

J. H. Giesdale
Exp. Farm, Ottawa
Feb 20, 1900

THE FARMER'S ADVOCATE

AND HOME MAGAZINE

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* AGRICULTURE, STOCK, DAIRY, POULTRY, HORTICULTURE, VETERINARY, HOME CIRCLE *

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Vol. XXXIV. LONDON, ONTARIO. APRIL 20, 1899. WINNIPEG, MANITOBA. No. 476.

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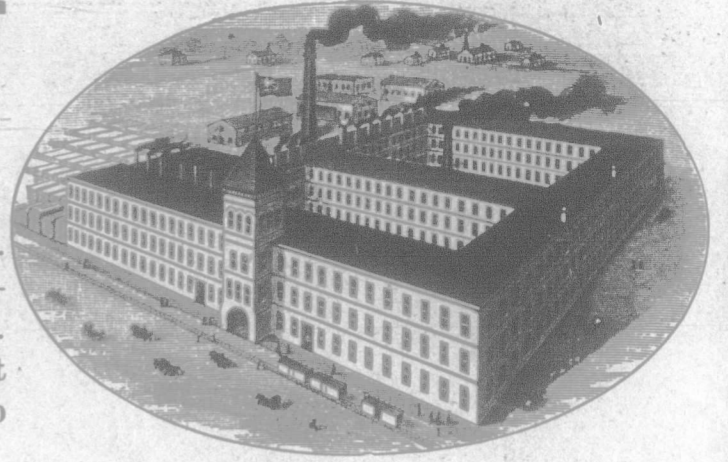
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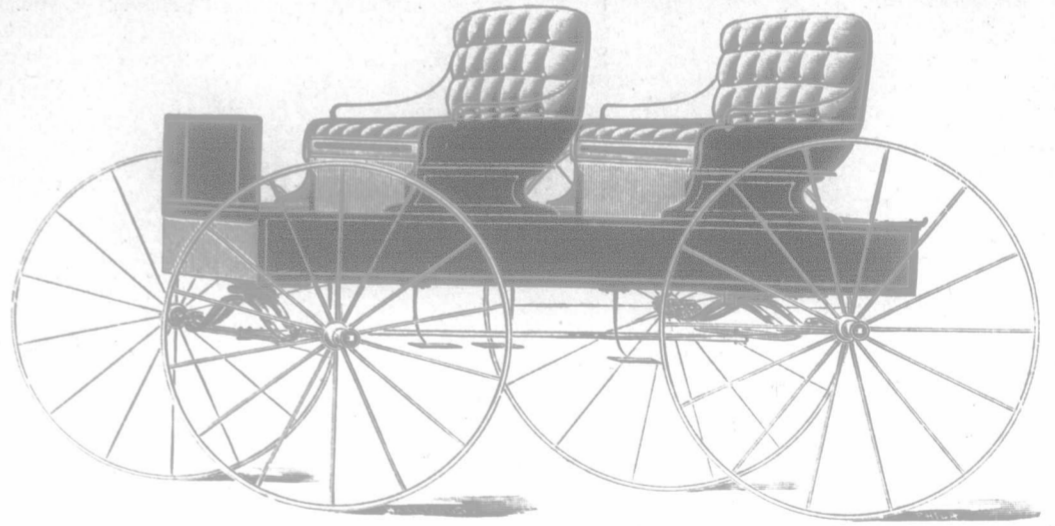
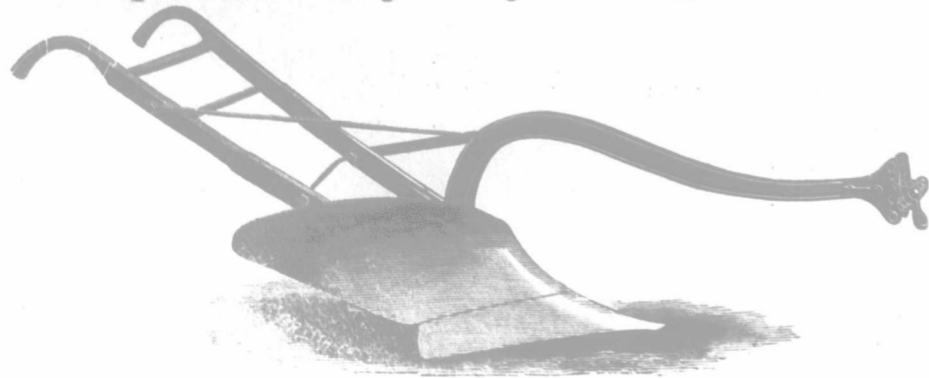
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VOL. XXXIV.

LONDON, ONT., AND WINNIPEG, MAN., APRIL 20, 1899.

No. 476

Arbor Day.

Friday, May 5th, has been set apart for the observance of Arbor Day in the Province of Manitoba. It is now several years since one day in the year has been specially set apart as a national tree-planting day, and no doubt the results to many appear very discouraging. However, as a little leaven leaveneth the whole lump, so the example of a single grove of trees or few rods of shelter belt here and there through the country has its effect, and slowly, but none the less surely, will the celebration of Arbor Day become more and more universally observed. Experience is teaching us the advantages to be derived from the shelter of a grove of trees, and the benefits from a home-making standpoint; it is also teaching us what varieties of trees are best adapted for different purposes, as well as the methods of cultivation and planting essential to success.

One thing is certain, there is no use trying to grow trees unless the soil is well cultivated and sufficient cultivation given to the young plantation to keep down weeds and grass and retain moisture in the soil for the nourishment of the trees. Unless the land where it is desired to have the trees is thoroughly well prepared, it will be a saving of time to postpone the planting for a year and prepare the ground; in which case Arbor Day can be as loyally observed in preparing land for a future grove as in the planting of it. Elsewhere in this issue will be found some interesting articles on shelter and avenue tree-planting, and also on the planting and cultivation of small fruits.

Cultivation.

In this and previous issues we publish a number of letters, giving the practical experience of old and successful farmers in soil cultivation and seeding in this western land. The consensus of opinion is that prairie land should be broken as shallow as possible, and the work done in June backset a little deeper as soon as the sod is well rotted, well harrowed, and seeded with a press drill. In cases where there is little sod or where the land is very lumpy, so that thin breaking is impossible, good results may follow deeper breaking, followed by disking to produce as fine a seed-bed as possible. Rolling the breaking is always helpful in hastening the rotting.

In handling old land, summer-fallowing every third or fourth year is almost universally recommended, especially in the western part of the Province and Assiniboia. Apart from keeping down weeds, the fallow is necessary to firm the land and retain moisture. In plowing in a heavy stubble, either spring or fall, it is difficult to get the land firmed down sufficiently; it is well to burn off the stubble, or if this cannot be done, to cut it as low as possible. In walking over fall plowed ground one frequently sinks to the ankle in hollow spots, showing that the soil has not been packed down. This condition is partly owing to bad plowing, and if more attention were given to the plowing the soil would require less afterwork. An ideal seed-bed calls for a very firm, well packed under layer of soil, with the top inch and a half fine and mellow, to serve as a soil mulch to retain the soil moisture. To assist in obtaining this ideal condition, an implement called a soil-packer is being introduced this year, and from what we can learn from those who have tested it, the machine does what is claimed for it.

Wheat, of course, is the staple, and there promises to be a greatly increased acreage devoted to this crop this year. Owing to the strong demand for good milling oats, and the high price of this cereal, a much larger acreage will be sown, provided enough good seed is procurable. A new linseed oil firm have announced that they will be prepared to take a large quantity of flax this fall, but from past experience with this cereal, it is doubtful if it will be extensively grown. One of the greatest drawbacks with flax-growing is the difficulty of getting seed free from all sorts of noxious weed seeds.

Cultivation.

SIXTEEN YEARS' EXPERIENCE IN SOUTH-WESTERN MANITOBA.

To the Editor FARMER'S ADVOCATE:

As spring work and seed time is at hand, according to the natural course of events, it would not be out of place to review the past experience of many of us as a good guide to the future operations of this our most prosperous year. I look upon 1899 as one of the record-breakers for bountiful crops, if past history teaches us anything, and I say history always repeats itself. As everyone who has farmed in this Province the past ten or fifteen years knows well that a good summer-fallow will mostly always have a good crop, if there are any good crops to be had that year, I always start to summer-fallow the first of June, when weeds are small. It is a good plan to run the disk harrow over it two weeks before plowing. I generally harrow three times and cultivate once before haying. This past season I had a thirty-five-acre field I only got half cultivated before harvest, the other half after harvest. The half cultivated before haying produced twice as much as the half after harvest. No difference in quality of land—all heavy clay loam.

Next to summer-fallow for a good crop is spring plowing. That can be done before you can get on summer-fallow. It is always desirable to sow fallow as soon as possible, as it is the last to ripen. I roll spring plowing as we plow it, then drag, then sow, roll, and drag again crosswise. I think we all do too little cross-dragging. The Campbell land packer should be a grand implement for spring plowing. We must have a solid, or rather a firm, seed-bed. Light land should not be rolled after seeding, neither should old land where the humus is all exhausted, as it is sure to drift, whether heavy or light.

In sowing, I would if possible drill east and west, as the roots are more shaded from the sun and wind, as our prevailing winds are north-east and south-west. In all cases, I never forget bluestoning well all kinds of seed grain. A change of seed every two years, put on clean or new land, will in nine cases out of ten produce grain free from smut, but it is always safe to bluestone.

We expect to have a large number of new settlers this year, quite strange to the ways of procedure to obtain the best results. I have farmed here since 1882. I would break all land as shallow as possible; an inch and one-half is possible in wet years such as this, but never more than two inches. Then backset three inches deeper, and you will have a seed-bed almost like a summer-fallow, provided you harrow when it is moist. I always harrow just after a rain. Backsetting can never be worked easier or better than before there is a crop put in the ground, and it must be backset sometime. Some break three or three and one-half inches and do not backset the first crop. Sometimes a good crop may be gotten that way, especially if the land is on the light side, but in most cases it means a difference of four to five bushels to the acre in favor of backsetting, which would pay for the work, and then it is done.

Now as to rotation of crops, to keep the land in good shape: Two years wheat, one oats, then summer-fallow, and repeat. If possible, burn your stubble, for two reasons. It helps to destroy the sawfly that makes so many white or blank heads in the wheat, especially where it is heavy, and it leaves the land cleaner and moister for the next crop. I would put in no crop on breaking. Potatoes and turnips will do fairly well on breaking, if it is a moist year. It is always best to rent enough land the first year for feed and seed for next year.

JOHN S. THOMSON.

Arthur Municipality, Man.

The Bull Business.

The trade of breeding bulls in Ontario and Manitoba for shipment to the Western ranges has steadily increased, and is a market that may be counted on, for cattlemen will have to invest more freely from that source in the future if the quality of range beef is to be kept up.

It is much easier to run a bunch of cattle down hill than grade up. To keep up the standard of quality requires persistent attention, especially under the existing conditions on the range, where indiscriminate breeding is difficult to avoid, and where the profits of the business are measured by the absence of cost in production.

The Department of Agriculture at Regina, in conjunction with the Cattle Breeders' Associations of Manitoba and Ontario, deserve commendation in

making arrangements for individual shipments in car lots at a nominal figure of \$5 per head from Manitoba or Ontario to any point west.

This importation of fresh blood is a necessity, notwithstanding the argument of a few that the range-bred bull costs less, leaves more calves, and therefore more money; but loss of quality has to be admitted, which is a dollar consideration too with the salesmen.

With a good selection, and given time to acclimatize and adapt himself to range conditions the average Eastern-bred bull will do as good work as the range-bred animal and leave better results.

Manitoba and Ontario are suited for the trade of raising bulls. Breeders have the advantage of a wide selection in crossing of the best strains, and calves never suffer a setback in growth, which gives size and substance.

To breeders looking to the Western market for disposal, the fact cannot be too strongly impressed that a bull with constitution and one that carries beef is the animal required. The beef and constitution he should have, the show points he may do without.

The severe climatic conditions cattle are exposed to in winter on the range at times demands a type that can most readily withstand it, if the business is to be profitable.

It is constitution and the lack of it that makes the difference of cost in pulling through the winter, nor does it need Western experience to tell that the steer that can "rustle" for himself will be the ripest and first ready for the market.

Another advantage in the beefy type from a range point of view is that cows, while well able to give their calves satisfaction, are less liable to get deranged in their udders from an overflow of milk when calving down on the flush of the grass. Since it often proves inconvenient or difficult to handle them, it destroys their utility to a great extent.

There may be an objection on the part of some that the purely beef type is in opposition to the interests of the dairyman, and this may be partly so, but the export trade in beef as a principal source of income in the Western cattle interests demands it for the present, with so much grazing land still lying idle.

CHAR. MICHIE.

Alberta, N.-W. T.

Children's Aid Society.

The first annual report of the Children's Aid Society has been issued. The aims and objects of this benevolent institution are fully described in the report, also the constitution and by-laws, etc. A brief account of what has been accomplished elsewhere by kindred societies is also given, with short accounts of some of the children that have been rescued. While the Society is empowered to take children from parents unfit to properly care for them, or rescue children from lives of crime and shame, still only a comparatively small number of the children that are taken into the Home come from this class; most of them are taken from poor parents unable to provide proper food and clothing, or are orphans unprovided for. The operations of the Aid Society are not confined to Winnipeg, but cover the whole Province, and they are ready to take charge of children needing their protection wherever they may be found. In some cases it is necessary to keep children in the Home for some little time for training, etc., but the object is to place them out in Christian homes, where they will be well cared for and where they will have a chance to grow up useful men and women. Any person having information of children who are being abused or neglected anywhere in the Province should communicate with the Secretary, and persons wanting children for adoption would do well to ask for a copy of this annual report, to be had from the Secretary, Dr. E. A. Blakely, Parliament Buildings, Winnipeg.

In speaking at a meeting of grain-growers at Fargo, N. D., lately, the great railway magnate, Mr. J. J. Hill, in advocating better methods in farming, illustrated his point by the following: "Suppose a man had a 100-acre field. The average cost of farming that field in first-class shape would be \$8 per acre. It is not unreasonable to suppose that he should realize 25 bushels per acre. Now, suppose he farms 200 acres with less care and at \$3 less cost per acre, which would be \$5. The average crop from such farming is about 12½ bushels per acre, so he would get the same number of bushels from each farm, every 25 bushels on 100-acre farm costing \$8, while every 25 bushels on 200-acre farm would cost \$10. This clearly demonstrates that good farming pays the biggest profits."

THE FARMER'S ADVOCATE AND HOME MAGAZINE.

THE LEADING AGRICULTURAL JOURNAL IN
THE DOMINION.

PUBLISHED BY
THE WILLIAM WELD COMPANY (LIMITED),
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1. THE FARMER'S ADVOCATE is published on the fifth and twentieth of each month.
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14. ALL COMMUNICATIONS in reference to any matter connected with this paper should be addressed as below, and not to any individual connected with the paper.

Address—THE FARMER'S ADVOCATE, or
THE WILLIAM WELD CO.,
WINNIPEG, MANITOBA.

Potato Growing.

To the Editor FARMER'S ADVOCATE:

The plan which I would prefer in preparing the soil for potatoes is to give the land a good coating of manure in the fall, then plow pretty deep, covering all the manure; then leave it until spring, when I would give it a good harrowing to smooth it down and start weeds. Then about the middle of May I would plow about three or four inches deep, and drop the potatoes in the third furrows, so that the sets will be from fourteen to eighteen inches apart in the row. Some varieties may be planted closer, about a foot apart. The large growing kinds require more room than the smaller early kinds. After planting I would harrow to start any weed seeds which may be in the soil, and repeat harrowing about every ten days or so, to kill the weeds when they are in the seed leaf. After the potatoes are about two inches above ground, I would run a horse cultivator between the rows, and repeat the operation once or twice, as necessary. Then when the potatoes show signs of forming buds for flowering, put the hilling moulds on the cultivator, and run it between the rows, throwing a light furrow towards the potato shaws. This helps to keep the tubers covered from the sun and weather. Pull out any weeds which appear among the rows. Never leave any to form seeds.

While I prefer this way of planting and preparing the soil for potatoes, still I have tried and had good success with several other ways. Plowing stubble land in the spring and planting the potatoes in the third furrow, and keeping weeds down by harrowing afterwards, gives very good crops in this neighborhood. I have also grown good crops without giving any cultivation after planting until the potatoes were dug in the fall. The only plan that did not do well with me was the following: I opened the land into drills and filled in lots of manure, then dropped the potatoes in the drill and covered up by dividing the drills. This plan was not a success.

I grew thirty-three varieties of potatoes last season, and while I find them giving very heavy crops, still the quality is not so good as usual, and I found the tubers more inclined to grow irregular in shape than I ever noticed in this country before. Of all the potatoes grown here, none have given as good satisfaction as the variety called Morning Star. I have grown this kind for years, and it always gives

good crops and good table qualities; in fact, I don't know any better for a main crop. For early potatoes I prefer Salzer's Earliest. It is a very good sort and of good table quality. Freeman is a very good sort, and so are Rose of the North, King of the Roses, Burpee's Early, and several others. Early Market is good, if used early. With me it grows to a large size, and is hollow. About five years ago I grew about seventy kinds of potatoes, and out of that number I have not got more than six varieties in my collection to-day, the rest being discarded for one reason or another. The largest and heaviest sorts that I grew last year were Seedling No. 83 C. E. F., Belle, Victor, Puritan, Queen of the Meadows, and Maggie Murphy.

For seed I prefer an average size potato, cut in two, always having two eyes in each set. Although I have planted them whole, cut to one eye in set, and got good crops from all these ways, still I prefer two eyes to the set. I notice Mr. McKay, Indian Head, in his paper recommends cutting a week before planting, and storing the cut potatoes in bags until planting time. Whilst I have no objection to having the potatoes cut a week before planting, I would strongly object to storing them in bags. I would spread them on the floor and cover with a horse blanket or with loose bags to keep the sun from them until ready to plant. But for this part of Manitoba I am of opinion the following will give good satisfaction: Remove the potatoes from the cellar or pit to the field, and cut them into sets while the team is opening the furrows, then plant and cover up with the plow, cultivate to keep down weeds, and a good crop may be looked for in the fall.

I will give you my experience in the matter of digging and securing the crop at some future time.

G. S. MCGREGOR.

Lansdowne Municipality, Man.

Summer-fallow Every Alternate Year for Wheat.

To the Editor FARMER'S ADVOCATE:

The soil of this district is a clay loam with a yellowish clay subsoil. In preparing for the first crop, experience has taught us that by breaking the sod as early and as thinly as possible in the spring, then backsetting it as soon as well rotted (not too deep, just sufficient to give it a nice smooth surface), is far ahead of any other method. By so doing it enables one to raise at least two good wheat crops before either manuring or summer-fallowing, which latter method I invariably adopt every alternate year after the second crop has been grown from the original soil, unless for oats. I then sow oats upon the land that would otherwise be summer-fallowed. As for the quality of seed, I heartily agree with Mr. Bedford's advice to use the very best of seed, taken from the very best land, and be cautious about having it free from fowl seeds, and bluestoned thoroughly.

I think it a very foolish risk for a farmer to act as I hear some purpose doing this season, by sowing an inferior grade of damp wheat. Such a "penny wise and pound foolish" system is sure to bring disaster.

As to the mode of sowing, we have proved conclusively that the shoe drill is the drill, no matter whether sown east, west, north or south. As for harrowing after the drill, a great deal depends upon the state in which the ground is in. If mellow, with the fiber pretty well worked out, I usually have the harrowing all done that is necessary, after which the roller is used, followed by the seeder, or if upon backsetting, one turn crosswise of the harrow. We then find the high winds in the spring do not get such a chance to uncover the seed. Several years ago the disk harrow was in great demand, being used principally upon deep breaking, but experience with us has proved it to be a failure, consequently they are only to be found set away in some odd fence-corner to rot.

In reference to a regular-rotation system to be followed, we find it very difficult, owing to the large fields and being unable to manure to any extent. Still, as I said before, our only salvation is the summer-fallowing after the second crop is taken off, and every alternate year, unless one wishes to put in some peas, oats or barley.

WM. GLASS.

Argyle Municipality, Man.

Some Valuable Hints for the New Settler.

To the Editor FARMER'S ADVOCATE:

As the probabilities are that we will have a large influx of new settlers this spring, many of whom will settle on homesteads and new farms, a little advice from those of us who have been here a number of years and learned much by experience might not be amiss. I know with myself, and I presume many others, the experience gained by farming in Ontario was of little use in starting on a homestead in this country. And while I made many mistakes, they would have been more only for the advice of those who had been here before me. As the cultivation and growing of wheat is the chief industry for a beginner, a few points on this subject might be helpful.

Breaking.—This should be done between 20th May and 1st of July, not too deep, but deep enough to turn under all the grass; backset in August or September from one to two inches deeper. If time is plentiful can be harrowed in the fall. Scrub land or loose prairie can be broken deeper and disk harrowed without backsetting. Oxen are the best for

a beginner, as the cost is less, and they will live on the prairie grass and do good work.

Seeding.—Sow as early as land will work, and don't be afraid to harrow well. The advice given me was to "harrow plenty, and then give another stroke." Sow with press drill, $1\frac{1}{2}$ bushels per acre; still, in old times we sowed by hand 2 bushels per acre, and the crops of those times have not been beaten since. Give one stroke of light harrow after seeder, going the same way as the seeder. I have not been able to perceive any difference in sowing north and south or east and west. A dry year, when the roots would need to be shaded, east and west, would be best; and a wet season, when sun would be required, north and south best. Heavy winds are liable to come from any point from south to north by the west. As to variety of wheat, Red and White Fyfe are the best varieties. Seed should invariably be treated with bluestone, thoroughly dissolved in warm water—one pound to eight or ten bushels, and every kernel moistened.

Harvest.—Don't let wheat get too ripe before cutting, especially after August 25th. It will stand cutting when quite green and soft, and if a frost comes a day or two will make a big difference. Don't stack until grain is dry and hard. Don't try to make nice stacks by "kneeling" down the outside sheaves; place them with a fork, and don't put any weight on them; keep the center full and tramp it all you like. Sow enough oats and barley to insure plenty feed, and put it in what you break after 1st July. In breaking, seeding and harvesting, stay with your job, and don't let anything interfere with your work.

F. BOLTON.

Pembina Municipality, Man.

Some Criticisms on Barn Plans.

To the Editor FARMER'S ADVOCATE:

In your issue of March 6th I notice the plan of two barns in Manitoba, which, to my mind, are not laid out to economize time or space. In the plan of Mr. Little's barn his stable is sixty feet long, and he has but one row of horses, two of cattle, and two feed passages. Now, if six feet had been added to the length, he could have had four rows of animals fed from the two feed passages. I also notice his calves' mangers are twenty inches wide, which I think too wide for calves, as they are apt to get into them and stand in them. Then his gutters are twelve inches wide, which is two small, except for calves; for cattle they need to be eighteen inches, so that they will hold two days' manure, which makes it unnecessary to clean the stable on Sunday or any other day when it is not convenient; and it also keeps the floor behind them dry.

I also think six feet six inches quite sufficient length of floor for the largest cows, and a manger eighteen or twenty inches, making about eight feet. The length of block floor under my horses is eight feet, and I find it just right for most horses. The passage across center of stable will make it very unhandy to arrange troughs in front of the cattle for water, unless twice as much piping and extra floats are used.

In the plan of Mr. Sanderson's stables, which are sixty by sixty-five feet, I think they are so cut up with harness room, feed room, root house, and silo, as to accommodate very few stock. I can only see stalls for twelve head of cattle, with one window for light. These cattle are evidently intended to eat all the turnips, as they are so far from the cattle in the open shed, and no way to get there but through the horse stable. The root house on the west side shuts out all light and the sheep pen on the north, and the open shed and loose feeding stable on the east practically shut out all light on these sides, and I fail to see where the light is to come from for the harness room and feed room, which are used every day.

Now, I think the old plan of bank barn and stable is hard to beat. I mean like the one on the Experimental Farm, Brandon, or J. E. Smith's, with cattle and horses standing crosswise of the stable, each facing the feed passages, with root house and silo on the bank side of stable, and doors into root house at the end of each feed passage, and when no high partitions are put up the light from all sides makes it pleasant to work, even when the doors need to be kept shut. I have been in a stable not one hundred miles from here where the owner, who is an intelligent man, had to light matches to let me see some of his stock in broad daylight, and yet he expected the animals to thrive.

I think Mr. Sanderson's plan for keeping the tank from freezing a good one, as the warmth from the stable goes up around the tank.

Oakland Municipality, Man. W. CHALMERS.

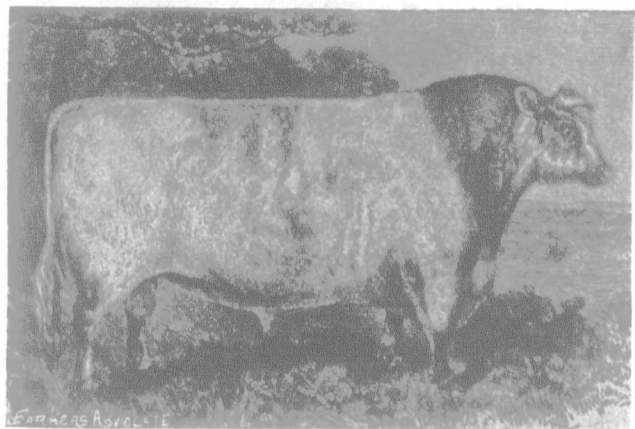
[It would seem, in view of the experience of J. G. Barron, described in our April 5th issue, that it is unnecessary to let the heat of the stable pass up round the water tank, as in Mr. Barron's new stable his sixty-five barrel water tank was untouched by frost during this past winter. His tank is encased in a close boarded chamber a little larger than the tank, otherwise no special protection was given.—Ed. F. A.]

Rosebank Farmers' Elevator.

A number of farmers in the vicinity of Rosebank are applying for incorporation, with a capital of \$10,000, to build and operate a grain elevator at that point. The following are among the principal movers: Jas. Riddell, M. P. P.; Chas. Mather, Peter Thompson, W. Davis, S. Topley, A. Bruce, and T. Smith.

The Honor Roll of the Royal Show.

Mr. Richard Gibson, who is widely and well known as a connoisseur of Shorthorn cattle breeding and an expert judge, the result of a lifelong experience and exceptional opportunities for observation, has kindly prepared for the information of our readers, a list of the winners in the mature classes of Shorthorns at the Royal Show, from its inception to this date. The preparation of this list has been no light task, but has involved a vast amount of patient research. The list has been confined to the winning animals in the aged classes, for the reason that to follow it through all the



DUKE OF NORTHUMBERLAND (1940).

BRED BY THOS. BATES. FIRST PRIZE AT THE ROYAL SHOW, 1839.

younger classes as well would occupy more space than we could consistently afford to devote to any one breed of stock, and the list as presented serves the purpose tolerably well of showing the lines of breeding which have produced the winning cards as a rule during different periods in the history of the breed covered by this record. The English Herd Book numbers of the bulls are given, and the volume in which the pedigrees of the cows are found. It will be interesting to note how in the early years of the record, Bates cattle practically carried all before them, and that in the following period Booth blood held almost undisputed sway. Then Towneley blood, Booth and Bates mixed, had a run of success, this era being succeeded by one in which the blood of the short-pedigreed Booth cattle from Killerby, and later those with Booth-topped pedigrees, in the hands of such men as Linton, Hutchinson, Outhwaite, and Thompson, held the fort for many years; while in the last decade, those of mixed breeding (the mingling of all good sorts) from the North Country, such as those of Cruickshank, Duthie, and others, have held winning hands, producing the blocky, medium-sized, early-maturing sort so popular at the present time. Mr. Gibson's comments upon notable numbers in the list will be full of interest to new beginners and the younger generation of breeders, while the illustrations accompanying the article will be found interesting as object lessons on the different types that have been produced by the various lines of breeding.

OXFORD, 1839.

Duke of Northumberland (1940); bred and exhibited by Thos. Bates, Kirkclevington.

Oxford Premium Cow, Vol. V., p. 752; bred and exhibited by Thos. Bates.

The first show of the English Royal Agricultural Society was held at Oxford in 1839, and Mr. Bates' *Duke of Northumberland* won in aged bull class. He must have been a freak, or our breeders have been standing still. I never yet met a breeder who knew him at his best, but what said he was better than any they had seen since. Mr. Torr, though a strong Booth follower, was most emphatic on his superiority. Another feature worth noting is that he was inbred, being by Belvidere and his dam by the same Belvidere.

CAMBRIDGE, 1840.

Hero (4021); bred by Mr. Topham, West Keal; exhibited by Mr. W. Paul, Pentney.

Red Rose 13th (afterwards named Cambridge Premium Rose), Vol. V., p. 125; bred and exhibited by Mr. T. Bates.

Hero was by Eclipse, a "Crofton" bred bull, out of Polly, by Young Rockingham, a "Raine." No better combination could be found in those days.

LIVERPOOL, 1841.

Cleveland Lad (3407); bred and exhibited by Mr. T. Bates.

Bracelet, Vol. V., p. 103; bred and exhibited by Mr. Booth, Killerby.

Cleveland Lad won first for Mr. Bates. This was the last Royal at which Mr. Bates competed, and the one at which the Booths won their spurs, and from this date until after the Manchester meeting in 1869, seldom is the name of Booth missed from the Royal prize list—more especially, however, for females. I submit a copy of an engraving by Ganel, of *Bracelet*, the first cow to win for the Booths, in 1841; and also one of her twin sister, *Necklace*, who won in 1842.

BRISTOL, 1842.

Sir Thos. Fairfax (5190); bred by Mr. Whitaker, Burley; exhibited by Messrs. Parkinson and Mr. J. Booth, Cotham.

Necklace, Vol. V., p. 726; bred and exhibited by Mr. John Booth, Killerby.

Amongst others must not be omitted *Sir Thos. Fairfax*, shown in 1842 by Messrs. Parkinson and J. Booth, Cotham; bred by Mr. Whitaker; also used by Mr. Fawkes. There raged quite a controversy between Mr. Parkinson and Mr. Bates as to the merits of the bull. Eventually he was bought by Mr. Hutchinson, Moneyray, N. B., and was first of the Royal winners to do missionary work in Scotland, and the seeds sown during the following twenty years are producing fruit now. The harvest has been ripe for years, and the

Scottish breeder is now reaping of it to its fullest extent. In 1844, Mr. Cruickshank bought a grandson of *Sir Thos. Fairfax* from Mr. Torr.

DERBY, 1843.

Musician (4523); bred by Earl Spencer; exhibited by Mr. Barnard, M. P., Gosfield Hall.

Rosey, Vol. VII., p. 532; bred by Mr. J. Colling, White House; exhibited by Mr. T. Crofton, Holywell.

In 1843 a white won first, bred by Earl Spencer, by Warlock, who was sold to Australia; out of a Mason cow (No. 25).

SOUTHAMPTON, 1844.

Strelly (7560); bred and exhibited by Mr. J. Cooper, Thurgarton.

Birthday, Vol. VI., p. 271; bred and exhibited by Mr. J. Booth, Killerby.

Strelly won in the bull class. He had but two registered bulls in his pedigree of three crosses, and apparently was as quickly hidden in obscurity as he had risen from it. In the cow class *Birthday* won, a white daughter of *Bracelet* (see 1841).

SHREWSBURY, 1845.

Cramer (6007); bred by Mr. Parkinson, Ley Fields; exhibited by J. B. Stanhope, Revesby Abbey.

Ladythorn, Vol. VI., p. 429; bred by Mr. J. Booth-Killerby; exhibited by J. B. Stanhope, Revesby, Abbey.

NEWCASTLE-UPON-TYNE, 1846.

Belleville (6778); bred and exhibited by J. Mason, Hopper.

Hope, Vol. IX., p. 300; bred and exhibited by Mr. R. Booth, Warlaby.

Belleville, the unconquered, was winner and afterwards became a pillar of the Herd Book. New York Mills original herd was very full of *Belleville* blood, and even "Rosedale" owed not a little of her wealth of flesh no doubt to his influence.

NORTHAMPTON, 1847.

Captain Shaftoe (6833); bred by Mr. Lax Ravensworth; exhibited by Mr. Parkinson, Ley Fields.

Cherry Blossom, Vol. IX., p. 200; bred and exhibited by Mr. R. Booth, Warlaby.

Capt. Shaftoe won in 1847 for Mr. Parkinson, who gave \$1,625 for him at the Trusthorpe sale. He was out of the same cow as *Col. Craddock's Mussulman*, noted as being the bull that John Booth selected to introduce fresh blood into his herd, for that purpose sending *Bracelet* to Hartforth for service. *Capt. Shaftoe* also left his impression in Scotland, as Mr. Douglass was very successful in winning prizes with his Queens of Trumps, the first of that name being by *Capt. Shaftoe*.

YORK, 1848.

Deception (7957); bred by Mr. Garne, Brodmoor; exhibited by Mr. R. Keavil, Melksham.

Violet, Vol. VII., p. 509; bred by Mr. Glaister; exhibited by Mr. J. Mason Hopper.

NORWICH, 1849.

Andrew (12306); bred by the Duke of Buccleuch; exhibited by Mr. Todd, Elphinstone Tower.

Charity, Vol. IX., p. 295; bred and exhibited by Mr. R. Booth, Warlaby.

Andrew, the first from Scotland to get on the roll, was a white without a recorded sire.

EXETER, 1850.

Senator (8548); bred by the Earl of Carlisle; exhibited by Mr. Ambler, Watkinson Hall, Halifax.

Isabella Buckingham, Vol. IX., p. 104; bred and exhibited by Mr. R. Booth, Warlaby.

WINDSOR, 1851.

Earl of Scarborough (9064); bred by H. Lister Maw; exhibited by Mr. Wetherall.

Plum Blossom, Vol. X., p. 526; bred and exhibited by R. Booth.

Mr. Wetherall won with *Earl of Scarborough*, who traces to *Belvidere*, *Bellerophon*, and *Waterloo*, all names dear to admirers of R. Colling's best families.

LEWES, 1852.

Phoenix (10008); bred and exhibited by Mr. L. Crisp, Hawk Hill, Alwicks.

Butterfly, Vol. XI., p. 354; bred and exhibited by Col. Towneley.

For the first time Col. Towneley's name appears. Note how persistently the Booth cows have been winning right along.

GLOUCESTER, 1853.

Pat (13456); bred and exhibited by Lord Berners, Keythorpe.

Vellum, Vol. XI., p. 733; bred by Sir C. Tempest; exhibited by Mr. H. Smith, The Grove, Notts.

Vellum, the winner, was afterwards bought for Mr. Alexander, and imported to Kentucky, where she founded one of the favorite families at Woodburn.

LINCOLN, 1854.

Vatican (12200); bred by the Earl of Ducie; exhibited by Messrs. Sandy & Smith, Nottinghamshire.

Beauty, Vol. X., p. 265; bred by Mr. Bannerman; exhibited by Col. Towneley.

CARLISLE, 1855.

Windsor (14013); bred and exhibited by Mr. R. Booth.

Bridesmaid, Vol. XI., p. 348; bred and exhibited by R. Booth.

Mr. R. Booth wins both prizes, the first time up to date that this feat has been accomplished since Mr. Bates showed the way in 1839.

CHELMSFORD, 1856.

Master Butterfly (13311); bred and exhibited by Col. Towneley.

Roan Duchess 2nd, Vol. XII., p. 578; bred and exhibited by Col. Towneley.

Col. Towneley followed suit by winning with two capital animals, the bull going to Australia at a price of \$6,000.

SALISBURY, 1857.

John O'Groat (13300); bred by Mr. Fawkes, Farnley; exhibited by Mr. Stirling, M. P., now Sir Stirling Maxwell.

Victoria, Vol. XII., p. 644; bred and exhibited by Col. Towneley.

This year produced a winner in John O'Groat, bred by Mr. Fawkes, and who made his reputation as a sire in Scotland.

CHESTER, 1858.

Fifth Duke of Oxford (12762); bred by Earl Ducie exhibited by Earl of Feversham.

Nectarine Blossom, Vol. XII., p. 54; bred and exhibited by Mr. R. Booth.

Of this year's show we can speak from eyesight. It was our first Royal, and 5th Duke of Oxford, as he stepped around the ring, left an impression that has never been effaced; large, heavily-fleshed, with a dignity of carriage seldom seen. Booth's *Nectarine Blossom* was his consort for the honors, and the male and female duties of our first Royal have not yet been obliterated. But more and more, year by year, has the conviction been indelibly impressed, that the best bulls yet produced have been Bates, and the best females Booth.

WARWICK, 1859.

Radford (15122); bred by Mr. Lythall, Leamington; exhibited by J. H. Bradburn, Lichfield.

Matchless 4th, Vol. XIV., p. 580; bred and exhibited by Mr. R. Stratton, Broad Hinton.

In this year, Mr. R. Stratton makes his initial bow. He, for awhile, bred more winners (not at the Royal) than any English breeder, especially at Smithfield. He created a distinctive type, and had he been wise enough to have had an American agent, his herd might have taken the rank that Aberdeenshire cattle have since. He has never received the recognition at the hands of English breeders and newspaper scribes that his efforts deserve. For a time he was pretty nearly the only one that had independence enough not to bow the knee to Baal—the gods named Booth or Bates; he cut loose and worshipped neither.

CANTERBURY, 1860.

Royal Butterfly (16862); bred and exhibited by Col. Towneley.

Rosette, Vol. XIV., p. 683; bred by Mr. Wetherall; exhibited by Mr. Eastwood, Burnley.

This was the year of the Canterbury pilgrims. We would like to quote the Druid's poetical sketch, but in these solemn chronicles there is no room for the "Kist o' Whistles." *Royal Butterfly*, the winner in 1860, was own brother to the winner in 1856—a rare record for *Butterfly*, their dam, Mr. Eastwood won with *Rosette* in female class. (Mr. Editor, excuse a digression.) Mr. Eastwood, Col. Towneley's agent, bought a Thoroughbred yearling filly. He asked Joe Cullshaw, the farm bailiff—

"He whom the gods called Cullshaw,
And men on earth called Joe."

If he would like an interest, "Yes," replied Joe, "if ye'll let me name it." "Agreed," *Butterfly*'s the name, after 'ould coo." It must have been a name to conjure with, or was it an inspiration, for after winning five races, the Oaks amongst the number, she added over \$10,000 to Joe's bank account.

LEEDS, 1861.

Skyrocket (15306); bred and exhibited by the Earl of Feversham.

Duchess 77th, Vol. XIV., p. 430; bred and exhibited by Capt. Gunter.

Leeds, 1861. This was Capt. Gunter's year, as he won let in cow class with *Duchess 77th*, R. Booth 2nd with *Queen Mab*, *Lady Pigott 3rd* with *Duchess of Gloucester*. Two-year-old heifers—*Capt. Gunter's Duchess 78th 1st*, R. Booth's *Soldier's Bride 2nd*. Yearlings—*Capt. Gunter's Duchess 83rd 1st*, Hon. G. S. Lascelles 2nd, Johnathan Peel 3rd.

BATTERSEA, 1862.

Lord Adolphus (18208); bred and exhibited by Mr. J. Woods, Darlington.

Queen of the Ocean, Vol. XIII., p. 673; bred and exhibited by Mr. R. Booth, Warlaby.

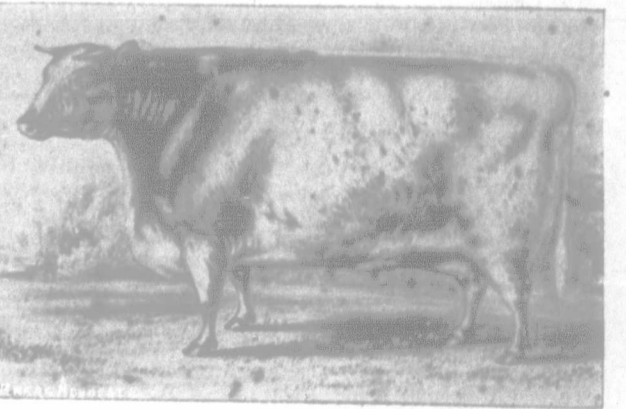
Booth's *Queen of the Ocean* was one of the incomparable coterie of Queens, a quartette never equalled or perhaps approached by own sisters. The others were *Queen of the May*, *Queen Mab*, and *Queen of the Vale*, all by Crown Prince, out of *Red Rose*.

WORCESTER, 1863.

Duke of Tyne (17751); bred by Mr. Spraggon, Nafferton; exhibited by Mr. Jacob Wilson, Woodhorn Manor.

Pride of Southwick, Vol. XV., p. 663; bred by Mark Stewart; exhibited by *Lady Pigott*, Branches Park.

Duke of Tyne was by a Towneley bull (mixed Booth and Bates), and out of a cow of Booth foundation, with Bates top crosses. It will be noticed from this time that mixed breeding is beginning to forge to the front. *Pride of Southwick*, by Mc-



BRACELET.

FIRST AT THE ROYAL, 1841. TWIN WITH NECKLACE.

Turk (a Bates bull by Grand Turk), out of a mixed Booth foundation, introduces *Lady Pigott's* name on the roll. She was a strong competitor, and many a noted winner returned to Branches Park with trophies galore. It is needless to say she was a strong Booth adherent.

NEWCASTLE-UPON-TYNE, 1864.

Forth (17806); bred by Mr. W. Stirling (Sir Stirling Maxwell); exhibited by Mr. A. Cruickshank.

Evelina 4th, by Sir Colin (16053). *Evelina 2nd*, Vol. XIII., p. 447, bred and exhibited by Sir M. W. Ridley, Blagdon.

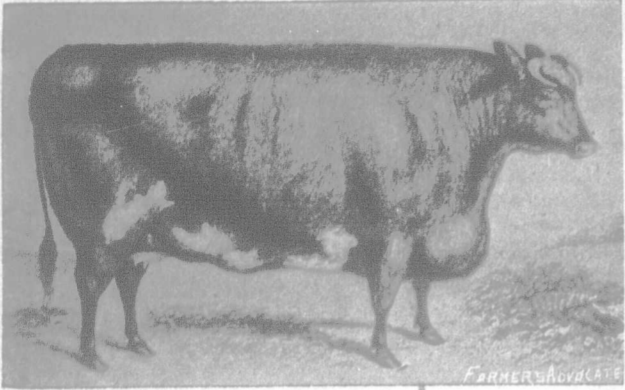
1864 introduces the name of A. Cruickshank for the first time, who exhibited *Forth*, bred by Mr. W. Stirling, afterwards Sir Stirling Maxwell, a bull of sterling character and influence, whose portrait we give.

PLYMOUTH, 1865.

Lord Chancellor (20160); bred by Jonas Webb, Braham; exhibited by Mr. Sharpe, Courtlands.

Corrinne, Vol. XVI., p. 398, bred and exhibited by Mr. Woods, Stanwick Park.

1865 brings to notice that Jonas Webb could not only breed Southdowns, but could breed cattle to win at the Royal. *Lord Chancellor* was by *Usurer*, the Mason bull, bred by Lord Spencer, and bought by Lord Ducie to cross upon the Duchesses. *Usurer* was a blot upon the escutcheon of the Duchesses of Wetherby and Tortworth for a time, but the wisdom of the out-cross was eventually proved. The dam was of Mr. Bates' favorite Cambridge Rose family.



NECKLACE.

FIRST AT THE ROYAL, 1842. TWIN WITH BRACELET.

Two years' shows were withheld on account of cattle plague.

LEICESTER, 1868.

Commander-in-Chief (21451); bred and exhibited by T. C. Booth, Warlaby.

Lady Fragrant, Vol. XVII., p. 568; bred and exhibited by T. C. Booth, Warlaby.

1868 was a memorable year for Warlaby, as *Commander-in-Chief*, a bull of mighty presence, won in aged bull class, and *Lady Fragrant* in cow section, while *Jolly Queen*, a beautiful cow, was 2nd. She was afterwards imported to the U. S. *Boltair* here put in his first appearance, and won as a yearling. His old coat had been preserved (he was a light roan), and the old hair was stained and discolored—looking rusty, as it were—but nothing could approach him in straightness of outline. I asked the herdsman how he preserved the old coat? "Sure and it's buttermilk." "Externally?" "I just dab him with it, and he gets a quart of sour buttermilk in his new milk." Here probably is the secret of the starter for buttermaking. An illiterate man was using this sour buttermilk as an aid to digestion thirty years ago, and those who attended the Royal shows in those days did not fail to be struck with the wealth of flesh and extraordinary coats carried by the young things Mr. Meadows showed.

[TO BE CONTINUED.]

The Export Steer.

In reading over Mr. Lynch's paper on "Export Steer Producing" in the *FARMER'S ADVOCATE* of February 20th, I notice that he says he has an easy job, but that he makes it hard by trying to produce a steer at a profit. Why not talk about cattle, as that would include heifers, as heifers are readily sold at from six pence to nine pence per stone of fourteen pounds over steers on the Old Country market, which, of course, is our export market. He goes on to say, "Get calves and give them good feed." I say it is better to get good calves, and the result will be good pay and no loss of money, as I hold there is no man in Manitoba who has any money to lose. There are, I claim, two requisites necessary for success—money and judgment. I have seen lots of men with lots of money fail, but I have never seen a man with good judgment fail, even when starting with very little money. I will pass over the "stealing, and feeding at some other people's expense" system spoken of by Mr. Lynch, and will not touch the ranchmen, as I agree with Mr. Lynch we can beat them. Thirty-six dollars for the cow is about right, but why charge interest? He has got value for his money as a speculator. This is putting profit against the interest, and whichever makes the most stick to it, if you wish to make money.

I differ with him as to the depreciation in value. As an instance, I offered a three-year-old heifer for \$35 three years ago, but did not sell. She went blind on three teats, and I killed her last fall. She dressed 760 pounds, and I got 6c. per pound—\$45.60. Was that losing money? Next, "keep of cow and calf"—\$12, according to Mr. Lynch's statement. Butter pays more than double that, so really you have the calf for nothing, and \$12 to take with it. He holds the butter high. He leaves us in the dark as to what breed of cattle. I have good Shorthorn grades, and keep a pedigreed Shorthorn bull, which I consider fills the bill. My ideal is a beast weighing 550 to 700 pounds dressed. Some buyers want large, heavy steers, many of them being more like animated scarecrows than anything else, and the reason they give for this preference is that they want to "fill the ship."

I think the new abattoir in Winnipeg and the scheme for killing cattle there and sending the dressed meat to the Old Country is a good scheme. As Mr. Lynch expects criticism, I need not apologize.

JAMES MILLIKEN.

Pipestone Municipality, Man.

Myrtle Farmers' Elevator.

The following are seeking incorporation as "The Myrtle Farmers' Elevator Co." with \$10,000 capital: R. McCullough, J. Little, E. W. Kirk, A. Phillips, A. Reimer, J. L. Wilson, and J. E. Taylor.

Important Meeting of Grain Standards Board.

A very important meeting of the western members of the Grain Standards Board was held in Winnipeg the first week of April. There were present: Hon. F. Young and Jas. Riddell, M.P.'s; Peter Ferguson, Kenlis, Assa.; R. J. Phin, Moosomin; S. C. Elkington, Fort Qu'Appelle; Jas. Elder, Virden; K. Campbell, of Brandon; Chas. C. Castle, Foxton; W. B. Underhill, Melita; C. Johnson, Baldur; with S. Spink, of Winnipeg, as chairman, and C. N. Bell, Secretary of the Winnipeg Grain Exchange, as secretary of the meeting.

The inspection, mixing and grading of grain was fully discussed, and the resolutions passed by the Board show that the interests that have been opposing each other are coming together, and that a unanimous effort is being made to restore and maintain the high quality of Manitoba hard wheat on the world's markets. There is no gainsaying that the changing of grades from year to year, the "mixing," "skinning" and "doctoring" that have prevailed have very greatly injured the character of our wheat on the export market, to injury of the producer first and also to the dealer. Now an effort is being made to make the higher grades permanent, and to prevent the mixing and doctoring of wheat at terminal elevators. The resolutions passed are as follows:

"That this Board heartily concurs in the resolution passed by the Winnipeg Grain and Produce Exchange, that the evils resulting from the mixing of Manitoba grain at Fort William and other terminal elevators are injuriously affecting the reproduction of Manitoba's grain in European markets, and further be it resolved that this Board hereby expresses its positive conviction that no mixing of wheat should be permitted in cargo shipments unless the inspection certificate issued therefor shall have written across the face a statement defining the various grades entering into its composition, and no mixed cargo shall carry a straight grade certificate."

"That in order to as far as possible prevent the shipping of what is called line wheat, all inspectors should be instructed that wheat being shipped from what may be termed mixing elevators shall not pass inspection unless such wheat is fully equal to the average of a like grade at Fort William."

"Resolved, that the term 'public elevator' shall be substituted for that of 'terminal elevator,' as referred to in the letter of the department, 24th March, 1899; that public elevators are those owned or operated by any persons or corporations who are not grain dealers, but who handle grain for storage purposes only as public warehouse men; that this Board strongly recommends that all public elevators should be under government control and supervision."

"Resolved, that when inspectors are called upon to inspect grain shipped from what are called 'mixing elevators,' they shall be governed in their inspection of such grain by the general standard of grades in force at the 'public elevators,' and no grain will be allowed to pass inspection that is not fully up to the general average quality of the different grades coming out from the regular bins of the public elevators, provided that grain may be cleaned only (not mixed) under the supervision of an inspector or his deputy at any elevator without coming under the above regulations."

"That the present system of paying official grain inspectors at Winnipeg and Fort William by fees is most undesirable. Therefore be it resolved that this Board ask the Minister to cause this fee system to be at once discontinued, and that instead thereof inspectors and assistants be paid salaries. We further would respectfully suggest that inspectors' salaries should be fully commensurate with the important responsibilities of their positions."

"Be it resolved that the Board is convinced that the time has now arrived when it is absolutely necessary, in the interests of the producer and the grain interests generally, that all grain grown in Manitoba and the Northwest Territories passing Winnipeg to Fort William, or south or east thereof, be inspected at Winnipeg and warehoused in Fort William or other eastern elevators on Winnipeg inspection."

A committee consisting of S. Spink, C. C. Castle and C. N. Bell were appointed to go to Ottawa to lay the recommendations before the Minister of Inland Revenue.

Another Canadian Dairy Expert for New Zealand.

J. A. Kinsella, for two years Superintendent of Dairying, on the Dominion Commissioner's staff, in Assiniboia and Saskatchewan, has accepted a very lucrative position from the Government of New Zealand, and will shortly leave for his new field of labor. Mr. Kinsella has done good work in the Territories. He has been very painstaking in every detail of his work, and has displayed a great deal of tact and perseverance, and leaves the dairy industry in that portion of the Northwest which was under his direct supervision in a very far way to success.

His successor is Mr. J. W. Mitchell, B. A., who has had a wide experience as buttermaker and milk tester at the Ontario Agricultural College, Guelph, and also in Assiniboia, where he has spent the past two or three summers.

Mr. Kinsella goes to join Prof. Ruddick, and together they should do great things for the dairy interests of New Zealand.

Neepawa Farmers' Institute Meeting.

[Reported for the *FARMER'S ADVOCATE*.]

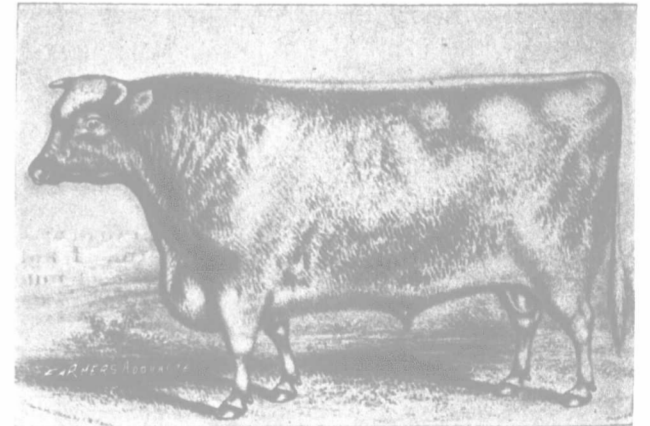
A meeting of the Neepawa Farmers' Institute was held on March 23rd, the speakers being A. P. Stevenson, of Nelson, Manitoba, and E. Caniff, of Winnipeg. A number of the leading farmers of the neighborhood were present, and judging by the interest and attention manifested by those present, it was evident that the subjects on which the speakers dwelt were appreciated. A very general discussion followed, and some very useful information was elicited.

A. P. Stevenson spoke on tree-planting for shelter belts and the growing of small fruits. Among other things necessary to a windbreak, the land should be thoroughly cultivated, one or two crops taken off first, the following spring plant trees three feet apart in rows, the rows at least six feet apart. Hoed crops can be grown between the rows for the first few years, or until the ground gets too much shaded. The willow should be planted on outside of grove to hold the snowdrifts from breaking down the trees within. For the latter purpose the best trees to plant are ash, elm, cottonwood, and Russian poplar—varieties being mixed in planting. In planting evergreen trees, one point of vital importance was strongly emphasized: That in planting, the roots should never be exposed to wind or sun or allowed to become dry. Our native spruce is the best for general planting; best size to plant three feet high; earth should be tramped firmly around roots. If a dry time, water once a week, and that thoroughly. Never allow grass to grow around trees.

SMALL FRUITS.

Plant strawberries in spring in rows four feet apart and two feet apart in rows, being careful not to plant too deep. Keep off all blossoms; when runners begin to spread, place something on them to hold them stationary, so that they may strike root. If you are not prepared to do this, don't attempt strawberry growing. Mulch with clean straw when ground is frozen six to eight inches deep; uncover in spring. Good varieties—Wilson and Crescent. With currants and gooseberries, the secret of success lies in two words—manure and prune. Rows six feet apart, and four feet apart in rows. Cut out oldest wood. Ashes for milkworm in gooseberries; white hellebore for the currant worm. Best varieties: Currants, Rabycastle; gooseberries, Houghton. Red raspberries should be planted in rows 6 ft. apart, 2 ft. apart in rows. Allow canes to form matted row, but never to exceed eighteen inches in width, all suckers outside of said width to be treated as weeds, good cultivation to be given up to time fruit is fully formed. All Black Cap varieties to be planted in rows eight feet apart, and three feet apart in rows. On approach of cold weather, all canes to be laid down lengthwise in rows and entirely covered with earth. No use in attempting to grow this fruit unless this essential to success is carried out every fall. Older is the best variety for general planting.

A general discussion followed on the growing of crab apples and plums, when the following points were brought out: Best location for growing crab trees is a northern exposure, with land sloping to north. Most prolific and hardy varieties, the Transcendent and Hyslop. Some protection to trunk of tree is necessary to escape sunscald. This may consist in wrapping trunk with brown paper, burlap, or boxing with boards, to be done in fall and removed in spring. The improved native plum appears to be fairly hardy wherever tried, and should have more attention paid to its cultivation, as of large fruits it is our most promising variety. The Cheany is, perhaps, the best variety yet grown; trees should be planted ten feet apart each way, trained on a single stem eighteen inches from the ground, then headed out.



FORTH (17866).

FIRST AT THE ROYAL SHOW, 1861.

STUBBLE BURNING.

Mr. Caniff then explained the working and benefits of his stubble-burning machine. He said that he had only three years' experience with his machine, and was not yet offering it for sale, but was having three made for the purpose of testing and showing the farmers what they could do. They would be tried on Experimental Farms at Brandon and Indian Head, and on the farm of the Hon. Thos. Greenway, at Crystal City. He did not claim to know all about stubble burning, but had given it considerable thought and attention; had noticed

that some spots of stubble burn easier than others, but cannot account for it. Ashes from burnt stubble make a valuable fertilizer, also help to draw heat in spring. From tests he found that wheat sprouted earlier in spring on burnt stubble land; noticed that men who are most interested in machine are those that have given the subject some attention. As to capabilities of machine for destroying noxious weeds, would not care to give definite opinion. If weeds are only sprouted they are easily killed by machine, but after weeds make some growth will take four times more heat. First machine he had made proved a failure, largely on account of having to burn oil; present machine is great improvement on old one; no oil is used; it is hitched behind a wagon, the wagon to be loaded with straw, which is fed to front of machine; where fire is burning it is not necessary to cover surface entirely, a strip can be missed; fire from side of machine will spread and burn strip missed. The supposed cost of machine is \$65, eight feet wide; it is light draft for one team; one load of straw is sufficient to burn from three to five acres; no danger of fire spreading from machine if ordinary care is taken.

A Word to Delinquents.

To the Editor FARMER'S ADVOCATE:

SIR,—Farmers who held their wheat over for a higher price are somewhat disgusted with the present situation. Many of them have paid interest on several hundred dollars for four months, and must now sell for less than the market price of last fall. This is bad enough for them, but it is infinitely worse for business men who are still waiting for them to settle bills contracted last summer and expanding ever since. Others borrowed money on their wheat and paid their debts. They lost on the deal, but the loss is all their own; nor is it any greater because it is their own. The money they borrowed has played its part in many transactions since then, and to that extent has promoted trade. Still others had no debts to pay, and are in a position to hold their grain till the price does rise.

We congratulate the latter and hope to profit by the experience of the former, but to the first-mentioned we beg to be excused. They have done their best to cripple the merchants and others who have helped them through. Blacksmiths and machinists are alike trusting and waiting and hoping to goodness that their tardy customers will pay their bills before they have to ruin next year's trade by placing them in the hands of a solicitor.

It would not be correct to say that all who can pay don't pay, but there is no denying the fact that some who can pay won't pay, so long as they can get out of it. We have in mind one instance of a man looking long at his money before he passed it over, expressing the wish that he could have left it in the bank two or three months longer, as he hated to lose the interest!

Those who "owe no man anything," and they only, have a perfect right to sell their grain when it suits them, and even they should remember that, one year with another, the price is higher early in the fall than ever again till next summer, and holding grain over involves considerable loss of weight as well as of interest. ROTARY.

A Correction.

To the Editor FARMER'S ADVOCATE:

I see the barn plan I sent you in your issue of March 6th. There are some mistakes in it, which should be corrected, as they give a somewhat wrong impression. A number of posts appear in the loose feeding stable that should not be there. One would think that half of the granary was not intended to be floored over. It is intended that it should all be floored over except the space back of the water tank. This is left for feed put down off top of granary. There should only be one trapdoor leading down from this space. The place for dropping feed down into stable behind silo should be marked "chute," not trap. Behind the horses the passage is seven feet wide, full length of stable. One window is omitted in the stable in front of horses, and also a door between horse and cow stable.

With regard to the editorial comment, you seem to think that the granary is large enough to hold all the grain that will be grown on the farm. I am a very small farmer, but I have grain, twice as much as would fill this granary in a single season. I most decidedly favor the granary built in an isolated place to hold the principal grain crop—which is wheat. This granary is intended mostly for feed grain, to be handy for crushing, etc. I still contend there is plenty of light, and as for convenience in feeding, there may be better arrangements, but I have not seen them. W. SAUNDERSON.

Glenwood Municipality, Man.

Ash and Elm for Permanent Planting.

The soft maple and cottonwood are declining in popularity as lawn and grove trees, and the ash and elm are beginning to receive the attention that they deserved long ago. When with the Institute we saw fine groves of the latter varieties on the same soil where cottonwood had nearly all died out. The mushroom trees are all right for temporary wind-breaks, but should always be set with a view to replacing them with good varieties in the near future. —Clarence Wedge, in St. Paul Farmer.

Changes in the Winnipeg Industrial Prize List.

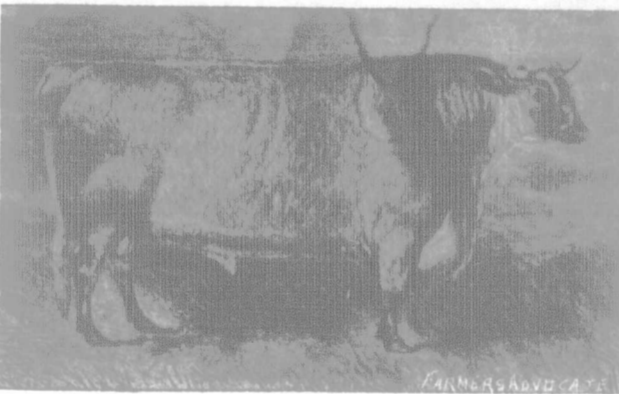
Among the important changes made in the Winnipeg prize list we note the following: In the horse classes, brood mares must have foals by their side. Horses shown in a team may also compete in the sections for single horses. Several sections have been added to the general purpose class: two for brood mares—one under 1,350 pounds and another over 1,350. There are also sections added for "team, under and over 2,700 pounds." Second prizes are given throughout the classes for "stallion and three of his get," and the Horse Breeders' Association have donated five gold medals for "stallion four years old and over" in Clydesdale or Shire, and also in the Standard-bred, Hackney, Thoroughbred and Carriage classes.

In the Shorthorn class the Dominion Shorthorn Breeders' Association have donated \$500, which makes a magnificent prize list. One hundred dollars is given for same specials as the Dominion Shorthorn Breeders offered last year, and in addition to these the Industrial prizes in the open sections are in almost all instances duplicated. The Exhibition Association have added sections for "bull and heifer calves" of the calendar year, so that there will be ample opportunity for calves under six months winning a share of the prize money. These sections have been added throughout the cattle classes. In the dairy breeds a change is made from "bull and two of his get, bred in Manitoba or the Northwest Territories," to "three animals, any age or sex, the get of one bull, bred in Manitoba and the N.-W. T." The donation of \$100 from the Dominion Swine Breeders' Association is added to the swine classes, divided into \$7 prizes for the best boar and best sow respectively in each pure-bred class.

One of the most important additions to the list is the additional money offered in the inter-provincial competition open to agricultural societies for the best collection of grains and grass seeds. There are three prizes now offered—\$75, \$50, and \$25, the conditions being as follows:

"All samples must have been grown in the district represented by the agricultural society making the exhibit.

"Each variety of grain must be properly named,



COMET (155).

BORN IN 1894. DIED IN 1815. BRED BY CHAS. COLLING. SOLD AT THE KETTON SALE, 1810, FOR 1,000 GUINEAS. GOT BY FAVOURITE (252); DAM BY FAVOURITE (252), OUT OF THE DAM OF FAVOURITE (252).

and the name of the grower, and the section, township and range of the farm upon which it was grown, stated on the entry form.

"The exhibit will be judged on the following points, the figures set after each giving the maximum per cent., the total of all such maximums being 100: Red Fyfe, 20; white Fyfe, 10; white oats, 15; two-rowed barley, 10;—two bushels of each. Flax, 5; rye, 5; timothy, 5; Brome grass (Bromus inermis), 5; native rye grass (A. tenerum), 5;—one bushel each.

"No first prize will be paid unless 80 points be scored; no second prize will be paid unless seventy points be scored; no third prize will be paid unless 60 points be scored.

"The exhibit taking first prize shall become the property of the Exhibition Association, to be used for immigration advertising purposes."

Of course, last year was not a favorable year for procuring good samples of grains or grass seeds, but we feel satisfied that if the agricultural societies would pay a little attention to making collective exhibits in this class it would present one of the most interesting features of the Industrial, as well as doing a great deal to advertise the locality represented by the agricultural societies participating.

FREIGHT RATES ON EXHIBITS.

For a number of years the Canadian Pacific and other Manitoba railways have shown in a very tangible way the interest they felt in the success and development of Western Canada's great Industrial Exhibition by carrying exhibits free to and from the Fair. With the immense distances and sparse settlement of this country, it would have been impossible to have made the Industrial the great holiday carnival of the West, as well as the important immigration agency that it has become, without this privilege of free transportation of exhibits. The C. P. R. have, however, decided that this privilege can no longer be continued, as every other fair in the country wanted like concessions, so they have fixed the rate for this year at 20 per

cent. of one-way fare. The exhibitor will deposit his one-way freight when shipping, and upon his return with the same exhibits as he started with, the freight, less 20 per cent., will be refunded him. This is not a very heavy tax, but will be felt especially by those at a distance from Winnipeg. It will have, however, a tendency to keep back exhibits of an inferior quality, and should therefore tend toward the general improvement of the quality of exhibits.

Pigs for Profit.

To the Editor FARMER'S ADVOCATE:

For spring litters I prefer the sows to farrow the end of March or the first week in April, then you can get the young pigs ready for market before the cold weather comes; for fall litters, the end of September, then you have good strong pigs to start the winter and take the place of the spring pigs. I always try and get two litters a year from each sow.

Before farrowing, I feed the sows any rough grain and the slops from the kitchen. Let them have plenty of exercise and not get too fat. After farrowing, I feed bran or shorts and chopped oats, with any skim milk or buttermilk there is to spare. Keep a watch on the little ones, as they will soon tell you if you are feeding the sows right.

I generally wean from six weeks to two months. When the little pigs are two or three weeks old they will begin to eat. Place a small trough outside the pen and give them a little warm skim milk three times a day. After they are weaned, put them in a good large pen with a sheltered place for them to lie in. Feed skim milk, buttermilk, and the slops from the kitchen, with a little shorts. Do not feed too heavy, just enough to keep them growing all the time. Never give them more than they can eat up clean. As they grow older, I add barley chop with the shorts. I always try and grow a patch of corn and mangels near the hog pen, and feed them this as soon as it is fit to cut. The last month or six weeks I feed them all the chopped barley they can clean up three times a day.

I generally sell alive and at the age of seven months. They weigh from 200 to 230 lbs. I have had good results from a Berkshire-Tamworth cross. E. HODDINOTT.

St. Paul's Municipality, Man.

The Weeders a Success.

To the Editor FARMER'S ADVOCATE:

In the case of old land that has to be spring-plowed for wheat, I would harrow every day that I plow. Firm the land well to retain moisture. Keep the seed drill well up to the plow. Select good Fyfe wheat, bluestone thoroughly, run the drill north and south. I would not harrow after drill until the grain is up, then harrow north and south. More weeds will be killed this way than by Mr. Bedford's early summer-fallow. The newly-introduced weeders are going to be a success in cultivating our grain, killing weeds, conserving moisture, etc. With virgin prairie, would break as light as possible, backsetting a little deeper, throwing up a couple of inches of fresh loam. In starting a new farm, I would fence as soon as possible, making out to have a good-sized pasture. Sow wheat two years, oats one year, and then summer-fallow, sowing barley or some kind of grain on the fallow and having the stock pasture this all fall, which would make it good and solid, and if the succeeding crop is not a good one it will not be your fault. After pasturing a field a few years, would break it up, and expect it to grow great crops of wheat. Would sow Brome grass and keep the farm in regular rotation. JOHN AIKENHEAD.

Cameron Municipality, Man.

A Ventilator.

In my piggery, which is 20x32 feet, I have a ventilator shaft 2 feet wide by 6 inches deep, made by ceiling over two of the upper floor joists, leaving a 6-inch board out over the center passage, and removing sheeting boards from the outer wall at both ends of the shaft, so that there is constantly a current of air passing through this shaft. It has worked all right; never filled with frost; seems to carry away all foul air, but does not take off the steam from the building, as in cold weather the inside walls become frosted over.

The piggery is divided into four pens, two on each side of the building, 8x16, with four-foot passage in the center. I have wintered twenty-seven September pigs, divided into three lots of nine each, in this piggery; one pen is kept for the stock hog. The pigs have all done well; have had no trouble with them going off their feet. I do not give much bedding at a time; always clean out old bed before putting in fresh. Only feed twice a day, except when finishing. I use a self-feeder. Montcalm Municipality, Man. W. A. SCOTT.

An Agricultural Laborers' Union.

A laborers' union has been organized at Brandon under the name of "The Manitoba Agricultural Laborers' Union." The objects, as stated, are the bringing together of the farm laborers of the Province and to secure for them a fair average day's work of ten hours per day, payment for overtime, and no unnecessary Sunday labor. To provide legal assistance to members, and to secure their just rights in payment of wages, etc.

Avenues.

Three varieties of trees have been principally used for avenue-planting, and many miles of roads have been made beautiful in this district by the planting of trees on each side. The native ash-leaved maple has been mostly used for this purpose. This well-known and deservedly-popular tree seems specially adapted for avenue trees in this part of the Province, and where the conditions are congenial thrives luxuriantly and is kept in order with a minimum amount of work. A description of the manner adopted at the Experimental Farm, with success, of planting, cultivation, and pruning, will perhaps be found useful by many intending planters.

The trees are planted twenty feet apart and six feet from the fence where planted near a boundary. Young trees about four or five years old, of good shape, are selected. Nursery-grown trees, on account of their superior root development, are preferred. It is always best to plant the taller trees in the low places, reserving the shorter ones for the higher ground. When the row is planted the trees are pruned to a uniform height, and if the same uniformity is observed in the height of their lowest branches from the ground, it will add greatly to the appearance of the whole avenue.

Cultivation.—The plan of cultivation followed with unvaried good results is as follows: When the first crop of weeds have come nicely through the ground, which is about June 1st, a space of at least four feet on each side of the row of trees is plowed with a breaking plow as shallow as possible, zigzagging the trees so that all the ground is turned over. This is followed by a good harrowing with one large section of harrows, with a rope attached to steer and lift it when necessary. It should have been explained that one horse is used for both the plowing and harrowing. This will not be found heavy work for one horse, as the ground should have been in a high state of cultivation before the trees were planted. When the trees have become at all branching, hedges that do not project above the horse's collar should be used, for obvious reasons. They are, in fact, indispensable. Later in the season it will be found advisable to go over the ground with a one-horse cultivator, and perhaps give it one good hoeing, catching any weeds that may have been missed and at the same time cutting off any superfluous growth of suckers growing at the base of the trunk.

Pruning.—This operation is performed each year in July, for at this season wounds which are made heal more rapidly. The stem is kept bare to about the height of five feet—never higher than is necessary for the horse to work beneath. Pendulous and unshapely branches are cut off, and the branches likely to hang down in the future are checked. Branches of an abnormal growth are also kept within bounds. Dead wood, if any, is of course cut out. Always keep an ideal and uniform avenue as the end in view, and try to attain it.

On an avenue a mile long, twelve maple trees were found this year to be unhealthy. This was attributed to two causes. Six of the affected trees were found to be in low, undrained locations, and on digging three which eventually died their fibrous roots were found to be rotted, which was evidently the cause of death. The soil in these low spots is an extremely stiff clay, which is known locally by the name of "gumbo." These trees will be replanted, and the remedy resorted to that has proven efficacious in former years, namely, making holes very much larger than required and importing soil from higher portions of the farm to fill in with, and if slightly gravelly so much the better. This procedure also applies to planting trees in alkaline soil.

The maple trees, however, will not grow in very wet places, and where these occur it will be found well to plant some species of the willow, preferably the white willow (*Salix alba*) or sharp-leaved willow (*Salix acutifolia*). These, if pruned from the start, can be trained to match the maple fairly well and will not look odd. They will thrive well in these low places, and so will often fill an unsightly gap.

The other six of these unhealthy trees were discovered to be affected by sun-scald, and in some cases the bark had split the whole length of the stem on the south side. This in itself would probably not have greatly injured the tree only in some cases the dead bark had made a receptacle for retaining the moisture, and on examination it was discovered to be decaying the tissues of the tree and rotting into the core and spreading upward until many of the branches were killed. The remedy that has proven beneficial for this disease is to carefully pare off all dead bark and wood until the hard or live wood is reached, when the edges of the wound will quickly callous or heal and no evil effects will be produced. Then cut the tree well back, give the ground surrounding it a good dressing of well-rotted manure, and it will soon catch up to its more thrifty neighbors. Native white spruce is another variety used extensively for avenue-planting, and has made remarkable growth, in some cases outstripping the maple in height and spread of branches with its perennial green foliage; and if planted alternately with the maple (that is, in a row twenty feet from them), breaking each joint with a spruce, a very pleasing effect is produced. The Russian poplar, known better by the name of *bercolinesis* poplar, is another tree greatly used for avenue planting. It is a fast grower, of very symmetrical form. Experience has taught us it is better not to prune this up to a bare stem, as it detracts from its beauty. It is also susceptible to

the influence of dry winds and hot sun when devoid of a good covering of foliage. The most pleasing characteristic of this species is its habit of retaining its leaves very late in the season when most other trees are bare, so prolonging the season of beauty many weeks. H. C. ROBRY.
Brandon Experimental Farm.

Results of Tests of Samples of Grain for Germinating Power from Manitoba and the Northwest Territories—Crop of 1898.

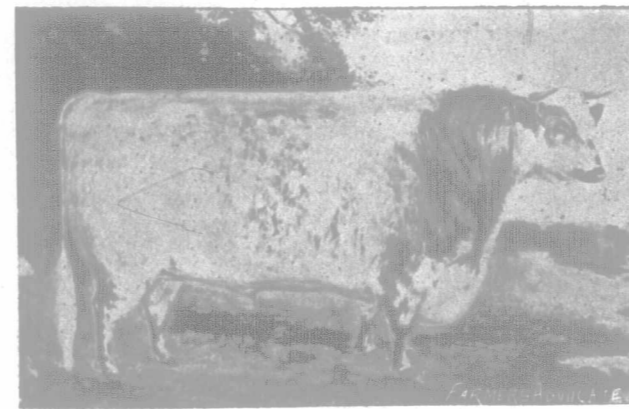
As the seeding period is approaching, a statement of the results of the tests which have been made at the Central Experimental Farm to determine the germinating power of samples of grain received from Manitoba and the Northwest Territories during the past three months will doubtless be of interest to the farmers on the western plains. In the summary of these results the samples have been divided into two groups. Those showing 60 per cent. and over of germinating power have been reported on as fit for seed, and samples ranging below 60 per cent. have been condemned for use for this purpose.

In all, 853 samples have been tested, consisting of the following:

Of wheat, 465 samples, 434 of which have ranged in germinating power from 60 to 100 per cent., the larger portion of them from 83 to 100; 31 samples have proven unfit for seed, having varied from 26 to 58 per cent.

Of oats, 250 samples have been tested, of which 191 have shown from 60 to 100 per cent. of vitality, the larger part of these ranging from 90 to 100 per cent.; 59 samples have been found lower in vitality and were pronounced unfit for seed, having varied in germinating power from 58 to as low as 11 per cent., a large proportion of these being under 30 per cent.

Of barley, 119 samples have been tested, 116 of which have ranged in vitality from 60 to 100 per cent., and most of these from 90 to 100; 3 samples only have been found unfit for seed, those having shown, respectively, 19, 36 and 38 per cent. of vitality.



COMMANDER-IN-CHIEF (21451).
BRED BY T. C. BOOTH. FIRST AT THE ROYAL, 1868.

These samples have been received from all sections of Manitoba and the Territories, and good and bad have come in from all over in about the proportions given above. It will be seen that the oats have been most injured, about 23 per cent. of all the samples received being unfit for seed. The wheat shows about 7 per cent., and the barley less than 3 per cent. of injured grain.

While the grain grown in the Northwest Territories is usually very high in germinating power, it was expected that the very bad harvest weather of last season would seriously injure the crops in this respect. It would be wise for farmers who are holding any doubtful samples for seed, especially if they have been stored in a damp condition, and particularly oats, to test them for germinating power themselves before sowing. This may be done by planting one hundred average kernels in a box of moist earth about an inch below the surface, and keeping the earth damp and the box in a warm room for a few days until the good grain has sprouted.

WM. SAUNDERS, Director Exp. Farms.
Ottawa, April 11th, 1899.

Agricultural Estimates.

The estimates passed by the Manitoba Legislature for agricultural purposes are about the same as last year, with a few increases. The Live Stock Breeders' Association and the Horticultural Society each get an increase of \$100, and the Brandon Fair gets an addition of \$2,000 for building purposes. Winnipeg Industrial also gets an increase. The items are:

Diseases of Animals	\$ 3,500 00
Farmers' Institutes	2,000 00
Agricultural Statistics	1,500 00
Noxious Weeds Inspection	2,000 00
Dairy School and Dairy Instruction	5,000 00
Dairy Association	200 00
Stock Breeders' Association	100 00
Manitoba Poultry Association	350 00
Winnipeg Industrial Exhibition Association	1,000 00
Western Agriculture and Arts Association	2,000 00
Western Agriculture and Arts Association special building grant	2,000 00
Horticultural Society	200 00
Total	\$37,650 00

A Combination Horse and Cattle Barn.

To the Editor FARMER'S ADVOCATE:

I enclose you plans for the floors of the barn now being erected on the South Side Farm. The barn is 40x64, with three floors. It is built on a sidehill, the excavating being done at the north end, and the walls at that end are built up eight feet with stonework. The balance of the wall has stone foundation three feet under ground and about eight inches above the level of the ground. The first story is built up eight feet in the clear, and the framework of the second and third floors are placed on top of that, using twenty-foot 2x6 studding. This gives us ten-foot ceiling for the second floor, which will be used for horses, and about nine feet

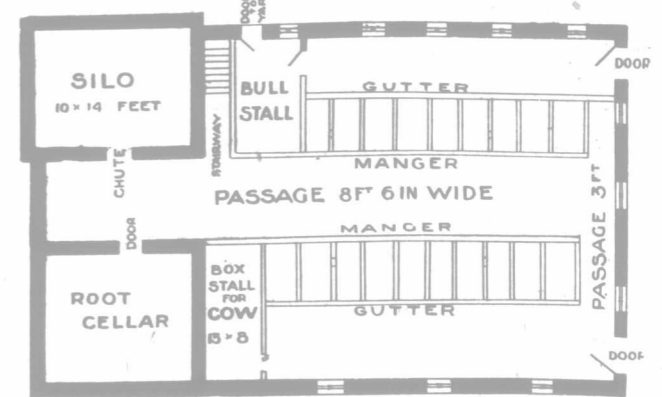


FIG. I.—PLAN OF GROUND FLOOR, FOR CATTLE.

above that to the eave of the roof, which will give us a good deal of room for hay. The silo, which is in the north-east corner, is 10x14, with a depth of thirty-three feet, and will hold about one hundred tons of silage. No doubt some of your readers may think, when examining the floor plans, that we are not very economical about room. However, we are very much in favor of allowing each animal abundant breathing space. The object in view with this barn is to house in as comfortable and healthful a manner as possible a small but select stock of pure-bred cattle and horses. The calves and young stock will be kept in another barn that we are remodeling for the purpose.

The lower story will be used for cattle, two rows in single stalls facing the feeding passage, which is eight and one-half feet wide. The front of the stall is a swinging panel, which can be moved backwards to make a small cow stand further back on platform, so that the droppings will fall in the gutter, and can be moved ahead to suit a large cow. The sides of the stall are on hinges, to accommodate the milkers and to allow the cow to pass out without backing into the manure gutter. The cows will not be tied by the neck at all, but will be kept in the stall by a chain across the back of stall. This will also compel the cow to move ahead when lying down, thus avoiding being soiled. The floor is cement throughout. The manger is also cement. The side next to the cow is eight inches high and three inches thick, rounding down into the bottom. The front side of manger is sixteen inches high, built in the same manner. The manger is two feet six inches wide, and runs in front of all the stalls. It will slope a little to one end, and be used for a watering trough, as well as feed. There will be a valve at one end connecting with a sewer underneath, so that it can be drained out when the cattle drink all they require. The gutters also will connect with sewers to be used only when flushing the stable out with water. I might add that we got this idea of manger and stalls from the new dairy barn at the Wisconsin Experimental Station. The cow stable will be lighted with eleven large windows and be well ventilated.

The second floor plan is self-explaining. It will be used for horses and grain. The floor is first laid



FIG. II.—PLAN OF SECOND FLOOR, FOR HORSES, ETC.

with one-inch matched flooring, with two-inch matched flooring over that, with a sort of rubber paper between. We expect it will be perfectly water-tight.

The third floor will be used for hay, and will be over nine feet to the plate, and about nineteen to the peak of the roof.

The building is first sided with matched flooring, tarred felt paper put on over that, and sided again with drop siding, and the inside lined with a good quality of flooring. I think we can count on Jack Frost being excluded, even if we occasionally have a winter like that of '99.

W. J. YOUNG,
Supt. South Side Farm Co.

Liquid Air --- A Nineteenth Century Wonder.

The closing days of the nineteenth century are being distinguished by brilliant achievements in mechanic arts. The forces and the elements of nature are being put to use for the service of man as never heretofore. The question arises, Why not put to new uses air, the world's cheapest and most abundant material? Cheap power the world is searching for. Air in motion drives the windmill. In any form can it do more? Till some twenty years ago, air, which is composed mainly of oxygen and nitrogen (four-fifths of the latter), was regarded a "permanent" gas; but Prof. Jas. Dewar, of England, liquified it, but by a process so expensive that the first ounce cost \$3,000, latterly reduced to \$500 a pint. Mr. Chas. E. Tripler, an experimenter of New York City, after eight years' work, has now perfected a plan by which he produces fifty gallons per day, at a cost of about twenty cents per gallon. It is done by means of intense cold and compression, which also causes heat to be given out. In his apparatus, air is compressed to between 2,000 and 3,000 pounds per square inch, and cooled down by water flowing round the pipes. No ice or other cooling substance is used. A proportion of the compressed air is allowed to escape, and flows back over the outside of the coil through which it has come. Pressure is continually maintained by the pump; and the apparatus is packed with felt, to prevent the entrance of heat. The air which escapes expands, is cooled, and cools the inner coil of pipe. Hence there is a continuous fall of temperature of the air within the pipe till it liquifies, at 312 degrees below zero. Mr. Tripler states that he has made about ten gallons of liquid air by the use of three gallons in his engine, so that he has a surplusage of seven gallons produced without expense, and which can be used as power elsewhere. He thinks he can keep on repeating this surplusage indefinitely. The practicability of this process is, however, disputed. In fifteen minutes after starting his engine he has liquid air. But whence the power? The reader asks. One cubic foot of liquid air contains 800 cubic feet of ordinary air which we breathe—a roomful pressed into the size of a small pail! Its expansive power is enormous—100 times greater than steam! When exposed to the air of ordinary temperature, it proceeds to return, as a gray, frosty vapor, to its original form. But it can be regulated, and Mr. Tripler has been driving an engine with it in his laboratory—an engine running without fuel or water, smoke, ashes or steam. And what a revolution in transportation on land and sea if this cheap—yea, almost costless—power be applied in practical machinery! It will not then take one bushel of our No. 1 hard wheat to carry another to market, or over one-quarter the value of a fat steer from Canada to market him in Liverpool. But the subject is of interest in other ways. Liquid air is so cold (312 below zero) that it will freeze alcohol and mercury. In his public exhibitions in New York and Washington, Mr. Tripler has frozen mercury into the shape of a hammer, solid enough to drive nails into a hardwood board. It will make iron and steel as brittle as glass, and boil—or freeze—an egg so hard that when broken by a sharp blow from a hammer it looked like a piece of quartz. It makes lead elastic as steel, and a rubber ball as fragile as an egg-shell. Mixed with other substances, it has tremendous power as an explosive. Still, says the inventor, you can safely do almost anything with it you can with water, except shut it up tight. It will sear the flesh like a white-hot iron, and can be used in surgery to eat out diseased flesh more quickly and safely than caustic potash or nitric acid. A New York physician has already used it in cancer treatment. For hospital use it will be absolutely pure air, and a vitalizing air, because the proportion of oxygen is very large. Oxygen liquifies at 300 degrees below zero, and nitrogen at 320, so that when in the form of liquid air the nitrogen evaporates more rapidly. Ice at 32 degrees F. is hot compared with liquid air (344 degrees warmer), so that a kettle of liquid air placed on a block of ice will actually boil violently, throwing off a white vapor. It has a remarkably cooling effect on rooms where a small quantity of it is used, and this suggests its use in refrigeration, where Mr. Tripler foresees another revolution, because the machinery is not expensive, and can be set up in a tenth part of the space occupied by an ammonia-gas refrigerator machine.

He predicts its general utility even in houses, and says in ten years a hotel guest can order a "cool" room in summer and be just as sure of getting it as a warm one in winter. Incidentally, a curious test has been made, showing the remarkable vitality of seeds though exposed to frost. Such seeds as barley, oats, peas, cucumbers, and squash, all grown in the temperate zone, were kept in liquid air for 110 hours at 312 degrees below zero and then thawed slowly for 50 hours. Yet after that severe treatment they germinated and grew. Liquid air is the talk of the scientific world, and bids fair to form a fitting finale for the achievements of a wonder-working century and give a great start to the next.

The Beef Cattle Industry.

The acknowledged scarcity of well-bred and well-formed beef cattle in the country at the present time doubtless accounts in a large measure for the improved prices being paid by dealers and shippers for the class of cattle suitable for the export trade. This fact also accounts in a great measure for the active demand for pure-bred bulls of the beef breeds, and the higher prices which are being obtained for such animals. It is gratifying to know that the farmers of Canada are waking up to a realization of the situation and of the needs of the times, and are, in increasing numbers, acting on their convictions and putting themselves in line with the requirements of our markets, as they apply to not only beef cattle, but also to dairy products, pork, and poultry. There is, however, yet much room for improvement and expansion in all these lines, and we need have no fear of overstocking the market, if we are only careful to produce the best quality. The live stock market reports furnish interesting reading for farmers and feeders, and the startling differences between the prices of well-bred cattle for beef and those paid for ill-bred animals should lead all who read to cherish the ambition to improve their stock, and thus to share in the best prices going. It is not at all uncommon to note a difference of 75 cents to \$1 per 100 lbs. between the prices paid for a bunch of ordinary ill-bred butchers' cattle averaging 1,000 lbs., and that of a well-bred and well-finished lot of export cattle averaging 1,350 lbs., and a little figuring will serve to show that, rating the former at say \$4.25 and the latter at \$5 per cwt., the difference in the value is just \$25 per head; \$250 on ten head of cattle, or \$500 on a carload of twenty head. And this may fairly be reckoned as the profit on one class over the other, as the scrub cattle have cost nearly if not quite as much to raise and fatten as have the well-bred ones, to say nothing of the pleasure and satisfaction which comes to all concerned in handling the better class. It is our entire confidence in the soundness of the doctrine that well-bred cattle are infinitely the most profitable to raise and to feed that prompts us to so persistently preach the gospel of good blood to our farmer readers throughout our vast constituency, feeling assured, as we do, that the general adoption and practice of these precepts would in a very short time add many millions of dollars to the value of our farm stock, and to the wealth of our farmers individually.

Entertaining this view, we offer no apology for devoting a considerable amount of space in this issue to an illustrated review of the prizewinning records at the Royal Agricultural Show of England of outstanding animals in a breed of cattle that has played, perhaps, a more prominent part than any other in improving the beef stock of not only the Old Land, but also of this continent, and which from its proved cosmopolitan character is doubtless destined to extend its leavening influence in all parts of the world where beef is produced. While we say this in perfect sincerity, we would not for a moment reflect upon the other useful beef breeds which have each made themselves an enviable reputation, have their enthusiastic friends and admirers, and have made splendid records in the Fat Stock Show competitions in Britain and America, both in the pure-bred and grade cattle classes, and frequently top the markets in the great live stock emporiums in both continents for quality and price. If there is room for all these to be profitably raised in the limited territory of the British Islands, as they undoubtedly are, there is surely room for them all in the vast domain of the Dominion of Canada, and we would advise no man who has a herd of any of the beef breeds to give up what is giving him satisfaction, but rather to seek to improve them and extend their sphere of influence in improving the common stock of the country, which any pure breed, if judiciously handled, will certainly do.

Evolution of Farm Machinery.

Farm work has in the last quarter of a century been greatly lightened by the invention and introduction of machinery calculated to economize time and labor. These inventions have been made to apply to nearly all the hardest jobs on the farm, and have contributed vastly towards the removal of the principal complaint against rural life. When we reflect that it is quite within the recollection of many living men that all the harvesting of the hay and grain crops in Canada was necessarily done by hand—mainly with scythe and sickle, involving untold aches and pains of muscle and spine—we may well be thankful that the inventive genius of mechanics and the enterprising spirit of manufacturers have brought within our reach the means of mitigating the hardest labor of the farm and making it so much more generally a pleasant and profitable occupation.

Necessity is said to be the mother of invention; and, no doubt, it was the increasing difficulty in securing hired help to harvest the crops when so many of the early immigrants had secured homestead farms for themselves that led the way, as fields were cleared of stumps and stones, for the introduction of horse-power machinery for harvesting purposes as well as for cultivation of the land. The help question has continued to grow a more serious one as the years have gone by—so much so, indeed, that without the aid of labor-saving machinery it would have been simply impossible to have handled the ever-increasing bulk of the products of our farms. Then, again, with the progress

of time, and the growing of new classes of crops, the tilled portion of the land in Eastern Canada began to require drainage, and very different methods of cultivation, which necessitated new types of implements—a process of change which is still going on. The opening up of the prairie lands of the West, and wheat-growing on a large scale, soon brought about improvements needed to suit these new conditions. The development of dairying has brought with it revolutionary changes in apparatus, the most noteworthy being the centrifugal cream separator and the Babcock test for determining the quality of milk. Remarkable advances, too, have been made in the production of power on the farm. A most important part of the farmer's business to-day is the judicious choice of implements and machinery suited to his soil and system of farming.

The degree of perfection to which farm machinery has been brought is one of the most satisfactory features in the experience of the present-day farmer, and the cost of improved machinery, which when first introduced was high, has been steadily reduced till it is now placed upon the market at prices which the average farmer can well afford to pay; indeed, he can not well afford to be without it. And the use of iron and steel in many parts of modern machinery, which were formerly of wood, has rendered it much more durable, so that with proper care it may reasonably be expected to last much longer, and owing to less liability to warping and twisting, from the effects of the weather, is calculated to do better work, while lightness and strength being combined makes it more satisfactory in every respect.

Upon the proper care and use of farm implements depends, more largely than most men are willing to admit, their satisfactory work. The keeping of the wearing parts and bearings well oiled and free from grit or gumminess, and keeping the cutting parts well sharpened, makes the draft very much less and the character of the work more complete. This applies to implements of cultivation as well as to those of harvesting and chaffing. We have known instances where a cultivator with dull hoes which would slide over hard places without effect, making an uneven and unsatisfactory seed-bed, has done good execution after being sharpened—the work of a few minutes by the blacksmith, and at a trifling cost. Yet many farmers neglect to have implements put in proper condition to do work, and then lay the blame on the implement or its maker.

We are free to admit that absolute perfection in agricultural implements has not yet been attained, but all, we think, will agree that gratifying progress has been made, and we have full confidence that the enterprise and ambition of our manufacturers will prove equal to the demands of the times in providing such improvements as are needed and practical, and will hold their own in the keen competition they have to meet and cope with in this line of work. The statements published elsewhere in this issue by a number of our leading manufacturers regarding outstanding improvements which have been incorporated in various classes of machines, and the article describing the implements of a half-century ago, will be read with great interest.

Glanders.

[Extracts from the annual report of the Manitoba Provincial Veterinarian, S. J. Thompson, V. S.]

Among horses, glanders is the principal contagious disease with which I have to deal. Glanders is caused by a germ or bacillus called "bacillus mallei," and is only spread by contagion, yet horses suffering from strangles, catarrh or other debilitating diseases are more liable to contagion than healthy horses. For this reason it is sometimes supposed to come from other diseases. In the horse, glanders is a disease that may lie dormant for months after infection and then develop very slowly into a sub-acute or chronic case of glanders, or it may develop into an acute case, causing the death of the animal in a few weeks. In chronic cases the animal may continue in good condition for months, and in exceptional cases for years. In the great majority of cases there is little or no cough. The animal may discharge from one or both nostrils, but oftener from one, and that the left. The temperature is but slightly affected. The discharge is generally of a dirty-brown color, adhering about the nostrils. Sometimes the discharge will sink in water, while in a short time afterwards the discharge from same horse will not sink. It is not a reliable test for the disease. A horse after discharging for a time may suddenly begin to bleed from the nose, after which the discharge will almost or entirely cease for a week or two, when it will gradually begin again and continue to get more profuse until it again bleeds. This may occur every two or three months for years, and is the most dangerous form of the disease, as almost all signs of the disease disappear for a short time after each bleeding spell, allowing the owner an opportunity of disposing of the animal to an unsuspecting party, thus giving fresh opportunities of spreading the disease. There is little or no smell from the discharge. There is almost invariably a lump between the jaws, from the size of a hickory nut to a hen's egg. These glands seldom, if ever, can be caused to break and discharge pus, and are mostly on the side from which the nostril is discharging. They are close to the jaw bone, but not attached to it. As the disease advances, ulcers may appear on the *septum nasi*, or membrane separating the

nostrils; these may first appear as whitish pimples or blisters, but they soon break away, leaving ragged, reddish ulcers, which continue to spread and deepen until they at times eat through the membrane; but in chronic cases they sometimes heal, leaving a scar. The horse often has a slight discharge from the eye, on the side of head most affected. This discharge does not run down, but appears like dirt collected in the corners of the eye. Again the disease may appear as farcey, or farcey may develop as the disease advances, when the disease breaks out in farcey buds (which mostly occur on the inside of the legs or along the belly, but may occur on any part of the body) which may be described as boils about the size of half a walnut. They break a short time after their appearance and discharge a bloody pus, after which they heal quickly.

There are symptoms somewhat similar to glanders, that are sometimes mistaken for it. In strangles, the discharge is of a lighter color than from glanders, and does not adhere around the nostrils to the same extent. The enlargements between the jaws are larger, situated higher up near the larynx, and usually break and discharge a light-colored pus.

An ulcerating tooth will sometimes cause the sub-maxillary gland to enlarge, and a discharge from one nostril, sometimes similar to glanders, and oftener mistaken for glanders than any other trouble. But, with the ulcerating tooth we invariably have a very disagreeable smell, quite different from glanders.

In all suspected cases of glanders, where the disease is not developed sufficiently to be positive as to the disease, I have the animal tested with mallein, which, when used with care, I find to be a positive diagnostic agent, and it has no harmful effects whatever on a healthy animal. Then follow instructions as to taking the test, destroying diseased animals and disinfecting the stables, etc.

For the past six years Dr. Thompson has inspected many hundreds of horses, and condemned the following: In 1893, 122; 1894, 94; 1895, 42; 1896, 80; 1897, 62; 1898, 120. As to the source of the disease the Doctor says: "I have no hesitation in saying this increase is entirely due to the great number of horses brought in from Montana and the N.-W. T." As the Chief Veterinary Inspector for the Dominion had stated through the press that there was no glanders in the Territories, considerable evidence is given to show that the disease does exist among the horses on the Western ranges, that the inspection is not thorough, and that horses brought into Manitoba from the ranges of the West are the chief source of infection, and that until a thorough system of inspection is established of all horses, either before they are allowed to be removed from the ranges or before they cross the Manitoba boundary line, it will simply be impossible to stamp out the disease.

CATTLE.

On the general health of the cattle of the Province, Provincial Veterinarian, Dr. S. J. Thompson, reports as follows: "I have to report a few cases of symptomatic anthrax, generally known as black leg. I have only been called to see a few cases of suspected tuberculosis, and from the reports of tests made by veterinary surgeons in the different parts of the Province, the percentage of diseased animals is very small outside of the large dairy herds of Winnipeg and one or two herds in other parts of the Province.

A Big Abattoir to be Erected at Calgary.

The Calgary Herald of March 14th says: For some time past it has been rumored that Messrs. P. Burns & Company intended erecting a large cold storage and slaughter house at Calgary during the coming season. We are pleased to learn from Mr. Burns, who has just returned from Toronto and Montreal, that the report is a correct one. The building now occupied by this company is much too small to accommodate the business, and it is Mr. Burns' intention to erect buildings capable of holding a large stock of all kinds of dressed meats, which will be shipped in refrigerator cars to the cold storages now being erected at different points in the Kootenay and British Columbia.

When it is considered that this firm supplies the entire Kootenay country and also ships to coast cities it will be easily understood that the proposed plant will be quite extensive. The buildings will be of the latest and most approved plan. Both the cold storage and slaughter house will be equipped with up-to-date appliances. The pay roll will be quite considerable, which will benefit Calgary, and the buildings will be a benefit to our city. The industry will be one of the most important in the west. Work will be commenced as soon as the weather permits. Mr. Burns, while east, visited the larger packing houses and examined the different methods of operating them.

Experiments with Cross-breds.

In the spring of 1895 the Marquis of Londonderry commenced an experiment in the breeding and rearing of cattle, with the view of ascertaining the most profitable class of cross-breds. For this experiment four heifers of the Aberdeen-Angus, West Highland, and Galloway breeds were specially selected and mated with a first-class Shorthorn bull. The calves dropped by these heifers have all been treated exactly alike from birth. They suckled their dams in six months old and have been well fed ever since, so that they

never lost their calf flesh, but they have never been forced in any way with concentrated feeding stuffs. The first and second years' calves of these crosses will be exposed to public competition at the Seaham Harbor sale, which is fixed to take place on 6th October. Respecting these cross-bred cattle Lord Londonderry's agent, Mr. Brydon, says:

"The two-and-a-half-year-old experimental cattle were weighed on Thursday, the 22nd inst. The Galloway crosses, which are all heifers, averaged 87 stones 4 pounds each. They were calved in April, 1896, so that by the time of the sale they will be two and a half years old. The Polled Angus crosses, which are all steers, averaged 99 stones 12 pounds each, or within 2 pounds of 100 stones. They were calved at the same time as the Galloway crosses. The Highland crosses are, on an average, one month younger than the others, and the three bullocks averaged 95 stones each, while the heifer scaled 82 stones."

The most notable feature in these results is the relative large weights of the West Highland crosses. It has been always said that the West Highlander is "a slow feeder," and that the West Highland cross shows the same characteristic, though in a lesser degree. But here it has been shown that the Shorthorn-Highland cross, when fed under the same conditions, shows a daily gain in live weight all but equal to that got from the Polled Angus cross, which has always had a high reputation for being "a quick feeder." In the same way the Galloway has been often accused of being "a slow feeder," though in a less degree than the West Highlander; but here, too, the Galloway cross has shown as large a daily gain of live weight as the Polled Angus cross, when it is remembered that two-and-a-half-year-old steers will usually weigh from 12 stone to 13 stone more than heifers of the same age, other things being equal.—*Farmers' Gazette.*

Mr. Crossley on the Horse Question.

I have read the two articles on the horse question from April 5th issue and agree with practically all they say. It certainly has always appeared to me strange that a government which has deemed it advisable, through the medium of the Farmers' Institutes, to give a series of lectures throughout Ontario on almost every known branch of farming, has so far almost entirely neglected one of the most important branches, namely, that of horse raising.

However, whether this subject could be advantageously added to the series to produce any practical good is to my mind an open question. Certainly a lecturer who could not carry his examples around with him would be somewhat at a disadvantage as compared to the one who can make his butter on the spot whilst he is explaining the process of manufacture. A few general remarks might, however, be given with advantage. It must not, however, be forgotten that the showyard is the best school in which to learn the practical lessons of breeding and crossing of all kinds of animals. There is hardly a district in Ontario which does not receive this opportunity for self instruction through the generosity of the Ontario Government towards its local show. Many a man has made his first exhibit at some one or other of these shows, and has gradually worked his way up until he has become a sweepstakes winner at the Industrial.

There are undoubtedly many evils in connection with horse breeding throughout the country. Anybody would think that it was an easy matter to remedy them; in fact, one would think that a farmer's own common sense would show him the remedy. Yet such is not the case. Everybody thinks that he was born to be a farmer, just as everyone at some time of his life has thought that he was especially brought into this world to serve Her Majesty in the army or navy. Unfortunately, farmers are not heaven-born, and every farmer knows, just as is the case in business, that nine farmers make a failure where perhaps one makes a reasonable competency or even a good living. Having attended hundreds of breeders' meetings, agricultural shows, and so forth, at which I have met thousands of farmers, it is natural that this subject has been discussed in my presence many times. There are scores of different opinions on this matter, but I have never yet heard of a practical suggestion for a remedy of any one of these evils.

Some talk of governmental interference—for instance, licensing stallions. Well, one can hardly say that that is a practical suggestion. It is an inherent right of every Englishman to do as he likes with his own money. No government in the world would dare to dictate to a man what stallion he should use, and even if they dare, what course would they pursue? Judging by my own experience, there is one pedigree stallion in Canada for from sixteen to twenty non-pedigreed, useless animals. Even the system of recording animals leads to abuse, as follows, and is illustrated in every country in the world:

There is a fashion for a certain breed, which naturally creates a large demand, followed by increased prices. Every male is, as a consequence, recorded, probably sold and used for breeding purposes, just because everyone must have a horse of this

breed with a pedigree. The breed becomes deteriorated at once through the increased demand and the consequence which follows of keeping entire animals which would not make good geldings.

Mr. Innes speaks in his letter of the plan of insurance adopted in this country. I must say that I entirely agree with him. I often hear of the abuses of breeding in Canada, but do not think they can compare with the abuses of this system of travelling horses. I do not agree with Mr. Innes about the price of stud fees, but think myself that for the class of horse generally used they are too high, and are made so by this very practice. We will take a horse that cost \$1,000. He has 100 mares a year at \$15 per mare, of which 50 per cent. down. He would realize right away \$750. Fifty per cent. of his mares ought to be in foal, so that he would still have \$375 coming to pay all his expenses. There are few horses which travel and are really worth more than the above sum. If there were no insurance at all, but a moderate fee were charged, it seems to me that a stallion owner ought to make a good season and pay for his horse in four years, when he would still be worth 50 per cent. of his original value and he would still have made a good profit. Say, for instance, 100 mares at \$7.50 paid down. This would realize \$750, of which \$250 to capital account and \$250 to profit, and still his horse would fetch \$500 at the end of four years. In my experience, the farmer when he puts his mare under the insurance plan often does not care whether he gets his mare in foal or not, as is shown by the fact that though the stallion travels two months, at least 50 per cent. of the mares never come until the end of the season. As a consequence the owner does not get anything. It appears to me unreasonable that a stallion owner should be treated in this way, but so long as this system prevails the owner is compelled to charge more than he should.

There are many ways in which a government can help the horse industry; for instance, by bonusing stallions travelling in certain districts at stipulated fees (low). The different governments of Canada have tried different ways, but probably the European countries have had the most experience. As a consequence, it has always seemed to me that Ontario or the Dominion ought to appoint a commission for the purpose of thoroughly sifting this matter before taking any steps to remedy the abuses complained of. HORACE N. CROSSLEY.

Teeth of Young Pigs.

Should the sow carry her pigs beyond the usual period of gestation, it frequently happens that the piglings' teeth will have made an abnormal growth, and in some instances the teeth will have become discolored to an extent which has led to the common saying that "pigs born with black teeth never do well." These little teeth are often very long and sharp, so that, when the little pigs attempt to suck, the teeth extend beyond the tongue of the pig and prick the inflamed and tender udder of the sow, giving her great pain, which frequently causes her to refuse to suckle the pigs, and sometimes she will attack the little ones with open mouth, when one grab from her powerful jaws seriously injures, if it does not at once kill the youngster. Unless immediate steps are taken to remove the cause of this trouble, the pigs soon die for want of food, and the sow's udder becomes distended with milk, and inflammation of it follows.

THE REMEDY.

This is simple, and easily applied by the attendant on the sow. He takes up each pig, tucks it under his left arm, opens its mouth with his left hand, and with his right hand and a small pair of pincers he breaks off the erring teeth, and places the pig to the sow; then by a little of both coaxing and scratching, the sow will turn onto her side; the little pigs, being unable to bite the udder and each other, will quickly relieve the distended udder of the sow and prove a source of pleasure to her, instead of an irritant and a cause of pain. Sometimes the sow will become impatient on hearing the shrieks of her little pigs whilst the operation of dentistry is progressing; if this does affect her, it is best to take the little pigs into an adjoining place, out of hearing of the sow. S.

Regina Agricultural Society.

The Regina Agricultural Society recently held its annual meeting, when it was decided to hold a spring stallion show on April 28th, and to hold a summer fair this year. The following officers were elected: President, G. Spring-Rice; 1st Vice-President, R. H. Williams; 2nd Vice-President, H. C. Lawson. R. Rigby was elected auditor. The following were chosen directors: Regina—J. W. Smith, G. Michaelis, A. J. Fraser, F. N. Darke, Jas. Bole, W. B. Pocklington; Camden—R. Bourne, Jackson Harrison; Sherwood—S. Beech; Greendyke—A. T. Hunter; Stirling—R. Cowan; Hednesford—Thomas Barton; Edenwald—Paul Bredt; Balgonie—Kingsbury, Ager; Davin—D. Hicks; Pense—J. A. Killough, John McGillivray; Cottonwood—T. E. Hind; Carssdale—E. Carss; Lumsden—Jas. Mutch; Longlaketon—Z. H. Barnes; Tregarva—W. Seed; Kennell—R. Mollard; Boggy Creek—W. Cullum. Wm. Trant was elected secretary and A. Macdonald treasurer. An executive committee was chosen: J. W. Smith, F. N. Drake, A. J. Fraser, Jas. Bole, R. Bourne, and the President and Vice-Presidents.

Forerunners of Modern Farm Implements and Machinery.

In tracing the progress of farm implements and machinery towards their present state of perfection, we find that in all ages and countries improvements have taken place as agriculture has advanced. Up to the middle of the present century, and even later than that period, we find that in Spain, Portugal, Russia, and Palestine and other eastern countries little, if any, improvement had been made for perhaps two thousand years. Thus we find even a few decades ago that the Israelites, instead of employing in their warm climate a threshing machine, or even a flail, to thresh out their grain, were accustomed to turn their oxen onto the farm floor to slowly tread out the seed. Their modes of cultivation were quite as rudimentary, as we find the first improvement upon treading land with hogs was scratching it with something similar to these animals' feet, and this was the road to the Egyptian sarle or plow. (Fig. I.) In the alluvial soil of Greece, where an instrument more favorable to the covering of seed was necessary, the hand rake had its origin, and from the Egyptian sarle we trace our plow.

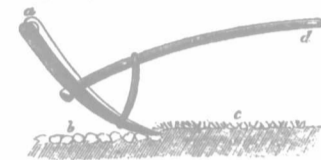


FIG. I.—EGYPTIAN PLOW.

It was not till about 1845 that anything like a rapidly improving condition of farming implements commenced in England, where we find there was a keen interest taken in draining, subsoiling, different methods of cultivating, sowing, harvesting, and threshing. In the *Farmers' Magazine* of the early forties we find considerable controversy as to the comparative advantages of sowing wheat broadcast or dibbling it in by hand, as potatoes are now usually planted. One of the greatest objections to the dibbling of wheat was considered to be the difficulty of getting the seed dropped into the holes with regularity, children being generally employed, and independent of time being required to teach them, the carelessness attendant upon youth was claimed to stand in the way. To overcome this difficulty by those who chose this method of sowing, because of the saving of seed and making it possible to hand hoe the crop, a hand dibble was invented which dropped the grain

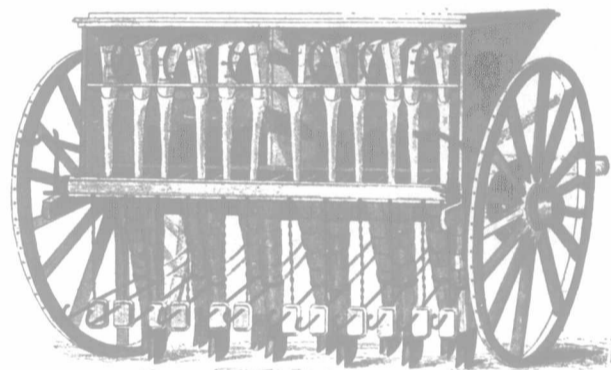


FIG. II.—GENERAL PURPOSE DRILL, 1841.

with certainty and regularity—two, three or four grains, as required. It closely resembled the hand corn planter, but was double, taking two rows at a time. There were grain drills in those days, and we find that tests between dibbling and drilling wheat proved that four pecks per acre, dibbled, yielded as much as ten pecks drilled. The drills used were to some extent in principle similar to our own of the present day. In 1841 we find that a prize of twenty-five pounds was awarded to Mr. Hornsby, at the Royal Agricultural Society Show of England, for the general purpose drill herewith illustrated. (Fig. II.) It was used to sow manure and corn at one operation. While much of the broadcasted grain was sown by hand, broadcast seeders on

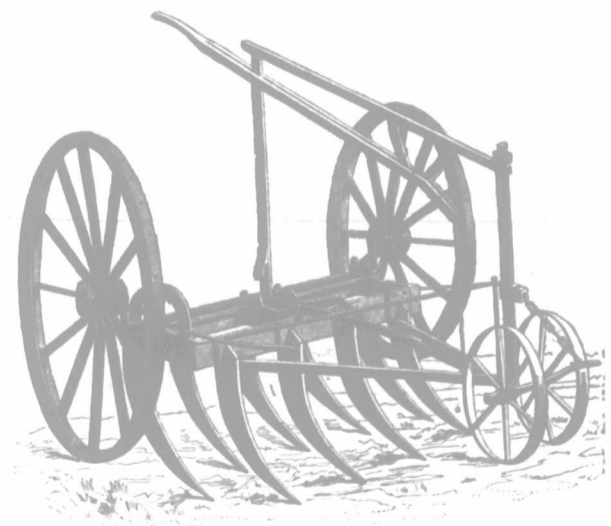


FIG. III.—BIDDELL'S SCARIFIER OR CULTIVATOR, 1839.

wheels were used, and consisted in a long seed-box suspended between two wheels. The box hung in front of the axle, and distributed the grain from the front, while the driver sat in a seat behind the axle, to some extent relieving the weight of the seed-box from the horse.

The matter of cultivating the land has, since the early part of this century, undergone many changes. Some fifty years ago, in England, the plow and the spading fork competed for supremacy, with a final victory for the plow, due only to the increasing expense of human labor. Tests between plowing and forking are recorded as having taken place in the forties, with the result that land prepared for carrots by forking gave three tons greater yield per acre than land that had been plowed and harrowed, while mangels on forked ground produced nearly five tons greater yield per acre than land prepared by horse cultivation. At that time the plow of the present day had not been perfected, and almost early new styles were being brought out. Cultivators and harrows were also being improved year by year, as they have also up to the present day. Fig. III. represents a cultivator known as "Biddell's Scarifier," for which the English Society's gold medal was awarded in 1839. It was very highly thought of in making summer-fallows and in preparing ground for grain seeding or for roots.

For harvesting grain the reaphook or sickle held sway through many ages, and we find that even as late as 1845 they were very generally used in England. In 1841 scythes commenced to displace reaphooks, and it was about this time that the grain cradle (Figure IV.) was invented in the United States. Reaping machines were suggested by the ancient Romans, but the first machines



FIG. IV.—GRAIN CRADLE, 1841.

that attained to much efficacy were made in the United States between 1830 and 1850. In 1833 Obed Hussey, of Ohio, patented a machine to which he applied saw-toothed cutters and guards. Fig. V. represents the machine as it appeared about 1840. Some years before this Bell's machine was invented, and by 1850 it had been perfected to the condition shown in Fig. VI. The grain after passing the knife fell upon the travelling canvas and was deposited as from a good cradle, as shown in the illustration. In 1834 McCormick, of Virginia, patented a reaper which had been so far improved by the year 1851 that it was awarded a medal at the World's Fair in London, England. It had a sickle-edge sectional knife, reciprocating by crank movement with the bearing and drive wheels. It also had a reel and two dividers, one on each end of the platform. The grain was elevated into a platform and raked off by hand. The self-rakers and self-binders marked the general changes from then to the present day. It is little more than two decades ago since the binder was turned out a successful machine—a huge, cumbersome affair, constructed largely of wood. It bound the sheaves with wire, and cost about \$300. It required three stout horses to haul it, but did a fairly creditable job in a standing crop. The improvements upon this machine came in quick succession from many sources along the lines of lightness, strength, and efficiency, until we now have the many makes of light steel cord binders—easy to run and to operate



FIG. V.—HUSSEY'S REAPING MACHINE, 1840.

even in a tangled crop, and purchasable at little more than one-third of the price of the binder of twenty years ago.

Threshing grain by treading it out by oxen on a hard clay floor was the system followed by the Egyptians and Greeks. The flail seems to have been the next step in advance, and until quite recently it was largely used in Britain and can still be found in Canada. Michael Menzies, of Scotland, is supposed to have been the first inventor of a threshing machine, which was merely an adaptation of suitable mechanism to drive a large number of flails by water power. In 1758 a rotary machine



FIG. VI.—BELL'S REAPING MACHINE, 1851.

was invented, which gave rise to the revolving cylinder machines. Fig. VII. represents the threshing machine meriting highest honors at the

Royal Agricultural Society Show of England in 1840. This machine is reported to have had no spikes in the drum or cylinder, which were soon introduced in America. To this was added the separating machinery and other improvements, until the

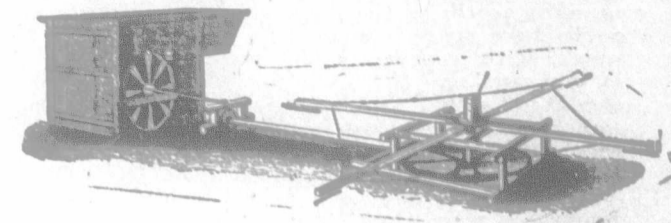


FIG. VII.—THRESHING MACHINE WINNING HIGHEST HONORS AT THE ROYAL SHOW, ENGLAND, 1840.

present complete machines were arrived at. What the coming few decades will produce no man knows, as the march of mechanical advancement seems to hasten with the progress of time.

Canadian Poultry in England.

Mr. Joseph Yuill sends us the following letter from the gentleman who disposed of the experimental chickens fed by Mr. Yuill's family, and which proved such a signal success. Messrs. Yuill & Sons, Carleton Place, Ont.:

I find that you fed and packed the chickens that I received and sold on behalf of the Department of Agriculture, of which J. W. Robertson, Esq., is the worthy commissioner.

The whole transaction was so completely successful and satisfactory in every particular that I am loth to let time pass without venturing to enquire as to your intentions in regard to the export to England of your fattened poultry. Being the first to handle your stock, I would hope to continue to do so, being sure that no one in England could offer you the same facilities, service and interest that I can command.

Anticipating, therefore, that you will be inclined to favor me with your consignments, I take this early opportunity of encouraging you to extensive operations in poultry for the coming season. You need have no fear as to the ultimate results. Only turn your poultry out in the same order and condition as you did the experimental lot and I will see that profits will accrue.

I am confident that I can create a large trade for Canadian poultry if I am able to secure responsible and reliable feeders and packers like yourselves. The business will need co-operation of a willing and intelligent order. The trade will then be readily established, and it will only be the packer's fault if he does not maintain his position and hold the business.

I might say that the English market receives poultry from every country in Europe as well as from Australia and New Zealand. I can state, however, without the slightest fear of contradiction, that the Canadian poultry has no compeer, and therefore no competitor on equal terms. For not only is the Canadian poultry superior as to quality and suitability, but its condition is always assured through the services of the refrigerator. Liverpool, March 2, 1890. JAMES RUDDIN.

A Cattle Exporter's View.

To the Editor FARMER'S ADVOCATE:

SIR,—Regarding the report that Argentine competition would yet drive the exporters of cattle on the hoof into dead-meat shipment instead, I may simply say: The present method is adopted because the English purchaser pays more for what is killed in England, and enough more to make the other method by contrast undesirable. So soon as the purchaser decides that Canadian-killed cattle are, say, as good as English-killed Canadians, we may expect the difference saved in cost of carriage of dead animals to induce that method of shipment. I think there is no prospect of the English taste so degenerating as to prefer mussy handled, and even very slightly musty, meat to the article which now sells freely as English-fed, and of which a large percentage is Canadian-grown.

Governments might blunder into such experiments as carcass shippers, but not the sensible business men engaged in this trade, unless they saw sufficient compensating advantage in a money bonus from a soft Government. There is no danger of Argentina having any influence upon the question raised (the system of shipment).

The price to be realized for Canadian cattle will of course be influenced by whatever competition presents itself in the market, and you do your best possible service to the cattle grower in developing the best methods of producing the best animals. Such ringing editorials as yours of March 6th—Away with Scrub Sires!—show the ADVOCATE to have an eye on real preventable grievances, and knows how to show them to its readers.

The balance of trade has been and is severely against the farmer, and shipments of cattle from Ontario show the poverty of the country, both in quantity and quality, but under the conditions existing, prudence in the selection of sires and stock retained for stock purposes becomes more than ever necessary. Let the farmer work both his head and his hands, and maybe he'll see a lot of things that can be remedied outside the farm—all reducing the drain on his estate.

The so-called grievance of the trunk lines and steamship lines offering lower rates to American

than to Canadian cattle does not seem preventable. Canadians can no doubt secure the same advantages through American soil, and on their vessels, when in a position to avail themselves of it. There is no set price, as far as steamships are concerned, for space. Sometimes half a dozen shippers will have as many prices as there are shippers. When you go to take space you go to a "Jew shop," so to speak, with apparently the same principle—"get all you can," and that's one reason why the farmer should not ship. As a last resort to fill the vessel sometimes an American is quickly wired a very low rate. It's what they call "business." You can't help it. No ship company is an exception to this rule. The Allans did once, and priced to all alike. So honorable were they that in those old days the price of freight was sometimes not known until the vessel was down the river with the stock. The shipper was told it would be "current rate and all alike," and it was so, and their price *always*, I think, was as high as their full anticipations, and sometimes much higher. A change has come over the scene—it's still "business," and you must know the game to stay in it.

However I have digressed, say what you like of this to your people—all if it please you; and believe me in full sympathy with the farmer and the ADVOCATE. Respectfully yours,
Montreal, March 27, '99. W. A. WILLIAMSON.

Turning Out the Flock.

BY J. M'CAIG, PETERBORO, ONT.

The change from winter-feeding to pasture is rather a violent one if not made with some care and judgment. Grass contains about 80 per cent. of water, and it is to be expected that an abrupt and complete change from stored foods to grass will bring on a strong flushing of the animal processes. Diarrhoea will be followed by a great lowering of temperature, flaccidity and relaxation of the muscles. If the digestive processes go wrong in a sheep, it goes down very fast. Its digestive machinery is very strong, but its vascular and circulatory system, on the other hand, is very weak, so that it cannot throw off adverse conditions easily. Its capacity for self-restoration is not nearly so great as that of the horse or cow. So much is this the case that if a sheep takes sick it is generally expected that it will die. They seem to be hard to diagnose and hard to cure. A western man, who started in with a band of a thousand and lost them all the next year, without being able to tell what was the matter with them, went out of the business, saying that he "didn't like to be handling stock that would die without a cause." It is impossible to emphasize too strongly the necessity of prevention in sheep rather than cure, and more particularly with reference to the business of nutrition.

The aim of the shepherd should be to make the change as gradually as possible. This can be done by making the winter-feeding and grazing overlap. The grass-feeding should not constitute the whole food of the flock for ten days at least after the first turning-out, and night shelter will be necessary for still longer. The first time they go out it should be only for a couple of hours in the warmest part of the day, and for sun and exercise rather than grass. If the grass is too short to make a full bite, all the better, as there will then be no possibility of gorging, and the sheep will still have some appetite for inside food. For this reason it is hard to get them out too early. Besides, the spring air and sun are fine for the lambs. There is nothing more wholesome for either shepherd or lambs than the moving spring breeze, with the sun shining on it. It is the time at which the doctors talk of ozone. Let the little fellows out on the side of a dry hill, and let them stamp and race around the little knolls; it will increase their capacity for food and growth. The morning hours are better than the evenings or afternoons. After the more than customary exercise, it would be a mistake, especially in the case of very young lambs, to let them lie out on the damp ground after the sun's heat begins to fail. They should be active outside, but should rest inside, in their dry, well-littered pen. After four o'clock the air gets chilly.

If it is good for ewes with lambs to run out early, it is still better for ewes that have not lambed. Grass is a great stimulant to milk secretion, and it is generally the case that pregnant ewes on heavy grass are more subject to udder trouble than those that have lambed in March, for example. For this reason such ewes should go out on short pasture, so that they will have to rustle for what they get, and thus check by exercise the tendency to rapid milk-secretion.

Ewes should be well fed before going out in the morning, in order to break their appetite. After the grass begins to improve, the appetite for hay will be slight, and only a little of the best hay will be necessary. If slops are fed, they may be greatly lessened or discontinued, and likewise turnips, though English shepherds continue the feeding of roots after the grass forms the chief food of their flocks. Dry oats are the best kind of grain food at this time. They are tonic in their effect, and help to counteract the looseness caused by the grass. The flock should have plenty of salt. This itself is, indeed, both a preventive and cure for diarrhoea. If young lambs are affected with violent purging, a teaspoonful of powdered chalk given in milk, repeated, if necessary, after five or six hours, will generally cure them, though they generally right themselves.

On account of the closeness of the feeding of the sheep, they check the growth of the grass in the spring, with the result that the sun burns it out later in the season by getting at the roots. On this account a field that is to be pastured for cattle should be closed to the sheep, and they should be kept away from meadows. There are few farms, however, that have not a piece of broken land covered with natural grass, on which the sheep may be turned early in the season. Failing this, the lanes may be used, or such fields of sod as are to be broken up for crop in the spring or early summer.

Improvements in Farm Machinery.

Reference is frequently made to the vast improvements that have been effected in agricultural implements and farm appliances during recent years. In this connection we recently requested manufacturers to name what in their judgment constituted the one most important feature or device from the point of serviceability to the farmer which they had incorporated in any farm machine which they were turning out. Among the replies received up to the time of going to press are the following:

STEEL FOR WOOD.

THE FROST & WOOD CO.:—"In our opinion, among the many changes and improvements made in farming machines during the past few years, the almost complete substitution of steel for wood is the most practical benefit to the purchaser, as machines can be made not only less cumbersome, but lighter and stronger, and will last much longer."

THE WIND STACKER.

JOHN ABELL ENGINE AND MACHINE WORKS:—"The Wind Stacker is probably the most important new feature in connection with threshing machines. The Band-cutter and Self-feeder which we are supplying is also very serviceable."

ROLLER AND BALL BEARINGS AND THE OPEN-END BINDER.

MASSEY-HARRIS CO.:—"While it is quite true that vast strides have been made in the way of improvement and development of agricultural implements of all kinds during the past year or two, it may be said that these improvements are largely in the way of perfecting principles already pretty well understood, rather than bringing out of startling and radical changes. In our own line large sums of money have been spent and a large number of patents taken out on various features of our machines and implements to make them more perfect. Perhaps the most marked advance has been the application of what is known as the Massey-Harris Perfected Roller and Ball Bearings to our various machines. These were not put in until they were thoroughly tested and proven practical and efficient in every sense of the word, and have met with appreciation and admiration at home and abroad. In the age of keen competition, with a business extending the world over, our abilities are taxed to their utmost to watch every detail in the construction of our machines and to keep them to the front in the various lines in which we do business. Probably the average individual has but little conception of the time and money that we spend in thinking out and developing even the most minor detail of every implement and machine we manufacture. It is the careful attention to the "little things" which in these days makes for success, rather than radical changes in the mechanical principles of the machine. The mechanical principles of the machines we manufacture, and which we control and have protected by patents, are for the most part the principles we have advocated for some years and proven to be the best in every sense. The perfecting of the roller and ball bearings was accomplished by ourselves in the face of much opposition."

ROLLER AND BALL BEARINGS ON WINDMILLS AND GRAIN GRINDERS—NEW GOVERNING POWER AND PUMPING MILLS—ANGLE STEEL FRAMES.

GOULD, SHAPLEY & MUIR CO., Limited:—"We select three of the greatest importance:

"First—Roller and ball bearings on windmills and grain grinders. We were the first in Canada and elsewhere to use them, and hold a Canadian patent on them. The first design was not fully satisfactory, but the improved roller bearings now in use for three years are an absolute success and are used on 95% of our output. One strong point of our roller bearing patent is the use of a steel outer case in which the rollers run. Windmills fitted with proper roller bearings give greater power and are more durable."

"Second—The new principle of governing both power and pumping windmills by which they are held into the wind by a governing device which allows relief to the wheel when struck by a heavy blast of wind, gives more equable speed, and also relieves the user from all anxiety about the safety of the mill. If the wire or other attachments break, the large spring on the mill pulls it out of the wind and applies a powerful brake, and stops it very quickly. All other windmills work on the opposite principle of letting the wheel loose into the wind and pulling it out to stop it. If the attachments give way the wheel will run until the wind slackens sufficiently to allow of its being stopped and the break repaired."

"Third—The use of an angle steel frame for our 'Steel King' pump, making it lighter and much stronger; also, the use of a malleable sprocket drive chain instead of cast iron gears. The mill runs twenty per cent. lighter and as noiseless as a bicycle, and is very durable."

NEW MODEL SEED DRILL, ETC.

JOHN S. PEARCE & CO.:—"Among the many useful implements invented and placed on the market for the use of farmers, market gardeners, and others, we think there is none that has proved more generally useful than the 'New Model' seed drill which we have been manufacturing here in this city for some years. This has given every satisfaction. We have sent them all over the Dominion, and have yet to hear of a single customer who is not more than well pleased with these."

"Other articles of very great use and service to farmers and market gardeners is the 'New Universal' double-wheel hoe, plow, drill, etc. These combined are the most unique and complete tool we have ever seen. We have been handling these for two years, and the company now contemplate manufacturing these here in this country for the Canadian trade."

Testimonials.

Joseph Martin, Wolsely, Assa.: "I must say the more I read the ADVOCATE, the better I like it."

J. E. Littlehales, Saltcoats, Assa.: "I am much pleased with the paper."
March 26, 1899.

George R. Thair, Glenboro, Man.: "I do not see how I could do without the FARMER'S ADVOCATE."
February 28, 1899.

Walter Jackson, Holmfild, Man.: "I am very well pleased with the FARMER'S ADVOCATE, and find it a very valuable magazine."
March 3, 1899.

Philip R. C. Pratt, Sunnymead, Assa.:—"I may take this opportunity for saying that I think your paper excellent, having taken it for nearly eight years."
March 10, 1899.

T. McRae, Brandon, Man.:—"I wish you all success in all the ways you are working to help the farmers in their places."
March 20, 1899.

Edwin Lister, Kenlis, Assa.:—"I have taken your paper seven years, and it is improving all the time. No farmer should be without it."
March 13, 1899.

John Nichols, editor of the Sun, Grenfell, Assa.:—"Allow me to congratulate you on the FARMER'S ADVOCATE. It is a growing power among the farming community, and full of practical up-to-date information on agricultural topics."
February 25, 1899.

Harold D. Buchanan, Cottonwood, Assa.:—"Without the FARMER'S ADVOCATE a man might as well quit farming, unless he is content to learn farming by the hard school of his own experience. I therefore enclose you \$1.00, asking you to be pleased to continue your paper, with which I am more than satisfied."
March, 1899.

Union Beekeepers' Convention.

(Continued from page 113.)

Is stimulative feeding of bees desirable?

A member upon introducing this question to the convention said that two years ago, during a cold spell which lasted late in the spring, the beekeepers who fed their bees got profitable results. In favorable seasons it might not pay to feed. A member said one year the frost came and destroyed the blossoms, and he believed he saved a good deal by feeding a little in dishes in the open yard. A member found it paid him one year in particular to feed by uncapping all the comb in the hives. It encouraged early and strong swarms. It was generally conceded that it is wise to tide over a dearth in late spring by feeding. A setback at that season will lose a lot of time. Mr. Holtermann claimed acquaintance with a man near Ottawa who two years ago stimulated his bees and got half a crop of honey, while men alongside him did not stimulate and their bees ran down so that they killed their drones, and these men did not get a particle of honey. A good plan is to change the position of combs in the hives, and from one hive to another. One has to be very certain he has no foul brood in his bee-yard before he practices this plan or it would be a means of spreading the disease.

Is spreading of brood in spring desirable? If so, with what strength of colony? When and how should it be done?

It was recommended that beginners should not attempt to spread brood, as it required an experienced beekeeper to decide when it would be of advantage and how to do it. The chairman dealt with this question as follows: "I have never done much spreading; have been very cautious for the simple reason that the weather may be favorable—nice and warm—just when you do it by changing the position of the brood combs in the hive, and soon after it may become much colder, and then there is danger of chilling the brood. If the conditions are right it seems to me that bees spread their brood just as fast as they can gather, providing there is anything coming in, or if they have plenty of stores to look to. You find in the spring, brood in the center and eggs in the outer edge of the brood chamber. If it should turn colder, and the swarm contracts, there is less harm done by drawing away from the eggs. The matter of spreading the brood is a matter of judgment, born only of experience."

Is it advisable to equalize colonies before the honey flow? What about doubling up weak colonies?

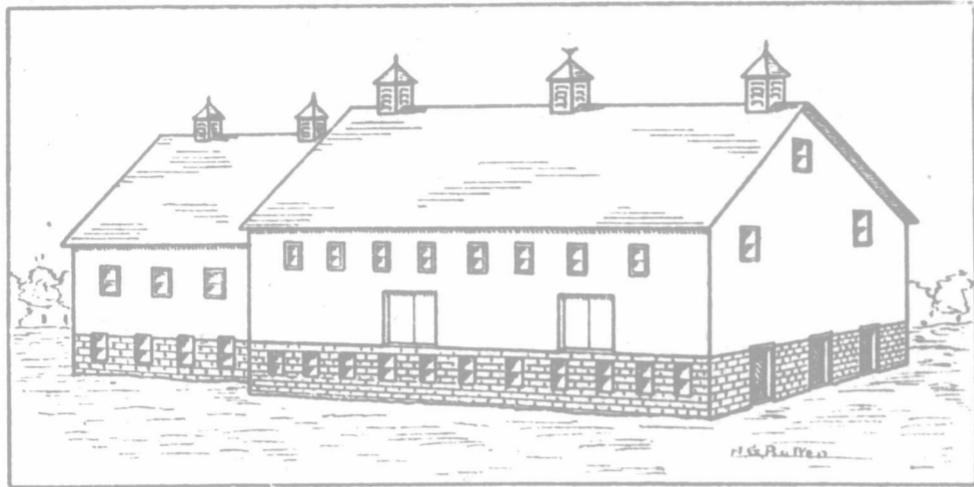
It was generally conceded that strong colonies are not too strong, but should it appear necessary in order to help a weak colony, a frame of hatching brood might with advantage be taken from the strong and given to the weak colony. Some of the members claimed to practice doubling up weak colonies just before clover bloom. It was advised to put a newspaper between the two colonies at the time of uniting.

Small, Thick-Fleshed Animals Now in Demand.

The partners in one of the leading firms of butchers in Llandudno, in Wales, have just published an interesting circular in which they give prominence to the announcement that the beast which is at present in most demand, and for which they are prepared to give the highest price, is the small, compactly-made animal, which carries a thick covering of flesh on the best parts, and yields nicely-marbled beef—that is, beef in which the lean and the fat are uniformly intermixed. The demand for over-fed cattle of all sizes has, they say, become a thing of the past; the big cattle will have to follow. The value of fat cattle will, they contend, be regulated in the future by their size and thickness. The best traders require the smallest cattle they can get, provided they possess the necessary thickness of nutritious, lean flesh, covered with a reasonable amount of fat. Cattle of this description, weighing in carcass 600 or 750 lbs., command the largest prices, while similar cattle, weighing 750 to 900 lbs., come second.—*Farmers' Gazette*.

A Highly Satisfactory Stock Barn.

The following is a plan and description of one of Messrs. H. Cargill & Son's stables at Cargill, Ont., importers and breeders of Shorthorn cattle. The size of this barn is 72 x 100 feet. The silo, mixing room, and the manure room are separated from the stable proper by a wall, having doors in convenient places, as shown by plan. They feed their stock feed from feed room, it being passed down through chutes from floor above, and the ensilage is conveyed from silo in car or truck built with two wide-tire wheels behind and one swivel wheel in front, so that it can be moved or turned easily in any direction.



BARN OF MESSRS. H. CARGILL & SON.

Regarding further details, Messrs. Cargill write: "Distance from floor to floor is 12 feet, ventilated with 6-inch tile through top of wall between the joists, about six feet apart. Water is supplied by a windmill and pumped into a large round tank, 8 x 8, which sets in implement house just over the wall between manure shed and root house; is piped from this tank to small supply tanks, marked S, which maintain water at proper level in water basins. The pipes from these small tanks for box stalls run along the floor, buried sufficiently in the cement to make surface level. Pipes to supply stall basins run along top of plank, which is the front of mangers, and where it crosses passage in center of stable is dropped low enough to cover with cement same as pipes in boxes. The cement used was from Battle's Cement Works at Thorold, Ont., and is very satisfactory. Manure is removed with wheelbarrow. Mangers are 16 in. wide, with bottom raised 2 in. higher than floor with cement. They are not wide enough for cattle with a little extra horn. Partition between stalls is 4 ft. at back and is 4 ft. 6 in. at head, and in front of cattle is 4 ft. 10 in. high. Partitions in front of boxes are 6 ft., and between 5 ft., except for bulls, which run nearly 6 ft. also. Mangers in boxes are 8 ft. deep and 14 in. wide and about 18 in. up from floor. Motor sets on a platform suspended from joists, driving a main shaft from which we run pulper, straw cutter, etc. Pulper can be moved from one end of root house to the other, keeping close to the roots, as pulley on main shaft is easily moved. Pipes from large tank to smaller ones are kept up at ceiling and run straight down into small tanks. Where water is taken off for supply to horse stable, etc., we have a Globe valve and connection to which we attach hose to supply thresher engine when threshing."

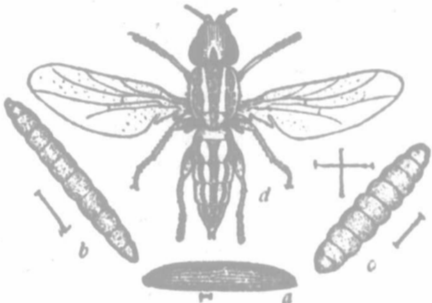
Injurious Insects -- "Dead Heads" in Manitoba Wheat.

BY DR. J. FLETCHER, DOMINION ENTOMOLOGIST, OTTAWA.

A subject which has attracted a good deal of attention and given rise to much discussion among farmers in Manitoba during the last two or three years is the cause of the so-called "dead heads" in wheat. While it is possible, I believe, that these may be due to two or three different causes, I feel convinced that much of it at any rate is due to the attacks of the maggot of the fly which in Ontario and other parts of Canada injures wheat and barley in a precisely similar way to that which in Manitoban wheat is known as "dead heads." The wheat-stem maggot, which, owing to its attack at the roots of wheat plants, is also called wheat-bulb worm, occurs all through Eastern Canada, and, although the adult flies are enormously abundant in meadows and prairies all the way from Northern Quebec, through the Lake Superior region, Manitoba, and the Northwest Territories, its attacks in grain fields have not been complained of under its own name until last season, when it was discovered by Mr. Geo. Greig, the Manitoba editor of the FARMER'S ADVOCATE, to be the cause of, at any rate, some of the injury. In company with Mr. Greig I was able to confirm his observation at several points in the Province of Manitoba during the past summer. The wheat-stem maggot, however, cannot be claimed to be the only cause of this characteristic effect, for we found near Deloraine, in Southern Manitoba, that many "dead heads" in the corner of one field were due to bruises by hailstones which had struck the stems after the ears had separated. It is probable also that "dead heads" are produced in wheat in the same way that they are in various grasses, by having

the juices of the stems sucked out by various plant bugs. Prof. Otto Luggler, the State Entomologist of Minnesota, has also found that "dead heads" are caused by the attacks of the maggots of another small fly, a frit fly (*Oscinis soror*, Macq.), the maggot of which he described as boring inside the lower portion of the culm. It has been supposed by some Manitoban farmers that "dead heads" were due to the attacks of the larvæ of the wheat-stem sawfly (*Cephus pygmaeus*). This, however, I feel sure is a mistake. Although the stems are sometimes seriously injured by the burrowing inside them of the larvæ of the sawfly, it is seldom or ever that the whole stems are destroyed and the ear turns white. Another cause to which this loss

has been attributed very generally is an obscure fungous disease. With regard to this last suggestion, all I can say is that having searched for it I have failed to find any trace of such a disease. The presence of the wheat-stem maggot in a crop of wheat is very easily detected in the summer time when ears of injured stems turn white before the rest of the crop ripens. If the stems be examined carefully it will be found that the base of the topmost joint has been gnawed away by a slender, glassy, green maggot, a quarter of an inch long. It is this injury to the growing part of the stem that causes the death of the heads before the grain ripens. The injury is known in various parts of Canada under the different names of "white heads," "bald heads," and "silver top." There is another attack on the wheat crop by the same insect which is harder to detect. This occurs in the root shoots close to the ground, not only in wheat and barley, but also, and perhaps much more generally, in various kinds of grasses. The severity of the summer attack in the top joints seems to vary very much in different years accord-



THE WHEAT-STEM MAGGOT (*Meromyza Americana*, Fitch).

ing to the season. Occasionally the injured stems will constitute as much as 25 per cent. of the whole crop. This was the case three years ago near Rounthwaite, in Manitoba, and in Ontario is recored as having been as much as five per cent. When full-grown, the maggot of the brood which causes the "dead heads" works its way up to the upper portion of the sheath and turns to a slightly flattened and very transparent green puparium, from which the fly emerges at the end of July and during August.

There are three distinct broods of the perfect insect. These appear during June, at the end of July, and at the end of September. They are active, elongated, greenish-yellow flies, one fifth of an inch in length, with shining green eyes, and three dark stripes down the back. The legs are short, the hind thighs thickened, and when the fly is at rest the fore part of the body is raised. Very soon after emerging the sexes pair, and the eggs for the next brood are laid on the upper surface of the leaves of grasses and wheat. These are snow-white, spindle-shaped, as shown at A, and beautifully marked in narrow lines.

Remedies.—Should the attack of the wheat-stem maggot increase seriously, which from past experience it may be confidently hoped will not be the case, as soon as its presence is shown by "dead heads" much may be done in reducing the numbers of the next brood by sowing a drill or two of wheat or barley in close proximity to infested fields. This

should be sown as soon as the injury is detected, so that the young plants may be got above the ground in time to attract the females for egg laying. After the middle of August these strips should be fed off by sheep or plowed down. All stubbles should be harrowed as soon as the crop is carried, so as to start a volunteer crop which can be plowed down early in September, when all of the eggs laid upon it will be destroyed. The late sowing of fall wheat where this crop is grown could not profitably be delayed long enough to escape the egg-laying period of the last brood.

(2.) The application of special fertilizers as a top dressing when young wheat is known to be attacked will help injured plants to throw out new stools and overcome to some measure the effects of the attack. I am hopeful that the wheat-stem maggot may not be a constant source of loss to the wheat-growers of the West. The insect feeds naturally in the grasses of the prairie, to which, under ordinary circumstances, it will chiefly resort, and I believe that its attacks upon wheat, occurring so occasionally, are due to climatic conditions, which are not likely to occur every year. Another hopeful feature is the invariable abundance of a special parasitic fly (*Celinius meromyza*, Forbes) which destroys large numbers of this enemy. Wheat-growers, however, will be wise to learn as soon as possible to recognize this enemy and detect its presence, for Prof. Luggler, who has studied it in Minnesota, says that in 1895, 1896, and 1897 it was common from the Red River Valley to the central part of East Minnesota. In some parts of the States, late sown fall rye, which had made but little growth during the autumn, and which grew slowly in spring, was greatly damaged, in some cases to the extent of one-tenth of the crop. Wheat did not entirely escape, and infested plants showed the presence of the insect by their small size and weakly appearance.

Milk Fever.

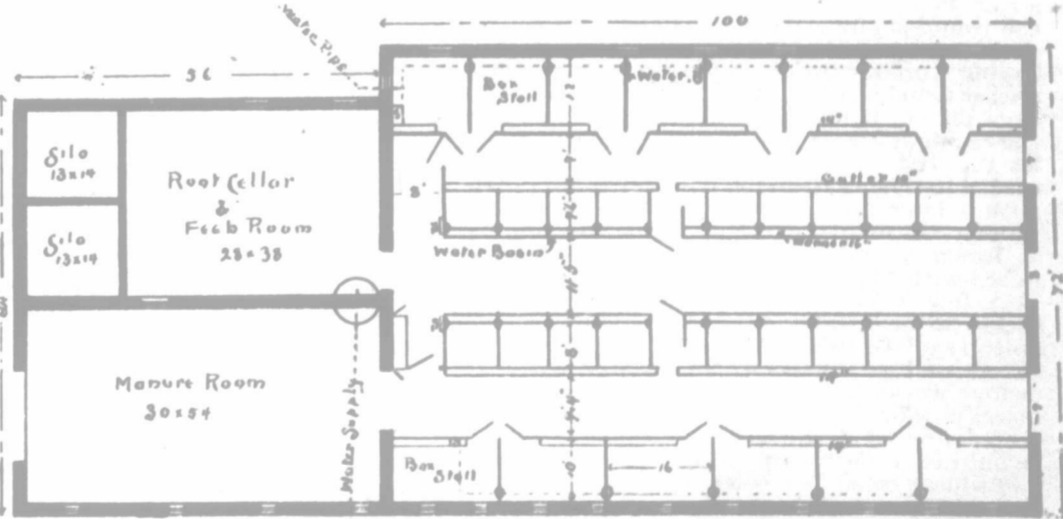
To the Editor FARMER'S ADVOCATE:

SIR,—In your April 5th issue I noticed a new system of treating a cow affected by the almost fatal malady of milk fever. We had a cow a year ago which had been moderately fed before calving, after which she gave a fairly heavy flow of milk. At the fourth milking we could hardly keep her on her feet to be milked. When through milking she dropped, never to get up again. We managed to keep her alive for almost four weeks, by the end of which time her bones started to mortify. We then shot her to rid her of terrible pain. We had milked her once before calving, but do not blame this for the trouble, but a chill by draft through stable shortly after parturition was pronounced the cause. Through this we have experienced that one cannot exercise too much care with cows at this period in regard to chills, and veterinary science tells us not to feed too much grain or roots of any kind to cows previous to time of parturition. W. J. B. Perth Co., Ont.

Found the Light.

To the Editor FARMER'S ADVOCATE:

SIR,—My brother, in a fit of economy some time ago, thought of dropping the FARMER'S ADVOCATE. He had been spending about an hour and a half each churning all winter, and when disgusted with the job, picked up the FARMER'S ADVOCATE to entertain himself while he was resting before finishing his ordeal. His eye caught an article headed, "Difficulties in Churning." He made the ideas expressed practical, overcame his tri-weekly trouble, and now he goes about a happy man, with sunshine in his face, and a good agent for the FARMER'S ADVOCATE. BROTHER.



GROUND PLAN OF BARN OF MESSRS. H. CARGILL & SON.

Dairy Meetings.

A series of meetings were held during the last week of March, under the auspices of the Manitoba Dairy Association, at Manitou, Pilot Mound, Minnedosa, Birtle, and McGregor. Miss Hind, the secretary, and Messrs. D. Munro and G. Harcourt, of Winnipeg, were the speakers at the latter place. D. W. McCaig, of the Dairy Association, and the Dairy Superintendent of the latter place

Turkeys.

SETTING THE EGGS—EARLY TREATMENT OF THE POULTS.

One should not be discouraged if a great number of turkeys are not raised, for even the average number, ten young ones from each old bird, gives a very high percentage—over two hundred per cent.—on the capital invested and the outlay for food. So that even less than the average increase is profitable, and most thoughtful farmers will agree with me that the insects, grasshoppers, etc., destroyed by turkeys in their wanderings, to say nothing of their fertilizing powers, will repay the cost of their keep.

At the present date (April 15th) very few turkeys have begun to lay. They should not be too highly fed, and if a successful season is expected the old turkeys should be large, strong and healthy, and should not be closely related to the male bird. At the present time plenty of range is essential, and roomy nest boxes provided in sheds, or perhaps a little straw in unused coops in the orchard or under evergreen trees will soon be taken possession of to furnish nests for the first lot of eggs. At this season they seldom show any desire to go a long distance to conceal the nests. The eggs should be gathered as soon as possible after being laid, so they will not get chilled, and should be kept in a cool, not cold, place. Those who have studied the construction and constituents of eggs, tell us that eggs should not be turned every day, nor turned at all, nor handled any more than is necessary, but be kept in a box or basket where the air is pure, and covered with a cloth; also that they should not be kept longer than three weeks before setting, though they may hatch if kept even longer. However, I should expect stronger and more lively turks if they were not kept any longer than two weeks, and I set just as soon as I get sufficient of them and sufficient hens to cover them, as I always want at least fifteen to twenty turkeys to go with one old turkey. I usually set about three Plymouth Rock hens on seven to eleven eggs each. These hens should be persistent sitters, and have nests in a room where other hens will not disturb them. My ideal nests for sitters would be a row of nest boxes about two to four feet from the ground, and having a door to swing downward to form a shelf in front when open. Through the front of this door I should like a strip of wire cloth to give plenty of air and a little light to the sitters. When this door is closed the rats will be excluded, as they will steal the newly-hatched birds if possible to get at them. The nests should be made of clean straw, and the day before setting the eggs the hen should be sprinkled with insect powder. To do this effectually, one can hang her to a nail, feet upwards, the feathers then open, and powder can be dusted all through them. A dust bath in the room also should be provided. By the time the eggs are set the strong odor of the powder will have escaped and will not effect the germ. Once a day during the hatch I open the nest doors and feed corn, and also give a supply of fresh water. A room where there is not much hammering or pounding may be best, as we are told one year an entire hatch at the O. A. C. was destroyed owing to nailing of sheeting in the incubating room. If the hens at first are not inclined to leave their nests for food, I place one hand beneath them and carefully lift them from the eggs so that none of the eggs may be broken or disturbed more than necessary. I usually leave them to feed, dust, etc., for about an hour, and return to see that two have not taken one nest, or to replace any that have not gone back, and to close the door until another day. As a rule, hens are not so good as turkeys to mother the young poults. While I depend on Rocks to do the hatching of the early chicken, I also depend on having a broody turkey in four weeks after the eggs are set to act as a mother for them. Last year the eggs did not hatch very well, and I had not nearly the required fifteen to put with an old turkey, so I let the first lot remain with a Rock hen and succeeded in raising them all, but they cast in their lot with a later flock of turkeys when it was time to wander through the fields. I find they are better as foragers and less exposed to parasites when raised with the old turkeys.

A few days is all that is necessary for the old turkey to be broody, though, of course, one cannot quite regulate such matters. I like Rocks best as sitters, and we thus keep the turkeys laying three or four weeks longer. She should be treated with insect powder a day or two before the turks are expected, and when the hatch is completed, all should be put in a roomy coop which is enclosed by a ten-foot square pen. The bottom of the coop should be covered lightly with sand or gravel to form the first meal of the young turkeys. A small heap should be placed in the pen, also one of dust and a fountain of skim milk or water. If the nests have been rat proof, the young ones should be left there until twenty-four hours old, otherwise it is safer to remove them before night to the coop. I have never had a turkey refuse to adopt the young ones, and my most successful lot was twenty-nine hatched by three hens and put in this manner with one old turkey. She succeeded in raising twenty-six to twenty-eight from unknown causes, and this year I intend to raise some in the same manner and raising some in the same manner.

GYRA.

The 15c. Hen.

BY H. T. OLDFIELD, B. C.

I heard, not long ago, a person speak of his fowls as 15c. hens, and on asking him what was his meaning, his reply was, "Well, they only lay when eggs are down to 15c." If I had not been afraid of insulting the person, I should have told him that he must be a 15c. feeder, which surely must have been the fact of the matter. It's the same with fowls as with anything else. No man can make a profit in any branch of stock-raising without he gives it suitable care.

So many people are afraid of overfeeding their fowls and getting them too fat to lay. I think I am safe in saying that the majority of fowls kept to-day are not sufficiently fed to keep them in proper laying order. I claim that fowls with a free range will not get too fat for laying, however much they are fed. I speak from experience. I once kept a flock of fowls alongside some grain stacks which the wind had blown over. We cleared up the grain as clean as possible, but there was sacks of it lying on the ground which we could not gather up. The fowls were simply running over the grain for weeks. I kept them supplied with water and roots, and they kept me more than supplied with eggs. I never before knew fowls to lay so well.

Many people feed their fowls only twice a day, and claim it to be best. Well, that's a matter of opinion. I feed three times a day. Some poultry-keepers say, to keep a hen in good condition for laying she should never have a full crop during the day. I do not agree with it. When I feed my fowls half a breakfast they will mope around as if waiting for more, and, on the other hand, if I feed a good breakfast it gives them vigor to get out and get a move on and hunt for grubs and grit, which is all we can expect them to get, unless they are running over a grain field in the fall.

The Incubator.—Somebody said, "The Incubator chick is free from vermin, therefore is stronger, and if placed in a first-class brooder it will continue to thrive, and a hundred can be raised with less trouble than a dozen under an old hen," but it does not sound feasible in my ears. It seems to me that when a man has fertile eggs sufficient to fill up an incubator he must have a good many sitting hens. I have no incubator, but am not going to run it down, for I have had no experience with one. I hatch all my chickens under hens, have a flock of about 250 laying hens, and can always find sitting hens when required. I set them on tobacco leaf on the ground, and am never troubled with vermin on the chickens. I set from 10 to 20 hens at a time, giving them 15 eggs each. When they hatch I select the best mothers and give 25 chickens to a hen. Each hen has a separate coop. That way, you see, four hens and four coops will take one hundred chickens, and give a very little trouble. The coops I made myself out of half-inch stuff, lumber being cheap here. My coops cost me about ten cents each.

The worst part of the business is, we have no market in Victoria, and a man has to run around and get private customers for his produce or be sat on by the middleman, but I am thankful to say, after three years' hard work, I have a nice lot of private customers. I stamp my name and address on the eggs with a rubber stamp, and guarantee them. I believe there is more money in poultry than in any other stock according to money invested, yet I think few farmers make as much provision for poultry-raising as they do for other stock. An estimate of \$2 as a clear profit for each hen is no uncommon limit if they are properly cared for, but 15c. attention won't do. It just depends on the care and attention. Give 15c. attention and you will get 15c. hens, and scarcely deserve it; but give \$2 attention and you will get your \$2 hen, and well deserve it.

H. T. O.

Cross-bred Poultry.

To the Editor FARMER'S ADVOCATE:

In your valuable paper I have noticed several times articles on cross-breeding of pure-bred poultry. In January 5th number there is given the results of different crosses made at the Central Experimental Farm. Perhaps a few words from a farmer's experience in crossing pure-bred fowls will not be out of place. My first experience was a cross between a pure-bred Plymouth Rock cockerel and pure Wyandotte hens. The results were very satisfactory. The cross took the color markings of the Plymouth Rock, the rose comb of the Wyandotte and the full breast of the Wyandotte. The cockerels looked to be as large as a fair-sized turkey, and the hens were at least one-third larger than either of the pure-bred stocks; the hens were just as good layers as either of the original stock, and were very much admired by the neighbors, so much so that I sold all I had, parties taking the cockerels in preference to the pure-bred, although I tried to persuade them to take the pure-bred, and even offered the pure-bred cockerels at only 25 cents each more than I asked for the cross-breds. The birds gave every satisfaction to those who purchased them. The same year I crossed a Wyandotte cock with a White Leghorn. The result was a bird not quite as large as the Wyandotte, but larger than the Leghorn, a fine rose comb and a full breast, and such layers! I crossed on these crosses, using a Wyandotte cock, and the result, a larger bird than the cross, but not quite as large as my pure-bred Wyandottes. I have one of the cross yet, the rest I sold. The hen I have is the first to start laying in fall, and the last to leave off. As she is easily coaxed to sit in spring, I consider her a valuable bird. I have always had trouble to get my Wyandottes to sit in

spring, as they prefer to lay all winter and on till last of June before they think of sitting, and some have laid all-summer without offering to sit; but our cross-bred can be coaxed to sit in spring, so I look upon her as a very convenient bird.

Eastern Assiniboia.

J. B. POWELL.

Care and Management of Sitting Hens.

Owing to the lateness of the spring we cannot look for a large percentage of our eggs to hatch, so that it is not likely that any of us will be able to get as many real early chickens as we would like. After the weather grows milder, we must give our breeding birds all the liberty possible, and begin setting eggs as fast as we can. The eggs will soon become more fertile, and the two remaining requisites to successful chicken hatching are, the kind of hen we use for setting, and the way we set her.

First, then, the kind of hen: We are firm believers in gentle treatment of all live stock, and our poultry as well as our cattle, sheep, and horses should become accustomed to being handled somewhat. The lighter breeds of fowls are too nervous to become trustworthy sitters even under gentle treatment; but the heavier varieties when treated in this way will make, with very few exceptions, good hatchers. Never set a fat, clumsy hen, as she will be certain to break eggs and trample chickens to death. Now, as to her treatment:

Have a comfortable place set apart in which to set your hen. It must not be connected with the poultry house at all, because sitting hens in the poultry house are certain to bring vermin. Then again, no laying hens should be allowed to disturb the sitters. In this hatching room provide a good dust bath and food and water. Close it so that the hatchers cannot get out of it. We have set a dozen hens at once in a place 20' x 30', and had little or no difficulty, although you must try to avoid quarrelsome hens. For nests use shallow boxes well filled with earth slightly hollowed and nicely shaped on top and covered with chaff or cut straw to the depth of an inch or two. We use earth, not for any special virtue there is in it, but because it is solid and will keep its shape. The box should be filled to within a couple of inches of the top so that the hen does not have to step down any distance to get on the nest. Place the nest in such a position that it is partly hidden. Put refuse tobacco or insect powder in the nest before setting the hen.

When a hen becomes broody, allow her to remain on her own nest for a day or two, then take her at night, dust her thoroughly with insect powder, and place her where you wish her to sit. Have her nest filled with china eggs. If she keeps the nest for a day or two you may remove the china eggs and place those selected under her. Keep fresh, clean water and grain where they can get it at all times. Dust all sitting hens with insect powder several times during the three weeks, giving a careful dusting on 19th day of incubation, putting some in the nest at the same time. Every possible precaution should be taken to see that there are no lice to trouble the young chicks. Lice destroy more chickens every year than all other diseases combined. It will be best to set several hens at a time, so that on testing out all clear eggs at end of a week, you can set some on fresh eggs again, thus saving time.

Waterloo Co., Ont.

J. E. MEYER.

The Influence of the Male in Poultry Breeding.

There is a considerable difference of opinion, even among acknowledged authorities, as to the length of time during which the influence exercised by a male bird while running with a flock of hens affects their fertility. Dr. H. B. Greene writes upon the subject:—"The answer to this question must be somewhat conjectural. A male turkey by one act fertilizes all the eggs (or, rather, the greater portion) that the hen lays during the season. But with the fowl, pheasant, grouse, and partridge, my personal opinion is that one successful coitus will fertilize a batch of eggs numbering as many as the hen would lay to form a nest and hatch. In the case of the fowl there is no reason to suppose that as many as twenty could not thus be fertilized. Certainly, twenty ova are frequently attached to the ovary at the same time, of different sizes and stages of development.—Exchange."

Fowls in Confinement.

If poultry confined in yards could be well managed, they would pay better than when given a range; but to give a small flock proper attention would cost too much labor. When one keeps a flock for pleasure, the labor is bestowed without regard to cost, but on the farm the case is different. When birds are confined they learn vices. They begin to eat their eggs, and pull feathers from the breasts and bodies of one another. This is due to idleness. If idleness can be avoided, the fowls will not learn vices. Fowls in yards become pets, and they are fed by every member of the family. As the hens soon learn to recognize their friends, they run to the attendant upon the first sound of approaching footsteps, and the result is that they are given food frequently, because they are supposed to be hungry. Their crops are always full, they become lazy and fat, having nothing to do; then, like all other idle creatures, learn vices. There is no point more essential to learn in keeping fowls in yards than that of when not to feed. All know when to feed, but to have the courage to withhold food is the most important requisite in the management.

Cement Concrete Walls.

MIXING THE CONCRETE—LAYING THE FOUNDATION—BUILDING THE WALL.

In making concrete, lay down some straight-edge boards on the ground, and drive stakes on each side to keep them from spreading. This platform should be 2 ft. square, with no sides to it. Now make a box without any bottom—just 2 ft. square, inside measure, and 8 inches deep—which will hold just two paper sacks of cement. Fill this with gravel as often as you wish your concrete gauged for walls; it is usually 5 of gravel to 1 of cement. After the gravel is measured, spread the cement on top and shovel over twice dry. By letting every shovelful drop in the same spot the pile will form a cone shape, and the concrete will mix by rolling down the sides of the pile. After the concrete is mixed dry, level it off about shovel deep and make a hole in center, and pour in about two pails of water, and work the concrete to center, and to finish wetting it, if a rose sprinkler is used it will distribute the water more evenly. Shovel this over twice, the same as it was done when mixed dry, and it is ready for use. The concrete should not be wetter than to resemble moist earth. By taking it up in the hand it will pack, but not leave any moisture on the hand.

In building walls for barns, the trench should be below frost and 20 inches wide. Fill in with concrete two or three inches deep, and then put in all the stone that can be got in one layer deep, and ram concrete around them till trench is filled. The footing should extend four inches on each side of wall. After the footing is in, nail two planks together edgewise and stand them on end for outside corner, and another on inside, and wire them together at bottom to keep them from spreading; also, tack a strip at top for same purpose. Brace them from top to stake in ground to keep them plumb. Tack a beveled strip in corner of outside plank, so that when wall is completed it will leave a beveled corner on building. Stretch a line from corner to corner, one at top, the other at bottom, from these outside plank in line with wall. Then stand upright, every six or seven feet, and opposite each other, and if wall is to be one foot thick they should be 18 inches apart, and three inches from the lines to allow room for plank and wedges. Wire these uprights at bottom, and brace them at top the same as corner plank. These wires are built in wall, and may be cut off after building is completed. Now place in plank, stand them on edge, and put inch wedges between plank and upright, one at top, the other at bottom. The top wedge should have a nail tacked in it, so as to allow the wedge to hang on plank to keep it from dropping down. Take small sticks and saw them a foot long, and place them between plank to keep the wedges tight to uprights; these spread-sticks can be taken out as wall is being built. Now fill in with concrete about 4 inches thick; place in stone in center of wall, and about two inches from plank and from each other; ram these down well and fill in with concrete well rammed; repeat till plank is filled. In raising plank, loosen the wedges, raise the plank up and let them lap about 1½ or 2 inches on wall already built; put in wedges and spread sticks as before, and fill again with concrete. These plank can be raised three times a day in warm weather. Never put in over four inches of concrete at a time before ramming. NORVAL B. HAGAR, Travelling Instructor for John Battle Estate Cement Works.

Welland Co., Ont.

Preparations for the Paris Exhibition.

In the division of the work recently made by the Canadian Commission for the Paris Exhibition, in connection with the Government exhibits to be made on that occasion, the following was assigned to the charge of Prof. Wm. Saunders, Director of the Experimental Farms and member of the Canadian Commission:

Group 8, class 30, vegetable food products, including cereals of all sorts in grain and in sheaf, leguminous plants, tubers and roots, forage plants, flax, hops, etc.

Group 8, class 45, fruits, including all species and varieties of apples, pears, cherries, plums, grapes, and other fruits and nuts.

Since agriculture is the most important industry in Canada, a very prominent place has been assigned in the Colonial Building to the exhibit of cereals. In this part of the Canadian display it is proposed to show specimens of all the more important farm crops, special prominence being given to the leading cereals of the country.

The space allotted to class 45, where Canadian fruits will be displayed, will be in the Imperial Main Building, where the productions of the Dominion will be shown alongside of the fruit products of all other countries, 1,587 square feet of space having been secured for this purpose. It is proposed that a grand exhibit be made here, consisting, during the early months of the exhibition, of the fruits of 1890, put up in handsome glass jars and preserved in antiseptic fluids, decorated with a number of fine specimens in pots of ornamental trees and shrubs of Canadian growth. During the summer of 1900 ample supplies of fresh fruits will be sent of the choicest character of that season's growth, so that abundant evidence may be forthcoming as to the true character of the Canadian climate and the wonderful capabilities of this country in regard to fruit production.

Dr. Saunders will be glad to receive the co-

operation of all agricultural and horticultural societies and associations in the different provinces and territories of the Dominion who may desire to aid in this good work. All those wishing to assist in making these sections of the Canadian exhibits truly national and fully representative of the great resources of this country will oblige by communicating with him. Letters may be addressed to the care of the Secretary of the Canadian Commission, Department of Agriculture, Ottawa, or to the Central Experimental Farm, Ottawa, April 4th, 1890.

Cheesemaking.

BY T. B. MILLAR.

For cheesemaking only milk that is clean, sweet and free from bad flavors should be used. To the cheesemaker I would say inspect closely all milk delivered at your factory, and reject anything that will not make good cheese. Having carefully selected the milk, heat gradually to 80° or 86°, stirring frequently and gently to keep the cream from rising and the milk from scalding on the sides of the vat. After the heat is up to the desired temperature, make a rennet test immediately to ascertain the degree of ripeness. If the milk is working slowly, a small quantity of nice flavored starter would be an advantage. Set the milk so that it will dip in from 2½ to 3 hours with from ¼ to ½ in. acid. Use enough rennet to cause perfect coagulation in from 30 to 35 minutes (I am now speaking of summer cheese), allowing the curd to become fairly firm and to break clean over the finger before cutting.

Commence cutting with the horizontal knife, cutting slowly, then follow at once with a perpendicular knife, but with this knife, to make a good job, it is necessary to draw it quickly through the curd and thus secure a clean cut, instead of driving the curd before the knife. Generally speaking, cutting three times is quite sufficient, but if the knives are coarse or if agitations are to be used, I would recommend giving an extra cut. Stir gently for 10 or 15 minutes, and see that the curd is free from the side of the pan before turning on any steam. Then heat slowly for the first 15 or 20 minutes, taking from 35 to 45 minutes to raise the temperature to 98°. After turning off the steam stir continually for 15 or 20 minutes, and occasionally after until the curd is ready for dipping. In most cases it is advisable to run off part of the whey soon after the heating is completed, and see that the curd is well cooked before sufficient acid for dipping has been developed.

Dip the curd with from ¼ to ½ in. acid, and by the hot-iron test, and have the curd in such condition that it will not require much stirring in the sink. Have the curd from 4 to 6 inches in the sink, and leave until matted sufficiently to turn without breaking, then cut in strips about 6 inches wide and turn often enough to keep the whey from gathering in pools on the curd. When turning the second time it may be doubled, always turning the cold ends or sides in and thus secure uniform maturing.

Mill the curd when it becomes flaky and will show from 1½ to 1¾ in. acid by the hot-iron test. I would not be guided altogether by the amount of acid, but by the acid and the condition of the curd. I would use a mill that would leave the curd of a uniform size and not too large. After milling, air well by stirring, and if the curd were maturing slowly, I would pile deep and stir out frequently. Air and mature well before salting; salt according to the amount of moisture in the curd and the length of time you expect to hold the cheese in the curing-room, for the curing-room must also be taken into consideration. Usually from 2½ to 2¾ lbs. of salt to 1,000 lbs. of milk is about right quantity. As soon as the salt is dissolved, put to press and see that the temperature is not over 85° or under 78°. Apply the pressure slowly at first, and leave the cheese in the hoops for 45 minutes before bandaging. Pull up the bandage neatly and trim off the shoulders that are almost sure to be on them. Put back to press, turn in the hoops in the morning, and see that they are finished in first-class shape before being taken to the curing-room.

The Mare at Foaling.

As the period of parturition approaches, the mare should be carefully watched and when definite symptoms appear (with which all breeders are familiar and I need not enumerate) a careful and intelligent man should stop with the mare until delivery has taken place. In most cases the act will take place in a normal manner without extraneous interference, but in many cases this happy termination of this most important event does not occur and conditions present themselves that endanger the life of the offspring or the dam or both. In many cases of this kind the intelligent interference of an intelligent man (not in all cases necessarily an obstetrician) will bring to a successful termination the birth of the young, while without this interference there would certainly be the loss of the foal and sometimes also of the dam. Of course, the interference must be intelligent and opportune. Uncalled for or inopportune interference is as much to be condemned as neglect to render the necessary aid when required.

The attendant should remain quiet and out of the sight of the mare if possible, especially if the

mare be a primipara (a mare bringing forth her first young). When the labor pains become frequent and long continued, if he observes that all things are proceeding in a normal manner, and birth will take place without aid, he should not interfere, but, on the contrary, if parturition is not advancing in proportion to the pains, he should, as carefully and quietly as possible, ascertain what is hindering the act. It may be due to some slight malpresentation of the foetus, such as a deviation of the nose or a foot, which can easily and quickly be rectified, or the cause may be more serious. Having, if possible, ascertained the condition, he must decide whether or not he can remedy it; if so, he must do so as promptly and quietly as possible, and if not, he must as quickly as possible secure more skilled assistance. Even though delivery may take place in an easy manner, conditions that require attention frequently occur. For instance, the foal is frequently born enclosed in the fetal membranes, which have not become ruptured, and it will quickly suffocate unless liberated. Instinct teaches the mare to tear the membranes with her teeth and thereby allow access of air to the young, but in the majority of cases the mare is more or less exhausted and will lie still for a few minutes after the foal is born, while in the meantime the young animal perishes. The attendant should at once liberate the young when this condition is present; should also attend to the navel cord, which, in these cases and in many others, is still intact and attached to the membranes. He should tie a soft, strong cord tightly around the cord, about an inch from the belly, and cut it off with a dull knife about an inch below the string; he should remove all mucus from the mouth, nostrils and eyes of the foal, and unless the dam is giving the necessary attention he should, with a wisp of straw or a cloth, apply brisk friction to the body in order to dry it and encourage circulation.

If the foal is unable to rise, he should assist it to its feet in about half an hour, and endeavor to get it to suck, and repeat this every half hour until it is able to help itself. He should ascertain whether all natural openings in the body are pervious, such as the anus for the passage of the feces and the urethra for the passage of the urine, and also the eyes. A very frequent cause of death in the foal at from one to four or five days old is retention of the meconium (the matter that is present in the intestines at birth); this exists in small balls or pellets of a dark brown or black color and about the consistency of putty. These balls are often of such size that the little creature has not sufficient strength to expel them, and the practice of giving purgatives, as oil, aloes, melted butter, lard, honey, etc., in such cases cannot be too highly condemned. Purgatives in such cases do not act upon the parts in which the trouble exists, viz., the large intestines, and especially the rectum, and while they cause an increase of the peristaltic action of the bowels and a fluidity of the contents of the small intestines, they do not remove the existing trouble and often cause death from exhaustion. The index finger should be well oiled, first cutting the nail to avoid irritation to the parts, and carefully inserted into the rectum and all of the lumps that can be reached removed, after which an injection of a little raw linseed oil or a little soap and water should be given. This operation should be repeated every few hours until the feces become yellow, which tells us that the meconium has all passed and that the milk taken after birth (or the feces formed therefrom) are passing, when, with rare exceptions, all danger of constipation will be passed. Retention of the meconium more frequently occurs in cases in which the milk has been escaping from the mare for some time before her delivery. The first milk (the colostrum) is of a viscid, thickish nature, a sort of an amber color, and has a laxative action. When this has run away before birth, constipation is more likely to occur in the offspring than in other cases in which the young animal receives it. In some cases it is necessary to give a laxative to the foal, but where injections, etc., will effect the desired result they should be avoided, as superpurgation or diarrhea is very easily induced and frequently proves fatal in a short time. Where it occurs, probably the best remedy is laudanum—about one to two drams in a little of the mother's milk every two or three hours until the diarrhea ceases.

The attention to the dam will depend upon the complications that have arisen during parturition. In normal cases nothing is needed except to keep her warm. Give a warm drink and bran mash an hour or so after delivery, and feed sloppy food for a few days. If the afterbirth has not been expelled in six to eight hours it should be removed by hand. More serious complications should be attended to by a professional man.

If the mare is to be bred again she should be taken to the stallion during the second period of heat after delivery. We know that the practice of breeding her at nine or ten days after delivery is commonly followed and generally with success. The success of this practice is the only point that can possibly recommend it. I consider it irrational, as it is almost impossible that the generative organs can have regained their normal condition in so short a time, and if there be any discharge from the uterus or vulva, there is a danger of causing disease in the stallion and also aggravating the diseased condition of the mare. It would certainly be safer and more rational, and, I think, just as successful, if we would wait until the next period of estrum before breeding.

HORSEMAN.

Agriculture at the Recent Session of the Ontario Legislature.

It will be remembered that at the first session in 1898, legislation was passed dealing with the

SAN JOSE SCALE.

During the past year, Mr. Geo. E. Fisher, with a large number of assistants, has been carrying on an extensive inspection of nurseries and orchards, principally in the Niagara Peninsula. Messrs. Bennett and Woodbridge have looked after Essex and Kent. In order to make the Act more workable, a few amendments were proposed this year by the Minister of Agriculture. One is that in case an orchard is found to have infected trees scattered here and there through it, and it is thought advisable and in the public interest to cut out and destroy the whole orchard, this may be done after a report by a second inspector, thereby saving the expense and time of having every individual tree examined. This is considered warranted because of the terrible devastation of the insect, as proven in several of the States. It was reported that in Maryland one block of 27,000 peach trees was destroyed last year. The next point in this Act is one that is of still greater importance. From the 1st day of April, 1899, no nurseryman or agent is allowed to sell any nursery stock until the same has been fumigated by hydrocyanic acid gas, in accordance with regulations provided by order of the Lieutenant-Governor-in-Council. We understand that the carrying-out of this work has been entrusted to Prof. Wm. Lochhead, the Entomologist at the Ontario Agricultural College, Guelph, who has lately visited some of the States where such work is being carried on, and who is now at work among the nurserymen, advising as to methods, inspecting fumigating-houses, etc. Every bunch or package of nursery stock purchased must have attached to it a tag with certificate of fumigation. The enforcement of this part of the Act should give us clean stock, for it is well established that all forms of insect life are destroyed by hydrocyanic acid gas, but the trees themselves are uninjured. In order to meet the increased work under this Act, the grant has been increased to \$20,000. If, however, our fruit-growers are saved from the enormous losses that have fallen to American fruit-growers, it will be money well spent. This scale is the most destructive enemy that has threatened Canadian orchards.

BUTTER AND CHEESE EXCHANGES.

The next bill affecting agriculture is one providing for the organization of butter and cheese exchanges. At the present time there are a score of "cheese boards" in Ontario. These are gatherings or associations for the purchase and sale of cheese and butter. They are somewhat loosely organized, and do not fully meet the end desired. In many cases the sales off the board greatly exceed those made on the board, and many disputes have arisen, for the settlement of which due provision has not been made. This Act proposes to provide for such associations, based on a statutory foundation, and providing for by-laws and regulations that can be enforced in courts of law. The organization is simple and inexpensive. An agreement is drawn up and the by-laws submitted to the Minister of Agriculture. When these are approved, the declaration and by-laws are filed in the local registry office, and incorporation thereby takes place. The expense, therefore, is practically nothing. The by-laws of such an exchange will provide for an inspector, who will have power to settle disputes between buyer and seller, and thereby both parties will be placed on an equal footing. The Act, of course, is not compulsory, but purely voluntary, and those who prefer to buy and sell to suit their own convenience are as free to do so as before. It places cheese boards on somewhat the same footing as cheese- and butter-manufacturing companies.

AGRICULTURAL EDUCATION.

The subject of agricultural instruction in public schools came up several times, being introduced by members on both sides of the House, and the opinion was apparently unanimously in favor of such instruction. The Minister of Education put through a bill empowering rural public schools to engage, if desired, the services of graduates of the Agricultural College to give instruction. To these classes, farmers and others interested might be admitted if they desired to attend. The Minister explained, however, that this was purely optional with school trustees. He stated that, beginning with Sept. 1st, agriculture would be a compulsory subject in all rural public schools, and that an examination in the subject would be required. It is presumed that it will be placed in the fourth form. Some subject now in the course will have to make way for it. This will be a matter to be dealt with in the Regulations of the Department, which may be looked for in the next month or so.

MISCELLANEOUS.

The Western Dairy School at Strathroy came up for discussion; and the announcement was made also that Mr. Sleightholm had resigned, and that another Superintendent would have to be appointed. The selection has not yet been made.

With the exception of the doubling of the grant for scale inspection, the votes were about the same as in 1898. Special deputations waited on the Government in behalf of four new grants. The Guelph Fat Stock Club asked for \$500. They got \$150 as a contribution on behalf of the College in connection with instruction of the students. A deputation representing the students and the Experimental Union asked for a new hall at the College and increased accommodation for students. There is no grant this year for this purpose. Representatives of some of the live stock associations asked for an extra \$1,000, to extend a sales scheme, but the Government did not accede to their wishes. The Board of the Toronto Industrial asked for a grant for a Provincial dairy building. Five thousand dollars (with conditions) was placed in the supplementary estimates, but when the champions of London and Ottawa and other exhibitions had been heard from, the Premier suggested that the vote be dropped, and this was done accordingly. It will be seen from this that the Government does not grant every request for money, and it should be further stated that the Opposition do not approve of every grant that the Government does sanction, for they moved that the agricultural vote be reduced by \$8,100, made up as follows: Western Dairy School, \$2,600; Pioneer Farm, \$1,000; instruction in spraying, \$2,500; and printing of reports and bulletins, \$2,000. This, however, the Government did not accede to, and the grants therefore stand.

Crossing Beef Breeds with the Buffalo.

Mr. Mossom Boyd, of Bobcaygeon, County of Victoria, Ont., is, we understand, conducting a series of interesting experiments in crossing Polled Angus cows with a pure buffalo bull, with the dual object of stamping these cattle with the robustness and vigor of the bison, also, and chiefly, of producing hides carrying heavy coats of hair from which a valuable class of sleigh robes may be made, which will combine size, strength and durability in a high degree. The produce of this course of breeding are said to be very large and thrifty and to have the fore parts of the buffalo strongly marked in their make-up. Experiments on a less extensive scale are being made in crossing the Hereford cows with the buffalo bull. The result of this innovation has not been sufficiently tested, we believe, to indicate with any considerable certainty whether it will be a successful venture or not, but another experiment in breeding which is being made at the same establishment, and which has proved eminently satisfactory, is that of crossing the two beef breeds, Herefords and Polled Angus, to produce good feeding cattle, the bulls of the latter being mated with cows of the former, with excellent results, a splendid class of polled Herefords being the outcome, and being uniformly thrifty, good feeding and early-maturing animals. If Mr. Boyd succeeds, as the probabilities indicate that he will, in establishing a superior breed of beef cattle without horns, he will have done much towards solving the problem of producing a class of cattle well suited for ranching purposes and the export trade. Of course, the crucial test of the experiment will come in the effort to continue the crossing judiciously so as to succeed in fixing a type that will reproduce with a reasonable degree of uniformity, and it is here that intelligent skill will be required. We shall watch with interest the results of this enterprise, and cordially wish Mr. Boyd success in his laudable undertaking.

Ontario Agricultural College Dairy School Closing.

The seventh session of the dairy school at the Ontario Agricultural College, Guelph, closed on March 25th. The number in attendance was 115—16 of whom were ladies. The majority remained for the full term of three months, and 44 wrote for certificates, with the results that 34 passed in all subjects, headed by C. W. McDougal, Guelph, Ont. In cheesemaking, 34 passed in practical work and 34 in written examination. In buttermaking, 28 passed in practical work and 29 in written examination. In milk testing, 32 passed in practical work and 27 in written examination. In cream separators, 21 passed in practical work and 19 in written examination. In dairy lectures, 22 passed, and in outside lectures six escaped being plucked.

Pasteurizing-Sterilizing Milk.

A great deal is written these days about sterilizing and pasteurizing milk. Many have been led to believe these two terms synonymous, meaning the same thing. Not so. In the case of pasteurizing, the milk is heated to a temperature of 155° to 160° Fahrenheit. In the other case the heat reaches 212° or more. Pasteurized milk will not keep sweet so long as sterilized milk, because the heat has not been sufficient to kill all the bacteria or germs in the milk. Sterilized milk is said to keep sweet so long as tightly corked and the air excluded. Butter made from both pasteurized and sterilized milk is said to keep longer, but in the heating process the quality of the butter is more or less injured. —*Southwestern Dairyman.*

English Notes.

INTERNATIONAL CONVENTION OF SHEEP BREEDERS.

The announcement made elsewhere in your columns of the proposal for an international conference of sheep breeders is one that is perhaps one of the most important notifications that have been made in respect to the sheep-breeding industry of the world. Personal interchange of opinion between the principal representatives of any breed in one country with those of another would be certainly advantageous to all parties concerned. The time has gone by when selfish motives or differences should be allowed to prevent a free interchange of opinion. Nowadays commerce knows no country, the market is the world at large, and the breeders of sheep, be they of Canada, the States, Argentina, Australasia, or England, have but one interest to promote, and that the prosperity of the breeders as a whole, for no matter what may be argued to the contrary, it is a fact beyond dispute that their interests are common to all, and the better or more successful any particular section of the composite whole is doing, the better, though it may be to less extent, is it for the remainder.

The idea is, of course, a novel one, and it marks in a pertinent manner the progress of ideas, as well as the great facilities of intercommunication between the different countries of the world. Novel, therefore, though the proposal is, there is no reason why its results should not be of great utility and value for all countries. Take, for instance, the want of uniformity of the export certificates issued by the English societies, and the consequent care that has to be taken to see that all the requirements of the laws governing the entry of the sheep into the Canadian or the American flock books, as but one point wherein there is great reason for increased simplicity, as well as greater uniformity. Surely if the matter were fully thought out by the societies on your side of the Herring Pond, there could be no great difficulty in making a mutual arrangement general to all societies that would be of value to all concerned.

That this is one of the principal hopes of the proposer of the conference we feel assured, for at the meeting of the National Sheep Breeders' Association, at which the aforementioned suggestion was adopted, there was agreed to, so far as concerns the English societies, an arrangement with the Flock Book Society of the Argentine breeders whereby full arrangements satisfactory to both parties were arrived at. The publication of the terms of this agreement are only awaiting its ratification by the Argentine Society.

This fact shows that there is every reason to presume that the ultimate result of a conference, such as is hoped will be gathered together at York in 1900, the last year of the nineteenth century, will be that once a sheep is recorded in its flock book in the country of its origin, there will exist not the slightest difficulty for its transference to the corresponding flock book in any country in the world.

Then, again, certainly no more appropriate time could have been chosen for an international conference, for not only will the representatives from your country be able to visit the Royal Show at York, where all the principal breeds of England will be represented by select specimens, but the opportunity will be afforded of becoming acquainted with the principal breeders of England and other countries, and also of taking a trip to Paris to see the great exhibition that we trust will be held in that capital next year. Quite a number of enquiries for sheep have recently been received from Canada and the States, many of which can be traced to the medium of the FARMER'S ADVOCATE, but most of them being for sheep to be shipped before the regular sale season in England, the values and prices quoted are for small lots, which makes the cost of them far greater than it need be.

The matter of purchasing sheep for breeding purposes is one that needs some explanation, and if the *modus operandi* were to be as follows: select your agent, inform him of your requirements, and entrust him to buy and select your desired number of animals to the best advantage, sending him a certain sum of money, beyond which he was not to give, this would enable your agent to visit, as they occur, the sales and fairs (not shows) whereat the specimens of the breed are generally disposed of, and to secure those you desire at public auctions, at prices far lower than it is ever possible to secure by private treaty. The essence of the whole matter is *trust*. You must trust your agent, and in order to secure yourself, your remittance could be made payable in London on presentation of the receipted bills, etc., for the sheep purchased. The agent would in these cases agree to do the work at either so much per head or on a certain commission, and, being entirely dependent upon the continuance of your patronage by the result of his selection on arrival at your home, would naturally take care to send only those animals which were first-class, and the best that could be bought at the price you gave him. In other words, the agent, untrammelled by any instructions from the purchaser, would have to act entirely upon his own responsibility, whereas, on the other hand, the general way that instructions to purchase come over is that certain points are to be given attention to, and certain of equal importance are unnoticed; and thus an agent is often compelled to leave cheaper and better sheep in the aggregate because certain specified points are absent. Trust all to your agent, and you may rest fully assured that, if he is a reliable man, you will be well pleased with the result that will follow the adoption of this advice. W. W. C.

Remedies for Smut in Oats.

BY DR. WM. SAUNDERS, OF OTTAWA, DIRECTOR OF EXPERIMENTAL FARMS.

The disease known as "loose smut" in oats is very generally distributed throughout Canada and the United States and seems to be more or less prevalent in almost every country where oats are grown, and is the cause of a large annual loss to farmers. In some parts of the Dominion this disease has of late years become very troublesome, especially in those districts in Manitoba and the North-west Territories where oats are largely cultivated, and in some instances the loss from this cause has reached serious proportions. The manner of growth and propagation of this form of smut has been fully explained in Bulletin No. 4 of the Experimental Farm series, prepared by Dr. James Fletcher, Botanist of the Dominion Experimental Farms. Copies of this publication may still be had on application to the Director.

COPPER SULPHATE AS A REMEDY.

Experiments as to the best remedies for this disease have been conducted for some years past at the several Experimental Farms. The copper sulphate (bluestone) which is so successfully used for the "bunt" or "stinking smut" in wheat—by thoroughly wetting the grain before sowing, with a solution of one pound of the bluestone dissolved in three gallons of water, and sprinkling this quantity on ten bushels of wheat—has not given very satisfactory results when used for the "loose" smut of oats.

HOT WATER TREATMENT.

Soaking the oats in water heated to 132 to 133 degrees Fahr. for five minutes has been found to give good results, but the maintaining of the exact temperature during the time of treatment, which should not be allowed to rise above 135 or fall below 130, is a very difficult matter for the ordinary farmer to manage.

POTASSIUM SULPHIDE.

Potassium sulphide, known also as sulphuret of potash or liver of sulphur, has proved an effectual remedy. (See Report of the Experimental Farms for 1896.) This is used in the proportion of 1½ lbs. of potassium sulphide, dissolved in twenty-five gallons of water, and the oats steeped in this solution for twenty-four hours. From the results of experiments made in 1897 (see Exp. Farm Report for 1897) it is shown that this remedy is not so successful when the grain is soaked for the shorter periods of four, eight or twelve hours in place of twenty-four hours. The soaking for twenty-four hours is inconvenient, and swells the grain to such an extent as to make it difficult to sow.

BORDEAUX MIXTURE.

Bordeaux mixture made with 4 lbs. of copper sulphate and 4 lbs. of lime in 40 gallons of water, and soaking the oats in this fluid for four hours, gave fairly satisfactory results in 1897. (See Report of Exp. Farm for 1897, page 9.) Experiments were repeated with this material in 1898, which have shown that while this treatment materially reduces the proportion of smut, it has not proved a complete remedy.

FORMALIN A SATISFACTORY REMEDY.

Formalin, or Formaldehyde (which are but two names for the same thing), has been recently tried for "loose smut" in oats, and has given the most satisfactory results. This liquid is a 40 per cent. solution of a chemical known as Formaldehyde, a fluid made from Methyl alcohol. Experiments were conducted in 1898 at each of the Dominion Experimental Farms with this material. The Formalin was mixed with water in two different proportions—one of 3 ounces to ten imperial gallons (equal to about 2 parts in 1,000), and the other 4½ ounces to 10 gallons (equal to 3 parts in 1,000). Three varieties of very smutty oats were selected for this test, and samples of the same lot sent to each Experimental Farm, so that the results might be fairly comparative. The oats were soaked in the liquid for two hours, and a plot of the grain untreated was sown alongside of the treated grain for comparison.

The results obtained show that Formalin may be regarded as a most satisfactory remedy for this disease, acting in most of the experiments as a complete preventive. The Superintendent of the Brandon Experimental Farm, Mr. S. A. Bedford, tried some further experiments in steeping the grain in the solution of Formalin for shorter periods, reducing the time to thirty minutes, ten minutes, and five minutes, and obtained results equally good with those had from the soaking for two hours. Further tests will be made along this line at all the Dominion Experimental Farms during the coming season. From the results obtained from these tests at the Experimental Farms and similar trials which have been made with this remedy in the United States, there seems no reason to doubt that Formalin may be regarded as a safe and successful remedy for this disease, and it is probable that soaking the grain for ten or fifteen minutes will be quite sufficient.

COST OF TREATMENT WITH FORMALIN.

The Formalin (or Formaldehyde) of commerce is sold at wholesale for about fifty cents per pound, and may usually be bought at retail for about seventy-five cents. Supposing it to cost eighty cents (equal to five cents per ounce), the ten imperial gallons of solution, of the strength of two parts to the 1,000, would cost fifteen cents, and that of three parts to the 1,000, twenty-two and a half cents. As

the same solution may be used for successive samples of the grain, the cost of treatment would be small. It would, I think, be wise in all cases to use the stronger solution, and soak the oats in it for not less than fifteen minutes.

When steeping the grain in the Formalin solution, a good plan is to enclose it in bags made of cheese cloth or some other open fabric which will allow of the free passage of the liquid through it.

The Cost of Pork Production.

BY AN EXPERIMENTER.

The problem of profitable pork-production to suit our present markets is one difficult to solve, and too often results are anything but pleasing when the balance sheet is made out. It is possible that a discussion of the relative feeding values of a few of our more common and suitable feeding stuffs would be of some interest to feeders, and the following notes are accordingly submitted.

Most of the common feeding stuffs are rather high-priced at present, when we consider the price of the product in the shape of pork, and it is, therefore, the more imperative to select such feeds as will give the greatest weight of pork for the amount fed, as well as meat of the best quality. The wise feeder will always remember that there are two markets to be considered: the local and the foreign, or that catered to by the bacon manufacturer.

In feeding for the local market, the feeder can often pay much less attention to quality, and devote his energies to securing great daily gains. Great gains, as a rule, are economical gains when pigs are under 200 lbs., and small gains are expensive. The pig that increases at the rate of 2 lbs. per day does so at a much less relative cost than the one that does so at, say, 1½ lbs. per day. The 2-lb. per-day pig, however, is likely to make soft bacon, and will not command as high a price as the 1½-lb.-a-day hog. The difference in price will not offset the greater cost, but the market for the 2-lb.-a-day hog is limited, while the 1½-lb.-a-day hog is, practically speaking, master of the situation, for his market is the best in the world.

The feeds which seem to be, generally speaking, certain of producing good bacon are rather few in number—oats, peas and barley being the only cereals which are at all certain, if fed alone, of producing a No. 1 article.

A limited supply of skim milk or whey along with these grains materially increases the gains from a given quantity fed. The value of skim milk and whey when fed with grains varies inversely with the proportion fed. When a fair amount of it is fed, say 4 lbs. per day, it apparently adds to the fattening power of the grain, as well as exerting its own proper nutritive function. Experiments conducted at the Central Experimental Farm, Ottawa, and elsewhere, indicate that care must be exercised in using this feed, as a large quantity seems to affect the quality of the meat indirectly by causing rather rapid fattening.

The most important principle to be observed in feeding for bacon seems to be the development of the animal naturally. Let his weight come as far as possible by growth rather than increase of fat. To this end, therefore, it is necessary to feed a ration containing a high proportion of flesh-forming food, and peas, oats and barley fill the bill. Any one of these grains fed alone will not, as a rule, give such good gains as a mixture of them. Variety is usually a very important consideration in feeding animals, and the pig is no exception.

In feeding for bacon, it is found that the early rations in the feeding period are not so marked in their influence upon the quality as the later, and advantage may be taken of this to use some cheaper ration during the building-up of, say, the first 125 lbs. of his pigship, care being taken to keep in a good growing condition rather than to fatten. Shorts, bran, corn and pasture or roots may, therefore, very properly go to make up his early rations, and will materially lessen the ultimate cost. With corn, it is necessary to supply a liberal quantity of foods containing protein for muscle-building and ash for the bones.

The ration which gives the greatest gain in pork for amount fed is corn meal and milk, and is in most sections the cheapest ration as well, but great care must be used in feeding it, as it is very liable to give soft pork, or at least too fat to suit the best markets. On the average, 3 lbs. of corn and as much milk will produce a pound of pork in summer, while the amount of every other grain required for a similar gain is considerably greater. Barley stands well up in rank as a rapid pork-producer, and a very high percentage of animals finished on this feeding may be expected to yield hard bacon. Peas and oats also give good results, and may be counted upon as economical and rather reliable finishing feeds.

With feed stuffs at present prices, and under usual winter conditions in Canada, a pound of gain in live weight may be estimated to cost, on the average: from corn, 2½c.; from barley, 3c.; from oats, 3½c.; from peas, 3½c.; from a mixture of oats, peas and barley, almost 3c. The above estimate takes into consideration the cost of a due proportion of milk.

[NOTE.—The question of the cost of producing a pound of pork, live weight, is one about which many are, no doubt, in the dark, and when feeds are high and hogs low it is a vital one to the feeder. We would be glad to publish the results of any careful experiments carried on by feeders the details of which will shed light upon this point.—EDITOR.]

QUESTIONS AND ANSWERS.

Veterinary.

SOW FAILING TO BREED—GIDDY SHEEP.

SUBSCRIBER:—"We have a young sow twenty months old, Improved Berkshire, which we cannot get in pig. She had her first litter last April, seven in all, two dead. The third last one had to be taken from her. Used an iron hook, which has been used for the same purpose before with good results. Would that be the cause? Have tried three different sires, five times in all—two Yorkshires and a Berkshire. Has been fed on raw turnips and oats, running in and out as she liked.

"2. A sheep, two years old, seems giddy in head; coughs some. Supposed to be in lamb. Have tried turpentine in the nose, thinking it to be a grub in the head, but with little effect. Had one die just lately which acted the same way. We are feeding her on pulped turnips, oats and some gruel. Please tell what can be the matter with her, if possible? This is my second year with the ADVOCATE. I like it splendidly."

[1. There may have been injury from the use of the hook, which has caused the difficulty, but there is no means of determining that. There are pig forceps on sale for this purpose which are said to be efficient and safe. If the sow comes in season regularly we would not despair of her breeding again. Lincoln's motto, "Keep pegging away," is the only advice we can give. We would have her served once each day while the heat continues, and keep her away from other hogs until it is over.

"2. Sick sheep are very unsatisfactory to doctor, so much so, indeed, that many shepherds do little more than administer a physic and follow up with linseed gruel. Giddiness is a symptom of diseases of the brain, impaction of the stomach, and other troubles. In this case it would seem that the stomach is wrong, although the feed the sheep have received should not put them wrong. We would suggest administering half a pint of raw linseed oil, and follow up with gentian and ginger, one dram of the former to half an ounce of the latter, once a day for a week, given in gruel twice a day to build up the strength.]

GRUBS IN SHEEP'S HEADS.

SUBSCRIBER, Ontario Co., Ont.:—"I have lost four sheep. They stood with their heads down and in about two weeks they died. I opened the heads of two of them and found two white grubs, about half an inch long, in each. I have another one afflicted in the same way. Can anything be done for her?"

[The white grubs found in the sinuses of the sheep's heads were the cause of death. They are caused by a fly depositing eggs in the nostrils of the sheep in the latter part of the summer, which hatch, and the young insect finds its way to the front sinuses of the head for development. They are very hard to dislodge before their proper time—in the early part of the summer. A sharp blow on the head, near the region in which they are located, will frequently remove them from their location, or, what we would suggest, would be to shut the sheep in a close pen and burn sulphur, causing them to inhale the fumes. But care must be exercised so as not to suffocate the sheep. The fumes may cause the grubs to seek other quarters, and the coughing of the sheep throw them off. If the sheep's noses were kept smeared with pine tar in the summer it would lessen this difficulty very materially. A skilled veterinarian may, as a last resort, cut through the skull and inject a fluid that would destroy the grubs, as the sinuses referred to are not in contact with the brain cavity.]

BLOODY MILK.

E. H., Grenville Co., Ont.:—"I have a valuable cow that made a very large bag last spring and nearly lost the hind teats, but I kept rubbing them. During the time, she gave bloody milk for more than a month. She is now starting to make a bag, looks well, and I am now milking the two hind teats. Kindly let me know whether I am doing right?"

[We do not recommend hand milking before calving, as we are of opinion it is one of the main causes of milk fever. We think that your cow suffered from a severe attack of garget, and that the udder became congested or inflamed as the result of cold by exposure. The bloody milk was an effort of nature to get rid of the material thrown out by the inflamed tissue. We would recommend that you feed your cow very sparingly, and should the udder become distended, support by means of a blanket over the loins, cutting out four holes for the teats. Give plenty of water at parturition, and immediately afterwards a dose of Epsom salts, allowing the calf free access to her for the first four days. When this practice is followed we have never been called in to treat a case of milk fever.]

DR. W. MOLE.]

LAME MARE.

C. D., St. Pierre, Man.:—"I have a heavy mare, lame in front feet. She is naturally flat-footed. She has been lame for three months. I put some oil around the coronet and some electric oil on corn inside of shoe. The horn looks burned and is very dry. Could you tell me any remedy?"

[Poultice the feet for three or four days with equal parts of bran and linseed meal mixed with hot water, changing the poultice morning and evening. After this, take the mare to a good shoeing smith and have her shod with properly-fitting bar shoes, applying at the same time leather soles with tar and tow stopping.]

W. A. DUNBAR, V. S., Winnipeg.]

LYMPHANGITIS.

YOUNG FARMER, York Co., Ont.:—"I have had several cases of lymphangitis in my horses lately. The last case was a young mare in foal. She was fed on cut straw, oat chop, whole straw, roots, etc., and was in nice, thriving condition. She was let run in barnyard part of every day. Please give cause, best preventive, and best treatment for this disease. If after treatment the leg remains swollen, is there any treatment that will reduce it to its normal condition?"

[From the fact that you have had several cases of lymphangitis it is evident that you are over-feeding them, considering the work they have to do. Thick-legged gross feeders are more predisposed to this condition than others. The cause of the disease is more chyle (digested material ready to enter the circulation through the lymphatics) than the lymphatic glands and vessels can take care of, causing congestion, swelling, and inflammation. Lymphangitis can be avoided by feeding lightly those horses which are not working, and by occasional bran mash (every other night) in which is dissolved light doses of diuretic medicine (those drugs which act on the kidneys to increase their secretion), such as saltpeter, teaspoonful doses once a week, or resin in slightly larger amounts, and by giving light work or regular exercise. The treatment for other than in-foal mares is to give a brisk purge of 8 to 10 drams aloes. Remove all food except bran mash, and after the purge operates give a course of diuretics for ten or fifteen days. Locally apply hot water constantly for four to six hours at a time in which is dissolved a strong infusion of hops, wormwood, etc., and rub in a good stimulating liniment, such as: $\frac{1}{2}$ oz. each of sugar of lead, saltpeter, spts. turpentine, and strong ammonia; 4 ounces spts. camphor; all dissolved in one quart soft water, well shaken, and apply every four to six hours. Regarding the after treatment for the thickness remaining there is little we can recommend other than regular work, careful feeding, etc. The parts become normal, or nearly so, as the lymphatic system becomes stronger. Each succeeding attack leaves the leg larger, and in no case should a horse be exercised during the acute stage except under the supervision of a competent and experienced veterinarian, as each time the swelling is removed by exercise, and returns, the leg is left larger. For in-foal mares all except the purgative is the proper treatment. When the fever is high at the very start a few light doses of tr. aconite is highly beneficial, about 8 to 10 drops every four to six hours in drinking water.]

STERILITY IN MARE.

SUBSCRIBER, Quebec:—"I have a Thoroughbred mare, 18 years old, which I desire to breed from, but she has always refused the stallion. Could you suggest some mode of conviction which would not be harmful?"

[Sterility in mares may depend upon many causes, and prolonged continence, especially old age, is a common one. Infecundity is frequently seen in mares which have worked for many years in towns and then transferred for breeding purposes. In many cases it is due to a closing of the os uteri, a circumstance more common than is generally supposed. The oestrus rutting, or heat season, marks the period of maturation in the ovarian ova, which desire continuing only a brief period, until the faculty of reproduction ceases. With regard to the period when procreation ceases in animals, it is difficult to arrive at a trustworthy conclusion. There are many cases on record of mares breeding up to the age of 25 years, but, of course, these are exceptional. We are inclined to the opinion that your mare lacks sexual desire, as we have often met with this condition in a number of breeding establishments, especially amongst Thoroughbreds. Excitable, vicious mares are less liable to procreate than those which are of a gentle disposition. It has also been observed that mares accustomed to work—active exertion, even to produce fatigue, before being put to the horse—is favorable to conception. We would first recommend that you get a competent veterinary surgeon to examine the os uteri and find out if the passage is quite clear and free from any fibrous deposit. In many cases the closure of the os may be remedied in this safe and simple operation. Then have the mare ridden or driven until free perspiration is induced; this will act as a purgative or the abstraction of blood before service. If these means fail, try full doses of camphor, say the following, which has been successful: Nitrate of potash, 1 ounce; powdered cummin, 3 ounces; powdered camphor, 1 ounce; powdered capsicum, 1 dram; salicylic acid, 2 drams; molasses sufficient to form six bolus. Give one every day before service. DR. MOLE.]

FAILURE TO BREED.

C. R., Simcoe Co., Ont.:—"I have a young purebred cow that got into a mud hole a month before calving last fall. She lost her calf a week after. I cannot get her with calf again, although she comes round regularly. Can you tell me what is the matter and what to do with her in your next issue?"

[Have the neck of the womb examined by a competent veterinarian. In all probability there was considerable inflammation following her calving, which has left a deposit at the entrance to the womb (os uteri), which obstructs the passage and which, if found in that condition, should be carefully dilated and treated with healing lotion: Creolin, 1 part; boiled soft water, 200 parts; and inject it daily for two weeks. Do not allow service for a month following treatment.]

HEIFER STRAINING.

SUBSCRIBER, Simcoe Co., Ont.:—"I have a valuable heifer rising three years old. In June she jumped out of the pasture field and was away for two days. I suppose she was in heat, but do not know whether she was with a bull or not. After returning she started to strain as if in pain, and kept this up till fall, failing greatly in flesh. She gradually got better, mended in flesh, and came in season. I have had her served twice, and after service she discharges a little blood and after an hour strains some. What is the trouble, is she likely to breed, and what treatment should I adopt? (2) My yearling heifers which have been in heat several times I notice a day or two afterwards discharge some blood. Do you think there is anything wrong in this case, and should I give any treatment? (3) Can you give any remedy for large tapeworms, about eight inches long, in pigs? Pigs are five months old and have been fed turnips and mangels, with oat chop."

[(1) The cause was probably excessive service by a strong and vigorous animal, causing inflammation of the womb. Time may bring about a healthy condition of the parts, and we would advise the use of a young bull and one service only. Heifers are liable to be injured by strong bulls. It is doubtful if any treatment would be helpful, but if the heifer gets into a healthy, natural condition she may breed. (2) This is not uncommon, and is no indication of anything wrong. (3) Give a handful of hardwood ashes for each pig in the food twice a week; also give a teaspoonful of sulphur for each pig twice a day in their food, which generally kills the worms.]

DISEASED TOOTH.

S. W. B., Sinaluta:—"Mare six years old, about eight days ago started to run at left nostril very offensive smelling pus. Took her to vet., who said it was from decaying tooth. One of her upper teeth was quite a bit lower than the rest; the vet. with his forceps broke off this tooth, and gave me condition powder to give her. I am feeding her three gallons of oats a day, either boiled or chopped, and hay. She eats very poorly, seems very weak, staggers when she walks, lies down often, and generally paws a little before she lies down. Has got very thin. What can be done for her so I can get her in condition to work?"

[The diseased tooth prevents the animal from properly masticating the food, which, in consequence, is swallowed in an unprepared state, producing indigestion, which is, no doubt, the cause of the symptoms of pain, weakness and general unthrifty condition you have described. The faulty tooth being, very probably, the primary cause of the trouble, should be entirely removed, and, as its crown has already been broken off, this can only be done by the operation of trephining. I would advise you to give the case in charge of a skilful veterinarian, who, from personal examination and observation, will be in a much better position to apply satisfactory treatment than any one who has not had the opportunity of seeing the animal can possibly be in. W. A. DUNBAR, V.S., Winnipeg.]

AILING PIGS.

J. E. G., Middlesex, Ont.:—"I have eight pigs about six months old. They did very well for the first three months, and then they began to slack back, and of late have stiffened up in their legs—both hind and front. I was feeding oats and peas, mixed—chopped together—and some bran mixed in. I have given them charcoal, sulphur, salt, salts, and linseed meal, and gave them some earth, and some fresh meat from the slaughter-house, but they are no better, but rather worse. They don't eat much now, and lie stupid the most of the time. Will you please tell me what is wrong, and what to do with them? The pen is dry and warm."

[A good many feeders have had this same experience the past winter, some who have been generally very successful in feeding fall pigs through the first winter. It is difficult to account for. It is generally considered that the best preventives of this trouble is exercise, and a sufficiency of grit, such as charcoal, gravel, etc. Our correspondent has evidently used these latter, and we could suggest no better treatment, but it does not appear clearly whether they were adopted before the trouble began. Prevention is much better than cure, and it is possible if these things had been provided earlier the trouble might have been avoided. Probably the best thing to do now is to give sun baths by letting the pigs out on fine days on the sheltered side of a building, and encourage them to pick at the first green grass; this, with exercise, will do more for them than anything else.]

COW FAILING TO BREED.

M. B., B. C.:—"We would like your advice on a young cow. She was due to calve on Sept. 23rd, 1898; lost her calf on June 27th; we bred her on Nov. 29th, Dec. 21st, 1898, and on Jan. 15th; she came in season to-day, 9th Feb.; did not breed her this time. Two days before breeding, Nov. 29th, gave her a dose of Epsom salts; washed her well with West's disinfectant fluid, also washed bull. What do you think we should do with her? We intend to let her rest for a few months."

[We cannot recommend any better course than the one you have followed, and can only counsel patience. From observation, we are satisfied it is not wise to breed a cow within three months after abortion. As a rule, cows having had this mishap will breed again, but there are a considerable number of exceptions. It is well to give her the rest you propose.]

INVERSION OF THE WOMB.

J. H. B., Megantic Co., Que.:—"What is to be done in the case of a cow prematurely calving and forcing out the 'calf-bed' or womb with the after-birth? Within this week there have been two such cases in my immediate neighborhood. In one instance the cow was at night, when fed and watered, apparently all right; but in the morning the calf-bed was hanging with the after-birth, and the cow dying from loss of blood. Being too far gone for recovery, nothing was done for her, and she died. In the case of the second one, she threw her calf at eight months, the calf-bed immediately following with the after-birth. An attempt was made to replace the womb, but it was an impossibility. The cord was therefore tied and severed, the cow dying immediately afterwards. In this case, the womb seemed to be decayed and spongy. What should have been done in these cases? Is this common amongst cows, or of rare occurrence? Can a cow live after removal of womb in any manner?"

[The cases described are not at all uncommon during calving season, although in the second case the abortion signifies a matter of more importance, as we believe contagious abortion is becoming alarmingly prevalent in some sections in Quebec, and all means should be adopted to prevent its spread, by thorough disinfection of the cow stables and keeping things clean generally.]

Regarding the treatment for inversion of the womb, first place a clean sheet beneath and around it (to protect it from straw, dirt, etc.), then carefully remove the adhered afterbirth and cleanse the organ thoroughly in clean warm water in which is dissolved a little carbolic acid (four drams to a gallon of water), after which it must be returned to its proper location by steady, persistent yet careful pressure when the cow is on her feet. This requires a strong, careful man. Place the fist as near the center of the organ as possible, and with firm and steady pressure return it, then make the following solution and inject: Powdered alum, $\frac{1}{2}$ oz.; tannic acid, 1 dram; fluid extract belladonna, 2 drams; carbolic acid, 1 dram; clean soft water, at 98 degrees or as near the animal temperature as possible, 1 quart; and inject the entire amount, remaining with the cow for some time, to prevent straining and throwing it out again. Repeat injection two following days.

Both the cases referred to died from shock. We have heard it recommended to insert a beer bottle into the vagina, bottom first, and secure there by tying a strong string to the neck and fastening the ends to a surcingle placed around the cow just before the udder. Leave the bottle in this position for a day or so, or until the cow has ceased to strain.]

INDIGESTION IN BOAR.

D. B., Hastings Co., Ont.:—"Please state, through the columns of the FARMER'S ADVOCATE, what is the matter and cure for Berkshire boar? Six weeks ago he became useless, and did not eat anything for a week or ten days, and what came from his bowels was thick and as black as tar, with a very offensive smell. He was running in the yard most of the winter."

[It is very important to be careful in estimating to what extent disease appears amongst swine. Although in this case we do not anticipate that you have the contagious disease known as hog cholera, still we look with a great amount of suspicion to the fact that your animal refused food for ten days and then voided excrement of a very black, tarry color, with a very offensive smell. This case is evidently due to some bowel trouble, and should you have any other of your herd taken sick you must report instantly to the authorities at Ottawa. This is only by way of a caution. You do not say what food your animal was taking or any symptoms other than those given, so that we are of opinion that it is due to some dietetic cause or bad feeding on offal, etc. Give a brisk purge—say two or three ounces of castor oil in feed, or one dram of powdered jalap mixed with a feed of swill. As we feel interested in your case, will you report progress for the benefit of the readers of the ADVOCATE? After the purgative, give the following powders: Sulphur, 1 oz.; black antimony, $\frac{1}{2}$ oz.; nitrate of potash, $\frac{1}{2}$ oz.; charcoal, 2 ozs. A tablespoonful in the animal's food every day. DR. MOLE, M. R. C. V. S.]

UNTHRIFTY BULL—INDIGESTION.

G. B., Oxford Co.:—"Could you or some reader of your valuable paper give me any information what ails my bull, and what treatment to use? Last spring I bought a valuable young bull with pedigree. He will be two years next May. He did very well until last November, then he began not feeding well, and has continued so ever since, gradually getting thinner and lighter all the time, refuses to eat good hay and grain, or roots either whole or cut, and when I turn him out to water he will try and get some old dirty straw around the manure pile and eat that. He looks dry in the hair and coughs a little."

[Your bull is suffering from indigestion. Give him a purge of Epsom salts, $\frac{1}{2}$ pounds; ginger, $\frac{1}{2}$ ounce; dissolved in a quart of hot water, and drench carefully when cold. After the purge operates, give him a heaping teaspoonful of the following mixture in a cup of whisky and one pint water three times a day: Ginger, gentian, bicarbonate of soda, and aniseed, of each 1 ounce; powdered capsicum, 3 drams; and powdered nux vomica, 6 drams; all thoroughly mixed. Repeat the purge in three weeks if he does not start to improve.]

LAME SHOULDER.

SUBSCRIBER, Ottawa Co., Ont.:—"I have a valuable Clydesdale mare, nine years old, carrying first foal; due to foal last week of May. She has been very lame in right front leg since 1st February last—too lame to go out to water. She gets no better. Mare worked in a team in the city until she got lame. When she walks she drags or scrapes the toe along the ground. She steps off sideways from the sore leg; keeps the elbow out from the body as much as possible. No heat nor swelling now. When standing, she keeps the foot flat on the floor, but a little ahead of the other. When she took lame, first she often stood with sore foot a little behind the other foot, with toe turned in. At first there was swelling around and above the fetlock joint, and sometimes a little swelling inside the arm of leg up near body, and sometimes swelling on the outside of the arm. Those swellings were painful to the touch. Was also swollen half way along the ridge of the neck from the point of shoulder to the throat. I never felt any heat. What is the trouble, and what should I do for her? Some people say her lameness is due to being with foal, and that she will be lame until she foals; after that she will be all right. Is this so? Can all medicines usually given to a horse be given to a mare with foal without injury to the foal?"

[The mare's trouble is high up—probably in the deep-seated muscles of the shoulder. It would not be wise to pursue any heroic treatment until she foals, and in the meantime give the entire shoulder a good rubbing, twice daily, with the following liniment: Nitrate of potash, acetate of lead, oil turpentine, liq. ammonia fort., of each six drams; tr. cantharides, 2 ounces; oil origanum, 1 ounce, and spirits camphor, 4 ounces; all dissolved in a quart soft water. After she foals we would insert a seton as near the seat of lameness as possible. In-foal mares should have very little drugs, and in no case should they be purged, especially with aloes.]

OPACITY OF THE CORNEA.

OSCAR SHIRLEY, Maine, U. S.:—"I have a four-year-old colt. One of his eyes was injured two years ago, and there is a light scum over the pupil. The sight can be seen through the scum. Can it be removed, or can you give me a remedy?"

[Opacity of the cornea of the eye is caused by an injury, and often remains as a permanent blemish, being due to the presence of the reparative material or deposition of lymph within the layers of the cornea. It is first of a bluish tinge, and is then called a nebula; as it becomes older it turns to a pearly-whitish color. With age it becomes firmer in its structure, but never entirely disappearing. From this it will appear that hope of a permanent cure or removal is not possible. Try the following, which, in some few cases when not of a long standing, has been successful in our hands: Take a piece of nitrate of silver, touch the spot light and delicately, firmly securing the horse during the operation. After two applications apply the following lotion: Goulard's extract, 1 ounce; tint. opium, 20 drops; distilled water, 4 ounces. Bathe the eye, with warm water, and apply the lotion every day. **DR. MOLE, M. R. C. V. S.]**

KNEE-SPRUNG.

W. J. K., York Co., Ont.:—"I have a Standard-bred mare rising three year old, a little weak in the knees. Would you kindly advise me what I had better do for her, and oblige?"

[Do not give her long or fast work until her legs become stronger. Shoe with a reasonably light shoe, raised about 3/4 of an inch in the heels, and if she has a thin foot, or thin at the heels, see that no undue pressure rests about the back part of her feet, as sometimes apparent weakness of the fore legs is due to tender heels, and the horse simply relieves the pressure by throwing the weight on the toe. After driving, apply the following liniment to the tendons, and bandage lightly with derby bandages for two hours after work: Nitrate of potash, acetate of lead, ol. turpentine, liquor ammonia, of each 1/2 ounce; spts. camphor, 4 ounces; soft water, 1 1/2 quarts. Shake well, and rub in with the hand from the knee down.]

CAPPED HOCK.

J. H. B., York Co., Ont.:—"I have a driver, rising four years old, with a swelling on the hock. It came on about six months ago, and I think is the result of kicking the stall while kicking at another horse in the stable. I treated by bathing with hot water and a light blister, but without effect. What treatment would you advise?"

[If we understand your enquiry, your horse has a capped hock, of which there are two kinds—serous and synovial. If the former, it should be opened; if the latter, an absorbent blister is indicated; and as we do not know which form it is we are at a loss to know exactly what treatment to prescribe, and would advise you to have a competent veterinarian at least diagnose the true condition.]

GOITRE.

SUBSCRIBER, Huron Co., Ont.:—"Please inform me what is best to do with my sheep? It has two large, hard lumps on its neck just below the head, one on each side, as large as a hen's egg. They are quite loose, but seem to press on the windpipe when he is eating. I would like to get a cure."

[The sheep is affected with goitre or enlarged thyroid glands. Clip wool off parts very closely and rub in a little of the following once daily over seat of the enlargements: Iodide of potassium, 1/2 oz.; iodine crystals, 1/2 oz.; alcohol, 4 ozs.; strong ammonia, 3 drams; water, 4 ounces. All well mixed and exposed to bright light until the liquid becomes clear, when it is ready for use.]

SORE LEG.

C. D. S., Marquette:—"Gelding, aged eight, took ill with what appeared to be malarial fever in the beginning of February. Got very weak, lost appetite, and legs swelled. Gave him linseed oil and a prescription compounded of gentian, tincture of iron, and chlorate of potash. He seemed to get better, felt well, regained his appetite, and seemed in good spirits. About a week after this improvement, got lame in the left fore leg, apparently in the cords below the knee. Leg a good deal swollen and getting worse. Used first a bottle of Hagyard's yellow oil, afterwards used coal oil and hot water. Leg no better—very hot lately, and appears to break out in a sweat. When swelling pressed, feels doughy. Giving him boiled feed, with powdered sulphate of iron and gentian. Animal appears still to feel well and appetite all right. No veterinary within twenty miles. What is the matter, and what can I do for him?"

[The lameness having appeared immediately after a debilitating disease would indicate that the ailment is probably of a rheumatoid nature. Would advise you to prepare the animal for physic by feeding exclusively on a bran-mash diet for sixteen hours and then give the following: Barbadoes aloes, six drams; calomel, one dram; ground ginger, two drams; treacle or soap sufficient to form a ball. Continue the bran-mash diet until the purgative has ceased to operate. After this give morning and evening in food for ten days: Salicylate of soda, nitrate of potash, and powdered gentian, of each one dram. Foment the leg for half an hour twice daily with warm water, and after each fomentation rub in the following liniment: Soap liniment and tincture of opium, equal parts; after which apply a bandage.]

W. A. DUNBAR, V. S., Winnipeg.]

Miscellaneous.

A subscriber of twenty-five years' standing, living in North Dakota, inquires for a scraper that can be used in cleaning out sheds where cattle have been fed loose, in which hay and straw is mixed with the manure. The sheds in which cattle are not fed any hay he cleans out with common railroad scrapers. Can any reader help him out?

CLIPPING HORSES AND ROLLING-COULTER DRILLS.

S. W. B., Sinaluta:—"1. Would you give me your opinion on clipping horses; is it beneficial?"

"2. What is the general idea of people who have used the coulters drills? Is there any advantage over the shoe drill? Would it pay to make the change?"

"3. I see by ADVOCATE several farmers recommend drawing manure from stable onto pasture. Does it not spoil the pasture for cattle? Will they eat the grass that grows where manure is spread?"

[1. Much depends on the work that is required of the horse, and the care and attention that can be given him. Some horses have naturally a very thick, heavy winter coat, which makes it very difficult to get them dried off quickly after a sweating without getting chilled, and it also makes it difficult to keep their skins properly cleaned. As a rule, however, it is safe to say that no horse should be clipped except one used for driving or fast work and that is provided with a good warm stable and the best of care and grooming.]

2. The rolling-coulters drills seem to be giving very general satisfaction; they seem specially well adapted for soddy or manured land. If your shoe drill works satisfactorily, there is probably nothing to be gained in changing, except that many who have used the coulters or disk drills claim they are lighter in draft.]

3. Manure should be applied very lightly on sod or any other land in this country; eight or ten loads per acre is quite enough. It won't hurt the pasture, and most people find putting the manure on sod the most satisfactory way of getting it incorporated in the soil. We believe most people err in applying too heavy a coat of manure in this country. **ED. F. A.]**

PLANTING A WINDBREAK.

C. A., Hernefield:—"I am desirous of planting a windbreak on my farm next spring. On what side of the buildings would you place it; when should I transplant the trees; how should the land be prepared; would I not succeed if I cut a hole out of the natural prairie sod for each tree and keep this cultivated; how far apart should the trees be planted?"

[In regard to planting the trees, I would keep them a good distance from the buildings, say one hundred to three hundred feet, depending on the lay of the ground, otherwise the trees will prove more injurious than beneficial, causing drifts around the buildings. Plant on the north-west and south-west of buildings. I would strongly advise you to thoroughly prepare the land by breaking and backsetting before setting out the trees, planting four feet apart each way, and keeping them thoroughly cultivated for three years. They will then shade the ground and cultivation will not be necessary. We find it impossible to grow these trees on uncultivated land, even if a piece of sod is cut out around the tree. It would be much better for you to put off setting out the plantation for one year, and then in the meantime have the land thoroughly prepared by breaking and backsetting for the coming season. **S. A. BEDFORD, Exp. Farm, Brandon.]**

FLOWING WELL TO SUPPLY HOUSE AND BARN.

L. WOOD, Simcoe Co., Ont.:—"I am sending you a drawing and instructions of how I am going to try and convey water to my stable from a flowing well at my house, asking you and your staff if you would kindly inform me, through your paper or otherwise, if it is practicable. The well is a two-inch pipe well, down in the ground about 100 feet, and there is a stream of water flowing out of it of about ten quarts per minute, and the outlet is about two feet above ground level. I want to know, if the conduit pipe to stable is attached to main well pipe, if the flow will rise the same height in stable as it does at present. The distance to stable is about 200 feet. Plan I. shows conduit pipe with a slight rise to stable; Plan II. shows conduit pipe with a slight fall to stable. Which of these plans would give best result, if practicable? When water is wanted at house, close Valve 2; and when water is wanted at stable, open Valve 2 and close Valve 3, which is the waste pipe to creek. When water is not wanted at stable, open Valve 3, and water will waste into creek. Of course, Valve 1 is shut all the time, only when water is wanted at house. Would I have to put another valve in well pipe just above conduit pipe to stop the water from rising at house if I wanted water at stable?"

[The accompanying plans, A and B, represent an artesian well, from which it is desired to convey water to the house and the stable, 200 feet apart.]

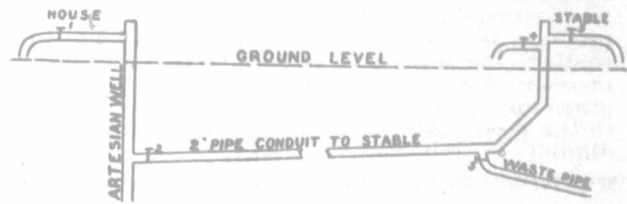


FIG. I.

In Plan A, the conduit slopes up slightly toward the stable, and in Plan B it slopes downward. The questions at issue are answered as follows:

1. The water will rise at the stable (4 and 5) as high as at the house (1).

2. It is easily seen that the downward slope, as in B, would empty the pipes better into the waste, and would keep the well clean from any sediment that might deposit in the pipes. This sediment would wash into the waste in Plan B, while in Plan A it would wash back into the well. Therefore the Plan B for laying the conduit is preferable.]

3. How to get water to the different points required. If Valve 2 is closed, the water will, of course, go to the house, with 1 open. To obtain water for the stable, it would be sufficient to close 1 and 3, and open 2 and 4 or 5. No other valve would be necessary, since if the pipes to the house were full the pressure of the water in them would help to drive the water through the pipes to the stable. Even Valve 2 is unnecessary, since if 3, 4 and 5 were closed and the pipes full, the water from the well must escape through 1.]

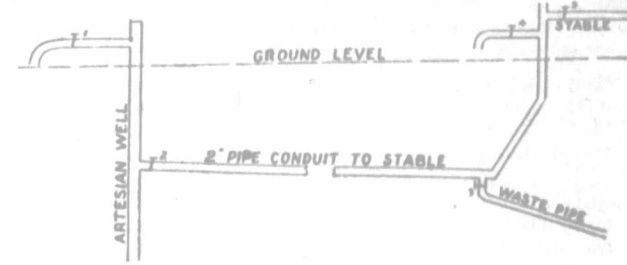


FIG. II.

It seems to me that the plan is a very ingenious and feasible one. If the frost is kept from the pipes, and the pipes are large enough to prevent choking, the system would undoubtedly operate successfully. **J. B. REYNOLDS, Dept. of Physics, O. A. C., Guelph.]**

POLLED DURHAM AND RED POLLS.

J. V., Mervin:—"Will you please tell me in the ADVOCATE what is the difference between Polled Durham cattle and Red Polls? Can they be bought in Canada? Why do their breeders claim they are better for milk than the Holsteins? Is it for quantity or quality of milk that the claim is made?"

[Polled Durhams are practically Shorthorns without horns. They originated some years ago in the United States from "sports" from pure-bred recorded Shorthorns, the first being a pair of twin heifers from a Gwynne cow. Many of the animals recorded in the Polled Durham Herd Book are eligible for registry in the American Shorthorn Herd Book; others, however, while carrying several crosses of pure Shorthorn blood, trace back to native mulley cows. The breed is not very widely distributed, and those who have been breeding them have given considerable attention to both the milking and beefing qualities, with the object of making them a general purpose breed. The Red Polls are a distinct breed, originating in the counties of Norfolk and Suffolk, England. They have undergone great improvement during recent years, and have come well to the front as general purpose cattle. They are said to have inherited the deep-milking qualities of their polled Suffolk ancestors. There are several herds of Red Polls in the United States, but we do not think there are any representatives of either breed in Canada. We are not aware that it is the claim of either breed that they are better milkers than any of the special purpose dairy breeds, whatever individual breeders may claim for their particular herds.]

EFFECT OF FOOD ON FAT OF MILK.

H. W.:—"A maintained that the percentage of butter-fat in a cow's milk cannot be increased by giving a rich ration, but that the flow of milk may. B maintained it may be increased, for that milk is richer in the fall than in the summer. Please answer who is right?"

[The question as to whether a cow furnishes a uniform product under all conditions, independent of the kind of feed used, was for several centuries answered negatively by almost universal consent. It was considered settled, but the invention of Dr. Babcock, giving to the dairy world a simple and accurate means of measuring the fat content of milk, shed new light on this problem. The reading of the Babcock test did not reveal the variation in quality of milk due to feed that had been supposed to exist, and a great many careful and practical investigators have been studying the subject during recent years. The investigations that have been conducted in Canada and the United States have generally indicated that feed has comparatively little, if any, influence in determining the quality of milk. It seems impossible at this date to decide absolutely whether A or B is correct, as recognized authorities are not quite agreed. The fact that cows give richer milk in autumn than in June is accounted for by the cows being in an advanced period of lactation rather than a difference in quality of food. We may point out, however, that a rather dry ration in cold weather, when cows will not drink much water, will tend to produce less watery milk than succulent June pasture, the difference seemingly being due to an increase of water rather than a decrease of fat and other solids, the result, of course, being a variation in the percentage of solids, due to its being more dilute.]

GROWING GREEN CROP ON GREEN-MANURED LAND.

C. A., Elkhorn:—"I have in previous years drawn out my barnyard manure green from the stable on to land intended for potatoes and wheat and plowed it in in June, cultivated the land on the surface during the balance of the season, and have obtained good crops of both potatoes and wheat. Could I grow a crop of oat sheaves on this land late in the season and obtain as large a yield of wheat or potatoes the next season?"

[I consider the plan that you have been adopting for potato-growing is much better than the change you propose making. It is not so much a question of fertility in this country as it is of moisture, and I think the summer-fallow is the best way of conserving moisture here. No doubt you would be able to cut quite a lot of green oats or rye, but you would certainly injure the potato crop, especially if the season is a dry one, and the same rule applies for growing wheat. We thoroughly tested this matter on the Farm a few years ago and found that growing a green crop reduced the yield of wheat very much and the returns were not nearly equal to a clean bare summer-fallow.

S. A. BEDFORD, Brandon Exp. Farm.]

COTTONWOOD FROM SEED.

W. T. F., Medicine Hat., Assa.:—"I have a native cottonwood tree which blooms pretty freely with cotton pods every year. Could this form of bloom be used for seeding, and if so, at what period should the pods be pulled for that purpose?"

[Cottonwood seed is contained in a pod and is quite woolly. The seed should be gathered when fully ripe, separated as much as possible, and sown at once on a finely prepared bed and raked in. Cottonwood is, however, generally increased from cuttings, which are taken in early spring. They are made from eight to twelve inches long, and in planting only one or two buds are left out of the ground. Summer-fallow land contains the most moisture, and for that reason gives the best results with all kinds of cuttings.

S. A. BEDFORD, Exp. Farm, Brandon.]

COMBINED CORN PLANTER AND FERTILIZER DISTRIBUTOR WANTED.

D. W. MCKENZIE, King's Co., New Brunswick:—"Is there any good combined corn planter and fertilizer distributor manufactured in Canada? I do not see any advertised in the FARMER'S ADVOCATE. There are several kinds made in the United States, but I do not care to pay duty on them if I can get as good made here."

[No doubt there are thousands of readers of the FARMER'S ADVOCATE eager to get hold of just such a machine as Mr. McKenzie wants. Any firm that has them to offer should let it be known in our advertising columns at once before the planting season commences.]

SHREDDING CORN.

W. D. M., York Co., Ont.:—"Can you give, through the ADVOCATE, any information about shredding corn? No doubt some subscriber has had experience with it."

[Shredding corn is commonly practiced in the U. S., but we do not know of any one who has tried it in Canada. If any of our readers have had experience with it we shall be pleased to publish their testimony.]

PUMPING DEVICE.

MIXED FARMING, Elva Mail:—"I would be much pleased if you would furnish me through the columns of your valuable journal with information relating to the construction of a device whereby it would be practical for stock to lift their own drinking water from a well some twelve feet deep."

CRIB BITING.

OLD SUBSCRIBER, Dominion City:—"I have a five-year-old mare; she has been working hard all winter; is in good health and fair condition. For the past two weeks I notice her crib-biting or wind-sucking on the manger. Please give cause and cure?"

[There is no known permanent cure for crib-biting. The vice may be, to a greater or lesser extent, prevented by the application of a muzzle or a strap drawn tightly around the neck, which any harness shop can supply. A crib-biting horse should have regular exercise.]

W. A. DUNBAR, V. S., Winnipeg.]

BARN WITH BASEMENT FOR MANURE—PLANK FLOOR FOR COLT.

A. C. A., Addington Co., Ont.:—"I would like to get the opinion of you or your readers in regard to building a stock barn on the following plan with a view to saving all the manure, both solid and liquid, in the best condition. It would be a basement barn, built into a sidehill with southern aspect, with end of barn to south-east. Instead of having stock in basement they would occupy all or part, as required, of first floor, excepting a twelve-foot drive floor through center of barn. Cattle would stand in two rows, lengthwise of building, with heads to center and feed passage between, so that feeding would be convenient from barn floor. The manure would be dropped through protected openings in floor behind cattle. Two sides and one end of basement would be stone wall, and south-east end would be boarded up, with large doors to close up in winter and also to allow of driving in to haul out manure occasionally. There would be some device for carrying off any odor arising from the manure in the basement without allowing it to penetrate the floor on which the cattle were standing. The floor would be double planking.

"(2) Should a young colt, which is kept tied in a stall, have manure left in stall to stand on, or would the plank floor be as well for him to stand on?"

[(1) We have personal knowledge of two barns arranged somewhat similarly to the plan recommended in the above letter—those of Messrs. D. M. McPherson and McBain, Lancaster, Ont.—and both give good satisfaction. We would consider it wise to have the manure hauled out to the fields every few days, or spread gypsum on the pile to prevent the odor penetrating to the stables above. We hope to hear from any of our readers who can speak from experience regarding the matter.]

"(2) It is much better for the colt's feet to have his stall cleaned out once or twice a week. His hoofs should be trimmed two or three times during the winter in order to prevent a tendency to ring-bone or other trouble.]

FARM GOSSIP.

Surely, stock-raisers are having their innings—if not, it is not for lack of good markets. Buyers have scoured the country over and over again for stockers, bidding such irresistible prices that scarcely anything on four legs is left to go to the pastures this spring. Who could refuse \$15 to \$20 for bare yearlings, after the prices that have ruled for finished two- and three-year-olds for the past years? While one cannot but regret seeing the country denuded of wealth-producing young stock, still, when the money is needed to stop interest account, or provide improved facilities for future work, who can say such sales are not justifiable? Stall-fed beef cattle have reached an out-of-sight price this spring, but there are, unfortunately, few farmers in a position to profit by it. There is every indication that beef cattle will remain at a good paying price for some time to come, and those who have saved their female stock should shape themselves to reap the benefit by breeding to the best procurable bulls of the beef breeds, using nothing but pure-bred bulls, and then giving the feed and care necessary to insure early maturity and good quality of meat.

Hog products have still to be brought in by the carload, and hogs are in strong demand at remunerative prices. It will take some little time to restock the hog market.

Owing to the depredations of the prairie wolf the sheep industry is almost annihilated, and mutton is already being brought from outside the Province. The same pest, the wolf, is seriously affecting the poultry interests, and many flocks of turkeys and domestic fowl have been ruined. In this connection a few authentic cases quoted by Mr. Riddell, M. P. P., in pushing his bill for increased bounty on wolves before the Provincial Legislature recently, might be cited: Mr. C. Louth, Stephentown, lost 40 fowl; Mr. McKenzie, 8 geese, 30 turkeys, 35 hens, and 3 pigs; Mr. W. J. Squires, \$24 worth of poultry; Mr. McQueen, 250 poultry of different kinds and 25 sheep and lambs in three years; Mr. John Stevenson, Lintrathen, 30 chickens, 8 geese, and 24 turkeys; James Campbell, Miami, 100 geese and turkeys; Thos. Gosney, 90 to 100 hens; Wm. Thompson, a calf, 70 turkeys and many hens, and so on through a long list, and this all in one constituency.

Dairy products command high figures, and the year promises well for those creameries and cheese factories that will operate and turn out products of good quality. Manitoba and the Territories cannot supply the home demand and the rapidly growing trade in British Columbia.

Horses are still coming in from east, south and west, and selling readily at advancing prices.

Settlers are also pouring in by the train load from east and south, and scattering out over the country, the free grant lands in the Swan River and Edmonton districts getting a large share, but even the older districts feeling the effects of the new life that is coming in.

Prices for many things, such as barb wire, hardware, stoves, lumber, etc., etc., are advancing, but there seems to be money in the country to buy with.

The annual meeting of the Wolsley Agricultural Society was held on March 23rd, the following officers being elected for the ensuing year: Messrs. A. B. Bompas, president; S. Mitchell, 1st vice-president; Mr. Bennett, 2nd vice-president. Directors: Messrs. Thomas Fleming, Robert McLean, W. P. Osler, E. A. Banbury, William Gibson, A. D. Duncan, A. Kindred, J. G. Fleming, Joseph Marlin, Charles Thompson, A. Kindred, Levi Thompson, secretary-treasurer. A number of matters were discussed with the object of making the Association more helpful to the farming community. A great deal of new land was broken up in this district last year, and it looks as if double the average would be in crop this year. Many of the large

tracts of land held by companies and individuals in this district that have been lying idle for years have now been bought up by resident farmers and brought rapidly under cultivation. The town also is improving, and many substantial business blocks are to be erected. A \$5,000 school-house is to be built. The question of water supply is one of the important things in this district. It is to be hoped that the Territorial Government will have their big auger kept busy in this district throughout the season. The small augers, or "gimlets," as they are nicknamed, are not much use. It is generally considered that there is plenty of water to be had by going deep enough. There has been plenty of feed for the stock throughout the past season.

Wolsley, Assa.

Chatty Stock Letter from Chicago.

FROM OUR OWN CORRESPONDENT.

Following were the prices lately current, with comparisons two weeks and one and two years ago:

	Extreme prices now.	Two weeks ago.	1898	1897
Beef cattle.				
1500 lbs. up.....	\$4 85 to \$5 80	\$4 70	\$5 50	\$5 35
1350 to 1500 lbs.....	4 50 " 5 75	4 40	5 40	5 40
1200 to 1350 lbs.....	4 20 " 5 75	4 00	5 25	5 20
1050 to 1200 lbs.....	4 00 " 5 50	3 85	5 25	4 80
900 to 1050 lbs.....	3 90 " 5 35	3 80	5 00	4 75
Fed Westerns.....	4 15 " 5 50	4 25	5 10	4 90
Hogs.				
Mixed.....	3 60 " 3 92	3 50	4 05	4 20
Heavy.....	3 55 " 3 85	3 50	4 10	4 20
Light.....	3 60 " 3 87	3 50	4 02	4 15
Pigs.....	3 25 " 3 75	3 10	4 00	4 10
Sheep.				
Natives.....	3 00 " 5 05	3 00	4 90	4 25
Western.....	4 00 " 5 00	3 80	4 75	5 12
Lambs.....	3 75 " 6 00	4 00	6 00	6 00

The cattle are not selling at boom prices, but if the feeding cattle hadn't cost so much when put in they would be selling at prices that would leave fair margins of profit. There are very few strictly choice cattle, and exporters are having considerable trouble in getting enough good ones. Prices for feeding cattle are still high, and farmers are having trouble to get what they want. Cattle exporters bought 4,509 cattle here as follows the past week: Shamburg, 375; Lehman, 211; Morris, 1,119; Brauer, 1,021; Allerton, 68; Swift, 438; Schwarzschild, 567; Gilchrist & Munro, 60; Coughlin, 101; Epstein, 100; Doud & Keefer, 200; Gordon & Ironsides, 200; Armour, 36; Lunness, 93. The total the previous week was 3,373, and a year ago 6,278.

A director of a big dressed meat concern speaks of the growth of the poultry trade in the East, and its influence upon the beef business. Not only do all the farmers raise more or less poultry, but it is sent there in refrigerators at all seasons from Illinois and adjoining States in large quantities. The increased consumption of mutton and poultry and of fresh pork has certainly made a marked difference in the demand for beef.

Indications point to comparatively small receipts of grass Texas cattle at all Western markets, especially during May, June and July.

The 2,172,339 hogs received at the Chicago yards the first quarter of 1899 averaged 230 pounds. The 2,079,632 received the same period of 1898 averaged 239 pounds. The range of hog prices is not only very narrow, but the fluctuations are very small. The general demand is good, but packers insist that they are losing money.

A Chicago sheep and lamb buyer, who handles them by the thousands, says: "The best time to market spring lambs is when they are eight or ten weeks old. Male lambs should be castrated as soon as possible after birth. If they are allowed to run a month it is better not to castrate them at all, as the operation will set them back seriously. They should be marketed, however, under three months old, as after that time their market value depreciates perceptibly. All sheep shipped out for feeding purposes even to points in this State, must be dipped in accordance with a recent Federal regulation."

Horses are selling higher than since the early nineties. A consignment of twenty-three head of prime draft horses, \$5,070, making an average of \$220 per head. Fourteen of the animals sold at a range of \$200 to \$325, making an average of \$235 per head. The consignment had been on feed since last November, and was grandly finished for the market. They were grade Percheron and Shire horses, weighing 1,600 to 2,110 pounds, and every animal was fit for the showing. One five-year-old black gelding, weighing 2,070 pounds, was knocked down to Al Ramp, Buffalo, N. Y., for \$325, and a bay four-year-old Shire gelding weighing 2,110 pounds was purchased by the same party for \$300. Other offerings sold for \$240, \$235, \$237.50 and \$225 for exportation to Germany.

Montreal Markets.

Cattle.—Up till yesterday's market, prices in Montreal have been fairly well maintained, but a heavy run of stock on Monday, April 10, caused quite a break in prices, nominally a quarter cent per pound, but, I believe, actually more on the general run of sales, with, of course, best to prime grades making the best of the market and doing more towards holding their own than did the medium and inferior grades. The best cattle on the market sold for 5c. per lb., and they had to be select. Good to choice beefs ranged from 4c. to 4½c., while common sold down lower accordingly than either of the above classes, making in some cases not more than 2c. per lb. Quite a number of cattle were left over at the close of the market to be carried over for Thursday's trade.

Sheep and Lambs.—Very few old sheep or yearling lambs are to be had on the market now, and those offered are quickly picked up by butchers at fair prices—4½c. to 5c. per lb. for lambs, and 3½c. to 4c. per lb. for sheep. Spring lambs sold from \$3 to \$5 each.

Calves.—The offerings of calves on Monday's market were lighter than usual, but were plentiful enough to meet the requirements of the trade, and sold all the way from \$1.50 to \$10 each, according to size and quality.

Live Hogs were in fair supply, and sold at 4½c. to 4c. per lb., weighed off the cars.

Hides and Skins.—Nothing of importance has taken place in the situation of this market since last writing. The feeling is decidedly weaker, owing to the grubby nature of hides coming forward, for one thing, and to the easier feeling in other large communities, but as yet no change in price has been put into effect. Prices are as follows for green salted: No. 1, 8½c. per lb.; No. 2, 7½c. per lb.; No. 3, 6½c. per lb. Calf skins steady, at 10c. for No. 1, 8c. for No. 2. Lamb clips, 10c. each; yearling lambs, 70c. to 80c. each.

New York Cheese Market.

"Only scattering lots of new cheese have arrived the past week, but the few coming have rarely shown desirable quality, and selling slowly at generally 11 to 11½c. though one small lot of exceptionally fine quality from a favorite western New York factory brought 12½c. The weather continues cold and unfavorable in the cheese-producing sections, and the supply of milk by April 1 have not as yet commenced operations, and it will be several weeks before any quantity of new cheese can be expected."—New York Produce Review, April 12th.

British Markets.

Following the recent steady upwardness of the British markets, a turn has at last come, and prices during the past two weeks have declined fully one cent per pound from former prices, best States cattle in London selling at 12c., and best Canadians at 11c., with Argentines 1c. per lb. lower. Cables on sheep were also lower by fully 1½c. per lb., best selling at 11c. per lb.



AN INDEPENDENT THINKER.

BY MARY E. WILKINS.

Esther Gay's house was little and square, and mounted on posts like stilts. A stair led up to the door on the left side. Morning-glories climbed up the stair railing, the front of the house and the other side were covered with them, all the windows but one were curtained with the matted green vines. Esther sat at the uncurtained window, and knitted. She perked her thin, pale nose up in the air, her pointed chin tilted upward too; she held her knitting high, and the needles clicked loud, and shone in the sun. The bell was ringing for church, and a good many people were passing. They could look in on her, and see very plainly what she was doing. Every time a group went by she pursed her thin old lips tighter, and pointed up her nose higher, and knitted more fiercely. Her skinny shoulders jerked. She cast a sharp glance at every one who passed, but no one caught her looking. She knew them all. This was a little village. By and by the bell had stopped tolling, and even the late church-goers had creaked briskly out of sight. The street, which was narrow here, was still and vacant.

Presently a woman appeared in a little flower garden in front of the opposite house. She was picking a nosegay. She was little and spare, and she bent over the flowers with a stiffness as of stiff wires. It seemed as if it would take mechanical force to spring her up again.

Esther watched her. "It's dreftful hard work for her to git around," she muttered to herself.

Finally she laid down her knitting and called across to her. "Lavinia!" said she.

The woman came out to the gate with some marigolds and candytuft in her hand. Her dim blue eyes blinked in the light. She looked over and smiled with a sort of helpless inquiry. "Come over here a minute."

"I-guess I-can't," said she.

Esther was very deaf. She could not hear a word, but she saw the deprecating shake of the head, and she knew well enough.

"I'd like to know why you can't, a minute. You kin hear your mother the minute she speaks."

The woman glanced back at the house, then she looked over at Esther. Her streaked light hair hung in half curls over her wide crocheted collar; she had a little, narrow, wrinkled face, but her cheeks were as red as roses.

"I guess I'd better not. It's Sunday, you know," said she. Her soft, timid voice could by no possibility reach those deaf ears across the way.

"I-guess I'd better not—as long as it's Sunday."

Esther's strained attention caught the last word, and guessed at the rest from a knowledge of the speaker.

"Stuff," said she, with a sniff through her delicate, uptilted nostrils. "I'd like to know how much worse 'tis for you to step over here a minute, an' tell me how she is when I can't hear across the road, than to stop an' talk comin' out o' meetin'; you'd do that quick enough, if you're strainin', Lavinia Dodge."

Lavinia, as if overwhelmed by the argument, cast one anxious glance back at the house and came through the gate. Just then a feeble, tremulous voice, with a wonderful quality of fine sharpness in it, broke forth behind her.

"Lavinia, Lavinia, where be you goin'? Come back here."

Lavinia, wheeling with such precipitate vigor that it suggested a creak, went up the path.

"I wa'n't goin' anywhere, mother," she called out. "What's the matter?"

"You can't pull the wool over my eyes. I seed you agoin out the gate."

Lavinia's mother was over ninety and bedridden. That infinitesimal face which had passed through the stages of beauty, commonplaceness, and hideousness, and now arrived at that of the fine grotesqueness which has, as well as beauty, a certain charm of its own, peered out from its great feather pillows. The skin on the pinched face was of a dark-yellow color, the eyes were like black points, the tiny, sunken mouth had a sardonic pucker.

"Esther jest wanted me to come over there a minute. She wanted to ask after you," said Lavinia, standing beside the bed, holding her flowers.

"Hey!"

"She jest wanted me to come over an' tell her how you was."

"How I was?"

"Yes."

"Did you tell her I was miser'ble?"

"I didn't go, mother."

"I seed you a-goin' out the gate."

"I came back. She couldn't hear 'thout I went way over."

"Hey!"

"It's all right, mother," screamed Lavinia. Then she went about putting the flowers in water.

The old woman's little eyes followed her, with a sharp light like steel.

"I ain't goin' to hev you goin' over to Esther Gay's, Sabbath-day," she went on, her thin voice rasping out from her pillows like a file. "She ain't no kind of a girl. Wa'n't she knittin'?"

"Yes."

"Hey!"

"Yes, she was knittin', mother."

"Wa'n't knittin'?"

"Y-es, she was."

"I knowed it. Stayin' home from meetin' an' knittin'. I ain't goin' to hev you over thar, Lavinia."

although it was hardly the one which she recognized. It was full of a lovely, wavering, gold-green light, and there was a fine order and cleanliness which gave a sense of peace. But Esther saw mainly her striped rag carpet, her formally set chairs, her lounge covered with Brussels, and her shining cooking-stove.

Still, she looked at nothing with the delight with which she surveyed her granddaughter Hatty when she returned from church.

"Well, you've got home, ain't you?" she said, when the young, slim girl, with her pale, sharp face, which was like her grandmother's, stood before her. Hatty in her meeting-gown of light-brown delaine and her white meeting-hat trimmed with light-brown ribbons and blue flowers was not pretty, but the old woman admired her.

"Yes," said Hatty. Then she went into her little bedroom to take off her things. There was a slow shyness about her. She never talked much, even to her grandmother.

"You kin git you somethin' to eat, if you want it," said the old woman. "I don't want to stop myself 'till I git this heef done. Was Henry to meetin'?"

"Yes."

"His father an' mother?"

"Yes."

Henry was the young man who had been paying attention to Hatty. Her grandmother was proud and pleased; she liked him.

Hatty generally went to church Sunday evenings, and the young man escorted her home, and came in and made a call. To-night the girl did not go to church as usual. Esther was astonished.

"Why, ain't you goin' to meetin'?" said she.

"No; I guess not."

"Why—why not?"

"I thought I wouldn't."

The old woman looked at her sharply. The tea things were cleared away, and she was at her knitting again, a little lamp at her elbow.

Presently Hatty went out and sat at the head of the stairs, in the twilight. She sat there by herself until meeting was over, and the people had been straggling by for some time. Then she went downstairs, and joined a young man who passed at the foot of them. She was gone half an hour.

"Where hev you been?" asked her grandmother, when she returned.

"I went out a little way."

"Who with?"

"Henry."

"Why didn't he come in?"

"He thought he wouldn't."

"I don't see why."

Hatty said nothing. She lit her candle to go to bed. Her little thin face was imperturbable.

She worked in a shop, and earned a little money. Her grandmother would not touch a dollar of it; what she did not need to spend for herself she made her save. Lately the old woman had been considering the advisability of her taking a sum from the savings bank to buy a silk dress. She thought she might need it soon.

Monday, she opened upon the subject.

"Hatty," said she, "I've been thinkin'—don't you believe it would be a good plan for you to take a little of your money out of the bank an' buy you a nice dress?"

Hatty never answered quickly. She looked at her grandmother, then she kept on with her sewing. It was after supper, her shop work was done, and she was sitting at the table with her needle. She seemed to be considering her grandmother's remark.

"I've been thinkin'—you ain't never had any real nice dress, you know—that it would be a real good plan for you to take some money, now you've got it, an' buy you a silk one. You ain't never had none, an' you're old enough to."

Still Hatty sewed, and said nothing.

"You might want to go somewhar," continued Esther, "an' be of course, if anythin' should happen, if Henry—It's jest as well to hev to do everythin' all at once, an' it's consider'ble work to make a silk dress— Why don't you say somethin'?"

"I don't want any silk dress."

"I'd like to know why not?"

Hatty made no reply.

"Look here, Hatty, you an' Henry Little ain't had no trouble, hev you?"

"I don't know as we have."

"What?"

"I don't know as we have."

"Hatty Gay, I know there's somethin' the matter. Now you jest tell me what 'tis. Ain't he comin' here no more?"

Not a word came from Hatty's lips. She would not speak another word. She did not seem to be crying, but she sat there, hiding her little plain, uncommunicative face.

"Hatty Gay, ain't he comin'? Why ain't he comin'?"

Hatty would give the old woman no information. All she got was that obtained from ensuing events. Henry Little did not come; she ascertained that. The weeks went on, and he had never once climbed those vine-wreathed stairs to see Hatty.

Esther fretted and questioned. One day, in the midst of her nervous conjectures, she struck the chord in Hatty which vibrated with information.

"I hope you wa'n't too farrard with Henry, Hatty," said the old woman. "You didn't act too anxious arter him, did you? I was welp to turn fellows."

Then Hatty spoke. Some pink spots flared out on her quiet, pale cheeks.

"Grandma," said she, "I'll tell you, if you want to know, what the trouble is. I waasn't goin' to, because I didn't want to make you feel bad; but if you're goin' to throw out such things as that to me I don't care. Henry's mother don't like you, there."

"What?"

"Henry's mother don't like you."

"Well, if you want to make yourself sick, an' go without eatin', you kin."

Hatty did go without eating much through the following weeks. She laid awake nights, too, staring pitifully into the darkness, but she did not make herself ill. There was an unflinching strength in that little, meagre body, which lay even back of her own will. It would take long for her lack of spirit to break her down entirely, but her grandmother did not know that. She watched her and worried. Still, she had not the least idea of giving in. She knitted more zealously than ever Sundays; indeed, there was, to her possibly distorted perceptions, a religious zeal in it.

She knitted on week days too. She reeled off a good many pairs of those reliable blue-yarn stockings, and sold them to a dealer in the city. She gave away every cent which she earned, and carefully concealed the direction of her giving. Even Hatty did not know of it.

Six weeks after Hatty's lover left, the old woman across the way died. After the funeral, when measures were taken for the settlement of the estate, it was discovered that all the little property was gone, eaten up by a mortgage and the interest. The two old women had lived upon the small house and the few acres of land for the last ten years, ever since Lavinia's father had died. He had grubbed away in a boot shop and earned enough for their frugal support as long as he lived. Lavinia had never been able to work for her own living; she was not now. "Lavinia Dodge will have to go to the poorhouse," everybody said.

One noon Hatty spoke of it to her grandmother. She rarely spoke of anything now, but this was uncommon news.

"They say Lavinia Dodge has got to go to the poorhouse," said she.

"What?"

"They say Lavinia Dodge has got to go to the poorhouse."

"I don't believe a word on't."

"They say it's so."

That afternoon Esther went over to ascertain the truth of the report for herself. She found Lavinia sitting alone in the kitchen, crying. Esther went right in, and stood looking at her.

"It's so, ain't it?" said she.

Lavinia started. There was a momentary glimpse of a red, distorted face; then she hid it again, and went on rocking herself to and fro and sobbing. She had seated herself in the rocking-chair to weep. "Yes," she wailed, "it's so! I've got to go. Mr. Barnes come in an' said I had this mornin'; there ain't no other way. I've—got—to go. Oh, what would mother have said!"

Esther stood still, looking. "A place gets run out afore you know it," she remarked.

"Oh, I didn't s'pose it was quite so near gone! I thought mebbe I could stay—as long as I lived."

"You'd oughter hev kept account."

"I s'pose I hed, but I never knew much 'bout money matters, an' poor mother, she was too old. Father was real sharp, ef he'd lived. Oh, I've got to go! I never thought it would come to this!"

"Don't think you're fit to do any work."

"No, they say I ain't. My rheumatism has been worse lately. It's been hard work for me to crawl round an' wait on mother. I've got to go. O Esther, it's awful to think I can't die in my own home! Now I've got—to die in the poorhouse! I've—got—to die in the poorhouse!"

"I've got to go now," said Esther.

"Don't go. You ain't but jest come. I ain't got a soul to speak to."

"I'll come in agin arter supper," said Esther, and went out resolutely, with Lavinia wailing after her to come back. At home, she sat down and deliberated. She had a long talk with Hatty when she returned. "I don't care," was all she could get out of the girl, who was more silent than usual. She ate very little supper.

It was eight o'clock when Esther went over to the Dodge house. The windows were all dark. "Land, I believe she's gone to bed," said the old woman, fumbling along through the yard. The door was fast, so she knocked. "Lavinia, Lavinia, be you gone to bed? Lavinia Dodge?"

"Who is it?" said a quavering voice on the other side, presently.

"It's me. You gone to bed?"

"No, they say I ain't. I wait to see you a minute."

Then Lavinia opened the door and stood there, her old knees knocking together with cold and nervousness. She had got out of bed and put a plaid shawl over her shoulders when she heard Esther.

"I want to come in jest a minute," said Esther. "I hadn't any idee you was gone to bed."

The fire had gone out, and it was chilly in the kitchen, where the two women sat down.

"You'll ketch your death of cold in your nightgown," said Esther. "You'd better git somethin' more to put over you."

"I don't keer if I do ketch cold," said Lavinia, with an air of feeble recklessness, which sat oddly upon her.

"Lavinia Dodge, don't talk so."

"I don't keer. I'd rather ketch my death of cold than not; then I shouldn't have to die in the poorhouse." The old head in its little cotton nightcap, cocked itself sideways, with pitiful bravado.

Esther rose, went into the bedroom, got a quilt and put it over Lavinia's knees. "There," said she, "you hev that over you. There ain't no sense in your talkin' that way. You're jest a-flyin' in the face of Providence, an' Providence don't mind the little flappin' you kin make, any more than a barn does a swaller."

"I can't help it."

"What?"

"I can't help it."

"Yes you kin help it, too. Now, I'll tell you what I've come over here for. I've been thinkin' on't all the arternoon, an' I've made up my mind. I want you to come over and live with me."

Lavinia sat feebly staring at her. "Live with you?"

"Yes, I've got my house an' my pension, an' I pick up some with my knittin'. Two won't cost much more'n one. I reckon we kin git along well enough."

Lavinia said nothing, she still sat staring. She looked scared.

Esther began to feel hurt. "Mebbe you don't want to come," she said stiffly, at last.

Lavinia shivered. "There's jest—one thing—" she commenced.

"What?"

"There's jest one thing—"

"What's that?"

"I dunno what— Mother— You're real good; but— Oh, I don't see how I kin come, Esther!"

"Why not? If there's any reason why you don't want to live with me, I want to know what 'tis."

Lavinia was crying. "I can't tell you," she sobbed; "but mother— If you didn't work Sundays. Oh!"

"Then you mean to say you'd ruther go to the poorhouse than come to live with me, Lavinia Dodge?"

"I-can't help it."

"Then, all I've got to say is, you kin go."

Esther went home, and said no more. In a few days she had worked hard to get an extra one to-day, too, but she had no heart to eat. Her mournful silence, which seemed almost obstinate, made the old woman at once angry and wretched. Now she wept over Lavinia Dodge and Hatty, and the two causes combined made bitter tears.

"I wish to the land," she cried out loud once,—"I wish to the land I could find some excuse, but I ain't goin' to give up what I think's right."

Esther Gay had never been so miserable in her life as she was for the three months after Lavinia Dodge left her home.

She thought of her, she watched Hatty, and she knitted. She was at last beginning to show the effects of her long worry. She looked badly, and the neighbors began speaking about it to her grandmother. The old woman seemed to resent it when they did. At times she scolded the girl, at times she tried to pet her, and she knitted constantly, week days and Sundays.

Lavinia had been in the almshouse three months when one of the neighbors came in one day and told Esther that she was confined to her bed. Her rheumatism was worse, and she was helpless. Esther dropped her knitting, and stared radiantly at the neighbor. "You said she was an awful sight of trouble, didn't you?" said she.

"Yes; Mis' Marvin said it was worse than takin' care of a baby."

"I should think it would take about all of anybody's time."

"I should. Why, Esther Gay, you look real tickled 'cause she's sick!" cried the woman, bluntly.

Esther colored. "You talk pretty," said she.

"Well, I don't care; you looked so. I don't s'pose you was," said the other, apologetically.

That afternoon Esther Gay made two visits: one at the selectmen's room, in the town hall, the other at Henry Little's. One of her errands at the selectmen's room was concerning the reduction of her taxes.

"I'm a-payin' too much on that leetle house," said she, standing up, alert and defiant. "It ain't wuth it." There was some dickering, but she gained her point. Poor Esther Gay would never again make her foolish little boast about her large tax. More than all her patient, toilsome knitting was the sacrifice of this bit of harmless vanity.

When she arrived at the Littles', Henry was out in the yard. He was very young; his innocent, awkward face flushed when he saw Esther coming up the path.

"Good afternoon," said she. Henry jerked his head.

"Your mother to home!"

"Ye-a."

Esther advanced and knocked, while Henry stood staring.

Presently Mrs. Little answered the knock. She was a large woman. The astonished young man saw his mother turn red in the face, and rear herself in order of battle, as it were, when she saw who her caller was; then he heard Esther speak.

"I'm a-comin' right to the pint afore I come in," said she.

"I've heard you said you didn't want your son to marry my granddaughter because you didn't like some things about me. Now, I want to know if you said it."

"Yes; I did," replied Mrs. Little, tremulous with agitation, red, and perspiring, but not weakening.

"Then you didn't have nothin' again' Hatty, you nor Henry?"

"Twa'n't an excuse!"

"I ain't never had anything against the girl."

"Then I want to come in a minute, I've got some-thing I want to say to you, Mrs. Little."

"Well, you can come in—if you want to."

After Esther had entered, Henry stood looking wistfully at the windows. It seemed to him that he could not wait to know the reason of Esther's visit. He took things more soberly than Hatty; he had not lost his meals nor his sleep; still, he had suffered. He was very fond of the girl, and he had a heart which was not easily diverted. It was hardly possible that he would ever die of grief, but it was quite possible that he might live long with a memory, young as he was.

When his mother escorted Esther to the door, as she took leave, there was a marked difference in her manner.

"Come again soon, Mis' Gay," he heard herself say; run up any time you feel like it, an' stay to tea. I'd really like to have you."

"Thank ye," said Esther, as she went down the steps. She had an aspect of sweetness about her which did not seem to mix well with herself.

When she reached home she found Hatty lying on the lounge. "How do you feel to-night?" said she, unpinning her shawl.

"Pretty well."

"You'd better go an' brush your hair an' change your dress. I've been over to Henry's an' seen his mother, an' I shouldn't wonder if he was over here to-night."

Hatty sat bolt upright and looked at her grandmother.

"What do you mean?"

"What I say. I've been over to Mrs. Little's, an' we've had a talk. I guess she thought she'd been kind of silly to make such a fuss. I reasoned with her, an' I guess she saw I'd been more right about some things than she'd thought for. An' as far as goin' to meetin' an' knittin' Sundays is concerned—"

"Well, I don't s'pose I kin knit any more if I want to. I've been to see about it, an' Lavinia Dodge is comin' here Saturday, an' she's so bad with her rheumatiz that she can't move, an' I guess it'll be all I kin do to wait on her, without doin' much knittin'." Mebbe I kin git a few minutes evenin's, but I reckon 'twon't amount to much. Of course, I couldn't go to meetin' if I wanted to. I couldn't leave Lavinia."

"Did she say he—was coming?"

"Yes; she said she wouldn't wonder if he was up."

The young man did come that evening, and Esther retired to her little bedroom early, and lay listening happily to the soft murmur of voices outside. Lavinia Dodge arrived Saturday. The next morning, when Hatty had gone to church, she called Esther. "I want to speak to you a minute," said she.

"I want to know if—Mr. Winter brought me over, and he married the Ball girl that's been in the post office, you know, and somethin' he said—"

Esther Gay, I want to know if you're the one that's been sendin' that money to me and mother all along?"

Esther colored, and turned to go. "I don't see why you think it's me."

"Esther, don't you go. I know 'twas; you can't say 'twas't."

"It wa'n't much, anyhow."

"'Twas to us. It kept us goin' a good while longer. We never said anythin' about it. Mother was awful proud, you know, but I dunno what we should have done. Esther, how could you do it?"

"Oh, it wa'n't anythin'. It was extra money. I ain'd it."

"Knittin'?"

Esther jerked her head defiantly. The sick woman began to cry. "If I'd ha' known, I would ha' come. I wouldn't have said a word."

"Yes you would, too. You was boun' to stan' up for what you thought was right, jest as much as I was. Now we've both stood up, an' it's all right. Don't you fret no more about it."

"To think—"

"Land sakes, don't cry. The tea's all steeped, an' I'm goin' to bring you in a cup now."

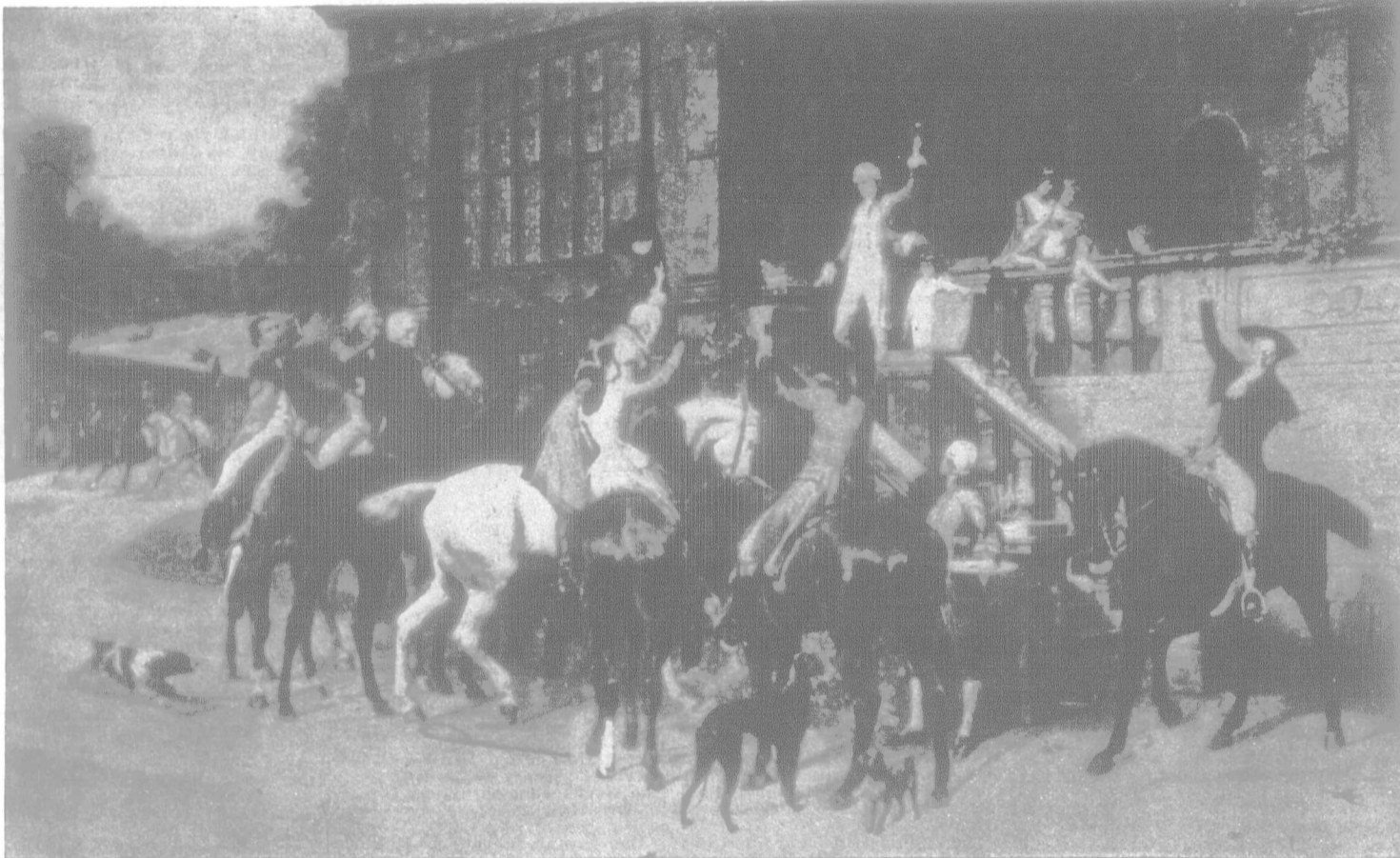
Henry came that evening. About nine o'clock Esther got a pitcher and went down to the well to draw some water for the invalid. Her old joints were so tired and stiff that she could scarcely move. She had had a hard day. After she had filled her pitcher she stood resting for a moment, staring up at the bright sitting-room windows. Henry and Hatty were in there: just a simple, awkward young pair, with nothing beautiful about them save the spark of eternal nature, which had its own light. But they sat up stiffly and timidly in their two chairs, looking at each other with full content. They had glanced solemnly and bashfully at Esther when she passed through the room; she appeared not to see them.

Standing at the well, looking up at the windows, she chuckled softly to herself. "It's all settled right," said she, "an' there don't none of 'em suspect that I'm a-carryin' out my pint arter all."

"One and Twenty."

This seems, indeed, to be a joyous anniversary, and we can well imagine all the bright hopes for the future which swell within this fortunate youth and his enthusiastic well-wishers. Every figure is full of animation, born of the festive occasion. This coming of age evidently means a great deal, for the surroundings bespeak wealth, and hint at the heavy responsibility entailed by inheriting vast possessions. What inward resolutions are often made at this great "One and Twenty" time! What great things are to be achieved! What youthful faults corrected! Yes, with such a majority as this, grave thoughts will naturally come to an earnest nature, and life is no longer quite the same.

The artist has introduced a pretty "side light,"



"ONE AND TWENTY."

as it were, in his picture, for while all attention seems to be directed to the central figure—glasses raised, congratulation in every gesture—there is certainly one gallant gentleman to the right whose thoughts are divided between the special festivity of the occasion and that fair lady who is leaning over the balustrade. We will imagine she is a sister or cousin of young "One and Twenty," and, of course, very much interested in him, yet she cannot quite refrain from a smiling glance at the favored one who seeks it.

And so we leave them all. Boyhood has passed, manhood begins. He takes his future in his own hands—to make or mar. God keep him manly and brave and true, this fine young fellow of "One and Twenty."

Preserving Furs.

We have heard old-time housekeepers talk about "airing" things in order to prevent their being moth-eaten, but we have found the reverse of this to be better. As soon as furs, woollens, etc., are laid aside, put them where the moth millers cannot get access to them to deposit their eggs, and they are safe from their ravages. During the summer months we keep a fox carriage robe by rolling it up and slipping it into a thick paper flour sack, and pasting paper over the entrance—putting it up early before any millers are flying. Dealers in furs paste paper around where the corners fit on the boxes, making them almost air-tight, and keeping them safely from all injury from moths.

It is said that parsley, eaten with onions, will destroy the offensive odor that affects the breath. The parsley should be served in sprigs and eaten as you would celery.

MINNIE MAY'S DEPARTMENT.

MY DEAR NIECES,—

There is an old song which used to enchant us in our school days, and many a time we have sung it—aye, even shouted it. The first line is, "Spring-time brings the robin and the bluebird home." Suppose we have a chat about the robin—the dear little bird which everyone loves. We all know that he is a migratory bird, going south when the cold comes, though a few robins remain all winter in some parts of the country, in sheltered spots. His return in spring is usually announced by the newspapers, like the movements of prominent people in towns and villages. Now Mr. Robin, like most human beings, has qualities both good and bad. He is a great favorite on account of his confiding ways, and we greet him cordially and give him the choicest crumbs from our table. But for all his winsome ways he is a greedy bird, and by his love of fruits generally, and cherries particularly, he causes much apprehension. Some people condemn him on this score, but he is too useful in other ways to be exterminated. He loves fruit certainly, but his food mainly consists of caterpillars, grasshoppers, and beetles—noxious insects which we are glad to be rid of. These compose more than one-third of his entire food, so we must not grumble too loudly, but let him have a tid-bit occasionally.

A strange thing about Robin is that although he is such a sociable and friendly little fellow, he is very pugnacious—always at war with some of his own kind. No bush was ever large enough to shelter too robins in amity. The nursery rhyme that records the courtship of Jenny Wren and Cock

Robin is a very unkind aspersion cast upon Robin's attitude towards the ladies of his tribe. He courted neither Jenny Wren nor any other Jenny, but one of the great family of Robins. "He woos her with his sweet and simple song through the spring days, and when she has accepted his advances and chosen him for her mate he proves himself the most faithful and tender husband, loving no other bird but her."

Many beautiful legends cluster round the name of Robin, inspired no doubt by his friendliness. Who does not remember his kindness in covering with leaves the little babes in the

wood? One legend tells us that his breast is scarlet because "he scorched it in his pity for souls in torment. Down the sorrowful way went Robin, carrying water in his beak to the sufferers, and burning as he flew the feathers on his throat." One of the most beautiful legends is that when our Saviour hung on the cross a tiny bird hovered round Him, uttering piteous cries. About the seventh hour it settled on His crown of thorns, and tried with eager little claws and fluttering wings to remove the thorns which pierced his bleeding brow. The bird succeeded, but in doing so wounded its own soft breast, and the feathers were stained red by the wound. Then an angel's voice was heard saying, "Children of every house shall yearn with natural love towards the birds of the ruddy breast."

Some one has said Robin is not a good solo singer, but that a chorus of them is unrivalled. However this may be, the story is told of a robin's song cheering the dying sister of William Wordsworth. Robin's perch in the sickroom was a nail in the wall where a picture hung, and the little bird's presence and brightness were so much to the invalid that shortly before her death she composed almost the only verses she ever wrote:

"Methinks that in my dying hour
Thy song would still be dear,
And with a more than earthly power
My passing spirit cheer.
Then, little bird, this boon confer,
Come and my requiem sing,
Nor fail to be the harbinger
Of everlasting spring."

Robin's nest is seldom robbed. The boys who rob other nests usually leave Robin's alone. There is a saying in some places that whoever rifles a robin's nest will carry on his face the marks of the spots that speckle the eggs.

Now for a peep at Robin's home. There it is in

that bush, well hidden, and made of leaves and dry moss mixed with hair, and padded with wool and feathers. Robin takes care not to go straight to his nest. Oh, no!—he is too cautious for that. He circles about for a time, and approaches slowly. Peep in, and you will see five or seven speckled eggs there. When the fledglings are out, Robin is an admirable father. He has more important business now than singing for has he not to provide worms for his numerous family? Dr. Watts said long ago that "birds in their little nests agree," but probably the Doctor forgot that a nest full of young robins are anything but agreeable, and to make matters worse, Father Robin, as they grow older, quarrels with them all, as he usually does with robins generally. Not only does he turn them out of the nest, but he orders them away from the locality. He and his mate think they have done enough for the youngsters, and now they may look out for themselves. So the poor little birdies have no alternative—out they go into the world; and a strange thing is that they do not go all together, but singly, solitarily, one by one winging their way to tracts unknown. Let us send after each of them a kindly wish. I could go on talking about this interesting bird, but shall close with a quotation from James Russell Lowell, who writes about the depredations of the robin in his garden: "Let them steal and welcome. I am sure I should had I had the same bringing-up and the same temptation. As for the birds, I do not believe there is one of them but does more good than harm, and of how many featherless bipeds can this be said?"

Your loving old Auntie— MINNIE MAY.

Recipes.

PUFF PASTE.

For a good, light puff paste, take equal weights of fine flour and butter and one teaspoonful of salt to each pound, break a part of the butter into small bits and mix these with the flour, then add enough water to moisten the flour so that there are no dry lumps in it, then draw together into a stiff paste and roll out thin; then spread some of the butter over the paste smoothly with a knife, dredge flour over it, fold it and roll again, and so repeat three or four times. Keep the paste cool and touch it with the hand as little as possible. Let it lie ten minutes, roll and fold it twice more and it is ready for the oven.

CHARLOTTE RUSSE.

Take half an ounce of gelatine and put in only just enough warm water to cover it; while this is slowly dissolving take one pint of thick, sweet cream and whip it up to a stiff froth; beat well the white of one egg; after the gelatine is dissolved boil it for two or three minutes, then sweeten and flavor it; when it is about as warm as new milk, add the cream and egg and beat the mixture until it is cold. If the sponge cake over which this is to be turned is baked on a large round tin which is scalloped around the edge, it adds much to the pretty effect of the dish. Put the cake while warm, to prevent its crumbling, into a round dish, allowing the scallops to show on top; then pour the whipped cream over it.

FURNITURE PASTE FOR WALNUT.

Mrs. P. R.—Please give a receipt for a good furniture paste for walnut. Ans.—Scrape four ounces of beeswax into a basin and as much turpentine as will soak it well. Powder a quarter of an ounce of white resin and add as much Indian red as will bring it to the desired color. Melt and mix and apply on a woolen cloth, rubbing it well in and polish with a rubber moistened with alcohol.

FURNITURE POLISH.

The following recipe will restore the original polish of furniture, especially in the case of such articles as pianos, fancy tables, cabinets, lacquered ware, etc., which have become tarnished by use. Make a polish by putting half an ounce of shellac, the same quantity of gum lac and a quarter of an ounce of gum sandarac into a pint of water. Put them all together in a stone bottle near the fire, shaking it often; as soon as the gums are dissolved it is ready for use. Then take a roller of woolen rags—soft old broadcloth will do nicely—put a little of the polish on it, also a few drops of linseed oil. Rub the surface to be polished with this, going round and round over a small space at a time, until it begins to be quite smooth; then finish by a second rubbing with spirits of wine and more of the polish. Furniture thus treated will have a brilliant luster equal to new.

The Little Wolves of Worry.

One of the rarities of our age is a person who is happy. The happiest people are generally those who, while cultivating habits of prudence and forethought, desiring only a comfortable independence, are indifferent to the accumulation of great wealth, and addicted to simple pleasures and home entertainments; who cherish a wholesome aversion to ostentatious hospitality and ceremonious display; who select their friends on account of their sterling character, and never think of inquiring how much they are worth. We meet with such now and then, who at eighty retain something of their youthful freshness of feeling and warmth of heart.

If there was a wolf constantly following any of us to worry out our lives, would we not at once try to have it destroyed? The same course should be pursued with regard to the many little wolves—the cares and trials of life which strangle our happiness and destroy our health.—*Journal of Hygiene.*



The Family Fairy.

There was once a fairy who had acted all her life as family adviser to a certain royal house. Generally she did everything that could be asked for or wished, but not always. She was obliged to take after her parents; and, good one day, she was bad the next. When she was good, she was as good as gold, as her fairy mother had been; but when she was bad, she took after her father, who was a very bad fairy indeed. Nobody was more grieved at this than the family fairy herself. Every other day she would sit and cry over her sins of yesterday, but directly midnight came she would get up and laugh, and go on still further in wickedness.

It was very lucky that she was unable on her bad days to undo all the good done in her periods of

"First Come, First Served."

Three dear little puppies, so pudgy and fat,
Are climbing the stairway steep;
They're all in a flurry
With trying to hurry—
The last one is ready to weep.

They started quite fairly to climb to the top;
Why, then, is poor Tim behind?
He happened to stumble,
And then had a tumble:
His brothers were very unkind.



Not a moment they waited to let him catch up:
"One biscuit is scanty for three!"
Said Pat to wee Thady,
"Stout heart wins fair lady—
First comers first served will be."

Such selfish remarks for a puppy to make!
They've never been taught at all
To help one another
Or wait for a brother
If he should happen to fall.

virtue, but it was very unfortunate that she was never able to set right all the wrong she effected. Still, since christenings, coronations and marriages are movable feasts, she was to all intents and purposes a good fairy, and was much sought after at the court on all festive occasions, things being so arranged as to make them take place on days when her goodness was golden. Her gifts, too, were of the very best quality—not such poor things as beauty, wealth or cleverness, but goodness, wisdom, courage, generosity, and humility. During her bad days she was never invited to court. Under her protection the royal line flourished, and made itself beloved by all.

But a day came, and with it the beginning of the end—a thing now to be told of.

How it happened was never quite known. Everybody tried to lay the blame on somebody else. A new king had come to the throne, and a royal bride being chosen for him, the marriage was fixed to take place. Whose fixing it was that made it come about on one of the fairy's wrong days was never known. Some said that leap-year was responsible, others that the fairy herself, by maliciously remaining good on one of her bad days, disturbed the regular order of her changes. However that might be, she came to the wedding looking as good as gold, but hiding all the time a temper as bad as it could be.

When the time came for the offering of the

wedding gifts, all waited for the benevolent fairy to speak first, the courtiers standing round with hands up ready to applaud. She waved her wand over the royal pair with the gentlest of smiles.

"Your Majesties," said she, "shall be the most forgetful couple that have ever existed since the world went round."

The whole court screamed with horror. The queen began to cry, but before the tears had reached the end of her nose she forgot what she was crying for and left off to laugh. The family fairy departed in wicked glee, and spent the next day weeping herself ill on account of the dreadful fate she had brought on her special pet royalties.

Indeed, now their misfortunes had begun. Sometimes they forgot each other entirely. It would take the court days and days to remind them of their position in life and their mutual relations. The fairy came and paid them visits of condolence, and wrung her hands over their lapses of memory. Then on her bad days she would go home and laugh, and calculate what a brood of misfortunes should presently spring from the curse she had so successfully implanted.

When their little daughter was born, and the christening day had to be fixed, both the king and queen had forgotten which were the fairy's good days and which were her bad. The king said they were the odd days of the week, and the queen said they were the evens. To settle the matter they asked the fairy to call "quite quietly—only ourselves, you know; don't dress!" which meant that the fairy was to leave her wand behind her.

So the fairy came unceremoniously, looking as good as gold. She was charmed to see the baby princess, and talked of all the good things she would give her when the christening day came.

The queen, convinced that this was one of the fairy's good days, made a note of the date, and from that the christening day was fixed. Now, this was just what the fairy in her artfulness had devised when she came pretending to be so good and gracious in her intentions. So at the christening she waved her wand over the princess, crying, "She shall be the most disobedient child that ever was born!"

Saying this she vanished, leaving the whole court plunged in grief.

As the princess grew out of babyhood, she became the most disobedient child that ever was known. Everything she was told not to do she did, and everything she was told to do she didn't.

The family fairy came and cried her eyes out over the deed she had done. "Only one thing you can do," she said, "to remedy such a state of affairs. Always tell the princess to do the exact opposite of what you really wish."

"That is all very well," said the queen, "but I so often forget what it is I really want her to do, and put me in a corner like this and it's like algebra. I shall never remember which way—the thing turns inside out when I want it to be outside in."

Nevertheless, except to her father and mother, the princess became, through the fairy's device, a very model of obedience.

[TO BE CONTINUED.]

Our Library Table.

"CAPTAIN JANUARY," Laura E. Richards.—There are some books which grow upon us; we cannot tire of them any more than we can tire of Nature's loveliness. Such a book is "Captain January." The story is simplicity itself—no second reading is required to express its meaning; but the telling—there is where lies its exquisite charm. It should be read with a certain method. I would say: read the book through, then refer to certain passages, which seem at each re-reading to open out into fresh beauty. The simple grandeur of the old Captain's character, and that of the quaint, passionate and loving child, Little Star, are drawn with rare skill. The scene is laid in a lonely lighthouse off the coast of Maine, where lives Captain January (the keeper) with the lovely child he rescued from a cruel wreck. One can well imagine the loneliness of the scene through this graphic description: "There is an island off a certain part of the coast of Maine—a little rocky island, heaped and tumbled together as if Dame Nature had shaken down a heap of stones at random from her apron when she had finished making the larger islands which lie between it and the mainland. At one end—the shoreward end—there is a tiny cove and a bit of silver sand beach, with a green meadow beyond it and a single great pine; but all the rest is rocks—rocks. At the further end the rocks are piled high, like a castle wall, making a brave barrier against the Atlantic waves; and on the top of this cairn rises the lighthouse, rugged and sturdy as the rocks themselves, but painted white and with its windows shining like great smooth diamonds. This is Light Island." Such is the home—we can all see it. The devotion of this dear old man to his little waif of the sea is equalled by her adoring love for him. He is her "Daddy Captain"—she is his "Star Bright"—"Pigeon Pie"—"Peach Blossom," and a dozen more pet names invented by the one of whose eyes she is the very light. Captain January's views of education are unique, as expressed in the following dialogue with an old sea friend:

"Get the school readers, hey! and teach her yourself, do you?" queried Captain Nazro.

"No, sir!" replied the old man; "I don't have no school readers. The child learns out o' the two best books in the world: 'The Bible, and William Shakespeare's book. Them's all the books she ever seed—*saw*, I should say."

"William Shak—" began Captain Nazro; and then he broke off in sheer amazement, and said simply: "Well, I'm blown!"

"The Minister giv'em to me," said Captain January; "I reckon he knows. There's a dictionary too," he added, rather sadly, "but I can't make her take to that, nohow, though there's a power o' fine words in it."

One can well picture the strange training Little Star gets. The pair often "play" Shakespeare. Especially when she dresses up in some beautiful clothes contained in her mother's trunk—washed ashore from the wreck—Star unconsciously falls into a quaint method of speech which is amusing and captivating. She is never tired of hearing her Daddy Captain repeat the story of the rescue, prompting him if he makes the slightest slip—after the manner of little children.

When—after all these years of companionship—the time arrives that little Star's relatives by chance discover her, and Captain January is forced to see that his Jewel Bright ought to leave him, the scene is heartrending.

"I think there is no doubt of Star's being Mrs. Morton's niece."

"And what if she be? . . . Did she take her out of the sea as ragged like all the devils let loose, and death itself a-hangin' round and fairly howlin' for that child? Did she stand on that rock, blind and deaf and e'en a'most mazed with the beatin' and roarin' and onearthly screechin' all round, and take that child from its dead mother's breast, and vow to the Lord as helped in savin' it, to do as should be done by it? Has she prayed, and worked, and sweat, and laid awake nights, for fear that child's fingers should ache, this ten years past? Has she—" The old man's voice broke off suddenly. The angry fire died out of his blue eyes, and he bowed his head humbly. "I ask yer pardon, Minister," he said quietly, after a pause. "I humbly ask yer pardon. I had forgotten the Lord, for all I was talkin' of Him so glib. I was takin' my view, and forgettin' the Lord had His. He takes things by and large, and nat'rally He takes 'em larger than mortal man kin do. Amen! So be it!"

The beautiful and pathetic finish of this story equals all the rest—which is saying much. To quote further would, perhaps, take from many readers the full and perfect enjoyment of a book which, of its kind, is a classic.

This authoress has written many other charming stories, called "The Captain January Series," a list of which is on the inside cover of the book.

FELIX.

Sleep and Health.

It is not sleep alone that rests the brain cell, though sleep is absolutely essential to recuperation of the brain as a whole. But not all parts of the brain are involved in any one kind of mental effort. The blood supply of the brain is so arranged that by expansion or contraction of different arteries parts of the brain may be flushed with blood and other parts dammed off, so to speak, somewhat as the various currents of an irrigated field are regulated by the gardener. And as rapid flow of blood is essential to great mental activity, this means that one part of the brain may be very actively at work while another part is resting and recuperating. Thus it is that a person suffering from brain fatigue may leave his desk and go out into the fields with a golf stick, or on the highways with a bicycle, and, by diverting his mind, give the overworked cells a chance to rest and recuperate. But it must not be overlooked that such exercise involves other brain cells, which, in turn, become exhausted, and that, in the end, for the recuperation of the brain as a whole, sleep is absolutely essential. No recreation, no medicine, no stimulant will take its place. The man who does not give himself sufficient hours of sleep, or who is unable to sleep when he makes the effort, it literally burning away his brain substance and can no more keep on indefinitely in this way than a locomotive can run on indefinitely without getting fresh supplies of fuel.—*New York Sun.*

Agriculture in the Bible and Bible Times.

BY REV. W. A. BURMAN, B. D., LECTURER IN BOTANY,
ST. JOHN'S COLLEGE, WINNIPEG.

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ARTICLE IV.

"The first Garden and Gardener."

We cannot dwell longer now upon this fascinating theme of how this earth was prepared to be the home of man, and not only home, but the source from which his wants were to be supplied.

As Professor Owen has said, "Man is the ideal being towards whose appearance nature had been working from the earliest ages, a being therefore whose existence had been foreordained." As David says of God, "the earth hath He given to the children of men."

We pass on now to the opening story of how man at the very beginning was set to till the earth.

The story of Eden never loses its charm; but we must look at it now only as far as it bears upon our present subject.

In Gen. ii., 8 and 9, we read: "The Lord planted a garden eastward in Eden; and there He put the man whom He had formed, and out of the ground made the Lord God to grow every tree that is pleasant to the sight," etc.

Eden, "the delightful place" or "pleasantness" God's garden; where it was we do not know. *Where* it matters not. It was God's handiwork; a garden planted by the Great King, and therefore sure to be bright and beautiful. We have come to call it "Paradise," a name which was originally given to

the pleasure grounds or parks of oriental monarchs.

Milton has sung its beauties in "Paradise Lost." Less known is the picture of Cædmon—the farmer on the lands of Whitby Abbey in England—who, in the 7th century, wrote a metrical paraphrase of parts of the Bible. Of Eden, he says:

"It stood good and spiritual, filled with gifts,
Fair washed the general land with running water
And welling brooks. No clouds as yet
Over the ample ground bore rains,
Lowering with winds;
Yet with all fruit earth stood adorned."

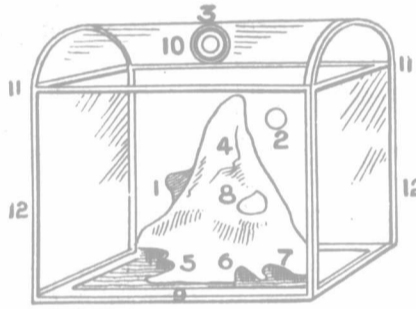
Long treatises have been written to prove, or disprove, some supposed location for this cradle of the human race. In the myths and legends of the ancients are found many stories suggestive of various parts of the Scripture narrative. The garden with its beauties—the wondrous trees, the temptation to eat of the fatal fruit, the serpent, the curse, the awful guards placed around the approach to the tree of life—all these have their counterpart in the folklore of races of long ago.

Perhaps later we may be able to give space to some of these intensely interesting stories, told or written as we tell or write now, to instruct or to amuse the serious, the inquisitive, the children of ancient days.

We are interested now in the work God gave to men. Gen. ii., 5: "The Lord God took Adam, and put him into the Garden of Eden, to dress it and to keep it." The "earth" was to be his workhouse and his storehouse. He was to work, and that was to be not only a delight, but his livelihood. The garden had flowers as well as trees; it was a "pleasant place" and beautiful.

There man learnt his first lessons in the oldest of occupations—"to dress the earth and make it more beautiful by his toil, to keep—that is, to guard—and protect from harm that which he called by the dear, sweet name of "home."

How many a man and woman since to whom God has given some "spot of earth"—"to dress it and to keep it"—has found it "Eden" indeed—a "place of pleasantness"; and the tiny farm has seemed to many to deserve the name of Paradise. There is a significant lesson for us in the fact that the first employment given to men was the healthful, delightful work of caring for some corner of God's earth, that all mankind might be the richer thereby. Next there follows the sad story of the Fall and the Curse.



Map of the heavens and earth, by Cosmas, a monk of Alexandria, sixth century, known as "The man who sailed to India." Shows supposed site of Eden. Reproduced from Geikie's "Hours with the Bible." Original in British Museum.

KEY.

1. The setting sun.
2. The rising sun.
3. The arch of the heavens.
4. The mountain which receives the rising and setting sun.
5. The Mediterranean.
6. The Red Sea.
7. The Persian Gulf.
8. The Garden of Eden.
9. Part of great ocean encircling the world.
10. The Creator surveying His works.
11. The firmament dividing and supporting the upper waters.
12. The heavens at each side of the earth.

The punishment was expulsion from the Garden of God, with all its delights. Yet, it was not destruction, nor even removal from God's presence and God's earth. All that it meant has not been revealed, but aside from spiritual loss, it evidently meant hardship, anxiety, disappointment, and death in the future. Work was to be more arduous and less remunerative. The very earth seemed to frown upon them, for in place of fruit luscious and sustaining, instead of trees yielding knowledge and life, the ground cursed for man's wrong doing brought forth to his sorrow "thorns and thistles." Gen. iii., 17, 18. Whatever else this may mean (and its full significance is beyond our ken), it points to truth we are learning all along, that only by hard work and long toil can the earth be wooed to yield us our daily bread. Thorns, thistles, briars, weeds, that haunt us year by year and dog our footsteps wherever man treads—these are here with us to stay. No doubt they have their uses; they are no unmitigated curse, but they are a perpetual reminder of what folly and covetousness can do to wreck or mar human happiness.

Of the identity of the "thorns and thistles" here referred to, nothing certain is known, but some of these pests now prevailing in Palestine and Bible lands will be referred to in another chapter.

Waur Things than a Cough.

An old Scotch beadle, Saunders by name, was a great victim to asthma. One day whilst in the act of opening a grave, he was seized with a violent fit of coughing. The minister, towards whom Saunders bore little affection, at the same time entered the kirkyard, came up to the old man as he was leaning over his spade wiping the tears from his eyes, and said, "That's a very bad cough you've got, Saunders." "Ay, it's no very gude," was the dry response, "but there's a hantel fowk lyin' round about ye that would be gey glad o't."

THE QUIET HOUR.

Help that Comes Too Late.

'Tis a wearisome world, this world of ours,
With its tangles small and great,
Its weeds that smother the springing flowers,
And its hapless strifes with fate;
And the darkest day of its desolate days
Sces the help that comes too late.

Ah! woe for the word that is never said
Till the ear is too deaf to hear,
And woe for the lack of the fainting head
Of the ringing shout of cheer:
Ah! woe for the laggard feet that tread
In the mournful wake of the bier.

What booteth help when the heart is numb?
What booteth a broken spar
Of love thrown out when the lips are dumb
And life's bark drifteth far—
Oh! far and fast from the alien past
Over the moaning bar!

A pitiful thing the gift to-day
That is dross and nothing worth,
Though if it had come but yesterday
It had brimmed with sweet the earth—
A fading rose in a death-cold hand
That perished in want and death!

Who fain would help in this world of ours,
Where sorrowful steps must fall,
Bring help in time to the waning powers,
Ere the bier is spread with the pall;
Nor send reserves when the flags are furled
And the dead beyond recall.

For baffling most in this weary world,
With its tangles small and great,
Its lonesome nights and its weary days,
And its struggles forlorn with fate,
Is that bitter grief, too deep for tears,
Of the help that comes too late.

—Margaret E. Sangster.

Some "Might Have Beens."

"There, I meant to have sent that coat and hat of Elsie's to the mission rooms!" said Mrs. Warner, as she began to clean out the closet in her little daughter's room in the early spring morning. "I am so sorry, for it would have kept some little body so comfortable during the very cold weather we have had. But now the weather is so mild, I think I had better pack it away until another winter."

That was one of the "might have beens." Some little child would have been made very happy by having that good warm coat which Elsie had outgrown, but just because of thoughtless procrastination it was left hanging in the closet, of no use to anybody.

"I believe there is a funeral across the way. I wonder who is dead," said Mrs. Whiton, as she stood by the window one afternoon.

"It was that little Barton girl's mother," replied the daughter, Agnes. "You know I told you she went to our Sunday-school and was in my class. Our teacher told Mrs. Hunter that the mother had been ill ever since they came here a month ago."

"It must be the very lady that Mrs. Hunter asked me to call upon because she was ill and a stranger," said the mother. "I told Mrs. Hunter I would try to go, but I really forgot all about it, so many other things have taken up my mind and my time."

That was one of the "might have beens." "I was a stranger and ye took Me *not* in." What comfort that neighbor could have brought into that suffering stranger's life if she had taken the time and trouble to go and see her during the last few days of her stay on earth. Oh, the "might have beens" that have made life lose so much of cheer and brightness! We could have brought joy into a sorrowing heart by a few words of hearty sympathy, but we let the opportunity pass and did not speak them. We might have given a lift to somebody who was carrying a tenfold heavier burden than we were, but we did not consider what help we could give, and passed by on the other side. Why are we so careless of these things that are but small matters for us to do, and yet are productive of so much good in the world? Why do we let the moth and rust destroy things that might have been of such great value to others if given at the proper time? Things that are useful to others should be considered as belonging to those of God's children who need them. They should never be allowed to hang or lie uselessly in secluded places in our home. We shall be called to account for wrapping up such talents and putting them aside, where they are of no use to anybody as much as for letting other talents God has given us be idle.

Let us all remember the injunction, "Do good as ye have opportunity," and then we shall not have to sorrow over the "might have beens," the remembrances of which have come too late to bless and help.

"And still beyond your household duties reaching,
Stretch forth a helping hand—
So many stand in need of loving comfort
All over this wide land;
Perchance some soul you aid to-day, to-morrow
May with the angels sing—
Some one may go straight from your earthly table
To banquet with the King."

Let every dawn of morning be to you as the beginning of life, and every setting sun be to you as its close.

We cannot remain at rest! When we think of enjoying ourselves, a foe is sent us to try our valor, a friend to try our patience.

He that will not permit his wealth to do any good to others while he is alive, prevents its doing any good to himself when he is dead.

Puzzles.

The following prizes are offered every quarter, beginning with months of April, July and October: For answers to puzzles during each quarter—1st prize, \$1.50; 2nd, \$1.00; 3rd, 75c. For original puzzles—1st, \$1.00; 2nd, 75c; 3rd, 50c.

This column is open to all who comply with the following rules: Puzzles must be original—that is, must not be copied from other papers; they must be written on one side only of paper, and sender's name signed to each puzzle; answers must accompany all original puzzles (preferably on separate paper).

1, A species of cake; 2, when; 3, to plunge; 4, a hideous scream; 5, against; 6, overthrow; 7, a net.

Primals and finals spell the name of a noted author.

3—A FLEET.

- (Example—The ship of manufacture, workmanship.)
1. The ship first in competition.
2. Two ships of noble rank.
3. The ship of a firm.
4. The ship of the student.
5. The ship of burdensome toil.
6. The ship of mutual attachment.
7. The ship of political knowledge.
8. The ship of inhabitants.
9. The ship for sailors.

4—CROSS-WORD ENIGMA.

First in cat, not in dog; Second in tag, not in log; Third in country, not in town; Fourth in feather, not in down; Fifth in spring, not in fall; Sixth in cane, not in doll; Seventh in dish, not in pan; Eighth in race, also in ran; Ninth in Dan, not in Sam. Whole is an adroit manager.

5—DOUBLE ACROSTIC.

1, Coldness; 2, a cave; 3, the last month; 4, the rainbow; 5, native simplicity; 6, a wicked person, transposed; 7, a large spoon; 8, a narrow valley; 9, a funeral solemnity.

Primals and finals each spell the name of a hero of modern history.

6—REBUSES.

1. H OR \$\$\$
2. WE (UR 2C ME) (LY CE) EK

7—HALF SQUARE.

A small European hawk; to set a value on; a warlike horse; to pour; a color; a type measure; a consonant.

8—CHARADE.

My first makes company, my second shuns company, my third assembles company, my whole puzzles a company.

9—ANAGRAM.

"I ON RAT CONES, FED."

"I went to the war—'twas long ago, When to get 'rat sup' was thought smart, Yet I do not know as I made any show, Tho' in TOTAL I took a great part."

10—ENIGMA.

My first is in lark but not in wren, My second is in raven but not in hen, My third is in grave and also in gay, My fourth is in sport but not in play, My fifth is in ill but not in well, My sixth is in speak but not in tell, My seventh is in piece but not in bit, My eighth is in kitten but not in kit.

My whole is an unwelcome visitor in nearly every home each winter.

11—CONUNDRUM.

What four things has God not got?

12—NUMERICAL ENIGMA.

My 1, 5, 6, 2, is a Norse poem; 4, 2, 10, 9, is a virgin; 6, 5, 7, 9, is a bauble; 6, 3, 5, 8, 9, is an organ of the body.

13—DOUBLE ACROSTIC.

In "dress" so costly and fine, In "cider" better than wine, In "cream" good and prime, In "peaches" from a sunny clime, Bought for a dime.

In "places" we want to see, In "hives" filled with bees, In "stones" from River Dee, In "diamonds" got with a fee From the land of Zuyder Zee.

In "moments" gone so quick, In "pigeon" shot by Dick, In "onion" grown by Mick, In "sardine" bought on tick, Eat all this, you'll be sick.

Now a puzzler gay from this list you'll get— He's really an addition to our set; Also the kind of puzzle in which he delights— Drear is his crime, but he's all right. Good night! Good night!

14—PRIZEWINNERS.

The prizes for original puzzles for January, February and March are awarded as follows: First (\$1), to F. L. Sawyer ("Ogma"), 118 Ann St., Toronto; 2nd (75c.), to L. B. Force ("Dickens"), Orill, Ont.; and 3rd (50c.) to Richard Stinson ("Dick"), Harriston, Ont.

The names of winners for solutions will appear next issue.

Answers to March 20th Puzzles.

1—Drear-rear-car-are. 2-c o w e r. 3-z i b e t. o l i v e. i n a n e. w i t a n. b a i r n. e v a d e. e n r o l. r e n e w. t e n l o.

4—Rejuvenescence. 5—Haste-hate; Boyne-bone; penal-peal; ducal-dual; booth-both; maple-male; dream-dram. Centrals—syncope.

6—Colorado, Dominion, Mexico, Lanark, Durham, Montreal. 7—Rag-a-muff-in. 8—Explain, coxcomb, hexangular, Oxford, exhale, proxy, galaxy, expostulate.

9—All Fools' day. 10—Crime-rime-me. 11—Valve, care, maid, vicar, Rome, label.

12—armand. 13—Sam-p-son, Kit-chen-er (chin, her), Minto (toe), Tarte, Hardy, Dreyfus (dry fuss), Sal-is-bury, Herschell.

14—Farm-m=far; mien-l=men; mild-l=mid; milt-l=mit; moist-l=most; moist-o=mist; monde-n=mode. Subtracted letters=million.

SOLVERS TO MARCH 20TH PUZZLES.

"Ena," "ARRY 'AWKINS," Lizzie Conner, Jessie Hyde, Peter Hyde, G. E. K., "Toledo," Stephen H. Collins, A. E. T., "Dick," M. R. G.

ADDITIONAL SOLVERS TO MARCH 6TH PUZZLES.

"Dick," "Ena," "Barney," M. A. A., J. McLean, Jessie and Peter Hyde, G. E. K., "Toledo," M. R. G., A. E. T., Lizzie Conner.

COUSINLY CHAT.

An accident happened the Pakenham mail-bag recently, and I received some mutilated letters containing puzzles, but was unable to decipher the contents. Doubtless some will find their names missing this time, but the above will explain the cause.

I regret that some of the puzzlers are again accused of sending copied puzzles; indeed, I am quite certain that some of

"FLORENCE."

M. N.

those sent during the past month are stale conundrums. I think we shall have to make expulsion from our Corner the penalty for this sort of dishonesty if it occur in future.

The editor continually begs me to "boil down the puzzles," consequently I am obliged to reject many really worthy ones, but I cannot help it, so you must not blame me.

Crief, Peter, Barclay, and Vera.—The above paragraph will explain the non-appearance of your puzzles. Indeed, you all do very well for such little people, and I should like to give you a chance. But do not de-pair—try again, and send solutions too, every issue.

C. B. M.—I presume you have ere this seen your name for the issue mentioned. Sometimes the work comes too late to appear in proper season.

Barney.—There was something wrong, but you did very well, and I give you credit for it.

Buttercup.—Just near the season for buttercups to bloom, so we bid you welcome. Do not send so many puzzles next time, but make those you do send as good as possible. Why not solve also!

"Dick."—You awful fellow! Why will you send those big form puzzles, that are hard to compose and take up so much room? Space is at a premium, "Dick," my dear boy, so short-er puzzles, if pithy, are more acceptable. The race has been very keen, but you are "in it." Try your hand at chatty personal puzzles.

"Florence."—So you are trying a new line with your new name. I hope you will succeed, but it's hard work all round now.

ADA A.

A Dream.

A lady, in her elegant carriage, drove up to the great dry-goods store, and stepping daintily out she walked into the busy place. Approaching a weary-looking girl at one of the counters, she said: "What time do you get off duty?"

"Usually at six, madam," replied the astonished girl, "but to-day at five."

"Don't you get very tired working so long?"

"Yes, madam; but I must work or starve."

"Well, will you let me take you for a drive of an hour, after you are through to-day? I'm sure it will do you good?"

The girl, knowing the wealth and social position of the lady, blushed with pleasure, and she was only too glad to accept the invitation so politely and kindly extended, and the lady, with a cheery smile and bow, walked out.

Then the man who dreamed this woke up and wondered how in the world people could dream such improbable and ridiculous things.—Detroit Free Press.

Life's Story.

A narrow road with twining branches bowed, A pair of lovers whispering in the shade; A sigh, a blush, a softly whispered "yes," A kiss, and thus the old, old contract's made.

(Ten years later.)

Three pairs of toothless boots require renewing, Three boys are waiting for the happy chance, That dad can buy another pair of breeches, His old ones going to the boys for pants.

A grocer's bill to meet, the winter's fuel, Rent day next week and school books to be had; The problem how to make one dollar fifty, Forever pressing on the happy dad.

(22 years later.)

Three lovers o'er three maidens softly bending; Six hearts that beat as three can never sever; The same old problems looming in the distance— And thus the merry world goes on forever.

"Doctor," said he, "I'm a victim of insomnia. I can't sleep if there's the least noise—such as a cat on the back fence, for instance."

"This powder will be effective," replied the physician, after compounding a prescription.

"When do I take it, doctor?"

"You don't take it. Give it to the cat in a little milk."—Tit-Bits.

Oilcloths or linoleum should never be washed in hot water or soapsuds; always in tepid water.

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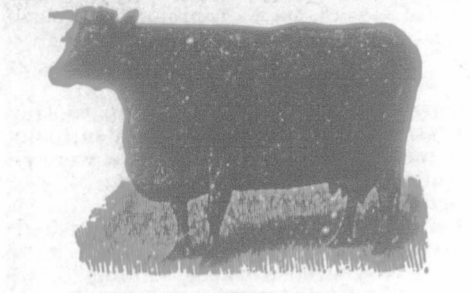
GOSSIP. J. B. Ewing, Dartford, Ont., writes: "I have on hand at present forty-seven head of Berkshires, of the up-to-date bacon type. I have January, February and March pigs for sale. My herd has been established some years. I have bred only from the best animals. My herd last year captured nearly all the red tickets at some of the best county shows in Ontario." W. W. Everitt, Chatham, Ont., breeder of Jersey cattle and Barred Plymouth Rock and Black Minorca fowls, has a herd of twenty-five head of richly-bred Jerseys, about one-half of which are milking or due to calve soon. Among the matrons of the herd is the solid-colored five-year-old Charity of Glen Rouge 102999, by One Hundred Per Cent, full brother in blood to Stoke Pogis 3rd, sire of twenty-seven cows averaging over twenty pounds of butter in seven days. This cow has raised four calves in five years, and her splendid three-year-old daughter (also solid color) swings a model shaped udder and is a persistent milker. She is by Perfect Combination, of the same blood as the winning cows in the World's Fair test. The three-year-old Leap Year Elsie is a solid fawn daughter of Massena's Son, a sweepstakes winner at Toronto, Montreal, and Ottawa, and whose dam made the great record of nine hundred pounds of butter in one year. Lady Lil is by Mighty Dollar, another first prize winner at Toronto, and her dam is Brevia Rogis. The present stock bull is Handsome Rioter, by Lillium's Rioter, winner of sweepstakes and head of first prize herd at Toronto Exhibition; dam Hugo Beauty 2nd, daughter of Hugo Beauty, first prize at Toronto Exhibition. Among the young bulls for sale is a three-year-old son of Magnolia of Highfield, by Hugo Alpha of Oaklawn, another first prize winner at Toronto, and a yearling son of Lady Lil by Massena's Son. Also a number of young calves of both sexes. The Black Minorcas are up-to-date, and the Barred Plymouth Rocks are of Shearer's strain, the pen being headed by a prizewinning cockerel.

FOR SALE OR EXCHANGE

FOR FARM LANDS OR LIGHT HORSES

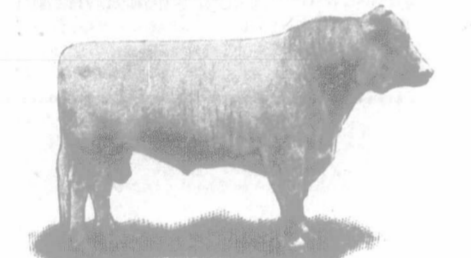
The imported Shire stallion
Grove Ringleader
No. 11544
English Shire Horse Soc. Stud Book. Foaled 1889; weight, 1,800 lbs. This horse is of the finest quality and disposition. He is sire of Ring Master, winner of the sweepstakes at Winnipeg, Portage la Prairie, Brandon, and Regina, 1895. For particulars apply to
GEORGE BOTTING, Brandon, Man.

J. E. SMITH

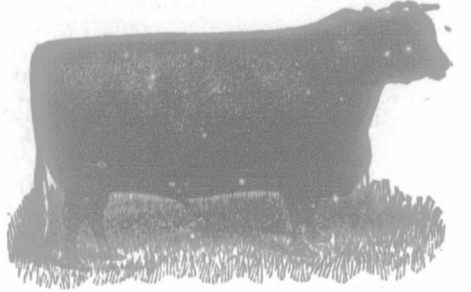


—HAS ON HAND FOR SALE—
CLYDESDALE STALLIONS AND MARES. SHORTHORN CATTLE--BULLS and HEIFERS.
All registered. Prices right. Come and see them. No reserves.
J. E. SMITH, Box 274, Brandon.

"PRAIRIE HOME STOCK FARM."



Bulls at head of herd: **JUDON = 23419 =** and **IMP. JUBILEE = 22858 =**.
Shorthorn and Ayrshire cattle, Shropshire sheep, Yorkshire and Berkshire swine. A carload of Bulls suitable for Northwest Territories for sale.
ORDERS BOOKED FOR SPRING PIGS.
Berkshires, by the great boar, King Clere, and out of such sows as Harmony and Gold Drop. Yorkshires, by the sweepstakes boar, Yorkshire Bill, and out of such sows as Stamina, Jubilee Queen, and Markham Maid.
THOS. GREENWAY, PROPRIETOR. **JAS. YULE, MANAGER, CRYSTAL CITY.**



Young bulls and heifers for sale from Topman = 17847 =, the winner of the sweepstakes and silver medal at the Winnipeg Industrial in 1897. My stock also won first for Manitoba herd. A good chance to get a splendid young bull to head a herd. Prices right. Write or call on
JOHN G. BARRON, Box 53, Carberry, Manitoba.

J. A. S. MACMILLAN

—IMPORTER OF—
Clydesdales, Shires, Hackneys.

STALLIONS:

Has a few choice ones for sale. Also Pure-bred



SHROPSHIRE SHEEP,

Rams and Ewes, from the most fashionable imported blood. Inspection invited. For full particulars,
Apply: **Box 483, Brandon, Manitoba.**

SHORTHORNS. My stock bull, Royal Duke 24610; six other bulls, varying in ages; five heifer calves. Will sell at reasonable figures, to make room for winter. Write
R. McLENNAN, Moropano, Man.

NOTICES.

Messrs. A. E. McKenzie & Co., of Brandon, Man., who make a specialty of handling field seeds, send us their 1899 price list, giving quotations on field seeds and grasses. Accompanying the list are timely and valuable suggestions on cultivation and care of the different grasses by S. A. Bedford, Superintendent of Brandon Experimental Farm.

Mr. G. J. Manson advertises in this issue farm lands for sale. Parties wishing information about farm lands anywhere in Manitoba, and particularly in the Winnipeg district, could not do better than communicate with Mr. Manson. His long residence and thorough business integrity enables him to furnish information of the most valuable and reliable nature.

The Fish Bros. Wagon Co., Racine, Wis., issue a large illustrated catalogue of the various styles of wagon manufactured by them. As this firm pays strict attention to the quality of lumber used in their vehicles, and to the finish of every detail, purchasers can rest assured that they get good value for their money when they purchase wagons, democats, carts, etc., with Fish Bros. "trade-mark" thereon. In any case of breakage, the result of defective material or poor workmanship, within a year from date of sale, they undertake to supply duplicates of the broken parts without charge to the purchaser.

The Fairchild Company, Ltd., Winnipeg, among the oldest and largest dealers in agricultural implements in the West, make a special announcement in this issue. This firm handle all through a magnificent line of goods, including the celebrated Wilkinson (Canadian) and John Deere (American) plows in both walking and riding patterns, harrows and disks in full assortment, the Monitor and Monarch disk and shoe drills in sizes from 12 to 24 shoes. This spring they are introducing a Soil Packer manufactured by the Wilkinson Plow Company. These soil packers have been used for several years in the wheat States to the south of us, where their use is rapidly increasing. They firm and consolidate the lower soil, leaving the top or mulch free and loose. The Deering mowers, rakes and harvesting machinery are also handled by this firm, and nothing we could say would add to the popularity of these machines. They also have the Northwest agency of the Advance Threshers of Battle Creek, Michigan, one of the best outfits made. Waterloo buggies and the Cleveland bicycle are among the fancy lines handled by the Fairchild Company.

The Cockshutt Plow Co. Ltd. (Mr. Mott, manager), Winnipeg, are doing an immense jobbing trade in agricultural implements of all kinds. They report a very heavy spring trade. The Cockshutt Plows, in Breakers, Stubble Plows, Sulkies and Gangs, are too well known throughout the West to require any commendation. They are, however, this year putting out a Disk Plow that is quite a novelty in the plow line. The claim for it is that it will clean anywhere. In seeders the Cockshutt Shoe Drill is having a great run and giving good satisfaction, while the new disk shoe that can be attached instead of the ordinary shoe is pronounced by those who have used them as almost perfect. They won't choke with stubble or manure, and are light draft. A full line of harrows, disk harrows, etc., are carried, but in this line the new weeders are having a great run this year. The usefulness and practicability of this implement having been demonstrated last year, farmers are finding out that they can't afford to be without them. The firm have the Manitoba and Northwest agency for the Gould, Shapley & Muir Company's IDEAL Windmills, which are so deservedly popular, and handle in connection with them a full line of pumps, grain crushers, etc. A special line of wagons, buggies, bicycles, etc., are always in stock.

J. Y. Griffin & Co., pork-packers, Winnipeg, have issued the following circular to the farmers of Manitoba and the Territories: "Why not raise more hogs? It seems to us this branch of agriculture is being very much neglected, as the supply of hogs is much smaller this year than for many years. It certainly seems strange that the importation of cured meats and lard from the United States to Winnipeg alone in 1898 should amount to 1,919,784 pounds, and in addition to this there were also large quantities brought in from Eastern Canada. Please bear in mind this was only to Winnipeg. Cured meats and lard imported to other Manitoba and Northwest points and British Columbia were simply enormous. To-day, March 15th, we are receiving dressed hogs for our packing house from Western Ontario, and paying \$4.65 for them f. o. b. Ontario points. Prices on hogs to-day in Chicago run from 3c. to 4c. live weight. Now, if these prices pay Ontario and American farmers, and it must be so or the quantity raised would not increase as rapidly as it does, then with the abundance of cheap feed in Manitoba almost every year, it certainly would pay to raise hogs in Manitoba. We have no desire to dictate to farmers as to what they should do in their business, but we would like to inform them that we have in Winnipeg a plant for handling live and dressed hogs, complete in every respect, with a capacity to handle 500 hogs per day, that at the present time it is only running about one-tenth of the time. There are a number of other firms engaged in the packing trade, and the competition in buying is probably as keen in Winnipeg as in any eastern market. Manitoba and British Columbia are large consumers of bacon, ham and lard, and our experience is that they very much prefer buying Manitoba products, but cannot get them, and the Americans are in the meantime, supplying these markets. Although wheat-growing is the staple crop in Manitoba, and the crop that has made our Province famous, yet there are years when farmers would make more money out of this wheat by feeding a portion of it to hogs than by selling it at low prices. Again, when we raise hogs easy it is for farmers in Manitoba to raise oats and barley, the best food products for raising and fattening hogs, there should be no break in the number of hogs raised, even in the years when our wheat is No. 1 hard and the price is high. If farmers will raise the hogs, the packing houses in Manitoba will see to it that every hog of theirs will be purchased. Manitoba and British Columbia markets supplied, and the money go into the pockets of Manitoba farmers instead of, as at present, into the pockets of American and Ontario farmers."

Meadow Lawn STOCK FARM.

Clydesdale Horses, Shorthorn Cattle.

The most fashionably bred stud of Clydesdale Horses and herd of Shorthorn Cattle in America. Prices reasonable. Quality assured.

N. P. CLARK, ST. CLOUD, MINN.

FOREST HOME FARM.

SHORTHORNS, BERKSHIRES, YORKSHIRES, and B. P. ROCKS.
Two young Bulls, good ones. Yorkshire Boars, ready for service. Spring pigs, both breeds, just arrived from Toronto. Three very large, well-marked Cockerels for use in our fine yard of Rocks. Eggs, \$1.50 per setting of 14.

A. GRAHAM, Carman, C. P. R. POMEROY, MAN. Roland, N. P. R.

12 YOUNG BULLS

of Missie, Mina, Rosebud, Strathallan, Wimple, and other choice Scotch breeding. Also, females at moderate prices.

W. S. LISTER, MIDDLECHURCH, MAN. Marchmont Stock Farm, near Winnipeg, Man.

D. FRASER & SONS, EMERSON, MAN.

Breeders and importers of Durham Cattle, Shropshire and Southdown Sheep, and Pure-bred Poland-China Pigs a specialty. Young stock for sale. 9-3-11

Shorthorn Cows and Heifers for Sale

Of good breeding. Prices right.
GEORGE RANKIN, HAMIOTA, MAN. "Melrose Stock Farm."

HOPE FARM, ST. JEAN BAPTISTE, MAN.

Headquarters for

Galloway Cattle.

Apply to—
T. M. CAMPBELL, Manager.

FOR SALE:

2 Pure Suffolk Punch Stallions, 3 years old, and 1 Yorkshire Coach Stallion, 5 years old, also Hereford Cattle. Correspondence solicited.

MOSSOM BOYD CO., Big Island Farm, BOBCAYGEON, ONT.

HEREFORDS

I keep only the best. For stock of all ages Write or call. **WM. SHARMAN, "Ridgewood Stock Farm," SOURIS, MAN.**

FOR HEREFORDS

CALL ON OR WRITE TO
J. E. MARPLES, DELEAU (Pipestone branch C. P. R.), MAN.

SIX JERSEY BULLS FOR SALE

Of high-class breeding. Also Cows and Heifers. Write
William Murray, Dugald, Man.

LEICESTERS!

Young Rams and Ewes for sale. Write or call on
A. D. GAMLEY, Box 193, BRANDON, MANITOBA.

BERKSHIRES AND SHORTHORNS

Young bulls and heifers of good breeding, and excellent young pigs, now for sale. Write or call.
R. L. LANG, OAK LAKE, MAN. "Spruce Bank Farm"

YOU CAN'T DO WITHOUT IT!

IF YOU WANT FURNITURE—IT IS MAILED FREE—OUR BIG CATALOGUE, CONTAINING OVER THREE HUNDRED ILLUSTRATIONS.
SCOTT FURNITURE CO., THE WIDE AWAKE HOUSE, WINNIPEG, MANITOBA.

THE GOLD STANDARD HERD



Of registered BERKSHIRES are still to the front. I have a number of fine sows bred for early litters to my two stock boars, "Fitz Lee" and "General Booth," and expect a lot of fine early pigs. Sows to farrow every month. Am now booking orders for spring pigs; unrelated pairs supplied. Correspondence solicited. Address,
J. A. MCGILL, Neepawa, Man.

- SNELGROVE - BERKSHIRES AND COTSWOLDS

High-class Berkshires of the large English bacon type, bred from the best specimens of the best importations. Young Boars and Sows of breeding age for sale. Also choice spring pigs six to eight weeks old. Can supply pairs not akin. Yearling Cotswold Rams and Ewes for sale.
R. P. SNELL, Snelgrove, Ont.

SHORTHORNS

Also a few Improved Large Yorkshires for sale. Write to
JAMES BRAY, Longburn, Man.

J. C. & A. W. FLEMING, Rosebank Stock Farm, Pilot Mound, Man.

Breeders of Poland-China pigs and Cotswold sheep of choice quality, offer select seed potatoes of eighty varieties. Write for catalogue.

SCOTCH COLLIE DOGS.

I have a number of fine sable pups for sale, by Merlin, out of Fanny G. They are full brothers of Belhelvie Dina, winner of two firsts and special at Winnipeg in 1898. Price, \$10. Also Fox Terrier pups from my prize-winning stock, \$10 each. Certificate of registration with each.
W. J. LUMSDEN, Hanlan, Man.

MAW'S POULTRY FARM

MY Bronze Turkeys, Toulouse Geese, Pekin Ducks, Wyandottes and Plymouth Rocks are breeds best adapted to our climate. They are the very best acclimated stock; have won prizes in all leading exhibitions. Eggs at lowest rates. Write for large, free, illustrated catalogue. If you are in a hurry, send along the cash and I will ship you full value.

M. Maw, Winnipeg, Manitoba.

FORT ROUGE POULTRY YARDS.

EGGS FOR HATCHING from high-class Golden Wyandottes, Langshans, Plymouth Rocks, Indian Games, Pyle Leghorns. \$2 per 15 eggs. Pekin Ducks and Pearl Guineas, \$1 per 13. Bronze Turkeys, \$2 for 10 eggs. A few choice birds for sale; also Belgian Hares and Fancy Pigeons. Write for circular. Address,
S. LING & CO., WINNIPEG, MAN.

LIGHT BRAHMA EGGS.

For hatching, from pen headed by 1st prize winner at Manitoba Poultry Show this year. Place orders early; will be filled in rotation as fast as can be supplied. Write at once to—
J. W. HIGGINBOTHAM, VIRDEN, MAN.

POULTRY CIRCULAR

I have issued my 1899 circular of pure land and water fowl. Prices given for eggs and birds. Send card for circular. **CHAS. MIDWINTER, Louise Bridge, Winnipeg, Man.** Winner of Lieut.-Governor's medal for best display of Poultry in Man. & N. W. T. by one exhibitor in 1898.

MINORCAS, B.

Eggs from our 1st prize winners, \$2 for 13; \$3.50 for 25. A few choice cockerels and pullets for sale. Satisfaction guaranteed.
A. M. ROBERTSON, KEEWATIN, ONT.

FOR YOUR SUPPLY OF Brome Grass Seed

AT REASONABLE PRICES AND
BEST QUALITY

APPLY TO **THO. COPLAND,**
"Hazelton Stock and Seed Farm,"
SASKATOON, SASK., N.-W.T.

Wanted

A GOOD SHEEP SHEARER WANTS WORK IN SHEARING TIME.
APPLY TO **George Johnston, FOXWARREN, MANITOBA.**

FOR THE BEST VALUE IN

BUGGIES, WAGONS, AND GANG PLOWS.

XX RAYS GANG
PLOWS,
RUSHFORD
WAGONS,
M'CLAUGHLIN
BUGGIES,
AND
GANANOQUE BUGGIES.



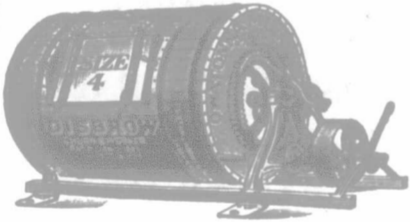
Everything at Rock-Bottom Prices, consistent with first-class goods.

A. C. McRAE,

COR. KING AND JAMES STS., WINNIPEG, MAN.
MENTION THIS PAPER.

DISBROW

Men WHO have achieved success are those who take advantage of every facility which the world affords in their particular line. The "DISBROW" COMBINED CHURN and BUTTER WORKER



for which we have accepted the sole agency for Manitoba and the Northwest Territories marks a new era in factory buttermaking. It is a factory in itself, as it will churn, wash, salt and work 50 to 100 pounds of butter in one continuous operation, while it occupies no more space than an ordinary box churn, and requires less power. It saves rent, fuel, labor and time, and makes more and better butter than the ordinary box churn. Send to us for catalogues and further information.

CREAM SEPARATORS.

WE MAY REMIND YOU WE ARE A LONG WAY AHEAD OF THE PROCESSION IN THIS LINE.

The sale of our "ALEXANDRAS" this year already is unprecedented, and "THE MELOTTE," a hand machine for use in herds of 20 cows or upwards, has proved itself to be even more than we at first claimed. We have printed a new Price List of Dairy Goods. Drop a post card and get one.

R. A. LISTER & CO., LIMITED

232 & 234 KING ST., WINNIPEG, MAN.

Shops: 579 St. Paul street, Montreal.

Works and Head Office: Dursley, England.

BLACK LEG

Pasteur Vaccine

SUCCESSFUL PREVENTIVE REMEDY.

Write for proofs covering treatment of nearly one million head in the United States and Canada.
PASTEUR VACCINE CO., 65 FIFTH AVE., CHICAGO.

GOSSIP.

In writing to advertisers, mention the "Farmer's Advocate."

Mr. George Johnston, Foxwarren, Manitoba, requests by advertisement in this issue work as sheep shearer.

J. E. Marples, Poplar Grove, Deleau, Man., breeder of Hereford cattle, advises us that he has recently sold two Hereford bulls to parties in Saskatchewan.

In the list of expert judges of beef breeds of cattle, recommended by the Pure-bred Cattle Breeders' Association, and published in the ADVOCATE of April 5th, the name of F. W. Brown, Portage la Prairie, was omitted.

William Chalmers, Hayfield, Man., reports the following sales: To Simon Clark, Rounthwaite, one red bull calf; to Ed. T. Petar, a red bull and a two-year-old heifer, Lady Aberdeen; to Samuel Martin, Rounthwaite, one bull; to Robert Rogers, Elkhorn, one bull; to James Henderson, Brandon, one bull. All sired by the Millar-bred bull, Aberdeen 2nd.

J. C. & A. W. Fleming, of Rosebank Stock Farm, Pilot Mound, have issued a catalogue listing seed grain, seed potatoes, and pure-bred stock. Poland China swine and Cotswold sheep are bred by the firm, and young stock offered at reasonable prices. Barred Plymouth Rocks and Single Comb Brown Leghorns, Rouen Ducks and Toulouse Geese are also catalogued; and as a speciality, Deerhounds, celebrated as wolf killers, are bred for sale. The Messrs. Fleming also handle Seed Potatoes in a great many varieties; also Mandscheuri and Beardless (Success) barley.

Mr. W. A. Heubach, of Fort Qu'Appelle, has made several important importations of horses and cattle this season from Ontario. Two carloads of Shorthorns will be brought in in May. Sixteen brood mares, several of them registered Clydesdales, and two stallions were shipped through in March. One of these, the Clydesdale, Charlie of Castlemore, bred by D. & R. McGeachy, was sired by imports Lochhill (532) (2950); dam Maggie Chisken (367) (5585) (imp.), by Farmers' Fancy (302). The other is a carriage stallion, Morgan Gold Dust, by Gold Leaf.

Roderick R. McKenzie, Maple Lodge Stock Farm, High Bluff, as will be noticed in our advertising columns, is offering Berkshires of very high quality for sale. They report sales brisk during the past few months, and have received many orders from all parts of Manitoba, and also from Innisfail and Edmonton, Alberta. Among recent sales was a young boar to Mr. H. I. Stillborn, Wolsley, Assa. This is a six-months-old hog, half-brother to the boars that won first and second under six months last summer at the Winnipeg and Brandon fairs.

M. Maw has imported a very fine pair of Rouen ducks from Paris, Ont., being the first prize drake at the Ontario Show, and a young duck from the winning pair at Ontario in 1898, and the drake that won first at Ontario last fall, and second at the Ontario and first at Galt and Brantford this winter. Also a forty-six pound Mammoth Bronze gobbler from the States to enable him to supply fresh blood to his many old customers. Mr. Maw's new catalogue, with illustrations of each variety of poultry kept, is now ready for distribution. It gives a very valuable recipe for destroying lice, and will be mailed to any address.

NOTICES.

In another column will be found the advertisement of Mr. Alex. C. McRae, corner of King and James streets, Winnipeg, wholesale dealers in carriages, wagons, buggies, plows, etc. He is Manitoba agent for X X Rays Gang Plow, Rushford wagons, and is also handling the McLaughlin Carriage Company's (Oshawa, Ont.) buggies, and Gananoque buggies. Mr. McRae has a full and complete line of these goods, and would be pleased to furnish prices and any other information desired to anyone making enquiries either in person or by letter.

Black Leg in Cattle.—Black leg is a well-known disease, and a costly one to many cattle raisers. No satisfactory curative treatment has ever been devised; but black leg can be prevented by "vaccination" just like smallpox. Until the celebrated French scientist, Louis Pasteur, undertook his researches, some 18 years ago, anthrax and black leg were considered as two forms of the same disease. But Pasteur found that they were due to two distinct germs. He discovered the preventive remedy, or "vaccine," for anthrax, in 1880, and the vaccine of black leg was developed in 1884. The two vaccines have been put to extensive practical use in Europe and Australia during the last 14 years, and were introduced to North America cattle raisers in 1885.

Anthrax is fortunately not very common on the North American continent, but black leg is very troublesome in all parts of the United States west of the Mississippi. In the same way, anthrax seldom occurs in Canada, but black leg among the calves and yearlings causes considerable loss every year in some parts of Ontario and Manitoba, and particularly in the cattle districts of the Northwest Territories. Preventive "vaccination" is therefore of particular interest to farmers and ranchmen in those localities.

Pasteur black-leg vaccine is thoroughly well known in the United States; it has been the subject of specific official endorsement by a number of States, and it is stated that nearly one million head have been successfully treated during the last three and one-half years in the United States alone. It has been used to some extent during this time in Canada, and is already fairly well known in certain districts— notably Alberta, where it has been used the longest and its merits, therefore, are the best known. The spring is the time of year when black leg principally breaks out, and the Pasteur Vaccine Co., whose headquarters are at 65 Fifth Ave., Chicago, is now thoroughly introducing its vaccine to Canadian cattle owners, and they will, no doubt, appreciate it. The Pasteur Vaccine Co. has published quite an interesting book on black leg and its treatment, which will be mailed gratis on request. The book contains official endorsements, and a considerable number of most gratifying testimonials from Canadian and American stockmen, who have been using the Pasteur vaccine during the last three and one-half years. It should be in the hands of every cattle raiser.

BICYCLES

WE HAVE THIS YEAR THE

RAMBLER

ONE OF THE HIGHEST GRADE WHEELS ON THE MARKET, AND NO HIGHER GRADE WHEEL IS OR CAN BE MADE.

PRICE, \$50.00.

TWENTY YEARS' EXPERIENCE HAS TAUGHT THE MAKERS OF THIS WHEEL HOW TO AVOID MISTAKES.

WE ALSO HAVE THE

"YALE"

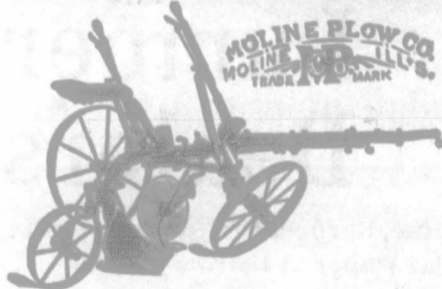
THIS IS A THOROUGHLY HONEST AND RELIABLE WHEEL.

PRICE, \$40.00.

AND IS GOOD VALUE FOR THE MONEY.

Write us for particulars. Catalogue on application.

The Hingston Smith Arms Co.
WINNIPEG, - MAN.



The Good Enough Sulky Plow

CAN NOT BE BEAT.

The Price will please you and its work will surprise you!

Write for illustrated circular. It will pay you.

MINNESOTA MOLINE PLOW CO.

H. F. Anderson, Agent, Winnipeg, Manitoba.

Durability Combined with Cheapness!

OUR HARNESS

HAS STOOD THE TEST. IT WEARS BETTER AND LOOKS BETTER THAN ANY OTHER MAKE, AND CHEAPER.

PEIRCE BROS

HARNESS MANUFACTORY,
WINNIPEG, - MANITOBA.



THE only ORIGINAL and GENUINE Fish Bros. wagon, made only at RACINE, WIS. Send for catalogue to us, or our agents for your territory.

Minnesota Moline Plow Company,
MINNEAPOLIS, MINN.



ITALIAN BEES

: FOR SALE :

PRICE LIST FREE.

WM. JAS. ROBINSON,
PORTAGE LA PRAIRIE.

7-1-11

STEAMSHIP Tickets

If you are going to the Old Country, or sending for your friends, apply to our nearest railway or ticket agent, who can supply outward and prepaid tickets at lowest rates.

Steamers leave Portland, Maine, every Saturday; St. John, every Wednesday; New York, every Wednesday and Saturday.

WILLIAM STITT,
General Agent, C. P. E. Offices,
2-2y-m WINNIPEG.

THIS SPRING!

Will be a good season for tree-planting, as the ground is in good shape. For a list of hardy and suitable varieties of

TREES, SEEDLINGS, SHRUBS,
SMALL FRUITS,
PERENNIAL PLANTS, AND
SEED POTATOES,

SEND TO
H. L. PATMORE,
BRANDON NURSERY.

DICK, BANNING & CO.,

Lumber Dealers

Pine, Spruce, Fir, Shingles, and
Tar Paper at bottom prices.

Yard opposite
C. P. R. depot, **WINNIPEG.**

SAVE MONEY AND BE WISE

J. E. ACTON
We are offering a Ceylon and Indian Blend tea at 25c. This tea is honest value for 50c. Before buying send for free sample, and when you have tried it you will use no other. To introduce this tea I will prepay freight on all orders over 10-lb. lots.
J. E. ACTON,
Tea Merchant, WINNIPEG.

R. A. BONNAR,
Barrister, Notary Public,
Conveyancer, Etc.

Office 494½ Main St., Winnipeg, Man.
Special attention to collections. Solicitor for "Farmer's Advocate," Winnipeg. 24-a-m

BROME GRASS SEED!

GUARANTEED FREE FROM NOXIOUS WEEDS.

For price and particulars, apply to
W. R. MOTHERWELL, Abernethy, Assn.

J. McVICAR, Grain and Commission Merchant.
GRAIN EXCHANGE:

P. O. BOX 574, WINNIPEG, MAN.
All kinds of grain bought and sold. Liberal advances (80%) on all consignments. Prompt returns. Send samples. Shipping instructions cheerfully given. Write or wire for prices.

CHOICE

FARM LANDS

FOR SALE IN ALL PARTS OF

MANITOBA.

Improved
AND Wild Lands

Prices Low. Very Easy Terms.

WRITE OR CALL ON

G. J. MAULSON,
195 LOMBARD ST.,
WINNIPEG, - MANITOBA.
8-c-m

BARGAINS

IN

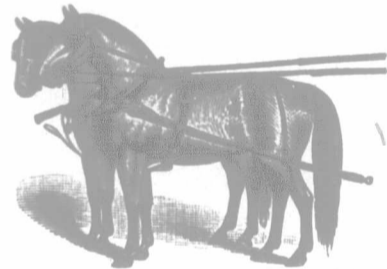
FARM LANDS.

IMPROVED and unimproved, in choicest districts, at lowest prices. Close to best markets, many adjacent to Winnipeg. Some at less than cost of improvements. Buy now before the advance in prices takes place.

See me or write for List.

WILLIAM HARVEY,
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OF MANITOBA AND N.-W. T. DISTRICTS:

We beg to call your attention to our having opened a Branch at Winnipeg, where we will endeavor to carry a complete line of all articles required in the manufacture of Butter or Cheese, for either Creamery or Dairy, and at such prices as will enable us to save you money.



Heading lists of goods stands the full line of "DE LAVAL" "ALPHA" Power and Hand SEPARATORS, which are conceded by our leading experiment stations and dairy schools, as well as advanced creamery and dairy men, to be the Best Cream Separator on the market today, and other goods of the same standard of merit, which will appeal to our dairymen as worthy of their consideration before purchasing elsewhere.

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IN SHEEP AND CATTLE,

WE CONFIDENTLY RECOMMEND THE USE OF

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[SYMPTOMATIC ANTHRAX VACCINE]

WE SUPPLY THIS VACCINE IN TWO FORMS:

- A. SINGLE VACCINE: each case containing ten doses. With this the animal is vaccinated but once. Price per case..... **\$1.50.**
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IN STOCK, YOU CAN PROCURE IT FROM

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WHO WILL PROMPTLY MAIL YOU A
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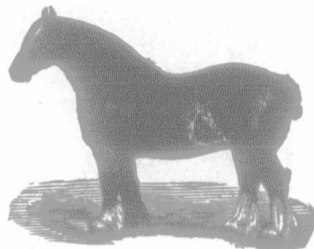
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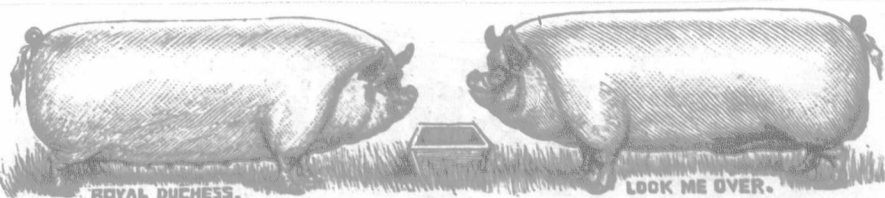
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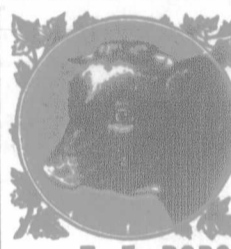
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Mostly Scotch-bred, and got by such bulls as Kinellar Sort (imp.), Northern Light (imp.), Prince and Prince Bismarck. Prices right. Correspondence Solicited, and Visitors Welcome.

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GOOD ONES. BREED RIGHT. READY FOR SERVICE.

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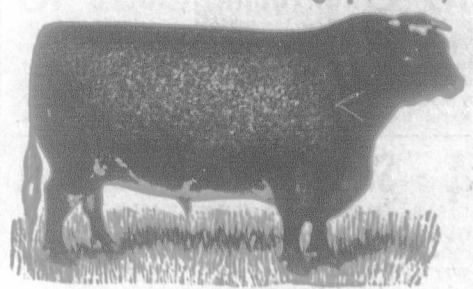
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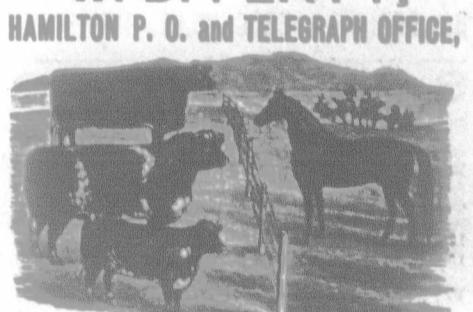
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Twenty-two Shorthorn Bulls

CHOICE from three to fifteen months old.

Persons requiring show bulls can be supplied from this bunch.

TWENTY COWS AND HEIFERS

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OF THE

Crimson Flower and Minnie Strains



And from such sires as Scotchman 2nd, Duke of Lauderdale, Premier Earl, Indian Chief, and Clan Campbell. A few splendid young bulls ready now. Cots-wold sheep.

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50 HEAD TO SELECT FROM.

We are offering four young bulls by Valkyrie, and a number of cows and heifers (including some show heifers), from such sires as Valkyrie = 21806 =, Young Abbottsford's Heir = 10047 =, and imp. Mariner = 2730 =, served by imp. Diamond Jubilee (Vol. 15) now at the head of herd. Farm 1 mile north of town.

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Ten Shorthorn Bulls FOR SALE,

Seven red and three roan, from 10 to 16 months old. In a herd of 95 head, no white calves since 1892.

THE HERD HAS PRODUCED

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A Yonge street trolley car leaves the Union Station, Toronto, to C. P. R. crossing, north Toronto; a car leaves here for Richmond Hill, four times a day, passes the farm.

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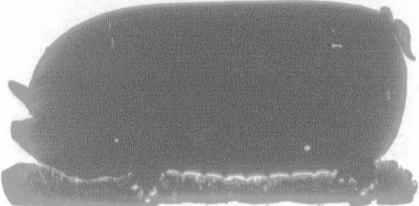
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Imported and Canadian-bred, from the Hasket family, which has taken more prizes at the leading fairs in Canada and the World's Fair at Chicago than any other family of Yorkshires in America. Young boars and sows fit for breeding for sale. Correspondence solicited, which will receive prompt attention.

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Herd headed by four first prize stock boars of large size, strong bone and fine quality. Young Boars and Sows, all ages, for sale. Orders booked for spring pigs.

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One Chester White boar, 12 months (imp.); one Chester White sow, 12 months (imp.), safe in pig; one Berk-boar, 2 years old, a herd header. Berk. pigs all ages. Write and secure a bargain.

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All ages, from prizewinners of the very best quality. Royal King 5215 at the head of the herd. Write for prices.

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The home winners of the imported boars, Conrad's Model and Klondike, assisted by Bacon Boy and Lennox. Has won 64 out of a possible 69 first prizes. Stock of all ages for sale. Write for prices or come and see

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Have twelve sows of the choicest breeding and quality due to farrow to my two boars, Brownsville Duke and Revell's Choice, bred direct from imported stock; also some choice fall pigs.

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I have to hand a choice lot of young ... **TAMWORTH SOWS** ... Some carrying their first litter and others carrying their second litter. Those sows will be sold at cut prices, by writing at once. Also, write for my new Catalogues. -om

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THE ORIGINAL Non-Poisonous Fluid Dip

Still the favorite dip, as proved by the testimony of our Minister of Agriculture and other large stockmen.

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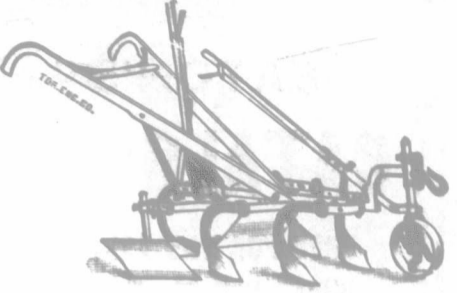
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Plain and Compound Traction Engines, Plain Portable Engines, Toronto Advance Separators, Wind Stackers, Parsons Band Cutters and Self-Feeders, Elevator Weigher and Baggers.

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We pack our twine in bags of the size of ordinary grain bags, and we are not ashamed to put our name upon it. Don't take any other.

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How many of Pearce's Eclipse Peas in a pint? One guess for every DOLLAR your order amounts to.

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Beautifully furnished, and fitted up with all modern improvements: bath room (hot and cold water), and heated throughout by hot-water system. A very large NEW BARN, with

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Grand layers and table birds. Mine are the finest strain in England; four unrelated pens. 10s. 6d. per setting.

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DO YOU WANT EGGS

From the Best Strains Procurable? If so, try us for B. and W. Cochins, L. Brahmas, Black Spanish, Langshans, Minorcas, and Javas. Buff Leghorns, S. L. Wyandottes, Red Caps, \$1.50 per 13. Barred Rocks (try our Rocks, they will please you), W. & B. Leghorns, and Pekin Ducks, \$1 per setting. Won 300 prizes last season. Satisfaction guaranteed. **J. C. LYONS, Lucknow, Ont.**

EGGS FOR HATCHING

From Barred Plymouth Rocks (imported direct from I. K. Felch, Natick, Mass., U. S.); Silver and Golden Wyandottes, and Pekin Ducks. My Wyandottes are all bred from my noted prizewinners. Only \$1 per setting of 13 hen or 11 duck eggs. Several extra good Silver Wyandotte cockerels for sale at \$1.25 each.

J. E. MEYER, - KOSSUTH, ONT.

EGGS! EGGS! EGGS!

From very choice selected pens of Barred Plymouth Rocks, Black Minorcas, and White Wyandottes, at \$1 for 15 eggs. From Toulouse Geese at \$3 for 11 eggs, or 30¢ per egg. Also a few pairs of Toulouse Geese. **W. W. EVERITT,**
Box 532, CHATHAM, ONT.

PEKIN DUCK EGGS

From grandly developed **PROLIFIC PRIZEWINNING STOCK.** \$1.00 for eleven. Perfectly packed.

E. A. SPENCER,
"DORSET FARM," BROOKLIN, ONT.

IN POULTRY SUPPLIES

WE LEAD, OTHERS FOLLOW. Sole Canadian Agents for the Cyphers Incubator, endorsed by all as the only practical incubator on the market. Endorsed and used by J. G. Jarvis, Agricultural College, Guelph, Ontario; A. C. Bennett, Agricultural College, Guelph, Ontario; J. C. Lyons, Lucknow, Ontario; Bone Mills, Mica Grit, and other poultry supplies. Two 250 egg incubators, and several smaller metal incubators for sale. Price, \$15.00. Also, a 240 Meyer's Incubator. **C. J. DANIELS,**
221 RIVER ST., TORONTO.

"CANADA'S GREATEST STORE."

"EATON'S" CATALOGUE

FREE FOR THE ASKING!
WRITE FOR IT AT ONCE!

WE have issued our Spring and Summer Catalogue for 1899. It contains 264 pages and over 1654 fine illustrations. It tells all you want to know about



Our Goods and Prices,

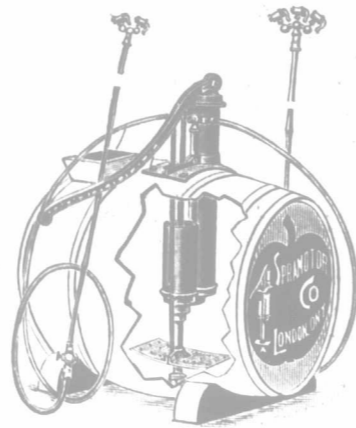
and gives you full instructions how to get our goods by mail. It will help you to *save money*—and big money, too—on things you are apt to need for home or personal use. Every reader of this paper is welcome to a copy. It is **FREE FOR THE ASKING.** Your name and post-office address on a postcard will do it.

When sending for it, address us in this way:

T. EATON CO. LIMITED
190 Yonge St.,
Dept. F. A. TORONTO, ONT.

ALL SPRAYING, DISINFECTING AND WHITEWASHING CAN BE DONE WITH THE SPRAMOTOR

It is the result of most careful and exhaustive experiment. Each feature was thoroughly tested before being placed on the market.



Toronto, November 9th, 1898. Spramotor Co., London, Ont.

Gentlemen. The machines for spraying and white-washing you have supplied to Dentonia Park Farm have done their work well, and are quite satisfactory. I could not have believed there was so much value in spraying fruit trees. We had a good crop of apples, whereas our neighbors who used no spraying machine had practically none. Yours truly,
W. E. H. MASSEY.

CERTIFICATE OF OFFICIAL AWARD.
This is to certify that at the Contest of Spraying Apparatus, held at Grimby on April 2nd and 3rd, 1896, under the auspices of the Board of Control of the Fruit Experimental Stations of Ontario, in which there were eleven contestants, the SPRAMOTOR, made by the Spramotor Co. of London, Ont., was AWARDED FIRST PLACE.

H. J. Hill Judges,
W. E. H. Massey

If you desire any further information, let us know and we will send you a 72 page copyrighted catalogue and treatise on the diseases affecting fruit trees, vegetables, etc., and their remedies.

SPRAMOTOR CO.,
17 RICHMOND ST., LONDON, ONT.
SOLE AGENTS WANTED

PLEASE MENTION FARMER'S ADVOCATE.

In your Spring Plans

REMEMBER THAT OUR...

METALLIC CEILINGS AND WALLS....

Will give you better economical service than any other style of interior finish.



SAMPLE PLATE—No. 227.

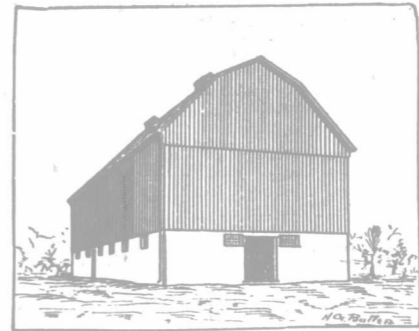
The great number of artistic designs gives a choice to suit any taste for any kind of building.

Besides being more handsome and durable than others, this finish is fireproof and sanitary, easy to apply, can be readily cleaned, and never cracks or drops.

If you send an outline showing the shape and measurements of the walls and ceilings to be covered, we will send an estimate.

The Metallic Roofing Co. Limited, 1182 King St. West, TORONTO.

WITH COMPLIMENTS.....
ESTATE OF JOHN BATTLE,
THOROLD, ONT.



This is the Barn that the Hurricane Blew Down.

But the walls built with Battle's Thorold Cement stood firm as a rock.

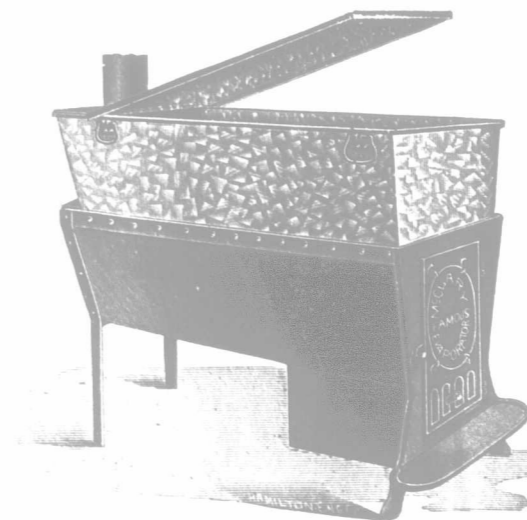
THE Thorold Cement IS TESTED BY A HURRICANE.

Read what Mr. Burt Kennedy, of Iderton, Ont., says about Thorold Cement: ILDERTON, ONT., January 27, 1899.

ESTATE OF JOHN BATTLE, Manufacturers Thorold Cement, THOROLD, ONT.: Dear Sirs,—We think Thorold Cement is the best Cement in use for building walls and floors in stables. Last June I built a wall 36 x 100 x 11 feet high at back and 8 feet at front. We were twelve days building it, under the management of Mr. P. Bowey, Iderton (five men in all). We raised the barn on the wall in twelve days after it was completed. The next day there came a hurricane, which blew down the framework. It all fell on the wall but one bent. The posts were 26 feet long, and seven of them broke. The wall stood the test, which was a very trying one, and it only chipped off a little in one place. I intend putting floors in this spring with Thorold Cement, for I think no other Cement could have stood such a test. Yours truly,
BURT KENNEDY.

For Free Pamphlet with full particulars, address **ESTATE OF JOHN BATTLE, THOROLD, - ONTARIO.**

Famous EVAPORATOR or FEED BOILER



For Poultrymen, Stock-Raisers, and Dairyman.

Can also be used for Boiling Sap; being light, can be readily carried into the bush.

Does the Quickest Work with Smallest Cost.

Boiler is made of galvanized steel, thoroughly tight and removable for cleaning. Fire-box, grates and linings are made of cast iron, which will not burn out quickly.

Body is made of steel, which heats quickly, and is properly protected against warping and burning out.

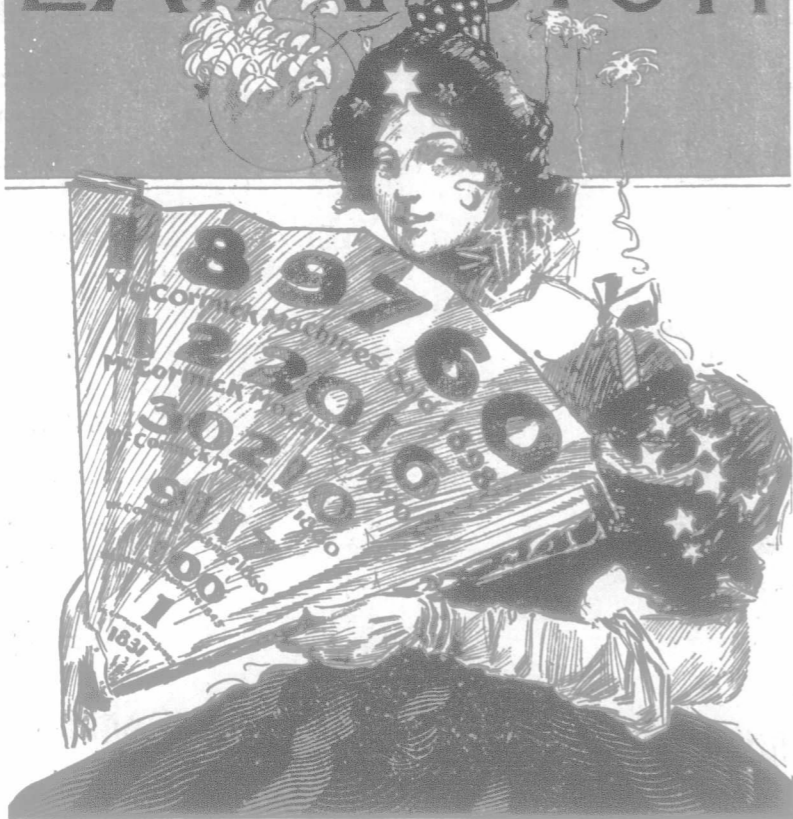
DIMENSIONS, ETC.
Width. Depth. Height.
SIZE OF FIRE-BOX . . . 19 30 11
SIZE OF FIRING DOOR . 11 x 12 inches.
CAPACITY OF BOILER . . . 50 gals. Imp.

The Newest and Most Successful Boiler Made in Canada.

THE McCLARY MANUFACTURING CO., London, Toronto, Montreal, Winnipeg, and Vancouver.

If your local dealer cannot supply, write our nearest house.

EXPANSION



Last season the McCormick Harvesting Machine Company of Chicago built and sold 189,760 machines. This kind of expansion dwarfs every other achievement American history records in favor of the well being of the farmers. Buy McCormick machines and you will get your money's worth.

GOOD ROADS MACHINERY CO'Y, HAMILTON, CANADA.

Steel "CHAMPION" Road Grader.

"CHAMPION" Steel Frame Mounted Portable Rock Crusher.

"CHAMPION" Horse Road Roller.

Road Graders, Rock Crushers, Steam and Horse Road Rollers, Engines, Road Plows, Wheel and Drag Scrapers, Macadam Wagons for spreading Road Material, Elevators and Screens.

Send for Catalogues, Mailed Free to any Address on Application.

Dr. HESS' STOCK FOOD

DR. HESS' POULTRY PAN-A-CE-A

INSTANT LOUSE KILLER KILLS LICE.

INSTANT LOUSE-KILLER kills Lice

DR. HESS & CLARK, Ashland, O., U. S. A.

Price: Pan-a-ce-a and Louse Killer, 35c. each; Stock Food, 7 lbs., 65c.; 12 lbs., \$1.00; 35c. articles by mail 5c. extra. Send for Scientific Book on Stock and Poultry, FREE.

BARRED PLYMOUTH ROCKS BRED FOR UTILITY.

Birds may score 100 in the showing and be useless as a business fowl. Eggs that will suit the farmer, from hardy, well-bred stock, with free range, \$1 per 15; for incubators, from same stock, \$1 per 100; from choice breeding pen, mated by I. K. Felch, and birds scored by him 90 to 93. \$3 per 15. These will produce prizewinners. (MISS) P. J. COLDWELL, Constance, Huron, Ont.

CATERPILLARINE.

A preparation for checking the ravages of all tree climbing insects and caterpillars. Costs one cent per tree. Sold by all seedsmen and druggists. Prices, \$1.00, \$1.50, and \$2.50 per ten-pound tin. SEND FOR CIRCULAR.

Dr. Wm. Mole,
443 Bathurst Street TORONTO.

NOTICES.

American Field Fence.—The fence problem is rapidly being settled, as not only is it being simplified and cheapened, but all objectionable features are deminishing. In this issue the American Steel and Wire Co., of Chicago and New York, advertise a fence worthy of consideration.

Queen Cultivators.—The illustration and description of the Queen Cultivator in the advertisement of The Copp Bros. Co. of Hamilton, Ont., shows the implement to be a weed killer and moisture saver difficult to surpass, while it is very quickly adjusted, both as to depth and width. It is becoming more and more realized that the success of a hoed crop depends quite as much upon frequent cultivation as upon richness of the soil, so that it is highly important to have proper implements to do the work.

Good Roads Machinery.—The agitation for better roads that has been going on for the last few years was not premature, as so much depends upon speed at the present time. Agitation will, however, do little except action be taken, and we all know that manual labor cannot be secured to do what is needed. What is needed is proper road material, such as broken stone, proper grading machinery, and a roller that will settle the surface and press the stones into the beds. The Good Roads Machinery Co., of Hamilton, Canada, is prepared to supply their machines so perfected that no municipality can afford to be without them. By their use good roads are made easily, rapidly and substantially.

Dip the Sheep.—No good shepherd is foolish enough to turn his sheep away to pasture in the spring without seeing that they are free from ticks and small lice. To allow sheep to be pestered with these vermin is to throw away dollars' worth of feed that should go to build up fleece and flesh. The cost of dipping a flock thoroughly, especially after the sheep are shorn, is practically nothing when one of the good commercial dips (such as those advertised in our columns this issue) is used, as all are reliable. The lambs especially need treatment, as the ticks seem to know the value of spring lamb, and where to get it at this season. Not only is it important to dip sheep for vermin, but horses, cattle, and dogs are rid of lice and skin troubles in the same way. See the advertisements, showing prices of these two dips, in this issue.

McCormick Harvesting Machinery.—There is needed no greater evidence of the hopeful condition of farmers on the American continent than to find them investing liberally in harvesting and other machinery. We have it from the McCormick Harvesting Machine Company of Chicago, that they built and sold 189,760 machines last year. While this immense number of sales may not have involved quite that number of transactions between individual men and the McCormick Company, we must conclude that a very great many shrewd American farmers have confidence in the McCormick machines. In fact, we may conclude that this mammoth concern is conducted on strictly business principles, sparing no amount of expense or pains to make their output satisfactory to every purchaser. Each machine turned out possesses a genius of design, an accuracy in workmanship, and a strength of material that creates popularity.

The Gem Grinder.—Every man that runs a reaper or mower realizes how troublesome it is to have the knives ground sufficiently often to do a clean work. A man, a boy and a grindstone for from thirty to sixty minutes is not a combination that every farm can support right in the busiest season without considerable disadvantage. This is all unnecessary if one only has a Gem Grinder, which is advertised on the back cover of this issue. The grinding wheels are of corundum, a mineral that stands next to the diamond in hardness, the former being No. 9, while the diamond is classed 10 in hardness. The advertisement explains clearly what the grinder is, and what it is capable of doing. We see a special field for it in sharpening straw and ensilage cutter knives, as well as a variety of tools. It may be interesting to learn that the president of this large, enterprising firm, Mr. Milton A. Snider, is a Canadian, who went to Chicago some twelve years ago, and by push and perseverance has developed this wheel-manufacturing concern until it has large branches in several large centers. Besides corundum, they also make emery and carborundum grinding wheels for many of the large American companies dealing in these things. Mr. Snider is also a controlling director of a very large Chicago mica firm, which indicates that he does business on business principles. The Gem Grinder should be a great seller, as it presents enormous advantages and is not expensive.

Used With Success For Coked Ankles, Etc.
Angola, Ind., June 22, '97.
The Lawrence-Williams Co., Cleveland, O.:
Wish to use "Gombault's Caustic Balsam" on an outside splint, and as our dealer has no printed instructions I would be thankful if you would mail me pamphlet. Have used the above remedy with success on coked ankles, curbs, and enlarged glands, but want some instructions on this splint, as the patient is one of my favorite driving mares. F. W. KINNEY.

29 of our Students have recently taken good situations; 4 positions remain unfilled.

CENTRAL Business College
STRATFORD, ONTARIO.

gives the "best" in the line of business or shorthand education. In fair competition our graduates are nearly always chosen, while others are turned aside. Enter now. Circulars free.

W. J. ELLIOTT, PRINCIPAL.

MARK YOU
your live stock of whatever kind with the thoroughly reliable, rust proof, non-corroding, easily read...
ALUMINUM EAR MARKERS
"STAY THERE" EAR MARKERS
Can't pull out, rust out or tear out. Name, address and consecutive numbers on competition. Free sample catalog etc. WILCOX & HARVEY MFG. CO., 201 Lake St., CHICAGO, ILL.

IMPORTANT TRUTH

FOR STOCK RAISERS.

LUMP JAW has been transformed from an incurable to an easily curable disease. The entire credit for this wonderful result is due to



Fleming's Lump Jaw Cure.

When this remedy was discovered no other real cure was known. No other positive cure is yet known. FLEMING'S CURE was first introduced in Saskatchewan, and from there its reputation has spread over the entire continent. It is the only remedy endorsed by leading ranchers, shippers, and stock journals. It is positively guaranteed; money is returned if it fails. One bottle usually cures one to five cases.

Like all other articles of exceptional merit, it is limited in external respects, but these limitations wholly lack the distinctive qualities of the genuine.

GET FLEMING'S LUMP JAW CURE AND BE CERTAIN OF RESULTS.

PRICE, \$2.00.

SENT ANYWHERE BY MAIL.

TERMINAL AND IMPORTANT REPORTS SENT FREE.

FLEMING BROS.,
CHEMISTS,
ST. GEORGE, ONTARIO.

BUTTER, HONEY, JAM!

Farmers and Dairymen!

The best packages for putting up butter, honey, jam, etc., whether for shipment or for storage, are made from our

Antiseptic Ware

WRITE FOR CATALOGUE AND PRICES.

THE E. B. EDDY CO., LIMITED,
Hull, Montreal, Toronto, Quebec
London, Hamilton, Kingston,
St. John (N. B.), Halifax,
Winnipeg, Victoria,
and Vancouver,
St. John's (Newfoundland).



The Wall Paper King

OF CANADA.
C. B. SCANTLEBURY,
Belleville, Kingston, Winnipeg.

Sample books of Choice Wall Paper for Residences, Churches, Offices, Lodge Rooms, Public Halls, Hotels, Stores, and our booklet, "How to Paper," sent free to any address. Write a postal. Mention what prices you expect to pay, the rooms you wish to paper, and where you saw this advertisement. We pay express charges. Mail Order Department at Belleville, Ont. Address all communications there.

SHOEMAKER'S POULTRY BOOK ON POULTRY
and Alms for 1899, 100 pages, 100 illustrations of Poultry, Incubators, Brooders, Poultry Houses, etc. Tells how to raise chickens successfully, their care, diseases and remedies. Diagrams with full descriptions to build poultry houses. All about INCUBATORS, BROODERS and Poultry, with Lowest Prices. Price only 15c. C. C. Shoemaker, Freeport, Ill., U. S. A.

BELLEVILLE
BOGLE & JEFFERS,
BUSINESS COLLEGE
PROPRIETORS.

Students have a LARGER EARNING POWER who acquire the following lines of preparation under our efficient SYSTEM OF TRAINING. IT HAS NO SUPERIOR.

1. Bookkeeping.
2. Shorthand.
3. Typewriting.
4. Telegraphing.
(Commercial and Railway Work).
5. Civil Service Options.

Students may commence telegraphing on the first of each month, and the other departments at any time.

J. FRITH JEFFERS, M. A., Principal.

Address: BELLEVILLE, ONT. -om

What is Your Work?
If you are dissatisfied with your situation, your salary, your chances of complete success, write to The International Correspondence Schools, Scranton, Pa., and learn how others so situated are getting an education by mail.

An Education by Mail
Students in the courses of Mechanical or Electrical Engineering, Architecture, or any of the Civil Engineering Courses are soon qualified for salaried drafting room positions. Write for pamphlets.

The International Correspondence Schools, Box 906, Scranton, Pa.

FARMERS WANT IT
AND WILL HAVE IT.



We Make It
And want you to sell it.

Write for our illustrated fence catalogue describing it.

The Frost Wire Fence Co.
WELLAND, ONT., CAN.

WRITE FOR SAMPLE STAY
and full particulars
Machine \$10

Wholesale Price where we have no Agents. AGENCY FREE. NO DUTY TO PAY

THE BOWEN CABLE STAY FENCE CO.
Box No. 58 NORWALK, OHIO, U.S.A.

WRITE FOR CATALOGUE
to weave your own fence of
Called Hard Steel
Twisted Wire,
36 inches high, at
25 Cts. per Rod.
500 buys wire for 100
rod fence. Agents
Wanted. Catalogue Free.
GARTER
Wire Fence Mach. Co.
Box G. Mt. Sterling, O.

8 to \$15 MACHINE
to weave your own fence of
Called Hard Steel
Twisted Wire,
36 inches high, at
25 Cts. per Rod.
500 buys wire for 100
rod fence. Agents
Wanted. Catalogue Free.
GARTER
Wire Fence Mach. Co.
Box G. Mt. Sterling, O.

S. CROUCH, Box 12, Ridgetown, Ont., General Agent for Ontario. FRED SMITH, Box 16, Brandon, Man., Agent for Manitoba and N.-W. Territories. No duty on wire. -om

CYCLONE FENCE CO.
From 27 to 60 inches.
From 7 to 11 cables.
Build Your Fence Cheap.
100 Rods Per Day.
TORONTO, ONT.

FENCE MACHINE
Still at the front!
The cheapest,
most efficient and best.
Price, \$85.00.
Write for catalogue and
specimens of wire.
Wanted in all
territories.
Mentioned in
Farmer's Advocate.
W. C. WILSON, Ont.

PLEASE MENTION FARMER'S ADVOCATE

GOSSIP.

Talking Ayrshires are offered for sale in this issue by James Boden, Ste. Anne de Bellevue, Que. They speak for themselves in their gaily performance and premiums won.

Henry Stevens & Sons, in making change in their advertisement, now offer service bulls unsurpassed in breeding; also females. They will send you description upon application.

At the sale of Aberdeen-Angus cattle belonging to Messrs. Charles Escher & Son, Botna, Iowa, held at Omaha, March 28th, fifty-two animals sold at an average of \$177.60. The eighteen bulls averaged \$163 and the thirty-four females \$155.15. The highest price was \$335 for a yearling bull, and the highest price for a female was \$330.

Mr. W. D. Platt, Hamilton, Ont., breeder of Shorthorn cattle, in ordering a change in his advertisement, expresses hearty appreciation of the FARMER'S ADVOCATE as an advertising medium, and confesses that he could not so successfully conduct his business without the aid of this means of communication with the farmers and breeders of Canada and the U. S., which has brought him a very satisfactory share of patronage. The enquiry for good stock is increasing daily, and the Trout Creek herd of Shorthorns, numbering about seventy head, are coming through the winter in good condition. The young bulls and heifers are a very promising lot, and a number of them should make winners in any company.

W. G. Pettit & Son, Freeman, Ont., report the following recent sales of Shorthorns and Shropshires: To Wm. Maw, Milton, the two-year-old bull, Red Chief, same family as Coral, the champion heifer at Toronto and Ottawa, 1895; to John Sockett, Rockwood, the eight-month-old bull Statesman, by Indian Statesman; to Smellie Bros., Norval, Ont., a fourteen-month-old red bull by Indian Statesman, out of Mara 12th; to M. M. Smith, Milan, Que., for the Agricultural Society of that district, the eighteen-month-old bull Golden Treasure; to W. S. Carpenter, Simcoe, Ont., ten choice yearling ewes; to W. H. Foreman, Port Carling, Ont., one pair of two-year-old ewes; and to J. G. Hammer, Burford, Ont., nine ewe lambs. They have six young bulls fit for service still on hand. Amongst the lot is the young bull Grand Quality, fifteen months old. He is doing exceedingly well, and will likely visit some of the large shows this fall. They also have a calf, seven months old, by Indian Statesman, that is likely to take a place in the front ranks this fall. He has size, style and quality combined.

At a council meeting of the National Sheep-Breeders' Association of England, the following resolution was, at the suggestion of Mr. W. W. Chapman, secretary of the Association, on the motion of Mr. E. Prentice, seconded by Mr. A. C. Skinner, unanimously carried: "That in view of the important interests involved, and of the great advantage that would accrue to breeders of registered sheep by the adoption of mutual arrangements for the transference of registered sheep from their record in one country to that of another; and also of the importance of devising means to prevent the substitution of unregistered sheep for registered sheep, etc., this council resolves that an international conference of representatives of the sheep-breeding industry throughout the world be invited to assemble at York, in June, 1900, at the time of the Royal Agricultural Society's meeting in that city; for the purpose of considering the above or any other questions affecting the interests of sheep-breeders generally." In view of the difficulty arising from the whole of the postal addresses of sheep societies throughout the world not being known, we are asked to request any such society to address themselves direct to Mr. W. W. Chapman, at the offices of the National Sheep-Breeders' Association, Fitzalan House, Arundel Street, Strand, London, England, who will at once give attention to any communication, and who also desires, through the medium of our circulation, to inform breeders of registered sheep that it will be taken as a great favor if they will communicate to him any suggestions or information that may, in their opinion, be desirable to bring before the said conference.

SNELGROVE BERKSHIRES AND COTSWOLDS.
Mr. R. P. Snell, Snelgrove, Ont., offers in our advertising columns young boars and sows of breeding age, and choice young pigs of this spring litters, of the large, lengthy type demanded by the times; also yearling Cotswold rams and ewes of the most approved sort. Mr. Snell's long experience and good judgment will enable him to supply the right kind of stock, and few men have better facilities and connections for making, breeding, and developing up-to-date stock in the lines he is handling. Parties ordering stock from him may rely upon its being as represented.

LATE AMERICAN SHORTHORN SALES.
At the sale of Mr. Geo. E. Ward, of Hawarden, Iowa, held at Omaha, March 28th, twelve bulls averaged \$233.33, forty-three females \$266.16, and fifty-five head averaged \$259. The highest price of the day, \$1,095, was made by the roan four-year-old cow, Monarch's Lady, by Gay Monarch, C. B. Dustin & Son, Summer Hill, Ill., being the buyer. The three-year-old roan bull Gold Dust, by Golden Rule, brought \$350, and St. Valentine 12th, \$605, which was the highest price for a bull. Mr. H. F. Brown, Minneapolis, Minn., sold forty-four head, March 29th, at an average of \$213. Eight bulls averaged \$231.25, and thirty-six females \$200. \$400 was the highest price for a female, and \$310 the highest for a bull. On March 30th C. S. Barclay sold sixty-one head at West Liberty, Iowa, for an average of \$193.44, and forty-four females an average of \$192.27. The highest price for a bull was \$405, and for a female \$430.

TORONTO ENGRAVING CO.
92 BAY ST
CUTS BY ALL PROCESSES
LIVE STOCK A SPECIALTY.

SHEEP MAY BE DUMB



but it takes a good fence to keep them in bounds. The most successful fence for all sheep pastures as well as for larger and stronger animals is the

AMERICAN FIELD FENCE

either in regular style or special sheep fence.

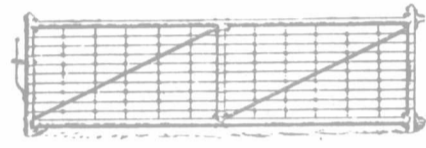
This fence is most successful because **IT IS THE BEST AS WELL AS THE CHEAPEST.**

Most durable, efficient and economical. If you can't find it at your local dealer's, write direct to us for catalogue.

AMERICAN STEEL AND WIRE CO.,
CHICAGO AND NEW YORK.

FARM AND LAWN FENCES

METALLIC SHINGLES AND SIDING.



GALVANIZED SHINGLES.

STEEL FARM GATE.

BEST

AND.....

HEAVIEST.

WRITE FOR CATALOGUE.

The Locked Wire Fence Co'y, Limited,
LONDON, ONTARIO.

GOOD FARM FENCE
should turn all kinds of live stock and even tramps; should expand and contract according to the weather so as always to be tight; should stand all storms—even fire and last indefinitely.

The Coiled Spring Page
is just such a fence.
Its virtue is attested by the fact that there is more of it in use than all other makes combined. Prices lower than ever this year.

THE PAGE WIRE FENCE CO., (Ltd.)
Walkerville, Ont.
Or DAVID ROSS, N. W. Agt.,
Box 565, Winnipeg.

SEND FOR ILLUSTRATED PRICE LIST.



WE SELL EVERYTHING.

Weigh Scales, to weigh from 1/2 to 4 lbs., \$2.50 each.
Weigh Scales, to weigh from 1 to 240 lbs., \$5 each.
Platform Scales, to weigh 1,200 lbs., only \$16 each.
Double Action Revolvers only \$2.25 each; postpaid for 15 cents extra.
Cornets at \$5, \$10 and \$15 each.

WILKINS & CO.,
166 & 168 KING STREET EAST,
TORONTO.



This cut represents our 240-eggs capacity improved

SAFETY INCUBATOR

Like all our machines, it is absolutely self-regulating and supplies its own moisture. It is manufactured in Canada—hence there are no customs duties to pay on it. It is guaranteed in every particular and your money will be refunded if you are not satisfied at the end of the first hatch. No matter what INCUBATOR you place beside it, there is none that can out-hatch it. Thoroughly well built and perfectly automatic. It will hatch chickens, ducks, turkeys, and geese. Just think, there is money in it for you. Address—

send in your address and get one of our free catalogues.
J. E. MEYER, KOSSUTH, ONT.

THE PROBLEM OF THE PRESENT DAY TO FARMERS IS
WHAT IS THE MOST ECONOMICAL POWER?
THE CANADIAN STEEL AIRMOTOR

Solves the Question.

Superior to all others.

Safer than Gasoline Engines.

Will not blow your barn up.

(Note the recent fires started by Gasoline.)

Will run any machine in the barn all the year round.

Full supply of water for house and barns.

All Steel.

Latest Designs.

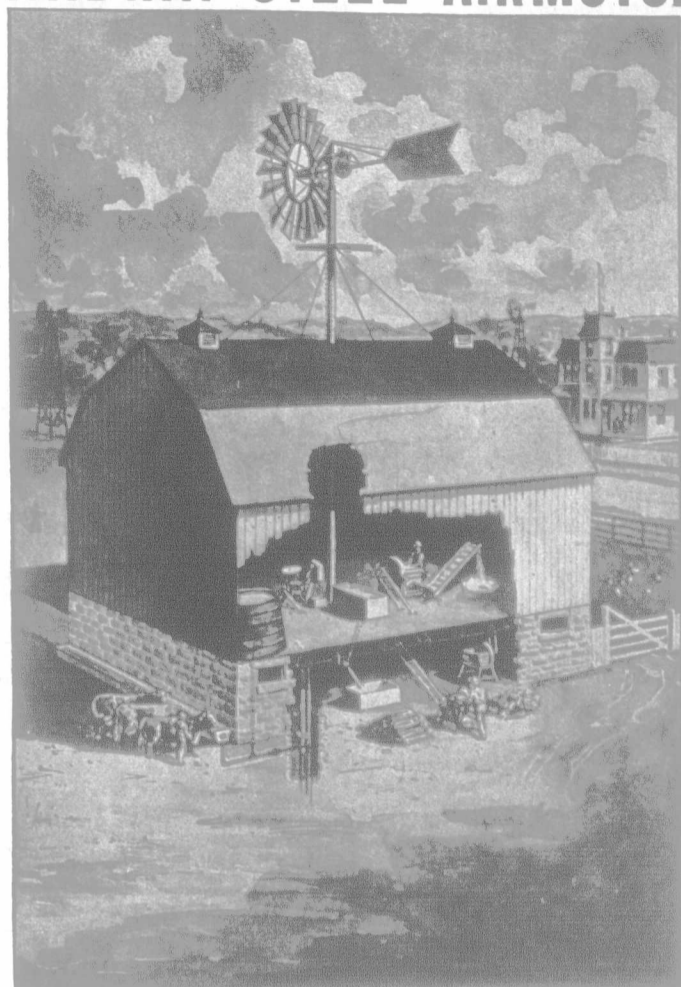
No Shoddy.

FULL LINE OF

Pumps, Tanks, "Toronto" Grinders, Haying Tools, etc.

"WOODWARD" WATER BASINS? THE LATEST.

Ontario Wind Engine and Pump Co., Limited, Atlantic Ave., TORONTO.



GOSSIP.

Wm. Grainger & Son, London, Ont., in ordering a change in their ad., write: "We have sold our last young bull to Mr. James Foster, Tilbury, Ont. Mr. Foster has in him a right good calf. We sold to Mr. Frank Wood, of London, Ont., the heifer calf Maid of Hawthorn 2nd, Vol. XVI., and to Mr. J. C. Stouilly, of Atwater, Ont., the heifer calf Britannia Lass 4th, Vol. XVI. These two heifers are got by Beau Ideal = 22554 =, our present stock bull. He is a bull of great substance and quality, weighing close on 2,500 lbs. in nice working condition. He was got by the great Cruickshank bull Sityton Stamp (imp.) = 13883 =, (6338), and his dam is (imp.) Bessie Lass = 24824 =, of the best milking family of Shorthorns in Scotland. We are having the best lot of calves this season we ever had—big and thifty, with fine, mossy hair."

Jos. Yule & Sons, Carleton Place, Ontario, write:—"Our Ayrshires, Shropshires, Berkshires, and Plymouth Rock fowls are coming through the winter in splendid condition. We had great luck for heifer calves; out of forty cows we had thirty-two heifer and eight bull calves, all sired by Jock of Burnside—1484—, winners of first prize at Ottawa in 1888. They are the finest lot of calves we have ever had. Have made the following sales: One bull and two heifer calves to J. R. Snider, Portage la Prairie, Man.; one two-year-old heifer and one bull calf to John Aikenhead, Hartney, Man., and one bull calf to John Currie, St. Catharines, Ont. We have a few litters of very fine Berkshires. They are like every other body's pigs, the real bacon type. Our Plymouth Rocks are a grand lot. We are prepared to supply any quantity of eggs. Prospects were never better for pure stock."

Mr. W. W. Ballantyne, Neidpath Stock Farm, Stratford, Ontario, in ordering a change in his advertisement of Ayrshires, writes:—"I have just sold a very fine pair of young cows to Hon. Thomas Greenway, Crystal City, Man.; one is an imported-in-dam daughter of Denty 7th of Auchenbrain (imp.), and the other is a daughter of imp. Bessie 2nd of Auchenbrain, by Beauty's Style of Auchenbrain (imp.). Earlier in the winter Jas. Callander, of North Gower, paid me a visit and took away with him Stylish Kirsty, imported in dam, a capital cow and daughter of imp. Kirsty of Auchenbrain. The demand for bulls has been excellent, and I am now sold out of all old enough for service, but have a choice lot of young ones by Craigielea (imp.). Craigielea has developed into a very fine bull, and he is siring the right kind of calves. Among recent sales of bulls are one to Dan Drummond, from imp. Kirsty; one to Jas. Pullar, Sault Ste. Marie, Mich., from imported Bessie 2nd of Auchenbrain; Donald Fisher, of Burnston, Ontario, got imported Denty 7th of Auchenbrain's last bull. A very promising young calf from Stylish Kirsty went to Alex. Doig, Lachute, Que. Stylish Daisy's capital bull was secured early in the season by John McKee, of Norwich, and the Bothwell Dairy Co. got a good one from Stylish Kirsty. John Blackburn, Gilles Hill, has a promising calf in the one he got from Stylish Denty (imported in dam)."

H. J. DAVIS' SHORTHORNS, BERKSHIRES AND YORKSHIRES.

Four of the ten Shorthorns at Mr. H. J. Davis' farm, near Woodstock, Ont., are matrons, and to one, Rosebud 28155, goes the credit of producing a promising young red-roan bull, Strathallan Brave, to Ross Prince, which is a straight, good handling fellow, possessing a wealth of natural flesh, with a level, good back, and approaching his useful age. A pair of young bull calves are also included in the number, and as they are the kind so much sought at present, parties desiring such stock should lose no time in seeing them.

Among the sixty-eight head of Yorkshires on hand at the time of our visit are a lot of splendid fresh young sows, and from which Mr. Davis has greatly increased his herd this spring. We have always advocated Mr. Davis' system of managing his brood sows, and this season we think demonstrates that we were not far astray, for we never saw so many brood sows of any breed with so many uniformly large litters. Mistress B 2831, by Golden Prince 2427, and out of Mistress 1th 42 (imp. in dam), at last farrowing, some two months ago, dropped seventeen pigs, and among them we saw some splendid youngsters, possessing plenty of length and quality. Lass Minto 2280, by Sovereign 2502, and out of Oak Lodge Snowflake 2107, is a splendid young sow, and gave her owner nine fine youngsters a month ago. Her dam also farrowed eight, and so on throughout the whole row of brood sows with their variety of pedigrees, which embrace many of the leading families of the breed, and one of the show rings of this Province. Among the sires most recently employed was Sovereign 2502, by King David 1089, out of Country Lass 906, who did two seasons' service in the herd, and in whose place the young boar lately imported by Mr. Brethour has stepped, the pedigree of which was not at hand at the time of our visit, but as he was bred by Mr. Gibson in England, who has a world-wide reputation as a Yorkshire breeder, we are safe in concluding that Mr. Davis is justified in his employment. In confirmation he is a strong young animal, very uniformly made, and of the strict bacon type, with a splendid head and good bone. A bunch of young Sovereign's daughters are being mated to him this spring, and as they are as good a bunch as we have seen together for some time, we may reasonably look for something choice from them.

The Berkshires are receiving equal attention with the Yorkshires, and the successful system of management here shows itself, as the litters run from eight upwards. Among the sows suckling this spring we saw Golden Duchess 5132, by Royal Duke 3611, and out of Royal Duchess 2335, and Royal Beauty 2nd 5277, by King Charmer 373, out of Royal Beauty, a pair of sows from which it would be perfectly safe to purchase young stock, their breeding and conformation being correct, while their management has been such as to bring out and transmit their desirable qualities to their progeny. The sire, Royal Lad 3044, by Royal Herbert 2402, and out of Lady 2872, was employed three seasons; while the young boar, Bandmaster, out of imp. Shapely, was recently purchased from Mr. Green, his breeder, to take his place. And to the excellence of the sires employed is due much of the satisfaction expressed by Mr. Davis' patrons upon receiving stock purchased by correspondence.

Horse Owners! Use

COMBAULT'S
Caustic Balsam

A Safe Speedy and Positive Cure
The Safest, Most Efficacious ever used. Takes the place of all liniments for mild or severe action. Removes all Bunches or Blemishes from Horses and Cattle. SUPERSEDES ALL CAUTERY OR FIRING. Impossible to profess too of its merits. Every bottle sold is warranted to give satisfaction. Price \$1.50 per bottle. Sold by druggists, or sent by express, charges paid, with full directions for its use. Send for descriptive circulars. THE LAWRENCE-WILLIAMS CO., TORONTO, CAN.

Woodstock Steel Windmills

FOR POWER AND PUMPING

GET A DANDY WITH GRAPHITE BEARINGS. THEY RUN WITHOUT OIL. STEEL TOWER PUMPS, TANKS, SAW TABLES, GRINDERS, AND WATERING TROUGHS. Woodstock Wind-Motor Co., Limited. WOODSTOCK, ONT. -om Write for catalogue.

IT DEPENDS ON THE PROCESS

Used in the manufacture of salt whether the production is of the highest grade or not.

The "Vacuum Process" for making salt is the most modern and scientific. It makes a finer and purer salt, most readily dissolved, and perfectly even in crystal.

WINDSOR SALT

Manufactured by
The Windsor Salt Co., LIMITED, WINDSOR, ONT.

Sheep Shearing Revolutionized.
New Chicago SHEEP SHEARING MACHINE.
Greatest Machine ever invented. Price, \$15.
(Used and endorsed by the Editor of the American Sheep Breeder.)
Don't butcher your sheep. Saves 1/2 to 1 lb. more wool per head.
Drop us a postal and we will tell you all about it. We also make Horse Clipping Machines. Chicago Flexible Shaft Co., 158-160 Huron St., Chicago.

ILLUSTRATED STOCK SALE BILLS

THE LONDON PRINTING AND LITHO. CO. (LIMITED)
Lithographers and Printers, London, Ont.

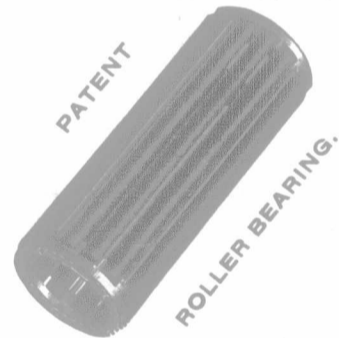
FAMILY KNITTER!
Will do all knitting required in a family, homepun or factory yarn. SIMPLEST KNITTER ON THE MARKET.
We guarantee every machine to do good work. Agents wanted. Write for particulars.
PRICE, \$5.00.
DUNDAS KNITTING MACHINE CO., DUNDAS, ONTARIO.

BRANTFORD

.. GALVANIZED ..

"Steel King"

Pumping Windmill



NOTICE CAREFULLY THE ROLLER AND BALL BEARINGS AND SPROCKET DRIVE.

View of engine of "Steel King" Pumping Windmill, showing patent Roller and Ball Bearings, Angle-Steel Frame, Sprocket Drive, Band Brake, etc.



ANCHOR FOOT



The "Steel King" is an all Canadian Invention of great merit. It is capturing the trade in all Canada. We make Galvanized "Ideal" Pumpers and Steel Towers of all kinds, "Ideal" Power Windmills, Iron and Wood Pumps, "Maple Leaf" Grain Grinders, Bee Supplies, etc.

SEND FOR ILLUSTRATED CATALOGUE. MENTION THE ADVOCATE
COCKSHUTT PLOW CO., (Limited), Agents for Manitoba and N.-W. T.

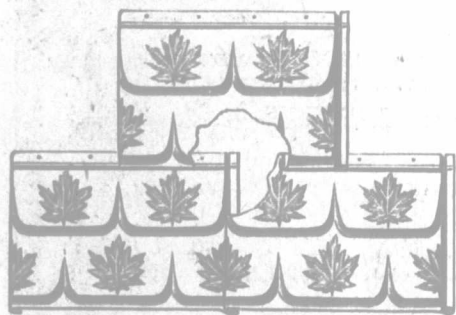
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**CANADIAN-MADE
HAND
SEPARATORS**

Turns easy. Open bowl. Well finished. Most durable. Price reasonable. Best investment farmers can make. Catalogue free. Dairy Supplies of Every Description. Genuine Parchment Paper, for lb. prints, neatly and tastefully printed. By mail, post-paid. Prices reasonable. Write us.

No. 9.—Canadian Ideal. Cap. 30 gallons per hour. JOHN S. PEARCE & CO., LONDON, ONT.



IF PEOPLE ONLY KNEW

the advantages of using metal roofing constructed on our patent "SAFE-LOCK" principles they would not accept a substitute.

OUR "SAFE-LOCK" SHINGLES

interlock each other on all four sides, leaving no openings for snow or rain to get in. They are easily put on by anyone, are practically fire and lightning proof, and give a building a neat, finished appearance. We can tell you more. Ask for free catalogue and samples.

THE METAL SHINGLE AND SIDING CO., LIMITED. PRESTON, ONTARIO.



HOTELS, SCHOOLS, LODGE ROOMS, PUBLIC HALLS, CLUB HOUSES, STORES, CHURCHES and PRIVATE RESIDENCES

can all be appropriately decorated with Pedlar's Steel Ceiling, not a substitute but superior to lath and plaster, will not crack and fall off, absolutely fire-proof, handsome in appearance. Estimates furnished on receipt of plans.

Pedlar Metal Roofing Co. OSHAWA, CANADA.

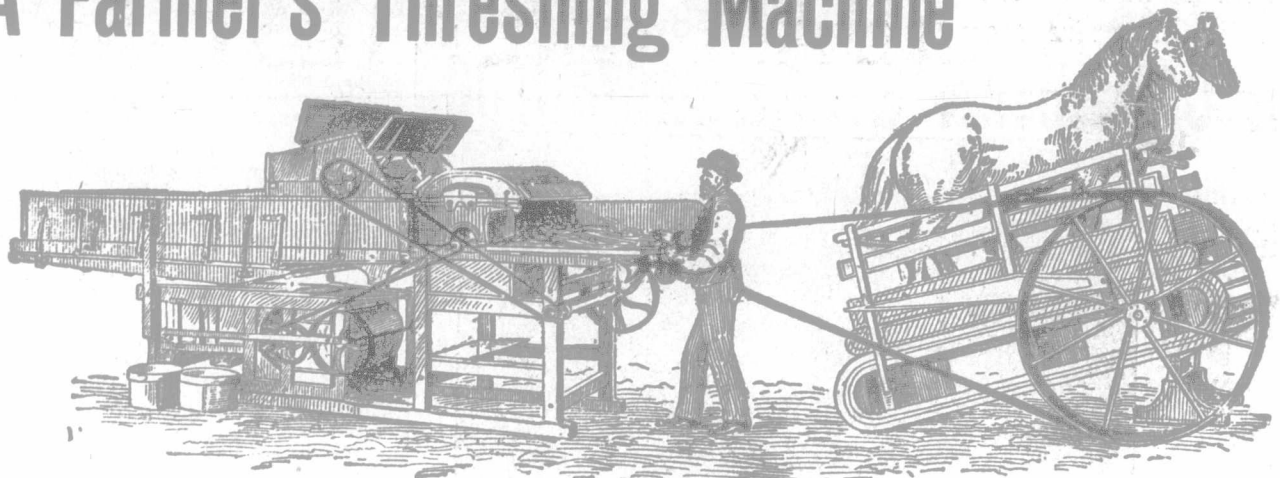
For Sale by J. H. ASHDOWN, Winnipeg Agent for Manitoba and N. W. T.



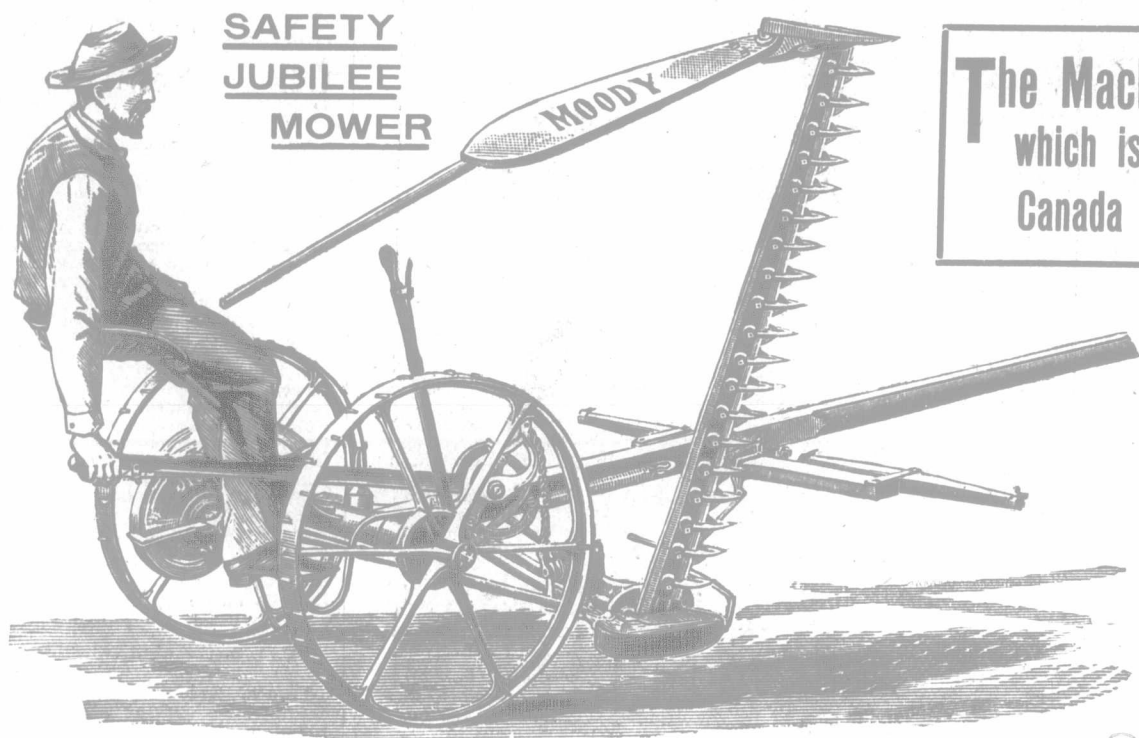
SHEEP, CATTLE, CALF, HOG. LABELS AND EAR PUNCHES.

R. W. JAMES, Bowmanville, Ont.

A Farmer's Threshing Machine



Threshes and cleans the grain fit for market. Do your own work. Save the tolls, and do it exactly when you wish, and do it so that there will be no grain in the straw to vex you for weeks and months afterwards.



The Machine which is making Canada Famous.

Agents Wanted.

Send for Catalogue.

The driver lifts cutter-bar into almost upright position without getting off the seat. Machine goes automatically out of gear as cutter-bar is raised, goes automatically into gear as the obstruction is passed and bar is lowered. Machine may be put out of gear instantly—as soon as you can say "Jack Robinson"—constituting a real Safety Mower. Roller Bearings, Serrated Guard Plates, Lang Pitman, High Driving Wheels, Simple Gearing,—last but not least—Canadian Machine.

MANUFACTURERS:

Binders, Reapers, Mowers, Rakes, Seeders, Harrows, Threshing Machines, Hay Presses, Stone and Stump Pullers, Circular and Drag Saw Machines, Etc., Etc.

MATTHEW MOODY & SONS,

SEND FOR CATALOGUE. TERREBONNE, QUE. AGENTS WANTED.

"Chainless"

"Perfect"

"Garden City"

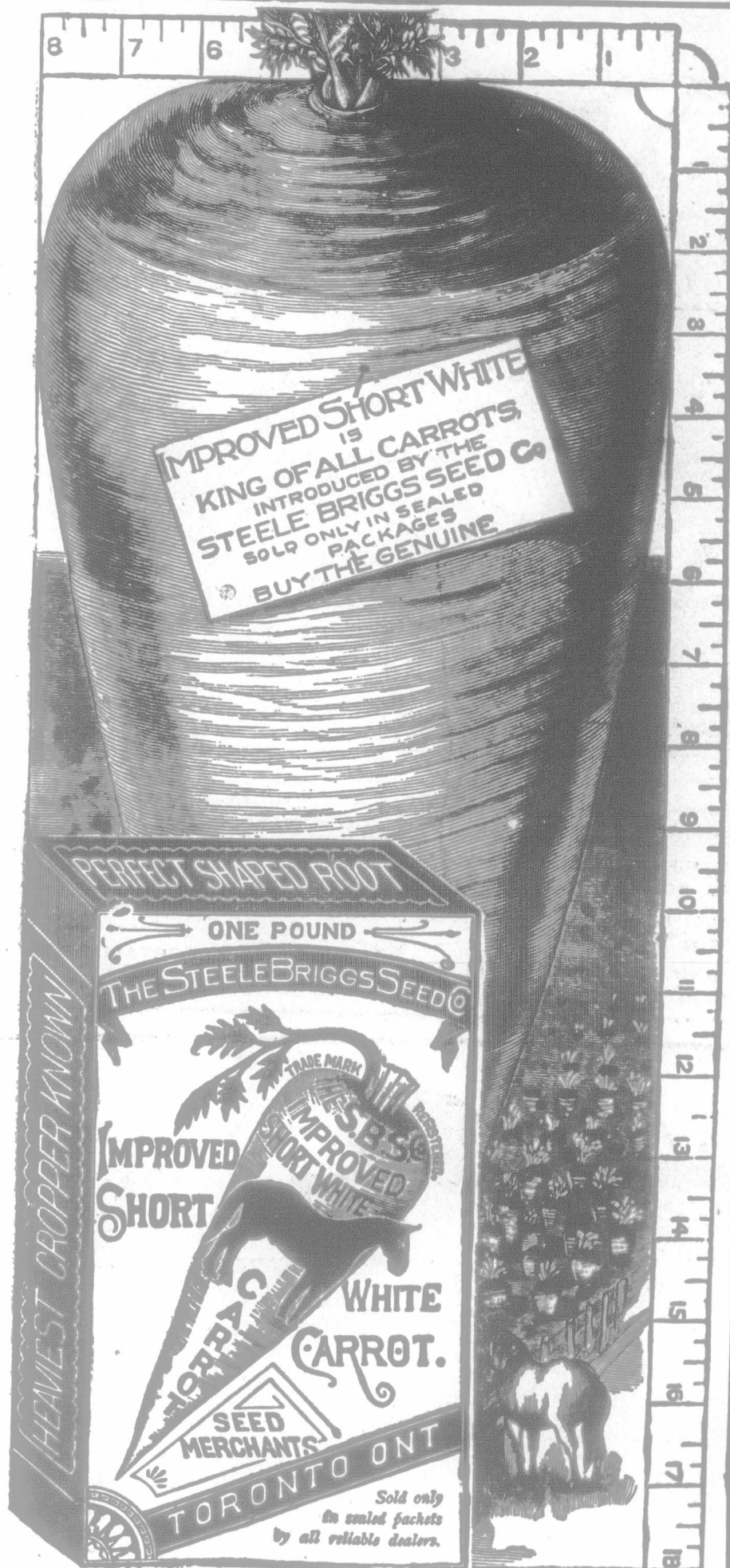
"Dominion"



WELLAND VALE MFG. CO., Limited,

ST. CATHARINES, ONT.

"CANADA'S GREATEST SEED HOUSE"



The Steele, Briggs Seed Co.'s

Enormous annual trade in Farm and Garden Seeds has been attained by 26 years of constant vigilance and care, and in supplying merchants and growers with the very highest standard of quality that can be procured, and at most favorable prices consistent with "Good Seeds," which is the first essential for a good crop.

Among our many introductions of merit

The Steele, Briggs' Improved Short White CARROT

Is the...

World's Champion

- Because it is the Surest Cropper
- The Heaviest Yields
- Easiest Harvested
- The Handsomest Shaped Roots
- And the Very Best Field Carrot in existence

It may be properly called "Little Giant." Seldom exceeds sixteen inches in length, and has been grown to measure twenty-seven inches in circumference; stands nearly one-fourth out of ground, with a strong, handsome top, broad and heavy at the shoulder, tapering evenly to a point, as perfect as if turned in a lathe. The color is pale green above ground, and a light creamy white under ground; flesh rich white, solid, sweet and very nutritious. Under good cultivation has yielded one thousand bushels per acre.

As an Exhibition Prize Winner it is the Peer

Price (post-paid) per lb., 45c.; $\frac{1}{2}$ lb., 25c.; $\frac{3}{4}$ lb., 15c.; oz., 10c.

PLEASE NOTE.—As a safe-guard to growers, we supply the genuine "Improved Short White" Carrot in sealed packages only, printed in colors and bearing our name and trade mark as shown in the illustration. If your resident merchant cannot supply you, write to us for it. Refuse imitations of our packages and varieties said to be "just as good."

NEW... Danish White Oats

A remarkably heavy-yielding variety, produces strong, stiff straw, large, plump, heavy, bright grain with thin hull, and adapted to a great diversity of soils; withstands stormy weather without lodging or shelling.

Price by mail (post-paid) per lb., 15c.; 4 lbs. for 50c., or by freight or express (purchaser paying carriage) peck 25c.; bush, 80c.; 10 bush. lots or over, 75c. per bush. Cotton bags, holding 2 $\frac{1}{2}$ bush., at 15c. each.

Write for our Catalogue, contains descriptions and prices of the newest and best Field and Garden Seeds. Please mention this paper.

"Canada's Greatest Seed House"
The STEELE, BRIGGS SEED CO., Limited
TORONTO, ONT.

CONTAGIOUS ABORTION AND HOG CHOLERA

can positively be cured or prevented by the use of

WEST'S FLUID, DISINFECTANT.

which is also a cheap and effective.

Circulars (specially prepared by a veterinary surgeon) on these diseases, on application.

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Agents wanted in all counties.

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Barrister, Solicitor, Notary Public, Etc. Moneys loaned on real estate at lowest rates. Investments procured. Collections made. Address: 87 DUNDAS ST., LONDON, ONT.

GOVERNMENT ANALYSIS

LABORATORY OF INLAND REVENUE, OFFICE OF OFFICIAL ANALYST,

Montreal, April 8, 1895.

"I hereby certify that I have drawn, by my own hand, ten samples of the ST. LAWRENCE SUGAR REFINING CO.'S EXTRA STANDARD GRANULATED SUGAR, indiscriminately taken from ten lots of about 150 barrels each. I have analyzed same and find them uniformly to contain:

99 ⁹⁹/₁₀₀ to 100 per cent. of pure Cane Sugar, with no impurities whatever."

(Signed)

JOHN BAKER EDWARDS, Ph. D., D.C.L.,

Prof. of Chemistry and Public Analyst, Montreal.

Reliable Seeds FOR THE FARM AND GARDEN.

Our stock includes all that is best in GARDEN AND GRASSES, FIELD ROOTS, CLOVERS, SEED GRAIN, FLOWER SEEDS, AND FLOWERING PLANTS.

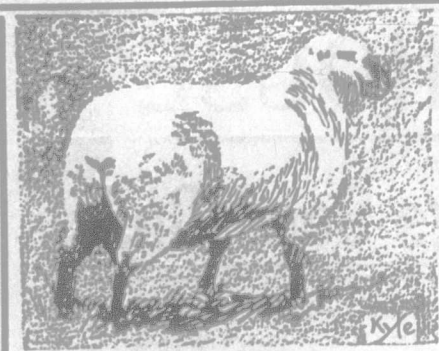
Illustrated Catalogues mailed free on application.

William Ewing & Co.,

Seed Merchants, 149 McGill Street, MONTREAL, QUE.

PURE SEED POTATOES.

PEARL OF SAVOY.—This variety has stood highest in late experiments at O.A.C. Our sample is good. Price, \$1.15 per bag of 50 lbs., F.O.B. cars Guelph—C. P. R. or O. T. R. Bags free. Cash to accompany order. JAS. L. SIMPSON, West End Road, GUELPH.



**Persic Sheep
and Animal Wash**

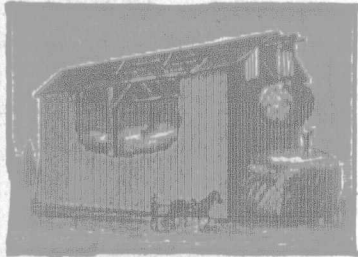
For the complete and effectual removal of all insects or vermin peculiar to sheep and cattle. Powerful without being harsh; immediate in effect, without any irritating effects; it leaves the animal refreshed and in good spirits after use; does more than destroy the pests, it completely removes all traces of their attacks—healing sores or boils, curing open sores and leaving the skin whole and sound. Mr. G. A. Brodie, a prominent stock-raiser of Bethesda, Ont., used it with great success in castrating lambs, the wash healing the wounds rapidly and keeping the maggots away. He considers it the most effectual wash in the market, and heartily recommends it to farmers generally.

If your dealer hasn't it, write us for it, and tell us of anything special in the ailments of your flocks or herds and we'll advise you how best to use it.

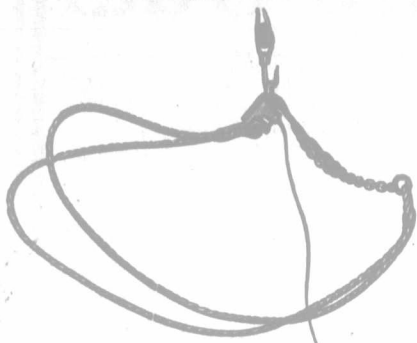
**THE PICKHARDT
RENFREW CO., Limited,
STOUFFVILLE,
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**BUCHANAN'S
(Malleable Improved)
PITCHING MACHINE**
For unloading hay and all kinds of loose grain.



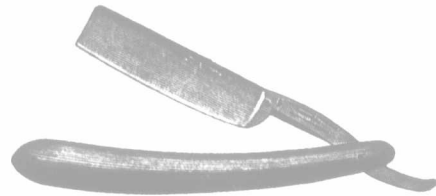
Unloads on either side of barn floor without changing car. No climbing necessary. Malleable Iron Cars, Steel Forks, Knot Passing Pulleys. Will work on stacks as well as in barns. Satisfaction guaranteed.



The Common-Sense Sheaf-Lifter
Works in connection with Pitching Machine, and is the most complete apparatus ever offered to the public for pitching sheaves. Sheaves left in the mow just as they come from the load.

RESPONSIBLE AGENTS WANTED

Circulars, Prices and Terms on application to
M. T. BUCHANAN & CO., Ingersoll, Can.



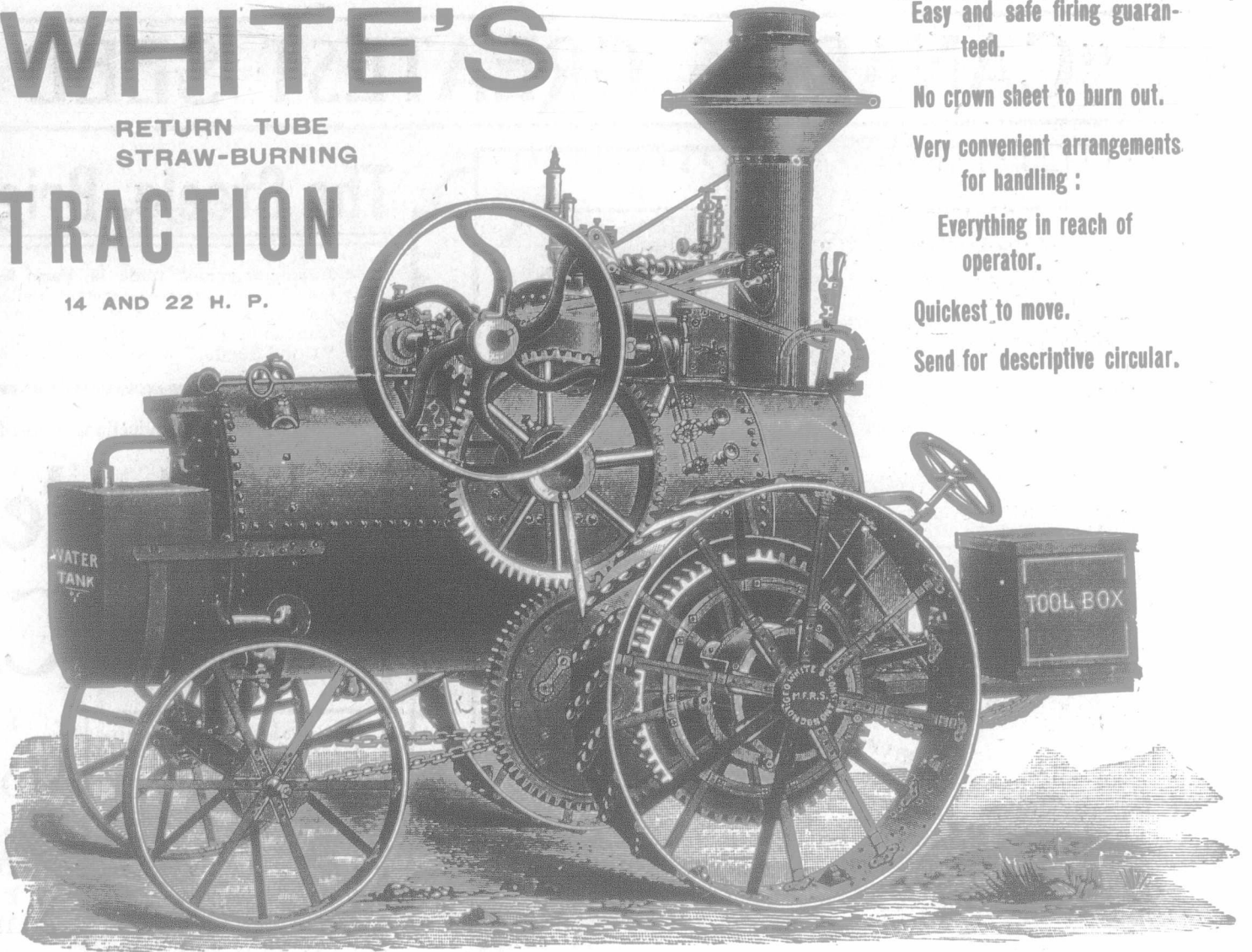
WANT A GOOD RAZOR?

If you send one dollar (\$1) to Stanley Mills & Co., of Hamilton, Ont., they will at once mail you a first quality convex or hollow ground Razor—a magnificent Razor with fancy strong and good handle—a Razor that is worth and was made to sell for \$4. It is an English-made Razor, and is made only by the finest cutlers in the world. No other Razor can be made. Our price is only \$1 each, and post to any Canadian address. When ordering, please specify want round point or square point.

Address: Letter Order Department
Stanley Mills & Co., Hamilton, Ont.

**WHITE'S
RETURN TUBE
STRAW-BURNING
TRACTION**

14 AND 22 H. P.



Easy and safe firing guaranteed.
No crown sheet to burn out.
Very convenient arrangements for handling:
Everything in reach of operator.
Quickest to move.
Send for descriptive circular.

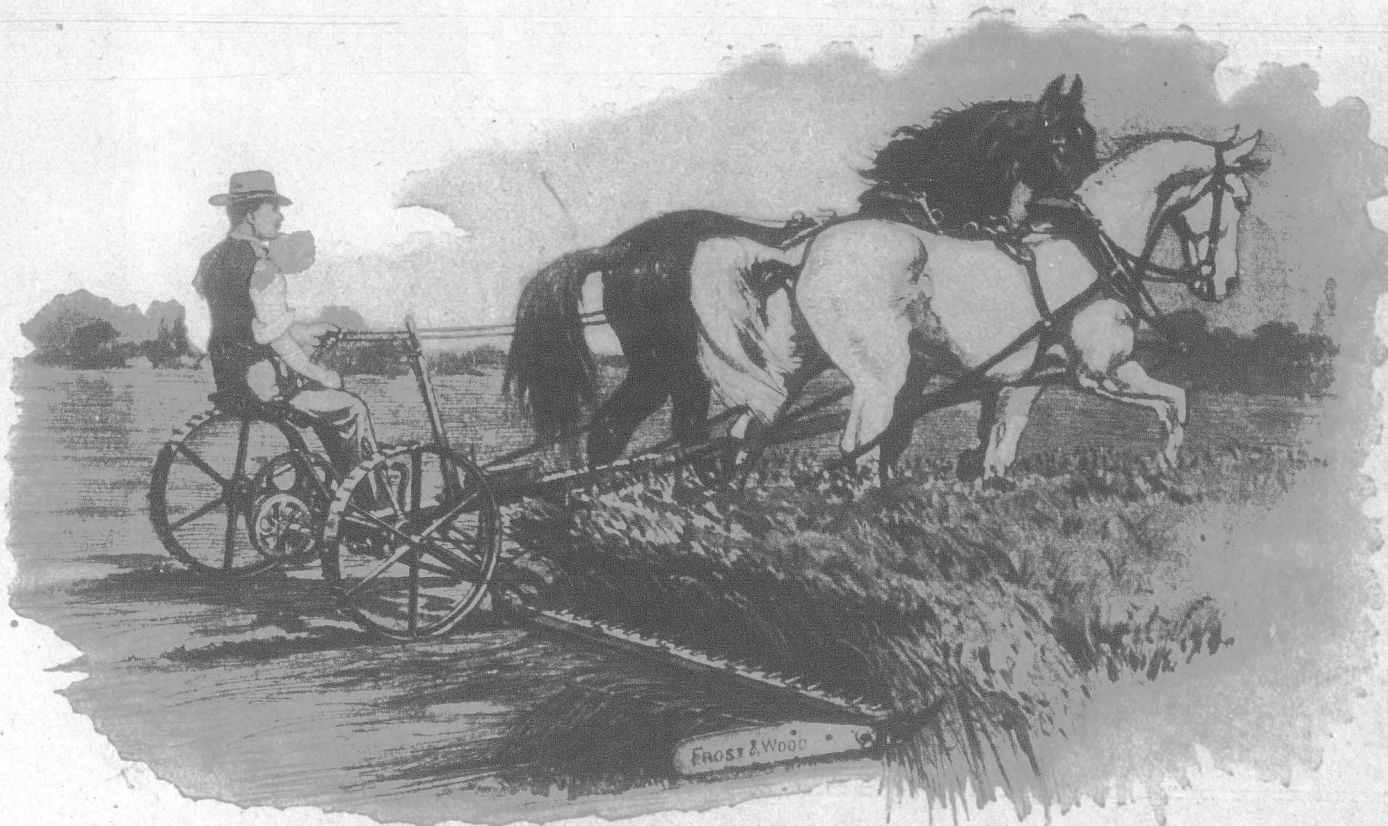
Points of Excellence:

- CUSHIONED SPRING WHEELS.
- WHITE'S ONE-PIECE CAST STEEL CONNECTING ROD.
- PIN JOURNALS FILLED WITH WHITE'S WRIST PIN METAL.
- FLY WHEEL AND STEERING WHEEL ON SAME SIDE OF BOILER.
- LARGE WHEELS AND WIDE TIRES.
- CORRECT DESIGN; HIGHLY FINISHED.
- 12 TO 20 H. P. PORTABLE ENGINES.
- SATISFACTION GUARANTEED.



See description of this Machine in our circular. 12 barred cylinder, 96 teeth; forks driven from both sides; wagon loading elevator; ground bagger; well designed, highly finished; a machine to do fast and clean work.

**The GEORGE WHITE & SONS CO., Limited,
LONDON, ONTARIO.**



3/4" S AND 6 FOOT CUT.

"O YES!" Our No. 8 Mower will start in heavy grass without backing the team, and will cut grass any other mower can cut. Will run as easy and last as long. We sell our machines on their merits, and build our reputation on the "quality," not the quantity, of goods we make.

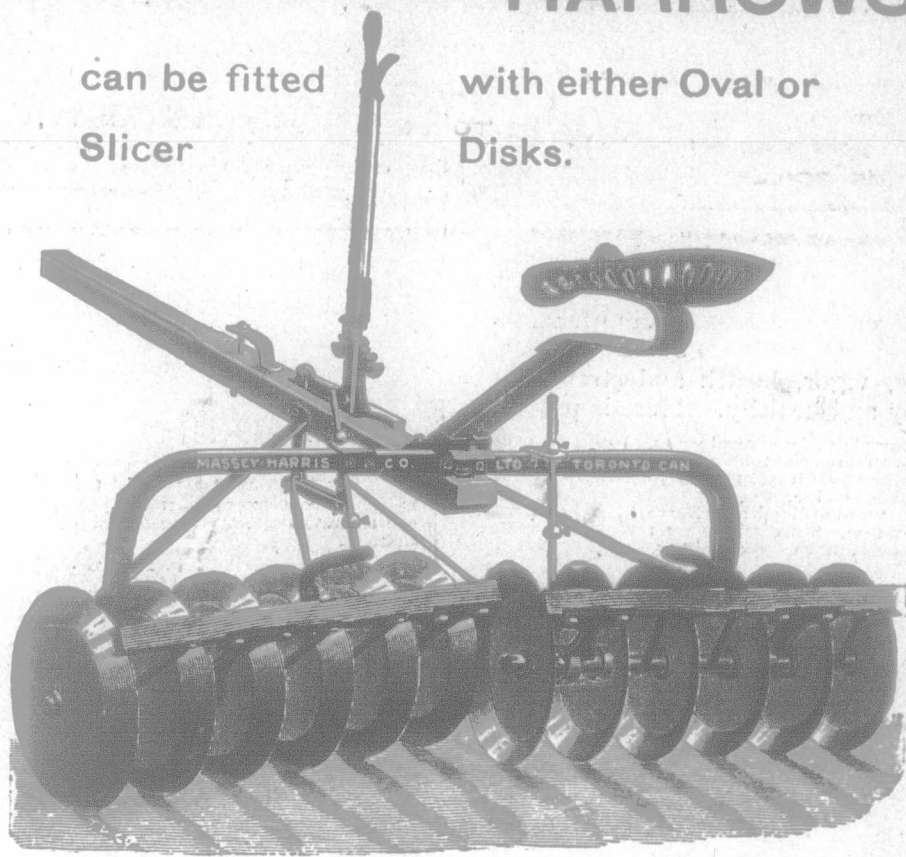
THE FROST & WOOD CO., LTD.,

HEAD OFFICE AND WORKS: SMITH'S FALLS, ONT.

Toronto Branch: 77 Jarvis Street. Winnipeg Branch: Market Square.

THE MASSEY-HARRIS HARROWS

can be fitted with either Oval or Slicer Disks.



MASSEY-HARRIS DISK HARROW. FITTED WITH SLICER DISKS.

They are very strong and reliable.

MASSEY-HARRIS Co. LIMITED.

TORONTO, CANADA.



RANEY, SELBY & COMPANY, BOX 620, KINGSTON, ONTARIO.

GOSSIP.

In writing to advertisers, mention the "Farmer's Advocate."

At the sale of Shorthorns, the property of Messrs. Garne, Broadmoor, Gloucestershire, March 16th, fifty-three animals sold for an average of 243 lbs. 4d. Lady Lucy brought 87 guineas; Monogram, 81 guineas; Broadmoor Lass, 61 guineas. The highest price for a bull was 67 guineas.

Mr. Alfred Mansell, of the firm of Alfred Mansell & Co., live stock agents and exporters, College Hill, Shrewsbury, England, has arranged to visit the United States and Canada, from the latter part of April to early in June. During that time he expects to make the personal acquaintance of as many farmers and breeders as time will allow, in order to make himself better acquainted with the wants and requirements of the stock breeders of this continent in British pedigreed live stock. It is the business of this firm to select and ship on commission all classes of stock, such as Shorthorn, Hereford, Polled Angus and other cattle; Shropshire, Southdown, Hampshire, Oxford, Cotswold and any other breeds of sheep; Shire, Clydesdale, Hackney and other horses as well as the various breeds of swine and poultry. During the last few years a large quantity of high-class stock, especially Shropshire sheep, has been selected and shipped by this firm to many of the largest breeders and exporters on this side the ocean with invariably good satisfaction. From April 26th till June 8th Mr. Alfred Mansell's address will be, care of The White Star Line, 9 Broadway, New York.

Henry Stevens & Sons, Lacona, N. Y., breeders of Holstein cattle, write us: "We notice an article in the ADVOCATE of a recent date, written by Mr. James Caskey, in which he refers to the young Korndyke cow which he recently sold to us at a long price. This is all very true. This cow is a half-sister to Korndyke Queen, one of our largest producers and best show cows. She was officially tested one week for butter in her four-year-old form by a representative of Cornell University, and made an equivalent butter record of 23 lbs. 7 1/2 ozs. at full age. She won the butter test at Mt. Gretna, Pa., in 1897 competition open to all breeds. There were six or seven Guernseys in the test. Korndyke Queen made more butter than any other two cows in the test, except her stable companion, Helena Burke. Korndyke Queen averaged 4.22% fat during this test. She is a cow of much constitution, is beautifully formed, and has a wonderful milk-vein development. We do not think Korndyke Queen or her sister, which we recently purchased of Mr. Caskey, are chance animals, as their dam, Belle Korndyke, is as perfectly a formed dairy cow as we have in our herd, and is also a cow of much constitution and vigor. She was officially tested one week for butter by a representative of Cornell University, one of the coldest weeks we had last January, and made 25.77 lbs., her milk averaging over 4% fat for the week. We know of but two cows that have ever equaled this amount of butter in any official test. They are Netherland Hengerveld and DeKol 2nd, and are stable companions of Belle Korndyke, and are the dam and sire's dam of the sire of the young cow we recently purchased of Mr. Caskey. We think the readers of the ADVOCATE will not criticize us for going down deep in our pocket to purchase this young cow. It is very evident that both American and Canadian breeders and dairymen are waking up to the fact that there is a great difference in Holsteins. They now want animals not only giving a large amount of milk, but those producing milk rich in butter-fat. It has been demonstrated by our experimental stations and agricultural colleges, both in Canada and the States, that butter-fat in milk cannot be increased to any great extent by feeding. This must be done by breeding."

GOSSIP.

J. E. MEYER'S INCUBATORS AND POULTRY, SHORTHORNS AND COTSWOLDS.

As Mr. J. E. Meyer, near Kossuth, Ont., has made a special study of the rearing and developing of fancy poultry, he has also given a corresponding amount of attention to the requirements of incubators, and is at present engaged in the manufacture of a machine which is the result of years of experimental work and practical use. While visiting the factory a short time ago we were shown the special points, which are claimed as superior to other incubators; and as Mr. Meyer guarantees his machine to give entire satisfaction, and to be perfectly automatic, we feel that he knows just what he is talking about. Among the strong arguments advanced we note that much stress is laid on the fact that it is perfectly self-regulating, requires no moisture added, or rather, furnishes its own, and when in full operation holds a uniform heat within a fraction of a degree of the proper temperature, and under test practically all eggs set have been hatched in different and inexperienced hands. Mr. Meyer's new egg-turning attachment is among its strong features, being very simple and positive in its action. The machine is made in different sizes—70, 100, 150, 240 and 300 egg size. They are also very substantially built, and every detail is personally looked after.

While Shorthorn cattle are not made the first consideration on this farm, a few very choice animals are kept. They are the descendants of three females personally imported in 1886, of the Kirklovington and Barrington families, on which have been employed Scotch-bred bulls. At present a young Nonpareil bull, bred by Arthur Johnston, heads the herd, a son of imp. King James, dam by imp. Indian Chief.

The Cotswolds are also in excellent form, and are descended from imported females. A few imported ewes are also in the flock. They are a good, well-covered bunch.

In poultry, Mr. Meyer is better known, and readers of the FARMER'S ADVOCATE will remember the illustration of his new poultry house on page 42, September 20th issue. Such breeds as Barred Plymouth Rocks, Silver Laced Wyandottes, Buff Rocks and Buff Wyandottes are among his specialties. And while much might be said of the individuality of each kind, we think that Mr. Meyer's prominence as a breeder and exhibitor is sufficient evidence of his standing, judgment and integrity, and as sires have been obtained from the most noted breeders both at home and abroad, at high prices, he is in a position to ship something fancy from his own pens. See his advertisements.

FARMERS!

NO MATTER WHAT YOU WANT, SEND DIRECT TO US, WE WILL GET YOUR

Butter, Eggs, Poultry, Wool, Hides, ETC.

and will pay you cash or goods as you may direct.

To secure a good crop of roots, order your SEEDS at once. Our prices are the lowest and the seeds finest quality.

For description of goods and prices, see our catalogue and spring circular.

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People's Wholesale Supply Co.

144-146 East King St., TORONTO.

R. V. MANNING, MANAGER.

It Pays to Care for Your Horse

The Crystal Rosette is double the size of this cut.



The Crystal Rosette is double the size of this cut.

NATIONAL GALL CURE

Is wonder-working in its effects. No other preparation in the world can equal it. It is the only speedy and sure cure for GALLS, SORE BACK AND SHOULDERS, CORNS, SCRATCHES, MUD SCALDS, ETC. National Gall Cure does its Good Work while the Horse is Working! For Sore Tests on Cows it gives immediate relief and certain cure.

OUR SPECIAL OFFER!

On receipt of 25 cents we will send a full size box of National Gall Cure and a pair of handsome Crystal Rosettes, like illustration above, which are retailed at 50 cents a pair. Money refunded if not found satisfactory. National Gall Cure is for sale by all dealers. When ordering from us, please write name and address plainly, and enclose this advt.

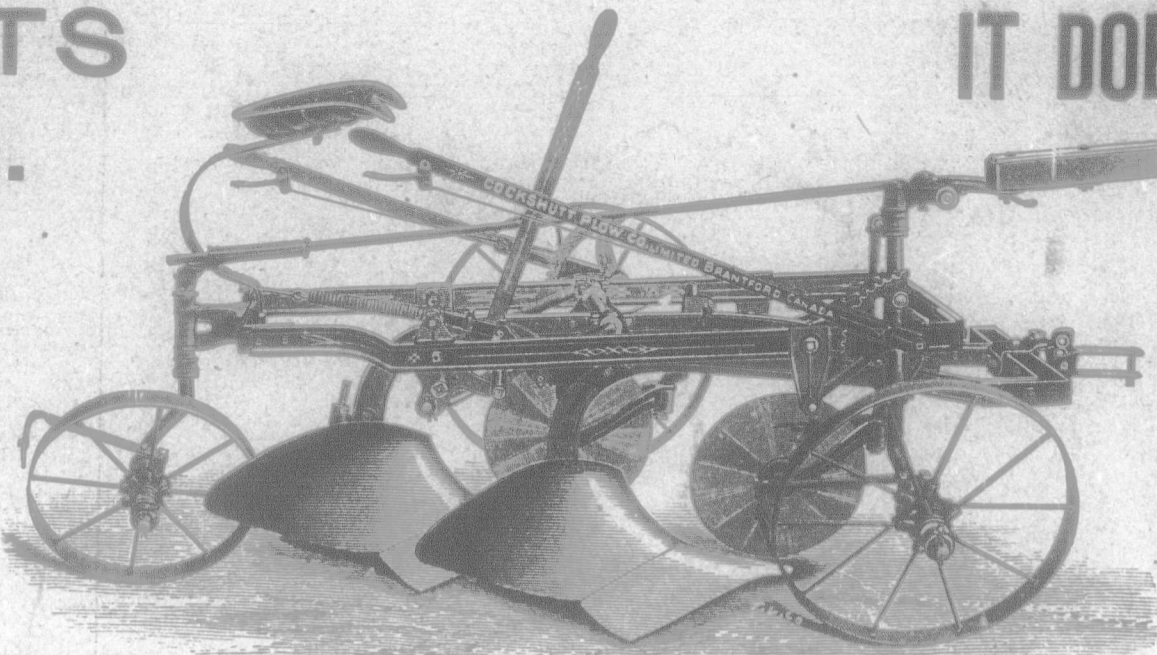
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**MOULDBOARDS
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Perfectly
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AGENTS AT ALL POINTS.

THE COCKSHUTT "HIGH LIFT" GANG.

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BETTER RESULTS WITH CATTLE

Can be obtained by keeping them in a healthy condition. No cow will fatten if afflicted with disease, especially with

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MITCHELL'S ANTI-LUMP JAW

Will remove the lump, cure the disease, and place the animal in as healthy a condition as any other in your herd.

Try it! If it does not do what we claim for it we will refund your money on request. Valuable information and treatise on Lump Jaw free.

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Prince Albert, N.-W. T.
Winnipeg, Manitoba

W. A. DUNBAR, VETERINARY SURGEON,
15 1/2 JEMIMA STREET, - WINNIPEG.

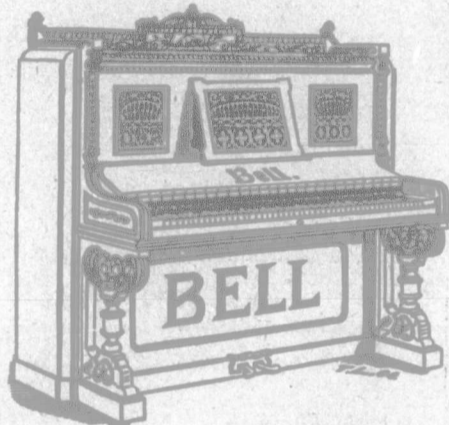
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Dr. Ward's Blood and Nerve Pills are sold at 50c. per box, 5 boxes for \$2 at druggists, or mailed on receipt of price by **THE DOCTOR WARD CO., Limited, Dept. F. 71 Victoria Street, Toronto.** Book of information free.

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THE demand for Manitoba farms is greater than ever. If you wish to sell, place your lands with us. We can sell them for you. We are constantly receiving inquiries from intending purchasers.

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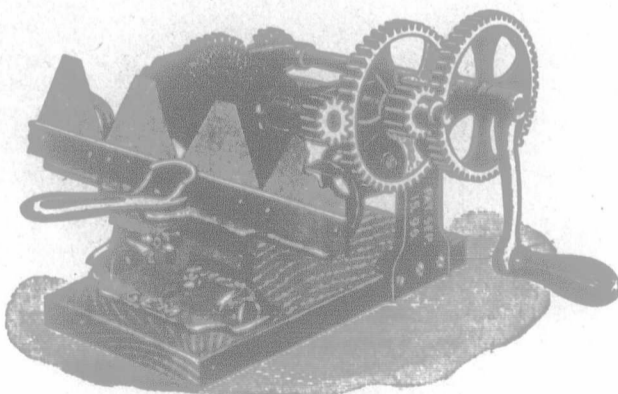
Do you intend to buy? Write for our lists. They will help you. We have farms for sale in all the best districts of the Province. Write now.

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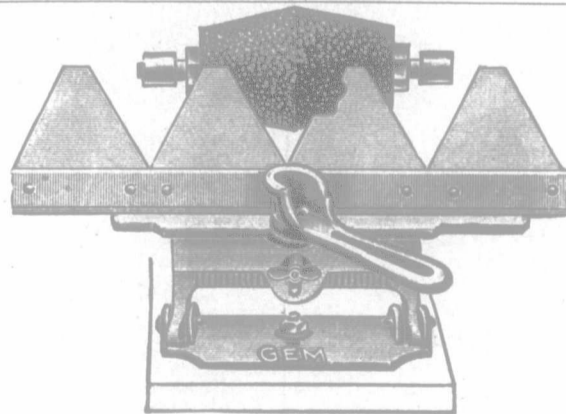


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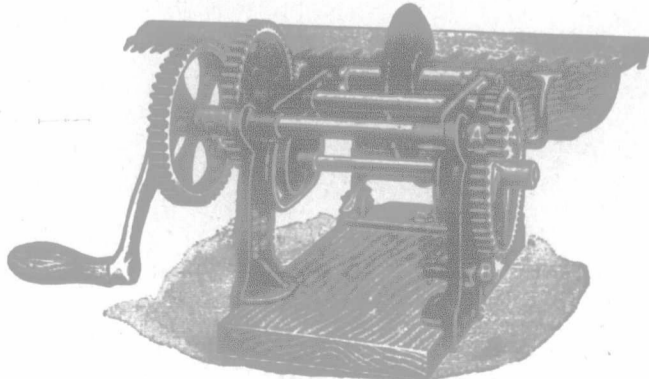
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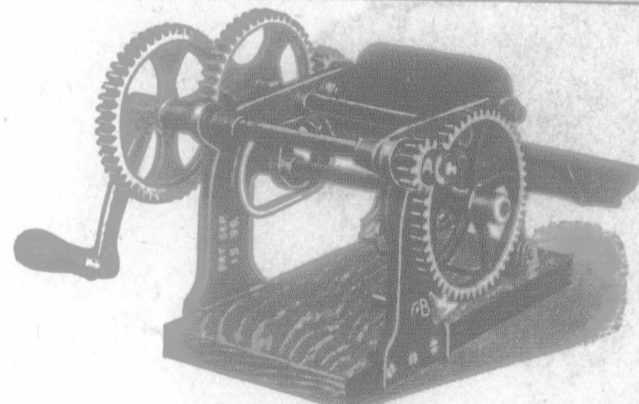
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