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CANADIAN Journal of Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XVII.

TORONTO AND MONTREAL, AUGUST, 1900.

No. 8.

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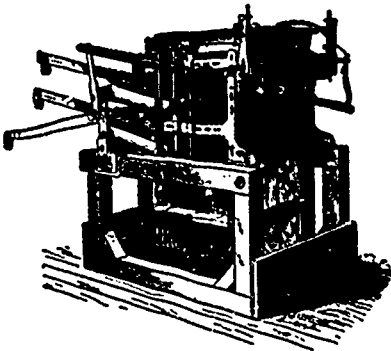
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THE GERMAN CHEMICAL EXHIBITION.*

It is not a recent thing for those who can see a little farther than the end of their noses to vie with each other in repeating that the exposition of 1900 would be the apotheosis of German industry. They were not heeded. They were even looked at a little askance; for in certain circles where the ostrich is imitated, the rule is, that the superiority of others cannot be announced without committing a sacrilege.

A few visits to the Champ de Mars are sufficient, alas, to convince oneself that these pessimists were not altogether wrong, and that the German industrial ex-

hibition is something marvelous, extraordinary, "kolossal," as they would say on the other side of the Rhine.

To give to this exhibition all the amplitude required to produce the effect which they had every right to expect, our neighbors must have made tremendous efforts. They have spared neither time nor money which they spent with a lavish hand. They added to these the reasoning, the intelligent discipline, the method, the precision and the tenacity of their race. Everybody has contributed, from the Emperor to the humblest working man, all animated alike by the desire for the national success. But if the effect was heroic, the success is triumphant, especially in the departments of chemistry and electricity.

What can be more striking, for example, than the German exhibit of chemical industries? Everybody should go and see it. Even the uninitiated would come away amazed. As for the initiated, it would simply floor them, to use a popular expression. But the enthusiasm it would awaken should be mingled with a little humiliation at the thought of chemistry, in which the French were once so eminent, having to pass through foreign hands to reach such heights.

Our chemical industry still occupies an important place in the world. We shall soon doubtless have an opportunity to show that. But there is urgent need for us to cry to it. Strain every nerve.

Impersonal and collective, the German chemical exhibit is situated in the centre of the hall of chemical industries. It consists of a series of 28 uniform cases of glass and oak in pure Renaissance style, whose elegance, together with an allegorical group in salt, and a superb bronze representing the genius of science, bears witness that the Germans are not as indifferent to artistic considerations as some superficial thinkers are inclined to say.

The exhibit is organized by a central committee composed of Dr. Holtz, president, Dr. Martius, vice president, and Messrs. Boettinger, Kroemer and Haueisen, and is divided into eight groups.

Group 1 is devoted to greater chemical industry in general (President Dr. J. Stroof). Here the potash salts industry, of Stassfurt, of which Germany exports nearly twenty millions worth a year, has, so to speak, a monopoly.

*Translated from Le Figaro, June 12, 1900, by Prof. Chas. F. Kroch, Stevens Institute of Technology, Hoboken, N. J.

Here also is that yellow liquid in which all metals except iron would dissolve like sugar in water—liquid chlorine obtained by electrolysis. Common salt, chloride of sodium, has been decomposed by electricity. The sodium passed over to one pole, while gaseous chlorine was collected at the other and had only to be liquefied afterwards by well known means.

Here are shown samples of chromium, manganese, titanium, etc., all pure metals, absolutely free from carbon. They bear witness to the excellence of the new method invented by Hans Goldschmidt and known as aluminothermy, which utilizes the formidable temperature of the combustion of aluminium. When metallic oxides are heated in the presence of aluminium, such a heat is developed in the crucibles that nothing can resist it, and the most refractory metals can be welded together.

Alumina itself is melted, and on cooling, is transformed into corundum studded with little artificial rubies. To start the reaction, only a jet of flame or even a single match is required; the affinity of the aluminium for oxygen does the rest.

Synthetic sulphuric acid is also found in the same group. No more clumsy and expensive leaden chambers in which dilute sulphuric acid was formerly manufactured, which had then to be concentrated in platinum apparatus as costly as the jewelry of a great coquette. At the present day, anhydrous sulphuric acid is prepared cheaper and with the greatest ease by combining directly the oxygen of the air with the sulphurous acid coming from the roasting of pyrites in the presence of platinized asbestos, and then it needs only to be diluted for commercial purposes. But if it is true that the state of advancement of a civilization should be gauged by the amount of sulphuric acid it produces, what must we say of a country which has carried this paramount industry to such perfection?

Group 2 (President Dr. A. Merck), contains the pharmaceutical products for which Germany indisputably holds the record, from the alkaloids, antipyrine and saccharine to the serums of Behring and Koch, and those magnificent substances called "radio-actives" on which the radiography of to-morrow will operate.

Group 3 (President Mr. Voigt), is that of smaller chemical industry with rare earths, the generators of incandescence, photographic products beginning with eikonogen, orthochromatic plates, etc., while group 4 (President Mr. Stueckelen), is reserved for mineral colors, lacquers, varnishes, and products extracted from bone, such as gelatine and glue.

The artificial perfumes, which are little by little crowding out the natural perfumes, form group 7 (President, Dr. A. Steche). This is another specialty in which Germany is alone. This is another rival, thanks to the regretted Tiemann, who discovered vanillin, heliotropine and artificial violets.

Group 8 (President, Dr. Heraeus), is devoted to utensils of all kinds that are employed in chemistry from the microscopic retorts used in the laboratories to the gigantic apparatus of great manufactories. Here Dr. Linde exhibits his ingenious machine for manufacturing liquid air.

But the acme and culmination of the exhibit is to be found in groups 5 and 6, presided over by Dr. Drunck, director of the Badische Anilin & Soda Fabrik and a member of the jury. Here, in a logical and suggestive order, are arranged the derivatives of coal tar benzene, from which the aniline dyes are obtained, naphthalene, which is used to manufacture artificial indigo and azo-coloring matters, and finally anthracene, the source of artificial madder. All this is surmounted by a pile of coal representing exactly the quantity of raw material from which the collection was produced.

Nevertheless, the industry of coal tar coloring matters did not originate in Germany. It is of French and English origin. But that does not prevent it from vegetating to-day in England as well as in France, while in Germany it reigns supreme in numerous works, a single one of which employs no less than 6,500 workmen and 150 chemists, doctors of science.

The appearance of large quantities of the Badische Anilin & Soda Fabrik's artificial indigo in the market in 1897, for example, dealt such a blow to the indigo plantations of India, that they were seriously endangered. In two years, the area of the indigo fields of north-western Hindoostan decreased from 1,876, to 953 square kilometers. In the same way the discovery (also German), of chemical madder formerly compassed the complete ruin of the Provençal cultivation of madder.

To be sure the process for the synthesis of indigo employed by the Badische Anilin & Soda Fabrik is not the only one there is. Others are known, one of them starting with Toluene. But all the factories in the world would be insufficient to produce toluene enough to supply the demand. The process of the Badische Anilin & Soda Fabrik, moreover, has the merit of getting indigo, which is very valuable, from naphthalene, which costs almost nothing.

I will stop here, having said enough apparently to give a summary idea of the prodigious development of that German industry, whose crushing shadow falls upon us, but which has, nevertheless, worked gloriously—why not recognize it?—for the fortune, the power and the comfort of the human race?

We may deplore the fact that on this account we do not occupy any longer so great a place in the domain which was formerly ours, but it is not sinning against patriotism—on the contrary—to salute the work accomplished by others with admiration, respect and even gratitude.

EMILE GAUTIER.

MANUAL TRAINING IN CANADA.

BY W. W. KING.

It is so essential that the public of Canada should receive some data upon this work, now being introduced into the country, and manual training is so intimately connected with technical work, though quite distinct from it, that some information in regard to the new-born Canadian sloyd will, no doubt, be welcome to readers of this journal.

Sloyd (English, sloyd), is a Swedish term for dexterity, connected with the English word sleight, in the phrase "sleight-of-hand." This system of manual training may be said to have taken its rise in Sweden, under the late Herr Abrahamson, and his nephew, Herr Salomon. The former, who owned an estate at Naas, in Sweden, opened a work-school for the children in 1872, appointing his nephew to the position of director. From this beginning the work has grown, and now Herr Salomon holds the post of director of the seminarium for teachers at Naas. Since 1882, the training at this now famous school has been given in short courses of six weeks, open to teachers only, from Sweden or from abroad, preference being given to applicants who can show that they have an immediate prospect of teaching the work. It is calculated that Herr Salomon has now sent out between three and four thousand trained sloyd teachers to all parts of the world. These have been gradually introducing the work into the various countries of the continent of Europe, into Great Britain and Ireland, and into the United States of America; and now begins its introduction into our own country.

The sloyd system of manual training is being introduced into Canada by Professor Robertson, through the liberality of Sir William C. Macdonald, of Montreal, whose gifts to the cause of education are well known. The fund which Sir William Macdonald has established is intended to equip and carry on for three years a sloyd school in one place in each province of the Dominion, and also as many schools in Ottawa as may be deemed necessary to give the training to all school boys of a suitable age. During this winter there will, accordingly, be schools of sloyd in Ottawa and Brockville, Ont.; Sherbrooke, Knowlton, and Waterloo, Que., Charlottetown and Summerside, P.E.I.; Truro, N.S., Fredericton, N.B.; Winnipeg, Man.; Calgary, N.W.T.; and probably Vancouver, B.C. The directors of these schools will be trained men brought from England and elsewhere; and it is expected that they will gradually train Canadian teachers to carry on the work as their assistants. Hence a start has been made by holding in July-August, a teachers' training course at Brockville, and another at Fredericton, in which some twenty-five teachers in all have begun their sloyd work.

The system itself must now be described. And in the first place it is needful that the reader should cease

to have an idea that sloyd woodwork is, in any sense, carpentry, or intended as an introduction to that trade. Sloyd is a means of education and valuable solely for its formative influence on the child's character. Carpentry is a trade and has its utilitarian value as such. The only connection between sloyd and carpentry is that they both make use of wood as a material and use the same tools.

Having thus cleared the view, we may go on to see just what sloyd is and at what it aims. The aims of sloyd as regards the formation of character in the child, are:

1. To instil a taste for, and a love of, labor in general;
2. To inspire respect for rough, honest bodily labor;
3. To develop independence and self-reliance;
4. To train in habits of order, exactness, cleanliness, and neatness;
5. To train the eye and sense of form; to give a general dexterity of hand, and to develop touch;
6. To accustom to attention, industry, perseverance and patience;
7. To promote the development of the physical powers.

Now it is obvious that each and all of the above aims of sloyd should be of prime importance in any rational scheme of education; and we find from the evidence of hundreds of educators that sloyd, or educational handwork does cultivate the virtues enumerated above.

Furthermore, sloyd is handwork in wood. Why not in other materials? When this means of education was introduced into Swedish schools, various other materials were used, but finally all others were discarded in favor of wood, because it was the only material which satisfied the following ten requirements: 1. The material used should accord with the children's capability. 2. The work must excite and sustain interest. 3. The objects made should be useful. 4. The training should give respect for rough work. 5. And train in order and exactness. 6. The material used must allow of cleanliness and neatness. 7. The work must cultivate the sense of form. 8. And be beneficial from a hygienic point of view. 9. The course should allow of methodical arrangement. 10. The work must teach dexterity of hand.

It is true that some other branches of the original sloyd fulfil several of these requirements, e.g., simple metal work, straw-plaiting, cardboard work, wood-carving, etc.; but wood is the only material which satisfies every requirement of the ten. When it is also taken into consideration that each kind of material used in sloyd forms, in reality, a new school subject, and that it is a waste of energy for both teachers and scholars to have more school subjects than are absolutely necessary, it will readily be seen that the interests of education are best served by choosing one satisfactory material for sloyd and using it throughout. It should be observed, however, that sloyd woodwork is intended for children from eleven or twelve years of age upwards. In the full course, which will probably be established

ultimately in our schools, the children will, on leaving the kindergarten, at seven years of age, be given training in advanced paper-folding for two years, and in elementary cardboard work for the next two years; and will then enter on woodwork when thus trained to thoroughly profit by it.

Now, as to what it is actually proposed to do at present in Canada. Take, for example, Ottawa, which will be the centre of the movement, during its initial stages, at least. During next winter, there will be in that city two "centres," or sloyd rooms, where instruction will be given to the teachers in the Ottawa Normal School, and to all the boys of suitable age in the Ottawa Public Schools. The work will be in charge of Mr. A. H. Leake, of Leicester, England, an experienced sloyd and a graduate of Naas. He will have immediate control of the chief centre, with two or three assistants, some of them Canadian teachers, and will supervise the work in the other centre, where another trained man will have charge, with an assistant. To these centres the Normal School students and the school boys will come in drafts, the former receiving practical training and lectures on the theory of sloyd, and the latter chiefly practical work. The boys will receive two or three hours per week instruction, and the full course for them is one of about three years.

The work is carried on by means of a system of "models," or objects, which each boy makes entirely for himself, there being thirty such models in the three years' course. The course begins with simple objects, such as a wedge, a round flower stick, a square ruler; goes through a more difficult series, such as a paper knife, a picture frame, a scoop; and concludes with book shelves and a cabinet, involving difficult operations such as dove-tailing, etc. The course is so arranged that each model represents some slight advance upon the one that preceded it in the course, either some new tool, or some new use of a tool, previously employed, being introduced in the making of it. The utmost importance is attached to having each object, when made, the work of one individual pupil. There is no division of labor, and the teacher himself must give to the pupil not the slightest assistance upon the actual model. When he wishes to show the pupil how the work should be done, the demonstration must be made upon another piece of wood. It is also an essential to the system that the utmost accuracy be insisted upon. The metric system of measurement is employed, and even a finished model is rejected for the slightest deviation from the measurements laid down in the drawing. A model, if rejected, must be again begun by the pupil, and brought to a successful conclusion before any advanced work is done; though it is sometimes found advantageous to allow the pupil to proceed temporarily with the next, after one or two failures, since he comes

back with renewed zest to that upon which he failed.

It will thus be observed that the keynote of the system is individual work by the pupil and individual attention by the teacher. Each boy is judged on his own merits, each boy's mistakes are pointed out to him by the instructors, and at the end of the course each boy carries home in triumph his own handiwork, whether it be only five models, or twenty, or thirty. As these models are all articles of service in a house, the maker and owner will see them in daily use with keen delight. In addition to the actual work with the tools, the boys are taught to make accurate drawings to scale of the models; and they are given practice in reading the drawings while making the models. Hence, at the conclusion of the course, the boy of fifteen can form an idea of an object he wishes to make, make a drawing of it, which could be read by any mechanic; cut out his wood and make the object exactly according to his drawing.

Now a word as to the purpose of this training and its relation to technical work, by which is meant the actual learning of a trade. Though, in any sloyd exhibit, the finished models are shown as an example of the work done, this is somewhat misleading. The object of sloyd is not to turn out finished models, but, by means of their work on the models, to train the boys in the manner indicated in a former paragraph of this article. The growing skill and ripening character of the boy is the true sloyd exhibit. It is hence absolutely essential to this system that the work of instruction should be done by trained teachers. "The worst teacher of sloyd is a carpenter," for the simple reason that his life-work has been the turning out of wooden articles as perfect as possible. His object in using a tool on wood, say in the construction of a box, is to turn out a good box; the aim of sloyd in having a tool used on wood in the same construction, is to turn out a good boy. Hence, after a lengthy trial of artizans, as teachers of sloyd, their services were totally dispensed with. Their attention was centred upon the finished object, and they could rarely abstain from actually helping the pupil at the critical point, thus undermining the qualities of honesty, independence and accuracy, which it is the very aim of the system to cultivate. Sloyd work is thus very different from technical work, or the learning of a trade. Sloyd is an educational subject, suitable for early school life. Technical work is of commercial value, suitable for boys who have decided on their future mode of life, and have come to years of strength and almost of manhood. At about sixteen years of age, one boy enters a dry goods store, another continues his studies in preparation for the University, a third is entered as junior in a banking or mercantile house, and a fourth enters a technical school to prepare for work as an architect, mechanical engineer, or carpenter. For each and all of these boys sloyd has been a most valuable school subject. Commercial work in school is not valuable only for No. 1,

nor literature only for No. 2, nor mathematics only for No. 3, nor sloyd work only for No. 4. They are all school subjects and good for all boys alike.

The following facts, however, must be carefully noted: First, that should the boy who has studied sloyd decide to train as a carpenter, he will have nothing to unlearn, though many things to learn. He is not only a well trained boy mentally, but his new master will find him well grounded in the rudiments of his work, and well prepared to understand and carry out instructions; while the manner in which he has been taught to use tools is thoroughly scientific from the practical carpenter's point of view; and second, the fact disclosed by the following: An experienced English teacher found that 90% of his sloyd class was, on leaving school, entering a neighboring electric works. He asked the manager how he found them equipped for their work. The answer was that they could read drawings at sight, were trained to exactness in the fulfilment of orders, and, in fact, could in a month be trusted implicitly to carry out their instructions, where the non-sloyd needed a year. And yet in the school from which these boys came, wood alone was used as the working material. From these facts will be seen the position of sloyd in relation to technical training.

For readers who desire to inform themselves on this work, I would recommend Professor Robertson's address on "Manual Training in Public Schools," and "The Theory of Educational Sloyd," by Herr Salomon, director at Naas. There will also appear shortly a series of articles on the work in Canada, illustrated with photographs of interest in connection with the subject.

ON THE PRODUCTION OF STREAKED YARN.

BY DR. E. FISCHER IN THE BERLIN FÄRBER ZEITUNG.

It is not possible to secure certain combinations without affecting the uniformity of the ground-color. It is best to choose two colors which by their combination produce the ground color. The simplest article of the kind is white clouds on a red ground. These are produced by closely wrapping parts of the yarn in vegetable parchment or paraffined paper, and then dyeing with Benzopurpurine. Black clouds may be added afterwards. Red yarns with yellow clouds are prepared by first dyeing the whole yarn with Chrysophenine, binding up places as above, and then covering with Benzopurpurine. To prevent the red from showing a yellow hue on account of the yellow underneath it is advisable to shade with a little Diamine Red 10B. Bordeaux Red grounds with yellow and red clouds are made as follows: 100 lbs. yarn are taken. They need not be bleached, as no white effect is wanted. This weight is dyed at the boil for three-quarters of an hour in the following bath: Chrysophenine OS, 1 kg.; Diamine Fast Yellow B, 600 grms.; Glauber's salt, 10 kg.; Soda, 500 grms.

After dyeing, the places which are to remain yellow are wrapped in the parchment, etc., and the yarn is then covered in a second bath, consisting of Benzopurpurine 4B, 2.4 kg.; Diamine Red 10B, 50 grms.; Glauber's salt, 5 kg.; soda, 500 grms.

As the yarn is very much compressed at the wrapped

places it is necessary to boil for at least one hour. The parts which are to remain red are now wrapped, and a third and final bath is given. This consists of: Diamine Bordeaux R, 500 grms.; Diamine Blue RW, 100 grms.; soda, 200 grms.; Glauber's salt, 5 kg. Boil about one hour, rinse and wring. For the first two baths copper vessels can be used, but not for the Diamine Blue bath. It is better to use wooden vats throughout.

Bordeaux Red yarns with blue and red flames are got by wrapping the yarn at the places which are to be red, and then dyeing the yarn with Diamine Blue BX, rinsing, wringing, unwrapping the bound places, and reducing with Benzopurpurine after wrapping some of the blue parts. As the blue on being covered with the red bleeds on to the white if the bath is too hot, care must be taken. The bath should also be strong so as to cover the blue well. The places first wrapped are now red, those wrapped second are blue, and the rest of the yarn is Bordeaux from the mixing of red and blue. To get yellow and blue clouds on a greener ground, places are wrapped, and the whole yarn is then dyed with Chrysophenine and Diamine Fast Yellow B, rinsed, wrung, unwrapped and wrapped again elsewhere, and then redyed with Chicago Blue 6G and Diamine Pure Blue FF. The first wrapped places are now blue, and the ground is greener from the mixture of yellow and blue.

Parti-colored yarns are more difficult to make when the ground-color has to be of a different color just produced by the mixture of the dyes used to form the clouds; for example, blue and red on a brown ground. This, too, is the easiest of these cases, for the blue and red give a Bordeaux ground which can be made dark brown by subsequent treatment with Diamine Green B or Diamine Brown M. After wrapping, the yarn is dyed blue. The wrappings are then transferred elsewhere, and the yarn is dyed with Benzopurpurine. The first wrapped places, which are now red, are rewrapped and the yarn is finally dyed with Diamine Brown M and a little Diamine Green B. More difficult to produce are yarns in which a lively green has to be combined with red and yellow. In such cases the ground-color must be dark, best dark blue or black. The whole mass is first dyed yellow, and the parts not to be red having been wrapped, the red is put on with Benzopurpurine and Diamine Bordeaux B. All is then wrapped, except where green is to be applied, which is best done by covering the yellow with Brilliant Green in a cold or lukewarm bath. The green places are then again wrapped and the yarn is boiled in soda, partly to level the ground and partly to remove the excess of dye. Then rinse well, and finish with Direct Blue Black B and Benzoazurine for dark blue or Diamine Deep Black SS for black. The whole yarn may also be mordanted with tannin and antimony, the clouds put on with basic dyes, and then, after wrapping the clouds, the ground can be put in with Diamine Deep Black SS.

Dark clouds on a light ground can only be produced by printing. For example, to get pink yarns with red and blue clouds, the whole is first dyed with Diamine Pink BD, and then printed with tannin steam colors, in this case Safranin and Methylene Blue, steamed, treated with tartar-emetic, and washed. In a similar manner we produce red and greener clouds on yellow. The dye first put on is Chrysophenine and Diamine Fast Yellow B, care being taken not to put too much soda into the bath, or the other colors will run when printed. It is best in any case to give a passage through an alum bath, and then rinse and dry before printing on the clouds. For green the following printing color is used: Gum Tragacanth, 660 grms.; Acetic acid, 500 grms.; Thioflavine T, 50 grms.; Brilliant Green, 40 grms.

These are well mixed and then stirred into 2 litres of hot

water. When they are dissolved, a solution of 180 grms. of tannin in its own weight of water is added, and the whole is made up to 5 litres. For red the recipe is the same except that the dyes used are 60 grms. of Safranine S 150 and 30 of Thioflavine T. After printing, dry, steam without or nearly without pressure, treat with tartar emetic, and wash.

Some effects can be secured neither by dyeing nor by printing; e.g., blue yarns with yellow and red flames. Such articles cannot be produced without discharges. The following is an example of the processes:

Dye 100 lbs. of yarn with 750 grms. of Diamine Blue B X, 5 kg. of Glauber's salt, and 500 grms. of soda, for 45 minutes at the boil. Then pass through an alum bath and rinse. Then dry and print with the following color gum. Water, 600 grms., Tragacanth, 70 grms., Tin salt, 40 grms., Tin acetate, 150 grms., Thioflavine T, 50 grms. dissolved in Acetic acid, 200 grms. Then add 150 grms. of tannin dissolved in its own weight of acetic acid, and make up to 1.2 litres with water. For red 150 grms. of Thioflavine are replaced by 60 of Rhodamine 6G. After printing, dry, then steam 10 to 15 minutes without pressure, pass through tartar emetic and wash. Dark blue yarns with color effects are got in a similar manner, dyeing with Diamogene Blue BB or Diazo Indigo Blue, discharging, and developing with beta-naphthol.

Black yarns with colored colors are generally wrapped first and dyed as above described. Discharges can also be used, but are not so often necessary. Most effects on a black ground can be got by mere dyeing.

TARTAR, LACTIC ACID AND LACTOLINE.

(Continued from last issue).

As regards color, No. 2 gave the darkest, and No. 1 the lightest. All three were perfectly uniform, and showed no difference in feel or other qualities, the dyed wool being hardly distinguishable, except by the eye, from the same in the raw state. The three lots and one of undyed wool were then spun, each with the same amount of oil, and each went through the same cards at the same place, one behind the other. The yarn was then spun all on the same self-actor. The spinning was kept up till the threads began to break to a large extent. This happened when the yarn measured 31 km. per kg. At this point the percentage of breakages was about 2 per cent. with the undyed and 4.4. No perceptible differences were manifested between different lots of the undyed or of the dyed yarn. Hence all the three mordants under investigation have a like favorable effect upon the spinning. The slight difference noticeable with the dyed wool is probably attributable to the mechanical action of the apparatus. It can be produced, as is well known, by dyeing in the open vat. In dyeing in machines, the duration of the process has little influence, but in the pan, the constant agitation of the wool by the boiling and working, the wool becomes felted, and the more so the longer the process lasts. In consequence lactic acid gives better results in the open vat, as regards spinning, than either tartar or lactoline, as with it the process is more quickly over.

After this spinning test, the separate lots were spun out to 12 km. per kg. Tests of strength were then made, and showed that the lactoline yarn was the strongest and the lactic acid yarn the weakest. The actual figures were:

| Mordant used. | Breaking weight in grammes. | Loss in strength in mordanting. |
|-------------------|-----------------------------|---------------------------------|
| Tartar | 5.750 | 25.6 per cent. |
| Lactic Acid | 5.450 | 29.5 per cent. |
| Lactoline | 5.970 | 22.7 per cent. |

The breaking weight of the raw yarn was 7.730 grammes.

It is evident that all three mordants detract greatly from the strength of the material. The loss is due, in the first place, to the chromic acid, as the tartar never reduces the chromic acid completely, and the lactic acid only slowly, while of the other two the lactoline reduces it most rapidly. Hence, in the case of lactoline the chromic acid has the least opportunity to act on the wool itself. Here then lactoline has distinctly the advantage.

The yarns were next woven, and it was at once evident that there was less breakage of threads in the material prepared with lactoline than in that treated with either of the two others. The woven fabrics were washed and tested as to their strength, and gave the same comparative results as the unwoven yarn. The different pieces were next all sewn together and milled with olein-soap for five hours. The lactolined stuff milled fastest and that prepared with tartar slowest. After four hours the lactolined fabric had shrunk 10.6 per cent. in width and 16 per cent. in length, while the tartared material had only shrunk 3.2 per cent. in width and 7 per cent. in length, the lactic acid treated goods only 7 per cent. in width and 8 per cent. in length. After the expiration of the full five hours the figures were: With lactoline, 12.2 and 18 per cent.; with lactic acid, 11½ and 12 per cent.; with tartar, 7 and 8.2 per cent. Here again, then, lactoline comes out the best. The difference is again attributable chiefly to the chromic acid.

As regards the effect of the milling on the dyes, no difference between the three mordants could be discerned. The same remark holds for fastness to light and air, and for the appearance and feel of the material. The net result of the whole work is to show that lactoline is the best of the three mordants subjected to investigation.—Dr. Sigmund Kapff in *The Berlin Farber Zeitung*.

THEORY AND PRACTICE OF DYEING.

Some idea of the magnitude of the work done in the dyeing department of Yorkshire College may be gained, says "Nature," from the fact that each session over 200,000 dyed patterns are distributed. Each student, according to the time spent in the dyehouse, receives during his course of instruction from 2,000 to 20,000 patterns, each of which conveys a definite piece of information on some point connected with the application of this or that coloring matter. Not only is the behavior in the dye-bath of each coloring matter investigated, but notes of the results obtained are made by the students during the progress of the work. Further, each student enters in his own book all the patterns received, together with notes of the materials employed, and the results of each experiment. Hence the students not only learn how to experiment and discover the capabilities of each coloring matter for themselves, but they also acquire the useful habit of observing and of making notes, while their pattern books contain a fund of information which is invaluable to them in their after career. The systematic training which they receive also prepares them to deal with the variable conditions of work in actual practice, such as the character of the water, the nature of the textile material employed and its ultimate uses, and many other points which must always be taken into account in dyeing.

In the practical and pattern dye-houses the students are shown how they are expected to apply in practice the principles they have learned in the course of their experimental work. Moreover, the solution of difficulties which naturally arise under the slightly altered conditions from those obtaining in the experiment dyehouse, the greater confidence inspired by dealing with the larger quantities of material, and the knowledge that the products of their labor are really to be employed in the

manufacture of cloth, are all factors of inestimable value in the training of the students before they enter into actual practice, to which they are, as it were, brought indeed one step nearer by the character of the work pursued. Altogether, the students are able, in the college dyehouses, to gain at least some insight as to the meaning and value of practical experience, and an influence is exerted which reacts by giving life and vigor to the work of the whole department.

The art of dyeing owes much to science, and in a university college like the Yorkshire College, it is not unreasonable to expect that students of the art should, in return, contribute something to science, more particularly to that branch of it which pertains to dyeing. If in the experimental and practical dyehouses the students are taught the art of dyeing, in the Clothworkers' Research Laboratory they are also urged to study the science of dyeing. The aim here is to assist in the work of gaining a fuller and truer knowledge of the fundamental laws and principles connected with dyestuffs and dyeing, and so help to raise, as far as possible, the whole tone and level of the dyeing trade, by infusing into it the traits of an exact science. The carrying on of original research by advanced students has already become, indeed, a marked feature of the department, and the Clothworkers' Company have, in a special way, recognized the value of such work by establishing a lectureship, the holder of which devotes his whole time to co-operating with the professor in introducing students to this higher form of study.

This research work, too, has an intimate connection with Professor Hummel's lectures, in the course of which are described the methods employed in preparing the coal tar colors, in isolating the pure coloring principles of dyewoods, and in studying the chemistry of mordanting, dyeing, etc. By allowing the students to carry out similar experiments themselves the college enables them to understand, in a clearer manner than is otherwise possible, how our knowledge concerning dyestuffs and dyeing has been acquired and it is hoped that by reason of the practical experience thus gained in the art of research some students may, in due time, become independent investigators.

TESTING COLORS FOR FASTNESS.

It becomes necessary many times to know what a given color will resist. Every dyer should know about the dyes he is using. The market is always becoming more critical and exacting, and goods are dyed so that the colors must meet certain requirements. With the growing exactitude of the public, it would not be surprising to have nearly all goods dyed to meet specifications furnished by their purchaser.

The test as to the power of a color to resist the action of perspiration is important to the dyer of knitted fabrics, those intended for ladies' dresses, men's outer clothing, corset covers, and the like. The best way to determine how fast to perspiration a certain fabric is, is to take 30 drops of acetic acid to a quart of water: heat this diluted acid to 100 degrees F., and dip into it the cloth to be tested. Rub with the hands white in the acid, and remove and dry without rinsing. This operation should be repeated five times; it will cause the color to become the same as it will when subjected to the action of human perspiration.

All sorts of fabrics are more desirable if they resist the action of the weather. This is a common test and easily made. Pieces of the goods are so fastened upon a board that part of them can be covered closely and the other part left exposed. A piece of turkey red, also a piece of indigo blue cloth are fastened on for comparison. These are exposed to the action of the weather, and careful observation of the time when they begin to

alter is made. In the latitude of New York in midsummer the turkey red will change in from 23 to 30 days; the indigo on the 11th to the 14th day. If the colors which it is desired to test are noticed carefully, those which begin to fade when the indigo does, may be classified as fairly fast, those which are equal to the turkey red as fast, and those which have lost their color when the indigo begins to fade may be called fugitive.

All goods which are wool or yarn dyed must resist the action of fulling and scouring. The best and simplest way to test for this quality is to take a piece of the yarn or wool, make a small sack, and let it go through the operations which have been mentioned. If this cannot be done, scour a piece by hand, giving severer soaping than the goods are to receive.

Goods which are to be worn next to the skin should be fast to friction. To test this have a wooden block made three by five inches. To this block a piece of the goods which are to be tested may be fastened. On the top of the block put a weight of five pounds, and cause the block to be drawn over a sheet of unstarched white cotton cloth.

Goods which are intended for ladies' dresses must be fast against the action of street mud. The soluble part of the mud and in consequence the part which attacks the color is carbonate of lime. To test cloth, prepare a solution of lime water by slacking a piece of quicklime, then mixing with water. Upon the cloth some of this water is sprinkled after the sediment has partially settled out of it. This is allowed to dry, and is brushed off, the effect of it upon the cloth being observed.

Another test is to take three ounces sal soda to a quart of water; sprinkle some of this solution over the cloth; dry it, and observe color after it is brushed. Cloth to be fast to street mud should also be dipped in a solution of ammonia, and not be changed by the operation.

It may generally be assumed that a color which will not be discharged by muriatic acid in dilute solution is dyed with the alizarines, and therefore faster than one which does change, the latter having been dyed with vegetable dyes. Besides the tests which have been enumerated, it is also important that goods which are to be ironed or hot pressed, should not alter their shade, or, if they do alter, the original color should be restored upon exposure to atmospheric conditions. The best way to test for this is to press a piece as a tailor or dressmaker would, and observe results.

Colors intended for awnings must resist the action of rain water as well as weather. To find their qualities in this direction place a piece of the color with white cotton, and if the color does not bleed into the white after repeated immersions in water and drying, it is fast.

When goods are to be cross dyed, as, for instance, when a piece of goods is made with a colored cotton warp and white worsted filling, the filling to be subsequently dyed, it is well to put a piece of the colored material through all the subsequent dyeing treatments before weaving it into goods.

BLEACHING KNIT GOODS.*

The process of bleaching fibers, whether animal or vegetable, requires great care in order to prevent injury to the fiber itself. With the exception of bleaching by exposure to the sun's rays, no process is known by which the natural coloring matter in animal or vegetable fibers can be removed without some risk of injury to the material itself. Whatever method may be adopted, it is essential that the material should first be thoroughly prepared by a careful boiling in alkali solution, to rid the fiber of all soluble matter, so that the bleaching solutions may come in direct and easy contact with the natural coloring matter, which is to be removed. Chloride of lime is

*Reprinted from the Textile World.

a cheap and efficient bleaching agent, which has long been in use for cotton goods. It is essential after using it to remove every trace of the chlorine from the goods, by passing them through an hydrochloric acid solution, and afterwards thoroughly removing the acid by scouring, as any chlorine or acid left on the fiber is liable to cause serious injury. The bleaching process itself is simply the care and skill required in the preparing and finishing operations referred to.

In this method, the goods which have been cleansed are introduced for about an hour into a cold solution of chloride of lime, standing about $1\frac{1}{2}$ Tw. Warm solutions act quicker, but are liable to tender the goods. Then the material is passed through a weak solution (about 1° Tw.) of hydrochloric acid for say 10 minutes; and afterwards thoroughly washed to remove any trace of chlorine or acid. An anti-chlorine compound is often used with good results in place of the acid, as it is claimed that it has no injurious effects on the fiber, while neutralizing the chlorine residue as effectually as does the acid process. One who has successfully employed this compound, writes us as follows: Perhaps more care is needed in bleaching cotton knit goods than almost any other class of cotton goods. How to make a good white and still retain the strength and "soft feel," has been a source of much anxiety to many bleachers and manufacturers. To produce a satisfactory white is comparatively simple. The other features are where the difficulties lie. Clean, pure water, is always essential for best result. Water should be analyzed and its properties learned. Where much iron is evident, it will be quite impossible to be certain of uniformly good results. If water is dirty, containing vegetable matter, etc., a good investment would be the introduction of a filter. The chloride of lime process is still in general use, for bleaching all cotton goods, it being the cheapest, easiest, and making the purest white of any process known. How to bleach with chloride of lime and eliminate the common points of danger, has been a study for bleachers, and those interested in the subject for many years.

To knit goods manufacturers the subject is of special importance. Both chlorine, the bleaching agent, and sulphuric acid, the long time common agent used to "kill" the chlorine, are both dangerous elements to deal with. The chlorine must be driven off, and where sulphuric acid is used for this purpose, it, too, must be removed, and herein lies much uncertainty and danger. As many bleachers have experienced: to use sufficient acid to thoroughly destroy the chloride means too much acid for entire safety and soft feeling goods. Sulphate of lime has been formed upon the fibers. This leaves some harsh, particularly objectionable for knit goods, and softening material is required to overcome this feature as much as possible. Soaps are often used, but a soluble oil made from pure castor oil is better adapted for this work.

Almost every bleacher has points in his bleaching process which are somewhat different from anybody else's, and no doubt he is well entitled to these, there being no teacher like experience, and different facilities for handling make the various methods of treatment quite necessary, when it comes to details, but certain fundamental rules should be observed. 1st. Good, pure, clean water. 2nd. A thorough boiling out of goods in an alkali bath before bleaching. Some use soda ash, pure alkali, caustic potash or caustic soda. The latter being most common, 2 lbs. being sufficient for 100 lbs. of goods, and boiled for 5 or 6 hours, using enough water to well cover the goods, which should lay loose. 3rd. A thorough rinsing from the boiling out bath, making sure to have no soda left in the cotton. 4th. Bleaching in a clear bath of chlorine liquor, some using $3\frac{1}{2}^{\circ}$ Tw. for 8 to 10 hours, some as strong as 2° Tw. for 5 or 6 hours. Coarse or fine yarn should make a difference in this respect. Bleaching cold is generally considered preferable,

though good results may be produced bleaching at a temperature of 110° F. 5th. A thorough rinsing in running water out of the chlorine bath. 6th. An anti-chlorine bath. 7th. If sulphuric acid be used for the anti-chlorine bath, use extra care to thoroughly rinse in running water from this bath, and then give, 8th. A bath of soap, including 1 lb. sal soda to 100 lbs. of goods. 9th. If B. & L. anti-chlorine be used for the anti-chlorine bath, rinse in a bath of cold or warm water, using blueing in this bath, no soap bath being necessary, but if an extra soft feel is desired, give goods an after bath containing 2 lbs. of pure soluble oil for 100 lbs. of goods. Bath to be at temperature of about 130° F.

The great liability of injury to the goods with the chloride of lime process makes it very desirable that an improved method should be discovered, and recently the process of bleaching by peroxide of sodium has come into prominence. In this process fully as much care is required as with the chloride of lime, in order to preserve the right degree of alkalinity in the bath. Peroxide of sodium is a grayish white powder which dissolves very rapidly in water evolving much heat. Being a powder, it is conveniently handled, and retains its strength for a long time. Care should be taken not to allow it to come in contact with wood, or other organic matter, as it is liable to set such materials on fire. Chloride of lime cannot be used in bleaching wool goods, on account of the injury which it causes to the wool fiber. Peroxide of sodium is not open to this objection, and is, consequently, well suited for bleaching of wool or cotton and wool mixed goods. Dr. Valtmer, a German authority on the use of peroxide of sodium, says:

Peroxide of sodium is nothing but a concentrated, very cheap peroxide of hydrogen, and all the advantages of the latter are also present in the former. The bleacher is thereby his own manufacturer of hydrogen peroxide; he simply orders a few boxes of sodium peroxide sent, and with them he can prepare as much material as if he had a large number of carboys of fluid hydrogen, because the sodium yields in dissolving fourteen times its own weight of commercial hydrogen peroxide, which contains only about three per cent. actual hydrogen peroxide in 97 per cent. water. Peroxide of sodium when dissolved dissociates into hydrogen peroxide and caustic soda, and in order, therefore, to neutralize the alkaline property of the latter, certain acids or salts must be added, for which purpose sulphuric acid and epsom salt are most appropriate. This done, the bleacher has after this operation the ordinary commercial peroxide of hydrogen. Since sodium peroxide represents fourteen times the quantity of hydrogen peroxide, it is one-half cheaper, and to this merit must be added the others, that it is far more easily transported, and will keep for an unlimited time. The various tedious processes connected with the manufacture of hydrogen peroxide are dispensed with, and the bleacher has in the dry substance before him a direct water-soluble metal peroxide.

As regards the bleaching materials, the bleaching processes must be altered according to the nature of the former; the concentration, temperature, the degree of alkalinity, and the preparing and finishing treatment of the material are sometimes of great importance. It is hardly necessary to mention that either wooden, or at most, earthen receptacles, can be used for both the sodium peroxide and hydrogen peroxide baths, because either of them corrodes metal, in consequence of which the dissolved metallic parts will soon cause a decomposition of the bath. The same effect is also produced by impurities, for instance iron in the water, for which reason water containing metals in solution must not be employed.

The temperature in which the bleaching operation is to be effected is best established by experience. It is well known that silk withstands a far higher degree of heat than wool; for

instance, chappe can be heated to 122 to 144° F, wild silk to 176 to 194°, and even up to 212° F, while wool will not stand a higher temperature than at most 140° F. The higher the temperature is raised, the quicker, naturally, progresses the bleaching operation. Another authority, which has employed the peroxide of sodium process, gives the following particulars regarding this method:

"Great stress is laid on a thorough preliminary cleaning, for which, if necessary, even caustic potash may be used with discretion. At all events, none but potash soap should be employed. The bleach bath is made up for 100 lbs. of goods, by mixing ½-lb sulphuric acid, 66° Be. into the necessary water, dissolving separately, 2¾ lbs. oxalic acid, and add to the bath, then stir in 2 lbs. peroxide of sodium, and lastly, make alkaline with 2 lbs. of silicate of soda. Enter goods, warm to 110 degrees F, bleach 2 to 6 hours, wash thoroughly, give 5 minutes in a sour bath, of 110 gallons water and 8 lbs. oxalic acid, wash again and dry. The silicate of soda may be replaced with 5 lbs. Marseilles soap. The bleach bath is restored for the next batch by the addition of one-half the above chemicals with the exception of the silicate and soap. Nothing has yet been found to equal the peroxide for bleaching qualities and peroxide of sodium is recommended only because it is the cheapest and most convenient variety."

The cost I will place as follows: ½-lb. sulphuric acid, ½ cent; 2¾-lb. oxalic, 19¼ cents; 2 lbs. peroxide, 90 cents; 2 lbs. silicate soda, 4 cents. Add about 55 cents' worth of the chemicals for the second hundred pounds of goods, and 8 lbs. oxalic—about 56 cents worth—for the sour bath, serving both lots, and we have \$1.12 for the bleaching chemicals for 100 lbs. of goods, which, I think, is a very low cost indeed, when we consider the little handling called for by the process. The cost of the peroxide bleaching is thus brought down to very nearly the cost of the old lime or sulphur treatment.

Sulphur is employed for bleaching wool goods, either by exposing the goods in a closed room to the fumes from burning sulphur, or by the more convenient method of immersing the goods in a solution of sulphurous acid for twenty-four hours and afterwards washing and drying, bisulphite of soda is used frequently in place of the sulphurous acid. A bisulphite solution standing about 20 per cent. Be. is prepared, and the woollen goods immersed for 12 or 15 hours, then wrung out, and passed into a sulphuric acid bath, standing at 4° Be. for about 12 hours. This process cannot be used on cotton or mixed goods on account of the danger of injury to the cotton by the acid. The bleach obtained by sulphur is not permanent. Washing with soap or exposure to the air restores the original shade.

(To be continued).

FINISHING AND WAREHOUSING.

When it happens that fabrics or yarns that are intended to shade with each other do not come up to expectation, the most natural thing to do at once is to blame the dyer for carelessness and poor work. Anyone who is connected with a mill understands the significance and truthfulness of this statement. There is no question whatever that the dyer is frequently called to account for mistakes and bad results which cannot with any kind of reason be laid to his charge. In this connection we might observe that if all the dyer has to do is simply to make one color match another, his work is comparatively simple, says a writer in an exchange. But the facts of the case are that a certain sample is placed in his hands, and he is expected not to make a sample that will leave his hands just like the one in question, but he is expected to color his goods so that they will finish and turn out from other departments than his own, and

result finally in a fabric that is like the sample that he has in hand. He is thus expected not to make a color resemble another color, but this resemblance must take place only after many intervening processes, the kind and character of which perhaps may be unknown to him, have been undergone. It is evident that the claim upon his skill and judgment is by no means an insignificant one.

If every dyer knew exactly what was to happen to his output after it had left his hands, he might be in a position to get a little nearer to the desired results. But when we remember that perhaps he may be working on the raw material or upon the yarn, and that either that raw material or yarn has to go through perhaps a score of processes, and be allowed to lie about the mill perhaps for weeks, and subjected to any and all sorts of conditions, it is no wonder that the problem becomes one of considerable weight. Another feature that adds to the difficulty in question is the fact that many of the coloring materials that he must employ are of such a nature that certain kinds of treatment alter their character entirely. For example, if certain degrees of temperature are employed, or if too long a time is allowed to elapse while the material is under way, there may be modifications in the coloring material itself for which he had made no calculation, and which can only result in bad work.

Every finisher is aware of the fact that there are numerous agents employed in his department that will always affect colors. The acids and alkalis used in fulling and scouring must always be taken into account in this matter of color preservation. Sometimes the use of sizing materials will affect the colors that have been put in the goods, and certain sizes will have one kind of an action, while another will act differently altogether. If the dyer is unacquainted with these details in the finishing processes, it is simply impossible for him to make his arrangements so as to bring about shadings that will be entirely satisfactory. Another element that has a tendency in the same direction is the matter of heat that enters into several of the finishing processes. Heat if it is allowed to be in excess will almost disintegrate some colorings, and many colorings it will impair, and therefore unless the dyer keeps these points in view, he is sure to have difficulty. Many of the blues are especially liable to be thus affected, and the tendency is generally towards a reddish shade. Frequently yellows under heat and moisture conditions will show a tendency toward orange shading. It is therefore incumbent as well upon the dyer as upon all the others who are called upon subsequently to handle the colored materials, that they should keep these facts always in mind.

Sometimes it is very hard to determine just what has been at work to change the shade that the dyer expected to produce. If goods have to be sized, this is always one of the most difficult points to be considered, and if the sample that is given to the dyer has been sized, he will find that if he makes his shade similar to that of the sample the results will be bound to be unsatisfactory. The sizing, its ingredients, the method of procedure and the length of time the material is under its action must all be approximately known before shades can be entirely satisfactory.

The other fact that has quite a marked influence on shades that the dyer is expected to produce is the conditions under which cloths, yarns and wools are warehoused. It frequently occurs that during the process of manufacture, wools and yarns have to be stored and allowed to wait before they are worked up into the finished product. Then it almost always happens that the finished goods are stored away for a greater or less length of time before they are finally put upon the market. It is a well-known fact that conditions may arise in

these instances that will lead to changes in colors. Yarns and stock after having been colored should never be placed where they will be exposed to direct sunlight. Yarns, stock or goods should never be placed in the neighborhood of boilers or fires, where gases are forming and coming into contact with material. A warehouse should never be in the neighborhood of a bleach house or a dyehouse or a soap making plant, because the fumes and vapors that are almost constantly attendant upon these operations will sooner or later through the warehouse windows and doors come into contact with the colors in the manufactured goods. All these features must be looked into or a degeneration in shade and in brilliancy of effect will certainly take place, and this change will take place without the dyer being in the smallest measure to blame for it. Where the change in shade affects wools or yarns, streaked appearances will be produced in the goods that are made from them.

GERMAN GOODS WATERPROOFED IN ENGLAND— BRITISH YARNS DYED IN GERMANY.

Germany's improvement traffic appears to be the subject of much discussion in English and German trade papers at the present time. In a recent issue of the *Textile Mercury* the subject is taken up very interestingly, as follows: It is well known that, under the existing German customs' laws certain raw materials and partly manufactured articles imported into Germany for the purpose of being improved or completed, and of being subsequently re-exported, are exempt from payment of German import duties, and that in a like manner half-finished materials exported from Germany for completion or improvement abroad are subsequently readmitted into Germany duty free. This system is called "Veredelungsverkehr," or improvement traffic, and is of considerable advantage for many branches of German industry, some of which at present could not exist without it. While certain German industries therefore are greatly in favor of maintaining this system, there are others which consider their interests seriously prejudiced by what they regard as a system of protection of foreign industries. Two instances of complaints lately raised by German industries against this improvement traffic are cited by the Hamburg Chamber of Commerce in its last annual report, and they concern commercial and industrial interests, both in the United Kingdom and in Germany; we subjoin the remarks on these two cases made in the report of the Chamber:

"We have repeatedly pointed out, in our annual reports, that a narrow-minded view is held in the interior of Germany with regard to the 'improvement traffic,' and that this view can only have injurious effects for German foreign trade, and no less so for German industry. During the past year we have had to deal with two examples of this mistaken view. The first referred to the long-established practice of dyeing British woolen knitting yarns in Hamburg. A vigorous protest had been raised by the Union of German Wool Combers and Wool Spinners against this practice (or 'improvement traffic'), in the hope that by its suppression an increase would take place in the sale of German woolen yarns. After minutely investigating the matter, we found, and pointed out, that the union had based their conclusions upon erroneous premises, for it appeared that the yarns concerned were of a particular kind, which, on account of their firmness, flexibility, and crispness, are especially sought after in northern countries, and which, in fact, cannot be produced in Germany. Attempted substitutions of German yarns have been refused by customers. The cessation of this traffic would accordingly not only result in the ruination or emigration of the dyers now established here, whose industry has been founded upon the present arrangement but it would further also result in the transfer of the

trade in these yarns from German to British firms. The loss of this branch of trade would, moreover, materially weaken the power of competition of German merchants, and a certain quantity of German goods now supplied by them would in consequence be replaced by foreign products. The fact that German merchants are driven by their own interests as far as possible to keep German goods in stock, and to substitute the same for foreign products, is proved by the following figures, which were furnished to us by a prominent German hardware firm: The total purchases of this firm amounted in 1887 to £166,600, and in 1898 to £250,000; of these the proportion of goods of German origin amounted in the year first named to 04 per cent., and in the latter year to 83 per cent. The value of the goods of German origin had accordingly nearly doubled, while that of the foreign goods had decreased by almost one-third. But in woolen knitting yarns the supply hitherto drawn from Great Britain has still equalled about 70 per cent. of the entire stock; a proof, therefore, that its substitution by the German product is not possible. The second case referred to the waterproofing of German cloak materials in the United Kingdom. Objections were in this instance raised against this practice by the German India rubber goods manufacturers, who asserted that Germany was in a position to carry out this waterproofing quite as well as was done in the United Kingdom, as proved by the fact that British materials are even sent to Germany for the purpose of undergoing the same process. Recent enquiries have indeed shown that Germany has made considerable progress in this branch of industry, and that for ordinary goods it is now quite on a level with the British. Thus a Hamburg firm engaged in this business, which formerly used strongly to advocate the 'improvement traffic' system, now no longer attaches any value to it. In certain more delicate kinds of waterproofing, however, German industry is not equal to British, and the cessation of the 'improvement traffic' would in consequence have this result, that German merchants, unless they were willing to give up the foreign trade in these goods, and to surrender the same to the British, would have to obtain the complete article from Great Britain. (This course has indeed already been adopted by one important exporting firm here on account of the many formalities connected with the 'improvement traffic.') The German weavers would in such case lose the sale of the materials, which are now sent to Great Britain for waterproofing. Both of the cases here cited show the complicated character of the commercial relations of the present day, and how easily the apparent protection of domestic industries may in reality prove injurious for them."

THE SILK INDUSTRY OF FRANCE.

BY JOHN C. COVERT LYONS.

The manufacture of silk and its affiliated industries have for several centuries been the chief business of Lyons and the surrounding country. The causes which have influenced the development of this trade, the pressure which has been brought to bear upon it by Government control and associations of workmen, render its history instructive and useful.

The Romans established works here in the third century, A.D., for the manufacture of cloth of gold and silver, but every vestige of these was swept away by northern invasions. The present silk industry was brought here from Italy and Spain and the Levant, about the year 1466, under the fostering care of Louis XI. He imported machinery and weavers, with the expressed purpose of diminishing the stream of gold then flowing into foreign countries. It is recorded that 5 aunes of silk at that time cost from 300 to 400 francs, or from 48 to 60

frances (\$9.26 to \$11.58), per yard, money then being worth about four times its present value.

Among the encouragements offered to silk weavers during the first century of the existence of this industry in Lyons was exemption from military service and taxation. So rapid was its development that in 1650 the weavers numbered 18,000, or 60,000, with affiliated pursuits. No branch of this industry was free. The Government determined the wages and hours of labor, ordained how many looms one employer should run, the number of apprentices and the term of apprenticeship, what class of goods he should make, whether a woman or a man, who had married into a weaver's family, should be permitted to work as a weaver, how many clerks a manufacturer should have—the whole business being involved in a code of complicated regulations causing constant wrangling between employer and employe, and creating an army of life-tenure officials to discover breaches and to enforce regulations. These were subject to frequent changes, such as the imposition of a tax on foreign workmen, prohibition to weave in the country during a period of ten years, a graded tax upon looms, limitations of the hours of labor and of the output, the whole creating a situation in which the rights of individuals were ill defined and subject to the arbitrary whim of inspectors. Complaints made by spies were followed by fines, exile, and hanging.

Lyons is a school for teaching the manufacture of silk, as well as a great centre of the silk trade. Young men come here from all countries to learn to make silk, acquiring the language while learning an important branch of commerce. In the silk department of the commercial school, there are generally from 250 to 300 pupils. The price of tuition is 800 francs (\$154), per year for Frenchmen, and 1,200 francs (\$231), for foreigners. All kinds of silks, velvets, plain and figured goods, are made by the learners under the superintendence of skilled workmen, with the most improved machinery. Some of this machinery bears the mark of a Philadelphia or Paterson manufacturer. A Singer sewing machine sews the pattern cards together. Thirty looms are run by hand and twenty-five by steam. The municipal school, on the Croix-Rousse Hill, the traditional home of the weaver, admits only Lyonnese youth. It is sustained by the municipality. Any boy, 15 years of age, with the residence qualifications, can here learn the theory and practice of silk weaving, designing, and making patterns, for 9 francs (\$1.73), the total registration fee for the three departments. The day course of study is ten months. In the night school, provided for children who are employed during the day, a course of three years' study is required before graduating. Among the 300 or 400 pupils are the children of the rich and poor, some kept there at a sacrifice on the part of their parents. Each learner is required to keep a carefully written diary of his work, with abstracts of lectures, patterns of silk, designs of machinery, diagrams, etc. A presentation of this book to a silk dealer invariably secures him a situation. The director, M. Guigardot, informs me that for several years he has not been able to respond to all the demands for young men made by the large silk houses of Lyons. Everything is taught here, from the breeding of the silkworm to the weaving of the finest stuffs for wearing, upholstering, mural decoration, and artistic embroidery. The product of the school, which is sometimes defective, is sold at nominal figures.

Upon the Croix-Rousse Hill, there are not less than 25,000 men and women engaged in weaving silks and velvets. Many of them have no idea how many generations their families have been working in the same rooms, but the genealogy would probably run back through several centuries. Their work represents the finest silks, satins, and velvets made in the

world. The men earn an average of 3 francs (about 57½ cents), per day, and the women 48 cents. A good workman engaged upon the finest material will earn 5 and 6 francs (96 cents to \$1.15), per day. A very few employed upon exceptionally fine goods, involving the use of an infinite number of colors and shades, receive as high as 12 francs (\$2.31), per day. For a year or more, Paris and Lyonnese artists have been making designs for work to be exhibited at the Paris Exposition. One piece of tapestry just finished contains two hundred distinct shades and tones sprinkled over the branches, buds, flowers, and leaves that compose it. Two hundred thousand cards were used on the Jacquard handloom upon which it was woven. There are satins and velvets printed on the warp, produced in the manner that a job printer employs for a colored bill or card, each shade requiring a distinct impression, and some as many as sixty different impressions. After the warp is printed, the wool is formed by two to eight shuttles, each carrying a different color of thread. After the silk is printed and woven, raised work is added by deft fingers. Hand work is rapidly giving way to power looms, especially in the plainer fabrics. The latter can do from three to four times as much work as the former, if producing light stuffs. In making velvets and figured goods, the difference will be about double. A power loom will produce some 15 meters (49.2 yards) of tulle per day, against 10 meters (32.8 yards) on a hand-loom worked by a good man.

The manufacture of velvets by power-looms was commenced about thirty years ago, and they have now pretty generally taken the place of handlooms. The Weavers' Bulletin of February 21, 1900, stated that the number of hand-looms in use in Lyons, December 31, 1885, was 17,294. On December 31, 1899, the number had fallen to 8,637. Between the same dates, the number of power-looms increased from 200 to 2,383. Thus, 8,637 hand-looms had disappeared in ten years. The output undergoes a slight annual increase. The estimate of the number of power and hand-looms applies only to the city of Lyons, but all the silk manufactured in France should be classed as coming from Lyons. The raw material first comes here, where it is conditioned; that is to say, a part of it is dried, and it is all weighed in the Lyons condition house. All raw silk contains more or less moisture, which buyers are naturally averse to paying for. When a bale of silk reaches the condition house, three hanks are taken from it and weighed wet. They are then dried and weighed again. The amount of moisture in the whole bale is thus computed, and deducted from the number of pounds that the bale weighed. This is called conditioning the raw silk.

(To be continued).

CONTINUOUS DYEING OF LININGS.

Linings are generally dyed with Oxy Diamine Black on the jigger, but as in many establishments it is desirable to dye continuously, in order to increase the production, Leopold Cassella & Co. have through their agents, W. J. Matheson & Co., Ltd., published the following detailed description of an apparatus adapted for this purpose and employed in practice for years. Such a machine consists of three vats, fitted with rollers, placed alongside of each other, each containing about 170 to 220 gallons of liquor. As the liquor can flow over from one bath into the other and circulate in the three vats, only the last vat needs replenishing. All the three vats of the apparatus are similarly charged with 1½ to 2 lbs. Oxy Diamine Black* and ¾ oz. soda for every 10 gallons of liquor.

The quantity of dyestuff to be added for replenishing the bath depends on the quantity of goods to be dyed, assuming

that 4 1/2 to 5 per cent. of dyestuff* are absorbed. The dyestuffs are dissolved at the boil in condensed water, or if this is not at command, in ordinary water to which some soda has been added; the solution is run into the bath during the passage of the goods, which lasts three to four minutes at the boil. An addition of Gaudet's salt or common salt, necessary when dyeing on the jigget, is not required if the continue machine is used. After being dyed the goods are deposited on the truck without rinsing, left there for 1 to 2 hours and then only rinsed. Although it is always preferable to boil or at least well wet the goods before dyeing, it is desirable in certain establishments to dye the pieces direct in the raw state; this can also be done on the continue machine, if care is only taken that in this case the first dye vat is more frequently run off (every evening or every other day according to the quantity of size contained in the goods), whereas if the goods have been boiled previous to dyeing, the bath may be used for weeks in succession.

The firm recommends the following dyestuffs as specially suitable for producing cheap black dyemys by the continuous method: Oxy Diamine Black D. A F F for the usual shades most in demand; Oxy Diamine Black A, or S A for black with a bluish tinge; Oxy Diamine Black A M for black with a brownish tinge; Oxy Diamine Black A T for very intense jet black. These brands are also supplied in a concentrated form of double strength.

A GLIMPSE OF SHANGHAI.

In a very instructive sketch of Shanghai, Henry Norman recalls a visit made to that quarter of China some years ago. He looks upon Shanghai as really a republic under cosmopolitan foreign influence, as the local authorities though nominally under Peking rule snap their fingers at any commands from the Imperial Chinese Government which do not accord with their own views. The imports of Shanghai consist almost entirely of cotton piece goods, metals and kerosene oil; exports, tea and silk. The tea trade, as elsewhere in China, has fallen off grievously of late, owing to the gradual fall in quality, and the competition of Ceylon and Indian teas. It seems as unlikely that the Chinese will learn to improve their qualities as that we shall learn how to know good tea from bad, and how to "make" it when we have secured it. To every Eastern tea-drinker the tea served at the best houses in England would be a horror. The same cause has already produced a standstill and will soon produce a reduction in the Chinese silk trade. Chinese silk would be as good as any in the world if it were properly prepared, but it is now used only to add to other kinds; whereas Japanese silk, because prepared with Western methods and conscientious intelligence, has increased its output tenfold since Japan began to sell it to foreigners. The figures of Shanghai trade are, of course, a striking testimony to the preponderance of British interests and enterprise. In 1893 the number of ships entered and cleared, both under steam and sail, was 6,317, with a total tonnage of 6,529,870. Of these, 3,092 were British, and their tonnage 3,664,175.

The wealthy Celestial keenly appreciates the fact that his person and his property are infinitely surer under the Union Jack and the Stars and Stripes than under the rapacious and unrestrained rule of the representative of the Son of Heaven. He is therefore prepared to pay whatever may be necessary to secure a good piece of property within which to live and trade in the foreign settlement. This influx of Chinese has had the effect of compelling foreigners, and especially those of small means, to seek every year dwellings farther away from the busy centres, which the Chinese now monopolize. The rents of foreign houses

*These figures refer to the normal strength. If the concentrated brands are used proportionally less dyestuff is absorbed.

in the settlements are gradually rising, for as each old-foreign building is pulled down Chinese houses take its place.

Two other causes are also appearing to transform the Shanghai of old time, and indeed all the business relations between foreigners and Chinese. The first is the growth of Chinese manufactures. The Chinese Cotton Cloth Mill Company, the Chinese Spinning Company, the Shanghai Paper Mill Company, the Minh Ginning Mill Company, and the Yuenchee Ginning Mill Company, are all Chinese concerns, with Chinese capital and under Chinese management, with foreign technical assistance. The first-named of these is supposed to be financed by the Viceroy Li Hung Chang himself. These enterprises have not yet paid much in the way of dividend, owing probably to inexperienced direction, but there is no reason to suppose that they will not be successful in the end. And their success would probably mean a nearly proportionate amount of European failure. The reader will naturally ask at once why foreigners have not started such concerns themselves. The answer is based to a great extent upon the supineness of a recent British minister to China. The Chinese claim—without any justice, Mr. Norman thinks—that the treaties give no right to foreigners to manufacture within the treaty limits, and their claim has never met with serious official resistance. It is to be hoped that one among the innumerable results of the present war will be the settlement of this question in favor of Europeans. If China were only fairly open to foreign enterprise, there is room in her vast territories and among her millions of inhabitants for all the surplus silver of the world for many years to come.

Foreign Textile Centres

MANCHESTER.—The feeling of anxiety in Lancashire towns dependent on the cotton industry continues to grow, and the local drapers are curtailing their purchases pending more definite news from China. Short time has been adopted in many quarters, and there is a general feeling that the wage-earning population of Lancashire will be deprived of a considerable portion of their spending power for some time to come, says the Warehouseman and Draper, London. Trade has remained very quiet in all sections of the Manchester market. Few big lines have changed ownership in either yarn or cloth. The raw material continues to maintain its price in American quality. Egyptian cotton is quiet. Users of yarns are operating very sparingly indeed, and spinners find that stocks are accumulating, and are rather more open to meet offers than of late, though offers are not numerous and are only sufficient to cover cloth orders as they are booked. Indian buyers have rather more business to offer, but in most cases it is at prices that makers are not disposed to accept; indeed, in most cases one finds manufacturers inclined to shut down machinery in preference to taking the low prices ruling at present, as they cannot be accepted without loss. There is more business doing for the Levant, but as yet nothing from China. One authority on the China trade says that no trade may be expected for the next eight months, which is a dismal prospect, as that market is a very large one for our goods. The higher rates ruling for flannel wools have given an impetus to the Rochdale flannel trade, as all qualities concerned have not only recovered from the fall they experienced, but are now higher than during the May sales. What with the new business coming forward, the repeats, and the Government contracts still unexecuted, manufacturers find that they have their hands full, and that there is every likelihood of things continuing to be so, with the prospect of another large army order to be shortly placed. Makers are now more inclined to buy wool, though the business is not large.

OLDHAM.—The movement to curtail production is growing, says The Textile Mercury. Following the decision of the directors at thirteen cotton spinning companies at Royton to close the mills for an additional week at the Royton Wakes holidays—being altogether a fortnight's stoppage—a few firms in Oldham are also working their mills less time. One firm's mills are being closed the whole of next week, and others are working shorter hours. The Oldham Wakes holidays commence on the last Saturday in August, and it is probable that, unless there be an improvement in trade, the mills will be closed for a longer period than a week. At present no united action is being taken on the matter.

LEEDS.—It would appear that the trade is passing through a period of general depression, and it is not easy to discover any factor which would have the effect of producing prosperity. Some old business is still being got out, but travelers and producers alike find the greatest difficulty in meeting customers, although the opinion is largely held that the lowest values have now been reached. It is believed that the inflated value of coal is having an adverse effect on business. Little is being done in high-class cloths, as the London trade in these lines has fallen away considerably, but a fair amount of business goes on in fancy tweeds, and there is an average turnover in serges. Covert coatings are somewhat weaker. Certain new productions in dress goods are favorably received. Wool is quiet.

HUDDERSFIELD.—Business throughout the woollen trade is quieter, and not only are the clothing factories busy, but there is more short time being made in the woollen mills than has been the case for some time past. Makers of khaki cloth and other Government serges are still, as a rule, well going, but even in this department the rush is nothing like so great as it was. Some few makers of specialties in fancy woollens are busy in the Huddersfield district, and some of the leading mills engaged on light-weight woollens for ladies' wear in the Morley and Yeadon districts are still well employed, and have good prospects of a good season's business ahead.

BRADFORD.—The fourth series of colonial wool sales in London came to a conclusion July 27th, and the general course of business there may be very briefly summarized. Opening with a fall of 15 per cent. in merinos and of 5 per cent. in the cheaper crossbred wools, prices were at once brought practically on a level with the quotations which had been ruling in Bradford. Only a slight recovery has been shown in the price of merino wool during the sales, and 5 per cent. will probably fully cover the extent of the improvement in the finest wool; but, helped by a good competition from both America and the continent, the prices of the cheaper crossbred wools quickly came back to the level of the May sales, and this position has been fully maintained up to the close of the recent series. The selling brokers and importers have arranged to eliminate one of the London sales altogether, and to considerably curtail the supply of wool to be offered at the only remaining sale which will be held for colonial wool at Coleman street this year, believing that the wool market is at the present time induly depressed, and that the above course of procedure will allow the consumption of merino wool especially to dispose of the surplus stocks which had been held back by speculators, but which have recently come again into the market. It is, however, the opinion of some well-informed authorities that the fact of an unknown quantity of merino wool being thus artificially kept out of sight will have the effect of holding back speculation on the part of buyers much longer than would have been the case if the full supply had been allowed to come forward in the usual way, and take its chance at the open auction sales in London. The burden of holding over this Australian wool

must, of course, to a large extent fall on to the London bankers, and the recent rise of the bank rate to 4 per cent. will not make this holding over operation any less expensive. As was shown above, and as was predicted as extremely likely in these letters, the cheaper classes of crossbred colonial wools have fully held their own at the recent series in London, and, in fact, some attempt is now being made to obtain an advance in the price of combed tops made from these wools in Bradford. The demand from these crossbred wools is still good, and as the tendency of fashion is still in favor of goods of the serge and tweed order (for which crossbred wools are used) there is every reason to look for a move in an upward direction as soon as business generally has thrown off that lethargy which has recently so distinctly affected it. Although, of course, the wool trade in Bradford must be seriously affected by such a falling off in the demand and such a drop in the prices as we have seen in fine merino wools this year, there has been a tendency for some years past for the trade here to run more and more on goods and yarns made from crossbred colonial wools, and to-day Bradford is the recognized centre of the colonial crossbred wool trade, and this part of the wool trade has in late years assumed really gigantic proportions. Flannel makers are still busy, and as the Government requirements continue to be large and public favor is more in the direction of the use of wool flannels, and the all-cotton flannelettes are so much dearer, the prospects of the flannel trade may be considered good.

ROCHDALE.—At the flannel market recently there was not much fresh business transacted, but the higher rates for wool now ruling are giving more tone to the market. The medium and lower classes of wool, which are largely used in the flannel trade, have recovered the fall in price in the earlier part of the London wool sales, and are now occasionally higher than during the May sales. The business coming forward and the old contracts still unexecuted keep manufacturers busy, and there is a prospect of their being so for some time to come.

KIDDERMINSTER.—The carpet trade grows more quiet, though as yet few looms are idle. A good many are making trials of patterns, but on the whole deliveries of carpet and the orders and enquiries that come to hand are fully up to the average for July. The yarn trade, too, is quieter, and with less yarn going into consumption spinners find particulars harder to get. Some few enquiries are made for new business, and, owing to the irregular state of the wool trade, yarn prices are very variable. Enquiries show them to be not so slow as they have been said to be, for the increased cost of production, apart from the raw material, has had its effect.

NOTTINGHAM.—Business is quiet in this market. Buyers of lace and curtain yarns are limiting their orders to proximate wants. Quotations remain nominally unchanged, but the tendency of prices is in favor of buyers. There is a moderate demand for hosiery yarns, but prices are irregular. Brown cotton nets and tulle are firm at previous quotations. Manufacturers of fancy cotton millinery lace are doing a good business.

LEICESTER.—The hosiery industry is active and the whole of the machinery is not only fully engaged, but there is every prospect that the output and the demand will be larger than in any former season, the stocks held being unusually small. The yarn market is recovering its tone, and although there are still large numbers of small orders, users are enquiring more freely for large quantities, with the view of covering prospective requirements. Lambs' wool and fancy yarns sell very freely, and the production is heavy, but cotton yarns have a small turnover.

BELFAST.—Spinners are booking very few new orders, and prices show a little weakness. No general agreement has yet

been come to with regard to curtailing the hours of production, but short time is in operation in some concerns, and may become more general before long. The home flax crop is showing splendidly, but it is feared in some quarters that the Russian flax crop will hardly be up to the average, says The Draper's Record, London. In the brown cloth market the volume of trade has been of the most moderate description, and rates tend to get lower. Power-loom linens for bleaching have sold slowly. The demand for cloth for dyeing and hollandis is practically unchanged, and is dull. Damasks and housekeeping linens are in poor request. The handkerchief trade is fair. Business in the bleached and finished end of the trade is quiet. The making-up factories are doing a fair trade—not equal to what has been done recently, but it is expected there will shortly be an improvement. The home warehouses are placing very few orders. For damasks and household goods demand is very quiet. A steady trade is passing in handkerchiefs. Export trade is not up to the mark. Orders from the United States are neither numerous nor large, and there is hardly anything fresh from Cuba. South American trade is much as before. The Canadian and Australian markets continue to buy freely—in fact, the colonial trade is the one satisfactory spot just now.

LYONS.—The Lyons demand for silk fabrics is quiet, business for ready delivery being of small proportions. Trade is not expected to improve until order business for next spring commences. Buyers of fabrics have before them the experience of other Exposition years, which were followed by a season or two of slow business in silk fabrics. While it is not certain that this time the same experience will be gone through, buyers prefer to wait for developments before they show a sanguine spirit. The situation in the industry is unchanged, but there is enough work on hand on muslin, piece-dyed goods and other light fabrics to keep the power looms engaged until the orders for next spring are placed. With the hand-looms, however, conditions are different. A number of them are idle and dyers are not very busy. A number of American buyers have been in the market and have done some ordering, says the correspondent of The Dry Goods Economist, New York, but as a rule, their orders have been small. In muslin supplementary orders continue to be placed. Taffetas retain favor and a fair business has been done in these. For winter consumption, fashion seems to be partial to woollen fabrics in grounds with adornment of silk effects with few dresses entirely of silk, silk retaining hold only in the form of lining or of trimming. But there are so many uses in which silk can be employed that if it is not adopted for dresses it will still have a large field of consumption, especially the lighter weaves. Muslin is the only article in which large transactions are reported. Crepe lisse has also been the object of some orders, and lace effects have been in fair demand. Fancy silks, as a whole, are not much favored, but a moderate business has been done in small effects on taffeta or on wool-filled grounds. Metal effects seem to be gaining ground, and a better demand exists for gold and metal designs on silk ground. In ribbons the demand is fair for wide taffetas and failles. Wide ombre effects are selling and printed goods find a market. Black velvet ribbons sell well in all widths and are great favorites. The velvet market continues active, good orders having been received for home consumption, as well as for export. Plain velvets and pannes are in favor.

CREVELD.—Little is doing in the Crevelde market. Retailers who had done some selling up to the very close of the season have also entered the between-seasons period. Travelers who have been out on their first trips for fall, have not received much encouragement by retailers in the form of orders for next season, and the business thus far done is disappointing in volume. Wholesalers, under the circumstances,

do not feel elated, and are operating very sparingly and limit their purchases to reassortments for current needs. Manufacturers do not see an improvement in the near future, and the manufacturing situation does not improve, as the orders on the looms are completed and little is found to take their place. A few orders for novelties for fall have been placed, but these have been limited in number as well as in volume. Among the goods ordered are evening silks, the business for which has been relatively good. Taffetas have also been the object of some orders and may still be considered favorites. A fair business has been done in changeable taffetas, in new color combinations, but the business done has been principally for small lots. Damasks have received some attention. The orders on hand for dress and trimming silks are not sufficient to keep the looms very busy, and in other branches of production the situation is no better. Tie silks, umbrella silks, linings, ribbons, etc., are all suffering from the same lack of animation. The cloak and garment making trade buy only for immediate requirements. They have completed their first lines for the season and are waiting for the demand to show itself. Buyers in this branch have not many requirements at present, and in buying they seem to follow the rule of wanting lower prices for each successive transaction. The result of this policy is the cheapening of the goods. This is especially the case for linings, but buyers do not care as long as the price is reduced. The pile fabric industry continues the favored branch, and in velvets, as well as in plushes, manufacturers have enough work on hand, notwithstanding the fact that new orders are not as liberal as was desired. The demand for the German market has been good for both velvets and plushes, but business for export has not been as satisfactory as was expected, and an improvement is desired.

ZURICH.—The Zurich silk goods market is quiet. There is little spontaneous demand, and orders for future delivery are not being placed. Some lots of ready goods have found takers, but at prices that give little encouragement to the sellers. There seem to be some holders left who are anxious to sell, and some of them are anxious to do so before taking stock. But in order to do this they have had to accept what buyers chose to offer, and prices, therefore, are still irregular, although it is expected that the better tone in the raw material market will cause an improvement soon. The demand for raw silk in this market has not yet become lively, manufacturers still being conservative. Prices, however, are firm, the result of the Italian crop having made holders more hopeful.

PAINTING FABRICS.

Corporation papers have recently been granted a new company named the Comross Process Co., which has been organized under New Jersey laws with a capital of \$100,000 for the purpose of carrying out inventions which it is claimed will revolutionize the present system of decorating textile fabrics. The company is to operate patented processes invented by J. T. Comross, says the Boston Journal of Commerce and Textile Industrial. The patented process by which the new company proposes to paint any woven design on any kind of cloth, is by using atomized colors. Paints, dyes, aniline colors, printers' ink, pigments and colored liquids can be used, and it is claimed by the company that the process will greatly reduce the expense of the present system.

In this new system the colors are applied by the use of hydraulic or atmospheric pressure, breaking up the dyes or paints into a spray or cloud which falls on the parts of the cloth or other material not protected by the design, and the company claims that it can produce, by the system of atom-

ized colors, any design on any sort of fabric, including velvet, burlap, corduroy and thin materials, at the ridiculously low price of one cent a yard. It is also claimed that wire screens can be decorated so as to resemble lace curtains, and that portieres can be made of the common cloths, colored and decorated with the expensive designs.

Textile Design.

ENGLISH COATINGS.

Roberts Beaumont gives the following four designs for coating weaves in the Textile Recorder:

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DESIGN 1.

In speaking of these designs, he says: In spite of the abnormal price of fine Botany wools—amounting to 113 per cent. since December, 1898—there will almost be a demand for piece-dye worsteds and vicunas for coatings. Woolen yarns are unsuitable for the smart, neat effects which are possible when 2-48s, 2-60s and 2-70s worsted yarns are available. This ex-

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DESIGN 2.

plains the effort constantly being made by manufacturers to obtain new effects of a weave character. There is no other source of pattern at command. Variations in setting and shrinkage in the relative counts of warp and weft yarns are all methods by which experience and observation have produced

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DESIGN 3.

cloths differing in some interesting detail from those previously manufactured. But all these methods of obtaining newness of fabric are limited in scope, and the weave or make has to be resorted to. A few examples of this order are given in Plans 1 to 4. They should be produced with the marks as warp effect when they yield cloths with an imitation warp back. The following is one method of weaving:

Warp:

2-48s worsted.
18s reed, 5s.

Weft:

24s worsted.
64 picks per inch.

This "false" scheme of backing has its advantages, for it brings every thread of warp on to the face, causing it to con-

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DESIGN 4.

tribute to the wearing power of the cloth, whereas the ordinary warp back only utilizes a portion of the warp yarns in the construction of the face of the fabric, which, after all, sustains the most friction in the made-up garment.

THE LATE THOS. SAMUEL.

The death took place at St. John's, Nfld., early this month, of Thos. Samuel, one of Montreal's oldest citizens. The deceased left the city a short time ago on a business trip to the Maritime Provinces, and although his health was not good, his death was quite unexpected. Mr. Samuel was born in Leith, Scotland, in 1825, and educated at Heriot's School, Edinburgh. He came to Montreal by one of the earliest steamers, the "Bellona," in 1840, and has been actively engaged in business in Montreal, with the exception of a brief period he spent in Hamilton, for about sixty years. He successfully represented Barbour Brothers, of Belfast, for many years, and recently on the arrangement of the different thread firms, he was appointed agent for the entire thread business in Canada. For over a quarter of a century Mr. Samuel resided in Westmount, and took an active part in all the town's interests. He leaves a widow, one son and six daughters.

THE GERMAN CHEMICAL TRADE.

In the light of the article at the beginning of this paper on the exhibition of the German chemical manufacturers in Paris the following figures are of great interest: The last report of the German Chemical Trade Association states that the imports of raw materials in the last reported year rose to 1,584,219 tons, worth 176,600,000 marks, and the exports to 587,893 tons and a value of 38,600,000 marks. Imports have thus increased by 67,700 tons and 1,200,000 marks, and the exports by 68,000 tons and 1,500,000 marks. The importation of manufactured goods rose by 6,700 tons but fell in value by 5,100,000 marks while exports increased 53,000 tons in weight and 17,700,000 marks in

money. The total value of exportation rose to 96,000,000 and exceeded that of the imports by 23,000,000. This is worthy of notice because in England the exports of chemical products fell by 1,300,000 marks in the same period. The home carriage by rail of chemical manufactures and raw materials rose last year from 7,800,000 to 8,700,000 tons, or 11.5 per cent.

The importance of the development of this trade is well shown by the statistics of the number of persons engaged. The number of establishments rose from 6,316 to 6,589, and the number of persons from 131,000 to 136,704, or 4.25 per cent., while salaries and wages rose from 120,900,000 marks to 129,500,000, or 7.2 per cent. The average wage of the work-people rose from M.922 to M.948. The following table compares the number of factories in 1888 with that in 1898:

| | 1888. | 1898. |
|--|-------|-------|
| Acid and alkali works | 39 | 56 |
| Factories of pharmaceutical, photographic and technical products | 28 | 34 |
| Dye factories | 22 | 50 |
| Factories of combustibles and explosives..... | 20 | 39 |
| Manure factories | 10 | 18 |
| Tar and wood distilleries | 10 | 21 |
| Fat and soap factories | 5 | 13 |
| India rubber factories | 16 | 36 |
| | 150 | 267 |

LITERARY NOTES.

The Textile World's 1900 Official Directory of Textile Mills and of Buyers of Textile Fabrics has just been published. It contains full information about the textile industry and allied interests, giving all details about each establishment, class of goods made, machinery, officers, etc. It also contains lists of dry goods commission merchants, manufacturing clothiers, suit and cloak makers, jobbers and large retailers, wool and cotton rag dealers, as well as cotton, woolen, worsted, knit, silk, flax and jute mills. Besides this there are valuable tables for manufacturers' use. A valuable feature is the system of textile maps, showing where mill towns are located, and so arranged that ready reference can be made to any town. A summary of mill statistics shows that great gains have been made in this industry in the past 10 years. There are now 21,057,983 cotton spindles in the United States; 7,806 woolen sets of cards, 1,510 worsted combs, 75,721 knitting machines, 1,426,245 silk spindles, 490,398 cotton looms, 80,759 woolen and worsted looms, 28,246 silk looms. The percentage of increase over the census figures of 1890 show in the cotton industry about 50 per cent. gain; in strictly woolen carding machinery, 8 per cent. increase; in worsted machinery, 76 per cent., while the knitting and silk industries have gained over 100 per cent. The book has 448 pages, with 22 map plates. The system of arrangement is very convenient, and the book is crossed indexed. Price in cloth, \$2.50. Flexible covered, \$2. Published by Guild & Lord, 620 Atlantic avenue, Boston.

The Rev. Dr. D. Z. Sheffield, president of the North China College and Mission at Tung-chau near Peking, was in America when the Boxer riots began, but immediately prepared to return to his post. Before sailing from San Francisco, late in June, he learned of the burning of his college. Dr. Sheffield left behind him the manuscript of an article which will appear in the September Century under the title of "The Influence of the Western World on China." As a result of the author's thirty years' experience as a missionary, he is said to argue strongly against the dismemberment of the Middle Kingdom. Equally timely will be a paper by R. Van Bergen in the same number, on "The Revolution in China and its Causes."

We have received the 1900-01 catalogue of the Lowell Textile School, Lowell, Mass., U.S., which explains fully the various courses in cotton and woolen manufacturing, dyeing, etc. There are a number of full page illustrations showing the various class-rooms, laboratories, etc.

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.

A farmers' co-operative binder twine company is being organized at Walkerton with a capital of \$120,000.

The Street Harbor, N.S., Lumber Co., is considering the establishment of a large pulp mill in connection with its present business.

Geo. Dick, formerly on the staff of the Hawthorne Woolen Mills, Carleton Place, Ont., has taken a place in a mill in the United States.

The Maritime Sulphite Fiber Co., Ltd., has applied for supplementary letters patent to increase its capital stock from \$225,000 to \$1,000,000.

Jos. Boothroyd, formerly superintendent in John Baird & Co.'s woolen mill, Almonte, Ont., is now filling a position in the Excelsior mills, Montreal.

Weston, Ont., is considering a proposition from a Jersey City wall paper establishment, which is looking for inducements for a branch factory.

The Cushing pulp mill, at Union Point, N.B., is now almost complete, and will be put into operation early in October. This is one of the largest in the Maritime Provinces.

C. D. Burdick, I. E. Burdick, H. D. Bates, G. F. Tull and H. A. Ruth, London, have been incorporated as the Helena Costume Co., Ltd., with a capital stock of \$60,000, to make clothing, etc., in London, Ont.

J. R. Moodie has brought suit against his brother, John Moodie, jr., to dissolve partnership in the Eagle Knitting Company. It is said that the trouble is due to some transactions in connection with the Cataract Power Co.

H. C. Fortier, T. Kennedy, G. H. Hayward and J. T. Loftus, Toronto, and P. Whelen, Brantford, Ont., have been incorporated as the Western Canada Woolen Mills Co., Ltd., with a capital stock of \$125,000; head office, Toronto.

Some 25,000 acres, belonging to the Kidston estate, of Glasgow, Scotland, and situated at Stoneham and Tewkesbury, on the Jacques Cartier river, have been bought, it is said, by Canadian capital, and a large pulp mill will be established there.

Z. Fineberg, H. Cohen, I. Mishkin, J. A. Cars and I. Rose, are applying for incorporation as the American Silk Waist Manufacturing Company, with a capital stock of \$10,000, to acquire the business of the American Manufacturing Co., and to make garments.

The National Paper Co., the name under which W. R. Reid, Lorette, Que., and E. A. Reid, Montreal, did business at Lorette, as makers of heavy papers, roofing felts, etc., lost its mills by fire, August 2nd. The firm assigned August 1st as a result of the assignment of Reid, Craig & Co., Quebec.

The Newcastle Advocate says that a pulp mill will soon be erected at some point between Chatham and Sinclair's Bridge. The site is not yet chosen. Chatham offers a bonus of \$5,000 and tax exemption for five years, but the company will select the best possible site. The mill will cost \$200,000.

Through the efforts of the local Council of Women, the Quebec Government has extended the powers of the female factory inspectors, Mrs. King and Mrs. Provencher. So far, the inspection of those ladies was confined to large manufacturing establishments, but under the new amendment, they may now visit all places where women are employed.

The Riordon Paper Mills Co. is building up the village of Hawkesbury, Ont., very rapidly. The mills, which are among the largest in Canada, are almost completed. The supply of pulp wood available at this point is very large, and of superior quality. Sawdust and mill refuse from the saw mills are used to generate steam power to run the Riordon mills.

A meeting of cotton spinners was held in Montreal recently to organize a Cotton Workers' Protective Association. The following officers were elected: A. Proulx, president; A. Martel, vice-president; J. B. Gervais, recording-secretary; H. C. Pigeon, financial secretary; J. Racine, treasurer. A committee of seven was appointed to make by-laws and secure a meeting place for the association.

George Stewart, eldest son of John Stewart, St. Johns, Que., has gone to Sydney, Australia, to fill the position of accountant in the branch house of the Corticelli Silk Co., recently opened in that city. Mr. Stewart has been in the head office of this concern for several years, and was presented before leaving with a purse of \$100 by the manager of the staff. Mr. Macpherson from the Toronto office, is the manager of the Corticelli branch house in Australia.

A most absurd strike began in the Dominion Cotton Mills Co., Magog, Que., on July 28th, when the operatives went out because the pay-day was changed from Friday to Monday. Later on a demand for increased wages was substituted as a grievance. The hands were all paid off on the 30th, and the resulting disturbances made it necessary to call out the militia. The strikers agreed to go back to work on the promise of the company to look into their alleged grievances.

Among the British paper makers who completed a tour of Canada and the United States, and returned to England about the first of the month were: James Marsden, the head of the firm of Charles Marsden & Sons, Barnsley, Wakefield, Sheffield and Tamworth; H. Duxbury, Darwen Paper Mills Company, Ltd., whose three mills are all at Darwen, Lancashire; Norman Duxbury, of Yates, Duxbury & Sons, Bury and Bolton; W. H. Dixon, Peter Dixon & Son, Oughtibridge, Yorkshire; John White, James Bertram & Son, Ltd., Edinburgh.

Richard Schofield, 14-16 Court street, Toronto, has completed the enlargement of his premises which doubles the capacity of this plant. He manufactures all kinds of cylinder dials, cams, yarn guides, cut pressers, mill supplies, fluted rollers, gear wheels, worm wheel, ratchet wheels, special screws, etc., and power knitting machines. He is Ontario agent for the well-known Union Special Sewing Machine for plain and ornamental stitching as used in the manufacture of shoes, gloves, underwear, etc.

For some time past the Montmorency Cotton Mills Co. has found that a branch of the Knights of Labor, established there, has been interfering with the help, and resulted in a threatened strike when the company decided to discharge all union help and employ nobody who was a member of any labor organization except benevolent societies. Since its determination to employ nobody who was a member of a labor organization, the company having given two weeks' notice to this effect, on Aug. 15th, a great many union hands have resigned from the society and gone back under an agreement not to join any organization. The employees profess to have a real grievance against the company in employing an overseer whose conduct is said to be immoral.

E. Campeau, aged 28, an employee of the Merchants' Cotton Co., Montreal, while at work in the mills at St. Henri got his arm fast in a machine recently, and had it so badly cut that it had to be amputated at the elbow.

James Sutherland, manager of the Embro, Ont., flax mill, had a narrow escape from being crushed to death the other day. Several tons of baled flax fell some distance on him and crushed him to the ground, but he was hastily rescued by some by-standers, when it was found that no serious injuries were sustained.

THE WOOL MARKET.

Toronto—The wool market is very quiet, and sales of Canadian wool are infrequent, as the country buyers are unwilling to consider the prices offered by the city dealers—about 16 cents.

Montreal—Sales are slow and buyers are evidently playing a waiting game while supplying present necessities. We quote: Greasy Cape, 18 to 22c.; Australian greasy, 20 to 24c.; B.A. scoured, 40 to 45c.; Canadian pulled, 19½ to 21c.; do. fleece, 17 to 19c.; Northwest fleece, 15 to 16c.

FABRIC ITEMS.

The firm of J. A. McGillivray & Co., London, Ont., dry goods and millinery, has assigned to C. H. Ivey. The meeting of creditors will be held on the 24th instant.

Vahey & Kerman, dealers in clothing at Grand Forks, B.C., were endeavoring to arrange an extension with creditors in June last, and now they have assigned, owing about \$15,000.

T. Gagnon & Co., Montreal, dry goods retailers have assigned, owing about \$3,500. Mr. Gagnon failed in January, 1897, with liabilities of \$13,000. He did not get a settlement, and next figured as a partner in the firm of Drolet & Gagnon, which failed the following year.

A demand of assignment has been made upon Major Bros. & Co., manufacturers of roofing felt, in Montreal, owing to complications arising out of the failure of Reid, Craig & Co., Quebec. The firm has practically been out of business several months, having sold their plant, etc., to the combine.

The dry goods store of Bernier & West, St. Catharines and University streets, Montreal, was destroyed by fire, whose origin is a mystery. The electric wiring is blamed by the proprietors. The stock destroyed was valued at \$150,000, and the insurance was only \$25,000.

The other day an illuminated address accompanied by a gold watch and chain, a scarf pin and diamond ring for himself, with a gold chain and diamond ring for his wife, was presented to Robert N. Smyth, by the Wholesale Dry Goods Association of Montreal, through James Rodger, the president. This was done at a luncheon given by a number of wholesale dry goods merchants, and these numerous gifts, bestowed in this unusual way, were given as a memorial of the courageous stand Mr. Smyth took, as proprietor of The Shareholder in denouncing the undervaluations of dry goods at the Montreal customs house. The Shareholder took the case of Fitzgibbon, Schafheitlin & Co., as a sample, and charged that the firm had been defrauding the customs to the injury of the legitimate dry goods trade, over a series of years, and involving a large aggregate sum. This firm then entered an action for \$50,000 damages against The Shareholder for libel. After holding the sword of Damascus over the heads of Fitzgibbon, Schafheitlin & Co. for a long time the Government finally compounded the case, much to the disgust of the trade, and though the case against The Shareholder was abandoned, the wholesale dry

goods merchants have in this presentation expressed their admiration of Mr. Smyth's courage and at the same time their contempt of the Government's action, fraught as it is with such danger to the character of the import trade of Canada.

TEXTILE IMPORTS FROM GREAT BRITAIN.

The following are the sterling values of the imports from Great Britain of interest to the textile trade for June and the six months ending June 1899 and 1900.

| | Month of June. | | Half-year to June. | |
|------------------------------|----------------|--------|--------------------|----------|
| | 1899. | 1900. | 1899. | 1900. |
| Wool..... | £1,011 | £ 862 | £ 8,325 | £ 24,089 |
| Cotton piece-goods | 31,506 | 41,776 | 276,816 | 349,279 |
| Jute piece goods..... | 11,803 | 14,772 | 57,408 | 79,623 |
| Linen piece goods..... | 14,880 | 10,858 | 87,935 | 99,536 |
| Silk lace | 834 | 174 | 8,912 | 8,869 |
| " articles partly of .. | 3,947 | 2,814 | 17,202 | 26,167 |
| Woolen fabrics | 28,237 | 27,163 | 136,566 | 197,996 |
| Worsted fabrics..... | 42,448 | 25,022 | 263,242 | 278,226 |
| Carpets | 6,559 | 8,229 | 102,398 | 150,334 |
| Apparel and slops..... | 12,652 | 12,436 | 100,508 | 133,346 |
| Haberdashery | 6,543 | 8,326 | 78,656 | 80,987 |
| Writing-paper, &c | 1,689 | 6,462 | 13,098 | 22,197 |
| Other paper | 838 | 2,019 | 4,973 | 6,422 |
| Stationery, other than paper | 3,120 | 2,370 | 7,841 | 9,238 |

NEW ANILINE DYESTUFFS.

Azo Fuchssine 6 B.—This new dyestuff is considerably bluer than the older B. mark, and is possessed of remarkable brightness of shade. Its fastness is on the whole the same as that of the other Azo Fuchssine. It is very fast to alkalis, and light even in light shades, and has also excellent level dyeing properties. Azo Fuchssine 6 B. can be employed for the production of bright navy blues, and fashionable shades on ladies' dress material, also for the printing of woolen fabrics and slubbing. Dyed on wool the color can be discharged with tin crystals or zinc powder.

New Acid Green 3 B. X. and G. X.—These two new qualities closely resemble Acid Green 3 B. and Acid Green G. G., but are somewhat clearer in shade. The level dyeing properties of these new colors are better than those of the older Acid Greens, and all their other properties are equally as good. New Acid Green, 3 B. X. and G. X., can both be employed for wool dyeing, as well as half wool dyeing, as the color not only falls on the wool in an acid bath, but exhausts well in a neutral bath. They are also suited for wool and silk printing, and discharge well with zinc powder, but not with tin crystals.

Brilliant Acid Green, 6 B.—This new wool dyestuff possesses an extremely clear shade and excellent fastness to milling. It dyes easily, level in a bath containing Sulphuric Acid, and Glauber's Salt or on wool previously chromed or may be afterwards treated with Chrome. It can be recommended for the shading of Alizarine dyestuffs, and the dyeing of shoddy. Brilliant Acid Green 6 B. is further adapted for printing woolen fabrics direct. The color can be discharged with zinc powder, but not with tin crystals.

Acid Black 5 B. and 8 B. produce bluish black shades very fast to acids, and as its mark implies, the 8 B. is more bluish than the 5 B. Both qualities are dyed with the addition of Sulphuric Acid and Glauber's Salt. The fastness to steaming of both qualities is excellent. Besides being adapted for the dyeing of piece goods and knitting yarns, they are especially to be recommended for half-wool dyeing. Dyed on wool, the color is discharged fairly well with zinc powder, but is only discharged a cream with tin crystals. Samples,

instruction circulars, and any of the above shade cards will be mailed gratis to interested dyers by the Dominion Dyewood & Chemical Co., Toronto, sole agents in Canada for the Farb-entabriken, Vorm Friedr Bayer & Co., Elberfeld, Germany.

GREY MIXTURES.

Sheep wool is by nature not white, but more or less yellow, and it is impossible to bleach it perfectly. Only pure black and pure white will give a neutral gray, but grays mingled with any other color may be got by using blue blacks, greenish blacks, etc. The clearness of the gray depends largely on the purity of the white. The wool is whitened as a rule by a preliminary bleaching with sulphurous acid or peroxide, and then whitened perfectly with a trace of violet, the complementary color to yellow. Aniline Violet, or cudbear and indigo in a lukewarm, tin salt bath, may be used, or Methyl Violet, Acid Violet, or Gallocyanine in a hot, feebly acid bath, may be used. On the whole, the Aniline Violet gives the worst result, the Gallocyanine the best. If the wool is to be milled, cudbear with indigo-carmine gives very good results. Hot-pressing is apt to spoil the white, as it destroys the violet and increases the yellow color of the wool at the same time. Gallocyanine stands hot-pressing fairly well, Methyl Violet not at all, but indigo stands it best of all dyed in a cold sodium hydrosulphite bath made strongly sour with acetic acid. This gives a perfect white, which stands light, milling and hot-pressing exceedingly well. To prevent any tinge of green the goods must be given plenty of hydrosulphite and a sufficiently long stay in the bath. If the reduction of the indigo is incomplete, green is sure to appear.—Deutscher Wollen-gewerbe.

WANTED—Two Hand Jack Spinners. Address CARLETON WOOLLEN COMPANY, Woodstock, N.B. 7-1f

POSITION WANTED—As superintendent, designer or boss weaver. Thirty years' experience in some of the best mills in Canada and the States. Of good habits. Temperate and industrious. Address "D. W.," Montreal Office Canadian Journal of Fabrics. 6-3

FOR SALE—\$1,500 buys the Durham Woollen Mills—quick sale to close estate; one set; large custom and wholesale trade; cost \$7,800. Estate J. H. HUNTER, Durham. 7-3

Lighting, Heating and Motive Power by Gas.

GAS FROM WOOD.

A rich permanent gas, almost equal to that of coal gas, can be made by using the **RICHE GAS GENERATOR**, at a mere nominal cost per 1,000 cubic feet.

The Generator is simple in construction and does not require skilled labor to work it. No purifiers required. Products being a rich permanent gas and charcoal.

These Generator's are replacing steam, and are extensively used in mills in Europe. One is on exhibit at Paris Exposition.

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7 Beaver Hall Square, MONTREAL.

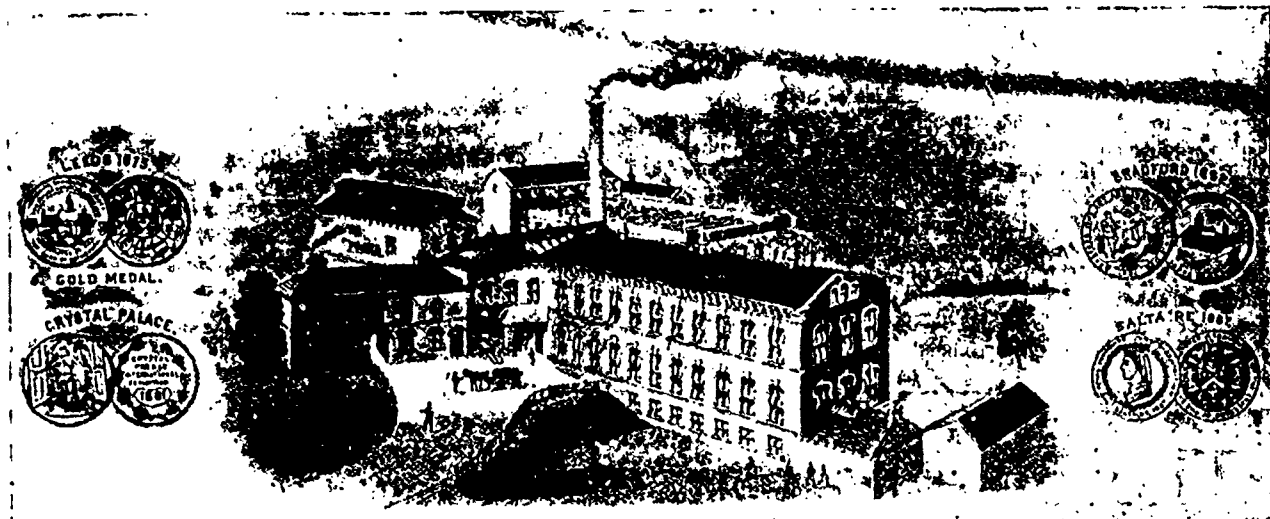
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FOREIGN
and
NORTH-WEST.

GEO. REID & CO.

11 Front Street East, Toronto.

Sole Canadian Agents for Francis Willey & Co., Bradford, Eng., have on hand and will carry in stock full lines of Foreign and North-West Wools. Samples on application. 7-1



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Round and Flat Wire Cards.

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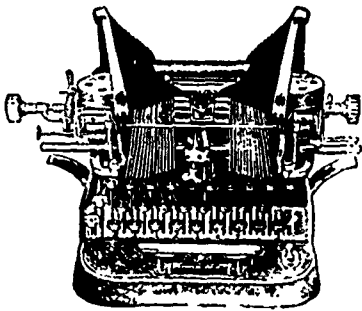
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—The British Consul at Stettin reports on the ready-made clothing trade at that centre as follows: The manufacture of ready-made clothing has, after going through many stages, become one of the most important industries at Stettin, giving employment to some thousands of persons, the greater number of whom would find it difficult to make a living in any other way. For instance, thousands of women and girls are able to earn a respectable livelihood, and are allowed to make clothes at their homes. Even the wives of Government officials earning small salaries employ their spare time in sewing for the manufacturers. The year's production of ready-made clothing amounted to about £1,500,000, and about £250,000 were paid in wages. Forty firms are engaged in this industry at Stettin, giving employment to about 10,000 hands.

—An instance of the manner in which modern enterprise creates a demand for what was once regarded as wholly useless is shown by the palmetto industry of Florida. Formerly the palmetto shrub went entirely to waste. It was, indeed, a nuisance to all purchasing new land, as it had to be cleared off at a cost of \$70 per acre. Now, at Jacksonville there are large factories that transform the roots into a fiber for filling mattresses. Another use for the roots is in the manufacture of tannic acid, and a big concern in Buffalo, N.Y., which has gone into the business, spends many thousands of dollars annually in Florida for the raw material. The palmetto leaves are largely used in the manufacture of the artificial palms, which are so popular to-day.

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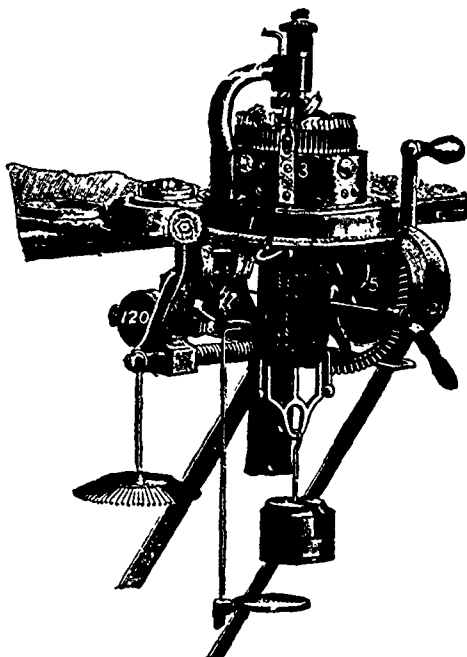
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GIVE THE BOYS A Stevens Favorite Rifle.

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

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

- number of looms and spindles, products of the mills, cable addresses, etc\$2 00
- Woolen and Worsted Loom Fixing. A book for Loom fixers, and all who are interested in the production of plain and fancy worsteds and woolens; by A. Ainley..\$1 00
- Worrall's Directory of the Textile Trades of Yorkshire, comprising the woolen, worsted, cotton, silk, linen, hemp, carpet, and all other textile mills, giving looms and spindles, and the various lines of goods manufactured, etc\$2 00
- Worrall's Textile Directory of the Manufacturing Districts of Ireland, Scotland, Wales, and the counties of Chester, Derby, Gloucester, Leicester, Nottingham, Worcester, and other centres not included in preceding works, with capacity, products of mills, cable addresses 2 00
- The Wool Carder's Vade-Mecum, by Bramwell; third edition, revised and enlarged: illustrated; 12mo..... 2 50

CHEMICALS AND DYESTUFFS.

There are no changes of consequence to note since last month. Trade is inclined to be dull. Caustic soda may be said to be firm. Castor oil is scarce.

| | | | |
|-----------------------------------|---------|----|--------|
| Bleaching powder | \$ 2 75 | to | \$3 00 |
| Bicarb. soda | 2 00 | " | 2 05 |
| Sal soda | 0 75 | " | 0 80 |
| Carbolic acid, 1 lb. bottles..... | 0 50 | " | 0 60 |
| Caustic soda, 60° | 2 35 | " | 2 60 |
| Caustic soda, 70° | 2 60 | " | 2 85 |
| Chlorate of potash | 0 13 | " | 0 15 |
| Alum | 1 35 | " | 1 50 |
| Copperas | 0 65 | " | 0 70 |
| Sulphur flour | 2 00 | " | 2 50 |
| Sulphur roll | 2 00 | " | 3 00 |
| Sulphate of copper | 6 00 | " | 6 25 |
| White sugar of lead..... | 0 08 | " | 0 08 |
| Bich. potash..... | 0 11 | " | 0 12 |
| Sumac, Sicily, per ton | 75 00 | " | 80 00 |
| Soda ash, 48° to 58° | 1 30 | " | 1 40 |
| Chip logwood | 1 90 | " | 2 00 |
| Castor oil | 0 09 | " | 0 10 |
| Cocoon oil | 0 10 | " | 0 11 |

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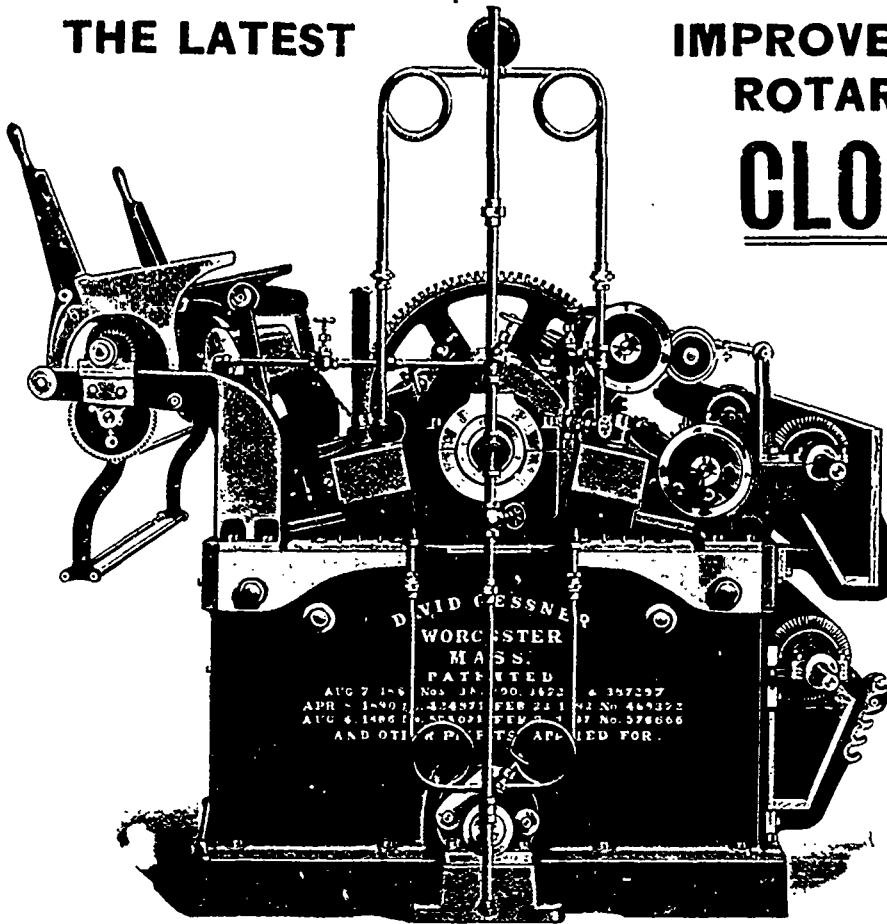
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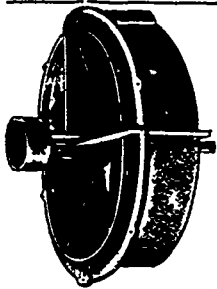
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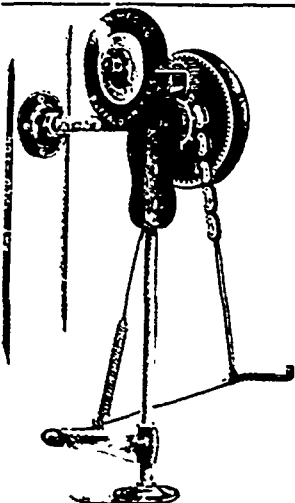
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The most practical foot-power Grinder on the market for light work. Stands 42 in. high. Speed 2,000 and upwards. Just the thing for bicycle repair shops, factories, mills, blacksmiths, etc.

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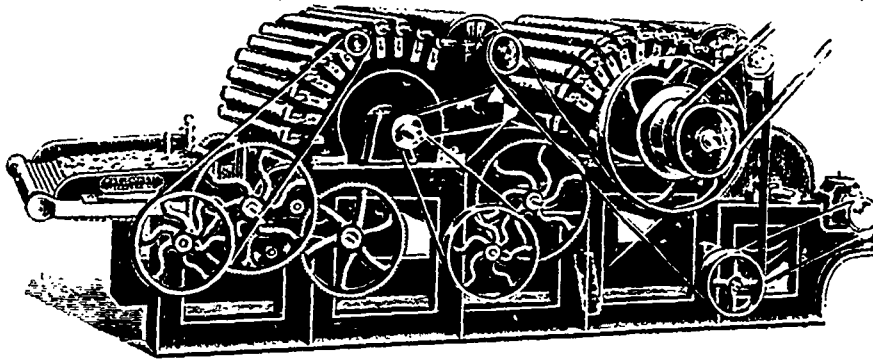
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Waste Opener or Garnett Machine, for Opening Hard Twisted Woolen and Worsted Waste.



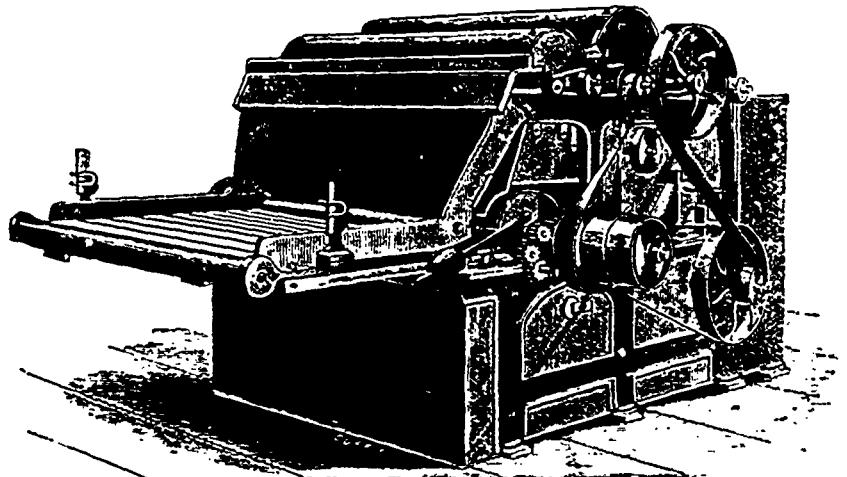
Garnett Wire.

This Wire is used for covering iron rollers, breasts of woolen cards, lichesin of cotton cards, comber doffers, etc.

Garnet Wire, or Metallic Card, made with any form of tooth, in Swedish Charcoal Iron or Cast Steel, with points hardened by electricity.

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By means of this simple and inexpensive apparatus parties can reclothe the rollers of their waste-opening machines in their own mills—and so save an immense amount of trouble and expense in sending their rollers away to be done.

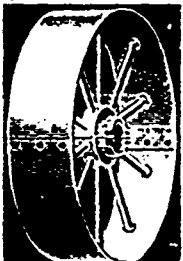


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Capable of cleaning 1,500 pounds of wool per day. The very best and most economical machine made for the purpose.

Wrought Iron Pulleys

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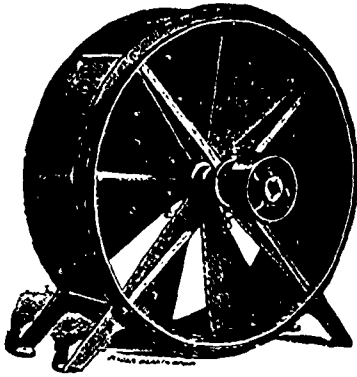
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—William Clark, Newark, N.J., president of the William Clark Thread Co., died suddenly, Aug. 6th. He was well-known on both sides of the Atlantic.

—Secretary Goldstein of the Vestmakers' Union, New York, states that the men's shirt waist agitation had so seriously affected the trade of waist-coat making that the proposed strike for higher wages, which was to have taken place Aug. 15th, had been indefinitely postponed.

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J. & R. Young, Belfast; Linen Yarns.

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The Canadian Textile Directory

Fourth Edition.**CLOTH, \$3.00.**

THE CANADIAN TEXTILE DIRECTORY is more than a mere directory of names. It gives facts and figures about the textile trades of Canada which have been attempted in no other work. It contains not only lists of all the general stores, retail dry goods dealers, hat and fur dealers, clothiers, haberdashers, tailors, milliners, etc. (the retail lists contain over 19,000 names), but all the wholesalers and commission merchants or manufacturers' agents in similar lines, and all the mills and factories engaged in manufacturing fabrics connected with the textile and kindred trades. It is the only work in Canada which gives a full list of the boards of trade, commercial travelers' associations, and dry goods and kindred associations, while the immense amount of statistical information, such as the details of the imports and exports of dry goods, etc., the tariff of Canada, of the United States and Newfoundland, sterling exchange rates, etc., make it indispensable in an office of any pretensions.

As an example of the information given in the various lists of manufacturers, the following shows the form of report of the Woolen Mills. Name and address of Proprietors, and names of the Officers (if a joint stock company), the capacity in sets of cards, looms and spindles, when established, whether water, steam or electric power, description of goods manufactured, whether the mill has a dye house, and names of selling agents, if any. Corresponding information is

given concerning the other mills, of which the following is a list: Asbestos miners and manufacturers, manufacturers of awnings, batting (wool and cotton), bedding, binder twine, braids, buttons, caps, carpets (including hand loom weavers), children's wear, cloaks, clothing, collars, cuffs, cordage, corsets, cottons, embroidery, feathers, felts, flags, flax, fringes, furniture, gloves, hair cloth, hats (straw, felt and cloth), haberdashery, horse covers, hosiery, jute goods, lace, ladies' wear, mantles, mats, mattresses, men's furnishings, millinery, mitts, neckwear, oil cloth, oiled clothing, overalls, paper, pulp, pins, print goods, regalia, rope, rubber goods, sails, tents, shirts, shoddy, felt, straw goods, suspenders, tarpaulins, tassels, thread, tow, trusses, linens, umbrellas, upholstery, wadding, water-proof garments, webbings, window shades, worsteds, etc. The woolen mills include the carding mills, manufacturers of tweeds, blankets, flannels yarns, homespun, and all other piece goods, carpets, felts, and all kinds of knitted fabrics. The cotton mills include all classes of cotton piece goods, yarns, wadding, batting, etc. There is also a complete list of the tanners and curriers, laundries, dyers, dealers in raw wool, furs, etc. Under each heading the whole of Canada and Newfoundland is included.

The number of copies left on hand is limited and those wishing to secure a copy before the edition is exhausted should order without delay. Address,

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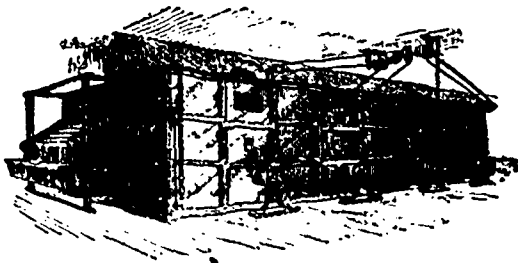
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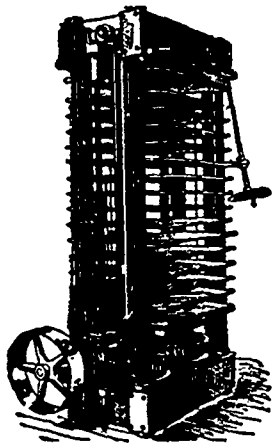
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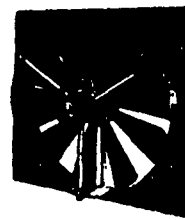
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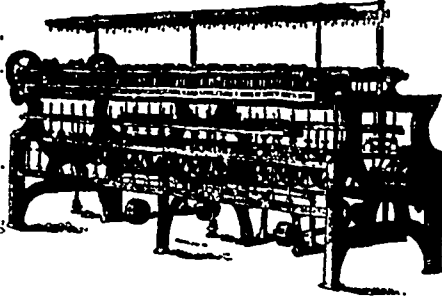
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Twisters, Card
Creels,



Dead Spindle Spooler for Warp or Dresser Spools,
Pat. Double Acting Gigs, Dyeing Machines.

—A Hungarian is reported to have discovered a method of spinning wood pulp into yarn, so that it can be woven into a fabric that may be converted into various articles of clothing.

—The Trade and Commerce Department has issued a report which will enable merchants, manufacturers and others to trace in their various lines the trend of the foreign trade of the last thirty-one years. The publication has taken months to compile and should prove of practical value to business men.

Khaki has found its way into the market reports; the popularity of these military shades has actually affected the indigo sales. The craze is said to be dying out, however, and Scottish firms report that they are daily receiving khaki goods for re-dyeing. The difficulty is that the shades are very unbecoming.

—The signs of reaction in business conditions, which have appeared recently in the United States, are not confined to that country. Business in the textile trades in England has slackened up somewhat and the same condition exists in France, where the woolen mills at Reims are running but five days per week, with a prospect of further curtailment.

—George Johnson in his recently compiled work on Canada's wood pulp industry calculates that about 40 per cent. of Canada consists of woodland and forests. That is about 1,400,000 square miles. If one-half of this is spruce there will be 450,000,000 acres of spruce area in the Dominion. The manufacturer of newspaper wood pulp makes from a cord of spruce, or 50 feet of board measure, half a ton of sulphite pulp, or one ton of ground wood pulp. An acre of spruce land yields a stand of 7,000 feet. This is equal to 6 tons of sulphite and 11½ tons of ground wood pulp per acre. Hence, taking ground wood pulp as the basis, and 10 tons per acre as the product, there are 4,500,000,000 tons of wood pulp in sight in Canada.

—According to R. E. Mansfield, United States Consul at Zanzibar, East Africa, the trade between this country and the island greatly increased during 1899. Of the total valuation of piece goods imported into Zanzibar in 1899, amounting to \$1,839,000, \$347,000 came from the United States, this being about one-fifth of the total. The cotton goods supplied by the United States are principally unbleached fabrics, and in some parts of the country these form the only currency. Manchester has not yet succeeded in successfully competing with the United States in this line, although considerable quantities of white shirtings and colored fabrics, both printed and woven, are imported into Zanzibar from Great Britain. The supply of kangas (printed cotton handkerchiefs worn by women) is confined almost exclusively to Holland. One would think that if American cottons are so popular here Canadian goods will sell also.

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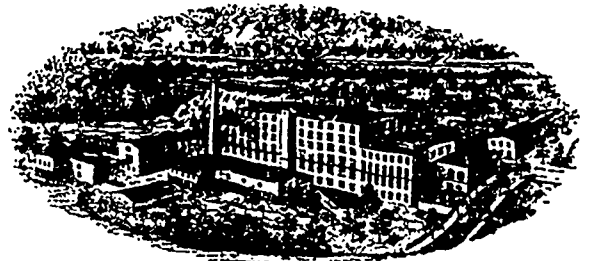
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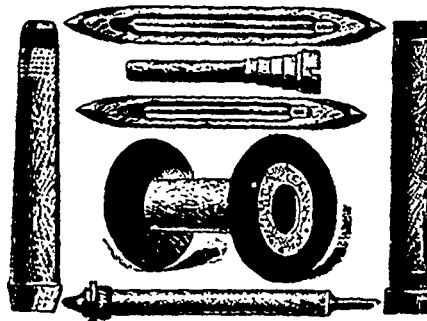
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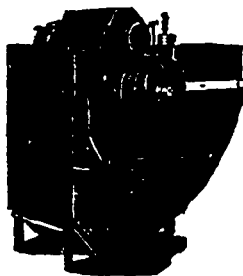
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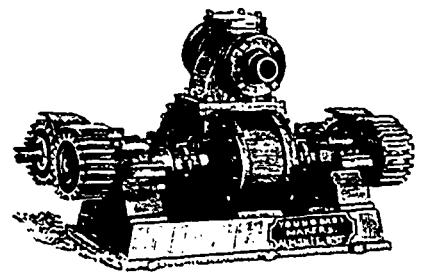
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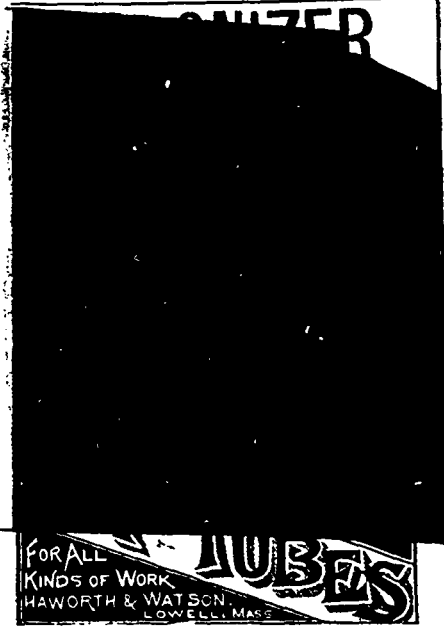


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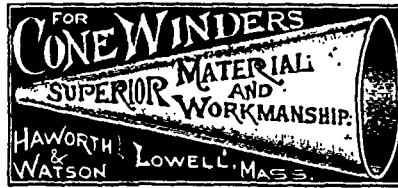
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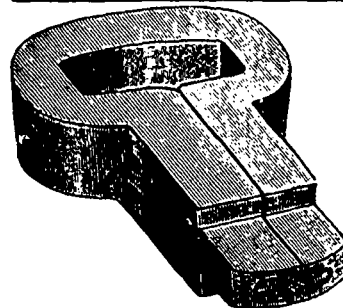
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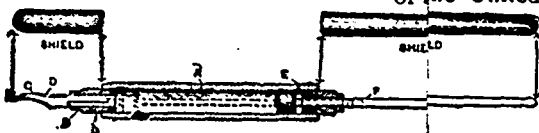
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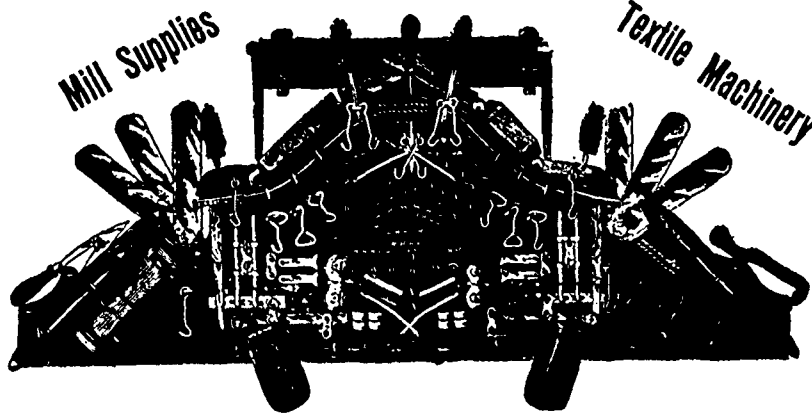
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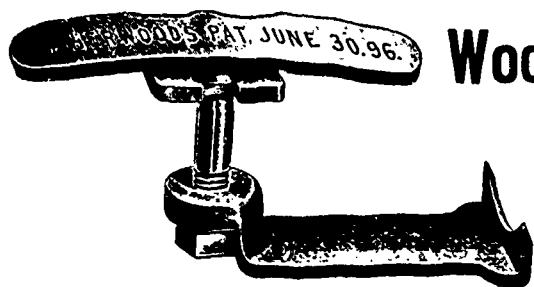
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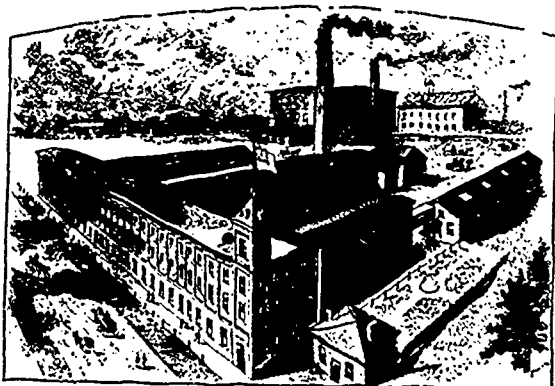
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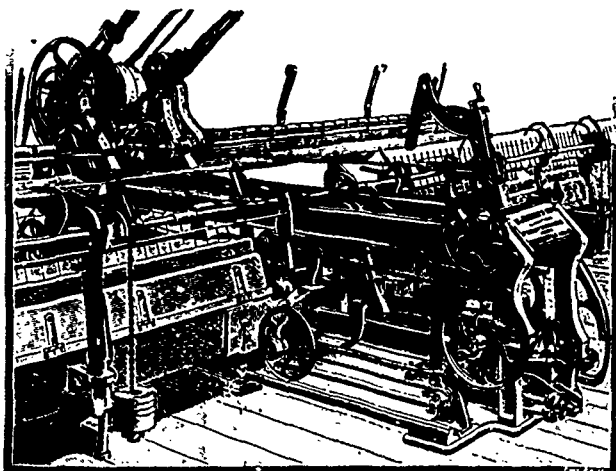
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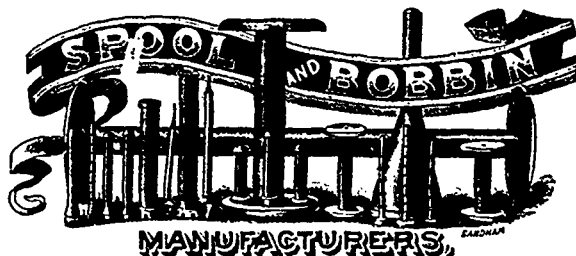
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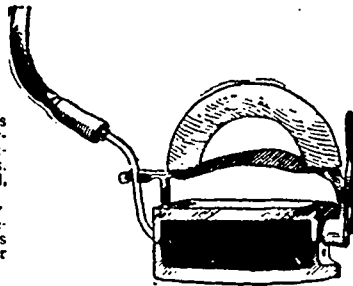
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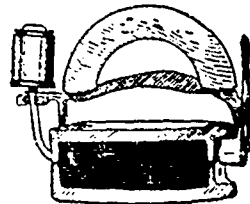


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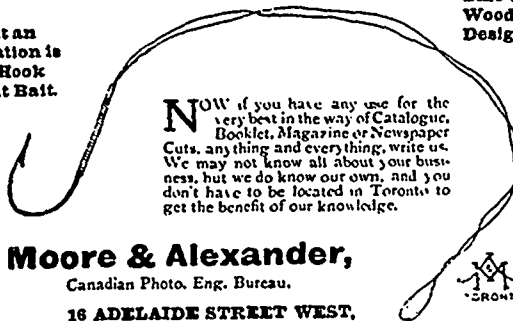
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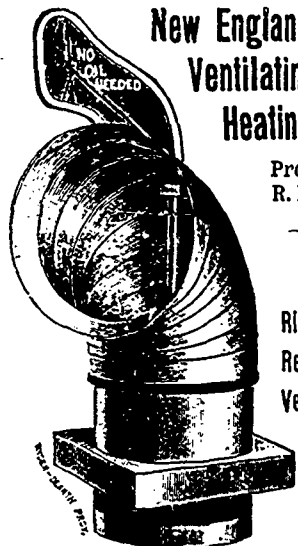
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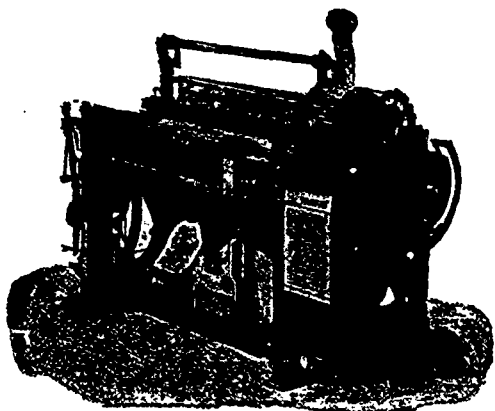
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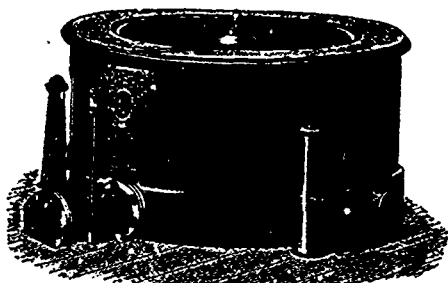
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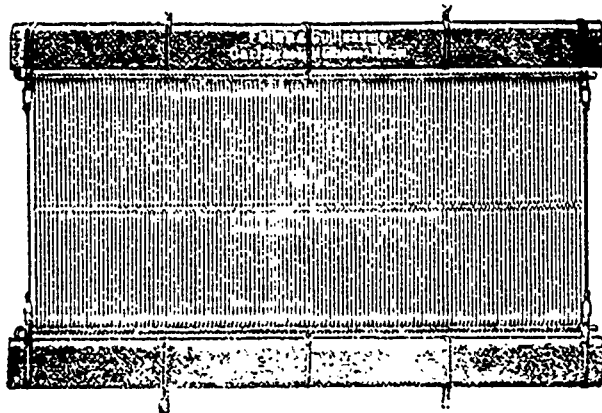
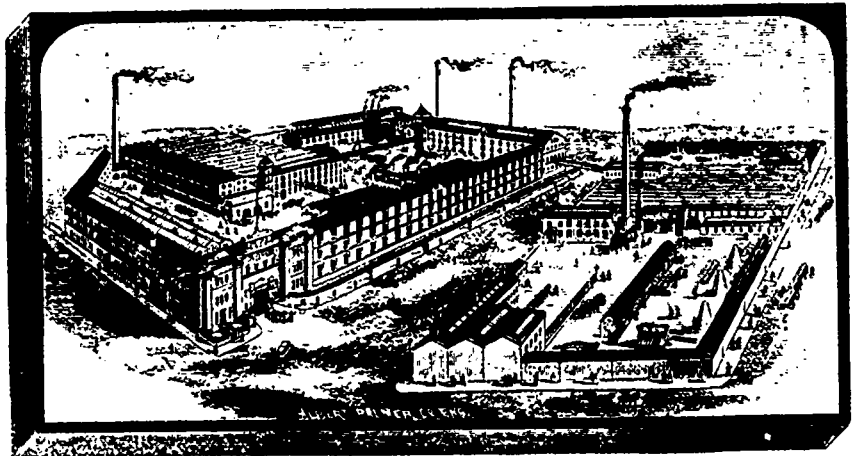
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