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New Series "Mechanical and Milling News"

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THE CANADIAN MILLER

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ENGLISH VIEWS ON WHEAT.

WRITING on the characteristics of various kinds of wheat used in England, "Feliv Holt" says in Liverpool Milling: The most interesting group of wheats with which we have to deal is what we term glutinous. These are produced chiefly on the interior plains of Europe and America and are, in many respects, similar, although for some reason, probably better farming, the American grain is almost invariably superior to Russian. The great advantage of the latter to the British miller is its general abundance and cheapness and, possibly, its great variety. This variety is troublesome to some millers, and sometimes the cause of fluctuations in the quality of their flour, which is quite unaccountable to them. The best of all Russian wheats is probably Saxonka, and the worst Novorosisk-Azima. Kubanka at one time was held in high repute as one of the strongest wheats, but, whatever might have been its reputation, there is little doubt that it has suffered a severe fall in public estimation. When roller-milling became fashionable, it was thought that hard wheats of all kinds were just the thing, the harder the better, and Kubanka was, par excellence, the wheat for the purpose. Those who tried it soon found that such wheat required far too much power to reduce it to flour, and that the results were not commensurate with the trouble. Since then there has been a further development, arising from the discovery that hard wheat is not the best for rollers any more than it is for stones, and that the best results are obtained from medium wheats, such as our conditioners now insure us. It is doubtful, moreover, whether Kubanka possessed all the virtues ascribed to it. The writer had a sample of a familiar wheat sent from America, with an inquiry as to its suitability for British millers, the sender stating that American farmers preferred to grow it, as it ripened earlier than other kinds, but that American millers would not use it, as it had no strength. There it was called "goose wheat." Whatever might be said about Russian Kubanka, there is no question that American Kubanka, grown from Russian seed, is by no means strong, in fact, its closest resemblance is to rice. We might compare it very well with the hard, flinty grains found in some samples of Bombay. To my mind the milder Ghirkas are far and away superior. But none of them probably are equal to first-class Saxonka, which partakes more nearly of the qualities found in American spring, that is, good, sound, tough gluten, which may always be relied on.

Some of the Ghirkas from the Black Sea provinces closely resemble Saxonka, but, being grown on the opposite sight of the continent and in a somewhat milder climate, lack some of its qualities, although the better soils can generally be relied on. The same with the better sorts of Azimas, which, although autumn-sown, are by no means deficient in strength. There is one district of which we might almost ask, "Can anything good come out of it?" That is Novorosisk. For some, to us, unaccountable reason this wheat is seldom good, and often very bad. During the last two seasons many millers have had bitterly to regret using it in any proportion. Its characteristic appearance is clear and somewhat watery, which might be taken for strength. It has, besides, a rough nondescript appearance, and nearly always has large round black seeds mixed with it. Whatever may be the cause, it is very strange that wheat from this quarter, which has these large seeds mixed with it, is seldom very good. This applies alike to the variety known as Danubian, which, although better than the foregoing, is of rather low quality, lacking strength, although otherwise sound. The fault of the former is its deceptiveness. Not only will it not impart strength, but it will help to destroy any existing strength almost as effectively as sprouted wheat. A very useful and cheap wheat, not over strong, but quite reliable is Odessa and Dnieper Ghirka. They are rather foul and in some cases a bit thin, but the low prices makes them really cheap. There are mills working at the present moment using one-half to two-thirds of this wheat in their mixture with very good results. It may be thought that a small yield would counterbalance the apparent cheapness, but the fact that the yield does not fall below 70 per cent. is sufficient to disprove this. Being mild, they have to a large extent taken the place of English in many inland mills, and have thus proved of great assistance this season. The fault with them is, perhaps, the yellowness of the flour.

BREAD IN THE OLDEN TIMES.

AMONG the ancient Greeks bread was not simply an adjunct to, but an essential portion of, the principal meal of the day. The chiefs of the heroic period lived almost exclusively on two dishes, roast meat, over which a little flour was sprinkled, and wheaten bread. The flour was ground in a handmill by the female servant; it was then made into dough, a portion of salt added, and baked in a special part of the kitchen. Wheat bread enjoyed a great reputation in those days. Homer calls it the strength of man. Bread was the first thing set before a guest. It represented civilization, while meat was representative of the old style. When Odysseus fled for refuge to the palace of Alkinoos, bread is specially mentioned among the "dishes" set before him. In the historical Hellas bread played a similar part; it was one of the principal foods of the people, and was regarded as indispensable by the better classes, and certain kinds of it were looked upon in the light of luxuries. The place most celebrated for its bakeries was Athens; but we really know very little about the method of making bread there.

It is characteristic of the position which bread occupied as an article of food that the Spartans, at their mid-day meal, had wheat bread only on special occasions as a particular luxury. Solon ordered that those citizens who were fed at the expense of the State in the Prythaneion should have white bread only on rare ceremonies. In republican Rome it was the custom for each household to bake enough bread for its requirements, and not purchase, and even under the Cæsars, when there was a goodly number of bakers in the city, the better families adhered to the old style of baking at home. They possessed a separate room for baking, situated next to the kitchen; this room was called "pistrina" (mill), for it embraced the place where the corn was ground. Bakers were called "pistores" (millers) until the fall of Rome, although the two branches had been divided long before. In imperial Rome the bakers were divided into three classes, white bakers, milk bakers and sweet bakers. The white or wheat bakers were the chief, because they produced food, a means of nourishment; the milk bakers made buns and cakes; the third class were noted for their skill in the baking of tarts and all kinds of sweet confectionery eaten for dessert.

When we remember how closely butter is connected with bread at the present day, it is strange to read of the antipathy which existed against it in those times. Butter was never used as a food either in Greece or Rome: it was employed chiefly as a medicament, externally in plasters and bandages, internally much as we take cod-liver oil; had pastry been made with it, the Greeks and Romans would have rejected the confectionary just as we should turn up our noses at a tart made with train-oil. It is true that the Thracians ate it, but they were only half-Greeks. In imperial Rome there were, in addition to bakeries conducted by private people, spacious state bakeries, which played an important part in providing for the wants of the people. The Roman ovens were just like those in use at the present time. A well preserved specimen was discovered during the excavation at Pompeii, it contained several charred loaves, on which the baker's name could be plainly seen, showing of what flour they had been made. The loaves of Pompeii weighed about two pounds, they were round and indented, to permit the breaking of them into eight equal parts. Similar loaves are made now in Calabria and Sicily.

THIS STRAINING AFTER YIELDS.

THE first new-process of patent flour was not made on a yield basis, says D. George, in Roller Miller; far from it. Rather it was made by a low system, contrary to the theory and practice of that time.

The yield question may not have actually knocked out the stone system, but it certainly did much to hasten its downfall. Hereafter, conditions may change, but to make the best possible yield will always remain a cardinal principle in milling.

Of course, the best possible yield is not a perfect yield, and is far short of our ideal; because, strange as it may seem, no miller has yet found that blessed spot, where the wheat is of one quality all the yield round, where the temperature never varies, where rain and fog and mist and every other sort of atmospheric humidity are unknown, and the sun shines clear from its rising even to its going down. Meanwhile, how many of us set our mills to suit ever-varying conditions?

The miller in charge of a 1,000-barrel mill does not want the packer to show only 800 just when he happens to have a visitor; nevertheless 20 per cent. must be taken off the output at times, not only to make a yield, but, what is of just as much or perhaps more importance, to keep the flour anything like uniform. To attain these two ends and at the same time get full capacity out of the mill every day in the year, is what most millers are constantly striving to do. But these horses won't pull together, except on rare occasions.

Come back to the main question yields. Does this effort start in the middle or near the end of the system? I trow not. It starts on the first break and continues throughout the system. The patent is certainly not improved by it; the baker's come next; the super comes in somewhere; the low-grade or red-dog call it what you will - must end the chapter. This is where the yield must be squeezed out finally; but at what cost!

Here is a better way. Take the conditions of wheat and weather into consideration, and make whatever percentage of patent the wheat will stand; the other grades will easily follow. Should the yield by this method not be so great and there can be no cast-iron rule here that will work every day the flour of all grades will be improved, to the better satisfaction and probable increase of the mill's trade and to the enlarging of the right-side ledger balance. Moreover the mill will act better and the boys work in better humor.

These arguments are familiar to many of us, yet most are forever trying to hold the mill above its real capacity and at the same time make a yield Boys, one and all, it's simply impossible.

HOW TO DO IT.

TO maintain perfect regulation, place the engine in the hands of a competent engineer, who is capable of adjusting and keeping the engine in good running order. A good engine, or piece of machinery, placed in the hands of an incompetent person, will never give good service or economical results.

NOTES ON BELTING.

A LARGE proportion of the so called accidents to belts, in which they jump from one cone to another, or run into neighboring gears, are due to excessive pliability. Owing to their greater lateral stiffness, thick belts are much to be preferred to thin ones So much do I believe that the property of stiffness increases the life of belts that I make it a rule to use as thick a belt in all cases as the diameter of the pulleys will permit A manifest advantage of belts made of two or more thicknesses of leather lies in the fact that imperfection of the leather will produce but little effect in a double or triple belt, while in a single it is fatal. Messrs. Lewis Bancroft have, in their experiments, demonstrated the fact that "no marked difference could be detected in the power required to run a wide double belt or a narrow light one for the same tension as modern speeds. And again, we see ropes up to two inches in diameter transmitting power with great efficiency, and with apparently but little loss of power owing to their thickness. Therefore a thick belt will be practically no less efficient than a thin one on account of its stiffness.

Many experiments have shown that the pulling power of belting for a given arc of contact is almost independent of the area of the belt in contact with the belt, and that it depends chiefly upon the sectional area of the belt, and its total tension, so that a triple belt will transmit about as much power as a single belt three times its width.

With wide belts, and belts running at high speed, it is especially desirable that the thickness should be increased. If thin belts are used at high speed, they almost invariably run in waves on the slack side, particularly if the load which they are transmitting changes suddenly. These waves frequently continue in the belt while it is rounding the driven pulley, so that one can sometimes even see light in places between the belt and pulley run when standing in the proper position. This wrinkling of belt, and the snapping that occurs as the waves straighten out, wears it very fast, and causes the splices to part, frequently in a few months. The remedy for this trouble I have invariably found to be an increase in the thickness of the belt. When a sufficient thickness is used, the belt settles down on the same pulleys and under the same conditions to a long, steady curve on the lack side, and the wrinkling and snapping cease.

It would seem also as though a certain ratio of thickness to the width of belt should be maintained, particularly in high-speed belts, otherwise the belt is apt to chase from side to side on the pulleys. This chasing would seem to be due chiefly to the oscillation of the belt around its longitudinal axis on the slack side, the belt being thereby tightened, first at one edge and then at the other, each side as it is tightened tending to run toward the center of the pulley This oscillation, and the resultant chasing, are almost sure to cease when the thickness of the belt is increased in proper proportion to its width As an illustration of this principle, the writer has in mind the case of a belt 78 inches wide and 9/16 inches thick, running about 5,500 feet per minute, which could never be prevented from chasing from side to side on its pulleys for any length of time without the use of an idler pulley This chasing was due to the oscillation about its longitudinal axis, which was caused by the small thickness of the belt in relation to its width A belt 5 inches thick and 72 inches wide, used on the same pulleys, was almost entirely free from the chasing, and I am convinced that an increase to 11/2 inches in thickness would have rendered it sufficiently stiff to permanently remove the trouble It should be noted that the thicker belt proved to be far more economical, durable, and satisfactory in every way than the thin belt If the principle is correct, of using thick belts on account of their lateral stiffness and consequent durability, it becomes of the utmost importance to determine the minimum diameter of pulley which can be used with a given thickness of belt, and still have the belt last well The writer is quite sure that the double leather belts 5/8 inch thick will last well and give excellent satisfaction on pulleys as small as 12 inches in diameter, as he has had many belts in use for years under these conditions For some time past he has had a triple leather belt 12 inches wide, 0.50 inch thick, running about 4,500 feet per minute, with an idler pulley pressing lightly upon it, and transmitting about 100-horse power to a pulley 12 inches in diameter. This belt has up to date given excellent satisfaction, and has already lasted much longer than the two double leather belts which preceded it.

Regarding the question of fastening the two ends of the belt together, I think it is safe to say that the life of belting will be doubled by splicing and cementing the belt, instead of lacing, wiring, or using hooks of any kind. When belts are subjected to the most severe usage, the spliced portion should be riveted, iron burrs being preferable to copper. For double belting, the rule works well of making the splice for all belts up to 10 inches wide, 10 inches long; from 10 inches to 18 inches wide the splice should be the same width as the belt, 18 inches being the greatest length of splice required for double belting.

CHEAP POWER FOR MANUFACTURERS.

IN a suggestive article on "The Economics of Electric Power, which appears in Cassier's Magazine for March, Mr H. L. Lufkin, a prominent electrical engineer, draws a very striking picture of what has more recently been accomplished in the way of applying electric motors to the driving of machinery of all kinds. So much has been said and written in a general way of the convenience and economy of applying electricity to the driving of shop tools that specific facts and figures, derived from actual experience, are most welcome additions to the literature of the subject, and every power user must, therefore, needs appreciate the valuable reference data given in the article. One of the advantages of using electric motors is found in the fact that they may be connected to the machinery to be operated almost directly, without the intervention of long lines of shafting, whose friction losses alone often represent an appreciable item of expense Referring to this feature, Mr. Lufkin says:

The apparent losses in shafting had always been vaguely estimated until the advent of the electric motor, by which, with the aid of an ampere indicator, these losses are readily and accurately determined. As a result of a test in some thirty shops of varied descriptions, made in 1890, it was discovered that 68 per cent. of the average power applied in these shops was consumed in the shafting. Some data recently very kindly furnished to the writer by one of the large electric companies, which, by the way, is furnishing current for operating about four or five thousand horse-power in electric motors, cover seventy-one shops. The totals of these shops showed that 121,524 watts represented the average total energy supplied, and that 84,700 watts were consumed in the shafting, etc., being 69 2-3 per cent, of the average power, thus approximately checking the tests of 1890 These friction losses in shafting in the mills and factories before referred to have been partially eliminated by means of grouping tools in sets and otherwise, driven by electric motors, so that entire sets might be completely shut down when not actually in use without interfering with the remainder of the shops, and long lines of transmitting shafting and belting between floors or from building to building have thus been dispensed with.

An interesting example of the economy derived from this grouping of tools is found in a factory now being equipped with an electrical transmission system. A preliminary experiment in this factory showed that the saving in fuel alone will certainly exceed 50 per cent and possibly 60 per cent. In one recent instance a card, indicating fifty-nine horse-power, was taken from an engine driving a large machine shop, a blacksmith shop with pneumatic hammer, blowers, etc., a pattern shop, and numerous special tools on three floors of a building about seventy-five feet square This card was taken with all tools idle, thus showing friction only The same tools were rearranged and grouped into several sets, driven by electric motors, and under the conditions the average indicator card from the engine driving the dynamos which furnish the power for these same tools is about twenty-five horse-power, covering friction, power for the tools and all.

The convenience and flexibility of an electrical power transmission system are frequently commented on by present users, from the fact that single tools or small groups of tools may be efficiently operated in isolated locations, or locations at considerable distances from the main power plant. The great saving derived in an electrical system owing to the intermittent use of tools, was long since taken advantage of by the builders of traveling cranes, and to-day probably ninety-nine out of every hundred traveling cranes installed are operated entirely by electric power, an independent motor being used for each of the several functions of the crane. Many foundries now work their jib cranes with directly geared motors, taking current, in many instances, from the same dynamo which lights the shops.

HOW MANY FLOUR MILLS?

HOW many flour mills are there in the country? is a question quite frequently asked. The Minneapolis Record has been gathering some figures on this point. It places the number in Canada at about 1,000. There are probably all told about 1200 mills in this country. In the States the number is placed at beyond 15,000. Pennsylvania leads all other States in the number of mills, there being 2,200; New York follows next with above 1,300; Ohio 975; Missouri 810; Indiana 750; Illinois 700; Michigan 600; Wisconsin 575; Iowa 500; Tennessee 490; Virginia, 460; Texas 450; North Carolina 405; Minnesota 390; Georgia 340; West Virginia 335; Kansas, 320; running down from that to 3 for the District of Columbia. While Minnesota is fourteenth in the list, according to number, the capacity is beyond the capacity of any other State, owing to the larger size of the mills. The daily milling capacity of Minneapolis is above 47,000 barrels, if run up to the highest possible limit This, however is impracticable, and during the last year the average production in this city was 67.8 per cent. of the total capacity. The average production of Duluth and Superior was 56.3 per cent. of the total capacity. The average production of St. Louis was 48.8 per cent.; of Buffalo 55.9; Milwaukee 60.9. The average daily capacity of Duluth and Superior during 1893 was rated at 12,301 barrels. The year began with less than that, but several mills were completed in West Superior during the season, and at the beginning of this year Superior had a capacity of 12,000 barrels daily and Duluth 6,300 barrels daily; St. Louis a daily capacity of 21,000 barrels; Buffalo 11,000; Milwaukee 10,200. Baltimore has some 3,300 barrels total capacity; Philadelphia about half as much; Detroit about 2,000; Chicago some 4,000; Kansas City above 2,000; Cincinnati about 2,000; Cleveland 4,000, and Indianapolis about 5,000 barrels. Minneapolis in 1892 manufactured 9,750,470 barrels of flour. In 1893 9,377,635 barrels. The product of Minneapolis exceeded in both these years, all the flour producing cities separately. The production of this city was greater than that of St. Louis, Baltimore, Philadelphia, Buffalo, Milwaukee, Toledo, Detroit, Chicago, Duluth and Superior, Kansas City, Cincinnati, Cleveland and Indianapolis combined, and they are the leading flour cities outside of Minneapolis. The production of flour, to capacity, in Minneapolis, in 1892, was 71.6 per cent. of capacity; St. Louis 51.1; Buffalo 64; Duluth and Superior, together, 51, and Milwaukee 71.3 per cent.

NOT ALWAYS THE CASE.

PERIODICALLY there floats through the technical press, says *Power*, an item to the effect that one-sixteenth of an inch of scale has been determined by accurate experiment to require 15 per cent. more fuel; three-sixteenths, 23 per cent. While this may be strictly true for the boiler experimented upon, it can not, in the nature of things, be of universal application nor an index of the loss which may be expected upon another boiler from a given thickness of scale. A boiler with a meager amount of heating surface would suffer seriously from an impairment of the efficiency of that surface by scale, while a boiler with ample surface would suffer comparatively little. The item evidently started from a formula based by Nystrom upon the alleged fact that saturated scale has about one-thirtieth the conductivity of iron plate, and giving the diminishing values quoted as the amounts of heat transmitted through a given amount of heating surface.

PRODUCTION OF WHEAT.

THE continued low price of wheat is a subject of much discussion in both the technical and general newspaper press. There are those who entertain the view that some day in the near or distant future we will experience a period when, at least, comparatively high prices will once more prevail. The MILLER has several times pointed out of late that the burden of evidence would seem to establish much more clearly, that a high-level of prices is something that we can hardly hope for unless by reason of an unusual and extraordinary phenomena. The Commercial, of Winnipeg, has discussed the question at some length, and holding to the view of the MILLER, gives a number of reasons, which seem to indicate that an era of prices on a permently low level has set in. Our Manitoba cotemporary says: "In the first place we have to recognize the fact that nearly all staple commodities have reached a lower plane of values, with the prospect that prices will permanently remain lower than they were a few years ago, though there may be some reaction from the very bottom prices which now prevail. Most other commodities being lower, it is only reasonable to expect that wheat will remain lower, and indeed, the fact that other goods are lower in price, will make possible the profitable production of wheat at lower values than formerly ruled.

"The next thing we have to look at is the wide area of territory where wheat can be produced to advantage. Wheat is being harvested somewhere almost every month in the year, and new territories are constantly being opened up by the advance of civilization and progress of the world, which are adapted to the production of wheat. Only the other day, it was announced that a large area of country in Africa, hitherto inaccessible, had been discovered to be well adapted to wheat. The cultivation of wheat has become so general, that a short crop in one country will hardly now affect the supply of the world, and to materially advance prices, there would have to be a crop failure over a very large area. It is even doubtful if a sharp advance in prices by reason of a short crop would be beneficial to wheat growing countries, for it might result in such an expansion of the wheat area generally as would quickly lead to immense over production, to be followed by lower prices than have yet been experienced.

"The third factor we will consider as contributing to lower prices for wheat, is the cheapening of transportation. There has been a wonderful decline in the cost of transportation by water during recent years, which has led to increased competition. It was stated that a cargo of California wheat was sold at Liverpool a short time ago at a price which would aggregate less than the freight rate alone would have amounted to twelve years ago. Few people realize what a factor the reduction in the cost of transportation has been in reducing the prices of commodities. Prices have been reduced and equalized in different parts of the world by the cheapening of transportation. Remote regions are now brought into active competition with near by countries in importing markets, with little or no disadvantage in the cost of transportation."

Then giving to the subject a local application the Commercial adds: "There is a large area of Western Canada, which is admirably adapted to the cultivation of wheat. What seems to be the natural product of the country, and can be grown to better advantage than any other crop, prices being at all equal. The question is, will we be compelled to cease producing wheat, for which the country is peculiarly adapted? We think not. We are at a disadvantage with some competitors on account of our inland position, but we have other advantages which should enable this country to produce wheat in large quantities. While it is evident that our farmers must diversify their operations and go more into stock-raising, dairying, etc., than they have in the past, we must still endeavor to keep in the race in the production of wheat. Instead of giving up wheat, we must study how to make it profitable at the lower prices now ruling, and endeavor to remove every obstacle to profitable production. Already considerable progress has been made in this direction. Through the great cheapening of agricultural implements and other articles necessary to the farmer, which has taken place in Manitoba during recent years, our farmers should be in a position to grow wheat very much more cheaply than they could a few years ago. Further reduction in the cost of growing wheat may be made by improved methods of agriculture. Customs taxation must be reduced. Manitoba, as an agricultural country, is in open competition with the world. Tariffs cannot do anything to protect our farmers and enable them to compete to better advantage with the world, but tariff taxation can do a great deal to handicap our farmers in this competition. Burdens of this nature must be removed. The cost of transportation must be reduced, and we believe will be very materially reduced. We have a northern and eastern water route, either of which are capable of great things for the country. The eastern water route is now of incalculable service, and is capable of further considerable improvement. Altogether, we have no reason to despair of being able to produce wheat at a profit, in competition with the world."

CURRICULUM OF GERMAN MILLING SCHOOL.

AS is well known there is in Chemnitz, Germany, what is called a mullerschule, or school for millers, being a branch of the State Polytechnic Institute, wherein the pupil is educated in technical science and the practical knowledge of milling and millwrighting. The course of study in this school is as follows:

FIRST TERM.

1. Milling in general (four hours). Practical part — the system of measures, weights, and standards in the other countries most important to the trade; estimates of price according to quality of grain; statistics of granaries and grain trade. Technical part (continued as mill-building in second term of No. 10)—systems of grinding, with their special arrangement of machinery and transportation; transporting, lifting, and weighing appliances of mills; effectiveness and expenditure of power of different milling apparatus; machines for cleaning the grain, etc; fanning, hulling, and brush machines, etc.

2. History of milling products in nature (two hours). Treatment of the elements and chemical treatment most important to plant life; analysis of grains, microscopic examination of their structure; flour, dough-making, and baking processes; determination of gluten and flour inspection.

3. Mathematics and mechanics (eight hours). Logarithms; elements of plane trigonometry; theory of curves so far as necessary to understanding of mechanics; theory of equilibrium and motion of material points and of rigid bodies; frictional resistance; strength. (Treatment elementary and limited by the demand of the practical application.)

4. Physics (four hours). Theory of heat.

5. Machine theory. (Same as Werkmeisterschule, No. 9.)

6. Machine drawing (eight hours). Preparation of working drawing of simple transporting and milling machine parts.

7. Free-hand drawing (two hours).

8. German language (four hours). Exercise in preparation of business papers; technological descriptions, etc.; exercises in extempore speaking, with taking notes, most important sections of history of German literature.

9. Field and water surveying (four hours). Handling of the simplest surveying instruments for laying out mill pits, mill ponds, etc,; leveling water surveying through gauges, floats, etc.

SECOND TERM.

10. Mill-building (four hours). Pulverizing machines, cylinders, swing mills, mill stones; setting up, adjusting, and cutting millstones; grinding and rifling machines for cylinders; cylinder sieves, etc.; machines for cleaning the meal, mixing, and packing flour; transporting apparatus, with reference to the motor and grinding system.

11. Mechanic (four hours). Same as Werkmeisterschule, No. 15; also weirs and mill pits.

12. Machine theory (six hours). Continuation of No. 5; valves; shafts; toothed wheels; water wheels; turbines; steam boilers; steam engines.

13. Machine drawing (eight hours). Drawing from examples and plans of different milling machinery and tools; water wheels; plans of mill apparatus from drawings.

14. Free-hand drawing (two hours). Continuation of No. 7; making and shading drawings from plaster models.

15. Building (one hour). Window openings, stone ceilings, simple arches, chimneys, wood-jointing, sleepers, beams, etc., and their supports; roofs, with their supports, roof construction with truss and strut frames, etc.; stairs; building site; foundation.

16. Building drawings (one hour). Drawings of small buildings from given designs and original

17. German language (two hours). Continuation of No. 8.

18. Business bookkeeping (two hours). Points most important to the students.

Students are also admitted to certain departments of the Werkmeisterschule

THE ESSENCE OF MODERN TRADING

ADAPTABILITY, says the Miller (London), is the essence of modern trading. Had not our millers adapted themselves to the altered condition of science, the fine flour which we use must have become the product of Hungarian or Minneapolis mills, and had not the difficulties raised by the free importation of various grades of American flour been grappled with there would be far fewer English mills now open than is to-day the case. But the farmer declines to adapt himself to his environment. He sows wheat for quantity when quality is his best chance for profit, he grows it on land which is too highly rented for a crop which gives at best four quarters at 26s. 6d. per quarter. The higher and more philosophical way of looking at the farmer's position would justify his tenacity. It is not to the national advantage that the farmer should be regarded as a trader pure and simple. Willingly or unwillingly he must also be regarded as insuring us a minimum of supplies in case of foreign complications. He has a function to the State to perform in raising a certain quantity of bread food. That is the view of the farmer which prevailed in ancient times, which the middle ages endorsed, and which is vigorously endorsed by all Continental nations and by the United States. Even the most advanced of English statesmen would hesitate to meet it with a clear denial. Yet it cannot be denied that had the English farmer shown since 1879 that adaptability to the circumstances of trade advantage which his friend and neighbor the English miller has known, the cultivation of wheat in the United Kingdom must needs have become extinct.

Thus it is that the end of one year and the beginning of another finds us confronted with varied but not uniformly unprofitable milling fortunes, with unvaried and unprosperous farming fortunes. As millers, we hope the English farmer will go on providing us with the soft and easy-working grain which tempers the steely wheat of Chili, the hard and nicey Indian, the varying qualities of different climes. But, as economists, we cannot honestly advise the agriculturist to go on doing anything of the kind. He is at present losing on every sack of English wheat that he brings to market, and there exists very little reason for price recovery in any future discernible from such vantage ground for outlook as the 1st of January, 1894, may afford.

TRICK OF A SAFETY VALVE.

AN engineer recently observed his steam gauge indicating a higher pressure than his safety valve spring was set for. He slackened the spring, but the gauge kept rising and the steam did not blow off. He slackened the spring further, still the steam did not blow. When the pressure rose to 200 pounds he became alarmed, and as he could not start the engine he started the injector and opened the water blow-off cock. The damper being closed, this had the effect to prevent further increase of pressure. On examining the safety valve it appeared that the brass seat of the valve was a bushing put into an iron casting, that it had become loose and that the steam had pressed it up against the valve. As the valve rose the seat followed it, and there could not have been a release of steam until the bushing was pushed out of its hole. Some serious accidents have occurred from this cause. It is not good engineering to so construct safety valves that it is possible for the valve-seat to become detached.

Canadian MILLER AND TRADE REVIEW

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—BY—
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THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavouring to promote the interests of our subscribers.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

NOTICE OF REMOVAL.

SUBSCRIBERS, advertisers, and others concerned are particularly requested to note that the offices of THE CANADIAN MILLER have been removed from the Canada Life Building to the CONFEDERATION LIFE BUILDING, Richmond and Yonge Streets. All communications should in future be addressed to C. H. MORTIMER, publisher CANADIAN MILLER, Confederation Life Building, Toronto.

CHANGE OF OWNERSHIP.

FOR some years I have been talking to readers of THE MILLER through these columns, but with this issue my connection with the journal ceases. Mr. C. H. Mortimer, the well-known publisher of the Canadian Architect and Builder and Canadian Electrical News has purchased the entire assets and good-will of the paper and with this issue assumes the duties of editor and publisher. That he is capable of maintaining THE MILLER in the front rank of Canadian trade journalism there is no room for doubt. I trust that not only will the patronage heretofore extended to me be continued to the present owner, but that the amount of advertisements and subscriptions will be supplemented. To the milling and grain trades my thanks are extended for favors in the past. In conclusion I would say: "Stick to your own trade paper and it will stick to you."

A. G. MORTIMER.

IN assuming control of THE CANADIAN MILLER, with the interests of which, as The Mechanical and Milling News, I was for several years intimately identified, it is a pleasure to me to know that I shall have the opportunity of renewing acquaintance with one of the greatest of Canadian industries and with valued friends of the past whose business interests are connected therewith. It is also my hope and desire that I may succeed in adding to the number of these old acquaintances and friends, many new ones, and that in the efforts which will be made to publish a journal that will be creditable in appearance and of interest and practical value to persons connected with the flour and grain interests of Canada, I shall be accorded the measure of encouragement and support which the merit of the publication shall deserve.

C. H. MORTIMER.

GROWING WHEAT RIVALS.

IN a letter of some length to the Globe, of recent date, Mr. James B. Campbell, of Montreal, discusses the question of tariffs in relation to the development of trade, and more especially in their relation to the cultivation of wheat and the finding of a market for this product. The information that the article furnishes touching the expansion of late years of the wheat fields of foreign countries will be of the most immediate concern to readers of the CANADIAN MILLER. Mr. Campbell's views on the tariff may be open to discussion, but the facts he has gathered regarding the strong position that India, and especially the Argentine republic, are assuming as wheat growing countries will provide food for thought for farmer, miller, and grain handler in this country. The development in wheat growing in Argentina is very remarkable, though as an English miller says elsewhere in these pages it may be that the best millers will want none of this wheat, even at 67 and 70 cents.

Only a few years ago the people of Argentina were importing wheat. In 1882, according to Mr. Campbell, she began exporting with an insignificant 62,000 bushels. In 1893 she exported 30,600,000. This year she promises 50,000,000 bushels.

With regard to the purchasing power of wheat and corn this correspondent says, the English sovereign is a star of the first magnitude. Gold is about 250 premium in Argentina. When the Argentine farmer sells his wheat, he sells it for paper money on an inflated basis, but this money pays his way in his own country, his transportation, taxes, buys his food, and last, but not least, pays his labor account. It is only when he invests in an imported article that he must pay out paper money on a gold basis.

"It is asserted," says Mr. Campbell, "that Argentina can sell wheat at a cent a pound in Liverpool and live. She is doing it at present at 67 cents per 60 pounds. I shrink from asserting that only 5 per cent. of the arable land of Argentina is under the plough, nevertheless it is said to be so. They have 750,000 square miles of land, irrespective of Chaco and Patagonia, and there is also Uruguay to be considered. Fifty million bushels is not a very large item in the world's supply of wheat, but these countries are developing, and the most serious part of the business is that their harvest comes on in December and January, and when they have a good crop the wheat will be pouring into Europe during the months of March. April and May, and taking the market for our spring shipments from the lake ports. The English merchants, if sure of Argentina, and watching the harvests of India and Egypt, which come on in March and April, will refuse to bid up for the American wheat, which has carried storage, insurance and interest charges throughout the winter at Chicago, Duluth and Port Arthur. England can always avail herself of the cheapest labor and transportation, and if we are to export we must sell on the same basis."

When we go away from the Argentine, which, as one of the newest wheat rivals, is commanding increased consideration just now, we learn that dams are to be built on the Nile, which are to add to Egypt a fertile belt equal to a fourth of the area of Europe. Wheat is to-day growing in the old world where it has not grown during the Christian era. The United States Consul recently reported to his government that the more settled condition of the country about Bagdad had given an impetus to the cultivation of wheat, and that "communications by means of lighters and steamers are good."

All these are conditions that give point and emphasis to those who tell us that the day of high prices for wheat has indeed found its resting place only in the gone past.

EDITORIAL NOTES.

DOMINION millers will regret to learn from the news columns of this issue of the MILLER of the destruction by fire of Barrett's flour mill and contents at Port Hope. Mr. H. Barrett is the capable vice-president of the Dominion Millers' Association.

REMARKING on the report that Montreal speculators lost $10,000,000 during 1893 in the New York and Chicago markets, the Milling World curtly says: "Well they will get little or no sympathy. They had no business to speculate." This is cold comfort to the men who dropped the money, but we do not know but what it is all they deserve. The ruinous spirit of speculation that is rife to-day is no helper to legitimate grain-buying and we can hardly suppose that the miller sees any solace for the present depression in flour in the speculative habit. A danger indeed that the miller must avoid is that of becoming a speculator himself.

A WHEAT-GROWING country that is pushing ahead with considerable energy lately is Turkey-in-Asia. A late English consular report says: The fact that the districts are yearly becoming more settled causes more land to be taken into cultivation. The year 1891, owing to the impetus given to the export of grain, has shown to cultivators the advantages to be gained by increased cultivation, and hence it may be safely surmised that the export of grain from Bussorah will in the near future make considerable progress. There are hundreds of square miles of land, both on the Tigres and Euphrates, which are capable of producing wheat, and which so far have not been cultivated. Communications by means of steamers and lighters are good between Bussorah and Bagdad. On the Euphrates, however, owing to natural causes, and also to the still unsettled state of the country communications are bad. Should the latter be rectified, there is no doubt but that the increase in the export of grain will be very large, and as a natural consequence the demand for European products will materially increase.

WITH the growth of many large milling concerns in different parts of the United States the question has been frequently raised, and discussed with a good deal of warmth on both sides, how far a development of trade in this direction is likely to effect the small millers of the country? It has been argued with much positiveness that as the trend of trade in almost every direction is towards centralization, so will it be with milling before long. The reply has been made with force, that the number of small mills is growing rather than declining throughout the country and these are paying their owners a fair profit, whilst it is notorious that some of the largest milling concerns have been unable to pay their shareholders any dividend worth naming. This is to be said that the flour mill is the pioneer manufacturing concern of new localities and that in this particular the small mill holds an advantage over the big concerns which will locate only, of course, in large centers. The greatest difficulty that the small miller, perhaps, has to contend against is competition in prices. We have not heard any serious complaint, so far, of trouble in this direction in our own country, unless we except a very bitter complaint, that comes from Moosomin, Man., where it is said the Ogilvie Company are crowding out some of the smaller millers by underselling, and some go so far as to call for legislation to prevent what is termed an altogether illegitimate use of organized capital. Just how much there is in this complaint it is perhaps hard to say, for it is to be remarked that the Ogilvie concerns have generally been given credit for generous and courteous treatment of rivals in the business.

A COMPLIMENT to the quality of Manitoba wheat is to be found in the efforts that North Dakota farmers have been making to secure this wheat for seed purposes. We have noted in our news columns that the application to Washington to permit of this wheat coming in free of duty has been refused. The Duluth papers are of the opinion that the privilege should be granted; that, "There is no question that the removal of the duty would stimulate the wheat trade of Duluth and it would at times give our millers the benefit of quality of wheat that they did not always conveniently get on this side of the border." Our contemporary then goes on to say that two railroads run from Duluth to Winnipeg now and the Canadian Pacific will soon have a line to the head of the lakes. All this would mean an expansion of trade that would be satisfactory to Duluth and which Manitobians would hardly likely dispute. Contrariwise, however, to this view is the opinion expressed by a prominent member of the Winnipeg grain trade, who says: "The surplus wheat from both countries, Canada and America, finds its market in England. The only time at which Manitoba would reap an advantage would be in case of a shortage of hard wheat in Minnesota and Dakota. But on the other hand the Manitoba farmer will lose the Ontario trade. At certain times, as now, the Ontario millers pay several cents above an export basis for Manitoba wheat for mixing purposes, but if the American people allowed our wheat to go in free we must take it for granted that the Canadian government would reciprocate. Ontario would then draw its supplies from the hard wheat of the States. As far as the Manitoba dealer is concerned, the carrying out of the idea would make no difference whatever."

AMERICAN FLOURS IN CANADA.

AT a time when millers are discussing tariff conditions and the question is a practical one in legislation both in the United States and Canada, the following extracts from reports of consular agents in Canada giving figures and opinions concerning the matter at the leading centres of the Dominion will be found interesting:—

MANITOBA.—American flour is barred from this market by an import duty of 75 cents per barrel. Besides, the freight rates from American points make competition with local mills difficult, if not impossible. Good wheat can be had close at hand in abundance at first cost direct from the farmer. With a full interchange of flour between the United States and the territory embraced within this consulate, our American millers might at times sell here, but they could not secure a steady profitable market. This is a wheat-growing country, and large quantities are annually raised for home consumption and for export.

ST. JOHN, N. B.—The importation of wheat flour from the United States for the past three years ending June 30, has been as follows: 1891, 1,193 barrels; 1892, 818 barrels; 1893 309 barrels. During those periods not a bushel of American wheat was entered at the port, and no wheat or wheat flour was imported from any other country.

ST. STEPHEN, N. B.—The importations of American wheat flour into this district during the year ending June 30, 1891, 1892, and 1893, were as follows;

Year.	Barrels.	Value.
1891	244	$1,459
1892	127	763
1893	80	478

During the same period no American wheat was imported into this district, nor were there any importations of wheat flour from other countries.

HALIFAX, N. S.—The following is an official statement prepared by Mr. Thomas Cardwell, statistical clerk in the custom house at this port, of the importation of American wheat flour into Halifax for 1891, 1892, and 1893:

YEAR ENDING JUNE 30—	WHEAT FLOUR. Quantity *Barrels.*	Value	WHEAT. Quantity *Bushels.*	Value.
1891	625	$2 729	20	$34
1892	2,948½	13,242	40	53
1893.	14	58	10	13

NORTHERN NOVA SCOTIA.—The quantity of American wheat flour imported into this district in the year ending June 30, 1891, was sixty-eight barrels, fifty-eight of which were entered into Pictou customs district and sixteen in that of Arichat, Cape Breton. The number of barrels in the year ending June 30, 1892, was six, entered at Arichat. The same for 1893 was four barrels, also entered at Arichat. There was no American wheat imported into the district during the years above mentioned, nor were there for the same period any importations of wheat flour from other countries.

BELLEVILLE, ONT.—I do not think that under present conditions the outlook for extending the market for American flour is at all promising; but it is the opinion of a majority of the larger dealers that were the same conditions existing as in and previous to 1865 our trade in flour with this district would be to a large extent regained, and in this opinion I concur.

CHATHAM, ONT.—No American wheat or flour can be sold here and pay the present duty imposed upon those articles, and none has been imported in years. All the flour used is made here from wheat grown in Western Ontario, with the exception of a very small amount made from wheat brought from the Canadian northwest. Of the total amount sold, 75 per cent. is made by the so-called "patent process." The facilities for shipping here are the best—either by one of three railroads or by steamer during navigation. The removal of the duty would admit a certain quantity of spring wheat or flour made from it, as the bakers generally prefer it; but the leading men in the milling business claim that the abolition of the United States duty would admit them to a proportionate share of American trade. They sell their best flour in carload lots at $2.75 per barrel. Local retailers buy at $3 and sell to consumers at $3.50.

COLLINGWOOD, ONT.—No wheat or wheat flour was imported from the United States or elsewhere into this district during the years 1891, 1892, and 1893. The obstacles in the way of an extension of trade in American flour are the prevailing rate of duty here, the local production, which somewhat exceeds the consumption, and the wheat and flour which are brought here from Manitoba and the Canadian northwest. There are no prospects for doing a more extensive business in American flour in this country so long as these conditions prevail.

HAMILTON, ONT.—The collector of customs at Hamilton has informed me that no wheat flour from the United States or from any other country was imported through his port of entry during the years ending June 30, 1891, and June 30, 1892, but that half a barrel of flour was imported from the United States during the year ending June 30, 1893, for the purpose of making certain special bread for the use of Hebrews in their religious observances. He has furthermore stated that one barrel of cracked wheat was imported from the United States especially, on private account, during the year ending June 30, 1891, and that six bushels of United States wheat were imported during that year and twenty-five bushels from the same country during the year ending June 30, 1893. These two lots of six bushels and of twenty-five bushels of wheat were imported, he believes, for use as seed. No wheat was imported from other countries through the port of Hamilton during the three years in question, nor was any foreign wheat flour or wheat imported during those years through the ports of entry of Berlin, Galt, Paris, or Brantford, Ont. with the exception of 950 barrels of flour imported from the United States through the port of Brantford during the year ending June 30, 1893. It appears, upon investigation, that this importation consisted of a lot of damaged flour purchased at a very low price for the purpose of manufacturing starch therefrom, and that its damaged condition and the low price at which it was bought admitted of its importation at a comparatively small cost to the importer, notwithstanding the high rate of duty on flour. The great and only serious obstacle in the way of the extension of trade in American flour in this district is the customs duty imposed by the Dominion of 75 cents per barrel on flour and 15 cents per bushel on wheat. The wholesale price in this market for Manitoba flour made from spring wheat and commonly termed here "strong flour" is from $3.50 to $3.80 per barrel. The wholesale price for flour from winter wheat is $2.60 to $2.75 per barrel. This flour is made from Ontario wheat. The latest quotations accessible here of the wholesale prices in the Chicago market are from $3.80 to $4.15 per barrel for flour from spring wheat and from $3.25 to $3.50 per barrel for flour from winter wheat. It will be observed that the above quotations indicate that the price of each of the two grades of flour in question is somewhat less at present in this consular district than at Chicago, but millers and consumers of flour here allege that the Manitoba spring wheat is equal in all respects to that of Minnesota, and that the flour from Ontario winter wheat is as good as American wheat flour. Furthermore, the payment of the duty imposed on American flour imported into Canada would add 75 cents per barrel to the price of the flour as quoted at Chicago when the same is received by an importer in Ontario. Under these circumstances it would seem that "the prospects for doing a more extensive business in American flour" in this section are not good.

KINGSTON, ONT.—From June 30, 1891, to the present time only one carload of American flour has been imported into this district; with that single exception, all flour used since that date has been from Canadian wheat ground in Canadian mills. The people are ready to eat American flour if it can be given to them better or cheaper than the Canadian article. Under present circumstances the outlook for placing American flour upon this market is not favorable.

OTTAWA, ONT.—Canada is essentially a wheat producing and exporting country, and the importations of American wheat and wheat flour are only nominal. During the fiscal year ending June 30, 1892, the last for which official figures are in print, Canada imported 66,113 bushels of wheat, of which 65,105 bushels came from the United States, and 36,559 barrels of flour wheat, of which 34,338 barrels came from the United States. During the same year Canada exported 8,714,154 bushels of domestic wheat, of which 1,486,881 bushels were sent to the United States, and 380,996 barrels of domestic wheat flour, of which 3,998 were for the United States. The obstacles in the way of extending the trade in the American wheat and flour in Canada are mainly twofold the import duty and the fact that Canada can and does produce these products quite as cheaply as the United States. For these reasons, and especially the latter, the use of American wheat flour can only be local and occasional.

SARNIA, ONT.—This is an agricultural district. They export from here large quantities of wheat to the United States so it would be difficult to extend the market for American wheat flour here. *There was no American* wheat flour imported into this district in the years ending June 30 1891, 1892, or 1893, and no American wheat during the same period. There was none from other countries during the above years.

MONTREAL, QUE.—Wheat flour is generally used, and in the country districts its use is probably more universal than even in the United States, there being very little bread made from flour or meal of other cereals. The quality of flour which seems to be in greater demand is stated to be what is termed "Strong Bakers," although the "Patents" and "Straight Roller" are largely used. I am informed that the greatest proportion of all manufactured for consumption here is ground from hard Manitoba wheat, while the quantity of Ontario fall-wheat flour consumed is very small. A Chicago firm formerly doing some business in Canada stated that their most popular selling grade in this country, especially in Toronto, Montreal, and Quebec, was what they termed a spring wheat bakers' flour, which was "used extensively in what is called bakers mixture." The quality of wheat and flour imported from the United States into the port of Montreal for the past three years is given in the following table, and also the amount of the same imported for consumption.

YEAR ENDING JUNE 30	TOTAL IMPORTS Wheat *Bushels*	Flour *Barrels.*	FOR CONSUMPTION Wheat *Bushels*	Flour *Barrels*
1891	2,453,647	15,272	40,661	9,459
1892	4,930,479	19,261	42,004	6,512
1893	4,110,229	21,069	1,825	4,005

Prior to the year 1890 the import duty on wheat was fifteen cents per bushel and fifty cents per barrel on flour, and even with this restriction a small trade in flour for consumption was possible; but in March of that year the duty was increased to seventy-five cents per barrel, and that increase seemed to have the effect of closing this market to the United States. The Chicago firm already referred to inform me that on the basis of fifty cents duty per barrel they were able to compete, to some extent, with Canadian millers throughout Ontario, Quebec, and the lower provinces, and, although the margin was small, they were able to do business, working closely; but after the increase to 75 cents they were entirely shut out. The imports from the United States for consumption at this port dropped from 81,000 barrels in 1889 to 4,000 barrels in 1893, as will be seen in the following statment of imports for each of the past five years ending June 30

	Barrels
1889	80,067
1890	31,210
1891	9,400
1892	6,513
1893	4,000

There is no wheat or flour imported from any other country, and, as shown in this table, but very little of that from the United States is for consumption. With respect to the obstacles to extension of the trade in wheat and flour and the prospect for doing a more extensive business, it may be stated that the chief and probably sufficient obstacles to extension are, first, the quantity of wheat grown within the limits of the Dominion, more especially in Manitoba and the Northwest and, second, the import duty. The first obstacle is not insurmountable, and, although competition might be sharp, it could be met with a fair degree of success, but the second is *substantially prohibitive, and places this* market entirely beyond the reach of dealers in the United States. The receipts of flour during past six years were as follows

Years	Total Receipts. *Barrels*	From the U. S. *Barrels*	From Canada *Barrels*
1888	933,121	56,223	869,858
1889	968,876	59,481	909,365
1890	978,843	28,870	949,973
1891	1,134,421	18,062	1,135,359
1892	686,888	10,285	676,603
1893*	795,286	19,781	

*Six months.

SHERBROOKE, QUE. — There were 152 barrels of American flour imported into this district in the year ending June, 1891; 30 barrels in the year ending June, 1892, and 311 barrels in the year ending June, 1893. There was no American wheat imported in the district during 1891, 1892, and 1893. There was no wheat flour, nor any wheat, imported into this district from other countries during the same period. The only obstacle that I can see to the extension of trade in American flour is the duty of 75 cents per barrel that the Canadian Government imposes upon American flour. If that duty were reduced there is no doubt but there would be a large increase of trade in American flour in this district. I have talked upon the subject to different flour merchants here, and they all say that they would like to handle American flour if they could buy it more cheaply than, or even as cheaply as, Canadian flour.

CURRENT COMMENT

GEORGE BULL'S grist mill at St. Albert, N.W.T., was destroyed by fire a few days ago The mill contained about 5,000 bushels of wheat and a quantity of flour. The loss will amount to about $10,000 with no insurance.

THE agrarians of Italy have issued a call for congress to meet on April 15th with a view to influencing the debate in the chamber of deputies in behalf of an increase of the duty on wheat A number of the various municipal councils, chamber of commerce and Agrarian societies throughout Italy have petitioned the chamber to make this increase, and the matter will probably be taken up within the next month.

OF the immense resources and commercial possibilities of India there has never been any doubt in the minds of those, who have made a study of conditions in that great empire. What seemed to be most needed is an opening out of the country by means of the iron horse, and thus give increased facilities of communication and transport. The Indian Commerce discussing the question of railways in that country sees great encouragement for development in that direction. The Director-General of Indian Railways, in his report for the year ended March last, is able to record a total of 18,042 miles open, which contrasts with 17,564 miles in 1892, and 15,243 in 1889. In the last five years no additions have been made to the mileage worked by guaranteed companies, not to "foreign" lines, but 1,774 miles have been added to State lines worked by companies, 312 miles to State lines worked by the State, 180 miles to assisted companies' lines, 120 miles to lines owned by native States and worked by companies, 108 miles to lines owned by native States and worked by State railway agency, and 335 miles to lines owned and worked by native States. This is progress in the right direction, but it should be quickened. There is, of course, the exchange difficulty to be grappled with, and this involved a loss which is estimated at Rs. 1,710,800 for the last calendar year. But one-third of that sum can be written off the lines which were avowedly constructed for military purposes, and not expected to pay their way; and those who look forward to commercial lines being remunerative have none the worse of the argument, even when regard is had to past experience. Already one of the greatest resources of India is wheat; to the extent, in fact, that it is already becoming a formidable competitor in European markets with the wheat of this continent.

A USEFUL RECIPE.

A FIREPROOF and waterproof substitute for paint, for use in boiler and engine rooms, consists of six quarts of freshly slacked lime, well sifted, to which is added one quart of rock salt and a gallon of water, the mixture being then well boiled and skimmed clean. To five gallons of this mixture are added a pound of alum, half a pound of copperas (stirred in slowly), three-quarters of a pound of potash, and four quarts of fine sand or hardwood ashes, well sifted. To this may be added any coloring material desired. It is said to be as durable as slate, and to be especially applicable to brickwork and similar surfaces.

EXPERIENCE in electrical welding shows that the metal is strengthened at the point of welding.

The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, bruse meat, split peas, etc.—at home and abroad. The interests of the miller who grinds the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The MILLER each month covers very effectually the field of flour handlers and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

DEFECTIVE EXPORT METHODS.

THE opinion is expressed by Mr. C. A. Pillsbury, the big Minneapolis miller, that the foreign flour trade is now worked by American millers for all there is in it, and that it may probably be regarded as having reached its maximum. This is high authority, though the statement will be read with surprise by many millers. Mr. Wilder Grahame commenting on Mr Pillsbury's view in an article in Milling, of Chicago, is inclined to hold to the same opinion. Mr. Grahame thinks, however, that the greater mistake of the miller has been in lax efforts to retain the foreign trade already secured and it is here the depreciation in this trade is to be most felt. Entering somewhat into particulars he states, to quote a vulgarism, that the American miller thinks himself so smart, that he knows better what the foreign flour handler wants than he knows himself.

The system of packing for foreign markets is believed to leave much to be desired. There is a difference in putting up flour for transportation by railroads with few handlings necessary, and quite another affair to successfully ship where about all the destroying elements of man and nature play a part.

"One of the general complaints from foreign countries," says this writer, "comes from the use of the destroying hooks in loading and unloading goods at the docks. Even ropes cause more or less damage. Then, too, the flour once stored is liable to lie side by side with barrels of turpentine or petroleum. Any one at all familiar with the ocean service will appreciate the damaging effects of hot, damp, saline-charged air with which a ship's hold is burdened. Add to this the odor arising from various heated and ill-smelling articles of commerce and the desirability of an odor-proof covering will be seen.

"It is not a settled conclusion that the cargo, at its destination, will be unloaded under cover or pleasant weather. In some parts it must lie unsheltered, perhaps in the midst of heavy rains, until claimed by the purchaser or shipper's agent.

"If the flour is consigned to some merchant of the receiving port or of some town having direct connections therewith by rail, perhaps its adventures are about over; in the latter case, however, the chances of a ride across the country in an open flat car through the prevailing weather are pretty fair. But if intended for some interior mining camp, new possibilities await it. First of all, if it must, as is usually the case in tropical countries be packed through forests and over mountains on mules or donkeys, the packages must be of convenient size for handling; as small as forty pounds being required for some trades. If the receiving merchant has to repack to make it conform to these conditions, he is not particularly prejudiced in favor of the original shipper. If it is conveyed in the original package it must be able to withstand the attacks of the elements, insects, and the half-savage muleteer. Some of the latter when entering camp allow the package to drop from their steeds and remain whenever chance directs, be that in a water hole or bed of rocks. During the day the route perhaps will lead through swamps and dense tropical jungles, where thorns abound, and the sun's rays never penetrate; where there is a perpetual reign of dew and moisture."

There is much that is practical and sensible in these suggestions. Foreign trade cannot be successfully developed if the conditions and requirements of trade with these places are not studied. Canadian millers have had experience in this matter in shipments to the West Indies. We were disposed for a time, and a rather long time, to send our flours to the Indies, packed as though they had not to go beyond the limits of our own country. Trade was being lost to Canada and going elsewhere, where the requirements of these countries were understood. The Dominion Millers' Association, through its ever-watchful secretary Mr. Watts, went careful into the matter, and thanks to this enquiry and the publicity which the MILLER was able to give to the matter, things were mended, and Canadian millers learned how to secure and hold a share of the trade of the Indies.

Millers are interested in foreign trade in other points and how far they may be wanting in some or all of the particulars stated by Mr. Grahame, it will be for them to learn, and act accordingly.

A WAY OUT OF THE TROUBLE.

A recent inquiry, as to the extent to which wheat in the province was being fed to cattle, the results being published in these columns a short time ago, elicited the information that much more wheat had been chopped up for feed this year than in previous years; and from inquiry we have been able to make of our readers from time to time, we are led to believe that the practice is growing. Now it seems an anomalous position to be forced into for millers to use their mills to grind grain to be fed to hogs in place of putting the mill to its legitimate use grinding grain for flour, to be fed to human beings. A Minnesota miller has been writing to the North Western Miller on this question. There the practice of feeding wheat to cattle is just as common, and perhaps more so, than it is here. This writer thinks there is a happy medium betweeh the two extremes. He argues that instead of selling flour at such prices as foreign importers choose to pay, that a home demand be created for all our mill products below patent, making us entirely independent of the export trade on lower grades. Feeding wheat, entire, he says, is reckless extravagance. The suggestion is that the miller will receive the farmers' wheat, take out the patent flour and return to the farmer all below that grade and thus be obliged to find a market only for the best flour. In other words the force of the suggestion is to sell the manufactured product, instead of the raw material; feed the more useless parts of wheat to the cattle, let the better be made into flour and have the country become exporters of the manufactured article in place of the raw material. With the facilities of milling in this country, even allowing for the improvements that have been made in milling methods in Great Britian, we ought still to have a long advantage over them when it comes to making flour. We believe the matter must occur to Canadian millers in this light.

A REMARKABLE DAM.

ONE of the most remarkable dams in the world for height and construction is that by which the Vyrnwy river, Northern Wales, is enabled to supply water to the city of Liverpool, some seventy miles distant. In building this dam a great trench was excavated across the valley for a length of 1,100 feet, a width of 120 and a maximum depth of sixty. The masonry was started in this trench; it consists of immense irregular blocks of slate, wedged together and thoroughly bedded in Portland cement mortar, the faces being formed of cut stone block, fitted together with great care, the greatest height of the dam being 161 feet. Its most remarkable feature is the lack of any channel to carry off floods, the surplus in the lake flowing down the front of the dam covers an area four and three-fourth miles long, from one quarter to five-eights of a mile wide and holds largely over 12,000,000 gallons. The aqueduct, leading from the intake tower to the distrubuting reservoir, about two miles from the city, is sixty-eight miles long, and consists principally of a large cast iron pipe line from thirty-nine to forty-two inches in diameter. There are a number of reservoirs and tanks along the line, and at one place is a great filtering plant.

Office of the CANADIAN MILLER, March 20, 1894.

THE GENERAL SURVEY.

ONE may almost say of the wheat market, that it is a case of telling over and over again the old old story of no improvement. Grain men and millers have been listening to this story from month to month, hoping that each month might represent a turning in the lane, but it seems not to be. The information that comes from every intelligent source points clearly to the fact that continued low prices of wheat will be the order of the day. In other columns of the MILLER we have discussed particular features of this question, and it is not necessary to go over the ground again. One word is suffice, that the rapid, and in some respects, extensive opening of new fields for wheat growing shows that the whole basis of calculation, as to the possibilities of wheat prices, must be changed in the future. Since our last writing Chicago wheat has dropped as low as 59c, and the lowest quotation ever known in Liverpool, namely, 60c. has been reached. Compared with prices 12 months ago, to-day's figures are 21c lower, they are 34c less than two years ago, and if we were to take prices of February 1891 there is a difference of 39c.

These conditions stand out in striking contrast with the very positive declarations made a year and two years ago, that wheat was becoming so scarce, or rather that the consumption of this commodity was growing to that extent, that it only meant a few years at the most before the American republic would become an importer in place of, as to-day, an exporter of wheat. But matters do not look this way just now.

The American Agriculturalist, a journal that has given a good deal of careful study to the subject of wheat growing, has lately compiled a table in millions of bushels, that shows the ratio as follows since 1871 :—

ANNUAL WHEAT EXPORTS.

Fiscal year.	U. S.	India.	Russia.	Total.
1871-75, average	63	2	55	120
1876-80, average	100	7	70	186
1880-85, average	140	29	63	232
1886-90, average	113	33	91	237
1891	106	27	104	237
1892	226	58	51	335
1893	192	28	4	304

Fiscal years end June 30, March 31, January 12.

According to these figures the exports for the ten years from 1880 to 1890 would average 235,000,000 bushels a year. The same authority furnishes also the following table :

IMPORT AND SURPLUS WHEAT COUNTRIES.
(In millions of bushels.)

Importing countries.	Net Imports.	Export countries.	Net Exports.
Belgium	19.2	Austria and Hungary	5.8
France	37.4	Bulgaria	5.7
Germany	18 8	Roumania	19.2
Greece	8 9	Russia	83.2
Italy	19 9	Servia	2.2
Norway and Sweden	1.9	India	30.9
Netherlands	8.6	United States	83.3
Portugal	3.7	Argentine Republic	5.7
Spain	6.1	Canada	2.4
Switzerland	10.9	Chili	3.9
United Kingdom	105.3	Australasia	8.2
Total	240.9	Total	248.7

This table places England as a customer for wheat at about 43 per cent. of the annual commercial supply. The United States, France, Germany, Italy and Belgium being the chief consumers of the remainder.

So it is, that all interested in the sale and consumption of wheat for commercial purposes, have presented to them in present conditions economical problems that will call for their best thought and consideration.

As far as local conditions are concerned some few sensations have occurred from day to day, or at longer intervals, as weather conditions have changed or statistical calculations of a semi-official character have been made public.

A recent statistical return of the United States department of agriculture indicates that a very considerable portion of the wheat now in farmers' hands comes from the crops of 1891 and 1892. The indicated stock of wheat in farmers' hands is 144,060,300 bushels. This is nearly 21,000,000 bushels less than the estimate for March 1st last year, and nearly 20,000,000 less than the average of the past eight years. The crops in producers' hands, as estimated, aggregates 589,000,000, or 36.4 per cent. of the crops of 1893. The official and commercial estimates of the world's wheat crop for 1893, make it 32,000,000 bushels less than last year. The final estimates will probably still further reduce the total for 1893, as the preliminary estimates for Russia and Germany are generally reduced by the final estimates.

CURRENT PRICES OF BREADSTUFFS.

WHEAT—Toronto—No change in the local markets. Red and white selling in limited quantity at 57c. ; spring 59c. to 60c ; red winter, 57c. to 58c. ; goose, 57c. to 58c. ; No. 2, hard, 73c. ; No. 2, hard, 71c. Montreal: No. 2, hard, Manitoba, 76c. to 77c. ; No. 2, hard, Manitoba, 74c. to 75c. Chicago: April, 59½c. ; May, 60¾c. ; July, 62c. ; September, 63¼c. Duluth: No. 1, hard, 62c. for cash ; No. 1, Northern, 60¾c. cash ; No. 1, hard, 62⅜c. for May ; No. 1, Northern, 61¾c. for May ; No. 1, hard, 64½c. for July ; No. 1, Northern, 63c. for July. St. Louis: 55¼c. for cash ; 55¾c. for April; 57¼ for May; 58¼c. to 58⅜c. for July. Detroit: 58½c. for cash; red 58½c. for cash; 59½c. for May; 61¾c. for July.

BARLEY—Toronto—The market is quiet. No. 1 is quoted at 41½c. to 42 at interior points, and at 44c. to 44½c. at water points. A Buffalo despatch says of American markets : The visible supply of barley at all principal points of accumulation is but 636,000 bushels as against 1,116,000 bushels at the corresponding date last year. There is 139,000 bushels in store here and over 200,000 bushels on the way from Chicago, and the entire amount has been either sold or will be shipped out on arrival. The receipts, however, will supply immediate needs of some malsters who are now on short supplies, but there is a fair enquiry here for barley at about the following quotations : Choice western, 67c. to 68c. ; fair to good, 60c. to 64c. ; common, 57 to 59c. ; state, 68c. to 73c.

OATS—Toronto—Fair sales are being made. White quoted at 34c., and mixed at 33c. Buffalo : Offerings light. No. 1, white 38½c. ; No. 2, white 38c. ; No. 2, mixed 36c.

PEAS—Toronto—Somewhat easier. No. 2 at about 55c.

RYE—Toronto—A fair call. Sales made at 47c.

BUCKWHEAT—Toronto—Very little activity. Car lots east quoted at 37c., and round lots at 39c.

THE FLOUR MARKET.

TRADE in flour keeps dull. There is a fair local trade doing, but little call for flour for export. Bran and shorts, however, are in good demand, and at leading points, noticeably Montreal a few days ago, a strong upward tendency is shown. A Liverpool despatch of the 14th inst. states, that quotations are stationery, prices favoring buyers. Of Minneapolis markets the Northwestern Miller reports, the demand for flour to be slow. The export part was of about the usual proportions. The bakers' grade is usually sold abroad and also some patent right along. "Our people complain that Duluth millers have been offering flour for lake shipment at cut prices, and, in order to protect their regular trade, Minneapolis firms have had to meet this competition to a greater or less extent. The Duluth mills are represented to be also selling flour very low on the other side of the water, prices being seriously affected thereby. Eastbound all-rail rates are badly demoralized, and it is a question if the difference in favor of lake transportation is not being largely discounted. Red dog is slow of sale, and millers are disposed to run it into their shorts pile."

PRICES OF FLOUR AND MEALS.

TORONTO.—Car prices : (Toronto freights) — Manitoba patents, $3.70 to $3.75 ; Manitoba strong bakers, $3.45 to $3.50 ; Ontario patents, $2.90 to $3 ; straight roller, $2.55 to $2.70 ; extras, $2.35 to $2.40 ; low grades, per bag, 85c. to $1. Bran—$15.50. Shorts—$16.50. The weekly Bulletin, of the Dominion Millers' Association, of the 19th inst., says of Ontario flour markets : Sales of straight roller, $2.65 to $2.70, and $2.75, and 90% patent $2.75, $2.80 and $2.85, f.o.b. for Lower Provinces. Bran $13.50 and $14.00, and shorts $15.00 and $16.00 f.o.b. middle freights. Export sales of straight roller reported at $2.76½.

MONTREAL.—Winter wheat, $3.50 to $3.60 ; Manitoba patents, best brands, $3.90 to $3.70 ; straight rollers, $3 to $3.10 ; extra, $2.76 to $2.90 ; superfine, $2.50 to $2.65 ; Manitoba strong bakers, $3.35 to $3.40 ; Manitoba strong bakers, best brands, $3.50.

CANADA'S NEW SHIPPING PORT.

THE business men of St. John, N. B., are putting forth very intelligent efforts to make known to ship owners and shippers of produce in the Dominion the capabilities of that port for export and import trade. From special information supplied by the Board of Trade of St. John, we learn :

The only Atlantic deep water terminus of the Canadian Pacific railway owned by it, is now at St. John, 481 miles from Montreal, and running on its own rails 3600 miles from Victoria, British Columbia. Freight can be discharged into vessels from cars on both sides of the harbor. The International railway has two deep termini here, receiving and delivering freight by cars and from and to vessels at the wharves along the harbor front, thus saving transfer and cartage charges.

The Canadian Pacific Railway Co., assisted by the city and the provincial government, has recently completed a first class grain elevator, fitted with all the latest improved machinery for hoisting, weighing and shipping, and is now ready to receive and ship grain, the size and capacity of which is a total storage room of 301,716 bushels, and can deliver 15,000 bushels per hour. The average receiving capacity of elevator is about 53,000 bushels per day.

There is now a well managed and very successful line of passenger and freight steamers, whose capacity is from 10,000 to 13,000 barrels each, carrying goods and passengers from China, Japan and the western provinces of Canada, running from St. John to the West Indies, carrying the West India mails under contract with the Dominion Government, calling at Bermuda, St. Thomas, St. Croix, St. Kitts, Antigua, Montserrat, Dominica, Martinique, St. Lucia, Barbadoes, Trinidad and Demerara, and leaving St. John every 28 days and returning to St. John via the same ports.

There is also a regular and satisfactory line of steamers (the Furness line) running between St. John and London, G. B., also under contract with the Dominion government which leaves each place simultaneously about every sixteen days. There are several lines or schooners running to all ports in the Bay of Fundy, which can deliver flour and other produce on through bills of lading at a lower rate via St. John than by way of Boston, New York and Portland.

Vessels of all sizes (steamers and sailing vessels) are open for charter at St. John at all seasons and at lowest rates. Atlantic insurance on vessels and all kinds of merchandise can be effected in St. John with reliable companies at the same (and occasionally at less) rates of premium as from New York, Boston, Portland or Halifax. Vessels can always depend upon being able to fill up with deals, timber and other freight to close out part grain cargoes at all seasons of the year. Steamers can be supplied promptly with first class steam coal at reasonable prices. Vessels of any site can be loaded and discharged very expeditiously at St. John.

There are no worms in the harbor of St. John, consequently vessels can lay in safety any length of time afloat, free from these pests ; the large rise and fall of tide giving peculiar facility for the repair and reclassing of vessels. Vessels bound to St. John can always find first class pilots on the lookout 80 or 100 miles at sea.

The coasts of both sides of the Bay of Fundy from its mouth to St John are plentifully supplied with lighthouses, fog whistles and automatic buoys, by which the greatest safety is secured. The registered tonnage at St. John amounts now to 560 vessels 155,221 tons.

St. John is the distributing centre for a large number of trunk and branch lines of railway, and of steamboat lines, in New Brunswick, Nova Scotia, Quebec, Ontario and the northern part of the State of Maine. The board of trade can point with much satisfaction to the very exceptionally low averages of losses on vessels arriving at and departing from the Port of St. John during a period of ten years as made up by the entry and clearing department of the custom house, viz.

1st. The percentage of loss of tonnage of steamers as compared with total tonnage of steam vessels, entered and cleared is ..... .08 of 1 p. c.

2nd. The percentage of loss of tonnage of sailing vessels as compared with the total amount of sailing vessels entered and cleared is ..... .41 of 1 p. c.

3rd. The percentage of loss of cargoes of steam vessels as compared with the total amount of imports and exports is .002 of 1 p. c.

4th. The percentage of loss of cargoes of sailing vessels as compared with the total amount of imports and exports is .05 of 1 p. c.

5th. The percentage of loss of tonnage of both steam and sailing vessels as compared with the total tonnage entered and cleared is ..... .26 of 1 p. c.

The arrivals at the port of St. John during the past seven years of sailing vessels and steamers amounted to 16,976 vessels of 4,447,009 tons, or a yearly average of 2,425 vessels of 639,858 tons. The clearances during the past seven years were 17,632 vessels of 4,627,088, or a yearly average of 2,519 vessels of 661,011.

A FEW days ago I had the pleasure of meeting and chatting with Mr. Howson, of Howson Bros., millers, Teeswater, and though a good many complaints are made of millers trade being slow, Mr. Howson tells me that they have done a good business in the past year. Of course he admits prices are low, and yet by careful management and push, he finds there is some profit in their milling in Ontario. I asked him if he thought much wheat was being chopped up for farmers and he says considerable has been going that way. Farmers simply take the ground that the wheat nets them a better price chopped and fed to cattle than sold at market prices as they have ruled for some time past in his locality. Mr. Howson says there is very little wheat in farmers' hands.

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One of the veterans of the milling trade in Canada, and there are none more highly respected, is Mr. James Goldie, of Guelph. I exchanged a few words with him a fortnight ago. He is as perfectly keen to business considerations to-day, as years ago, when a much younger man he planted himself as a miller in the Royal city. The Goldies are large millers and to make milling with their great capacity pay, they must find an export field for their product. Because the export fields have been so depressed for the past year is an explanation, no doubt, of Mr. Goldie's remark that milling has not been any too profitable for a year back. Prices, he says, are simply demoralizing and the trade in export localities continues dull. A good deal of wheat in his locality is being chopped up for feed.

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Mr. Angus McKay, manager of the experimental farm, at Indian Head, N. W. T., has been visiting Ottawa on business connected with the proposed distribution of seed grain among Territorial farmers. Speaking to an interviewer of the shortage of seed grain he said: "It will take 50,000 bushels of wheat and 40,000 bushels of oats to supply the demand. This grain the Dominion government is now buying from well-to-do farmers in the Territories and Manitoba. About 15,000 bushels of the wheat will be purchased in Manitoba and a greater part of the balance from farmers near Indian Head. The grain is not given to the farmers as a present but sold at cost on a year's time, without interest, the government taking mortgages on the land." "Is this scarcity of seed grain general?" "No, indeed! The shortage is confined to three districts, the south-eastern part of Assiniboia, and the district adjacent to Regina and Moose Jaw." "How were these districts affected?" "They were visited by the 'chinook' and one particular day which will pass into history as the 'hot Sunday' did much damage to the grain." "Was the wheat crop totally destroyed in these districts?" "No, not by any means." "Don't you think there are good many asking for grain who could get all the seed they wanted without government aid?" "Certainly there are. The way of it is that one man who really needs seed grain asks for it, and then everybody in the neighborhood joins in the chorus. Yes, there is no doubt but that a large percentage of those who are getting seed grain from the government are simply taking advantage of the reasonable rates held forth." "Are the prospects good for a successful year in general through out the Territories?" "They were never better. The majority of the farmers are prosperous, and there is a good tide of immigration setting in. The ground is now nearly ready to seed, although it is too early to sow."

* * * *

A Peterboro grain dealer in looking over his correspondence the other day found telegraphic orders for 13,000 bushels of wheat for which $2.50 per bushel was paid. The telegram was dated 1865, the time the American war was coming to a close.

THROTTLING vs. AUTOMATIC CUT-OFF ENGINES.

UPON this question the American Machinist in a recent issue says. There can be but little doubt, we think, that in some instances the throttling engine, with fixed cut-off, will equal in all respects, the automatic cut-off, and we believe it is possible to conceive of an engine being operated under such conditions that the former would show slight superiority. But in the great majority of purposes for which steam engines are employed it seems that the reverse must be true.

The great point of superiority of the automatic cut-off principle comes from the fact that most steam engines are subjected to variable loads, and quite generally some fluctuation in steam pressure. If this was not so then a properly designed throttling engine would be unobjectionable. For, of course, there is a point of cut-off for any engine that is the most economical, and a cut-off can be fixed for that point that shall, at least, be as good in all respects as that under the control of the governor. But because there is such a pint of cut-off it does not follow that it is best to fix it, and reduce the pressure as by throttling for lesser loads. This economical point of cut-off varies with the steam pressure, and the automatic cut-off governor so varies it, which is right in principle. That is, if a cut-off at one-quarter stroke is the best for a given pressure, if the pressure is somewhat higher than that, it is better to take advantage of that high pressure by cutting off earlier than to reduce the pressure by throttling or otherwise. This is very near, but probably a universal fact. For example, with the point of cut-off correct for a given pressure it is possible we think probable—that a little, not much, throttling may be better than a change to earlier cut-off. And in case of very materially higher pressure considerable throttling may be advisable. This would depend upon the quality of steam, and upon other circumstances, perhaps; at any rate it is to be shown that there is enough in it to afford a margin for the economical use of the throttling governor, except in selected instances.

The reaction in favor of throttling is not likely to be violent, but it is interesting. Engineers who set out to-day to improve the throttling engine have to add them a good deal of general information that was not on hand at the time the automatic cut off engine made its appearance. Should serious effort be made to bring the throttling engine into competition with the automatic cut-off the attempt will be on quite different grounds from what it would have been made on twenty years ago, and it would not be safe to predict the outcome. It is possible only to fall back on the argument—which does not amount to much—that it cannot be seen how the effort can be successful, and await results.

WHY STEAM-BOILERS EXPLODE.

WHY do steam boilers explode? They do explode and lives are lost and property destroyed, and there is a cause for the trouble in every case. In a large number of such instances it is safe to say the trouble would not have occurred if those in charge had given heed promptly to some trifling defect at the proper time. It is the old story of the stich in time and when the stich is not made the rent enlarges, and in a steam boiler a rent is a serious affair. Some statistics have come to us from the Hartford Steam Boiler Inspection Company, which give much needed emphases to the moral we have here drawn. We are told that since the company began business they made 796,725 visits of inspection, inspected 1,580,010 steam boilers, made 608,786 complete internal inspections, tested 102,195 boilers by hydrostatic pressure, found 1,205,309 defects, of which 154,749 were dangerous, and condemned 8,406 boilers. Concerning their work in November, 1893, they say: "During this month our inspectors made 6,745 inspection trips, visited 14,706 boilers, inspected 5,241 both internally and externally, and subjected 537 to hydrostatic pressure. The whole number of defects reported reached 10,471, of which 1,058 were considered dangerous; 27 boilers were regarded unsafe for further use." Of their work in December, 1893, they say: "During this month our inspectors made 7,642 inspection trips, visited 15,971 boilers, inspected 6,647 both internally and externally, and subjected 574 to hydrostatic pressure. The whole number of defects reported reached 12,335, of which 1,385 were considered dangerous; 83 boilers were regarded unsafe for further use." The summary for those two months is as follows:

Nature of Defects	November. Whole Number.	November. Dangerous.	December. Whole Number.	December. Dangerous.
Cases of deposit of sediment	810	30	1,327	71
Cases of incrustation and scale	1,591	65	2,266	105
Cases of internal grooving	87	7	179	18
Cases of internal corrosion	523	10	776	40
Cases of external corrosion	754	44	887	45
Broken and loose braces and stays	161	39	276	89
Settings defective	229	28	291	46
Furnaces out of shape	101	17	410	17
Fractured plates	345	67	440	71
Burned plates	227	26	320	31
Blistered plates	256	12	348	25
Cases of defective riveting	1,282	111	1,549	80
Defective heads	96	20	165	53
Serious leakage around tube ends	2,565	122	1,645	346
Serious leakage at seams	169	29	330	62
Defective water gages	111	80	115	76
Defective blow-offs	135	42	174	44
Cases of deficiency of water	18	6	15	11
Safety valves overloaded	57	11	97	45
Safety valves defective in construction	80	23	96	26
Pressure gages defective	471	18	611	57
Boilers without pressure gages	1	1	1	1
Unclassified defects	45	11	15	8
Total	10,471	1,058	12,335	1,385

OPINION ON ARGENTINE WHEAT.

AN element of concern in wheat raising in this continent has been the reported figure that the Argentine republic was likely to play in the raising of wheat, the larger part of which would reach the United Kingdom and come into competition with the wheat of this country. Added to the cheap prices at which wheat is being laid down from India the case has sometimes looked serious for wheat-growers here. One miller signing himself "Verax," writing in Milling, of Liverpool, Eng., does not see any cause for alarm, not at least so soon as millers get to know the kind of wheat raised in the Argentine. This miller very frankly writes: "I am greatly exercised in my mind concerning the big efforts which are being made to boom the wheat of Argentine on to the English market. I doubt whether south-country millers will take a large dose or be caught napping. I say this advisedly and as the outcome of experience with this class of wheat. I have tried in combination with many mixtures and also alone, and my firm conviction is that where you can lay hold of suitable English, it is best let alone. It is all very well in places where the supply of native wheat is greatly below the demand, as it goes towards making the blend a bit cheaper, but as regards to carrying power it is of no account whatever. The utmost any one can expect from it is its ability to lift itself into a medium-sized loaf, and only that. The yield of flour is also not high, and it loses considerably in bulk weight during the cleaning process. Several merchants having been making various attempts to force it down here, but have not been making much progress, and that too, after a fair trial alone and on its merits. Of strength there is not much, and the statement of a recent writer that it will replace some of the northerns is pure imagery, because impossible. This wheat has been figuring in the distance ever since the Liverpool convention; it is now coming to a head, so to speak, and I predict for it a speedy deliverance from its false position. At the same time, I have no doubt it will find a place in many mills, and rightly so, on account of continually shortening supply of native wheat; but that place will not be in the vicinity of the loaf-raising department. This is the ground of my contention anent all that is being said to the contrary."

AN INGENIOUS WATER-WHEEL.

AN order has been given for a power plant of the following description by a Minneapolis man, for use upon a small river in Minnesota. Three canoes are to be anchored abreast in midstream, about eight feet apart, and they will sustain the shafting on which the paddle wheels revolve. The current will run these wheels, gearing will convey to a driving wheel in one of the boats the power developed, and a wire cable will complete the transmission to the shore. Pains will be taken to keep the paddle shaft at right angles to the current. In order to submerge the wheels sufficiently, the canoes will be partly filled with water, the amount being regulated by watertight compartments. Each paddle has a superficial area of thirty square feet, which, when wholly immersed in a a rapid current, must withstand a considerable strain. The arrangement is such that the average turning effect is about equal to sixty square feet, immersed all the time.

VARIETIES AND PROPERTIES OF FOOD.

THE remark is quite commonplace, and yet it is worth repeating, that no man can know too much of the particular trade or vocation he is following. There has come before our notice a paper prepared by Prof. V. C. Vaughn, of Michigan University, and read before the Michigan Millers' State Association the early part of the present year. Prof. Vaughn is not a practical miller, but he is believed to have been possessed of a measure of scientific and expert knowledge on the subject talked of, to warrant the association in asking him to convey this information to a body of men who have an experimental insight of the question, and yet it was possible for them to learn something more.

Prof. Vaughn entered quite fully into a definition of a food. What amount of energy does a food contain? What are the properties of a food? What are the different classes of food? Having disposed of the general question, he then spoke of the particular food which millers are engaged in preparing. On this point he said:—

"Flour contains proteids and carbo-hydrates, with traces of fat. The amount of fat, however, is so small that it may be left out of consideration. The most important proteids which are present in flour are the following: Plant albumen, plant casein and gluten. Plant albumen exists in flour in very small amount. It is readily soluble in cold water, and in this way it may be easily separated from the other substances. Plant casein is not soluble in pure water, but is soluble in water which contains phosphates. The amount of plant albumen and plant casein in flour is so very small that we will give our principal attention to the other proteid substance found in flour, the gluten. We may say that there are two kinds of gluten in flour. These are sometimes called gluten propei, or gluten fibrin and gliadin, or plant gelatin. The gluten fibrin is the most abundant proteid substance in flour. It is not soluble in water, but when mixed with water it forms a sticky, doughy mass, and it is by virtue of this property that bread can be made. You can readily see that a deficient amount of gluten in flour would necessarily result in making the flour unfit for bread, because the necessary adhesiveness of the particles of dough could not be obtained. Not only should the gluten be present in sufficient quantity, but it should also be of proper quality. In some flour the gluten does not hold together well. It breaks easily. It is said to be rotten. In a very few flours the gluten is too much like mucus; it is gelatinous. It can be drawn into fine threads, but these threads have no strength. In an examination of flour, a study of the kind and amount of gluten present is of the greatest importance, and if the kind and amount of gluten are normal, the other proteid substances in the flour may be overlooked. Of course, the most abundant food principle present in flour is the starch. The study of the starch grain may be made with a microscope, and any changes which it has undergone may be readily detected.

"Now I come to the practical points of this paper, the examination of flour. I will say nothing about the adulterations of flour, because, so far as my experience goes, adulterations of flour do not exist in this country. Certainly, intentional adulterations are not found. It has been claimed by some that there is an excessive amount of iron in American flours, and this has been attributed to the use of the wire binder. I have examined a good many samples of flour and have never been able to find any evidence of this accidental adulteration.

"I will also leave out of consideration the presence of foreign and harmful grains, because, fortunately, in this country, poisonous plants such as the darnel are never present in sufficient quantity to cause trouble. The miller and the baker know that sometimes a certain run will produce better flours than can be obtained at other times. In some instances these differences can be explained. In other instances no explanation can be found. I think it altogether probable that if flours were frequently examined some light might be thrown upon these unexplained cases. There is, possibly, in many instances, something wrong with the wheat to start with, or something wrong with the care which the farmer has given to the wheat in gathering it or in storing it.

"The following are the practical tests which are applicable to flours: First, the color. The exact shade of color is determined by means of the tintometer. The tintometer consists of a series of plates made with gypsum, the first of which, or No. 1, is made of pure gypsum, the second with gypsum to which a small amount of coloring matter has been added, and the third with gypsum with a larger amount of coloring matter, and so on. The color of the flour is to be taken while it is moist. It may be pressed into a little mold and while moist its color is to be compared with the gypsum plate.

"Second, the adhesive properties of the flour. Flour should not be lumpy, and yet when pressed in the palm of the hand, there should be formed a cake which slowly but spontaneously crumbles to pieces, or when a handful of the flour is thrown against a smoothly planed board a small amount of flour should adhere to the board.

"Third, the amount of water which is in the flour. Good flour contains about 10 per cent. of water, and flour which contains 18 per cent. or more of water should not be considered marketable. The method of estimating the per cent. of water is simple. It consists in weighing out a given amount, say one grain, of the flour, and drying . . closed or box water bath, at a temperature of 190 deg. centigrade, until the weight remains constant. The flour which contains under 14 per cent. of water should be considered, so far as this test is concerned, good, one which contains from 14 to 16 per cent. of water medium, and one which contains from 16 to 18 per cent. of water poor.

"Fourth, the amount of gluten. This is estimated by washing out the starch and other constituents, after which the gluten may be weighed moist, if only an approximate result is desired, or it may be dried at 100 degrees centigrade, and weighed, where exactness is desired. Practically, gluten is usually weighed in the moist condition, and it has been found by a large number of experiments that this weight divided by three gives approximately the weight in the dry state. Thus, a flour which contains 33 per cent. of moist gluten would contain practically about 11 per cent. of dry gluten.

"Fifth, the kind of gluten. This can be determined only by an expert, who can judge by working up the flour with water as to the ductility and strength of the gluten fibrin which is present.

"Sixth, the starch granules can be examined under the microscope.

"Seventh, the bread breaking properties of the flour should always be tested by a trial baking."

ABOUT PACKING.

IF the rod is in first-class condition almost any kind of packing will answer the purpose, but where it is scored or worn tapering, or is out of line, we must use a packing that will follow up the inequalities in its travel, and to do this without excessive friction the packing must be very elastic. The following plan is a very good one, says the American Machinist.

Suppose that the stuffing box is 4 inches in diameter and the rod is 2.5 inches, leaving a space three-quarters of an inch wide to be filled with packing, and assume that the stuffing box is 3¼ inches deep. Take a piece of pure gum rubber sheet packing, without cloth insertion, which is one-quarter of an inch thick, and cut a piece from it 3 inches wide, and of such a length that when it is rolled up into the form of a circle, it will form a bushing for the stuffing box, reducing the space around the rod to ½ inch in width. Care must be taken to cut this so that the ends will meet squarely, leaving no space between them, for this bushing of rubber must be a perfect fit in order to be effective. Next take a piece of firmly made packing, which is ½ inch square, and cut rings enough to pack the rod out flush with the rubber bushing, which we made 3 inches deep, thus taking six rings. These rings should be of such a length that when they are in place there will be at least ⅛ inch between the ends. They must never be cut so as to make a tight fit, although it makes a neater looking job in that way, for, unless there is room for the rings to expand, the heat will cause excessive friction, sometimes to the extent of burning out the packing and scoring the rod.

We have left a space ¾ inch deep, which is sufficient for the gland to enter, but the nuts which hold it in place should not be screwed up with a wrench, but with the fingers only. If there is a leak of steam when the engine is started, it will do no harm for an hour or two, but if the expansion does not take it up then, the nuts may be screwed up until the joint is tight, but no further, for obvious reasons. If packing put in according to these directions does not abolish the disagreeable hiss of steam at each revolution of the engine, I do not believe that any other kind of fibrous packing will do it, and the rod should be turned true and put into line.

So far as flange joints are concerned, it is a very good plan to have them ground so that no packing will be required, but as many of them are not built that way, it remains to select the packing which will render the best service. If the steam is not saturated with oil, we may select any elastic grade that is most convenient, but the flanges of the throttle valve, and any other that may be beyond the lubricator, must be packed with something that will not be dissolved by the oil. A corrugated copper gasket for each of such joints will answer a very good purpose, unless the faces are very rough. If we are to use soft packing, it is well to take a small piece of it, and put it in a cup of oil, and let it remain for about a week. There are several kinds in the market that will not stand this test, for when taken out there will be but little left of them, as they will be either partially or wholly dissolved, but others will be just as good as new after the test, and these should be used exclusively.

Flange joints, when newly packed, should not be suddenly subjected to a heavy pressure, but should be warmed up gradually, and while still under a very light pressure, the nuts should be carefully screwed up until all of the lost motion caused by the relaxation of the packing is taken up. Under no circumstances is it proper to screw up these nuts under a heavy pressure, for if one of them should fail, the additional strain thrown on the others might cause them to break, and a serious accident would be the result.

In making up these joints do not begin on one side and screw up the nuts in rotation, as that will cause the flanges to be brought together on one side, and thrown open on the other, and then when this side is tightened up also, if it does not break the flange, it will cause a very heavy strain to be brought to bear on the bolts, much of which is entirely unnecessary.

In using old bolts for this purpose, they should be put in a vise, well oiled, and the nuts run down on them, until it is known that they are an easy fit a little farther down than they will ever be needed when in place. If this precaution is not taken, it is quite possible for the bolts to be twisted off before the flange is together properly.

In packing a cylinder head it is not necessary to have a large rubber gasket, as some asbestos wicking will answer every purpose at a very low cost. In packing a large valve stem, which is worn down, or has been turned down until it no longer fills the hole in the bonnet, a washer or gasket cut from thick pieces of cloth insertion sheet rubber packing will answer a very good purpose, if put in first, or if the gland is a loose fit it may be put in last, to prevent the wicking from working into the space around the stem.

NEW KIND OF GRAIN.

SOME interest and curiosity is being attached to a grain that has been found growing in the Himalayan Mountain country. "It is called Kownee," says the American Elevator and Grain Trade, "and the fact that it grows at such altitudes is what lends special interest to it. It looks something like wheat; but very much larger ears. The grains are quite small, of a brown color and quite like wheat. It is not impossible that it is wheat modified by culture and circumstances. It yields very largely, and would be suitable for our mountain and extreme northern territory and for British America. The plant from which the Indian tea, now so popular, was grown, was found growing wild in the same Himalyan districts."

THE NEWS.

CANADA.

—Montreal dealers are agitating for a flour inspector for that city.

—A hundred barrel roller flour mill is to be built at Rosenfield, Man.

—The Welland and St. Lawrence canals will be opened for traffic about April 23rd.

—The flour mill of Mayhew & Myers, at Glen Mills, Ont., is doing a large trade.

—The Portage oatmeal, at Portage la Prairie, Man., has been leased by Jos. Martin to Wm. M. Smith.

—Application has been made to the courts to wind up the Rapid City Elevator Co., of Rapid City, Man.

—J. B. O. Archambault, grain dealer, Montreal, has assigned with liabilities unsecured of about $21,000.

—The completion of the new flour mill at Glenboro, Man., was celebrated by a banquet attended by ladies and gentlemen.

—A company has been formed to erect a roller grist mill at Ruther Glen, N.B., with J. J. Collins, of Ottawa, as president.

—An appeal to Washington by Dakota farmers in favor of free admission of wheat from Manitoba for seed purposes has been refused.

—The grist mill at Sundridge, Ont., owned by Mr. J. K. Blain, Sterling Falls, has been destroyed by fire. Loss $3,000. Partly insured.

—W. R. Cahoon, of Marquette, Man., will rebuild his flour mill, which was destroyed by a boiler explosion only a few weeks ago.

—The Canadian Pacific Railway will carry grain in Manitoba and Northwest Territories for seed purposes only at one half the tariff rate.

—Barret's flour mill and contents at Port Hope, Ont., were completely destroyed by fire on the 20th inst. Loss $18,000. Insurance $7,000.

—The Lake of the Woods Milling Co., of Keewatin, Ont., will have a store and barrel factory in full running order next summer. About a dozen men will be employed.

—Something over two million bushels of wheat are now in store in Fort William and Port Arthur elevators. Last year at this time there were over three million bushels there.

—Geo. Ball's grist mill at St. Albert, New Edmonton, Man., was destroyed by fire a few days ago. Loss $10,000. No insurance. Five thousand bushels of wheat were destroyed.

—The Lake of the Woods Milling Company will increase the capacity of their mill at Portage la Prairie, Man., to 800 barrels a day, which will be two-thirds of the company's mill at Keewatin.

—A post mortem examination on the body of a Montreal carter who died suddenly disclosed that the throat was clogged with wheat only partially masticated. Wheat was also found in his pockets.

—J. H. Lafreniere & Co., flour and grain merchants, Montreal, are reported in financial difficulties. It is stated by a Montreal journal, that a few years ago Mr. Lafreniere could have retired with $100,000, but since then he has sustained losses that have completely wiped out his surplus.

—The large roller flour mill of George Elphick, Pinkerton, Ont., was destroyed by fire on 12th inst. The origin of the fire is unknown, but is supposed to have been caused by lightning. Loss, $18,000; insured for $7,000.

—The Acton Flouring mills, which Mr. John Harvey has been the proprietor for the past eight years, have been sold to Messrs. Cheyne Bros., of Guelph, with all privileges in connection with the property. Messrs. Cheyne Bros. are practical millers, and have for a number of years been conducting the Speedvale Mills at Guelph. It is their intention to remodel the mill throughout, putting in full roller process machinery of the most approved class. Mr. Harvey gives up possession on the 1st of April.

GENERAL.

—The Milling World says that reports from the winter wheat areas generally tell of favorable conditions.

—"When the Erie canal is improved as is proposed," says a Chicago paper, "and grain is carried from Buffalo to New York for 2 cents a bushel we can ship grain from our fields in the Northwest at much less cost for transportation, and give other exporting countries a harder fight for the trade of importing countries. Much Canadian grain also would be exported via the Erie.

—The Rio de Janeiro flour mills, built several years ago in Brazil by British capitalists, are reported to have made in the year ending August, 1893, a net profit of about £10,000 or $50,000. Considering the serious competition of American flour, which enters Brazil free of duty, and the overcrowded condition of the railways, we must admit that this is an excellent showing; especially so if we compare it with the results of the preceding fiscal years, namely, £2,411 to August 31, 1891 and £5,583 to August 31, 1892.

—An exchange from N. Dakota tells of a leading farmer in that locality, who has decided to change the wheat crop this year on his farms to flax, and will sow 700 acres of ground already prepared for wheat to flax, with 20 quarts of seed to the acre, using press drills. Flax ripens in about nine weeks after seeding and if the season is favorable it is believed that the crop can be harvested and threshed out before wheat is ready and got in the market ahead of the fall rush of flax which breaks down prices. By this means it is possible to take advantage of the present high price of flax and this outlook has induced the change from wheat.

—The West Superior Board of Trade are considering the practicability of opening a sample grain market in Superior for the Northwest. The Superior mills have a capacity for nearly 15,000,000 bushels of wheat, and there is a demand from the Duluth mills for a sample board. The millers were decidedly in favor of the measure, and a guarantee fund was raised to carry the board for one year in order that the project could be thoroughly tried. Several firms of Minneapolis commission and elevator men have decided to open offices in the city to solicit the mill trade. The buying so far has been on the Duluth Board of Trade, but the Superior mills have decided to withdraw their trade from that body.

PERSONAL.

We regret to learn of the death of Mr. Enoch Stevens, father of Mr. N. H. Stevens, proprietor of the Kent mills, Chatham, Ont., which took place at Blenheim, a few days ago. The deceased was a pioneer of his neighborhood, an extensive land owner and a man of unblemished character. He came of U. E. loyalist stock, was a life long Reformer, and had attained the patriarchal age of 87.

CAUSES OF WHEAT DEPRESSION.

SAYS the London, England, Millers' Gazette: Mr. John F. White, the well-known Dundee miller, ex-president of the National Association of British and Irish Millers, recently spoke rather strongly in a meeting of the Dundee chamber of commerce on the question of the causes which have led to the present depression in wheat. He said: "To suppose that the position of wheat arises from the question of currency is simply absurd; 21 years ago the price was 42s.; to-day it is 25s. Does any reasonable being say that this fall in price has been to any extent caused by the question of currency? The fall in prices is the result of a surplus of 40,000,000 quarters." We are disposed entirely to agree with Mr. White on this question. Had it not been for the superabundance of wheat in the past three years, the fall in the price of silver and the appreciation of gold in the Argentine would have been of little or no effect. In other words, the price of an article like wheat depends entirely upon demand and supply; when the latter exceeds the former, the price must fall, and when there is excessive competition in the disposal of these surpluses beyond actual requirements, such as we have seen of late, then the effects of the exchanges are superadded. That excessive supplies of wheat are the prime cause of the present low prices is shown by the fact that the average production of wheat in the world in the past three years has been 295,000,000 quarters, against only 275,000,000 quarters, in the three previous years. This is the strongest argument that can be adduced against the statement which one hears so frequently nowadays that "the low price of silver is responsible for the low price of wheat."

SOME BOILER EXPERIENCE.

IT hardly seems possible that too much practical information can be cited on the question of handling boilers, and especially when this is in the line of personal experience. An inspector sends to the Locomotive the following notes:

First, and more particularly, I wish to mention a case I met with recently, in which oil caused a deal of trouble. There were eight boilers in the battery, each 60 inches in diameter and 16 feet long. They were all connected together, and were supplied with feed-water through an open heater. In the course of time a new compound condensing engine was put in, in addition to the one they already had. This left only a part of the work for the old engine to do, which caused her valves to rattle badly. The second engineer used oil very freely to stop the noise. The result was that inside of two weeks all of the eight boilers began to leak at the seams next to the bridge walls, the leaks being noticed in all of them on or about the same day. An inspection was made, and tallow-like lumps were found standing on the fire sheets over the grates, quite thickly. A sort of glutinous dirt was also found all along the water line and around the opening to the dome. Water was coming out of the boilers in sheets between the rivets, when they were shut down; and, take it altogether, it was the worst case I ever saw. I expected to have to have some of the seams rivetted over, sure; but I had the boilers cleaned out at once, and put five pounds of rice in each one. I then looked after the heater to see that the trouble there was stopped, and in a few days the boilers were right again. This certainly was the worst and most remarkable case of the kind I have ever seen. The engineer is an excellent man, but the best get caught with open heaters sometimes. He had used this heater for six years, and knew all about it.

I want to refer, next, to boilers with manholes under the tubes. I find that engineers having charge of boilers of this kind are apt to do all their cleaning from below, through the lower manhole. Many times they do not open the boilers on top, and so, before they know it, the boilers are in bad condition above the tubes, and perhaps filled up with incrustation between them. I find it very important out this way, that they should open on top, as it is impossible to wash the dirt down from the top by doing all the washing from the under side of the tubes.

Bridge walls are giving some trouble, too, in this neighborhood, for the masons set the bridge walls and grates up too close to the boiler, and this causes trouble, especially when the boilers are pushed beyond their fair capacity. I wish we could educate some of these masons out of the notion that a bridge wall must conform to the shape of the boiler, regardless of what the damage is. I have tried, as much as possible, to overcome the belief. I tell them a bridge wall is only for the purpose of keeping the fire from working back off from the grates. I have more boilers broken and bagged from filling up on top of bridge walls than in any other way. It is hard to get most engineers and brick masons to understand that the heat does not have to be forced up, but that it ought to be distributed as evenly as possible all through under the bottom of the boiler.

TRADE NOTE.

The F. E. Dixon Belting Co., of this city, have issued a hand-book of useful information about leather belting, that ought to be, it seems to us, in possession of every man who finds a leather belt a necessary part of the equipment of his mill. And what mill can get along without leather belting? Their little book contains a variety of mechanical tables that are practically invaluable to all interested in mechanics.

MILLERS' & MANUFACTURERS' INS. CO.

ESTABLISHED - 1885

32 Church Street, Toronto

The President, James Goldie, Esq., in moving the adoption of the report on the business of 1892, said: I have much pleasure in drawing your attention to the fact that this company has verified, in a marked degree, every expectation set forth in the original prospectus when organized in 1885.

Up to the present time the insurers with this company have made a saving, when compared with the current exacted rates, of $[illegible]. And in addition thereto bonus dividends have been declared to continuing members amounting to $[illegible].

Besides achieving such result, we now also have, over all liabilities—including a re-insurance reserved (based on the Government standard of 50 per cent.—(50%), a cash surplus of [illegible] per cent. to the amount of risk in force.

Such results emphasize more strongly than any words I could add the very gratifying position this company has attained. I therefore, with this concise statement of facts, have much pleasure in moving the adoption of the report.

The report was adopted, and the retiring Directors unanimously re-elected. The Board of Directors is now constituted as follows: James Goldie, Guelph, president; W. H. Howland, Toronto, vice-president; H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines; George Pattinson, Preston; W. H. Story, Acton; J. L. Spink, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

HUGH SCOTT, Mgr. and Sec'y. THOS. WALMSLEY, Treasurer

WANTED AND FOR SALE

ROLLER MILLER SINGLE—OPEN FOR engagement as first or second, good references. Address Box 17, Wroxeter, Ont.

MILLER GOOD REFERENCES EITHER first or second, reasonable terms. Box 50, Clarksburg, Ont.

AS HEAD MILLER CAPABLE OF RUNNING and improving the output of any mill, have references from prominent milling firms. Address Box 485, Mail.

AS MILLER CAPABLE OF TAKING charge of roller mill, any capacity, married, steady and temperate, can furnish good references if required, open for engagement immediately. Address, J. C., miller, 58 Brock Avenue, Parkdale, Toronto.

MILLER WANTED

WANTED, A GOOD MILLER TO MANAGE a 75 barrel mill. Must be competent man and single. Address

A. LAPOINTE,
St. Justine de Newton, Que.

SITUATION WANTED

BY MILLER, 4½ YEARS EXPERIENCE. Young, single, industrious and strictly temperate. Uses no tobacco in any way. Best of references. State wages when writing. Good mill. Address

JNO. FORD, Jr., Markdale, Ont.

EXECUTOR'S SALE

OF THE

"Norris" Roller Mills, St. Catharines; "Fyfe" Mills, Thorold, and the Steamer "Persia."

TO LIQUIDATE THE ESTATE OF THE late JAMES NORRIS, the executors have decided to sell the following properties.

MILLS "A and B," on the Welland Canal, St. Catharines, Ontario. Capacity mill "A," 400 barrels, "B" 325 barrels. These mills are on the direct line of water communication between Chicago, Duluth or Fort William and Montreal, and enjoy the benefit of water rates on all grain inward, and flour outward. Both mills have ship elevators capable of handling 1,500 to 2,000 bushels an hour. Grain storage capacity, 60,000 bushels; large flour and feed storage. Steamers can load for Montreal and way ports direct from the flour warehouses at mere nominal cost. Brick cooper shops and ample storage for cooperage stock and barrels. These mills are full roller process, thoroughly modern in all their appointments, and are running daily. The brands manufactured are registered, and are well known throughout Canada and Great Britain, and are standard wherever used. The mills enjoy a large and profitable local business. Never failing water power, costing only $200 per annum. There is 400 feet dock frontage on the Welland Canal. On the property is a large two-storey stone warehouse, now used for the storage of merchandise in connection with the steamer "Persia." Could be utilized for other purposes, or extra flour and grain storage. Entire premises electric lighted by a modern Thomas-Houston incandescent plant belonging to the property, and at a very small expense over cost of lamps.

STEAMER PERSIA. This boat is in excellent condition, and has always done a large freight and passenger business between St. Catharines, Toronto and Montreal. The "Persia" is a valuable auxiliary to mills "A and B," enabling them to deliver flour at seaboard at a very low rate of freight.

FYFE MILLS, on the Welland Canal, Thorold, Ontario. Capacity, 150 barrels daily. Full roller process. Never failing water power, summer and winter. Water and railway communication. This mill will be sold cheap, and offers a capital opportunity for any practical miller.

For further particulars apply to EXECUTORS ESTATE OF JAMES NORRIS, St. Catharines, Ontario.