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Canadian LIVE STOCK AND FARMING JOURNAL

VOL. XII. No. 6.] TORONTO, JUNE, 1895. GUELPH

Beef! Beef! Hereford Beef!

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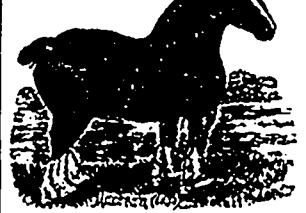
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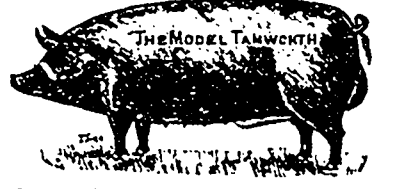
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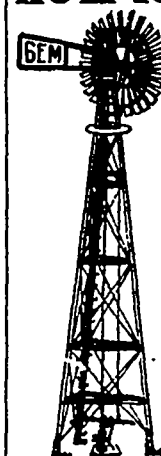
Have you read "Dairying for Profit," by Mrs. E. M. Jones, Judge of Butter at World's Fair, Chicago? If not, you miss a treat, which would save you hundreds of dollars. Only 50c. by mail. **ROBT. BROWN, Agent, Box 224, Brockville, Ont., Can.**



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MRS. E. M. JONES, Brockville, Ont., Can.

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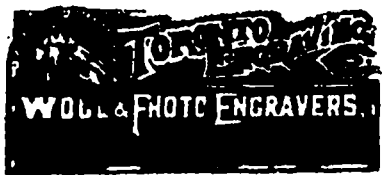
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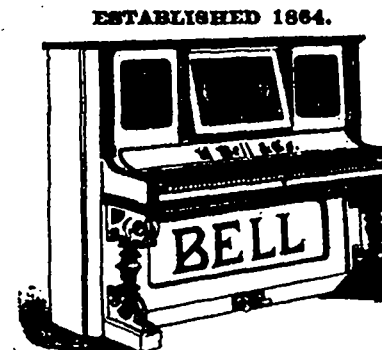
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192



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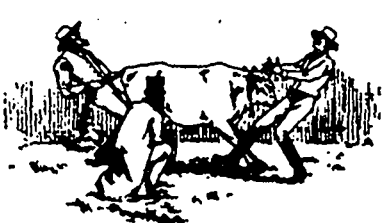
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THE Canadian Live Stock and Farm Journal.

Devoted to the Interests of the Stock-Raisers and Farmers of Canada.

Vol. XII. No. 6.]

TORONTO, JUNE, 1895.

[WHOLE No. 139



A Group of Shetland Ponies,

The property of Messrs. John Anderson & Sons, Hillswick, Shetland.

Shetland Ponies.

To those unacquainted with the fact that the size of animals is adversely or otherwise affected by the conditions of climate, soil, and feed to which they are subjected, the statement that the ancestors of the diminutive Shetland pony and the massive Shire or Clydesdale horse were one and the same may sound ridiculous and unworthy of credence, but, nevertheless, the statement is perfectly true. They are certainly descended from common ancestors, but, in the case of the Shet-

land, exposure to cold and storm for centuries, and the absence of juicy herbage, have caused a great diminution of stature, together with a great increase of thickness of coat, to enable them to withstand the biting cold, while their more fortunate cousins of the heavy breeds enjoyed a milder climate, and a much more succulent pasture, both of which tend to encourage great growth.

It is said that the Shetland pony is the purest bred variety of horse in existence, and this is probably true, but, of late years, many animals are passed off as purebred Shetlands

that have a cross of foreign blood in them. As a rule, these crosses grow larger than the purebreds, although the purebreds grow to a larger size when fed on better food than is obtainable in their native home. Ten hands high or under is the average height, and the smaller the size the greater value is put on them. They are much used in Great Britain for carrying children. The head is very fine, and the neck small at the head, but thickens at the shoulders. The back is short, the ribs well sprung, and the quarters big, whilst the legs are flat, and the feet rather round. The

most prevalent colors are bay, brown, and dun, but other colors, such as black, piebald, or white, are sometimes found. During the years when horse importing into Canada was brisk not a few Shetlands were brought over by importers, and single specimens can now be found in many parts of the Dominion.

The half tone on our front page represents a group of Shetlands owned by Messrs. John Anderson & Sons, Hillswick, Shetland, the well known breeders and exporters of pure bred Shetland ponies and cattle. At their backs is one of the "dykes" so numerous in Scotland.

THE CANADIAN Live Stock and Farm Journal

PUBLISHED ON THE
FIRST OF EACH MONTH BY

THE BRYANT PRESS,
20 BAY STREET, - TORONTO, CANADA.

G. W. GREEN, MANAGING EDITOR.
F. R. SHORE, STOCK EDITOR.

Representative for Great Britain and Ireland:
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Fitzalan House, Arundel St., Strand,
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A monthly illustrated magazine, devoted to the ladies and young people of the household.
Furnished to subscribers to THE CANADIAN LIVE STOCK AND FARM JOURNAL as a free supplement.
Subscription price to non-subscribers 50 cents per annum.

British Embargo to be Permanent.

Advices from Great Britain would seem to show that the British Government, so far from taking the embargo off our cattle this season, are rather aiming at making it permanent. The reason given is not that, among the many thousands of Canadian cattle killed at the lairages at different British ports last year there were any reputable cases of contagious pleuro-pneumonia discovered, but because of the supposed cases found among one or two of our cattle landed at Belgian ports. Thus does the British Government bolster up the false position that it has assumed towards Canada on this question. In this connection it is reported that the Belgian authorities are inclined to reconsider the question of scheduling our cattle, and may modify their restrictions in the near future.

The Cold Weather and the Crops.

It is almost impossible to say, with any certainty, how much damage has been done to crops of all kinds by the unusually cool and frosty weather which prevailed over Ontario, with intervals, from the 11th of May to the 21st. One thing, however, seems certain, that the grape crop is ruined, and other fruit crops more or less badly damaged; but, until settled weather comes and growth starts up again, the damage cannot be estimated. Fall

wheat, which came through the winter in only fair condition in many places, has, probably, escaped much injury, but spring grain has been badly checked, and, what is most extraordinary, the clovers, which had made a fine start, have turned white and laid over as a result of the severe frosts. This is the case especially with lucerne. All early sown unangels, which were up, will have to be resown. On the whole, much damage has been done, and opponents of early sowing are now criticizing those who favor as early sowing as possible. In spite of this, however, it is better to lose a crop once and get the advantages that accrue from early sowing during most years than to be always late and get poor crops every year.

Winners in the Prize Poultry Competition.

The number of essays received for this competition was sixteen, and nearly all of them were of high merit. In fact, the closeness of competition made us wish that we could have awarded several more prizes. One essay, that of Mr. W. J. Haycraft, Scarborough, exceeded the limit of words announced, and, therefore, could not be considered. We have awarded first prize to Mr. H. Bollert, Cassel, Ont., and second prize to Mr. R. L. Holdsworth, Port Hope, Ont., while a special second prize has been given to Mr. D. Stewart, Upper Kent, N.B., on account of the practical way in which he treated the subject. These three essays seemed to us to cover the ground the best, on the whole, although several of the other writers were very close to them in marks.

The poultry will be sent to the successful competitors about September 1st.

The Australian Live Cattle Trade.

The live cattle trade that has started up between Australia and Great Britain has met with several discouragements in its early career. The first few shipments were insured at a moderate rate, but, after the disastrous voyage of the *Gulf of Bothnia* steamship, the English insurance companies raised their rates up to 20 per cent., as they considered that the risks encountered on the long journey of 12,000 miles were too great to allow the continuance of insurance at the old figures. The steamship freight, too, has been increased from £6 a head to £8, thus giving the trade a serious check, and that, too, when hopes had been entertained that the freight rates would have been sufficiently lowered to enable exporters to make a profit on the cattle shipped. In consequence of this, the live stock export trade from Australia is greatly hampered, and it is probable that the result will be an extension of dead meat shipments, as being more profitable than those on the hoof.

Loading Export Cattle on Steamers.

The method of loading cattle at Montreal on the steamers bound for ports in Great Britain and other countries has hitherto been very crude and unsatisfactory. The animals have been driven from the yards through the streets, followed by a crowd of yelling men and boys, and have, while thus heated, been tied in the stalls allotted to them. It was this overdriving, with the subsequent chance of catching cold on board, owing to draughts, that, we believe, was responsible for the cases of broncho-pneumonia found among our cattle, and which the British veterinarians have determined to classify as being of the same nature

as contagious pleuro-pneumonia, an entirely different disease. Every one knows how many are the opportunities that cattle have of catching cold on the trip over, even when in normal condition, and, therefore, it can well be imagined what the effects of draughts would be on cattle in a profuse state of perspiration.

Some steps have lately been taken to improve the loading facilities at Montreal. Mr. J. C. Murray has built a cattle barge for moving cattle from the stockyards to the ocean steamers direct, thus obviating the necessity of driving them through the streets. It has been used, and is highly spoken of. A shipment of three hundred and seventy cattle were placed on board the barge from the Grand Trunk stockyards recently in seventeen minutes, and afterwards transferred to the steamer in one hour and ten minutes. This innovation must prove a great benefit to shippers, by enabling them to get their cattle on board in better and healthier condition.

Scab in Exported Sheep.

Our special correspondent in Great Britain sounds, none too soon, a note of warning, in this month's issue, to our sheep exporters. Complaints have been made, by the live stock inspectors at British ports, that scabby sheep are occasionally found among sheep exported from Canada to Great Britain, and our correspondent writes that, unless a stop is put to such practices, the British Government will probably place an embargo on our sheep, as has been done on our cattle, and will cause all live sheep to be slaughtered at the port of landing, which will be equal to a discrimination against our sheep.

If it is true that cases of scab have been found among our sheep exported to Great Britain, it must mean that the inspectors, who are supposed to closely examine every animal shipped, have either been remiss in their duties or are incompetent. Scab is so easily detected that there should be no room for excuse for overlooking a sheep affected with it. It matters not whether the sheep shipped were Canadian or American; on their arrival on the other side in a Canadian vessel they are classed as Canadian, and they have to pass the Canadian inspectors here. Let these be doubly watchful for the future, and not be the cause of getting our live sheep export trade spoiled.

To the careless sheep farmers, too, we would urge the need of greater care lest they imperil their flock's health and that of their neighbors by allowing scabby sheep to run at large in their flocks. Scab can be easily cured by dipping. If the case is bad a second or third dipping may be necessary, but these should suffice. Dip, then, your scabby sheep, and help us to maintain the character of our country for raising and exporting as healthy stock as can be found anywhere in the world.

The Horn Fly.

The unusually warm weather that we had during the first ten days of May brought on vegetation very rapidly, and it also brought out that modern pest of cattle, the horn fly, which has done so much mischief during the last two or three years. The cold weather that followed those abnormally hot days for that time of year has checked the flies for a while, but, as soon as settled warm weather once more sets in, these little pests will again become troublesome. It, therefore, behooves the stockmen to be on the watch and com-

mence an onslaught on them as soon as they reappear.

There are two effectual methods of protecting cattle from the attacks of the horn fly. The first is the spraying or dressing of the animals with the kerosene stock emulsion or some other preparation, which will keep the flies away, owing to their dislike to the odor of the dressing. This spraying or dressing has to be repeated every few days, inasmuch as the odor gradually gets fainter from day to day. It has, however, a deterrent effect on the horn flies. When there are many animals to be treated the spraying should be applied by using one or other of the many excellent spraying pumps now on the market, as time will be saved thereby.

The other method to which we have reference is the Guthrie horn-fly trap, which is now largely used in many parts. Of this valuable invention, which is patented by Mr. Guthrie, Paris, Ont., we gave a full account in the July number of THE JOURNAL last year. The cattle pass through a frame in which is fixed broom corn fibre, which sweeps the flies off the cattle and then closes again, thus preventing them following the stock, and the closing of the swing door behind the cattle by the operator drives the flies into a glass case, whence they cannot escape. When the case is full it is removed and the flies killed. This invention is, as its name signifies, a regular trap, and the cattle, after passing through, get instant relief, and can rest or graze in quiet till a fresh brood of flies get hatched out or appear from a neighbor's farm.

These, then, are the two best ways of combating the flies. The farmer can select which he likes, but it is absolutely necessary that he follow one or the other. A systematic and combined effort on the part of stockowners would soon lessen, if not destroy, these pests, which are now increasing so fast, and which will increase and prove yet more destroying, if they are not checked at once. Farmers, the opportunity is yours, if you will only use it.

Cold Storage.

"Cold storage" is the cry of the day wherever one goes, whether in far-off Australia, in Great Britain, or here at home. Without cold storage it is impossible to handle perishable articles to the best advantage, and it is not to be wondered at that such a cry has gone up everywhere for the erection of cold storage buildings.

Among the perishable products in which farmers are interested, cheese and butter will at once suggest themselves to the mind as requiring cool storage until the market is in a profitable state for their reception. The perishable nature of butter, in particular, requires that it be either marketed at once or stored where the temperature is low enough to prevent the butter turning rancid or losing its flavor. Unless this is done, there can never be an extensive trade done in butter between a country like this and Great Britain, because the changes in the market there, at such a distance from us, if such changes were in a downward direction, would disastrously affect regular shipments that had to be placed on sale at once on account of lack of cold storage buildings.

Then there is the fresh dead meat trade, in which at present Canada does but little, owing to lack of steamers fitted up to accommodate this trade, and to lack of packing houses and storage receptacles on land. This trade, we are sure, could be established in Canada with great advantage over the present

mode of shipping live cattle to Great Britain, and would have been inaugurated some time ago if only we had some of the push of our American cousins.

The fruit trade, especially the apple trade, is another branch that needs cold storage. To meet the demands of the fruit trade there should be cold storage houses in every large city and town, to which all fruit could be sent as a central point, and where it could be auctioned off as required, without experiencing the deteriorating effects which it undergoes when exposed on docks or in markets. Or, if shipments of it had to be made, the perishable fruit would leave the storage building in far better shape than where the same was not kept at a low temperature.

The erection of cold storage buildings, in order to further our export trade in perishable products, is one which merits the attention of our governments, both Dominion and Provincial, and is one to which, we think, some assistance might well be given by them. Competing, as we do, in dairy products, with the United States, Australia, New Zealand, and other countries lying nearer Great Britain, we have a hard battle to fight, and need every reasonable encouragement in order to hold our own. This we believe we can do if the proper facilities are provided as regards cold storage, and we shall hope to see some steps taken in this matter shortly. Montreal merchants are even now making a move to get the desired privilege, and have selected a suitable location with a building on it, situated conveniently for loading or unloading on to steamers or cars.

Stallion Syndicates.

During the last few years the sluggish demand for horses in commercial circles has caused a corresponding dullness in the enquiry for stallions of all shades of breeding.

It is this fact, coupled with the determination to make money in any form, questionable or not, that has brought out a number of designing men, who, by exercising their ingenuity, have been exceedingly successful in raking in large sums of loose cash during the last few winters. They have also been successful in finding a way of disposing of their surplus stallions and placing them in a great many sections of Ontario, as this province has been discovered to be a particularly fertile soil for their operations. The number of very ordinary animals that have been unloaded upon a too confiding public, at figures many times beyond their value, would surprise any one who has become accustomed to hear of hard times and the unprofitableness of horse breeding.

Now, let it be understood that we have no desire to criticize the co-operation of a body of men who have in view the improvement of our horse stock, for a vast amount of benefit may be done in this line where single individuals might fail. It is the manner in which this syndicate business is conducted, and the means employed in making the sales, against which we enter our protest. It does not require much logic to prove that, when horses can be made to change hands at a figure three or four times beyond that at which they may be purchased by private bargain, some one gains and others lose, and that the vendor has decidedly the best of the bargain. Yet such is the modest dealing that has placed at high figures many an ordinary animal in the hands of a syndicate.

If it were merely the mulcting of a few hundreds out of the hard-earned dollars of Ontario

farmers, with their eyes wide open, we might be informed that it was no business of ours, but the question is more important than that. We shall content ourselves with throwing a little light on the subject, so that our readers may be enabled to judge for themselves. The method pursued is as follows: A dealer, whose chief characteristic consists in his being a good talker, brings over one or more stallions into a town or locality best suited for his purpose. Prices varying from \$2,500 upwards are quoted as the lowest sum at which a certain horse can be bought. The operator next looks up one or more local men suitable for his work, and the ease with which these are to be found is no credit to this day and generation. These men are used as decoy ducks, or receive one or more shares in the syndicate gratis, provided that their influence is successful in getting up the desired number of names, which is one part of the understanding.

All kinds of arguments are made use of to induce men to buy shares. They point to numbers of successful horsemen who have turned money out of the stallion business, and show that by taking a share they will not only have the service of the horse for nothing, but large profits will accrue from outside patronage.

As each new member is obtained he signs a contract binding him to carry out the bargain, and when sufficient names are placed on the contract each discovers that he has to sign a note in which he is liable for the whole amount should there be defaulters at the maturity of the note, which latter is also drawn subject to a liberal interest.

Now, have we not sufficient Canadian breeders and importers of good standing ready to supply, on any terms, better horses at far less money—men that are accountable, that have handled horses that have proved to be of good service in improving our horse stock? Then why patronize men who have no reputation at stake, who make a business of gulling people? Many of the horses brought over are American trotters that cannot trot, and poor German coachers whose offspring are simply unsaleable, for they have been tried in Ontario and found wanting, and in England they have proved themselves particularly lacking in durability and quality. Belgians that cannot be given away in the United States are also brought in, and have been proved entirely lacking in stamina.

We are now on the eve of a revolution in prices. Every day good horses are gaining in demand. Our Clyde and Shire crosses are being shipped in larger numbers than for some time past. The sale of these has brought large sums of money into the country during the last few months, and many more good ones are needed.

Our thoroughbred stallions are getting horses that have topped the market at the New York sales. English coachers have left a grand list of names behind them. Look at Peacock, Sir John Stevenson, Luck's All; how often they appear in the breeding of winners at the Industrial and other shows. Trotting-bred horses have also furnished their quota of winners in light harness. We want them for road and carriage, if only they are handsome and have the right conformation, but a trotting weed is as nearly useless as anything that can be found.

Then the Hackneys are breeding right. The few that came in years ago left an impress upon our horses that speaks highly of the potency of their blood. How well Lord Derby and Old Phenomenon mares are producing only a few know, but we know of

sweepstakes winners in three out of five years that had either one or the other cross in them. But it is of late years that this strain of breeding has begun to tell. Look at the late Canadian Horse Show at Toronto, last season's Industrial, and other shows. Wherever this line of breeding has been followed, there we find them carrying off the winning colors in the open classes.

What are we breeding horses for? Is it not with a view of obtaining good prices? And do not size and weight count in horses for draft purposes, as do action, quality, and conformation for light harness and work under saddle? Then let us stick to the reliable sorts which have proved so good in the past, and which have built up such a name for the Canadian horse.

Pasture for Swine.

This question receives altogether too little attention at the hands of those who keep swine. It should not be forgotten that the pig is by nature a feeder upon grass as well as upon grains and fruits; hence, if swine are to be cheaply fed, some attention must be given to furnishing them with pastures of a suitable character during the larger portion of the season when the ground is bare.

The first pasture that comes in the spring is blue grass. Pigs are very fond of it so long as it is green and succulent. But we should be careful when we first turn brood cows out upon it that are nursing their pigs. They should only be allowed access to it for a short time at first, until they get accustomed to it, or the milk will become so affected that the digestion of the young pigs will be deranged. Blue grass also makes a good pasture for brood sows in the fall, when clover has been injured by frost. But, even in the fall, they should get some additional food when out on pasture.

Clover of the common variety is probably the best kind of pasture for pigs in summer, all things considered. The clover is ready as soon as the blue grass loses its succulence. Both sows and their young may be pastured on clover, but, in addition to the clover, even when at its best, some meal should be given to the pigs, both young and old. When the clover gets too strong for the pigs, so that it begins to get woody, it may be cropped down by other kinds of live stock. When thus cropped down it begins at once to grow again, and so furnishes young, tender food. When the season so shapes that there is likely to be too strong a growth of the clover pasture, it may be divided by a movable fence. One part may be mowed for hay quite early, and, as soon as it grows up nicely again, the other part can then be mown. If the clover in the second instance is not fit for hay, it will make litter, and in some instances it may be allowed to fall and lie as a mulch upon the land. A clover pasture properly managed will last from May to the end of September.

Barley and oats mixed will also make a good pasture for pigs. When used for this purpose the chief part of the seed should be barley. Three bushels of seed may be sown to the acre, of which one part would be oats and five parts barley. This mixture may be sown at two or three different times, and, in this way, the pasturing season will be prolonged. Pigs are very fond of this pasture, and they will eat large quantities of it until it becomes woody. They should have some other food also when grazing upon a pasture of this character.

Peas also make a good pasture for pigs. But they should not be allowed on the pea pasture until the peas are nearly ready for cooking, in the green stage. This is a favorite pasture with Theophile Louis. But he feeds his pigs the green peas a week earlier, to accustom them to the change of diet before they are given the range of the pea field. By sowing at different times a pasture of this kind may be made to last several weeks.

Rye is a good pasture for pigs, especially in the autumn, when other pasture is liable to be scarce. The rye may be sown in the autumn, and the pigs turned in upon it when it has made a good growth. They are very fond of it at that season of the year. It will also answer nicely in the spring, but there is usually plenty of blue grass at that season.

Rape also furnishes a good pasture for swine. It also may be sown at different seasons of the year, commencing with June, or even with May. It may be made to furnish pasture for pigs for several months. They are fond of it, and it has properties which push them on rapidly, providing they are given some meal at the same time.

It is thus not a difficult matter to provide abundance of pasture for swine the whole season through. There can be no question of the benefit to them of large liberty of access to such pastures, as they come on in succession. When pigs are kept upon succulent pasture they will eat nearly all the day, except while the sun is very warm, before, at, and after midday. They will thus consume a very large amount of pasture, and it must be good for them or they would not consume it. Pasture is a cheap food for swine, hence it should always be provided for them wherever it may be practicable to do this.

Dominion Cattle Breeders' Association.

At a meeting of this association held in Toronto on April 19th, Hon. Thos. Ballantyne was re-elected president. Mr. J. I. Hobson, Mosborough, becomes vice-president, and Capt. Rolph second vice-president. Mr. F. W. Hodson was elected secretary-treasurer in place of Mr. D. E. Smith, Churchville, who retired. The president, vice-president, secretary-treasurer, and Mr. Arthur Johnston were nominated as an executive committee, and, in conjunction with Messrs. J. C. Snell and D. McCrae, were authorized to revise the present constitution. Messrs. Jas. Russell, J. C. Snell, and Jas. McCormack were elected a committee on registration, and Messrs. A. Johnston, D. McCrae and J. I. Hobson on legislation.

Hackney Horse Society.

The annual meeting of the Hackney Horse Society was held at the Albion hotel, Toronto, on Saturday, May 4th.

Those present were: Messrs. Robt. Davies, president; H. N. Crossley, R. Miller, John Holderness, John Kemp, Geo. Pepper, A. E. Major, R. Beith, M.P., N. Awrey, M.P.P., Geo. H. Hastings, and H. Wade.

The following officers were elected for 1895: President, Robt. Beith, M.P., Bowmanville; 1st vice-president, H. N. Crossley, Rosseau; 2nd vice-president, Geo. H. Hastings, Deer Park; 3rd vice-president, A. G. Ramsay, Hamilton. Vice-presidents: For Quebec, Jas. A. Cochrane, Hillhurst; Nova Scotia, J. B. McKay, Stellarton; New Brunswick, Hon. D. McLelland, St. John; P. E. Island, C. C. Gardiner, Charlottetown; Northwest Territories, W. Bell Irving, Coch-

rane, Alta; Manitoba, J. Rutherford, V.S., Brandon; British Columbia, S. F. Tolme, Victoria. Directors: Robt. Davies, Toronto; Robt. Miller, Brougham; R. Graham, Claremont; N. Awrey, M.P.P., Hamilton; R. Bond, John Holderness, John Kemp, George Pepper, Toronto; and A. E. Major, Whitevale.

The secretary, H. Wade, was appointed delegate to the Industrial Exhibition, and G. H. Hastings and Geo. Pepper as auditors.

H. N. Crossley was appointed inspector for the Muskoka and Parry Sound district, and Arch. Wilson for Paris and vicinity.

It was decided to recommend the appointment of Messrs. R. Gibson, Delaware, and Robt. Miller, Brougham, as judges for Hackneys at the coming Industrial Exhibition.

It was also resolved that additional representation for this society be asked for at the next annual meeting of the Industrial Exhibition, as only four delegates from horse associations are now on the committee.

Agriculture and Arts Association.

At the meeting of the Agriculture and Arts Association held on the 17th, 18th, and 19th of April, 1895, there were present Messrs. J. Sissons, Barrie (president); J. Legge, Gananoque; R. Mallory, Frankford; W. J. Westington, Plainville; J. C. Snell, Edmonton; N. Awrey, M.P.P., Hamilton; John E. Cohoe, Wellandport; Wm. Dawson, Victoria; Jas. Rowand, M.P., Dunblane; R. McEwen, Byron; Albin Rawlings, Forest; and H. Wade, secretary.

Messrs. J. Sissons, J. C. Snell, and H. Wade, the committee appointed to open tenders as to sale of property on the corner of Queen and Yonge streets, reported that the day before the tenders were to be opened a letter was received from the Attorney-General's office, stating that the sale must be stopped, so the tenders were returned unopened.

A letter was read from W. W. Ballantyne president of the Ayrshire Breeders' Association, asking that the second volume of the Ayrshire Herdbook, lost in the fire, be reprinted, as so few of them were in circulation. This it was determined to do.

It was resolved to hold a dairy show some time during the year in eastern Ontario, and Gananoque was selected as the place to hold it; \$2,000 was appropriated for this purpose.

It was resolved, on motion of Mr. Legge, seconded by Mr. Rawlings, that a copy of the following resolution be sent to the Minister of Militia and to the Commandant of Military District No. 2:

"That the great success of the first Canadian Horse Show, just terminated in this city, and which will, without doubt, contribute largely to bring into prominence the superior horses bred by the farmers and stock breeders of Canada, and also to stimulate the farmers and breeders to still greater efforts in superior breeding, and thereby advance the general interests of the farmers of Canada, and which has been so admirably managed by the joint action of the executives representing this association and the County and Hunt Club of Toronto, is a result most highly appreciated by this board. At the same time, the carrying out of such a show would be impossible without the use of a suitable building in which to hold it; and this board esteems it a high privilege to have obtained, through the kind efforts of Lieut.-Col. Otter and commanders of corps in this city, the consent of the Minister of Militia and Defence to the use of

the New Armories, they being, in fact, the only premises in Toronto in which such a show could be held. This board, therefore, desires to place on record its sincere thanks to the Minister of Militia and Defence for the use of the building, and to Lieut.-Col. Otter and the commanders of corps for their efforts in obtaining the use of same."

A Tribute to Mr. Richard Gibson's Services.

A number of Shorthorn breeders, including Mr. A. Johnston, president, met together at the Albion Hotel, Toronto, during the Horse Show, to witness the presentation to Mr. Richard Gibson, Delaware, the retiring president of the Dominion Shorthorn Breeders' Association, of the testimonial which, at the last meeting of the association, the members decided to present to him as a small token of their appreciation of his services to the Shorthorn cause, not only during the four years that he has occupied the president's chair, but also on every occasion when it was in his power to further that cause.

The testimonial was selected by Mr. Robert Miller, Brougham, and Mr. James Russell, Richmond Hill, who had been deputed for this task, and took the form of a handsome gold watch.

Mr. Robert Miller, in presenting the watch, spoke in terms of high praise of Mr. Gibson's services to the association. Other members also expressed themselves in similar terms.

Mr. Gibson replied as follows:

Mr. President and Gentlemen:

I desire to thank you very much for your consideration, and for the flattering manner in which the presentation has been made.

While I am willing to admit that I may have been of some use to the Shorthorn cause, had I not had the loyal support that I have had, nothing could have been accomplished. Why I feel that something has been accomplished is the satisfaction of knowing that the breed with which we are identified is one of which we cannot exaggerate the merits. They are entirely worthy of all we can do in their behalf. Such being the case, my best energies have been employed in their behalf, and the work has been one of love. While such is the case, have we done all that is necessary? I ask each one in this room, Have you, individually, helped to boom the breed? In my opinion the time has come when it behooves us to be up and doing. We have been too satisfied that our favorites need no puffing. While it may be so, the breeders of other sorts are reaping the harvest of our apathy. My letter-box is flooded with Jersey literature; papers all over the continent are besieged with matter asking to have such printed. Having judiciously spent \$50,000 to win at Chicago, Jersey breeders are not letting that victory be a blank. I think the time has come when we should bestir ourselves, and carry the war into Africa. Let us not be afraid to advertise our goods, nor afraid to speak and write well of them. They are worthy of our best efforts, and would, were they more popular and better known, add millions to the value of our live stock. Gentlemen, I have but little more to say. I would that I could express my feelings properly. I can simply say, I thank you.

Utilizing Waste Products.

This is the day of small things. In every business it is only by attention to small things, which years ago were not taken into account,

that the merchant or farmer, as the case may be, can make a profit in his business. Competition is so keen in every branch of trade that economy and careful attention are absolutely necessary for the successful carrying on of business operations. What are known as leaks, on the farm and in the store, must be stopped, and nothing wasted that can be utilized in some way or other. Even the big packing houses in Chicago are conducted on the same plan, and, to take a single instance, not a drop of blood is wasted by any of them, and its manufacture into fertilizers has become a profitable industry. Armour & Co. alone turn out from ten to twelve tons of it every day, and it has a market value of from \$32 to \$45 a ton, according to the amount of ammonia which it contains.

The process of preparing the blood for commercial uses is very interesting, says a Chicago contemporary. At the base of each slaughtering pen there is a spout which collects all the blood that flows and carries it off to the drying vats. These are huge cauldrons, and when they are heated to a temperature of 215 degrees part of the free water in the blood, amounting to more than 70 per cent. of the whole, is driven off in the form of steam, and the albumen is coagulated into a thick, pulpy mass. When the proper consistency has been reached—and the workman who stands above knows the exact time necessary—the mass is run off into a great hydraulic press, the bottom of which is covered with three or four thicknesses of burlap. Then the power is put on and more of the water is forced off through the burlap to troughs below. The pressure is maintained for some time, and when it is at last released the blood comes out in solid, moist chunks. Each of these is taken and fed between the huge revolving rollers of a machine which is known as the Anderson dryer. The rollers are heated by steam, and still more water is pressed out of the blood. The product comes through in cakes, dry for the most part, and hard. The fibre dust and crumbs fall through a sieve into a receptacle below, and the large, rough pieces, or "screenings," as they are called, which remain are carried along to the attrition mills, where they are ground into fine powder.

An attrition mill is a simple but very effective grinding machine. It consists of two upright cylinders, revolving in opposite directions, one inside of the other. Instead of being solid, the cylinders are made up of steel rods set close together, and when the chunks of dried blood are shaken in at the top they are crushed against the rods and ground together until by the time they reach the bottom they are as fine as powder. This machine has a capacity for grinding out from fifty to seventy-five tons of dried blood every day. The workmen who attend to the process have to become accustomed to their employment by degrees, because the odor of ammonia about the place is so strong as to be almost unbearable to the uninitiated.

The product is enclosed in air-tight compartments until it is ready for mixing with potash and phosphoric acid to make a complete fertilizer. It is chiefly valuable for the large amount of nitrogen which it contains in the form of ammonia. Nitrogen is one of the most necessary parts of plant food, and must play an important part in every complete fertilizer. Ordinary blood contains about 17 per cent. of ammonia, and of this about 13½ per cent. is pure nitrogen. The fertilizers made at the stockyards by the big packing houses from blood and ground bones are shipped all over the world.

C. H. McDowell, who is the fertilizer expert for Armour & Co., has made some interesting figures in regard to the value of the blood in a single animal. The average steer killed at the stockyards contains four or five gallons of blood, or thirty-two to forty pound. If the water be driven off by drying, the product will weigh about sixteen pounds, which, at two cents a pound, would be worth thirty-two cents—its value as a fertilizer. The amount seems small, but when the number of animals killed in a day runs far up into the hundreds the total is great.

For The Canadian Live Stock and Farm Journal.

Live Stock in Minnesota.

By PROF. THOMAS SHAW, St. Anthony Park, Minn.

Although Minnesota is the home of the famous stud of Clydesdale horses owned by Mr. N. P. Clark, of St. Cloud, and of the no less famous herd of Shorthorn cattle owned by H. P. Brown, of Minneapolis, it will not compare with Ontario as yet in attainment in the high average of the live stock kept. It will be remembered that the St. Cloud horses were the champion stud at the World's Fair, and that the Minneapolis Shorthorns held a similar place among cattle of their class. In nearly all the state wheat-growing has been the passion of the farmers, and this has reacted most unfavorably against the development of the live-stock industry.

While there are some good studs of horses in this state, they are, relatively, not very many, and the immediate outlook for horse-rearing is not particularly bright at present. In the great cities of Minneapolis and St. Paul the bicyclists are so numerous at certain hours of the day as to render street crossing positively dangerous. I have just returned from attending a series of farmers' meetings along the Soo line of railway, and, while thus engaged, met with travelling men on all sides who were riding their bicycles in preference to going by train. But, of course, horses for farm purposes will always be wanted; and, therefore, even now it will, doubtless, be good policy for those in the business to keep on breeding good ones.

The beef cattle industry has not made great progress in this state. On the immense ranges in the west cattle are very cheaply raised. Many of the range cattle are bought up at the stockyards in a half-finished condition in the autumn, and are taken to farms in Wisconsin, Iowa, Indiana, and Illinois, and there finished on corn. Our Minnesota farmers have not caught on to the idea of finishing beef in this way to any great extent. When they do, and the day for beef-making is coming with us, Minnesota will be a veritable beefman's paradise. If properly managed, corn for stock feeding can be grown right up to the Manitoba boundary, and with but little danger of failure. In northern Minnesota it may be difficult to secure maturity, but it will make fodder for live stock. It is not generally known, probably, among Ontario people, that Mr. S. A. Bedford, the excellent manager of the government farm at Brandon, Manitoba, has made good corn ensilage for many years. Our farmers have the idea that fattening beef will not pay, but some of them are pushing the business notwithstanding, and are doing well at it.

We have nine steers between two and three years old at our station under experiment. We bought them in the fall for about three cents per pound, live weight. Had we sold them three weeks ago we could have taken six

cents per pound for them, but, of course, we have been favored with a rise in the price of beef since the time of purchase. The commoner class of steers could have been bought to any extent desired last autumn at from two to three cents per pound.

I have much faith in the future of Gallows in our state. They stand well the dry cold of the winters, and, in this land of low temperatures, the skins will undoubtedly be in demand to take the place of the hides of the vanished buffalo. At Minneapolis, St. Paul, and Stillwater they are now being tanned in fine form.

Sheep-raising has made but little progress. The farmers have grown them almost entirely for wool, consequently the Merino types prevail. They, too, have the impression that we cannot compete with the range sheep of Montana and Dakota. In our state to-day there are not half a million of sheep, and many of these are not of a class to make good mutton. But the day for sheep husbandry is coming. Foods can be cheaply raised here. The winter climate is everything that could be desired for sheep rearing, with the exception of occasional snow storms. Sheep can winter very well out of doors in the shelter of a ravine, or in a grove, but the summers are not so good. In the last part of the summer the grass gets very dry in some seasons. To meet this difficulty we are experimenting with growing corn and rape and other things, to provide succulent pastures, and with encouraging success. Last autumn, lambs could have been bought for \$1.50 each almost anywhere in the state, but they were not good lambs. At our experiment station we fed forty grade Shropshires last winter, and sold them in March. They were Minnesota lambs. They averaged 113 pounds each when sold. When finally disposed of in Chicago they brought 6 cents per pound live weight, the highest price paid in that market in 1894 or 1895, up to the date at which they were sold. They gained nearly 10 pounds per month while being fed. Some of them were fed on wheat, and some on wheat screenings, and all got hay and some oil-meal, but no roots. We are urging the farmers here to go more and more into this business, and more especially to rear the breeding stocks required within the state, so that they will not have to go abroad to buy. As soon as good common grades are reared by our farmers, we expect a winter trade with Britain. Some shipments were made last winter from New Brighton, near Minneapolis, over the "Soo" line, direct to Liverpool *via* Boston. The only serious obstacle in the way now is the lack of quality in the sheep.

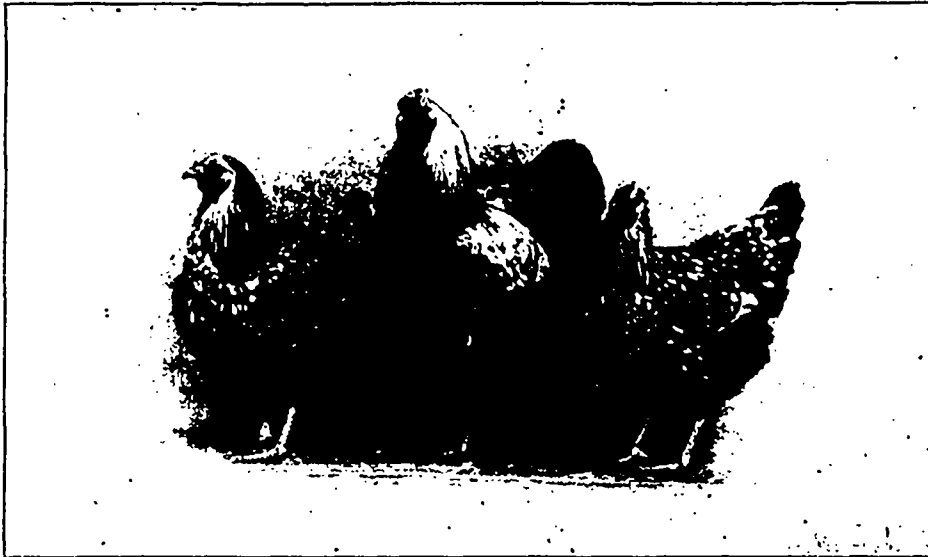
Dairying has made much progress in some parts of the state, but in other parts it is not yet started. Butter dairying has made the greatest advance. There are about half a million of cows in the state, and many of them are very good ones. Professor T. L. Haecker is doing very valuable work at the station. His bulletin, recently issued, on the relation of dairy form to dairy production is considered the most valuable addition to dairy literature that has appeared during recent years. It has been reprinted by many of the leading agricultural papers in the United States, and should be in every dairyman's house,

A Trio of Silver Wyandottes.

We have great pleasure in presenting our readers with an illustration from life of a fine trio of Silver Wyandottes, the property of Mr. John J. Lenton, Oshawa, Ont., a contributor to our poultry columns. Poultry are very hard to photograph, as they are continually moving, and it is rarely that three birds can be got to stand properly together. In this case, however, the photographer has managed to get them in very fair positions. The male bird is the cockerel that won third at the Ontario show, January, 1895, scoring 93. He was pronounced by competent judges to be the best male bird exhibited, but, as he was then very young, he was cut one on weight. Had this one point been added, he would have easily won first. His sire and grandsire have a long list of first premiums to their credit, while the females on his side are no less noted. Several noted Silver Wyandotte fanciers consider him the best male of that variety in Canada. The hen to the left has only been shown once, viz., at Toronto, in 1894, where she was shown under a disadvantage, but won second. She is from the same sire as the cock, and is a

dence that, as a food for pigs, separated milk may be extremely useful.

Separated milk alone will be sufficient, not only to keep pigs alive, but it will, if given in sufficient quantity, cause a considerable increase in the fat and lean meats of pigs so fed. Experiments at the Glasnevin and Munster School Farms have shown a considerable increase in the weight of pigs fed upon skim-milk alone; but upon following those pigs to the slaughter-house, it was found that this flesh was of inferior quantity. Messrs. Lawes and Gilbert have carried out some very interesting experiments upon the feeding of pigs, and some startling revelations were made. They bear upon the question of fat formation in animals fed upon nitrogenous or flesh-forming foods. In these experiments the increase in body weight ranged from 51.3 to 68.9 per cent. when the feeding was conducted eight weeks, and between 85.4 and 106.8 per cent. when conducted ten weeks. From 59.9 to 79 per cent. of the total increase was reckoned to consist of fat. From the nature of the food the proportion of the stored-up fat that could possibly have been derived from the readily formed fat ingested, even supposing the whole



A Trio of Silver Wyandottes.

The property of Mr. J. J. Lenton, Oshawa, Ont.

particularly fine bird. The other hen has been shown twice, both times in Port Hope, at the winter shows. She won first there in 1894 as a pullet, scoring 93, and in January, 1895, she won second with a score of 92, her mother, for which Mr. Margach paid over \$20 to Mr. A. C. Hawkins, of Massachusetts, U.S., winning first, with a score of 92½. The beautiful even lacing of this hen has often been commented on.

Separated Milk in Pig Feeding.

The use of separated milk in the feeding of pigs is of much importance to Irish farmers, says Prof. Carroll in a paper read at the Dublin Dairy Conference. In all dairying countries pigs are considered an important department in connection with the dairy, and, as a general rule, it may be taken that feeding pigs with separated milk is about as profitable as any other legitimate system of disposing of this by-product of the dairy. Unfortunately, the same ideas prevail in respect to the wholesomeness of separated milk for pigs as are general in respect to calves fed upon this substance. We have, however, sufficient evi-

of what was supplied had been assimilated, was so small as to leave no doubt that a very large proportion must have originated from some other source. According to the figures given, the proportion of fat which must have so originated, ranged from about two-thirds to eight-ninths of the total amount stored up. Thus, then, it was shown that fat must have been formed from the food ingested. The next question for solution was whether the fat produced originated from the nitrogenous or non-nitrogenous elements of the food or both.

In the experiments of Messrs. Lawes and Gilbert they purposely varied the relative proportion of the nitrogenous and non-nitrogenous parts of the food given to the several pigs. From the results obtained it appeared that there was no material difference in the amount of fat produced, although, if fat were capable of originating only from the carbohydrates, it would be reasonable to expect that on diminishing this supply, as in replacing a portion of them by nitrogenous matters, the amount of fat developed would have been less. The experiments of Messrs. Lawes and Gilbert tend to encourage the impression that the component parts of food have but small influence

upon the proportion of fat and lean produced in the animal. This impression may be strengthened in those who note the Glasnevin and Munster Agricultural School experiments upon feeding pigs upon skim-milk alone, from which all fat had been abstracted. Here there was a decided increase in the weight of the animal, and the increase included a fair proportion of fat.

It must not be concluded as absolutely certain that the chemical composition of food has no influence on the quality of meat produced; in other words, that carbohydrates will produce only fat, and that nitrogenous food will produce only lean meat. Carefully conducted experiments in some of the American experiment stations have shown that fat and lean meat are directly influenced by the composition of the food given to pigs, and that, when a nitrogenous food is given, flesh of a lean quality is formed, and that by the feeding of fats, starches, or other of the carbohydrate groups, the proportion of fat in the pig is increased.

I have endeavored to obtain some information as to the use of separated milk in pig feeding from persons who use it largely, and who are keenly sensitive as to profit and loss in the matter. During late years the bacon industry of Denmark has increased enormously in importance, and the quality of the bacon received from that country is most excellent. Large quantities of separated milk are used for pig feeding in Denmark. Indeed, the making of skim-milk cheese, which was at one time an important industry in Denmark, has given way before the system of using the separated milk for pig-feeding.

The experiments upon the use of separated milk in pig-feeding will be carried on at Glasnevin and at the Munster Dairy School with the view of testing the combinations of food that are most serviceable in conjunction with separated milk in the feeding of pigs. I may say that I am perfectly satisfied that such milk has considerable value as pig provender, but that I must impress upon the meeting the absolute necessity for careful treatment of separated milk in the feeding of pigs.

I do not consider that sufficient evidence is obtainable to warrant my offering an opinion as to whether separated milk should be fed to pigs in a sweet or in a sour state.

I should like to suggest experiments being made at creameries upon the fattening of fowls with separated milk as food. The poultry industry is an important one, and it is possible that in the fattening of poultry by the use of skim-milk a profitable outlet might be found for at least a portion of the separated milk that could not be otherwise usefully employed.

White Points.

In criticizing some remarks of a correspondent of the English *Live Stock Journal* on the frequency of white feet in Shire horses, who had quoted the opinion of Hartmann, that "these markings are transmitted by heredity, and always become larger in the descendants, so much so that finally pied horses will be produced," Mr. Wm. Housman writes:

I apprehend that the "always" of this passage must be taken with some degree of qualification, and that the predicted outcome

of breeding from white-footed horses does not pledge the seer who foretells it to anything more than that some pied horses will eventually appear if the tendency to extension of the white markings be not kept under control.

When animals with white points are paired without regard to their markings, and without regard also to the colors and markings of their progenitors, there is certainly often a great tendency in the white to encroach, sometimes to run wildly away, extending from the original points until it covers a large portion of the body of the animal. But this tendency may be kept in check by the breeder who sees and reasons.

The tendency of the white to spread beyond the points appears to be greatest when the prevailing color is a weak one. Take, for example, the colors and markings of Hereford cattle. I have myself noticed that in some families of Herefords the red is not only of deeper dye, but is also of more aggressive power than in other families, and that it occasionally runs forward from the neck, in a solid mass, across the cheek, almost to the eye, and in other cases, whilst the main body of color stops short on reaching the cheek, detached patches are thrown forward around or near the eye, whilst the red descends the legs in a solid state, stopping abruptly about half way down the hind legs (more or less), but going down to the fetlocks of the forelegs. We do not often see, I think, at least I have not noticed, the pale yellow-red thus trying to drive out the white points. I suppose that it is of feebler tenacity, and is more ready to retreat before the white than to dispute the ground with it. Black may be thought a stronger color than red, and in some conditions it overpowers red; but the relations between black and white are curious, and black appears to be often, more easily than red, exchanged for white. Thus a black animal with white points is not necessarily more disposed to transmit the black color in prevailing power than a red animal with white points is disposed to transmit the red with prevailing power over the white; but, on the contrary, sometimes may be more inclined than the red to favor a sport to excess of white. In some conditions, indeed, a roan or other broken color resists the encroachment of white quite as strongly as a solid black or red can. I have known a white Shorthorn cow breeding to a red Shorthorn bull with four white legs produce a rich roan heifer with legs of a deeper and more dense roan than the roan of the body, the color of the legs being continued to the feet; the same pair of animals having previously bred a light roan heifer with a considerable quantity of roan on the legs down to the feet. In that case, the sire of the white cow was a white bull, by a white bull, but from a red-roan dam, dark-colored down to all her feet; and the white cow's dam was a roan, which I never saw, but I noticed that a full sister to the white cow was roan with roan legs, and that in the same family the legs were generally well colored. Another white cow, also Shorthorn (these were pedigree cattle), breeding to the same bull several years in succession, both male and female offspring, always produced yellow roans, with white legs. She was by a roan sire, of medium quantity of color, but not a strong roan, his legs all white down the front and mottled with roan down the back; her dam was white by a white sire, from a line of dams in which yellow-roan was a frequent color. The white-legged red bull was by a roan sire, with white fore feet and white hind legs up to

the hocks, and from a light-roan dam with roan legs. The offspring of the same bull from a blue-gray cow, crossbred between Shorthorn and Scotch Highland, with legs shaded from blue-gray to black, was a jet-black bull, black all over down to his feet. The same blue-gray cow, paired with a full-red son of the same white-legged red bull, produced a black bull with four white legs, although both the sire and the dam of the calf had deeply-colored legs, those of the dam being mostly black, breaking to a gray as the color spread from the knees and hocks upward, and those of the sire being dark red. The reversion in body-color was to the Highland parent of the dam, and in leg-color to the paternal grandsire.

Here, among the offspring and grand offspring of a single bull, we have instances of reversion; both to the colored-leg, in the offspring of white-legged animals, and to the white-leg in the offspring of animals whose own legs were fully and deeply colored. We must, therefore, look beyond the immediate parents if we would either perpetuate or avoid certain markings; and the same rule holds good of other properties besides color. Each animal is a compound, not of its father and mother exclusively, but of their progenitors also, and owes a little to one, a little to another, of the various animals whose mingled influences gave them severally their shapes, colors, markings, and other distinguishing peculiarities.

By carefully studying the tendencies of individual animals, which with various imitations become hereditary and extend to families, or to large portions of families, we may readily learn to govern the reproduction, the increase, or the modification of form, color, markings, or any other characteristic. By attention to these things, the Hereford breeders were enabled to produce a mottled-faced section of their breed, and four colors, red, white, dark gray, and light gray; and when the white face and the red color found the most general favor, they were able to change nearly the whole breed into a red breed with white points. In some cases the white comes out increasingly strong, in other cases the red threatens to drive the white to the extremities, but in the whole Hereford breed neither the red nor the white gets the mastery over the controlling will of the breeders. The markings are kept about as nearly constant in the extent of the red and of the white as the admirers of Herefords generally can desire. If a herd begins to show too much white, a bull, judiciously chosen from a family much steeped in red, and that red a good strong color, will usually correct the degeneracy towards white; and in the same way a bull with plenty of white in his family will check the opposite tendency. But we must not expect to have always the happy mean between too much red and too much white established by a single selection, nor can we reasonably hope to gain our object in a single generation. Perhaps the surest way to succeed would be to use sires or bulls as nearly of the desired color and marking as possible (due attention being given to other characteristics), only to let the leaning be towards the opposite of the weak point in the stud or herd. Whenever we try an extreme difference, to correct a fault or an excess, we are in danger of losing the very balance we desire to gain, and of seeing our animals varying between extremes for many generations. Two or three successive sires, each moderately strong in that which we wish to have impressed upon our animals, will be likely to do far more, and to

do it far better, than a single sire more widely differing from the dams.

It is not always necessary to go far from home for what we want. Timely selection at home, or near home, may save the trouble of seeking, and the risk of taking, a strain of blood not sufficiently known.

Rotation of Crops in a Pond.

It has been discovered from long experience, says a writer in *Blackwood's Magazine*, that in no stew or pond do trout grow so fast as in one which is absolutely new. Mr. Andrews, the very successful fish-culturist of Guildford, informed me that his best results were obtained in a newly-made pond into which he had introduced trout-fry after the water had been standing some three months only. In Catholic times, when there were no railways to bring sea-fish for the Friday's fast from the coast to the interior, a series of fish-ponds were found on the estates of most country gentlemen, and it was the custom to have—to use an agricultural term—a rotation of crops. That is to say, the pond having been sown with carp eggs by the introduction of some spawning fish, the parents were withdrawn, and as soon as the resulting young fish—which were often artificially fed—had attained maturity, they were netted out, the pond drained, and a grain crop grown in the mud at the bottom; then followed another crop of fish, and so on. In the same way, there is little doubt that to obtain the best results from lochs which already contain large numbers of small fish, the water should, where it can possibly be done, be drained off and the bottom left exposed to the light and air for a considerable period. What may be the exact change which takes place in a pond, stew, or lake, left devoid of water, we do not quite know. Without the least doubt the change is one highly favorable to the healthy growth of fish. In this matter, as in many others, we profit by the experiences of our unscientific ancestors.

Notes from Great Britain.

(By Our Own Correspondent.)

The position of agriculture here at the present time is certainly one of very grave moment, particularly so in the purely grain-growing districts. Owners as well as occupiers are constantly crying out for help and for remedies, but still the facts are clear and evident that, under the present method of cultivation and management, the English farmer cannot hold his own. Why is this? The universal answer is low prices. The remedies suggested are numberless, ranging from protection to relief of local taxation, and thousands of other remedies of all descriptions, all of which are of little value, for the simple reason that the cause of the depression, in the writer's opinion, is one that can only be overcome by looking it fairly in the face, and at once admitting that it is simply and mainly caused by the fact that farmers are carrying on their business upon the same lines as those which were in force twenty-five or even fifty years ago, before the advent of steam and telegraph; hence it is quite certain that the business can never be made to pay under these circumstances. Many of your farmers would scarcely believe it, but it is still a fact that within half an hour's ride of London land lies vacant and uncultivated. Surely this must be, and is, wrong in every way, but it, nevertheless, is a fact, and it will continue to be so until farmers wake up and realize the fact that they have now to compete with the world, and

not with England only; and to do this they must be prepared to cast aside all their old-fashioned notions and apply themselves to the means that science has placed in their hands. Take, for example, many of the excellent implements made in your city, Toronto. These are laughed at in England by farmers as being toys and of no use. You do not realize what difficulty one has to induce our farmers to use them. What not only the agriculturist at home but also with you and everywhere else must do in the future is to use every means at his command to cheapen production, to grow only the best varieties of grain, to keep only well bred registered stock, and generally to apply himself and all his energies to the production of those commodities for which there is a demand.

A WORD TO CANADIAN SHEEP EXPORTERS.

Sheep are now again beginning to arrive from your country. As a free trader, I welcome them as I do all other produce, but I feel it my duty to write, perhaps some will say very strongly, to warn you, if you want to keep this valuable trade, that you will have to be exceedingly careful in seeing that every sheep sent is healthy, clean, and free from every infectious disease, particularly "scab," for, from certain information to hand, and from general observation, I fear that in the past sheep have been sent here that have not been perfectly free from this dreaded and most infectious disease; hence, it is all the more important that your breeders should be warned of the fact, for it is as certain as certain can be that, if scab is found to exist in sheep from your country, the trade in live sheep will have to be stopped entirely, except they are slaughtered at the port of landing, for it must be clearly understood that the English flocks are far too valuable to be placed in jeopardy for a single moment for the sake of the few thousands of sheep that we get from you.

This disease is simply, in my opinion, a certain sign of carelessness and want of business capacity on the part of the sheep farmer, for I hold decidedly the opinion that if every breeder of sheep did that very simple thing that every breeder ought to do, *i.e.*, dip his sheep twice a year, his flock would be kept perfectly clear and free. Why, then, risk losing a lucrative trade simply and surely through sheer neglect and want of thought?

Two very important Southdown flocks will be sold by auction shortly in England. The flocks alluded to are those of Messrs. Penfold & Toop, both of whom are members of the Southdown Sheep Breeders' Association of England. I understand that the sheep to be offered are very choice indeed.

The trade in live stock is very fairly active, particularly for first-class animals of all descriptions. The sheep trade is very good and will certainly, so far as one can judge, continue so, for the demand is very large and the supply is short; in fact, we have not been so short of sheep in England for some time. Therefore, it is very evident that our breeders have a very satisfactory prospect of a good market at home for their surplus stock, especially if the same are perfectly healthy and sound.

A Combined Piggery and Hennyery.

A correspondent writes asking us to give the plans of a piggery and hennyery combined in one building, capable of accommodating twenty-five pigs and sixty hens.

Herewith we present the accompanying cut of the ground floor plan, with description of a building the dimensions of which are 36x30,

conveniently laid out for feeding or breeding both swine and poultry. The design is intended for a loft above in which bedding, feed, or chop may be stored.

A concrete or stone wall a foot high is sufficient for that part intended for fowls, while that for the pigs may be run up two feet higher, or three feet in all, or up to the tops of the doors intended for egress to the pig yards.

Studding, boarding and tar paper will form a barrier that will keep out wind and weather, and will insure quarters that will be warm, dry, and comfortable.

The compartments for fowls are suitable for keeping three varieties, should it be intended to breed; if keeping or breeding fowls for commercial purposes only is the aim, the yards may be dispensed with, that is if the fowls are allowed the run of the adjoining land.

Again, if a larger herd of swine require accommodation ten more feet may be added to the length of the building, which would give two more pens with a capacity for accommodating twelve to sixteen more head, according to age.

One of the pens may be used for fowls if more room is required for them, while the design has the advantage of indefinite extension if breeding in either department on a larger scale is contemplated.

That part of the building allotted to the fowls should be at the end facing the south. The heavy and dotted parallel lines in front should be built with plenty of glass, or the windows may be made of any size, but should be large enough to insure plenty of sunlight in the winter. The passage EE at the back of the hennerly gives access to all three compartments, the nests being readily reached from this passage by letting down a lid which exposes the nests to view.

The roosts, R, are built in a frame with a floor to catch the droppings. This arrangement is hinged at the back, and may be lowered in front during the evening and night, thus allowing the fowls to reach their roosts in the evening, and the floor in the morning, with very little exertion. By folding up during the day the compartment is made more bright and airy.

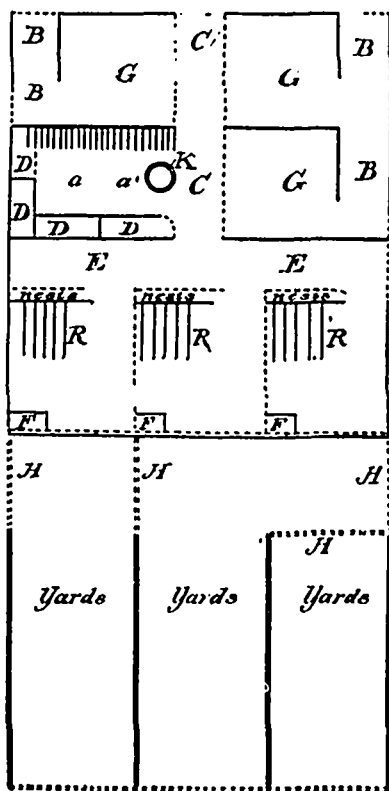
A dust bin, F, is boarded off at one side, next the window, while at the opposite side a board for soft feed is hinged, which folds up against the partition when not in use, thus insuring cleanliness. Water-cans are hung in the partitions, and trays should be placed underneath to catch any water that is spilled. By this means the floor is kept dry. The design affords ample floor space for feeding the grain among a plentiful supply of straw. When it is fed in this way the fowls are kept busy scratching for their rations, and thus get the needful exercise during cold weather.

If the yards are to be used, these should be ten feet wide, corresponding to the width of the compartments inside the building, and a gravel roadway exactly the same width should be run along the face of the building. Gates ten feet long, HHH, either complete the division fences between the yards or confine the fowls in their respective yards ten feet away from the building. By this arrangement any one of the yards of fowls may be allowed a run outside the yards and easily driven to their allotted quarters and another variety allowed a run. The gates should be hung so that they will swing freely in any direction, right or left, so as to block either yard or the gravel roadway between the building and the yards. Gates at the other or far end of the yards may be placed so that these yards can be plowed every few days while the inmates

are confined. This will contribute much to the health of the occupants, as by this plan the ground is kept perfectly fresh.

The piggery is also conveniently arranged. The cook room has bins, D, to store away a limited quantity of mill feed or meal, and a cellar may be built underneath this compartment, in which roots for pigs and poultry may be stored. Water may be supplied from a tank over this room, or from a well underneath, as best suits the circumstances. There is ample room for operating a feed cooker of the steam variety, K, while, if the house is closed up at night, this will serve the purpose of warming the henhouse during the extreme cold weather.

The pens for the pigs are arranged as described in a plan given in the last October issue, in which we showed how easily the pens may be converted into box stalls for colts or cattle, or pens for sheep. The floor should be built of cement; the back passages, which are four feet wide, should be three or four inches

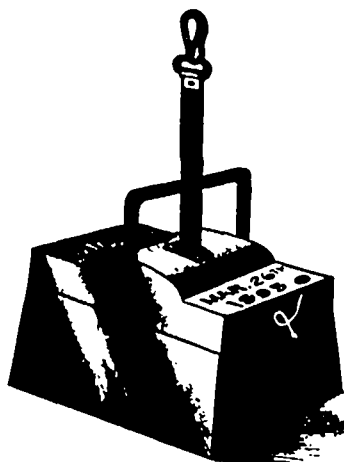


lower than that of the pens, which should slope towards the partition next to the opening to the back passage. A board floor should be placed under the sleeping place, for pigs cannot stand dampness in winter. A swinging door over the troughs is by far the best arrangement for feeding, as the troughs are more easily kept clean. The back passage, B, permits of cleaning out the manure with a horse attached to a stone boat, and, as this passage will be made use of entirely by the pigs in depositing their droppings, the pens proper, G, will always be found to be clean. Any soiled bedding may be thrown into this passage, and thus help to keep the feet of the pigs clean.

A Patent Automatic Horse Weight.

A very neat and useful invention is the patent automatic weight for tying horses in the street represented in the accompanying cut. It is the invention of a young Canadian, Mr. D. B. Macnachie, 30 Soraraen avenue, Toronto, and is a great improvement on the old-fashioned tie weight, with its long strap, which

is always in the way. The strap in this weight runs on an automatic roller, and will stop at any length desired. When the driver wishes to proceed he merely pulls the strap, and then lets it go and it is drawn into the box as far as



the hook, leaving no strap to be trodden on by the feet when the weight is deposited in the bottom of the carriage. The same principle can also be applied to a manger tie for fastening horses in the stall.

A Letter from Mr. Galbraith.

Editor Canadian Live Stock and Farm Journal:

Sir,—Since returning home last week, I have intended writing to you to express the satisfaction and pleasure I had in visiting the Toronto Horse Show, and in appreciation of all the kindnesses which I received while there, and during my hurried run through part of Ontario.

The management of the Horse Show in all its details seemed to be so perfect that our western people could, with great advantage, take a leaf out of the Canadian book.

I should take it as a favor if you will, in the next issue of THE JOURNAL, mention that any Canadian Clydesdale breeders who may wish to record their stock in the American Clydesdale studbook can save all penalty fees, whether of registration or transfer, by making their entries before the end of June, and should they at any time desire any information that it is in my power to give, I will most gladly do so. For each entry they now make they will be furnished with a custom house certificate, free of charge, which will enable their animal to get across the line without trouble or delay.

ALEX. GALBRAITH, Secretary. Janesville, Wis.

Lucerne Clover.

Editor Canadian Live Stock and Farm Journal:

Sir,—In reply to your request for my experience with lucerne clover, I beg to state that in the spring of 1894 we lost several lambs, sheep, and one cow through indigestible fibre collecting in the stomach, and obstructing the passage. Both cattle and sheep were fed on lucerne clover hay during the winter. Prof. Pantou found the same fibre in the lucerne as we found in the stomachs of the sheep and cow. Particulars of this will be found by referring to pages 39 and 40 of the report of Dr. Reed, V.S., in the last Annual Report of the Ontario Agricultural College. Last year I had the lucerne clover cut early in the hope that it would be more digestible, but, in spite of this, we lost a shearing ewe last week from the same cause, a post-mortem examination disclosing two balls of indigestible fibre in the stomach. This experience with lucerne has caused me to decide on getting rid of it as soon as possible. I have found no bad effects from it when fed green, but my experience with it is that stock will not eat lucerne if they can get any other clover.

WM. RENNIE, Farm Superintendent. Ontario Agricultural College, Guelph.

Is Lucerne Dangerous to Feed to Cattle?

Editor Canadian Live Stock and Farm Journal:

Sir,—A neighbor of mine who attended one of the farmers' institute meetings in this part of the country

tells me that Mr. Wm. Rennie, Farm Superintendent at the Agricultural College, Guelph, in the course of a discussion on lucerne, said that it was dangerous to feed it to cattle, because the fibre accumulated in the stomach and caused impaction. Can you give me any information on this subject, as a great many are thinking of growing it here? Elgin county. SUBSCRIBER.

[In our own experience with lucerne we never found any bad results from feeding it to cattle, but it is possible that, if it was cut late, there might be such results as Mr. Rennie spoke of. Can any of our readers give us any further enlightenment on this point? See Mr. Rennie's letter above.—ED.]

Questions and Answers.

How Long to Keep a Brood Sow.—Bush Farmer: I have a good brood sow which has brought me six litters, two each year. This spring she reared ten piglets, which I sold at \$2 apiece. This came in nicely to buy spring grain. I may not raise a litter this fall, and I should like to know how much longer I can keep her to be of any use.

ANS.—We presume that the sow is only an ordinary grade sow, and, in a case of that sort, unless you had some special reason for keeping her, it is generally advisable to turn such off for pork after the second or third litter, as, after that time, the flesh gets so coarse. If the sow were a thoroughbred, and you were rearing good profit from her, you could keep her till she failed to breed, or bred weak or poor litters. The time that a sow remains in profit depends altogether on what treatment she has received during her life.

Special Stock Reviews.

Mr. S. Coxworth's Berkshires.

Mr. S. Coxworth, formerly of Claremont, has quite recently moved to Whitby. Many old-time breeders will remember Mayfield, the farm so long identified with the capital herd of Shorthorns bred there in the times when the late Mr. Jos. S. Thompson was among the most prominent importers of showyard Shorthorns. Mayfield is conveniently situated, being within a few minutes' walk of the Whitby town station, and a mile further from the junction on the main line of the G.T.R. At the time of our visit Mr. Coxworth had just moved in, and was getting things in ship-shape for the season's work on the farm, and the year's trade in Berkshires, and a good trade he should have, for just now some capital specimens of Berkshire swine are domiciled in their new quarters.

Three excellent boars have been used in the herd, including that exceedingly good pig, King Lee, sired by Enterprise (imp.), dam, Oxford Girl, by Gladstone (imp.).

A year ago King Lee promised to grow into a pig of great scale, and in this he has not disappointed his owner, as he has not only lengthened and thickened out, but has retained his smoothness in a remarkable manner, while he has capital Berkshire character as well.

A most promising youngster is Major Lee, a son of the foregoing, his dam being Bonnie Queen, by Royal Standard (imp.). That he will uphold the laurels held by former champions in the herd we confidently expect, as he is particularly smooth and handsome, and has no lack of size.

Queen's Own is the latest addition to the herd, and we are not surprised that Mr. Coxworth thinks highly of this boar. He was bred by Mr. Russell Swanwick, Cirencester, England, from whom so many good ones have come to Canada during the last thirty years. Queen's Own was sired by Notty, dam Sally 57th, of Mr. Swanwick's noted family of that name, which have continued to be held in the highest estimation for the last quarter of a century. Queen's Own is a two-year-old pig of fine finish and full of quality, and has been used quite freely during the past mating season.

Among the sows we noticed two capital specimens of the Bonnie Queen branch of the Sally family, which are proving excellent breeders. One of them is by Royal Standard (imp.), while the other is by Lord Lorne. Shaftesbury Maid 2nd, by Highclere Prince, is also a fine sow. Her dam was Lady Shaftesbury (imp.), which has bred some good things for Mr. Coxworth. Maiden Lass 3rd is a yearling daughter of the last mentioned. She was sired by Champion Duke, which boar was bred by Mr. Gentry, of Sedalia, Mo., and used for some time in that herd. Maiden Lass 3rd won four firsts at three shows last season. Lady Shaftesbury (imp.), the first of the family, is beginning to show her age, but is still breeding some right good things.

The spring litters by Queen's Own (imp.) and King Lee were unusually promising, and, doubtless, will make a mark during the fall campaign.

Mr. Coxworth has also a neat, well developed lot of Cotswold shearing rams and ewes, that will, doubtless, also make themselves known at the fall exhibitions, and, meanwhile, those interested in either Cotswolds or Berkshires may profitably pay their proprietor a visit at his new home.

Mr. Arthur Johnston's Shorthorns.

Shorthorn breeders who have noted the prize lists of the last few years are continually reminded of the many good things that have been sold from this herd, and carried numerous winnings, to the honor of their purchaser and the credit of Mr. Arthur Johnston as a breeder. But it is only through visiting Shorthorn herds in different parts of the country that one has any conception of the number of excellent young bulls that have been selected by breeders, east and west and north and south, and are proving particularly potent in improving the cattle of our country.

Indian Chief has proved a gold mine to Mr. Johnston, and, if one may be allowed to judge by this season's grand crop of calves, he is likely to continue as good as ever for several years to come, for it would be hard to find on any farm as good a lot as those shown us during a recent visit to the Greenwood herd. In fact, we were astonished at the number of wonderfully good bulls and heifer calves, out of twenty-seven of which no less than eighteen are bulls, and sufficiently handsome in form and color to please the most fastidious. There were a goodly lot of mossy-coated roans, some grand reds, and one or two whites, from which one might choose a good one of the color one liked best.

There was no lack of development, and this fact struck us very forcibly while viewing the herd, for Mr. Johnston evidently does not believe in stinting his bull calves even if the prices do not range as high as they did a few years ago. That he is right in this we are assured, for, with the present boom in beef, farmers will want bulls that will beget steers that will quickly mature.

To attempt to describe any member of the herd would entail upon us a task that we would scarcely like to undertake, yet there were several that impressed us so favorably that we are loth to pass them by without making a brief mention of them.

Of these the first shown was a mossy-coated and exceedingly promising roan bull calf. His dam is one of the many Duchesses of Gloster that the herd now contains, orthodox in breeding in every sense of the word. Many of them have four or five crosses of Sittytion bulls at the top, and Sittytion bulls of the best individual merit to boot. A member of that justly famous family of Nonpareils has produced a heifer calf, by Indian Chief, that will take quite a lot of beating, if we mistake not, and yet again a right handsome yearling named Mina Rogers of the celebrated Kinnellar Mina family, should also make her mark at next autumn shows. Then there is a particularly handsome roan bull calf, by Indian Chief, from the imported cow, Sunray. With one exception, that of her great grandsire, a bull of Mr. Bruce's breeding, Sunray has no less than seven straight crosses of Sittytion bulls, so those after Cruickshank blood may find here what they want.

Royal Senat is a richly-bred white that is as good individually as he is in breeding. Sired by Indian Chief, and out of a Duchess of Gloster dam of the belt breeding, he can boast of no less than five of the choicest bred Sittytion sires at top. Another calf, The Turk, should make a show animal. He is a good one now, and is by the same sire as the last, and out of a nicely bred Orange Blossom dam. A very handsome calf is Engineer, another of Indian Chief's get, whose dam is an imported Kinnellar cow of the Claret family.

Royal Gordon, Mr. Johnston declares, is as good a calf as he ever bred. He is certainly a good one, and is of Duchess of Gloster blood, with three Sittytion-bred top crosses.

Space, however, will not allow us to mention any more, but from what we have said our readers may infer that there is no lack of the choicest material in the Greenwood herd, and those after show things should not linger too long or they may miss their mark when exhibition time comes around.

Mr. Johnston is still breeding a few choice Berkshires. He also says that some of his oldest customers are asking for Yorkshires, and he has got together a few choice specimens of this breed. Those wanting cattle or pigs should go and see Mr. Johnston, and we bespeak a rich treat for those fond of choicely-bred stock.

Mr. James I. Davidson's Clydesdales and Shorthorns.

Few have bred Clydesdales so long and continuously as Mr. James I. Davidson, Balsam. With a determination of starting out with the best blood, he, thirty years ago, imported the mare, Darling (500), sired by

the Prince Royal horse, Young Clyde. This was nearly ten years before the issue of the first retrospective volume of the Clydesdale Studbook, and twenty years before the present series of volumes were published. Breeding was not so clearly defined then as to-day, and individual merit was the sole guide. We question, however, if a more successful brood mare has since been imported, for in Mr. Davidson's hands she for many years carried winnings wherever shown, and produced mares and fillies and stallions whose blood flows in the veins of some of the best strains of Canadian Clydesdales, and Mr. Davidson still contends that his more recent additions to the stud are in no way superior to his first venture. Of those now in the stud, Kate Hill II. is a beautiful four-year-old, by that handsome prize-winning horse, Lewis Gordon, her dam being imported Kate Hill, by Young Surprise, while her most promising foal at foot is by Mr. John Davidson's horse, Tuffy. We were also shown two choice yearlings by Westfield Stamp, one of which, Hoylston Stamp, is from the exceedingly handsome mare, Boydston Lass, that won second in the brood mare class at last autumn's Industrial. She also took the first for mare and two of her progeny, while Hoylston Stamp carried the red ticket as a foal.

It is, however, as an importer of Sittytion-bred cattle that Mr. Davidson's name has obtained a world-wide reputation, and, although there is not the choice to be seen that we used to see in former years, he still sticks to some of the old families. Such is Village Beauty 5th, by the imported Sittytion-bred bull, Hospodar, that was exported to England in the fall of 1891, and has since been used in several noted herds there. Village Beauty 5th is producing some good things. A two-year-old by Hospodar and a yearling heifer by Sittytion Chief are particularly good ones. The former won first at the last Industrial in a capital class of yearlings. Another good breeding cow is 40th Duchess of Gloster, also by Hospodar. She has produced two choice heifers, both whites, the two-year-old by Hospodar, while the yearling is by Sittytion Chief. We also noticed several other cows and heifers of other strains of breeding, and found Mr. Davidson just as strongly impressed with the value of Cruickshank blood as ever. His present stock bull was bred by Hon. John Dryden, and was sired by that gentleman's late stock bull, Sussex, while his dam is a cow of the Secret family.

Mr. John Davidson's Clydesdale and Shorthorns.

For several years Mr. John Davidson, of Ashburn, has been a successful exhibitor of Clydesdale stallions at both spring and autumn shows.

Lewis Gordon and Westfield Stamp have each in turn carried home honors from show-nugs where the best horses have congregated, and have both done good service in the locality, having left behind them many a good one.

To our mind, however, the present stock horse, Tuffy, is superior to either. He is a horse of great scale, with handsome top, carrying a wonderfully high head upon a nicely shaped neck. He has capital shoulders and a neatly coupled back, while at the ground he has both plenty of sharp, finny bone and silky feather, and as nicely set pasterns as one could desire.

Tuffy is also a choicely bred one, his sire, Bonanza, is full of the blood of Darnley, Farmer, Merry Tom, Time of Day, and other good ones, while his dam, Belinda, has that of Prince of Wales, Old Times, Johnnie Cope, and other old time celebrities.

We have yet to see many of this horse's get, but such as we have been shown are strikingly like himself, a kind which Scottish breeders are finding they must cultivate more, in order to get size sufficient to work between the shafts.

Mr. Davidson has also a useful colt of his own breeding, sired by Lewis Gordon, dam by Boydston Boy, which won second in the class for Clydesdales, rising three, at the late Canadian Spring Stallion Show, and which we expect will turn out a good one.

Mr. Davidson is also breeding a few Shorthorns. The calves in the stables are chiefly sired by bulls owned by his father, Mr. James I. Davidson, and show the right breeding and conformation.

Maple Shade Shorthorns.

The herd of Shorthorns, owned by Hon. John Dryden, at Brooklin, is still kept up to its usual size. During a recent visit we found somewhat over fifty head, including all ages. All, without exception, were in the finest condition, and, although the Minister of Agriculture declared that they were not in as high flesh as usual, yet we fancied we have seldom seen them looking better.

The old bull, Conqueror, by the Sittytion-bred bull, Vengath, was in high flesh, as it is the intention to turn him off to the butcher. We thought highly of the calves he has sired since he came back into the breed. They are deep in the rib, carry plenty of flesh

and are handsomely formed. The bull now in use is Earl of March, of Messrs. J. & W. Watt's breeding. He was sired by their noted bull, Hampton Hero, while his dam, English Lady 8th is of the Upper Mill family of that name. She was sired by the Box Park bred Butterfly's Duke, a son of the famous Fourth Duke of Clarence, while his dam, imported Butterfly Duchess, was bred by Mr. G. Garne, Gloucester, England. Earl of March is a bull of good scale and smooth finish, and is particularly stylish in appearance. As the cows in the Maple Shade herd are particularly low in the leg they will, doubtless, stand this cross which may give them a tittle more style, although they are by no means lacking in this respect.

It is pretty generally known, through a letter published in THE CANADIAN LIVE STOCK JOURNAL, in December, 1897, that the majority of cattle now in the Maple Shade herd were either bred in, or are descended from the herd of Mr. Edward Cruickshank, Leithewy, Aberdeenshire, who, in turn, obtained them through a draft made from the Sittytion herd, owned by his uncle, Mr. Amos Cruickshank, with a few head from the herd of Mr. Longmore, of Rheite.

On the imported herd, Mr. Dryden has used several bulls used at Leithewy. These were the Sittytion Secret bull, Sussex, and the Rheite bred bull, Patriot, and, later on, the bull mentioned above, the Maple Shade bred bull, Conqueror. As it now stands, the Sittytion families represented are chiefly Bravili buds, Lavenders, and Orange Blossoms, with a few of the sorts originally brought from Rheite.

The cows, as intimated be ore, are low in the leg, carry any amount of natural flesh, and are easy keepers in every sense of the word.

The young things are very neat and nice, and promise to attain quick development and good weights. We noticed some good young bulls that should command the attention of those on the lookout for bulls to head herds.

The Shrophires are also in fine trim. A well-fed lot of shearing rams, of good size and capital character, have been wintered over in anticipation of a brisk trade to which everything points forward.

The shearing ewes are also a good lot, very uniform, and neat and nice, while there is a goodly crop of lambs also coming forward.

Shrophires at Fairview.

It was Mr. John Campbell, of Woodville, Ont., that so successfully fought the battle on behalf of Canadian Shrophire interests at the World's Fair, Chicago. The way the contingent from Fairview carried away the lion's share of the prize-money offered is still fresh in the memories of those attending the great exposition, and breeders of Shrophires from both continents give honor to the man who had the ability to pluck the coveted laurels amid such competition as had gathered there; for money had been lavished with no regard to hand upon American Shrophire flocks, in order to win where the world had met either to contest or look on.

It was, therefore, with more than ordinary interest that we visited the home of this flock a few weeks ago, eagerly looking for a rich treat in viewing the surroundings which had produced such grand individuals. We were in no manner disappointed, for, three years ago, Mr. Campbell provided himself with a sheep barn suitable for his purpose, the equal of which we have not hitherto seen. A plan of this building was given in the February issue of THE JOURNAL for 1897, but the description there given hardly does it justice, as it requires to be seen to enable one to judge of its merits. Suffice it to say that it is a barn 50x50 feet, with stone basement, in which every convenience for the attention and comfort of the flock has been thoroughly studied and carried out, while ample storage room for hay and grain above and roots below, has been secured, with a view of accommodating a large flock.

About sixty sheep have been wintered. For these there has been no lack of orders, hence the flock has, of necessity, been kept well within bounds. The individuals, from the oldest favorite breeding ewe down to the youngest of the lambs, were in the highest possible condition, and, doubtless, the exhibitions of 1895 will find as strong a muster from Fairview as in any year in the past.

Newton Lord, who is still at the head of the flock, has had an almost unexampled record as a prize-winner. He was bred by Mr. Harry Williams, Newton-on-the-Hill, Shrophire, England, and won first all over Canada as a shearing. He repeated this record in his two-shear term in 1897, again winning first at the Industrial, Toronto, in 1893, after which, at Chicago, he won the highest honors for his breeder, including first in his class, sweepstakes for the best ram of any age, the silver cup given by the Cooper Dip Co. for the best Shrophire ram, \$250 given by the English Shrophire Association for the best Shrophire ram over one year, and stood at the head of the pen

consisting of one ram and three ewes over three years old. Newton Lord has left a lot of grand two-shear ewes, which testify to his excellence as a sire. The two-shear ram, Chancellor, which is a son of his, and a wonderfully good sheep, is certainly one of the largest we have ever seen. He was bred on the farm, his dam being an imported ewe that was a first-prize winner in England. Chancellor will be a hard one to beat this season, if he continues as he is now doing. Seven shearing rams have been wintered. Among these is a grand sheep that deserves particular mention. He was sired by Newton Lord, and his dam won no less than four first premiums at Chicago. With such royal breeding he should command a place at the head of some distinguished flock, particularly as he is a right good one himself.

Two other good ones had been selected by Mr. Koffland, Iowa, which are left in Mr. Campbell's hands to fit for the fall campaign.

Among fifteen hand-some shearing ewes in high condition we were shown Campbell's 540, the extraordinary lamb that won first over all ages and breeds at the Guelph Fat Stock show last fall. She has continued to develop in fine form, and looks like winning again, although among the remaining fourteen are several which are not far behind her. We had nearly omitted to mention the two-shear ewe that was so nearly a tie with Mr. John Gibson's shearing Lincoln for sweepstakes at the same show. She is now suckling a very promising lamb sired by Newton Lord.

This year's crop of lambs are also got by Newton Lord, and are a uniformly good lot, displaying plenty of quality and character, which we should expect, when we consider they are from this distinguished sire, and from ewes that have almost all been winners in the past, as Mr. Campbell has found that winners breed winners, perhaps not the first year, but certainly after a year's return to the breeding flock.

Mr. Campbell has a useful herd of Shrophires, which are also being carefully handled. Last winter a capital son of Indian Chief, of Mr. Arthur Johnston's breeding, was selected to head the herd. He looks like doing some winning to the future credit of this department.

Mr. Dennis Hawkins' Berkshires and Yorkshires.

Close by the village of Woodville, Mr. Dennis Hawkins has for several years been quietly breeding Berkshire and Yorkshire swine. It only requires a short inspection to reveal the fact that Mr. Hawkins has been especially careful in selecting his breeding stock, for these are not only choicely bred, but are exceedingly good individually. There were two aged Berkshire sows, of which the elder is Belle of the Fair, imported by Messrs. J. G. Snell & Co., Edmonton. She was bred by Mr. William Cross, Castle Cary, England, and has produced several good ones, which are still retained in the herd. Empress, a daughter of the above sow, is by Young Arthur, and so is Countess of Eldon. Both these are large sows, with all the length that one could desire, and of the best type of the breed. There are also some other sows of equal merit from the first mentioned Belle of the Fair that are quite the equal of those mentioned. These have farrowed nice spring litters to the imported boar, Cressman's Homer, which was imported in dam by Mr. Israel Cressman, New Dundee, from whom Mr. Hawkins purchased him.

A boar full of quality and nicely finished enough to make a strong show in the coming fall exhibitions is a young six-months-old pig by Sir Hubert, a son of Enterprise (imp.). His dam, Amarilla, which, by the by, is a good one herself, is by that capital breeding pig, Perry Lad (imp.), and is descended from that justly celebrated Moulson family that have produced so many good ones. Edessa is also a sow bred by Messrs. Snell. She is by the imported prize-winning boar, Enterprise, while her dam is Helderse (imp.). Lelia Maid is another by Enterprise, and a good representative of this breeding she is. Her dam was sired by Royal Pride (imp.), and is out of Moulson (imp.), but of a different branch of the Moulson family. Lelia Maid was nursing a choice litter by Cressman's Homer (imp.).

In Yorkshires Mr. Hawkins has a fine smooth boar in Pride of Eldon, of Mr. J. E. Brethour's breeding. He was sired by Maid's Diamond, his dam being Laundress 3rd. He also has a sow from the same herd. She was sired by Dominion 3rd, and is out of Buttercup, in whose veins runs a good deal of Mr. Sanders Spencer blood.

Mr. Hawkins is also breeding several varieties of fowls, in which line he has been at much pains to get the best, having obtained eggs this season from a number of the best known poultry farms of the United States.

Holstein-Friesians at Helbon Stock Farm. The beautiful farm of Mr. J. W. Lee is situated within two miles of the town of Simcoe, the house being placed a short distance from the road leading

north from the station, while the farm buildings stand next a lane which divides the farm exactly into two equal parts, the fields on either side being eighty-five rods in length.

The farm bears evidence of careful cultivation, and is laid out with a view of working the land to the best advantage. Horses, cattle, sheep, and swine are all carefully bred, but it is with the herd of Holstein-Friesian cattle that we have most to say in this short review. Mr. Lee purchased the nucleus of his present large herd in 1885, or ten years ago, when the exceedingly good imported cows, Gentle and Bouncing Bess, were selected. The former was bred by Herr Jan Posch, Berkshere, North Holland. She was sired by Fischer, her dam being Marie. Bouncing Bess was bred by Herr de Boer, Midwood, N.H., and was sired by Jacob Witt, and is half-sister to the famous cow, Tirannia, which has a record of 36 lbs. 11 oz. of butter in seven days. Jacob Witt, the sire of Bouncing Bess, has probably sired as many cows with records of 25 lbs. per week and over as any bull of the breed. He was also a celebrated show bull, having won the premium of one hundred guilders, and was selected out of sixty-six bulls for one of the best breeding sections of North Holland.

Another good cow purchased is Rosa Bonheur, which, along with the two previously mentioned, has been the source from which the present herd of fifty-two head have all sprung.

The first bull used in the herd was Plaijer, bred by Mr. Westover, Bay City, Mich. His sire was Sentinel, whose dam had a milk record of 88½ lbs. per day in her three-year-old form. Planter quite fulfilled Mr. Lee's expectations, and left behind him a lot of wonderfully good producing heifers. Another good one was Rouchelle, also bred by Mr. Westover. This bull weighed 2,890 lbs. when sold, showing to what enormous weights some of these cattle attain.

At the present time the bull, Ben Hanchett, bred by Mr. Martin L. Sweet, Grand Rapids, Mich., is being used. He is a bull of great substance, with plenty of quality, and is a capital type of a dairy bull, while he is also royally bred. He was sired by Tritonia Prince, whose dam, Tritonia, has a two-year-old milk record of 74½ lbs. per day and 2,62½ lbs. in thirty-one days, while Mercedes, the dam of his grandsire, Mercedes Prince, has a milk record of 85 lbs. 11 oz. in a day, having made 7 lbs. 10 oz. of butter in one day, and 60 lbs. 6½ oz. in thirty days.

With this care in selection, Mr. Lee has bred up a particularly fine herd. The cows have proved particularly prolific, the cow Bouncing Bess having produced ten calves before she was eleven years old, of which eight were heifers. Mr. Lee has sold no heifers, having retained all in the herd, as the heretofore would allow no one to pick or choose, which doubtless accounts for the high producing qualities of the herd, in proof of which, during the year ending March, 1893, fifteen head, including four two-year-old heifers—the balance, except one, being all under five years old—made the handsome sum of \$1,116.37 through the sale of their milk products, besides keeping a family of ten in butter and milk. There are, at present, a splendid lot of young bulls from these cows awaiting purchasers. These should be at the head of herds elsewhere, and those seeking anything in this line would do well to call at Helbon stock farm and judge for themselves.

Mr. Lee is also breeding some excellent Improved Large Yorkshires. A capital sow, bred by Mr. Sanders Spencer, has done grand service. She is large, smooth, and handsome, and from her several exceedingly fine sows have been bred.

A flock of purebred Oxford Down sheep are also kept. These are chiefly from stock imported by Mr. Henry Arkell, Arkell. Mr. Lee has evidently entered the lists as a breeder of high-class stock, as he has never hesitated to give high figures for good animals.

Mr. W. Toop's Southdowns.

Among the many Southdown breeders of England the name of Mr. W. Toop is very well known. Mr. Toop's flock was founded in 1833, and is one of the foremost in that country. The prize record of his flock, particularly for lambs, both rams and ewes, as well as for fat sheep, is unique. In these classes Mr. Toop has secured more, or at any rate quite as many, prizes as any other breeder. These have been won in the longest competition, not only at home but abroad, in France, in the States, and in Canada.

Mr. Toop informed the writer that he would sell every sheep upon the farm entirely without any reserve. He felt, he said, that it was useless to place any reserve upon any single sheep, for he was perfectly sure that their pedigrees as well as their general appearance would ensure their being sold at a satisfactory price.

The flock is a grand one. They have a character of their own, and match like peas. Their well-developed ribs, grand chests, and legs of mutton are such as very few other flocks could pro-

duce. The rams are a wonderfully grand lot, headed as they are by that grand old sire, Waterbeach, a sheep who, although now in his eighth year, is as active as ever, thus giving proof of his excellent constitution. This sheep was sire of the sheep that headed the class of two-shear rams at the Royal Show last year, and the group that won the Challenge Cup for the best group at Canterbury in 1894. Cambridge Ear, No. 19, F.H. 1450, another particularly good ram, is a son of the above, who is being prepared for this year's summer shows, and who will most probably be a very hard customer to beat.

A very large portion of the flock, of which every sheep, ewe and ram, is individually tattooed and its full pedigree duly recorded, are by that celebrated sheep, Waterbeach 304, mentioned above, or by sons of his, and, in order to show how great a value is put upon this ram, we give the following facts regarding him. Born 1837, he was shown as a shearing at the Royal in 1838. Here Mr. W. W. Chapman, on behalf of the then important flock of Messrs. De Murietta, of Wadhurst Park, hired him for the season at \$125. In 1839 he was shown at the Windsor Jubilee Royal Show, where he was again hired for the season by Mr. Chapman for \$250. For the next year or so his owner and breeder used him. Then Mr. Toop was fortunate enough to buy him, and from his get he has a very grand lot of sheep. In 1893, having but few ewes to put him to, Mr. Toop was honored by being patronized by H.R.H. the Prince of Wales, from whose flock a selection of twenty ewes were sent to be coupled with his sheep at \$5 each. Mr. Toop refused, in March 1894, a bid of \$125 for the sheep, which will, we understand, be included in the sale if he lives. From this brief account it is perfectly evident that buyers will find an excellent opportunity open to them to buy sheep at this sale by either coming themselves to this sale, or placing their commissions for the same. We are informed that Mr. W. W. Chapman, London, Eng., one of our advertisers, will be pleased to receive any commissions in reference to this or any other sale, and that he will personally undertake to execute them, as well as make all arrangements for shipping animals.

Veterinary.

Joint Disease of Foals and Other Young Animals.

PROF. PENNETHY, in the Journal of the Royal Agricultural Society of England

From times coincident with the early literature of animal diseases we have evidence of the existence, at home and abroad, of a malady known to British breeders of horses, cattle, and sheep as "joint ill," "navel ill," "foal ill," or scrofulous joint disease, and, technically, as "specific arthritis," "rheumatic arthritis," or "pyemia," as well as by different purely provincial names, such as "schole," used in Norfolk. The affection is most commonly observed in foals, lambs, and calves, and less frequently in young pigs and puppies. It invariably makes its appearance in the young animal soon after birth, and its effects are often fatal, or such as to render its subject worthless. Sometimes it occurs as an isolated case in a stud, flock, or herd; this is oftenest observed in the last. It not uncommonly happens, however, that many animals are simultaneously or concurrently affected. When this occurs it assumes an alarming character and excites considerable attention in the neighborhood; while, if valuable animals are the subjects, it may become a matter of widespread interest.

"Joint ill" attacks young animals of all breeds, pure and crossbred, heavy and light. It has been regarded as an hereditary constitutional condition belonging to some strains of blood, or acquired by residence of the mother in special situations. But, though the disease may affect alike all classes and conditions of animals, it is evidently more often met with among the high-bred and valuable, on the preservation of whose health the greatest care is bestowed, than among those whose value secures for them less solicitude and attention.

Previous to the recognition of its true nature, the disease, when once appearing in a place,

usually exercised an abiding influence there. We have the history of one German stud in which it is known to have existed for more than one hundred and twenty years, in some seasons causing very extensive losses and an average, for many years, of more than five per cent. of all foals born there. Happily, in consequence of a proper appreciation of the affection, measures have been adopted, with the result that no death in this stud has been recorded for some years.

With regard to the cause of joint ill, until comparatively recently there has been a great variety of opinion, which, even at the present time, cannot be said to be unanimous. That most generally held attributed the malady to in and inbreeding and the "scrofulous" constitution of one or both parents; indeed, it was generally believed to be the manifestation of hereditary tuberculosis or scrofula in the offspring a constitutional disease of the parent transmitted to the progeny before birth. Prominent among the other reputed causes have been improper feeding, irregular working of the mother during pregnancy or the suckling period, overheating of the dam, soiling of the foal while the mother is at work, cold and damp affecting the parent or young animal, prevalence of east winds, and exclusive feeding on turnips or mangels. At other times, probably from the symptoms of lameness and swollen joints, the disease has been regarded as of a rheumatic nature.

At *post mortem* examination, however, the microscope has clearly demonstrated that it is not tuberculosis, or scrofula, which we may regard as interchangeable terms. Experiments and closer observation of the living and the dead have yielded evidence of the communicability of the disease from the affected to the healthy animal, so that it has come to be regarded as a truly contagious affection, and we know that, if communicated from the parent to the offspring, it depends upon some other cause than that of scrofula.

Though there is sometimes evidence of disease affecting the mother at the same time as the offspring, further experimental proof would appear necessary before we can speak positively as to any connection between the one and the other. It is beyond question that the disease is due to the entrance of a germ, and that this entrance may be, and frequently is, effected after birth. Certain circumstances seem to indicate that the germ, or virus, may enter the system of the fetus while in the womb, also that it may gain access during the act of being born. The possibility of the former has not yet been established, while the probability of the latter is very great. Whether contracted in the womb, or during the act of parturition, or subsequent to birth, there is ample reason for believing that the germ usually enters the young animal at the navel. It may be taken for granted that, in the great majority of cases, if not in all, this disease is due to the entrance, by the navel, of germs, which become distributed through the system, and set up the changes on which the symptoms and consequences depend.

In endeavoring to obtain correct views of the nature of this affection it is important to remember that, at birth, the cord passing through the navel is made up, amongst other matters, of vessels which, in the womb, carry the nutritive blood from the mother to the fetus, and the used-up, impure blood from the fetus to the mother. At birth this cord is severed and the blood-flow stopped by a clot which forms in the vessels. Soon after separation the end of the cord shrivels and the aperture through which it passes heals up.

The extremity of the cord in the navel dies, and, under favorable circumstances, becomes absorbed. Conditions which favor the absorption of the dead part hasten the closing of the navel, so that, in the healthy newborn animal, there is a natural process to prevent the entrance of injurious matters through it. It is well known to physiologists and pathologists that anything which retards the natural healing process favors the growth of microbes there, and affords a means for their entrance into the blood vessels which distribute them through the system.

It is important, therefore, in view of the evidence that the germ of this disease enters through this opening, to inquire into those circumstances which interfere with the natural disposition of the navel to heal. In all probability, anything which, during pregnancy, debilitates the system of the mother may have this effect. Improper feeding, insufficiency of material essential to the nourishment of the fetus, want of exercise, and especially anything which causes the birth of the young animal considerably before its time, must be regarded with suspicion. Malignant parturient fever in ewes and abortion in mares are sometimes so closely related to joint ill as to suggest its dependency on the same cause. In one very important outbreak of joint disease in foals, it transpired that a large number of abortions occurred in the stud in the same season, and that the abortion in mares preceded the appearance of the disease in the foals. It may not be correct to infer from this occurrence that the cause of abortion was alone the cause of the foal disease that is to say, that if the abortion was of a contagious nature, as it appeared to be, it was caused by a germ which entered the mare, and that this same germ, on entering the foal, induced in it joint disease. But if the fact of birth before time in an undeveloped condition rendered the navel less healthy, retarded its closure and the proper disposal of its dead tissue, it would afford conditions favorable for the growth and entrance of the immediate cause of joint disease. Thus, at least, abortion may be regarded as a contributory factor in the production of the affection under consideration.

After birth, for the carrying out of the healing process at the navel, milk containing the essential constituents and free from deleterious matters, in fair and regular supply, is necessary. Anything which interferes with this must also be regarded as accessory. The appearance of the disease in a larger proportion of males than females (seventy out of one hundred cases are said to be in males) suggests that the urine which is dribbled by the male interferes with the healing of the navel.

In any attempt to understand the nature of this affection with a view to prevention, it is essential not to lose sight of any condition which may interfere with the rapid and healthy healing of the navel; but it should not be forgotten that, be this region ever so unhealthy, unless the germ is there to enter it, the disease will not occur. Yet, inasmuch as at birth, under the most apparently favorable circumstances, there is an opening here, the germ may gain early entrance, and probably set up the disease. It will thus be clear that, from a practical point of view, the utmost importance attaches itself to preventing access of the germ.

As implied by the majority of names given to the affection, the more prominent symptoms are associated with the joints of the navel. Before swelling in these situations is appreciable, it may, however, be noticed that, a few days after birth, the young animal has great

difficulty in moving, is more or less lame, and manifests the indisposition to move by constantly lying down or standing in one position. Debility is evident, sucking is not carried out vigorously or continued, appetite is sometimes absent, and the little subject is tucked up, the coat becoming dry and harsh. There is often a slight discharge from the eyes and nostrils. The navel is generally swollen, open, and discharging matter, and, though sometimes it is healed on the outside, its neighborhood is inflamed. In the course of a few days, at some of the joints or other external parts, there are noticed hot and painful swellings, which assume a considerable size. Any joint may be affected, but it more frequently happens in the hock, stifle, hip, or knee. In lambs, more rapidly than in calves or foals, it becomes evident that in these situations abscesses have formed, which sometimes burst and discharge a peculiarly unhealthy-looking material. The loss of flesh at this stage is very marked. From the commencement the breathing is hurried, and with the progress of the disease it becomes more and more disturbed, shorter, quicker, and sighing. This disturbance is often very marked, and the subject is deemed to have taken a "chill." The pulse, at first small and quick, becomes weaker and weaker, till it is scarcely perceptible. Occasionally, in the early stages, diarrhoea is a prominent feature; this, however, may not make its appearance until the disease is advanced, but, sooner or later, is observed in most cases. The temperature is raised, proving the febrile nature of the affection.

As a rule, the symptoms are manifested from seven to twenty days after birth, and the disease runs through its course in from seven days to three weeks. Sometimes, however, the patient dies within three days of its being noticed to be ill. In such cases the symptoms are acute, and death may occur before abscess formation at the joints. The course may be prolonged, and some subjects "hang fire" for months, though this is the exception. There will, naturally, be variation of the symptoms, dependent, to a great extent, on the parts involved in the local changes set up by the germs after entering the body.

(To be continued.)

The Farm.

The Later Soiling Crops.

Soiling crops may be grown so as to furnish food for stock during the whole of the growing part of the season, from the time that rye will do to cut until the arrival of frost severe enough to check growth in vegetation. But it is only of the later soiling crops, which may be sown after the first of June, that we wish to speak in this paper.

One of these is corn. It may be sown for a soiling crop as late as July 1st, but usually it should not be sown later than the middle of June. It is not our purpose here to describe the various modes of growing it so much as to call attention to the fact that it is always safe to have more or less corn for soiling where live stock are kept in any considerable numbers. We sometimes have dry weather right up to the advent of winter, and, when we do, such a source from which to get an abundance of food is certainly a very great advantage. It should be borne in mind, too, that corn for soiling uses is not only good for cows, but for horses and all kinds of cattle, sheep, and swine.

Millet may also be made to serve a good purpose during a portion of the autumn. It

furnishes excellent soiling food. It may be sown as late as the first of July in a favorable season, but usually it is safer to sow it somewhat earlier. But it should be remembered that millet wants a good soil. On poor lands it will not make a heavy growth in any season, and in a dry year the growth cannot be otherwise than feeble. Although millet is commonly fed as a soiling crop to milch cows only, it furnishes excellent food for sheep, and, unless cut at a too far advanced stage, is also relished by hogs.

Barley may also be sown in the month of June, after rye has been turned under, or on any land that may be available at such a time. But, usually, where land is available, it will pay better to plant to fodder corn, as the latter will produce a heavier yield. Nevertheless, even on lands from which hay has been cut, a goodly stand of barley may be obtained.

Rape may be sown as a soiling crop, in the month of June, for nearly all kinds of stock. When thus grown it should be sown broadcast, and on good clean and rich land. A small patch of it thus grown will furnish a large amount of food. It will serve admirably for sheep and lambs, for swine, and even for milch cows. When fed to the latter it would be safer to feed it after they had been milked.

There are other soiling crops that may be planted in June, more especially for sheep and swine. These include such foods as fall turnips and squashes. Fall turnips are excellent for the former, but squashes are to be fed to the latter. When squashes are planted as a food for swine they should be put in hills, not less than eight feet apart each way, and the ground kept clean by cultivation. Turnips are usually better managed in drills.

Whatever kind of soiling crop may be wanted, let it not be overlooked or forgotten. It is very unfortunate to have to put stock into winter quarters in a thin condition. It is also unfortunate when, at that season of the year, the pastures have to be cropped off closely, for, when they are so cropped, they do not start nearly so soon in the spring, nor do they grow so vigorously or produce so large a yield of food in the season. It is even more unfortunate when the stock are turned into the meadows to crop the aftermath down to the ground. The yield of hay next year is thereby shortened very materially, more especially if the season should prove dry. To make sure that these results will be avoided, let all who are interested be warned in time to make provision, in case of need, in one or other of the ways pointed out.

A Balanced Ration for the Soil.

We hear very much about the wisdom of feeding animals a balanced ration. In fact, so important is it considered that the stockman who does not understand something about this feature of feeding is looked upon as not yet beyond the alphabet of his business. When the animal is not fed a balanced ration, two results are sure to follow. The first is that the animal does not do nearly so well, that is to say, it does not give nearly so good a return in work, or dairy products, or in flesh, as the case may be. The second is, that a part of the food is wasted, because one kind has been fed in excess.

But the danger is even greater that, when we feed our soils, we shall waste food. We know what the animal wants to make it grow, at least we know this approximately, according to the kind of the animal, and the end for which we are feeding, for we are daily getting

more and more light with reference to these things. But it is not so with our soils. We may readily know that they want some kind of plant food, but we cannot, perhaps, tell exactly which kinds. We set to work to find them, and in doing so we work somewhat in the dark.

We do not know exactly what they want, because, in the first place, it is not easy to find out, and many, very many, farmers have not the means to use the mode of finding out that would seem most accessible and certain. The chemist may find out: give him time enough. But to find out exactly he may have to analyze many samples of earth taken from different parts of the same field, and then his analysis may not tell enough. It may speak of plant food present in certain quantities, but it may not tell exactly in what form all the plant food is found. Now, plant food may be present, and some of it may be in the active form, and some in the inert or inactive form. If present in the latter form, the plants could not take it up; hence, they might starve, as it were, in the midst of abounding plenty.

And analyzing soils is expensive. The average farmer cannot afford to pay the chemist for analyzing many samples of soil from a field, and the chemist cannot afford to do the work for nothing. Therefore, as a rule, the farmer must judge of the needs of his soil in some other way.

It is true that samples of soils are analyzed free at the Central Experimental Farm, Ottawa, but farmers have been slow to use this boon.

The question will be simplified if we remember that in nearly all soils there is a deficiency of all the elements of plant growth save four. These are nitrogen, phosphoric acid, potash, and lime. But lime also is present in sufficient quantities in nearly all soils: hence the lack is usually confined to the other three elements. When we remember that phosphoric acid and potash are not nearly so easily lost out of the soil as nitrogen, then we may safely conclude that, when crops will not grow well, the great lack is very likely to be a lack of nitrogen. Manure soils freely with farmyard manure for a number of years in succession, and there is almost certain to accumulate an excess of potash in the soil, even though there is a deficiency of nitrogen. The unused increment of the potash in the soil does not leach out as does the unused increment of the nitrogen.

But it may turn out that, in some kinds of manuring, an excess of nitrogen may be put into the soil for a time. This result may follow where clover and other legumes are grown for a number of years successively on the same soil, or even frequently on the same land without the application of phosphoric acid or potash. The legumes bring nitrogen from the air to the soil. They, at the same time, take phosphoric acid and potash out of the soil, and, if these are not returned in equal quantities in the manure, or in some other form, they must certainly diminish in the soil.

Another way of destroying the soil equilibrium is by growing crops other than legumes year after year upon the same soils. Suppose wheat is grown for many years in succession on the same piece of land; since wheat requires a large amount of nitrogen to perfect its growth, it will in time so deplete the soil of nitrogen that it will not grow a good crop of wheat, and yet there may still be a fair supply of potash in the soil.

When our lands, therefore, get impoverished, and, in consequence, they grow diminished crops, we may at once assume that they

want more nitrogen, or phosphoric acid, or potash, and we may pretty safely assume that the great lack will be a lack of nitrogen. In the absence of a better plan, we can test the wants of the soil somewhat as follows: We can apply some nitrogen on a small piece under cereal crop, on a small piece alongside of it some phosphoric acid, and on a third piece some potash; on a fourth piece we can apply all three, and then note the results. But, even when we adopt this plan, we must not be too hasty in our conclusions, for the season will exercise an important influence on the results.

The Effects of Lime upon Certain Soils.

Lime hastens the decomposition of organic matter in certain soils. Take, for instance, a soil filled with the roots of quack grass or other vegetable matter, and strew lime upon it: the reduction of the grass roots will be much more rapid than if no such application had been made. On peaty soils it may thus be made to render most excellent service. And where barnyard manure in a long and unreduced condition is to be plowed under, an application of lime will tend very much to hasten the reduction of the manure. But care should be taken not to apply the lime before the manure has been strewn over the surface of the ground, as lime, when applied to manure heaps, tends to make them decay so rapidly that, in their decomposition, much of the nitrogen possessed by them would be lost.

Lime liberates plant food locked up in the soil, more especially in such forms as potash and soda. In this we have one explanation of the value of land plaster when applied to certain crops. It liberates potash so that the growing plants may get a plentiful supply, and, when the other conditions are right, the results are a very much increased growth in the crops.

It tends to neutralize any acid bodies in the soil. In some instances we find soils in a condition that may be termed sour. Lands that are saturated during a considerable part of the year are oftentimes thus affected. Now, if lime is applied, this condition of things will soon be corrected. But it should be remembered that such lands must first be drained if the lime is to effect all the good expected from it. Its benefits will be neutralized just in proportion to the want of drainage in the lands.

Lime promotes granulation in stiff soils. This is brought about in part by the drying action of the lime. But such soils are seldom in need of lime. They generally have a sufficiency to supply the needs of plant growth. Under these conditions the further application of lime would be waste.

It aids in the destruction of some kinds of weeds, both in pastures and in arable lands. Its action in this respect is largely owing to the stimulus given to the growth of the useful plants that may be grown on these, but this is not the only explanation. It has been noticed that lime is generally helpful to the growth of clovers.

Lime tends to destroy certain forms of insect life, and certain forms of fungi that may be hurtful to crop growth. This arises in part from its caustic nature. It may be said to destroy them by burning them up.

But on no soils is the action of lime more beneficial than on those sandy and gravelly character. It often works wonders on the soils when they are derived from sandstone slates, and rocks that are deficient in lime. In some instances a simple application of lime

on these has proved more beneficial than an application of farmyard manure. But, generally speaking, farmyard manure and lime can be applied to such lands with most benefit when applied in conjunction. When lime is applied to such soils it gives them greater power to attract moisture and to retain it, and, when combined with organic manures, it prevents them from rapidly leaching out of the land.

In some instances we find an excess of lime in the soil. In those regions of chalk formation this is true, as, for instance, in the Downs in the south of England. The influence on vegetation is to dwarf it, and to render it at the same time sweet and palatable. The Downs of the south of England have formed the cradle in which many of the most useful breeds of sheep originated.

When lime is applied to land it should be used frequently, and in small quantities. When applied in large quantities, and but seldom, it tends to work downward into the subsoil, hence much of the good that it would otherwise accomplish is neutralized. The roots of the plants fail to follow it downward. The importance of this principle of application cannot easily be overestimated.

Sorghum for Fodder.

Sorghum has not been much grown for fodder in this country, and yet its claims are well worth looking into. In some of the states of the Union, sorghum is one of the most fruitful sources, both of forage and of fodder. It makes an excellent autumn and winter food for live stock wherever it can be successfully grown and matured. In Texas it is a mainstay. In Kentucky it is grown in large quantities. Its value has been well proved in Kansas and Missouri, and now it is beginning to receive no little attention in Ohio, Pennsylvania, New York, Wisconsin, and even in Minnesota.

Sorghum grows very slowly at first. When put into the ground, say, at the end of the corn planting season, it does not make much growth until the arrival of hot weather. But later it grows apace. Its shoots push upward as high as, and even higher than, corn, and the early varieties of sorghum will mature seed about as early as the ripening of the corn.

The seed of sorghum is small, and, therefore, should not be buried as deeply as corn. When it comes up it may easily be mistaken for foxtail, which grows at the same season. Because of this resemblance, where foxtail is plentiful, the labor of keeping sorghum clean is increased, and because of its slow growth the land should be very well worked from the opening of spring onward, where a crop of sorghum is to be grown.

As a fodder crop, sorghum may be sown with the grain drill or broadcast. But it is decidedly preferable to put it in rows. The rows should be wide enough apart to admit of cultivation between them. The amount of seed will vary from one peck to three or four pecks, according to the mode of sowing. After it is several inches high it is claimed that it will bear harrowing well with a light harrow. It should be cultivated as carefully as corn, and in the same way.

Sorghum is ready to be cut for winter use as soon as the seeds begin to brown nicely. Sometimes the heads are first cut off and utilized in feeding pigs or swine, and sometimes they are left on and fed with the stalk. The harvesting should be done in much the same way as corn is harvested, but with this difference, that

the sorghum should not be put up into large shocks at first, as it takes a long time to cure. Care must be taken not to allow it to freeze before it is cut, or it will be much injured in consequence. If it should be overtaken with a frost, cutting should be pushed on with all possible haste.

In feeding sorghum there is no serious trouble if it has been properly cured. Live stock are very fond of it. If the stalks can be kept clean it will be eaten with avidity by cattle, sheep, horses, mules, and swine. There will be but little waste in feeding it, as the stock will not reject portions as they do when feeding upon uncut corn. But, unless sorghum is properly cured before cold weather comes, that is, before the season of hard frost, it will take serious injury from the frost. This fact cannot be too carefully kept in mind when we are growing sorghum.

But we have not yet spoken of its value as a soiling food. It is possessed, in a marked degree, of the property of growing up again after it has been cut off. This fact may yet turn out to be important. It may yet turn out that, because of this property, sorghum may be greatly utilized, more especially in warm climates, in growing summer food for live stock. In the sunny south it is much used in this way, even now, and the south is by no means a cattle-feeding country.

Our readers are doubtless aware that much has been said about the dangers from pasturing the second growth of the sorghum late in the fall. Injury has been traced to this source. But it would seem that such injury has resulted only after the plants had been frozen, or at least injured by frost. This plant is worthy of trial for fodder uses. In some parts of Ontario it has been grown successfully for the cane, and in those parts it may be successfully grown for fodder.

Good Tools and Bad Ones.

When we think of the hindrance which poor tools are to progress, the wonder is that any one will work with them. Some men appear satisfied to work with inferior tools the year round. One would suppose that they were quite satisfied to work thus from the fact that they do so work. The objection may be made that they are not able to get better tools and implements, and oftentimes this objection is true. But we do not refer to those who do not invest in improved tools, because they are not able to buy, but rather to those who work away with inferior tools which they might easily put into a better condition, and yet they do not do so.

Take, for instance, the ordinary handsaw used upon the farm. It is an implement which is likely to be used on the farm every week, and oftentimes every day in the week. If such an implement is allowed to become dull or to lose its set, it is a sort of misery to use it, and yet that is what men often do year in and year out. A man with a bucksaw in good order will do more work in one day, and he will do it more pleasantly and with more satisfaction to himself, than he would accomplish in two days with the saw blunted, and without sufficient set.

Using tools in poor condition means a serious loss of time, and oftentimes of time that is very valuable. Take, for instance, the man who commences cutting his hay with his mower in a poor condition. He makes but indifferent progress. The implement goes from bad to worse, and, probably at a critical moment, when he has some very important work to do, it gives way altogether. How

very much better would it be in every way to have the mower put in good shape before the arrival of the season for mowing.

Using tools in poor condition leads to serious loss in outlay. If one man with a good chopping axe will do as much work in two days as another man will accomplish with another axe in poor condition in three days, the two men being equal so far as all other conditions are concerned, it follows that in three days, in the second instance, the price of an axe has been lost, and in thirty days, or a month, the price of ten axes has been lost. Now, apply this to other implements on the farm, and, if all those used are, generally speaking, in a poor condition, the loss will be very considerable in a year; in fact, it will be serious.

The use of tools out of condition is very discouraging to the workman. Let a man whack away all day with a hoe out of order, and he makes very slow progress. There is a positive pleasure in using an implement in good working order. Every stroke brings a sort of satisfaction with it because of desire accomplished and that in fine form. We cannot well conceive of anything that will more tend to discourage a workman than to make him drudge away all day, and from day to day, with a tool that will not do its work well. No wonder that, with such conditions, he should sometimes long to get away from such a grievous grind.

The use of unfit implements is oftentimes a grievous tax upon the strength of the animals used in labor on the farm. Start a team to plow with an implement that is rusted and otherwise out of order; the labor of drawing it is excessive, and not very much is accomplished in comparison with what would have been done had the plow been in the pink of condition. Apply this also to other implements of horse labor when they are habitually used in poor condition, and the addition thus made to the team's weary burden is very great.

The lesson is twofold. It would have us exercise every care, when tools are purchased, to get good ones. This question is worthy of the most careful investigation. Suppose a man, in purchasing a fork, buys a heavy and a cheap one just because it is cheap. Let him use that fork for a day in pitching hay; suppose that it is only a pound heavier than it ought to be; suppose that he lifts but two forkfuls in a minute, and that he works but ten hours in a day: he has lifted twelve hundred pounds that day to no purpose.

And it would have us keep our tools in good order. The other we can do, and this we can do also; hence the farmer can have good tools so far as he has them, and he can also have them in good working order. These two things accomplished, a very great advance will have been made. It only takes a little while to grind an axe or sharpen a saw, and yet it makes a very great difference in the results achieved at the end of the day. It is a small matter to clean all the earth away from a plowshare when it is put into the tool-house, and yet it may mean a great deal when that plow is used again.

Timothy and Clover.

Timothy or clover, which shall we grow? This question is frequently asked. In answering it many things will have to be considered. Sometimes the one should be grown rather than the other, but oftentimes it will be found more profitable to grow them together.

Without any doubt clover will stand pasturing better than timothy. In the first place, it

has greater power to spring up again than timothy, and, in the second place, it has much greater power to resist drought. When clover is eaten off it will spring right up again at any season of the year after growth commences, and will grow on until the growing period ceases. This is true, at least, of common red clover, but not to the same extent of the other varieties. And with each renewed attempt at growth, there is a renewed attempt to throw out fresh roots to sustain growth, but with timothy it is different; when this is cropped off, its power to grow is hindered, as it does not throw out fresh roots to sustain further growth as does clover. And, while the roots of clover go away down deeply into the soil, and gather from the moisture in the lower soil, and in the subsoil, the roots of timothy are shallow, and they feed near the surface. When the leaves are eaten bare, the mulch for the roots is removed, and, in consequence, the moisture is soon taken out of the soil by the air and by the winds. After the season of maturity is passed, moreover, timothy is but little inclined to grow. And if we look into the chemical analysis of the two grasses when young, we shall find that, while timothy pasture is better for working horses, clover is better for all kinds of young and growing stock, owing to the larger proportion of albuminoids or flesh-forming constituents which it contains. It must be remembered, however, that timothy will grow on low-lying soils, which are not well adapted to the growth of red clover.

As a food in the matured form clover again has the advantage. It has the advantage in point of yield. This is true, at least, of the common red clover, which yields two crops a year. As a flesh-forming food it has also a decided advantage; hence it is better for flesh production, but timothy, being richer in carbohydrates, that is, in elements which produce heat and fat, is better relatively for working horses.

Clover has been found better for milk production than timothy, hence it furnishes a more suitable food for milk cows. It is also more suitable for sheep, more especially for pregnant ewes and ewes in milk, and it is decidedly far ahead of timothy as a food for poultry or brood sows. But the superiority of clover, as a food for these uses, is owing not only to its greater richness in flesh-forming qualities, but also to its adaptability in milk production.

But clover is very useful in another way. It brings fertility to the land in the form of nitrogen, while timothy takes nitrogen out of the land. Clover, then, is an unending source of fertility, where it can be grown, while timothy tends to the impoverishment of land if the manure is not put back again on the soil. This fact in itself is a strong point in favor of clover, where clover can be grown. It is apparent, therefore, that clover is the more useful plant of the two.

But the idea must not be cherished that timothy is not a very useful plant. As yet, it is by far the most useful of the grasses proper that have yet been grown in America. It will grow on soils where the common red clover will not do well. We refer to low-lying soils, where, at certain seasons, the water table comes too near the surface. Timothy is much more permanent than common red clover. It will remain in the soil for years, and will continue to produce good crops, more especially in Ontario and eastward. But in the western prairies, as in those of Manitoba, and the Northwest, it does not continue to yield well for a long term of years, as it does in the east; hence it must be renewed more fre-

quently. As alsike clover is a perennial, and as it grows well on the same soils as timothy, the two grow well together, and when thus grown they may not require renewal for years. Timothy will also grow in some countries in which clover will not grow, as, for instance, the cold climates of the Northwest. This gives it a greater adaptability than clover.

And timothy is more easily cured than clover; that is to say, it is more easily cured than the common red or mammoth clovers. Because of this property, it is more commonly well cured than clover; and when grown along with clover, it renders the latter more easily cured. And there is the further advantage from growing timothy along with clover, that it gets food from the roots of the latter when they die. The plan, therefore, of growing timothy and clover together has many good things about it to recommend it, and, wherever it can, it should be adopted, unless there are some good reasons why it shall not be done.

From Country to City.

The tide has been flowing steadily from country to city for generations. Is it ever going to ebb? Will the tide ever flow from city to country, and, if it does not, what will the end be? These are momentous questions. The statistics on these points are calculated to alarm, so much more rapid has been the increase of urban population for many years past as compared with that of the country.

Thoughtful men are not only thinking about these things, but they are asking about them. Nay, further, they are considering the causes of that perpetual inflow of population from country to city, and they are asking themselves and others, Is there no way of reducing it? If it can be lessened, it means that the masses who live by charity will be lessened, and it means that crime will be lessened also. Not that the arrivals from the country are of the criminal type, for the opposite is true. But these never-ending arrivals so far throw the wheels of labor out of gear that there is not anything like enough of work for the masses. In the scramble for labor the weaker always go to the wall. Therefore the numbers out of employment grow larger and larger, and, in consequence, the demands upon charity increase. And, as is always the case, crime increases as the numbers of the indigent increase.

It is certainly worth while asking, therefore, is there no way of lessening the inflow from the country to the city? If charity could devise any means of effecting this end, it would accomplish a great work. It would tend to check at the fountain the volume of that inflow which so much tends to swell the numbers of those who have to be fed and clothed in the cities during a large portion of every year.

Can any means be devised to prevent the young people of the farm from leaving the same for other lines of life? No doubt they can. Among the immediate causes of the desertion of the farm complained of are the unprofitableness of farming, the marked success of some of those who have left the farm to sojourn in the city, the laborious work of the farm, and the lack of social privileges. There is a measure of truth in all of these, and the list may be further swelled, but, after all, there is one great reason, if we are only willing to admit it. That reason is found in the unprofitableness of farming. And why is farming unprofitable? Some will say because the times are hard, others will answer because

prices are low, and yet others because there are trade restrictions. There is a measure of truth in all of these, but is it not true, at the same time, that farming, in the aggregate, could be made greatly more profitable than it is now, if farmers generally knew better how to farm? Many farmers do know how to farm well, but, on the other hand, very many could greatly improve their methods, if they only had the requisite knowledge.

Some of our readers may imagine that we have made a statement that is scarcely tenable, when we say that very many could greatly improve their methods. Let us see. Dairying is one of the most prosperous of our industries. The average cow gives about 3,000 lbs. of milk per year. But is it not true, at the same time, that it takes about as much food to keep the cow as the milk is worth? The average farmer, then, who is engaged in dairying, is working for little or no margin at all. True, he is making a living, but that is all. But it is also true that some herds give 6,000 lbs. of milk per annum, and that the owners of the same are making a handsome profit. What makes the difference? Why, the farmers in the one case have a knowledge, which in the other instance they have not. And if this be true with reference to dairying, how much more is it true in reference to other branches of agriculture.

Educate young men of the farm properly with reference to their future life work on the farm, and they become more prosperous since they know better how to farm. The earth is a great storehouse, which only yields its treasures to those who know how to get them, and those who know best how to take nitrogen, phosphoric acid, and potash from the soil in the form of plants, and who also know best how to turn these into more concentrated food products for man, will get the largest share of those treasures.

Then let us educate the young people of the farm with reference to farming. Let us educate them carefully, and let us educate as large a proportion of them as possible, and we shall do much to increase the prosperity of farmers. With the increase of prosperity we shall increase contentment. When young people see that they can make money on the farm they will be more willing to stay there, and when they are convinced that the money made will usually be proportioned to the knowledge and skill which accompany the tilling of the soil, this great calling will rise much higher in their estimation. When these changes do take place, without any question, the current from country to city will be much arrested.

The Proper Time to Sow Grain in the Spring.

At the Central Experimental Farm, Ottawa, considerable attention has been paid since the year 1890 to the question of the proper time to sow different kinds of grain in the spring. Since 1891 the tests have been carried on at the branch experimental farms as well, and Prof. Wm. Saunders now gives the details and conclusions to be derived therefrom in a bulletin just issued.

Barley, oats, and spring wheat were the grains experimented with, and in every instance two varieties of each were used, and, generally, the same varieties were used at each of the experimental farms. Five or six successive sowings were made each year, the first sowing as soon as the land was in fit condition to receive the seed, and the subsequent sowings a week apart

In comparing the results at the Central Farm, it was found that great variations in the yields occurred from year to year, which were due, mainly, to the favorable or unfavorable character of the season. In the case of some of the grains some of the later sowings did better than the earlier ones, but, when the average of the whole series was taken, the losses from late sowing were clearly shown, and the advantages, taking one season with another, of early sowing are very manifest.

The following are the averages for the whole of the tests of all the varieties for the five years during which they have been carried on at the Central Experimental Farm:

Yield per acre.	Bush. Lbs.	Spring Wheat.											
		1st sowing	2nd do	3rd do	4th do	5th do	6th do						
39 38	110	20 14	10	19 39	12	13 41	11 71	12	10 41	12	8 55	12	
35 27	110	20 14	10	30 27	12	26 36	12	21 9	12	20 1	12		
52 23	110	20 14	10	49 33	12	40 18	12	36 3	12	33 3	12	23 27	12
40 18	110	20 14	10	40 18	12	36 3	12	33 3	12	23 27	12		
36 3	110	20 14	10	36 3	12	33 3	12	23 27	12				
33 3	110	20 14	10	33 3	12	23 27	12						
23 27	110	20 14	10	23 27	12								

It will thus be seen that early sowing is greatly important in order to secure the best results in Ontario and Quebec, as the tests at the Ottawa Farm may very well be taken as applying to those provinces. The second sowing, indeed, gave only slightly poorer results, but the crops sown two weeks later show a tremendous shrinkage in yield, which increases as the weeks go on, until from the sixth sowing the crop harvested is less than one-half of that harvested from the earliest sown grain.

At the branch farm at Nappan, N.S., where the climate fairly represents the larger part of the Maritime Provinces, the question of very early seeding does not appear to be so vital. The averages of the first three sowings have produced results nearly equal; the subsequent sowings, however, show a considerable falling off, which is steady from week to week, except in the case of the wheat.

At the Experimental Farm at Brandon, Man., there was no material falling off in the yield of either oats or wheat, until the last two sowings; in barley the later sowings have given the best results; hence it does not appear, so far as these tests have gone, that early seeding is specially advantageous for Manitoba. The seeding of wheat and oats should, however, be finished by the 20th to the 25th of May, and barley by the 1st of June.

At the Indian Head Farm the advantage throughout has thus far been on the side of later sowing, provided it be finished by the 16th to the 25th of May, depending on the earliness of the season.

At the Experimental Farm at Agassiz the results of experience thus far gained are also

in favor of later seeding, but seeding should be finished in the coast climate of British Columbia by the 15th to the 25th of May.

Tapping Maple Trees.

It has become a common practice to tap maples to a depth of only about an inch, writes Prof. Wood in Bulletin 24 of the New Hampshire Experiment Station. This practice is based upon the belief that the flow of sap comes chiefly from the wood of very recent growth, and that to tap beyond the growth of the last six or eight years is a useless expenditure of labor, and an unnecessary injury to the tree.

To determine as to the correctness of this belief, as well as to investigate the comparative richness of the sap from the outer and inner wood, the following experiments were made: In the spring of 1892, two thrifty rock maples, about fourteen inches in diameter, and growing in thick woodland, were selected and tapped, each of them with two holes, one in each being 1 1/4 inches, and the others 3/4 inches deep.

The 1 1/4-inch holes yielded 89.5 pounds of sap, while the 3/4-inch holes gave a little more than double that amount, or 187 pounds.

In 1893, three trees were tapped, one of them twice, one hole being 1 1/4 inches deep, and the other 2 1/2 inches. The second tree was tapped 2 1/4 inches deep, and the third 1 1/4 inches. These trees were large, thrifty shade trees. The rate of flow was determined by noting the amount of sap that flowed in two minutes.

April 9th, the 1 1/4-inch holes were deepened to 2 1/2 inches, the rate of flow being taken just before and after the deepening. The results were again much in favor of the deeper holes. In this trial, the deepening of the 1 1/4-inch holes brought the rate of flow from these holes nearly to an equality with that from the holes originally 2 1/2 inches deep. The increase is especially noticeable if a comparison is made between the rates of flow just before and after deepening.

April 17th, a tree about twelve inches in diameter was tapped 2 inches deep with a 1-inch bit, the hole was then bored 2 inches deeper with a 1/2-inch bit. An iron spout was driven into the inner hole, and an old-fashioned sheet-iron spout driven under the outer one, so that the sap from the inner and outer wood could be gathered separately.

At the time of tapping, the rate was: Inner hole, 9 cubic centimetres per minute; outer hole, 6 cubic centimetres per minute.

Three days later, April 20th, the run was 11 and 3 cubic centimetres, respectively. Thinking that the greatly decreased flow from the outer hole might be due to the free exposure of the sap-wood to the air, another similar tree was tapped in the same manner. The rate of flow from this second tree was 16 cubic centimetres from the inner, and 13 cubic centimetres from the outer hole. In both trees the flow from the inner wood exceeded that from the outer wood, although the diameter of the outer hole was double that of the inner one.

In 1894 four trees were tapped as follows: A tapped 2 3/4 inches deep with a 3/8-inch bit, and the hole continued 2 1/4 inches with a 1/2-inch bit. An iron spout was driven into the inner hole, and the outer hole was closed with a rubber stopper, through which tubes were passed to give outlet to the sap from the outer and inner wood without subjecting the outer wood to exposure to the air: B tapped 3 1/2 inches deep with a 1/2-inch bit. A thin

rubber stopper, through which a small tube was passed, was driven to the centre of the hole, the tube extending out through the centre of the spout driven into the outer wood of the tree. We were thus able to compare the rate of flow from the outer and inner wood with the same bore throughout: C tapped twice with a $\frac{3}{8}$ -inch bit: the holes being 4 inches apart and apparently in equally favorable positions, one hole 6 inches deep, the other 2 inches deep: D, standing near and similar to C, tapped with a $\frac{1}{4}$ -inch bit, 6 inches deep.

Here, again, the results from the deeper boring were far better than from the shallower, in some cases being twice as much.

The only conclusions that can possibly be drawn from the result of these trials are that the flow of sap is very largely dependent upon the depth of tapping; that the theory that all or nearly all of the sap comes from the outer wood is erroneous, and that our sugar-makers may, with great profit, tap their trees to a depth of four or five inches. The additional injury to the tree is slight, especially if the hole is small and the bark but slightly hewn away. Where a $\frac{3}{8}$ -inch bit is used and the bark practically uninjured by hewing, a majority of the holes will be grown over the first summer after tapping. If double the amount of sap can be obtained by tapping four inches deep instead of two, and the sap be of nearly equal richness, then it is time to stop giving directions to tap but one inch deep, as many have done, on the assumption that the sap from the inner wood was scanty and poor.

In 1892 two trees with as uniform tops as could be found, and standing in thick woodland, were tapped both on the north and south sides. A similar tree was tapped on the south and west sides. With trees 1 and 2 the south side yielded about 23 per cent. more than the north side, while with tree 3 the west side exceeded the south side by about 9 per cent. Without doubt, differences in season and the exposure of the trees to the sun have much to do with the results from tapping on different sides of the trees. There can be little doubt, however, as to the correctness of the common practice of tapping the south side wherever practicable.

To test the profits of tapping trees twice, putting the holes near together and letting the sap from both spouts drop into the same bucket, a test was made, with the result that the trees tapped but once gave slightly more sap than those tapped twice. It would seem, therefore, that but little is gained by double tapping, although more sap is frequently obtained by this method.

The Washing of Soils.

A very serviceable bulletin has been issued by the U.S. Department of Agriculture on the washing out of soils on hillsides, and the best method of prevention and reclamation.

The following are the methods suggested for the prevention of soils washing:

"(1) *By chemical means*, in the application of manures and fertilizers and in the accumulation of organic matter, which change the texture of the soil and make it more porous and more absorbent of water, so that there is less to run off over the surface.

"(2) *By means of cultivation and under-drainage*, which prevent erosion by distributing the surface flow over the ground and increase the amount carried off by under-drainage.

"(3) *By reforestation*, or the planting of trees, which act mechanically to prevent washing.

"(4) *By grass and similar vegetation*, which

bind the soil grains and prevent their washing away.

"The erosion of a soil is caused by the wearing of the rain and snow waters which cannot penetrate into the soil fast enough to be carried away by under-drainage, and which, by reason of the slope or contour of the land, run off over the surface, carrying along particles of sand and clay.

"The extent of washing to which the soil is exposed depends upon the quantity of rain fall in a given time, the slope or contour of the surface, the texture of the soil, the vegetative covering of the surface, and the kind and condition of cultivation. A soil composed chiefly of moderately coarse grains of sand, and having good under-drainage, will absorb the heaviest rainfall without much danger of surface erosion. A clay soil, on the other hand, into which the water cannot percolate with anything like the rapidity of the precipitation, will be washed and gullied by the torrent of water which must flow over the surface.

"It has been repeatedly shown by experiments and by the experiences of farmers that a soil, as a rule, absorbs water more readily as the content of organic matter and of humus increases. Surface erosion can, therefore, be largely prevented by such a system of cultivation and cropping as will introduce as large a quantity of organic matter into the soil as possible. A very old method of recovering washed and gullied lands is to place straw in the furrows while plowing, the straw not only acting mechanically to hold the soil in place and prevent surface erosion, but also in a very efficient way to increase the quantity of humus, thus making the soil hold large quantities of water which otherwise would have passed off over the surface. In this simple way fields which have been badly washed and gullied and entirely abandoned may be recovered and made highly productive.

"As soon as a sufficient supply of humus has been accumulated and the lands are brought up to an adequate condition of fertility, clover or grass should be seeded, if the land is at all suited to these crops, or rye, oats, or field peas should be sown to help hold the surface.

"A soil containing a fair supply of lime is much less liable to wash than one similarly situated and exposed which is deficient in lime. The reason of this is that clays which are deficient in lime, when once brought into suspension by moving waters, will remain in suspension and keep the water turbid for a long time. Clays which are heavily impregnated with lime salts, on the other hand, are in a flocculated state, the fine grains of clay being held together and in contact with the larger grains of sand. This flocculated mass quickly settles, and is originally not so easily disturbed and carried off by moving water.

"The change in the physical condition of the soil which is produced by the lime, and which is likewise produced by a number of other chemicals ordinarily used in commercial fertilizers, is another important factor worthy of consideration. A stiff clay soil is practically impervious to the penetration of surface water when it is delivered in such torrents as we are liable to have in our summer storms. A well-limed soil, on the contrary, although it may contain as much clay, but in which the particles are flocculated or drawn together, is much more pervious to water, and the amount of water which the soil will carry down through under-drainage is increased, and the excess which has to flow off over the surface is diminished. The surface washing of cultivated fields, especially those which are

naturally deficient in lime, can be greatly diminished, therefore, by the free application of this substance to them.

"The depth and character of the tillage are very important factors in the washing of lands. A field in a condition of fine tilth and plowed to a depth of ten inches will hold two inches of rainfall and absorb it very readily, and a soil in such a condition will suffer no surface washing from any ordinary rainfall. Where it is possible, therefore, land which is apt to wash should have the soil gradually deepened and be kept in a fine state of tilth, so as to increase the storage capacity for excessive precipitations. This will not only save the surface from being washed and gullied, but it will also increase the store of moisture held by the soil, which is of very great value in the case of drought.

"It is important also for this, as for other reasons, that the soil be covered with vegetation as much as possible throughout the year, as the roots and organic matter serve to bind the grains of the soil together. Any crop which requires very clean culture, as, for example, cotton, is exhausting to the land for the reason that constant exposure of the surface to the sun and storms uses up the organic matter, makes the soil less porous, and the soil particles themselves are more easily washed away; so that this clean cultivation is in its effects very favorable to excessive erosion. With crops which require such clean cultivation, it is very advantageous to sow some crop like rye in the field during the last working of the crop, both to bind the surface and protect it from washing in the winter, and for other benefits which such a crop provides.

"Another very effective method, when properly carried out, to prevent the washing of lands is to under-drain the soil with tile or other drains. These drains carry off quite rapidly an excess of moisture, so that much more of the rainfall is absorbed by the soil and carried off through the drains and less washes over the surface of the land. Not only this, but a well-underdrained field is usually drier and more porous, and has a greater capacity for absorbing the excessive rainfall and thus preventing surface washing. A field thoroughly underdrained with tile drains will carry off the water of any ordinary rainfall without any surface erosion."

Side-hill ditches and terracing the hillsides are also suggested where the contour of the land is so steep as to preclude simpler methods of prevention. Great care, however, has to be exercised in laying out these ditches and terraces, as any defects in the levelling will only make matters worse. Where the washing has gone so far as to render the land unfit for cultivation, the planting of forest trees is recommended. Full particulars as to planting and the kinds of trees are given. The ways in which the forest protects the soil are:

"(1) By preventing the rain from falling directly upon the soil, the foliage of the tree crowns intercepting and breaking its force, the water reaching the soil more gently from the leaves and along the branches and trunks of the trees.

"(2) By interposing a loose cover or mulch of litter formed by the fallen leaves and branches, which breaks the direct force of the raindrops, and keeps the soil from being compacted or puddled by their blows.

"(3) The deeply penetrating roots, and holes left from decayed stumps and roots of trees, assist in the underground drainage.

"(4) The litter with the stumps and projecting roots and trunks of trees prevent the water from rapidly running over the ground

and from gaining the momentum and force which is necessary in order to erode and gully the soil.

"(5) The forest cover prevents the drifting and the rapid thawing of snow, thereby insuring more even distribution of the waters and an increase in the time during which it can percolate or be absorbed into the soil.

"If the forest floor is not disturbed by fire, nor the litter trampled and compacted by cattle, it always reduces rapid surface drainage, and largely, if not entirely, prevents erosive action.

"On gentle slopes a good turf of perennial pasture grasses, especially those with creeping root-stocks, prevents erosion, or washing, of lands, and short steep embankments may also be protected with this same covering. On longer and steeper slopes, however, this method is not as effective as that of reforestation.

"In enumerating the effects to be obtained by the growth of grasses and other herbaceous vegetation on washing lands, or lands liable to be eroded, it should be stated that such growths are calculated to break the force of the rainfall and prevent its packing the soil; to render the ground more porous through the root penetration into the subsoil; to make the soil more absorbent and more retentive of moisture through the addition of humus to the soil from the decay of the plants; to retard the rate at which the surface waters flow off; and, lastly, to bind the particles of soil together, which is especially effective in the case of light sandy lands and of newly-formed embankments, whether of sand or clay.

"The turf which would answer the present purposes should be composed of perennial grasses of varieties which have creeping root-stocks, and it is frequently essential that they be able to grow upon an impoverished and often hard soil. To secure a strong turf on lands of this character, it is very important that the soil be put into the best possible condition. Where practicable, the soil should be thoroughly plowed or loosened, and some variety of field pea or clover be seeded down, such as the cow pea, Japan clover, or the crimson clover, all well adapted to this purpose. These crops may either be cut off, leaving a high stubble to be turned under, or the whole may be plowed under, thus furnishing a quantity of organic matter to the soil as a preparation for the grasses which are to be seeded. As drought is one of the most serious conditions to be contended with on lands of this character, crimson clover is one of the best of these green manuring crops, as it makes most of its growth in the winter months, when there is less liability of drought. This, however, cannot be used too far north, as it does not stand the winters well.

"With this preparation of the soil Bermuda grass is one of the best grasses for the purpose of preventing erosion, or of reclaiming eroded land in the south. This should be planted by cutting up a turf rather than by seeding, as the seeds do not germinate very readily, even where they have been gathered in a mature condition. Care must be taken in the introduction of this Bermuda grass, as it is exceedingly troublesome in the cotton field. In the north the English blue grass is one of the best grasses for this purpose, and the Hungarian brome is valuable for the same purpose in both localities.

"Where the soil will support other good turf grasses of higher value for hay or pasture, or where the soil can be brought into a condition to support them, these more valuable grasses should be introduced."

Questions and Answers.

Buying Hay in Mows.—Subscriber, Stratford: How much hay is there in two mows? The first is 14 feet long, 20 feet wide, and 1 foot high, and the second 19 feet long, 20 feet wide, and 2 feet high. It is bought by the ton, but the buyers do not want to load and weigh it.

Ans.—If the hay is timothy and well settled there will be about 5.45 tons in the first and 4.13 tons in the second. If the mows are only partly settled the amounts would be about 3.10 tons and 3.25 tons respectively. Of course, these weights can only be approximate.

Root Cellar.—W. H. M., Stanley House, Ont.: My barn and stable are built on rock, so that I cannot have a root cellar under them. Could I build a root house of lumber to stand on the rock by itself, and be able to make it frost-proof? If so, please tell me how to do so.

Ans.—By Prof. Thos. Shaw: The fact of the barn and stable resting on a rock will not prevent you having a basement under the whole of the barn. This could, of course, be lifted up, and stone walls built to enclose the basement portion. You could then place the cellar in any part of the basement desired. Some of the best basement barns in the country are not built into the side of a bank. If there was danger from frost to the roots lying against the wall, this could be averted by making an air space between the wall and the roots. Such an air space could be made by placing strips upright against the wall, and nailing other strips, with spaces between them, across these. But of course a root cellar could be built outside of the stable altogether. It could be built of stone, the roof being shingled and lined underneath the rafters, and ceiled with tar-paper. Or it could be made of wood, using one or two thicknesses of boards on both sides of the studding, with tar-paper between. One thickness of boards would suffice on each side of the studding, if tar-paper were used also, and if the air space of the wall were filled with some such substance as dry sawdust. It would be necessary to have two doors at the entrance, with a space between them, and provision would also have to be made for ventilation leading up through the roof. One or more small double windows would also be necessary, according to the size of the cellar. A root-house with a ridge roof and low side-walls may easily be kept warm in winter by banking manure against the walls in the autumn. The objections to this lie in the fact that the work has to be done every year.

Orchard and Garden.

Anthracnose of the Bean.

The annual loss from the above cause to farmers and market gardeners in this vicinity for the past three or four years has been very considerable. The following experiments were suggested by the results of laboratory investigations conducted by Dr. B. D. Halsted, an eminent authority on fungous diseases of plants, of the State Agricultural Experiment Station at New Brunswick, N. J. Dr. Halsted states that the fungus "most frequently attacks the pods of the bean, when they are only partially grown, and, causing the formation of deep dark pits, materially lessens the yield of saleable beans from the field infested. The disease spreads rapidly from pod to pod in the market place, as has been shown by repeated inoculations in the laboratory, where, under the most favorable conditions, a spot may be established upon an otherwise healthy plant in thirty-six hours." Acting on the belief that the seed beans themselves furnished the principal means for the perpetuation of the anthracnose from one season to another, samples of infested seed were soaked in copper solutions of varying strength. Plants raised from soaked seed showed very little anthracnose in comparison with other seed untreated.

The following experiments were designed:

- (1) To show the effect on the germinating power of seed beans of soaking them in solution of copper carbonate and copper sulphate.
- (2) To test the efficacy of soaking seed

beans in the above solutions to prevent "anthracnose," or "pod spotting."

The experiment comprised the treatment of 48 samples, each containing 100 seed beans. These were sown in rows, each 25 feet in length. When the pods were fully formed, but yet green, they were picked and sorted, the first grade consisting of *sound pods*, the second of pods *slightly spotted*, and the third of those which were *badly spotted*.

(3) Seed soaked for half an hour in 1 oz. to 1 gallon of water gave the lowest percentage (58 per cent.) of healthy pods, and the highest (77 per cent.) germinating percentage.

(4) Seed soaked for one hour in a solution of 3 oz. to 1 gallon gave the highest percentage (82 per cent.) of healthy pods, and the lowest (43 per cent.) germinating percentage.

(5) As a general rule, the percentage of healthy plants was in inverse ratio to the percentage of germination; showing the fungicidal effect of strong solutions, as well as their weakening effect on the germinating power of the seed.

(6) The most satisfactory results were obtained by soaking the seed for one hour in 1½ oz. of copper carbonate, dissolved in a pint of ammonia, and diluted with water to one gallon. This gave 79 per cent. of healthy plants, with a germinating power of 73 per cent., as against 43 and 84 per cent. respectively for the untreated.

CONCLUSIONS AND RECOMMENDATIONS.

(1) Seed beans can be treated for anthracnose cheaply and advantageously by soaking in copper compounds.

(2) Soak the seed beans for one hour before planting, in a solution made by dissolving in a pint of ammonia 1½ oz. of carbonate of copper, and diluting with water to one gallon.

(3) When carbonate of copper is not easily obtained, use copper sulphate (blue vitriol) one-half ounce to each gallon of water.—Prof. John Craig, *Horticulturist to Experimental Farm, Ottawa.*

Manuring Fruit Trees.

It is no more unreasonable to expect blood from a turnip than abundant crops of good fruit from poor soil, writes Prof. H. E. Van Deman in *Gree's Fruit Grower*. Fruit trees and plants of all kinds are like animals—they must be fed if they are expected to be profitable. It is rarely that either of them fail to make ample returns, if they are given wise and faithful attention.

Nature has in many sections of our country enriched the soil with stores of plant food, all ready for the use of man, when he shall require them to nourish the trees, plants, and seeds which he may wish to grow. Nearly all forest lands are rich in these elements, and the same is true of the vast prairies which have been the pasture grounds of countless wild herds for ages past. Even many of the deserts have rich soil, and only lack water to make them equal to the best of arable lands.

Now, the richest and deepest soil will, in time, become poor by constant cropping and little or no manuring. Indeed, there are virgin soils which at first might seem reasonably fertile, that must be manured before a single good crop can be grown. Such are found in most of the regions both north and south which are covered by a native growth of pine timber. Aside from some of the "hard-pan" patches of Kansas, and the shifting sandy

deserts of the far west, I have never seen poorer lands than in the pine clearings of northern Michigan, Florida, and other regions of like character. But manure and cultivation will change all such barren soils into fruitful fields, orchards, and gardens, provided there is sufficient water to meet the requirements of vegetation.

There are certain cardinal principles which must be kept constantly in mind in connection with this subject. The first is to have a correct knowledge of what constitutes manure.

Potash is the best and most essential of all, and for fruits especially. Any so-called complete fertilizer that does not contain this chemical as a prominent ingredient is lacking, and may be worth very little. Those who buy manures will do best to get muriate of potash. This costs about \$40 per ton. Sulphate of potash is another form in which potash may be procured in the markets. It costs about \$50 per ton. Unleached wood ashes contain potash in various proportions, but the average is a little more than 5 per cent. They are always beneficial to the soil, but, owing to the uncertainty of their composition, it is not safe to pay more than 10 or 15 cents per bushel, except upon strict chemical analysis. Corn-cob ashes are much richer in potash, and, when they can be procured at the mills and grain elevators, there are usually good opportunities to secure a valuable fertilizer at low cost.

Kainit is a mineral that contains over 13 per cent. of potash, and costs about \$13 per ton. It is just the thing to scatter under hen roosts and mix with the droppings as they are stored in barrels under cover, because it unites with them chemically, and makes a highly concentrated manure equal to good guano.

Phosphoric acid is the second in importance as a fertilizer. It is to be had in greatest abundance in dissolved phosphate rock, chiefly from South Carolina, Florida, and Canada, and in pulverized bone. The phosphate rock is the petrified remains of the bony structures of prehistoric animals, which were deposited in masses in ancient ocean beds.

There is much misunderstanding as to the value of the different forms of bone fertilizers. Raw ground bone is of less value, pound for pound, than the dry preparations which have been treated by acids. The oily matter in fresh bone is of no value as a manure, according to eminent authorities, and the purchaser loses so much of it as he pays for. If the bone is ground without chemical treatment it should be very fine, to have early effects, that the roots may the more easily lay hold of its constituents. There is no loss by age as laying in the soil, for the phosphorus and lime will remain there until every particle is gradually appropriated. "Dissolved bone black" is the best and most available form in which to buy, and the drier it is the less water there is to pay for. It costs about \$25 per ton.

Nitrogen is third in value, and is especially useful in stimulating growth. It is largely contained in dried blood, and guano, either imported or made from dead animals and fishes. It is rarely that the fruit grower need purchase nitrogenous manures, as they are more cheaply produced on the land by plowing under green crops. Clover and cow peas are the two most serviceable "nitrogen traps" to be used in securing this element from the air. When plowed in green, they, as well as rye and other rank-growing crops, loosen and aerate the soil, and materially aid the roots in their work.

Lime is also an active agent in helping to dissolve other mineral elements, and is re-

quired by most growing vegetation. It is most cheaply secured from burned limestone, and (along the sea coasts) from burned oyster shells. Bones and phosphate rock also contain lime in considerable quantities.

All these essential manures are found naturally in most soils in varying abundance, but it requires frequent and thorough cultivation to bring them into vigorous action. Otherwise they are largely unavailable, although within easy reach of the roots. Hence, stirring the soil often during the growing season is highly important and truly economical. It will not make manuring unnecessary, but it will help wonderfully.

Stable manure is valuable in the orchard, vineyard, and berry patch, but it is more suitable to vegetable and forage crops, because it tends to increase the size of the tree or plant more than is sometimes best for the fruit grower. There is many a load of coarse stuff hauled for miles at great labor of man and team that is little else than trash and water. It would be well to carefully consider the comparative values and suitability of different kinds of manures before investing money and labor in them. One of the largest and most successful peach growers in America once told me, while we were looking over one of his most profitable peach orchards, that he considered stable manure highly injurious to peaches; that it made them coarse, and poorly flavored and colored. Yet he bought muriate of potash by the carload to put on these same orchards. However all this may be, I would advise enriching the soil of orchards with stable manure rather than not to enrich it at all.

While a little manure is better than none, it is the part of wisdom and economy to apply it liberally. Muriate or sulphate of potash should be put on land at the rate of 500 pounds to the acre the first time, and in bearing orchards, or other fruit plantations, followed each year by not less than 250 pounds. This will give vigor to the trees, and color and quality to the fruit.

Phosphate rock or bone dust should be applied at about the same rate. Wood or cob ashes may be spread twice as liberally. There is no danger of injury from using larger quantities of any of these manures, for only so much of them will be absorbed as the growing plants need.

Nitrogenous substances should be sparingly used, for there is danger of injury to both plants and seeds. Dried blood is especially dangerous, and, whether this or other animal substances containing ammonia are used, the greatest care should be taken to mix them well with the soil. If well scattered, 200 pounds of dried blood or fish guano to the acre will be beneficial, especially to young trees. Lime is rarely needed except in old orchards. There need be no fear from scattering 50 bushels, that has been well air-slacked, to each acre, but this will not need being done more than once in five years.

If the requirements of each case be well studied, and the ingredients bought separately and mixed on the farm, there will be less chance for fraud and more satisfactory results. In all cases manures of any kind should be finely scattered over the whole surface of the soil, and not about the trunks of the trees.

It does not matter so much what time of year the manure is applied, as that it be not neglected entirely. However, I prefer fall or winter, and to have it plowed under as soon as scattered. Commercial manures act quickly, and just before growth begins is as good a time as any to apply them.

The Dairy.

Branding Cheese.

A bill has been introduced into the Dominion Parliament at Ottawa to compel cheese factories to brand their cheese with the name of the factory and the date of make, but there is some doubt as to whether it will pass. A conference of some of the leading cheesemen has been called to discuss the question, and on their decision, we presume, will depend the fate of the bill. We certainly hope that the bill will pass. Last fall it was reported that some exporters had passed off cheese of an inferior make as having been made at a better time of year, and the outcry raised at the time threatened to work injuriously against our export cheese trade. We cannot afford to imperil this, one of the best and most profitable sources of revenue to so many of our farmers, and, therefore, the branding of our cheese should be welcomed by every one interested in the trade, as that will prevent any chance of fraud. Let us keep the cheese trade on an honest basis, and maintain our present good name.

Dairy Products Cheap.

The outlook for good prices for butter and cheese this year is certainly not promising at the present time. Owing to the early start of grass, a good deal of cheese was made during the early part of May, and it is said that the greater part of the cheese made during the past month in Western Ontario was made from full grass. The demand in Great Britain is not very keen at present, and exporters are figuring on 6 cents per pound for the season's make. The April cheese was sold at 7½ to 7¼, or about three cents per pound below the opening rates last year. The prospects for butter, too, are not bright. Owing to the increase in the number of creameries in the country, and the larger output, it is said that best creamery butter will be quoted no higher than 15 cents per pound. Of course, things may improve and prices go up, but the dairyman who would extend his business should do so with caution.

Skim-Milk for Pigs.

A subscriber wishes to know how much he can afford to pay for separated skim-milk to feed to pigs.

The question is one that it is difficult to answer, so much depending on circumstances, such as how far the milk has to be drawn, and the ability of the feeder to use it to the best advantage.

In answer to a writer in *The Breeders' Gazette* who asked whether he could afford to pay 20 cents per 100 for skim-milk to feed pigs, with hogs selling at 4½ cents per 100 lbs. live weight, Prof. W. A. Henry, director of the Wisconsin Experimental Station, made the following statement, which will serve as a guide to our correspondent in buying his milk:

"As a bare proposition with no contingencies I would say, yes. For young pigs the feeder can find nothing equal to skim-milk. It gives them a start that nothing else can. For such, feed three pounds of skim-milk to one of cornmeal. A mixture of half cornmeal and half shorts is perhaps more satisfactory from a practical standpoint, though not theoretically. I think shorts are less harsh in the young pig's stomach. Certainly pigs fed shorts and milk do wonderfully well, while theoretically cornmeal is the complement of

the milk. As the pigs grow older, unless there is milk in abundance, reduce the proportion of milk gradually.

"One pound of milk to each pound of grain with fattening hogs makes the grain wonderfully effective, and even half a pound of milk to one of grain will show good results. Under favorable conditions, where there are no serious losses or accidents and everything goes right, one can easily get 20 cents a hundred out of his skim-milk after a reasonable allowance for cost of all the grain with hogs at four and one-half cents live weight. But it is not fair to allow the skim-milk all of its value in such cases. A part of the value comes from combining it with corn or other feeds, and these should be credited somewhat above their market value when used in combination. Again, losses are almost sure to occur in handling stock, and all the theoretical value of the feed cannot be allowed in purchasing it. Fifteen cents per hundred is therefore, I think, as much as one dare allow for separator skim-milk. Skim-milk from deep setting as ordinarily conducted leaves more fat in the milk, and home made skim-milk is often far superior to that of the creamery for pig-feeding. Too many creameries allow their skim-milk tank to be germ-breeders, and all sorts of ferments grow there. Then, too often, the washings of the factory are sent up into the tank, and this further reduces the value of the milk through dilution. I know of creameries where I should consider 10 cents per hundred a high value for the skim-milk, owing to dilution and the filthy condition of the tank."

Mistakes in Cheesemaking.

At this season of the year (January) it would be well for cheesemakers to devote a part of their leisure hours to considering some of the mistakes made in the manufacturing of cheese during the past season. True, every cheesemaker does not make many mistakes, yet almost every one makes a few. It may be that the one who buys the cheese does not find fault with them; he inspects and passes them as all right, yet, although there is nothing said about the quality, the maker feels that there is something about certain lots that should be better, and he will set about to find the cause and then to remedy it. That is, he will if he has his own interest and the interests of the industry at heart; and, unless a maker has something of this spirit, he should quit the business at once, and try some other line of work that does not require the untiring watchfulness and attention that cheesemaking does.

In pointing out a few of the mistakes that have been made during the past season, I do so with a view of throwing out a few hints on cheesemaking that I trust will be helpful to makers, more especially to those who have made these mistakes. In this article I shall confine my remarks to summer cheesemaking.

Using rennet. I take it for granted that all cheesemakers are familiar with and use the rennet test. If not, they should, as it is very essential that every cheesemaker should know just when the milk is in the proper condition for the application of the rennet. To determine this, the rennet test is a very simple and accurate method. All makers admit that adopting the rennet test has been a great stride in the right direction, and the maturing or ripening of the milk before setting is of untold value to cheesemakers. Yet all good things may be overdone, and I must say that this practice of maturing milk has been over-

done in a great many instances. A certain class of makers persist in maturing the milk too far before adding the rennet. By doing so they think it will enable them to get out of the factory an hour or two earlier in the evening. This is a great mistake. After maturing milk past a certain point it develops forms of fermentation and bad flavors, that otherwise might be escaped. The results are that it requires more time to get the curd in proper condition before going to press. During the past four seasons I have made cheese in almost every cheesemaking district in Western Ontario, and, in all my experience, the best results were obtained from milk set at about 18 seconds by the rennet test, using 1 drachm Hansen's pure extract and 8 oz. milk at 86°. Of course, there are exceptions to all rules, and local circumstances must always be taken into consideration. It is a well-known fact that if milk is allowed to become overripe, or to develop too much lactic acid before it is set, it has a detrimental effect upon the quality of the cheese; there is a coarseness in the grain or texture, and it lacks that silky texture and quality so very desirable in all cheese.

Coloring. In coloring, some add the annatto immediately before adding the rennet, and stir both in together. The coloring matter is not evenly distributed in the milk, and the result is mottled cheese. Then the maker wonders what is the matter with his annatto. Add the coloring as soon as possible after you get the weight of milk in the vat, and be sure that it is thoroughly mixed before the rennet is put in.

Coagulation and cutting. Right here the question arises: How much rennet should be used for 1,000 lb. of milk? I find makers using all the way from 1½ oz. to 4 oz. Still, the quantity is not a safe guide to go by, as a great deal depends upon its strength or quality. Yet I find vats of milk coagulating and ready for cutting, varying all the way from 20 to 45 minutes. This is another mistake. We should have a more systematic way of doing our work. Enough rennet should be used to cause perfect coagulation, fit for cutting, in from 30 to 35 minutes. Commence cutting with the horizontal knife, then follow at once with the perpendicular. Begin cutting while the curd is tender, and handle it very carefully, as rough or careless handling at this stage means a decided loss both in quantity and quality.

Stirring. Some make a mistake by turning the steam on the vat as soon as the cutting is completed, and commence stirring at once with a rake, and the way they go at it would give one the impression that they were raking hay, or something that did not require careful handling. After cutting, the curd should be stirred gently by hand (where agitators are not used) for 10 or 15 minutes before any steam is turned on, except in the case of a fast-working curd; raise the temperature gradually, taking about 35 or 40 minutes to raise from 86° to 93°. Continue stirring for 15 to 20 minutes after the temperature has been raised to the desired point, and occasionally afterwards, to keep from matting, until the curd is dipped.

Acid development. With regard to the amount of acid that should be developed in the whey before the curd is ready to dip, ideas are varied and numerous. Some dip with one-sixteenth inch acid, or as soon as they can see those fine silky threads on applying curd to the hot iron, while others would not dip with less than half an inch, and often develop three-quarter inch, but they do so at the expense of quality. It is a mistake to go to the extreme, either one way or the other. The

best results are obtained with from one-eighth to one-quarter inch acid, and I would not advise using more than one-quarter inch acid at any time. Some claim that in case of a bad-flavored curd it is an advantage to develop more acid before dipping; they pile it up in the sink as deep as they can get it, and leave it there for hours before milling. At this stage it has developed anywhere from 2½ to 3½ inches acid, according to the hot iron test. After milling they will turn it over a few times, then cover it again, and keep it covered until salted. This is a decided mistake. The longer the curd remains in the whey the stronger the flavor becomes. When a bad flavor is developed in the vat, draw off the bulk of the whey early, dip curd with a little acid, and keep it warm until it is ready for milling. If you have not proper means for keeping curd warm in the sink, it is advisable to raise the temperature 2 higher just before dipping. This will help to maintain the heat at the desired point, about 94° to 96°. Turn the curd frequently, and mill when it becomes velvety or flakey, and will show about 1½ inch acid. Give it a good deal of stirring. Air and mature well before salting.

Salting. Use from 2½ to 3½ lb. of salt per 1,000 lb. of milk, varying the quantity in proportion to the percentage of moisture in the curd, and by all means use some brand of dairy salt. Do not use common barrel salt on any account, as some of it contains ingredients which are anything but beneficial to the cheese. Allow the salt to dissolve before putting curd to press, and see that the temperature is not above 85° at this stage.

Hooping and pressing. After putting the curd in the hoops do not be in a hurry to apply the pressure. Some practise putting the full pressure on as quickly as possible, using a lever three or four feet long for that purpose, keeping them at high pressure mark for 10 or 15 minutes, then take them out and bandage in a haphazard way and into the press again, paying very little attention to the style or finish of the cheese. They do not turn the cheese in the hoops in the morning, but have them taken to the curing-room at once and placed on the shelves. There you may find them all shapes and sizes, medium, little, and big, with straight and crooked shoulders, with bandages pulled down off the corners, and wrinkled on the sides, yet hardly any two of them alike. From their appearance one might easily be led to believe that they had been specially prepared for a variety show. In the first place, it is a mistake to apply the pressure so quickly. This should be done very slowly at first, and gradually increased until the full force or pressure is applied.

Bandaging. It is a mistake to try to bandage cheese in 15 or 20 minutes after they have been put in the press. They should be left in the press at least 45 minutes before bandaging. Pull the bandages up neatly, and try to have about an inch of the bandage to lap over each end of the cheese. Use a double set of cap or end cloths, so that one will be left on the cheese until a perfect rind is formed. Turn the cheese in the hoops every morning, and trim off any shoulders that may have been formed during the night, then put back to press for some hours before removing to the curing-room.

Cleanliness and neatness. I would like to impress upon every maker the necessity of keeping his factory clean and tidy. No matter what the quality of his cheese may be, unless he is clean and neat, he cannot be rated as a first-class maker.—T. B. Millar, at the Western Ontario Dairymen's Meeting.

Poultry.

Poultry on the Farm.

By JOHN J. LINTON, Oshawa.

I have said before, what I now repeat in brief, that the poultry interests of this country are most intimately connected with the business of the farmer of Canada. The "fancy"—the amateurs and small breeders, who, as a rule, make up the contributors to our public fowl shows of late years—compose but a moiety of the vast numbers of persons in the country who raise good poultry, and large quantities of it, in every direction.

This assumption must be correct, since we all know what enormous quantities of chickens, fowls, ducks, geese, and turkeys are constantly required to satisfy the market demands for ordinary consumption in Canada. And surely this branch of the business is not conducted to any great extent, nor is this supply furnished, by the class recognized as modern "poultry fanciers." The farmers are the people who answer this call, and those who have followed up the business in a regular but moderate way all their lives, raising but a few dozens or scores of birds, perhaps, annually, in most cases, are the class of "poultry breeders" who supply our markets with this desirable commodity.

That our "fanciers" are a very useful and needful adjunct to the profession must also be admitted; for to this enterprising and now wide spread class of workers is the general public universally indebted for the advancement of the good quality of Canadian poultry that has taken place among us in the past ten years, and the keeping alive of this great aid to the cause is a matter of vast consequence to our future in this laudable work, as they are all aware.

Yet, to the farmers we must look for this supply of poultry food in our markets; and to this class of breeders we conceive it a duty to constantly appeal in the columns of our publications which are devoted to the upbuilding of agriculture, and to show the best ways and means to derive remunerative results from poultry raising.

We desire, therefore, to press the important fact upon the consideration of farmers, that they should give more attention to this comparatively most profitable class of stock-raising. If judiciously cared for, no class of live stock gives back to the farmer a better return in clear money than chickens and eggs will upon his place. The industry must not be neglected, and it should not be overdone. But when properly cared for and rightly managed it will pay most liberally.

For comparison, take the raising of beef. To bring an ox up to the weight of "one" to fourteen hundred pounds, fit for the butcher, requires three years or so. The beef, when slaughtered and marketed, will pay five or six per cent. upon the cost of food and outlay—never over eight per cent. if bred in the eastern provinces.

In six months' time from the shell the same value in poultry, say in round numbers 125 chicks, can be produced, grown, and readily marketed in good condition, at one-third the cost for feeding and investment. A hundred and twenty-five common chickens can be hatched and fed, up to five or six months of age, for \$25 on any man's farm, where the latter goes about his task sensibly and discreetly; that is to say, by raising upon his own premises the grain, potatoes, etc., needed to supply the food to keep them for the six months

of their lives, because all the small vegetables and unsaleable stuff upon the farm may be given to this stock, and where cows are kept the sour milk and house offal can be thus disposed of to a great profit.

These chickens will give an aggregate dressed weight, at this age, of 600 pounds of meat. If good thoroughbred or crossbred varieties are kept, this weight may be increased from 15 to 20 per cent. in the period mentioned. Six hundred pounds of clean, plump chickens in the months of September and October will always, in any city market, command fifteen to eighteen cents a pound, frequently more, if the buyer knows that it will be marketed in extra nice condition.

Thus the producer may realize in six months' time, and for \$25 cost at the outside, a sum which, if he attempts to make it in beef-raising in preference, he will take half as many years to earn at twice the cost. In the one case he makes a profit of from 5 to 8 per cent. on his outlay, in the other from 100 to 200 per cent. The poultry industry could be compared with any other branch of farming, and it would be found just as profitable, so why is it not worthy of the closest attention of our enterprising farmers?

Crossing for the Table.

Many people who keep poultry will not hear of crossing their fowls, because they say it spoils a good strain, writes W. Cook in the *Cable*; but, on the other hand, there are many thousands who keep a few fowls simply for the purpose of supplying eggs, and will not hear of, or shall I say cannot afford to keep pure breeds? Now, to this latter class of people an article on the exhibition points of fowls would be of very little use or interest; at the same time, they would like to know the best way of crossing or mating their birds, so as to enable them to get a good supply of eggs and breed good table birds at the same time. If I were breeding entirely for egg production during the winter, three parts of my birds would be crossbred.

Some of my readers may ask the question, "What crosses do you recommend as the best table birds?" My experience teaches me that there is no best so long as the birds are bred from a good strain, but, like most people, I have my fancies even in crossbreds. Much, of course, depends upon what the birds are required for, whether for table purposes or as egg-producers. One of the best crosses for the table are Indian Game-Dorkings. Some poultry keepers prefer mating the Black Breasted Red Game with the Dorking, but I like the Indian Game the best, as the crossbred pullets lay rather larger eggs, and many of them come very handsomely marked, almost like pure Indian Game. The chickens sledge fast and grow quickly, but they require a lot of exercise. They do much better if they have a large range.

The cockerels come of a mixed color, and are ready for the table at an early age. Many of the eggs from the crossbred pullets come tinted or brown, and seventeen out of every twenty birds will come evenly marked like an Indian Game. Some have five toes on each foot, and the tails are rather longer than those of the Indian Game. Some have white legs, others brown. They make excellent sitters and mothers and are fair winter layers, but when the hot weather comes on they are a lot of trouble, as they come on so broody.

Next come Indian Game-Orpingtons. They are splendid table fowls, nearly as good as Indian Game-Dorkings. Only a few come with

black legs instead of white. Eighteen out of every twenty of the pullets will come black or show little mottling on the breast and neck feather. They are excellent winter layers, and, if hatched the same time as the Indian Game-Dorkings, they will often lay three weeks earlier. Most of the pullets come about the same shape as the Indian Game, only they grow out bigger birds and lay very brown eggs. If hatched fairly early they will lay right through October and November, and usually come broody in December and January. They are good sitters and mothers, and, as a rule, will lay from twenty-five to thirty-five eggs more per bird in twelve months than the Indian Game-Dorkings. Many of them come with a pea comb like the latter breed.

Indian Game-Brahmas also make a splendid cross for the table; the pullets come a beautiful color. If an Indian Game cock is crossed with light hens, the pullets come very handsome and even. When Dark Brahma hens are used, many of the pullets will come black or very dark; the skin and flesh is rather yellow, but they fatten wonderfully well when put in a coop. Although they cannot be called a first-class table bird as regards the quality, they have an immense cut of meat upon them.

If an Indian Game cock is crossed with Buff or Partridge-Cochin hens, they produce very handsome birds. The pullets make excellent winter layers, usually commencing to lay at seven months old.

When crossed with Buff Cochins, the pullets come with buff bodies and black and brown markings, but, if the partridge are used, the pullets are beautifully pencilled all over. They make some of the best sitters and mothers of any cross-breeds we have, and can be sent on a railway journey without being put off their broodiness. As layers I have known them to produce 100 eggs per bird between September and the end of February, but such cases are the exception and not the rule.

The Houdan-Dorking is another excellent cross to use when laying and table qualities are required; they grow very quickly, feather fast, and are wonderfully hardy. The Houdan is a very good table bird in itself, but not large. When crossed with the Dorking, however, the crossbred chickens are almost as heavy as pure Dorkings. It is fresh blood on both sides and an entire change, so that this cross cannot fail to give satisfaction.

Houdans and Dorkings in their pure state both lay white eggs, therefore the pullets lay eggs of the same color. They are usually in full lay at six months old, and will lay well during the winter months. I have known birds of this cross to produce 180 eggs in the twelve months. The cockerels come a mixed or splashed color, more like that of a Dorking, but they have a little topknot on the head.

The pullets come very handsome. They are nearly all one shape, and, as a rule, nearly every one is black. They have a small topknot fitting close to the head, and a bib under the throat. Some of the pullets come white, and a few come the color of a Dorking.

As a bird for crossing, the Houdan cock cannot well be put in the wrong place. He can be mated with any other pure breed, cross bred, or mongrel.

Whenever table fowls are required for the market, it is always well to have a little Dorking blood in their veins, as the crossbred birds will have nice long breasts, as well as shortness of leg, and both these qualities are required in good table fowls.

Houdan-Orpingtons are quite equal to the Houdan-Dorkings as regards their table qualities, but they lay a larger number of eggs

during the year than the former cross, particularly through the cold weather.

Houdan-Indian Game are one of the quickest-growing crosses and the deepest-breasted table birds I know of. The Houdan has a long and the Indian Game a very deep breast, and the cross bred birds are wonderfully hardy. They would pay to go in for as table birds 15 per cent. better than any other breed, as they mature so quickly, and are ready for the table at an early age.

Most of the Houdan-Indian Game pullets come black, and the cockerels a mixed color. Some of the pullets will be in full lay at five and a half months old, if the early ones are kept, but it is better to sell the January and February hatched chickens for the table.

There is no advantage whatever in mating large birds together for table purposes to sell as spring chickens, as they are often not ready so early by three weeks as chickens which are reared from nice compact birds properly mated.

Houdan-Brahmas, Houdan-Plymouth Rocks, and Houdan-Orpingtons are good crosses to use; they answer very well in the early spring as table birds. Anything crossed with the Brahma or Plymouth Rock always plumps up well in the fattening pens. The Surrey people are glad to get hold of anything crossed with either of these breeds.

The Apiary.

The Honey Bee.

By R. F. HOLTERMAN, Brantford.

The lack of interest in the bee department of the farm, and failure in some of the operations with the bees, can often be traced to a lack of information upon the natural history of the bee. It is not so long since the superstitious, where a death occurred, told the bees of it, and many equally senseless superstitions were followed.

Not only will a little of the natural history be of interest and profit to beekeepers, but it can be studied to advantage by all who wish to enjoy the advantages to be derived from rural occupations.

A swarm of bees consists, when in a normal condition, of queen, workers, and sometimes drones. The queen is the mother of the hive, and only in rare instances do we find more than one queen in the hive. She is in no sense a ruler, as the name would imply, and the German term is far more appropriate, which, translated, means "mother bee." The queen, although produced from similar eggs to the worker, owing to a difference of treatment, becomes a very different bee, different physically, and different in its instincts. The general lifetime of a queen bee is three to four years or even more. She is carefully looked after and fed by the bees. Rarely, indeed, does the queen help herself to stores from the cells in the comb, but, after careful preparation, the worker bees are ever ready to feed the queen. She is the mother of the entire swarm, and at times deposits as high as three thousand eggs in a day, which is several times her own weight. Some would imagine that the queen must have excellent digestive organs to get the requisite amount of nourishment, but, as a matter of fact, the true stomach of the queen bee is smaller than that of the worker bee. The secret lies in the fact that the worker bees mix the food of the bees—pollen and honey—and allow it to undergo the first stages towards digestion in their own system, and, when it is about ready for assimilation, it is fed to the queen. The number of eggs deposited by the queen depends upon the variety, the individual queen, her age, the weather, the room in the hive, and the amount of honey coming in.

Such varieties as the Carniolan, Holy Land, and Cyprian are very prolific, the latter two especially so. The Italian is medium in this

respect, and, as a rule, the black the least so. Some queens, aside from variety, have the individual characteristic of being either very prolific or comparatively sterile. When selecting a queen, the preference should, other things being equal, be given to the prolific queen. A young queen will, as a rule, deposit more eggs than the old. In this respect a queen bee follows the general disposition of the hen. The first year she is at her best, the second she may show slight symptoms of failing, and so on until she becomes comparatively valueless in the hive. The weather, apart from influencing the inner temperature of the hive, even if there are flowers in abundance, may, through rain, prevent the bees from working, or the cold may have the same effect. When much honey is gathered, and the bees are carrying more food about the hive, the queen gets a greater quantity, and she is stimulated to deposit eggs, so that more honey gathered and more excitement in the hives means that more brood is reared, and the old bees perish more quickly and young bees are required to replace them. The room in the hive must, at times, influence the amount of eggs deposited. By that I mean that when the hive begins to be crowded with brood in all stages and with honey, and the queen cannot find room to deposit eggs, she must deposit less eggs in the combs.

Sometimes, when the queen does not appear to respond to generous food and carry out her function in life, the worker bees supersede their queen. They begin a number of queen cells, and rear young queens. The young queen is impregnated, and begins to deposit eggs in the cells, and, under such conditions, though rarely, I have seen, week after week, the young and old queen together in one hive. It appears almost as if there was a feeling that the old queen had labored faithfully during her best years, and the bees recognized that she deserved to die a natural death. Again, when the hive is crowded, and honey in the fields and woods in abundance, the bees get what is known as the swarming impulse. Under that impulse they start from five to over a hundred queen cells. The egg hatches in three days, and sixteen days from the time that the egg is deposited, or thirteen from the time that it hatches, the young queen emerges. The bees generally start several batches, maturing at different times. The object of this will be seen later on. The question will also be asked, Why are there so many queen cells? Several young queen cells hatch at the same time. These young queens have a royal combat; the strongest and most vigorous is thus likely to become the mother of the colony, and transmit her qualities to the worker bees. It is not generally known that the old bees and the old queen leave the old hives and look for a new home. Such, however, is the case. Generally about a week or eight days before the first cells start to hatch, the swarm emerges and leaves the hive queenless, with the exception of the partly matured cells. When the first batch of cells hatch, and a second swarm is thought of, these emerge with more bees to form another swarm, and leave the remaining cells, from which the mother of the old colony will emerge. The several young queens, which emerge and fly out with the second or after swarms, have a royal combat in their new home, and, as a rule, after swarms can be distinguished by the young, and sometimes numerous, queens. If a colony for some reason becomes suddenly queenless, the bees take eggs which would otherwise have developed into worker bees, and build about the

young larvae a queen cell, feed it with royal jelly, and in that way replace the old queen. The above will give us an idea of the conditions under which queen cells are built.

Jottings.

NOTICE.—New advertisements, notice of which is desired in the Jottings or Stock Notes columns, must reach us by the 20th of the preceding month. Items for Stock Notes, to secure insertion, must also reach us on the same date.

Manitoba Farm for Sale.—See the advertisement, in this issue, of the Manitoba Life Insurance Co., who have an improved farm in southern Manitoba for sale.

A Prolific Ewe.—A ewe belonging to Mr. Brackenridge, Westwood, Ont., recently gave birth to triplets, and, not content even then, followed this up by presenting its owner with a fourth lamb on the following day.

The Farmers' Binder Twine Co.—This company advertise their Red Star and Blue Star binder twine at 7½ and 6½ cents per pound, freight prepaid. Their advertisement will be found on another page.

Central Prison Binder Twine.—This pure manilla twine is advertised by Ald. John Hallam, Toronto, at 7½ cents, freight prepaid to nearest station, in lots of not less than 100 lbs. Read his advertisement.

American Hereford Record.—We have received from the secretary, Mr. G. R. Thomas, Independence, Mo., Vol. 14 of the American Hereford Record, which carries the number of entries from 55,001 to 60,000, and which is similar in every respect to volumes previously issued.

American Guernsey Herd Register.—The second number of the herd register and journal published quarterly by the American Guernsey Cattle Club has been received. A scale of points for Guernsey cows is given, and a large number of pedigrees and transfers are included in the issue.

Windsor Salt.—The Windsor Salt Works, Windsor, Ont., have obtained a great reputation for turning out the choicest brand of dairy salt. Butter and cheese makers would do well to give it a trial. If, instead of using cheap, common salt they used this, their dairy products would sell more readily and at better prices.

The North American Review.—Under the title of "Our Situation as Viewed from Without," Prof. Goldwin Smith eloquently considers, in the *North American Review* for May, the various political, financial, and social problems at present confronting the American people, and points out the storm centres of danger which may menace the stability of the Congressional system.

Rock Salt.—Rock salt does not waste away with the rain when placed in the pasture field, the only precaution necessary being to see that it does not lie in water. A strong box, with a slat bottom, or holes in it, so that the water can run out, is a good thing to use; but by placing the lumps on a rise of the ground so that the water falls away from it, you will find that it will not waste. Our best stockmen are now using the rock salt.

Seed Corn.—Mr. J. A. Simmers, seed merchant, Toronto, has in stock a large amount of that popular variety, of corn, the Early Hyson Dent. He can also supply the celebrated White Cap Yellow Dent corn, a new kind, introduced and sold by him for the first time. This is said to be the best corn yet offered, being suitable for all climates and soils. It grows large ears, and matures from seven to ten days earlier than the Leaming. Those desirous of getting choice turnip seed should procure some of Simmers' Champion Purple Top Swede. Roots grown from this seed won first prize at the last Industrial Exhibition, Toronto, for the best six roots, size and variety considered.

Tolton's All-steel Flexible Harrows.—It is with pleasure that we record information from Messrs. Tolton Bros., Guelph, the manufacturers of this celebrated harrow, to the effect that they have done a fine trade this season in this excellent harrow, notwithstanding the hard times, and that they have the very best of reports from parties who are using them, which indicates that there will still be a greater demand for them next season, and the firm will have to increase their output. This speaks well for their goods as being built "on honor." As the season has now changed, they introduce their celebrated Pea Harvesters, an advertisement of which appears in another column of this paper. This is another implement of which the firm have just reasons to feel proud from its record in the past, and those interested in growing peas would do well to acquaint themselves with this labor-saving implement.

Spray Pumps.—We have examined the Lewis' combination spray pump advertised in our columns by Mr. W. H. VanTassel, Belleville, Ont., and have come to the conclusion that it is an exceedingly valuable pump, not only for spraying, but also as an agricultural syringe for sprinkling potato vines, while it can be used as a veterinary syringe for injections. A very valuable feature about it is that it is all made of brass, except the small quantity of hose required for spraying purposes, and all the parts screw together. This enables the operator to take them apart with great ease when changing from one operation to another. These

arts, too, can be duplicated at any time with the certainty of getting a perfect fit. The arrangement of the nozzle by which the spray can be graduated from a solid stream to a fine or coarse spray without stopping work is very ingenious, and the nozzles cannot be clogged. The pump will throw a stream thirty feet high, if required. The illustrated book on "Insect Foes," sent free with each pump, contains very valuable information on spraying. A pump will be sent to any express office in Canada, prepaid, for \$6.95.

The Farmers' Manual and Complete Accountant.—Our last issue contained a reading notice of the "Business Guide" published by Messrs. J. L. Nichol & Co., Wesley Building, Toronto, a work which has had a great sale, and which has been found very useful by those who have purchased it. The present issue of THE JOURNAL contains an advertisement of another very handy book issued by the same firm. This is "The Farmers Manual and Complete Accountant," a large volume of nearly 500 pages, which is full of things that farmers can refer to with profit. There is a legal department, which gives concisely points of law on various questions, and useful tables are given. Farm bookkeeping receives due attention, and a special feature is the account book, which can be removed at the end of the year and a fresh one inserted. We have not room to mention all the useful things that can be found in it, but a sample copy will be sent to those applying and forwarding price, \$1.75, and the money will be refunded if satisfaction is not given.

Flavor in Butter.—(1) Is what the market calls flavor and aroma in butter the direct influence of the feed? Can flavor (market kind) be secured by the feed? If so, what rations fed to cows will give the desired flavor? (2) Has butter fat, when first drawn with the milk, any flavor that has a resemblance or relationship to the flavor that is found in the choicest made and high-priced butter? (3) Would indigestion in a cow, or her being unable to digest the ration because so large in amount, or gluttony, incident to a change of food where the amount was unrestricted, have any influence, had or otherwise, upon the taste of the butter? (4) What causes butter at times to have a taste like the food the cows have eaten? (5) If food is the source of flavor in butter, as some assert, of what use are "starters," cults, "No. 41," and the like, in fine butter-making? The above important questions will form the basis for a valuable treatise, to be printed in *The Royal News Yorker* of May 25th, by such noted authorities as Prof. H. W. Conn, Con-

Horse Owners! Try
GOMBAULT'S
Caustic
Balsam
 A Safe Speedy and Positive Cure



The Safest, Best BLISTER ever used. Takes the place of all liniments for mild or severe action. Removes all Bunches or Blisters from Horses and Cattle. **SUPERSEDES ALL CAUTERY OR FIRING.** Impossible to produce scar or bluish. 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 circular. **THE LAWRENCE-WILLIAMS CO., Toronto, Ont.**

THE BEST JUDGES

Of how much salt they need are the animals themselves, and, by placing a few lumps of

Rock Salt

around in the pasture, each animal gets just what they need. Keeps stock healthier because they are salted all the time. Here is one letter we got May 18th:

"Enclosed is \$2.00. Please ship me 400 lbs. of Rock Salt. We have already had THREE tons from you, and are all well satisfied with it. I expect to send you a larger order next week.
 R. F. McKay, Beaverton, Ont

You and your neighbors try a shipment. 400 lbs. or over at 50 cents per 100.

(Cash with the order.)
TORONTO SALT WORKS,
 228 Adelaide Street East, - Toronto

Butter and Cheese Makers.

Might as well expect to catch birds by applying salt to their little tails as to expect to make good cheese or butter with cheap, impure, common salt.

It is now an axiom among progressive dairy men that it pays to use the best salt.

Windsor Salt

is known to be the purest and most wholesome salt that can be found anywhere.

WINDSOR SALT WORKS, WINDSOR, ONT.

It is not Paradise,

But

If you have some cash to spare and are willing to work, financial independence cannot be more surely secured than by buying a few acres of irrigated land in Salt River Valley.

This valley is in Southern Arizona, and is noted for its fine semi-tropical fruits and superior climate. Horticulturists say that greater profits can be realized here from oranges and grapes than in Florida or California. Physicians assert that the warm, dry, bracing climate excels in healing qualities Italy's balmy air. The great blizzard of 1895 did not blight the tenderest leaf in this protected spot.

To get there, take Santa Fe Route to Phoenix, A. T., via Prescott and the new line, S. F. & P. Ry. Address: G. T. Nicholson, G. P. A., Monadnock Bldg., Chicago, for illustrated folders. They tersely tell the story of a remarkable country. Actual results are given - no guesswork or hearsay.

It is the Salt River Valley.

FOR SALE

Volume 1 to 31 Inclusive
American Shorthorn Herdbook
 with volume of pedigree English bulls and Allen's History of Shorthorns.
 First cheque for \$60 takes lot.
 Apply to
JOHN IDINGTON, Stratford, Ont.

FOR SALE.

Seven Shorthorn Bulls and twelve Heifers, forty (registered) Southdown and Leicester Rams and Ewes and a lot of Berkshire.
 All first class Stock, at hard-time prices.
 Come and see us or write for prices.
E. JEFFS & SONS,
 300 BOND HEAD, Ont.

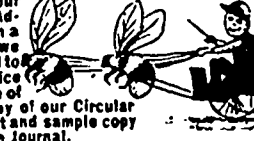
FOR SALE

Four extra good bull calves (Ayrshire) and a few fine heifer calves, out of such bulls as Prince of Byron and Norman of Robertsonland. Also some very fine Berkshire pigs, of different ages, bred by Knowlton. All direct from imported prize-winning stock, and all registered.

226 **A. TERRILL, Wooler, Ont.**

BEEES AND BEE-KEEPERS' SUPPLIES

ADDRESS GOULD, SHIPLEY & MUIR CO., LTD., BRANTFORD.
 By sending your Name and Address to us on a postal card, we will send you our Post-Office and Price List and sample copy Canadian Bee Journal.



W. C. EDWARDS & CO., Breeders and Importers.

ELMHURST STOCK AND DAIRY FARM,
Clarence, Ont.

Shorthorns of milking families with imported Grandeur at the head of our herd. Our Shorthorns are all imported from the best stocks in England. Berkshire Pigs. Young stock for sale. Post office and telegraph office, Clarence, Ont. Railway station and steamboat landing, Thurso, P.Q., on the C.P.R.

114

HENRY SMITH, Manager.



PINE GROVE STOCK FARM,
Rockland, Ont.

Special bargains on young bulls of superior merit and select Scotch breeding. Also thick young heifers at right prices.

Post Office, Telegraph Office, and Steamboat Landing, Rockland, Ont., on the C.P.R.

LAURENTIAN STOCK AND DAIRY FARM,
North Naiton Mills, P.Q.

Ayrshires, imported and homebred; herd headed by imported Emporor of Dromore 5431 C.A.H.R. and 1868 S.A.H.B. Jerseys, all of the celebrated St. Lambert family, herd headed by Lisgar Pigma of St. Annan 25704, A.J.C.C. Berkshire Pigs.

Young stock of all the above breeds for sale. Post Office, Telegraph Office, and Railway Station, North Naiton Mills, P.Q., on the C.P.R.

Jottings - Continued.

necticut; Prof. S. M. Babcock, Wisconsin; Maj. H. E. Alford, New Hampshire; Prof. J. L. Hills, Vermont; Prof. H. H. Dean, Canada; Professor J. W. Robertson, Canada; Professor W. H. Jordan, Maine; Prof. H. J. Waters, Pennsylvania. Up to the present time there is no published information on this subject, and as this series of articles is exhaustive, and by unquestioned authorities, they will form a valuable addition to dairy literature. The *Export and Importer* is giving just such valuable matter as this every week, and you can get it all for \$1 a year. Send two twenty-cent stamps for this number. Address *The Rural New Yorker*, New York.

The Thorncliffe Sale.—The sale of Shorthorns, the property of Mr. Robert Davies, Toronto, which took place on May 16th, was not largely attended. Perhaps the fact that it took place the day after Mr. D. D. Wilson's sale prevented many from being present. Only fair prices were realized for most of the stock, but in two or three instances the bidding was brisk. Isabella 3rd, a daughter of the famous old show cow, Lady Isabella (imp.), was bought by Mr. A. Johnston, Greenwood, for Col. Moberly, Kentucky, for \$250. Marnhall Duchess 6th, another Bow Park-bred animal, went for \$170 to Dr. Morton, Barrie, and Evelode 16th (imp.), a cow from the famous herd of Mr. J. Garne, Gloucestershire, Eng., to Mr. R. Miller, Brougham, for \$155. Several others passed the three figures. A very choice, mossy-coated heifer calf, Isabella Thorncliffe, a daughter of Isabella 3rd, brought \$100 from Mr. R. Myles, Toronto. Northern Light, the stock bull, fetched \$150, while Dr. Morton gave \$130 for the yearling, Aurora Borealis, and Mr. H. N. Crossley, Rosseau, \$125 for another yearling, Lord Outhwaite and. The following are the prices obtained and the buyers' names: Maggie Bly 12th, J. L. Dinsmore, Thornbury, \$75; Maggie Bly 13th, Geo. Prout, Zephyr, \$75; Lydia 4th, Dr. Morton, Barrie, \$131; Isabella 3rd, Col. Moberly, Kentucky, \$250; Evelode 16th (imp.), R. Miller, Brougham, \$155; Marnhall Duchess 6th, Dr. Morton, \$170; Isabella 3rd, Mrs. R. Miller, \$80; Thorncliffe 1st, R. White, \$70; Adeline and, J. Warnick, Barrie, \$66; Duchess of Brant 9th, A. D. Stewart, Hamilton, \$75; Evelode 11th, J. M. Lottridge, Hamilton, \$100; Thorncliffe Dawn, J. L. Dinsmore, \$71; Wave Rise, R. Miller, \$75; Isabella 9th, W. Holte, Toronto, \$100; Thorncliffe Dawn 2nd, J. Armstrong, Chester, \$45; Annabella 2nd, Capt. Robinson, Ilderton, \$50; Thorncliffe Dawn 2nd, G. Prout, \$50; Thorncliffe Dawn 4th, H. N. Crossley, Rosseau, \$50; Adeline 3rd, Dr. Morton, \$60; Adeline 4th, J. L. Dinsmore, \$55; Thorncliffe Pattie 2nd, J. Armstrong, \$41; Lydia 5th, Dr. Morton, \$50; Isabella Thorncliffe, R. Myles, Toronto, \$100; Lord Outhwaite and, H. N. Crossley, \$125; Northern Light (imp.), J. M. Lottridge, \$150; Aurora Borealis, Dr. Morton, \$120; 11th Duke of Hillsdale, Jas. Graham, Port Perry, \$70; Moonlight, D. B. Burch, Lambeth, \$90; Starlight, Anthony Howes, Concord, \$57; Northern Light and, Jas. Leask, Tamton, \$62; Lord Outhwaite 3rd, C. H. Irving, Newmarket, \$80; Northern Light 3rd, F. Jucker, Thornhill, \$40.

Mr. D. D. Wilson's Sale of Shorthorns.—A representative company of Shorthorn breeders met at Sixforth on Wednesday, 15th ult., to witness the dispersion of Mr. D. D. Wilson's recently established herd of Shorthorns. The more cheerful outlook, owing to a better demand for farm products, and especially the higher prices for beef cattle, made Shorthorn breeders jubilant, and the sale was decidedly a satisfactory one, although, had the cows and heifers been more forward in calf, several hundred dollars more would doubtless have been realized. This, together with the fact that only two had calves at foot, doubtless militated much against higher prices. Auctioneer Smith, however, was in his happiest mood, and he had nothing to complain of, as the bidding was brisk from start to finish. This sale, like several that have taken place this season in across the line that purchased were Green Bros., Indianola; T. W. & J. H. Gerlock, Harstman, Ohio. The first-named purchased the three-year-old heifer, Blythesome 12th, while Missie 13th and her yearling daughter, Missie May, by Pride of the Morning, went to J. H. Gerlock, W. C. Edwards, Rockland, Ont., secured the handsome three-year-old cow, Missie 12nd, by Sea King, while H. Cargill & Son bought no less than seven head, a royally bred lot of good things, among which was the splendidly bred imported two-year-old bull, Rantin' Robin, which we thought to be really the best individual yearling that we had ever seen on our rounds last season. Under are given a list of purchasers and the prices obtained: Early Bud (imp.), H. Cargill & Son, Cargill, \$195; Tulip 2nd, John McConnell, Dublin, \$95; Princess Dagmar 11th, John I. Hobson, No-borough, \$105; Diamond 12th (imp.), Adam Fleming, Milverton, \$150; Diamond 18th (imp.), H. Cargill & Son, \$280; Tulip 3rd, John Morrison, \$90; Missie 13th (imp.), J. H. Gerlock, Harstman, Ohio, \$265; Alexandria 2nd (imp.), H. Cargill & Son, \$140; Missie 12nd (imp.), W. C. Edwards & Co., Rockland, \$245; Spicy 14th (imp.), H. Cargill & Son, \$255; Rose of Autumn 4th (imp.), John Miller & Son, Brougham, \$185; Diamond Queen, J. Reynolds, Galt, \$145; Alexandria 2nd (imp. in dam), H. Cargill & Son, \$80; Missie May (imp. in dam), J. H. Gerlock, \$150; Blythesome Girl (imp. in dam), H. Cargill & Son, \$185; Rantin' Robin

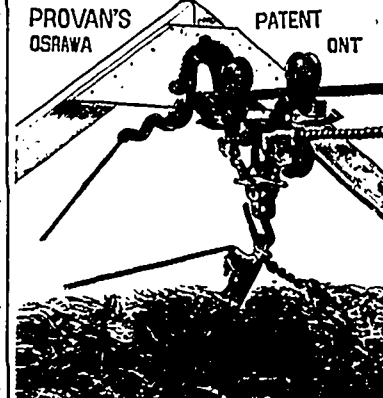
PROVAN'S

(Improved Malleable and Steel)

Horse Fork and Sling

Has been awarded first prize at all competitions, both in Canada and the United States, the latest victory being the only Medal and Diploma given on Hay Carriers, Fork and Sling, at the World's Fair at Chicago.

The jurors were unanimous, and many valuable points of undoubted superiority were allowed over an extensive opposition.



SIMPLE, STRONG, DURABLE.

Many farmers who had other kinds have taken them down, and bought mine after seeing it work.

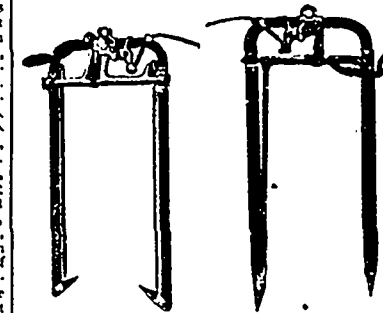
My Machine Handles Shelves as well as Hay and Peas. It is the simplest and Best Stacker Manufactured.

Our machine has been in successful competition for seven seasons, and its superiority over all others is not placed beyond a doubt. It is the only Double-Acting and Self-Reversing Machine on the continent that has the following advantages: A loaded fork or sling can pass the stop block. Our Pulley Hoister instantly raises or lowers the pulley from or to the peak, thus avoiding climbing or untying the rope from the whiffletree. The track used with this car is the best for the following reasons: It acts as a strengthening brace to the barn. It never warps or is affected by a side draw. The car runs easily, and can be readily moved from one barn to another. For unloading at the stable we have much the strongest end-lift. It takes up less room, and does not disfigure or weaken the building with posts or projecting beams.

While we do not recommend a Wood Track, we claim to have the latest improved and most reliable working Wood Track Car on the market.

GUARANTEE.

We guarantee every machine sold by us to do first-class work, and to unload one ton of hay in from three to five minutes, when properly handled and put up; and, if it fails to do so, will be taken back and money refunded.



SENDING TO FARMERS ON TRIAL

It has been for years a part of our business to send our machine on trial to fair-minded, responsible farmers living at remote distances, such machine to be put up by them and used until their harvesting is half done, when they are required to decide whether they will keep their apparatus or return it; if the latter we will pay return freight charges.

J. W. PROVAN OSHAWA, ONTARIO

Sole Manufacturer and Patentee.

SCOTCH SHORTHORNS AND BERKSHIRE PIGS FOR SALE



Choice young cattle of both sexes of the most select breeding. Also young Berkshire pigs from sows selected from the herd of Mr. J. C. Snell, Edmonton, Ont. Write for prices. W. WAARD, Hreilton, P.Q. Farm one-half mile from station C.P.R. 246

FOR SALE.

3 YOUNG SHORTHORN BULLS 3

From 8 to 24 months old, at prices and terms to suit the times. Come and see stock, or write

DAVID MILNE, Ethel, Ont.

Maple Lodge Stock Farm

—ESTABLISHED 1854—

We are now offering a splendid lot of young

BERKSHIRE PIGS

Can supply pairs not akin.

JAS. S. SMITH,

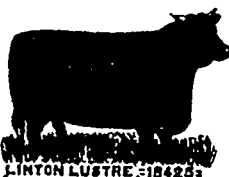
Maple Lodge, Ontario

AMPLE SHADE STOCK FARM

In Shorthorns and Leicesters we have some excellent show-yard timber, sure winners, coming forward for the fall fairs. Inspection invited.

E. GAUNT & SONS
St. Helens, Ont.

SHORTHORNS



I have for sale two nice yearling heifers, red, and red and little white, good ones. Also two bull calves, well bred, and well grown. All are from first-class stock, and at reasonable prices.

D. ALEXANDER, Bridgen, Lambton County, Ont.

SHORTHORNS FOR SALE



YOUNG BULLS AND HEIFERS

FOR SALE.

Write for particulars, or come and see stock. Prices reasonable. Address,

JOHN MILLER, Markham, Ont.

Farm three miles from Locust Hill, C.P.R., and four miles from Markham, G.T.R. 2091

SIMMONS & QUIRIE, IVAN, ONTARIO.

Breeders of Shorthorns and Berkshire Pigs

The herd is headed by the Matchless bull, Royal Saxon 10317 =, by Ex. S. 1017 (imp.) = 2693 = (5123), with Barnpton M. 10240 =, bred by Barnpton Hero = 374 =, as reserve. Among the females are representatives of the Strathallans, Minns, Goldeneyes, Mysies, Elvins. They are Bates, with Scotch crosses. The herd of Berkshires includes many prize-winners, and are an exceedingly choice lot. Farm 2 miles from Ilderton Station, G.T.R. Stock of all kinds for sale. Apply to

C. M. SIMMONS, Ivan P.O., Ont., or JAMES QUIRIE, Delaware, Ont.

GLENBURN STOCK FARM.



A fine lot of young Berkshire pigs ready to ship. Can supply pairs not akin. Prices reasonable.

JOHN KACEY, Jr., 24 Lennoxville, Que.

"THE BRIARS" SUTTON WEST, ONT.



84 Head of Registered Shorthorns.

Including bulls of various ages, incorporating the best blood of the Scotch and English Herds. Also HORSES AND PIGS. Inspection invited.

F. C. SIBBALD, 249

J. CARSON, Agent, Yorkton, Assa.

H. I. ELLIOTT

BREEDER OF

Scotch Shorthorns and Southdown Sheep Imported King James at the head of herd. Riverview Farm, Danville, Que. 335

FOR SALE.

Three very fine young SHORTHORN BULLS, from twelve to eighteen months old, sired by the imported Scotch bull Invincible, and from good recorded cows. Also a few heifers and a number of improved large White Yorkshires and large Berkshire pigs for sale at reasonable prices.

H. J. DAVIS, 195 Woodstock, Ont.

FOR SALE. SHORTHORN BULL

An extra good roan calf, eleven months old, from the unbeaten show heifer Vanity, winner of firsts at Toronto, Montreal, and London; also cows and heifers, good ones.

H. & W. SMITH, 256 Half a mile from Exeter Stn. Hay, Ont.

FOR SALE.

Two yearling Shorthorn bulls. Good animals. Will be sold at prices to suit the times.

JOHN DAVIDSON, 332 Ashburn, Ont.

AYRSHIRES.

AVONDALE STOCK FARM.

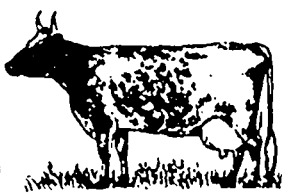
Dominion Chief, by (imp.) Royal Chief, dam (imp.) Jess, at the head of the herd. Among the cows are imported Fairy Queen and Amy, the 1893 silver medal cow at the Industrial. From these I now have young bulls for sale, also a number of superior young bulls and heifers of different ages. Heifers always on hand.

JOHN H. DOUGLAS, 232 Warkworth, Ont.

ALEX. HUME,

Burnbrae P.O., Ont.,

Importer and Breeder of Ayrshire cattle and York-shire pigs, besides bulls, cows, heifers and calves of the choicest breeding, either for milk or showing. We have on hand and coming on, grade calves whose dams, g. and g.g. dams, are deep and persistent milkers. Purebred bulls have been used on herd for past twenty years. Pigs of the best type and pairs not akin always on hand. Prices low.



Telephone Hoard's Station, G.T.R.

AYRSHIRES.

NEIDPATH STOCK FARM

Thos. Ballantyne & Son
Stratford, Ontario.

Purebred Ayrshire Cattle

Herd consists of the imported bull, Beauty Style of Auchincbrain, and ten imported cows of the highest milking strains and their progeny, by imported bulls.

GREENHOUSE STOCK FARM.

W. B. Cockburn, Nassagaweya, Ontario,
Breeder of Ayrshire Cattle, Oxford Sheep and Berkshire Pigs.

I have several choice bull calves from imported cows for sale, at prices to suit the times, also a nice lot of shearing Oxford ewes, and some very promising Berkshire pigs. Write for prices and particulars.

AYRSHIRE BULLS FOR SALE.

One yearling Bull, one two-year-old Bull, Heifer and Bull Calves. All from choice milking stock. Prices reasonable. Address,
WM. KIDD, Petite Cote, Que.

HIGH-TESTING AYRSHIRES

Our herd has won the dairy tests at the leading eastern exhibitions for the past two seasons. The famous Stock Bull GOLFUR GUINNA was for years at the head of our herd. We breed to produce performers. Young stock to dispose of. Write for particulars.

ROBERTSON & NESS,
Howick, Que.

AYRSHIRE CATTLE

DAVID BENNING, Glenhurst,
Williamstown, Summerstown Station G.T.R.,
Breeder of Ayrshire Cattle, Leicester Sheep, and Berkshire Pigs. The bull, Tom Brown, and heifer White Floss, winners of sweepstakes at World's Fair, were bred from this herd. Young stock always for sale.

AYRSHIRES FOR SALE.

Young stock of both sexes, sired by Silver King 589, and Chieftain of Barcheskie 536, for sale at reasonable prices. Write for prices or call and see my stock.
D. DRUMMOND, Jr.
Near Montreal. 187 Petite Cote, P.Q.

BRITISH ADVERTISEMENTS.

Secretary to the National Sheep Breeders' Association of England and the Southdown Sheep Breeders' Association; Hon. Sec. Kent Sheep Breeders' Association.

W. W. CHAPMAN,

PEDIGREE LIVE STOCK AGENT AND EXPORTER.

All kinds of Registered Stock, Horses, Cattle, Sheep, and Pigs Supplied on Commission.

References—**JOHN JACKSON & SON,** Abingdon, Ont.; **N. CLAYTON,** Selsey, Chichester, Eng.

Offices: Fitzalan House, Arundel St., Strand, London, England.

Registered address for cables—"Sheepcote, London."

SALE OF REGISTERED SOUTHOWNS

This celebrated registered stock, the property of **MR. H. PENFOLD,** Selsey, England, will be sold during August, 1895, without reserve. Breeders, don't lose this opportunity, a chance of a lifetime, to buy. **W. W. CHAPMAN,** Fitzalan House, Arundel Street, Strand, London, Eng., will execute any commissions entrusted to him.

Jottings—Continued.
(imp.), H. Caroll & Son, \$250; Scottish Pride (imp. in dam), Gardhouse Bros., Malton, \$300; Toronto, Alex. Gardner, Leadborough, \$50; Sailor Lad, G. T. McKay, Kuppen, \$75. Huron, John Berry, Leadborough, \$75. Summary: Twenty-one animals sold for \$1,410, an average of \$67.19.

Stock Notes.

NOTICE.—New advertisements, notice of which is desired in the Jottings or Stock Notes columns, must reach us by the 20th of the preceding month. Items for Jottings, to secure insertion, must also reach us on the same date.

Horses.

Messrs. R. BRITH & Co., Bowmanville, Ont., have sold, to Mr. Stevens, Attica, N.Y., their well known sweepstakes Hackney stallion, Ottawa.

MR. W. A. FANNING, Cambrai, who has hitherto handled roadsters entirely, has purchased a half interest in the imported Clydesdale stallion, The Thistle.

MR. T. C. PATTERSON, Eastwood, Ont., has shipped from Montreal a pair of fine carriage horses for the Prince of Wales, and another pair for Lord Lansdowne.

MR. HUGH CARMICHAEL, Manilla, has purchased from Mr. W. Lamb the imported Clydesdale stallion, Haddo Chief, and is travelling him in the townships of Mariposa and Brock.

MR. T. H. EVANS, Yelverton, Ont., has sold his prize-winning Clydesdale stallion, Uanvar (imp.), to Messrs. Herbert & Hawkins, who are having a good season with him in the neighborhood of Lindsay and Ormeau.

Hov. M. H. COCHRANE, Hillhurst, Que., held a sale of Hackneys and half-bred stock, at the Victoria Rink, on the evening of the 10th of May. Fairly satisfactory prices were made. The following is a list of the sales: Maxwell, imported gelding, to Mr. W. Price, \$210; Grandier, bay gelding, to Mr. L. Martin, \$130; Qui Vive, gelding, to Mr. Geo. Foster, \$155; Sandringham, bay gelding, to Mr. Montagu Allan, \$400; Councilor, chestnut gelding, to Mr. J. Magor, \$135; Sir Charles, to Mr. Skead, Ottawa, \$225; Game Cock, gelding, to Mr. Beaubien, jr., \$155; Mayfair, chestnut mare, to Mr. W. J. Price, \$170; Florella, bay mare, to Mr. R. J. Dillon, \$230; Florentia, bay mare, to Mr. J. Magor, \$170; Hackney stallion, Donnacoma, to Mr. T. H. Smith, \$100; Monarch and Mikado, to Colonel Hughes, \$200 pair; Mona, bay mare, to Mr. W. G. Ross, \$140; Gold finch, bay mare, to Mr. J. Perault, \$165; Clansdowne, gelding, to Mr. R. Beith, \$200; Lansdowne, gelding, to Mr. J. Darling, \$165; Kilkenny, gelding, to Mr. J. Roi, \$180; Marquis, gelding, to Mr. Geo. W. Stephens, \$275; Sir Patrick, gelding, to Mr. Boswell, Quebec, \$100; Lisgar, gelding, to Mr. Skead, Ottawa, \$160.

Cattle.

MR. R. H. CRUMP, Masonville, Ont., has two Holstein bulls for sale.

MR. J. W. LEE, Simcoe, Ont., advertises a few grand young Holstein bulls for sale, also Yorkshire pigs, and Oxford Down rams.

MR. CHAS. CUMMING, of the firm of Cumming & Powell, furniture dealers, Galt, has purchased from Mr. Wm. Kough, Owen Sound, his farm of 300 acres, and will interest himself in stockraising and dairying.

MR. H. K. FAIRBANKS, Theford, Ont., reports his stocks as doing well, and cows are milking heavily, as there is plenty of good, luscious grass. He is fitting up some fine young things for the principal fairs this fall, and has a good young bull for sale.

MR. JOHN MILLER, Markham, Ont., has sold his wonderful two-year-old red Shorthorn bull, Aberdeen, winner of the first prize at the last two Industrial exhibitions, Toronto, and at other places, to Mr. E. Green, Indianola, Ill., for a high figure.

MR. DAVID DUNCAN, Don, Ont., has purchased from the Flood Farm, Lowell, Mass., the young Jersey bull, Costa Rica's Son, a son of Costa Rica 64579, dam of the great Merry Maiden. He has also bought from the same firm a couple of inbred combination heifers.

MR. R. H. CRUMP, Masonville, Ont., reports that his herd of Holstein-Friesian cows averaged him \$65 each from milk sent to the creamery in 1894, in addition to the fresh milk fed to calves and kept for homes.

Dick's Liniment cures All Lameness and Sprains

BRITISH ADVERTISEMENTS.

Hampshire - Down - Sheep GREAT ENGLISH PEDIGREE SALES,

JULY, AUGUST, and SEPTEMBER, 1895.
WATERS & RAWLENCE, SALISBURY, ENGL., will sell by auction during the season upwards of **50,000 PUREBRED EWES, RAMS, and LAMBS** including both Rams and Ewes from the best prize-winning flocks in the country. Commissions carefully executed. Address,
Office of WATERS & RAWLENCE, The Hampshire Down Sheep-Breeders' Ass'n, Salisbury, England.

Edwin Buss, Elphicks, Horshoude, Kent, Eng.

Breeder of Pedigree Large White Yorkshire and Berkshire Pigs. Highest awards at Royal Shows. Boars, Yells, and in pig Sows of either breed always for sale. Yorkshire boar in use, Holywell Bath (1799), winner of 10 firsts, 4 seconds, 2 reserves. A few pedigree Blate-bred Shortorns kept.

Important Southdown Sheep Sales in England.

John Thornton & Co. will sell by auction on Thursday, August 22nd, 1895, the entire Registered Flock No. 21, belonging to Hugh Penfold, Esq., at Selsey, Chichester, Sussex, N.H.—This flock will be sold in conjunction with Messrs. Hobgen Bros., Friday, August 23rd, 1895. The entire Registered Flock No. 9, belonging to W. Toop, Esq., Westergate, Chichester, Sussex. Catalogues and particulars may be had of **JOHN THORNTON & CO., 7 Princes Street, Hanover Square, London, England,** who will execute commissions and attend to shipping.

NUTTON SHEEP.

PUREBRED SUFFOLK SHIRE, from registered flocks, for exhibition or exportation. Full particulars may be obtained upon application to the Secretary of the Suffolk Sheep Society. Address

ERNEST PRENTICE,
Auctioneer and Commission Agent,
Stowmarket, England.

SIR THOS. BARRETT LENNARD, Woodingdean, Rottingdean, Brighton, England.

Registered Southdown Flocks 7 and 8 at Bellus in Essex and Woodingdean in Sussex. Winner of many prizes, including the gold medal given by the Emperor of the French at Poissy; first prize, Fat Stock Show, Lewes, 1892; and commended at Chichester, 1892. Full pedigrees kept, and all ewes numbered.

PAGHAM HARBOUR CO., Selsey, Chichester, England.

Flock of 1,000 ewes, winners Southdown Challenge Cup in 1894, 1st prize Wool; Jubilee, Royal, and Royal Prize Ram Lamb in 1892-93-94.

SUSSEX CATTLE.

Pedigree Sussex cattle descended from the oldest and best strains of blood (first prize for bull and also for cow at County Show, 1894), also registered Southdown sheep (Flock No. 25 S.D.F.B.), for sale at reasonable prices. Apply to the owner

T. BANNISTER, Litchhurst, Hayward Heath, Sussex, England

H. T. LOCKE-KING, Brooklands, Weybridge, England.

Registered Southdown Flocks, 10 and 11.

Ewes individually numbered and full individual pedigrees of every sheep recorded in private flockbook. Rams and ewes always for sale, descended from all the best and purest blood. Shire horses also kept, bred from noted prize-winner.

KIDNER EDWIN,

LICENSED VALUER AND SALESMAN,
BREEDER OF
Registered Dorset Horn Sheep, Shropshire Sheep, and Devon Cattle.
All commissions personally executed. Address:

MANOR FARM,
Cothelstone, Taunton, Somerset, England.

Messrs. J. R. & R. R. KIRKHAM . . .

Own a flock of about 2000 Lincoln sheep, having always rams and ewes for sale. Individual pedigrees recorded, and given with every animal. Enquiries and inspection solicited. Address:

Biscathorpe House, Lincoln, England

The Household Companion is included with THE JOURNAL in the subscription price of \$1 per year.

BRITISH ADVERTISEMENTS.

Lord Hastings' Grand Champion Red Polled Bull, Broadbent 1721 is for sale. He is by Bardolph 977, out of 1905 Hunch, by Passion 714. Broadbent won champion and 1st prizes at the Royal Agricultural Society's Show, at Warwick, 1893, and Reserve for Champion, and 1st prize at Chester, 1894, and numerous other prizes. He is a rare stock getter, and is only sold in consequence of having been used quite enough in the herd. This is a magnificent opportunity for any one to obtain the best bull ever bred.

Some young bulls, cows, and heifers also for sale. APPLY TO
Estate Office, Melton Constable, Norfolk, England

F. N. HOBGEN, F.S.I. T. C. HOBGEN, F.S.I.

HOBGEN BROS.

Auctioneers and Cattle Commission Agents,
CHICHESTER, SUSSEX, ENGLAND.
Appointed Auctioneers to the Southdown Sheep-Breeders' Association.

Lincoln Longwool Sheep-Breeders' Assoc'n Ram Sale, 1895.

The Fourth Annual Sale of Lincoln Longwool Rams will be held in Lincoln, England, on Friday, Sept. 6th, 1895. The Fourth Flock Book is now ready. Price, 5 shillings.
St. Benedict's Square, Lincoln, Eng. Stephen Upton, Secretary.

SIR THOS. BARRETT LENNARD, Woodingdean, Rottingdean, Brighton, England.

Large White pigs of prize-taking blood, bred entirely from the stock of Sanders Spencer, Walker Jones, and Duckering, and Berkshire pigs from the stock of Benjafield. Boars, yells, and sows always for sale at very moderate prices.

KENT OR ROMNEY MARSH SHEEP.

The Walmer Court Flock, established in 1822, duly registered and recorded in "The Flock Book of the Kent or Romney Marsh Sheep-Breeders' Association," has long been considered a leading flock, and has won over \$2,500 at the R.A.S.E., and other leading shows. Inspection and enquiries invited. Apply to the owner,

H. PAGE, Walmer Court, WALMER, KENT, ENGLAND.

Southdown Sheep-Breeders' Association of England.

THE ANNUAL SHOW AND SALE OF RAMS, Ewes, Lambs, and Ewes will be held at **CHICHESTER, ENGL.,** on August 27th and 28th, 1895. A Second Sale will also be held at **Lewes, ENGL.,** in September, 1895.

All enquiries, etc., in relation thereto to be addressed to
W. W. CHAPMAN,
Fitzalan House, Arundel Street, Strand, London, England,
who will execute any commissions entrusted to him.

LORDS A. & L. CECIL, Orchardmains, Tonbridge, Kent, England,

Breeders of Clydesdales, and successful exhibitors of the same at all the chief shows of Great Britain. Numerous prizes have been won in the closest competition. Only the best and most fashionable strains are kept. The stud, which can be seen at any time, is always kept in a natural condition and is under the direct personal management of the owners. The whole of the colts and fillies, being reared in a hardy way, can be thoroughly recommended. Mares, colts, and fillies always for sale. Foreign orders executed, and stock shipped by experienced men.

REGISTERED SOUTHOWNS,

Flock No. 6, Southdown Flock Book.
Property of **F. N. Hobgen, Appledram, Chichester, Sussex, England.**

Sheep always for sale. Inspection invited. The best only are kept. Specialty, good wool and mutton combined.

JAMES LAWRENCE, Stall Pitts' Farm, Shrivvenham, Bucks., England

BREEDER OF . . .
Registered Berkshire Pigs, from stock unsurpassed for true characteristics, size, and quality. One of the oldest established herds in England.
Enquiries Solicited - - Prices Moderate

AYRSHIRES.

MENIE STOCK YARD.



Bro. der of Ayrshire Cattle and Berkshire Pigs. First-class pedigree stock always on hand and for sale. First-class milking stock a specialty. Hoard's Station, C. E. R. W. M. STEWART, Jr., Menie, Ont.

CHOICE AYRSHIRES.

Stock bull is Imported SILVER KING who took 1st prize 2 year old class in 1913 at Montreal Hochelaga, London, Ottawa, Toronto, as also silver medal there as best bull of any age. Dam of Silver King is Nelly Osborne (imported) who took 1st as milk cow and champion medal at World's Fair, and has sire is Traveller, the champion Ayrshire bull of Scotland. I offer For Sale young stock of both sexes raised by this famous young bull, and whose dams are not only good individuals and prize winners, but heavy milkers as well, with exceptionally high test for quality. Please address D. MOLACHLAN, 126 Petite Côte, P.Q.

JAMES COTTINGHAM,

Riverside Farm, Breeder of Ayrshire Cattle. Herd traces direct to stock imported by Andrew Man, Montreal, and headed by the prize-winning bull, Sir James (5051); sire, Rob Roy (3971). Stock of both sexes for sale at all times, including some choice young bulls and heifers. Correspondence solicited. Visitors welcome. Railroad station and post office, Ormstown, Que. Farm one mile from station. 337

WOODROFFE STOCK AND DAIRY FARM.

YORKSHIRES! YORKSHIRES! Sired by the celebrated sweepstakes boar, Kincroft Giant - 424 -, now stock boar at Central Experimental Farm, and also others by my own stock boar, Wallace - 1671 -, all from choice sows. Fairs not akin. Also AYRSHIRES. Write for prices. J. G. CLARE, Ottawa, Ont.

F. W. TAYLOR, WELLMAN'S CORNERS, - ONTARIO.



A number of purebred Ayrshire calves of both sexes, and also a few high grades, due to calve in March, April, and May. 2:3

A. McCALLUM & SON Spruce Hill Dairy Farm. DANVILLE, Que Importers and breeders of purebred Ayrshire cattle. Our stock is specially bred from cattle of the deepest milking strains, with high percentage of butter fat. Young stock always for sale at reasonable prices. Correspondence solicited. 198

POLLED ANGUS.

THE HOME OF THE DODDIES.

Hardy Healthy Hornless Handsome We have still some very fine bull calves, and one bull just two 3/4 year old dam Myra - (Vulfram, sire Rannymede 2nd, that grandly bred terrible Ruth bull, which we will sell at a bargain to make room; also females, all ages. Farm 3 1/2 miles from Sarnia Tunnel Station. Give us a call. W. M. STEWART & SON, WILLOW GROVE FARM, Lutesville P.O., Lambton Co., Ont. 182

Stock Notes.—Continued.

Use. The dairy of the two yearling bulls Mr. Crump offers for sale elsewhere in this issue averaged, for the year, 4 2/3 and 4 per cent. butter fat. Mr. R. GIBSON, Delaware, Ont., will hold a great sale of Jersey cattle, comprising all his fine herd, except calves, on Thursday, June 20th. These cattle can be highly recommended both for breeding, business purposes, and for the show ring, as every one is aware who has attended the Western and other shows during the last few years. At the same time will be sold a number of good Shorthorn cows and steers, York-shire pigs, and a Shetland pony. Jersey buyers must not omit to take in this sale.

Mrs. S. P. TANKER WILLETTS, "The Old Brick," Rosslyn, I. L., has lately sold to Mr. Graeff, Westport-on-Champlain, N.Y., a splendid lot of young Guernseys. Among the lot are a beautiful daughter of Squire Kent, Mrs. Willetts famous stock bull, and also a daughter and granddaughter of Squire Kent's dam, imported Anodyne. May King, a beautiful young son of May Queen, was also among the number. The lot selected were an unusually choice lot, and compare very favorably with the other purchases made by Mr. Graeff. This gentleman also took from "The Old Brick" a fine Berkshire Longfellow boar and six sows. He has now the largest farms in New York state, and his herd is, perhaps, only exceeded in numbers by that of Governor Morton.

Messrs. W. M. STEWART & SON, Willow Grove Farm, Lucaville, Ont., write: Winter is over and spring is here, and our stock have held their own well. We have just sold the following young bulls: Magnet of W. G. 17/53, dam, Myra 2nd, sire, Rannymede 2nd, to Mr. Wm. Miller, Bunyan, Ont.; also one of our fine Polled Angus Bull calves, Lord Forest of W. G. 2/985, dam, Mayflower 3rd of Hill 6882, sire, Lord Forest 1/152, to Wm. Loehe, Sebringville, Perth county, Ont. We have a very fine lot of calves, consisting of four bulls and two heifers, also some very good young females, which we would sell reasonably to make room for the increase in our stock. If not sold, they will give an account of themselves in the show ring this fall.

Swine.

Mr. C. R. DECKER, Chesterfield, Ont., has Berkshires for sale.

Mr. E. B. KOLB, Berlin, Ont., can furnish pairs of Tamworth pigs not akin.

Mr. DENNIS HAWKINS, Woodville, Ont., has a choice lot of Berkshires advertised in this issue.

Messrs. H. BENNETT & SON, St. Williams, Ont., will sell good York-shire pigs at reasonable figures.

Mr. JOHN RACRY, Jr., Lennoxville, Que., says: Our Shorthorn and Berkshires have come through the winter in fine order. We have an exceedingly good lot of young pigs to dispose of, principally by our boar Randolph, bred by N. Benjamin, the balance being by the old prize-winner Clifford, and out of choice well-bred sows. There are some grand young boars in the lot. Our young bulls have all been sold, with the exception of one that is too young for service this season. Persons wanting something good in the way of Berkshires would do well to write, or call and see our stock.

Mr. M. H. PARKER, Sussex, N. B., reports: My Berkshires have wintered well, and, as a result of advertising in THE JOURNAL, I have made a large number of sales. Prices this season are fair, and the demand for Berkshires has been much greater than I expected, and nearly all my young pigs of this breed are now sold. Among recent sales are the following: To the Kincardine Agricultural Society, Carleton county, N. B., one boar and four sows; to the Clifton Agricultural Society, one boar and two sows; to Mr. Charles H. Cook, Carletonville, N. B., one boar. Yorkshires have also done well, but there is not as great a demand for them as formerly. Farmers are beginning to realize that the hog that is easiest to feed is the best for them. I have several young pigs of this breed still left, and can supply good pairs, not akin, from choice stock. I shall breed Berkshires more extensively in future, and expect to have a large stock for another season. The following are some recent sales of Yorkshires: To Mr. Samuel M. Gamblin, English Settlement, N. B., one boar; to the Clifton Agricultural Society, one boar and two sows; to Mr. Archibald Scott, Glassville, Carleton county, N. B., three boars.

Sheep.

Mr. JOSEPH STRATFORD, Bradford, Ont., intends shortly having a dispersion of Shropshire and Dorset Horned sheep, lambs all ages, together with a lot of well bred colts. Look out for advertisement later on.

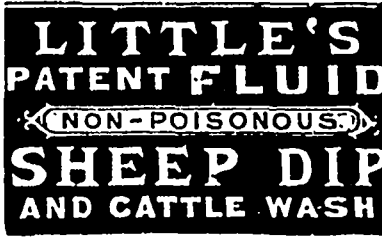
Messrs. JOHN THORNTON & Co., London, Eng., advertised in another column, will sell by auction, on Thursday, August 2nd, the entire flock of South-downs belonging to Mr. H. Penfield, Seley, Sussex, and on the following day the entire flock of Mr. W. Toop, Chichester, Sussex. Catalogues can be had from Messrs. Thornton.

Poultry.

Mr. JOHN J. LEFROS, Oshawa, writes: Please tell your readers that I have no more Bronze turkey eggs for sale this season. The way people have been ordering turkey eggs gives me the idea that I should need at least twenty-five hen turkeys to fill all orders. The egg trade this spring has simply been enormous, while the results from the eggs sent out are very satisfactory. I have a large stock of youngsters on hand ready for the fall trade. They are doing well, some weighing one and a quarter pounds already.

Dick's Condition Powders Fattens Horses and Cattle

TO STOCKMEN AND BREEDERS



For the destruction of Ticks, Lice, Mange, and all insects upon Sheep, Horses, Cattle, Pigs, Dogs, etc. Superior to Carbolic Acid for Ulcers, Wounds, Sores, etc. Removes Scurf, Roughness and Irritation of the skin, making the coat soft, glossy, and healthy. The following letters from the Hon. J. Dryden, Minister of Agriculture, and other prominent stockmen, should be read and carefully noted by all persons interested in Live Stock: "MAPLE SHADE" HERDS AND FLOCKS.

DRAR SIR,—I cannot afford to be without your "Little" Sheep Dip and Cattle Wash. It is not merely useful for Sheep, but it is invaluable as a wash for Cattle, etc. It has proved the surest destroyer of lice, with which so many of our stables are infested, I have ever tried; it is also an effectual remedy for foul in the feet of Cattle. I can heartily recommend it to all farmers and breeders. JOHN DRYDEN.

1917 Gold, Silver, and other Prize Medals have been awarded to "Little's Patent Fluid Dip" in all parts of the world.

Sold in Large Tins at \$1.00. Special terms to Breeders, Ranchmen, and others, requiring large quantities. Ask your nearest druggist to obtain it for you; or write for it, with pamphlets, etc., to

ROBERT WIGHTMAN, Druggist, Owen Sound. Sole Agent for the Dominion.

HOLSTEINS.

HOLSTEIN-FRIESIAN CATTLE.

For Sale, two extra bulls from the best milking strains, at prices to suit the time. Correspondence solicited. JOHN MCGREGOR, Constance P.O., Loudesboro Station. 171

SPRING BROOK STOCK FARM.

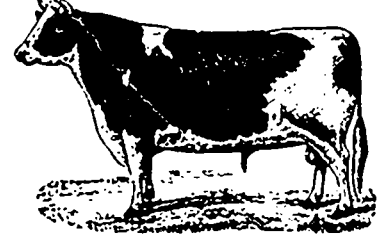
Holstein-Friesian Cattle, Improved Yorkshire and Tamworth Swine. Bargains in Holsteins; special in calves. Stock of all ages for sale, be 1 strain. Great choice in Tamworths. Ask at once for prices. A. C. HALLMAN, Now Dundee, WATERLOO CO., ONT.



Fairview Farm

E. PANNABECKER Breeder of Grand Milking Registered Holstein Cattle. A specialty in females of all ages at present. 244 Hespeler, Ont.

BROCKHOLM HOLSTEINS



Netherland Ronulus, a grandson of Netherland Prince and Albino 2nd, at the head of herd. Original stock cows all imported from Holland. Also Improved Large Yorkshire Pigs of the best strains. Young Stock for Sale. R. S. STEVENSON, ANCASTER P.O., ONT. 177

HOLSTEIN-FRIESIAN CATTLE FOR SALE.

Five extra good bull calves fit for service, and one two-year-old heifer in calf, at reasonable prices. Come and see them. Wm. SUHRING, SEBRINGVILLE, Ont.

HOLSTEINS.

FOR PRICES ON

HOLSTEINS

WRITE TO

F. A. FOLGER

RIDEAU STOCK FARM

BOX 577 KINGSTON, ONT.

HOLSTEIN-FRIESIANS H. BOLLERT, Cassel, Ont.

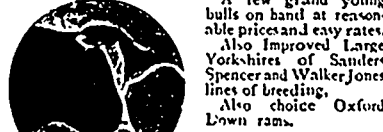
I now offer for sale several very choice bulls fit for service; they are of rare breeding, with great milk and butter records to back them. Also females of all ages and at breeding at prices that are right. Remember the best are the cheapest. Come and see them, or write for prices and full particulars. 339

Two Thoroughbred Holstein Bulls for Sale.

Both calved April, '04, sired by my imported bull Excelior Netherland Clothilde. His six direct female ancestors have records which average 19 lbs. 1 1/2 oz. of litter in a week, and five of them average 15-410 lbs. 12 2/3 oz. of milk in a year. Both well marked. Price \$50.00 each. R. H. CRUMP, Masonville, Ont.

HELボン STOCK FARM

Holstein-Friesians of the highest producing strains, founded upon the best imported families of NORTH HOLLAND.



A few grand young bulls on hand at reasonable prices and easy rates. Also Improved Large Yorkshires of Sanders Spencer and Walker Jones lines of breeding. Also choice Oxford Down rams. J. W. LEE, Simcoe, Ont.

FOR SALE.

Three Registered Holstein Yearling Bulls, fit for service. Dams Heavy Milkers.

Terms Reasonable. Address,

JAMES RAE, Avonton, Ont.

Brookbank Holsteins Won Milk Test at Toronto, both 1st and 2nd prizes. Silver medal for best female, any age. Prizes in every female section, from cow to calf inclusive.

At the Great Fairs, first and diploma, best bull, any age; also first prize and diploma, best herd, at Ottawa.

All our Prize Winners in the two-year old, one-year-old and calf sections were bred at Brookbank. All ages for sale. Special bargain in choice bred bulls and heifers from prize-winning stock.

Also Poland China pigs, sired by a World's Fair prize winner. Write for particulars. Visitors welcome.

A. & G. RICE,

Currie's Crossing P.O. and Station Six miles south of Woodstock, Oxford Co., Ont. 165

REGISTERED HOLSTEINS

FOR SALE BY

ELLIS BROTHERS, BEDFORD PARK P.O., ONT.

1/2 miles north of Toronto, on Yonge Street. Electric cars bring you to our gate. Inspection Invited and Correspondence Solicited.

JERSEYS.

JERSEY BULL CALF FOR SALE.

Calved 26th July, 1911, handsome, solid, dark fawn black tongue and switch. Sire, Exciter 23626. Dam, Matrina of St. Lambert 87304. The dam is grand-daughter of the famous Canada's John Bull 8385. Also some fine registered Berkshire pigs. 234 WILLIAM CLARK, Meyersburg, Ont.

JERSEYS.

JERSEY COWS.

Heifers in calf, heifer calves, and bull calves. Handsome, richly bred, good color, and in fine condition. Come and see, or address

J. C. SNELL,
Edmonton, Ont.

R.R. Station, Brampton, G.T.R. and C.P.R.

GREAT SALE OF JERSEYS

I will sell my entire herd of Jerseys (except calves) at my farm, Delaware,

ON THURSDAY, JUNE 20th, '95

They are of the highest breeding, and for business purposes cannot be excelled.

At the same time will be sold a number of
**Shorthorn Cows and Steers,
Yorkshire Swine, and a
Shetland Pony.**

RICHARD GIBSON, Delaware.

FOR SALE.

A. J. C. C. JERSEY BULL CALF.

Dropped Nov. 12th, 1894. Solid color, black points. Combines close up to blood of Ida's Rioter of St. L., 19 tested daughters.
Stoke Pogis, 37 " "
Tormontor, 33 " "
Ida's Stoke Pogis, 33 " "
Pedro, 21 " "
Ida of St. L. tests 30 lbs. 2 oz.
Allie " 26 " 12 oz.
Onan " 22 " 2 oz.
Eurotas " 22 " 7 oz.

For particulars and prices, write

H. FRALEIGH, - St. Marys, Ont.

SHEEP.

SMITH EVANS, GOUROCK, ONT.,



BREEDER and IMPORTER of Registered Oxford Down Sheep
Importation for 1893 arrived August 4th, selected from some of the best flocks in England. Stock for sale at reasonable prices.

156

SHROPSHIRES FOR SALE

A choice lot of shearling rams, ewe and ram lambs. A few rams two and three years old

Also young Yorkshire pigs, all ages

T. H. MEDCRAFT,

Sparta, Ont.

Eight miles from St. Thomas, Ont.

122

1881 SHROPSHIRES 1881



Our flock, the oldest Shropshire flock in Canada, was founded in 1881. Importations made from time to time, selected in person from best English flocks. This season stands are a strong lot, dropped in January and February. Orders can now be taken for pick.

J. COOPER & SON,
Kippin, Ont.

157

A Choice Lot to Pick From.

Consisting of Ram and Ewe Lambs, and Ewes in Lamb. The finest lot of Shropshire Lambs we ever bred, and you cannot object to the prices we ask. Let us hear from you.

Allen McPherson,
Forest, Ont.



SHEEP.

FOR SALE

SHROPSHIRE RAMS,

AND

YOUNG SHORTHORN BULLS (Registered)

Also a few females. Apply to

C. H. IRVING,

Box 99, Newmarket, Ont.

112

MONTROSE STOCK FARM

Breeder of Shorthorns (Waterloo Booth strains.) Shropshires, Berkshires, Shornes, Turkeys, and Fancy Plymouth Rocks. I make a specialty of raising Swede Turnip Seed, warranted fresh and 1/2 lb. sufficient per acre. The best quality of turnips grown. Write for prices.



HORACE CHISHOLM, Paris, Ont.

218

T. W. HECTOR

The Cottage,

Springfield-on-the-Credit, Ont.

Breeder and Importer of

DORSET HORN SHEEP

And dealer in

Saddle and Carriage HORSES.

Stations: Springfield, C.P.R., and Port Credit, G.T.R.

179

LEICESTERS.

In strong competition at leading fairs our flock won high honors. We will dispose of a number of choice ewe and ram lambs. Also good breeding ewes in lamb. Write us for particulars.

E. ARCHER & SONS, Warwick, Ont.

212

SPRINGBANK STOCK FARM

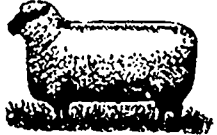
SHORTHORN OATLE, OXFORD SHEEP, BERKSHIRE PIGS, AND BRONZE TURKEYS.

Three Bull Calves for sale, sired by a grandson of Indian Chief. Good animals. Prices to suit the times.

Having made some additions to our breeding pen of Bronze Turkeys, we will be prepared to offer eggs for settings from stock of the best quality. Price, \$2.50 per 13.

JAS. TOLTON, Walkerton, Ont.

115



The Largest Lincoln Flock in Canada!

Our breeding ewes, 150 in all, are from the best English flocks. Our last importation was made from the flock of Mr. Henry Dudding, and were all personally selected. If you want a ram or a few ewes, send along your order. If you want shearlings or lambs of either sex, we can supply you with the very best.

J. F. GIBSON, Denfield, Ont.

W. WALKER, Ilberton, Ont.

On London, Huron & Bruce Railroad.

148

FAIRVIEW'S SHROPSHIRES.

I can now book orders for lambs sired by the Columbian champion, Newton Lord. Many of them have for dams first-prize winners in Canada, England, or at the great World's Fair. A few late 1894 lambs of similar breeding are now offered for the first time. Among them is a ram by Newton Lord, and out of the two-year-old first-prize ewe at the World's Fair, which won, in all, four firsts at that great show. No one wanting something choice will be disappointed in paying Fairview a visit. A personal selection preferred.

Come or Write.

JOHN CAMPBELL,

Fairview Farm,

WOODVILLE, ONT. CANADA.

213

Whiteside Bros.,

The Glen, Innerkip,
Oxford Co., Ont.,

Shropshires—Yearlings and lambs. Berkshires—Breeding stock, both sexes. A Yorkshire—Three excellent bull calves for sale.

In writing mention this journal.



133

SHEEP.

SYLVAN AND BRANT STOCK FARMS.

We have a very choice flock of Oxford Down Sheep from which we have a very superior lot of ram lambs by imported rams.

Flock is registered. Personal inspection solicited.

Turner & Jull,
125 Burford, Ont.



BUENA VISTA FARM, - HARRISTON, ONT

Breeders of improved large Yorkshire Swine, milking Shorthorns, Oxford Down sheep, and Plymouth Rock fowls. Some fine young Yorkshires now for sale. Write for prices.

JOHN COUSINS & SONS.

71



Oxford Downs.

Our flocks are composed of imported sheep, or sheep directly descended from imported stock. Choice ram lambs, sired by the Royal winners, Royal Warwick 3rd and "Bath and West."

Also choice Yorkshire pigs, principally of Walker Jones' breeding.

Railway Stations,
Dutton, on M.C.R.
Glencoe, on G.T.R.



R. J. HINES, Dutton.
K. FINLAYSON,
Campbellton.

SWINE.

ST. WILLIAMS HERD

OF IMPROVED

YORKSHIRE SWINE.

A grand litter for sale from our prize-winning stock. Bred from best strains. Stock guaranteed as described. Prices low. Correspondence solicited.

H. BENNETT & SON,
St. Williams, Ont.

Large English Berkshires

Of the best recently imported families from which I now have a choice selection of fall and spring pigs. Pairs furnished not akin. Also a few superior York hires of the best strains.

Dennis Hawkins, - Woodville, Ont.

The PINE GROVE HERD of DUROC-JERSEY SWINE

I have a few choice boars fit for service; also a few choice young pigs of either sex, ready for shipment. Can supply hams not akin. Prices reasonable, and satisfaction guaranteed. Inspection invited and correspondence solicited. Address,

CHARLES ANSTICE, Springfield, Ont.
B. & T. Railway.

354

FOR

Chester Whites

All ages, and at prices in accordance with the times, write to

JOS. CURNS,

Cumlochle, Ont.

375

Large English Berkshires for Sale

Three sows in pig, also young stock, both sexes. Address

R. J. DIXON,
Glensden, - Ontario.

273

Your paper is always welcome to our home, to myself and family. Am sorry that more of my neighbors do not see fit to take it. Of course the plea is that money is so scarce, but I think the little money is well invested.

DONALD FRASER, Emerson, Man.

SWINE.

Pleasant View Nerd

REGISTERED TAMWORTHS



Sows in pig to (imp.) Birmingham Hero, also fine young stock of both sexes. Pairs not akin. At prices to suit times. Call and inspect or write.

E. B. KOLB, Berlin, Ont.

BERKSHIRES.

A CHOICE lot of sows for sale, bred to farrow in February and March, and some to breed yet. A few boars fit for service. Young pigs of various ages. Call and see stock, or write for prices and description.

J. H. STEFFERT,

NORTH BRUCK, ONT.

DANIEL DeCOURCEY, Bornholm, Ont.

OHIO IMPROVED CHESTER WHITE SWINE

Young Stock of above always for sale. Satisfaction guaranteed and prices right. Pedigrees furnished with all sales, and nothing shipped but first-class stock.



250 Correspondence solicited and visitors welcome.

Young Registered Berkshires.

NITHSIDE FARM.

A choice lot of young registered Berkshires for sale, ten sows seven months old, in pig by an extra good sire of the modern type, also six boars from five to seven months old at prices to suit the times. A grand lot of young ones two months old. Satisfaction guaranteed.

E. E. MARTIN, Canuing, P.O.

Paris Station, G.T.R., Ont.

YORKSHIRE PIGS

of the best type and breeding. Pairs not akin now ready.



Also ROAD AND CARRIAGE HORSES, bred at King's Road Stock Farm.

J. M. HURLEY & SON, Belleville, Ont.

Box 412.

The Home of the Poland Chinas

We have the best herd of Poland China Swine in Canada. Our herd won all the sweepstakes diplomas and herd prizes, and 22 out of 26 first prizes, at the three largest fairs in Canada in 1894.



Our herd is headed by Darkness Quality, the winner of first prize in his class over 41 entries at the World's Fair in Chicago in 1893. Young stock for sale at all times. Prices reasonable and stock guaranteed to be as represented.

Address,
W. & H. JONES,
Mount Elgin, Oxford County, Ont.

160

ESSEX COUNTY HERD OF POLAND CHINAS.

I have still a few boars left fit for service, and a few sows ready to mate, which I will sell cheap, in order to make room for fall pigs, of which I have a nice lot, and expect more soon.

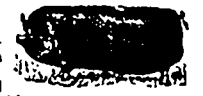


I give a registered pedigree and guarantee every pig to be as represented. R. B. McMullin, Goldsmith P.O., Ont.

243

LARGE ENGLISH BERKSHIRES FOR SALE.

Choice boars, fit for service. Some choice sows in farrow by 600 lbs. boar. Young stock, both sexes, all ages. Pairs furnished not akin at reasonable prices. Write for further particulars to



C. R. DECKER, Chesterfield P.C.

2/3 miles to Bright Station, G.T.R.

KEEP YOUR EYE ON THIS SPACE

MAPLE LANE FARM. One mile north of Clarendon, on C.P.R.

Choice young boars from three to nine months old. Young sows imported and homebred, bred to three imported hogs. A fine lot of ten just farrowed; four imported sows to farrow. Special rates by express. All stock guaranteed as described. Visitors welcome.

C. T. GARBUTT,
Clarendon, Ont.

247

SWINE.



E. D. GEORGE
PUTNAM, ONT.
Impoter and breeder of
**OHIO IMPROVED
CHESTER WHITE SWINE**
The largest and oldest estab-
lished registered herd in Canada.
I make this breed a speciality and
furnish a good pig at a fair price.
Write for prices.

ELMDALE TAMWORTHS



Boars fit for service.
Sows ready to breed. Also
a choice lot of spring pigs,
all from prize-winning
stock. Pairs furnished
not akin. All stock regis-
tered.

JOHN C. NICHOL,
Hubrey, Ont.

**FINEST STRAINS
LONG ENGLISH
BERKSHIRE
PIGS**

BOW PARK

'JOANETTE'
OATS

**BOW PARK CO. (LTD.)
BRANTFORD
CANADA.**

Canada Wilkes.

A first-class specimen of the most
fashionable strain of Poland Chinas
in the world at head of herd.

Stock of all ages for sale at hard-times prices



Send for illustrated catalogue of

**POLAND CHINAS,
POULTRY,
and RASPBERRY PLANTS**
(In season)

Correspondence solicited, and per-
sonal inspection invited. Address,
CAPT. A. W. YOUNG,
Tupperville, Ont.

**Red Tamworths, Yorkshires,
and Ayrshire Cattle.**

Tamworths, all ages, of good quality and best of
pedigree.
Five Yorkshire Sows, 4 months, registered, crated
F.O.B. \$15.00 each, good individuals.
Ayrshires of the very best strains. All ages, of
either sex.

CALDWELL BROS.

Brlery Bank Farm, 217 ORCHARD, ONT.

BERKSHIRES

of the best strains, not akin, from a number of grand
sows and three different boars, 24 first prizes won this
season, all ages, for sale, including sows in farrow.

W. McALLISTER, Varna,
Buckhorn Station, Huron Co.

MAPLE LEAF FARM

IMPROVED LARGE YORKSHIRES

Markham Bards, the
sweepstakes litter
over all breeds at Fat
Stock Show at Guelph
in 1897, was bred by
us. A choice lot of
young sows old
enough for mating.
Also young boars. Pairs furnished not akin. Only
first-class stock shipped.



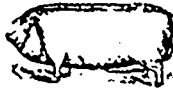
JOHN PIKE & SON,
Locust Hill, O., C.P.R. Markham C.T.R.

I enclose your paper, and consider the infor-
mation you impart invaluable to the general farmer.
Long may you prosper in the good work. CHAS.
T. PARK MARTIN, Eganville, Ont.

SWINE.

THOMAS DOLLIN & SON
Chatham, Ont.

Importers and breeders
of Ohio Improved Chester
White Swine. Young stock
of above always for sale.
Satisfaction guaranteed,
and prices to suit the times.
Pedigrees furnished with all sales, and nothing but first
class stock shipped. Four choice brood sows for sale,
registered. Correspondence solicited.



**Ontario Central Herd of Improved Chester
Whites.**

A few choice show boars and sows from two of the
best sows in Ontario, and sired by (Imp.) White Lord,
also a few extra good imported Duroc Jerseys and their
produce from the best herds in the United States.
Satisfaction guaranteed.

WM. BUTLER & SON, Dereham Centre.

DUROC JERSEY SWINE.

We have a fine lot of
first-class young pigs of
either sex, also a few
young sows ready for
breeding, all are bred
from imported and prize-
winning stock. Call
supply pairs not akin.
Before buying come and inspect our stock or write for
prices.



TAPE BROS., Ridgetown, Ont.

THE PINE VIEW HERD.

Chester White and Berk-
shires spring litters now
ready for shipping at rea-
sonable prices. Would like
to clear all Berks off this
month, as I intend to make
a speciality of the one breed, Chester Whites. For
further particulars, write



JAS. H. SHAW - SIMCOE, ONT.

Norfolk Herd of Registered Poland Chinas

Several very fine young sows bred to my imported
boar due to farrow in March and April. Also pigs
from six weeks to three months old. Breeding stock
selected from some of the best herds in Ohio and
Canada.

Prices low, considering quality of stock.

R. WILLIS, jr.,
Box 38, GLENNEYER, Ont.

**The Spruce Grove Herd of Tamworths and
Yorkshires.**

We offer young
sows ready to breed,
and fit for service, of
either variety, of best
breeding and indi-
vidual merit, at right
prices. Stock heavy.
Call and inspect, or write for prices.



J. P. MASTER,
New Dundee, P.O.; Baden, G.T.R.; Drumbo, C.P.R.

**The Avon Herd of Registered Tamworth,
Chester White, and Imported
Poland China Swine.**

We have still some
choice Tamworth
boars and sows, fit
for service. We have
a choice lot of spring
pigs of Tamworths,
Poland Chinas, and
Chester Whites; pairs
furnished not akin.

HERRON & DAFOR, Avon, Ont.

LARGE ENGLISH BERKSHIRES.



My breeding stock have been selected from the best
English herds. Two imported boars, and eight im-
ported sows all breeding. Pigs of all ages to select
from.

ISRAEL GRESSMAN,
NEW DUNDEE, Ont.

TAMWORTH SOWS.

Bred to farrow in March, pigs not akin, four
months old, extra good, from prize-winning stock.

POLAND CHINA BOARS.

Fit for service. Prices moderate. Come and see
me, or write.

FRANK ROW, Avon, Ont.

SWINE.

**The HURON HERD OF REGISTERED
POLAND CHINAS.**

Young stock from prize winning
strains at the leading shows. Have a
number of first class young boars and
sows, six weeks old. Can supply
pairs not akin. All stock registered
or eligible. All stock guaranteed as
described. Prices to suit the times.
Write for particulars and prices, or call.



WESLEY W. FISHER,
Bonmillier, Ont.; Goderich Station.

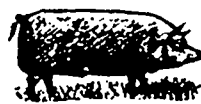
RED TAMWORTH PIGS.

Red Tamworth Pigs of
the best strains. Stock of
my breeding has taken
highest honors at the
Industrial and other shows
this season. Young boars
and sows of all ages now
on hand. Pairs furnished
not akin.



LEVI MASTER,
Haysville, P.O. New Hamburg, G.T.R.

**THE MAPLES HERD OF PUREBRED
TAMWORTHS.**



A fine lot of young
sows just the age for
mating; young boars
ready for service; a
great choice in wear-
ing pigs.

J. L. REVELL, Putnam, Ont.

RED TAMWORTHS.



My breeding herd is
almost all imported. The
noted English herds are
represented. Boars and
sows old enough for mat-
ing, also some good spring
litters all ready for shipment. Correspondence solicited.

ANDREW DUNN, - Ingersoll Ont.

FRANCIS RUSNELL,

Mount Forest, Ont.

Breeder of Improved
Large Yorkshire pigs,
young boars and sows of
good breeding for sale.
Prices to suit the times.



BERKSHIRES FOR SALE

My Berkshires have secured a large number of the
most important prizes at Toronto, Montreal, and Lon-
don exhibitions in 1897; also several prizes at the Fat
Stock Show in Guelph, including sweepstakes for best
purebred sow of any age or breed.
A choice lot of all ages for sale.

Please mention THE LIVE STOCK JOURNAL.
GEO. GREEN, Fairview P.O.,
Stratford Station and Telegraph Office.

**Ohio Improved Chester and
Tamworth Swine.**

Our herd of Improved
Chester Whites have won
more sweepstakes for the
past five years at the large
exhibitions of Ontario and
Quebec than all other herds
combined in the Dominion, also in holding the sweep-
stakes sow over all breeds at Fat Stock Show, Guelph,
1896.

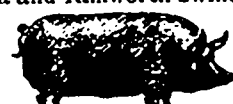


Our Tamworths are selected from the best herds in
England, and winners of several of the best prizes at
the large exhibitions of Ontario, including the sweep-
stakes, Ottawa, and Fat Stock Show, Guelph, of 1894.
Have thirty imported and home-bred sows of the
above herds, bred to imported boars, for spring trade,
also a few boars fit for spring service. Orders looked
for spring pigs in pairs or trio, not akin. Reduced
rates by express. Prices away down for the next 30 days.

H. GEORGE & SONS,
Middlesex Co. Crampton P.O., Ont.

**POPLAR HILL HERD OF REGISTERED
Poland China and Tamworth Swine.**

A few good
September and
October pigs for
sale. Also one
good P. C. show
sow, one year old
last September.
The sows that I
bred for March and April pigs are first-class aged sows,
and nothing but good pigs will be shipped on order.
Prices reasonable.



WM. ROW, Avon P.O., Ont.

"I am well pleased with the results of my adver-
tisement in THE LIVE STOCK JOURNAL, and wish you
every success with your paper." - J. G. MAIR, Howick,
Que.

SWINE.



**ASHTON
GRANGE FARM.**

Improved Yorkshire and Berkshire Swine.
Young stock from prize winners at leading shows
or pairs of either breed now ready for shipment.

WM. TAIT,
St. Laurent, P.O.
Near Montreal.

MEDAL HERD OF 1894.

Chester White Swine and Dorset Horned Sheep, of
all ages, for sale at prices to suit the times.
R. H. HARDING, Thorndale, Ont.
Middlesex County.

**POLAND CHINAS.
My Herd**

Is composed of the most popular strain of im-
ported prize-winning blood. I now have a num-
ber of

Superb Young Sows

due to farrow in May or June. Others ready to
mate. Also young boars. Satisfaction guaran-
teed, and prices to suit the times.

**OLIVER DRURY,
FARGO, ONT.**

JOSEPH FEATHERSTON, Pine Grove
Farm,
STREETSVILLE Post Office and
Telegraph (late Springfield-on-the-Credit,
Ont.). Impoter and breeder of Improved Large White
Yorkshire and Essex swine. This herd obtained twenty
first, nine second, five third, and four fourth prizes at
the World's Fair, Chicago, 1893. I have now on hand
a choice lot of Yorkshire sows, from the first prize boar,
and out of some of the sweepstakes sows; also a limited
number of first-class young boars fit for service this
fall, and fifty breeding sows, which I am breeding to
Hazel King (1891), Halton King (1892), and the boar Holy-
well Key, bred by Sanders Spencer, England, just im-
ported in July last, selected for me by J. G. Snell,
Edmonton, as the best boar in all England.

**63 CHESTER WHITE SWINE.
REGISTERED STOCK.**

Tonloue Geese, Pekin Ducks,
Brazo Turkeys, eggs \$1.00 per
12. Partridge and Buff Co-
chins, Plymouth Rocks, Silver
Gray Pouter, Golden, Silver,
and White Wyandottes, Brown
and White Leghorns, Black
Hambours, American Domin-
giques, Black Red and Black
Sumatras, and Italian and Bli
Games; eggs, \$1 per 12. Will
mix sittings if desired; also a few pairs of Wild Tur-
keys for sale. **G. BENNETT & PARDO,**
Charing Cross, Ont.



HORSES.

ROBERT NESS
Breeder and Breeder of
CLYDESDALES

FROM THE BEST STUDS IN SCOTLAND.
English and French Carriage Horses, Shetland
Folies, and Ayrshire Cattle.

**WOODSIDE FARM,
HOWICK P.O., Que.**

**—IMPORTED—
Clydesdale and Hackney Stallions**

FOR SALE
Highest Prize-winners in the Leading
Shows of the World.

And the gets of famous
sires, such as Lord En-
line, Darnley, Old Times,
McCamol, Garnet Cross,
Prince Edward, Prince
Henry, Sir Windham,
Good Hope, Fireaway,
and Macgregor.
Prices reasonable.
Catalogues furnished
on application.



ROBERT BEITH & CO.,
Bowmanville, Ont.

237 Bowmanville is on the main line of the G.T.R., 40
miles east of Toronto, and 294 west of Montreal.

POULTRY.

W. J. STEVENSON,
OSHAWA, ONTARIO.

BREEDER OF
GOLDEN AND WHITE WYANDOTTES,
WHITE LEGHORNS,
WHITE PLYMOUTH ROCKS.

I have been at it for 30 years, and will cheerfully give my experience to beginners who send stamp for reply. One pen of white Plymouth Rocks for sale.
384 EGGS, \$1.00 for thirteen.

CANADA'S BEST

ARE IMPORTED, BRED, AND SOLD BY

JOHN. J. LENTON,

Park Farm, - Oshawa, Ont.

EGGS FOR HATCHING, from grand pens of White, Silver, and Golden Wyandottes, Barred and White Plymouth Rocks, at only \$1 per nine, or \$100 per fifteen. Also Bronze Turkeys of immense size, eggs, 25 cents each, or \$1 per thirteen. My birds are bred for use, as well as for sale; so if you want to be sure of success, you need eggs from this stock. No birds for sale until after July 1st.

I am Canadian agent for the celebrated WEBSTER & HANNUM BONE-CUTTER.
Send to me for catalogue.
311

PINE TREE FARM

JAMESBURG, NEW JERSEY.

2,000 Land and Water Fowl.

EGGS

For hatching, from our noted strain of Mammoth Pekin Ducks.

\$1.50 per 13; \$2.50 per 25;
\$4.50 per 50; \$8.00 per 100.

EGGS

From Light and Dark Brahmas, Barred and White Plymouth Rocks, White, Silver and Golden Wyandottes, Black Minorcas, and Buff Leghorns.

\$1.50 per 13; \$3 per 30.

EGGS

From White and Brown Leghorns.

\$1.00 per 13; \$2.00 per 30.

Send for large Catalogue of other varieties.

D. A. MOUNT, W. H. ORDWAY,
Superintendent. 379 Proprietor.

EGGS for hatching from White Plymouth Rocks, \$2 for 13, White Holland Turkeys, \$1 for 13, Aylesbury and Rouen Ducks, \$2 for 13. My fowls took 1 first, and 1 second prize at Toronto; 1 first, and 2 second at London, and 1 first, 1 second, and 1 third at the Ontario Show. Address,
379 JAMES McKEE, Norwich, Ont.



FOR SALE

Eggs for Hatching from thoroughbred Light Brahmas, Black Langshans, Black Hamburgs, White Wyandottes, White Plymouth Rocks, Redcaps and Pekin Ducks. Write for prices. Eggs guaranteed fertile.

C. J. WRIGHT,
Dixville, P.Q.

P.O. Box 114

Barred
Plymouth Rocks.

Fowls of best strains and color.

EGGS FOR SALE - - \$1 per 13.

Guaranteed fertile. Full particulars on application.

E. DUNSMORE,

356 St. Paul's Station, Ont.

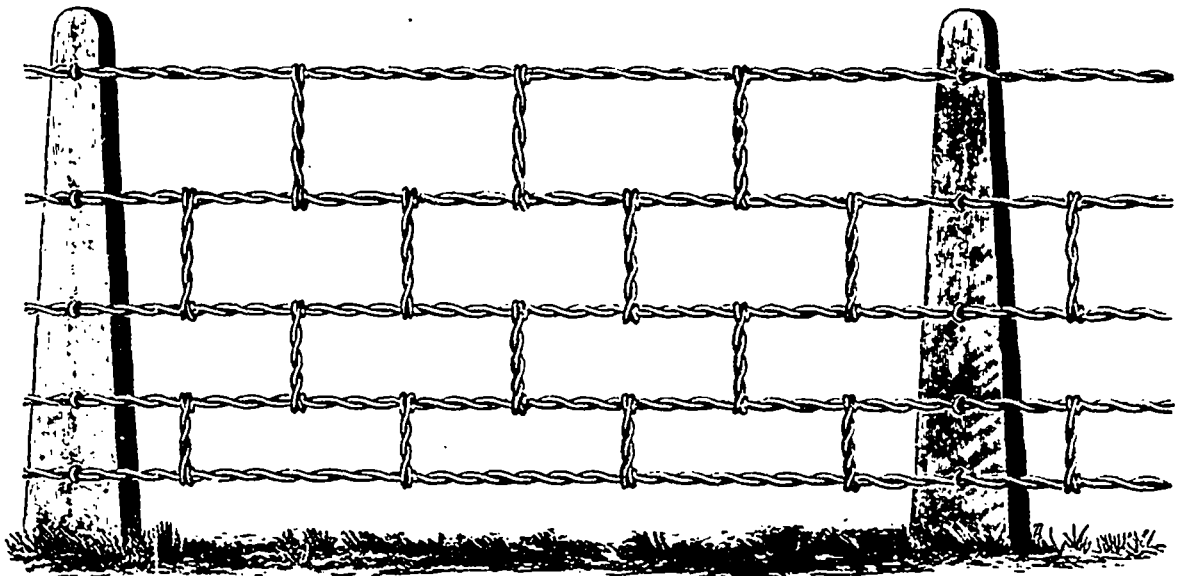
Mammoth Bronze Turkeys, . . .
. . . Silver Grey Dorkings,
Brown Leghorns, . . .
. . . Black Minorcas,
White Wyandottes. . . .

Still a few grand Bronze Toms left. Eggs from our best mated yards, at farmers' prices.

T. & H. SHORE,

31 White Oak, Ont.

The Collins Twist Fence Wire.



The Newest, Latest, Best and Cheapest Fence Wire in the Market.

Made of two No. 12 Steel Wires, uniformly twisted, making it very strong and handsome. Being galvanized will not rust. The great advantage in this fence is in our cross sections, or connecting wires. Should one wire be subjected to a strain, the strain is at once equally distributed over the whole fence, thus preventing sagging and getting out of shape as most others do. It is light, consequently cheap, requiring less strands to make a complete fence. Correspondence solicited. Prices and particulars cheerfully given on application. One good agent or representative wanted in every town and village in the Dominion to represent us. Cut this out, it may not appear again.

MANUFACTURED ONLY BY THE COLLINS MFG. CO., 66 ESPLANADE ST. W., TORONTO

Mention LIVE STOCK JOURNAL.

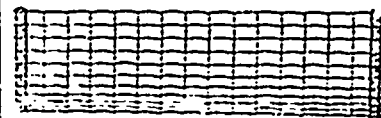
The World-Beater of the Pea Field

Wettlaufer Bros.'
Pea Harvester

Testimonial from W. W. BALLANTYNE, son of the HON. THOS. BALLANTYNE, M.P.P.:

I bought one of the Wettlaufer Bros.' Pea Harvesters, and I worked on smooth and rough ground, cutting twenty acres with it. It is far ahead of all Pea Harvesters I ever saw or heard of. It has no rod behind, nor hinge, which all other Pea Harvesters have.
DOWNE, September 21st, 1893.
W. W. BALLANTYNE.

WETTLAUFFER BROS. - - - Stratford, Ont.



BEFORE BUILDING

FENCE

Get Particulars and Prices of

The Page Wire Fence Co.

of Ontario, Ltd.

Walkerville, - Ont.

THE FARMERS' BINDER TWINE CO.

BRANTFORD, ONT.

Don't confuse this company with any other. This is the Farmers' Company, Mr. Joseph Stratford president. We have named a price at 2 1/2 cents for our "Red Star" and 4 1/2 cents for "Blue Star" binder twine, freight prepaid. So don't be lugged with unknown brands of sial or old American twine. Even our "Blue Star" is principally manilla, and of a quality that will stand comparison and test with twine quoted at a very much higher figure. Also bear in mind that this company was instrumental in reducing the price of twine, and holding it at about cost for three years. Give us your undivided patronage if you want us to remain in competition.

Iron Fencing,
Communion Railing,
AND ALL KINDS OF
IRON AND WIRE WORK.
ADDRESS:
Toronto Fence and Ornamental
Works.
JOSEPH LEE, Manager. 73 Adelaide St. W.

USE
MYERS'
ROYAL
POULTRY SPICE
THE GREAT EGG PRODUCER

THE Locked-Wire Fence Company

INGERSOLL, ONT.

The accompanying cut represents five panels of fence and gate of the LOCKED-WIRE FENCE, which has been built with improved corrugated hardened steel stay and flanges steel clamps, a combination which is proof against the most curvy stick or designing men. The stay in the wire is continuous with steel clamps, which are locked into a spring adjusting the fence to heat or cold.

Perfectly Safe, Stronger, Better, and Cheaper

than any other fence, and without doubt the best fence on the American continent.

All persons having wire fences erected in the past should use the stay and steel clamps of the Locked-Wire Fence Co. on them. The clamp consumes all the slack, makes the fence tight, and adds one to two percent to its value, at a very small cost.

We desire to inform the farmers and public generally that we are prepared to supply the material for erecting the fence throughout the Dominion of Canada.

Recollect, we are the only firm that is furnishing the genuine material in the form of the corrugated hardened steel stay and flanges steel clamps.

THE BEST FENCE MADE FOR FARMS AND RAILROADS.

AGENTS WANTED in every township

Send for circular and particulars

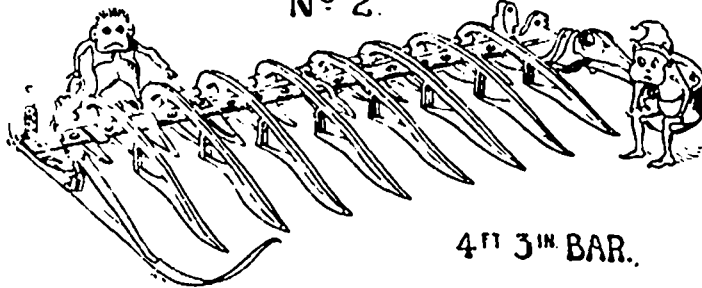
THE Locked-Wire Fence Co.

INGERSOLL, - ONT.

The Genuine Tolton Pea Harvester

THOUSANDS NOW IN USE.

No 2.



4 FT 3 IN BAR.

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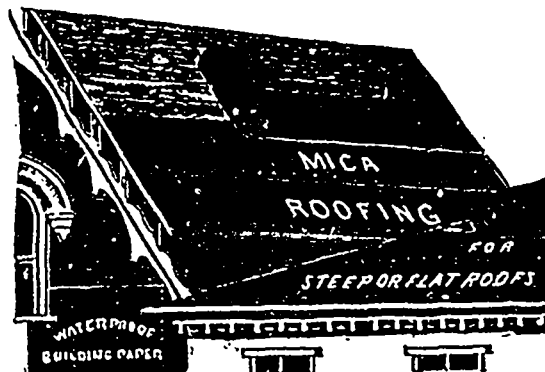
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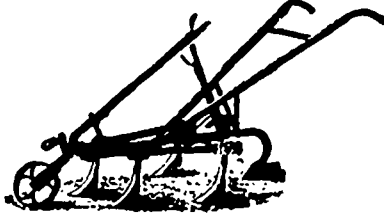
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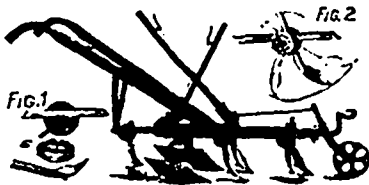
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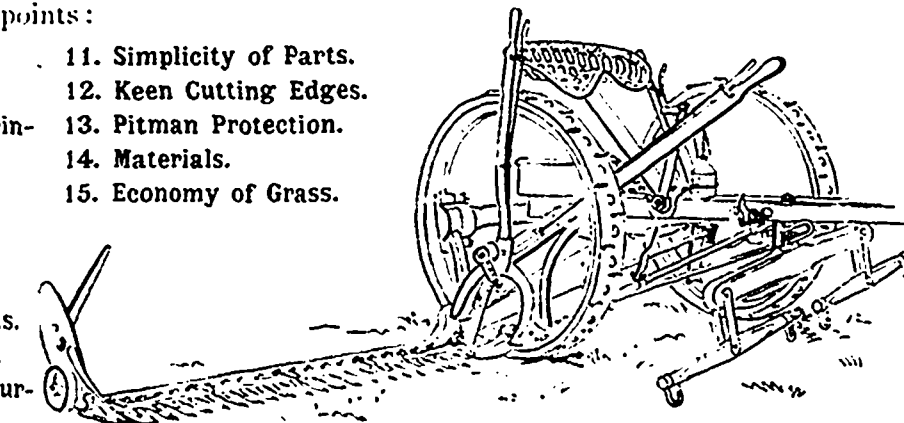
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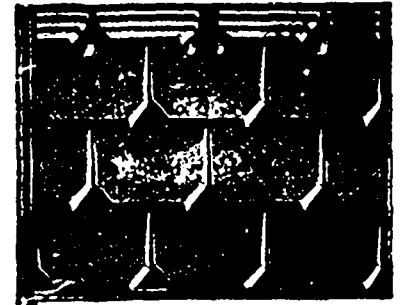
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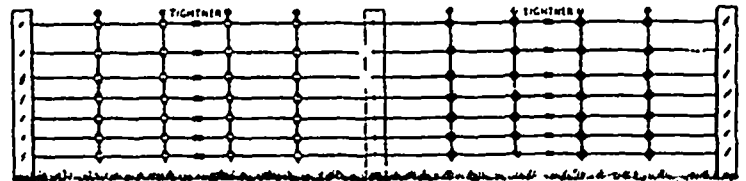
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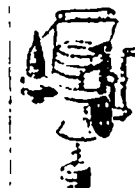
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