill, Ont., will probably be operated in future by a joint stock company, which is being organized for the purpose. A high class of tweeds will be manufactured and Canadian wool will be used exclusively.

Henry Scott, formerly employed in the Brodie Co.'s mills, Hespeler, Ont., who about June 1st started up at Guelph, Ont., as a hosiery knitter, operating three hand machines, has decided to close down his business in Guelph, and may return to the employ of the Brodie Co.

Wm. Graham, whose manufacturing experience is of much value in aiding in the selection and buying of wools, is now doing business as a wool merchant, handling both foreign and domestic wool. His offices and warerooms are at 54 and 56 Wellington street east, Toronto.

Robert Mercer, Almonte, Ont., arrived home last week from Massachusetts, where he was engaged in one of the big factories for a time, but it has closed. Mr. M. says the war is playing havoc with the manufacturing industry in Uncle Sam's domain.—Almonte Gazette.

Juha Reverski, who operates a loom at the Waterloo, Ont., woolen mills, contrary to the rules of the factory, recently tried to clean her loom while in motion. The waste she was using caught in the gearing and drew in her hand, crushing it badly one of the fingers having to be amputated.

The many friends of Geo. W. Ward, of Alton, Ont., and formerly superintendent of the Almonte Knitting Co.'s mill, will be sorry to hear that his health has of late been a source of alarm to his relatives. It is a continuation of the illness from which he suffered before he left here.—Almonte Gazette.

The Dominion Cotton Company, in applying to the Kingston council for a bonus of $25,000, promised to employ 250 hands, at an annual wage of $90,000; to spend $150,000 on new plant, and run every working day in the year except fifteen days. The terms were accepted by the council, which made a stipulation for indemnity in case of breach of the agreement.

J. J. Westgate, C. L. Higgins, Montreal; B. W. Higgins, H. E. Higgins, St. Paul, Que., R. Lucas, Lachine, Que., have been incorporated as the Hudson Bay Knitting Company, capital, $50,000; headquarters, Montreal, to manufacture and sell knitted goods and other articles of clothing, and all kinds of rubber, woolen and cotton goods and boots and shoes.

The Bluevale, Ont., flax mill has commenced operations.

Improvements have lately been made on the Tay Knitting Mills, Perth, Ont.

W. Cairns, Berlin, Ont., is having a new electric motor put in his glove factory.

The Empire Carpet Company, of St. Catharines, are at present running overtime.

The Port Dover, Ont., knitting mills are being equipped with some new machinery.

The new wing to the C. Turnbull Co.'s knit goods factory at Galt, Ont., is almost completed.

Taylor & Rouse, manufacturers of laundry machinery at Brantford, Ont., are looking for larger quarters.

D. Dunlop, formerly of the Gillies' woolen mills, Carleton Place, has left to take a position in a similar establishment at Dryden, N. Y.

Currie Nelson, an employee in the Woodstock, N. B., woolen mills, had his hand badly lacerated while tending the carding machine.

An action for $3,000 damages has been taken out by Robert Hill, who was injured some time ago at the mills of Adam Lomas & Son, Sherbrooke.

W. H. Kennedy, cutter in Thompson & Smith's clothing establishment at Ingersoll, Ont., has gone into partnership with Geo. Tolton, clothing manufacturer of Galt.

J. T. Wood is considering the question of removing his knitting factory from Rockwood, Ont. Mr. Wood at present operates fourteen hand machines on hosiery, underwear and glove linings.

There are prospects of an immense pulp mill being established on the Ashland branch of the Bangor & Aroostook railway. The proposed industry contemplates the employment of nearly 1,000 men.

Johnnie Kanapin, a spinner in the A. W. Brodie mills, Hespeler, Ont., had the misfortune on Aug. 3rd, to get his left hand in the gear of the machine, and had his second and third fingers taken off.

The new crop of flax having matured, most of the flax mills of Ontario have started manufacturing operations for the season. We understand the yield of flax is good, except that sown on low lying lands, where it is a failure.

Alfred Parker, who has been for many years well known to the woolen manufacturers of Ontario, with whom he did business under the firm name of the New Toronto Wool Stock Co., died at his home in Toronto, July 29th. Mr. Parker was an Englishman, and formerly lived in Batley, Yorkshire. He was a prominent Mason, and was very popular among his friends, as he was a fine singer, and possessed a good voice.

The Lancaster Machine Works are manufacturing for the Canadian Colored Cotton Mills Co. several large stock dyeing machines.

George Morrison, boss carder in the Hawthorne mills at Carleton Place, Ont., has gone to Montreal, where he purposes going into business for himself.

The proprietor of one of the St. Catharines knitting factories has been fined $10 for employing girls and allowing them to work more than sixty hours per week. The *Inspector of Factories* was the complainant.

The Archibald Company, Ltd., Truro, N. S., has applied for incorporation to carry on a wholesale business in gents' furnishings, hats, caps, furs, straw goods; capital, $25,000. The provisional directors are J. H. K. Mack, W. F. Mahone and E. M. Fulton.

The Kennedy Co., Ltd., has been incorporated to manufacture clothing, hats, shoes and shirts in Montreal; capital, $100,000. The incorporators are: K. E. Kennedy, Chas. A. Barnard, H. W. Beatty, A. E. Paris, Montreal; J. A. Richard, Winnipeg, and J. Tessier, Quebec.

There was a strike in the Montreal cotton mills at Valleyfield, Que., July 20th, by which 600 operators were affected. The mill had been closed ten days for repairs, and the management wanted the employees to work half an hour a day overtime to make up for the lost time. The weavers objected. Finally it was agreed that they should put forth extra exertions to catch up with the work during the regular hours.

Chas. Woodward has left Waterloo, Ont., for Ingersoll, where he has secured a position in the Ellis Upholstering Works.

A young lad named Philip Pinault had one of his arms broken in the Canada Cotton Mill, Cornwall, Ont., recently. He was riding up on the elevator and when he came to one of the landings he went to get off and his arm was caught between the doors and broken.

The Chatham, Ont., police have arrested Ira Fields and John Butler, of Chatham Township, charged with robbing the T. H. Taylor Co.'s woolen mills in Chatham last November. A large quantity of stolen goods was found in their possession. They have been found guilty and have been sentenced to three years at Kingston.

It is nearly thirty years since Charles F. Taylor, of Providence, R. I., introduced his cop tubes into the cotton mills of the Dominion. The quality of the tubes has been strictly maintained. The tubes commend themselves both in the mule-room and weave-shop by their economy in use, as is shown by the cop tube accounts of mills using these tubes exclusively. They certainly tell their own story in use and do not go back on their records of the past 30 years.

—The whole of China will be opened to foreign trade within a few years' time. That portion of the empire which falls within the influence of Great Britain comprises the heart of the country. The valley of the Yang-tse-Kiang is not to be alienated to any other power. In other words, Great Britain holds a political mortgage on it, on which that country may in time be forced to foreclose.

CHEMICALS AND DYESTUFFS.

The demand for chemicals and dyestuffs continues good. Bichromate of potash and soda, after two reductions, has been put ¼c. per lb. higher. The following are current quotations in Montreal:—

Bleaching powder	$ 1 95	to	$ 2 00
Bicarb. soda	2 00	"	2 05
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 00	"	2 10
Chlorate of potash	0 13	"	0 15
Alum	1 35	"	1 50
Copperas	0 70	"	0 75
Sulphur flour	2 00	"	2 50
Sulphur roll	3 00	"	3 50
Sulphate of copper	4 50	"	5 00
White sugar of lead	0 07	"	0 08
Bich. potash	0 09	"	0 10
Sumac, Sicily, per ton	55 00	"	60 00
Soda ash, 48° to 58°	1 25	"	1 50
Chip logwood	1 90	"	2 00
Castor oil	0 09½	"	0 10
Cocoanut oil	0 06½	"	0 07

A WRINKLE IN WOOL.

It was an angry farmer who, in response to a letter saying that a large shipment of wool made by him was under weight, visited the city the other day for the purpose of seeing his wool weighed. The sacks were all in place and as one after another was put on the scales showing but little variance from the weight marked on the bags, an "I told you so" look beamed on the farmer's face. "This is wool from my own sheep," he declared, "and was carefully weighed in my presence. I knew it must be right." "But," the merchant said, "wait a bit" And soon the latter had his innings. Sack after sack went on the scales only to discredit the weights which were marked upon them. "That wool is from my neighbor ——'s sheep," cried the amazed farmer. "It was good weight the day I bought it, for it went on the scales with these other sacks," pointing to those which had passed the test. "Has your neighbor a damp cellar and a good pump?" grimly remarked the merchant. "The villain! He watered the wool," shouted the farmer as he made for the door. We are looking for the report of a family feud, which must appear in a certain country newspaper, the details of which will put "Soapy" Smith's experiences in the shade.—Monetary Times, Toronto.

The picker cylinder in F. Scanthon's shoddy factory, Almonte, Ont., burst a short time ago from an unknown cause, wrecking the machine and damaging the building. Fortunately none of the operators were near and so escaped injury.

—Tops should be examined to see that they are free from neps and motes, since these always detract from the appearance of the yarn by riding on the surface

—Is the revival of hand weaving desirable or possible? The question itself implies a time when handloom weaving not only existed but flourished, and that under changed conditions it has perished.

Strength of fibers and softness are features which largely determine the spinning powers of the wool A soft, flexible top possesses much more drawing power than one which is horny and stiff

—After being combed and converted into tops, the next process through which wool passes is the drawing, and this may be said to be the most important operation in the series preparatory to the formation of the thread