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MISSING

THE FARMER'S ADVOCATE AND HOME MAGAZINE

PERSEVERE AND SUCCEED — FOUNDED 1866

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

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EDITORIAL.

The waste of manure is one of the greatest leaks on thousands of farms. The special letters we are publishing on this subject will well repay perusal.

Experience is the great teacher, and if class-room theories do not harmonize with practice, the fault is with the theory. Sound theory and sound practice must be in accord.

Questions and answers on wintering sheep are continued in this issue and present the well-matured knowledge of men who have made a lifework of this branch of stock raising.

Mr. Joseph Yuill's vigorous paper, given in another column, treats in double-barrelled fashion a most important subject. If any reader is not concerned in the enrichment of an impoverished farm, he certainly will be in preventing a fertile farm from becoming impoverished. Mr. Yuill's suggestions are based on practical experience.

The letter by Mr. John I. Hobson on the management of farmyard manure will deservedly command widespread attention. His own success and long experience as a farmer and his varied opportunities in Canada and elsewhere, particularly for years as a judge of Ontario prize farms, in observing the practice of others gives his observations especial force and value. The prominence we are giving this subject is more than justified by the importance he attaches to the subject in the introductory sentences of his letter.

The following telegram has been received from Washington: "The United States Collectors of Customs along the Canadian border have a practice of requiring importers of animals brought into this country for breeding purposes to make a separate affidavit for each animal, that it is intended for the purpose named, thus securing it free entry. A fee of ten cents is charged in each case. Secretary Carlisle has ordered collectors to discontinue the practice and directed them to require separate oaths only for each class of animals, and in the case of sheep, one oath for each invoice."

The Western Dairy School.

A member of our staff recently visited the Western Dairy School which was opened about twelve months ago by the Ontario Government at the town of Strathroy, in Middlesex County. As little advertising was done previous to its opening in 1896, a crowded session was not expected. However, some thirty-two students attended two weeks or more each, ten of whom were awarded certificates by passing the prescribed examinations. While this may be considered a fairly successful opening season, it shows clearly that there was not an overpowering demand in the western part of the Province for a dairy school. This is especially evident when it is remembered that it costs a student next to nothing above his or her board to take the course, with all the splendid advantages offered. During our visit we learned that the probability of there being a full class this season is very slim, there being less than half a dozen in attendance on the day in question. It is expected, however, that the courses later will be much better attended.

Knowing these facts, the question arises, Is the Government justified in carrying on such an institution as at present nine or ten weeks in the year with so little return? It will be remembered that the building and equipment lack little or nothing in excellence, nor could a more energetic or better qualified instruction staff be readily procured; in fact, there seems to be nothing lacking except the demand for knowledge in the manufacture of dairy products. This fact is indeed lamentable when we remember the need of such knowledge on many dairy farms.

While it may appear to have been a misdirected effort to have built the school in the first place, we believe that it is entirely within the range of possibility to conduct it upon a plan that will make it a great benefit to the dairy industry. The institution is there; the practical question is, How can the best use be made of it?

The plan that suggests itself is that it be run the year around on the basis of a regular cheese factory or creamery, or a combination of the two. While this would render the institution in a large sense self-supporting, it would also fit its instructors the better to teach how to overcome the difficulties met with in summer dairying and which never appear in the winter season. For instance, gassy curds and grassy flavors, which only exist in summer, cannot be understood when they are not met with in practice. As an advantage to students, which was the primary object of the institution, the twelve months' system has much in its favor; it also has its advantages from the standpoint of economy. This latter is especially worthy of consideration when it is pointed out that the building and equipment cost some $14,000, and the running expenses, including salaries for the nine weeks in which it was run last year, was something like $800. To allow this expensive building and plant to lie idle five-sixths of the year seems absurd, to put it very mildly.

There can be no question as to the incidental advantages of the year-'round plan, as then a series of experiments could be conducted, by which many questions could be solved that cannot receive attention in the present system of winter schools. This would be an everyday educator to farmers in the immediate neighborhood, by sight and contact, and to the country at large, through the press and otherwise. It would thus help to keep the most approved methods and latest researches always before the public.

Develop the dairy industry and prepare products properly for the British market is being constantly dinned in the public ear, and we believe some useful work may yet be done in experimental butter shipments by cold storage to different markets to determine the best system and ascertain exactly what is needed. Were this school to run under skilled directors, as we have endeavored to point out, it could soon be ascertained by a few shipments—surely a justifiable return for public money.

To show that the farmers of the Strathroy district are prepared to patronize a creamery or cheese factory it is only necessary to refer to this and last winter's experience. When the school opened it was difficult to procure sufficient milk within reasonable distance at 21 cents per pound of butter-fat, while this winter the farmers were prepared for the demand, and now enough can be procured comparatively near the school at 19 cents per pound of butter-fat to supply four or five such institutions. During our visit one of the patrons who came for his cheque offered more milk than could be accepted, and expressed a wish that he could supply the factory the year around.

However, enough has been said to demonstrate the need for reform in the general plan of running the institution and to indicate one way in which reform might be effected.

The Wisdom of Observing the Lessons of Experience.

One often hears it said of a man, "He would be a very good servant, but will never succeed in business for himself." When we hear that remark we understand it to mean that the man in question has to be shown or told what is best to do. It is surprising how many persons there are of that sort—good men, perhaps—who work hard and try to get along, but have little foresight, and indeed have little discernment between right and wrong methods in doing things. Then, again, how few will change their old ways before they are forced to. That there are superior means of doing farm work and feeding stock is proved by the success of one man and the failure of his neighbor living on the next lot. Almost any neighborhood will furnish a proof of this. We publish in this issue letters from men who rank among the most successful in sheep raising, beef raising, and general farming, upon subjects of vital importance to thousands of readers along the very lines taken up. As will be seen, the letters are nothing more nor less than an epitome of the experience of these men in achieving success in their occupation. While many believe this, and after reading what is written will modify their practice somewhat for the better, too many will drift along with old methods and receive no benefit from the evidence given.

With regard to the sheep letters, there can be no question as to whether the general plan given is practicable, as in almost every instance the practices of the different contributors agree in the main, though differing on minor points. The inexperienced need have no trouble in deciding what is the proper course to pursue. Notwithstanding this, many will possibly be found, a month after reading, allowing lambs and older sheep to run together. Others will keep them continuously housed, or too much exposed, or leave them to get their drink by eating snow, just as though they were satisfied with the poor returns that such treatment will afford.

The group of letters on winter feeding and fattening young cattle is worth a great deal to almost every one who will pay any attention to their teaching. Not one of the contributors but has made a success of that line of farming, and yet there will be those who will say they cannot afford to feed their yearlings any grain, but will continue to winter them on straw and leave them out six hours a day—just the very method to hinder them ever becoming able to feed better. If the writers of those letters had waited until they had made money before commencing to do well for the young things they would always have found it impossible to enter upon a profitable line of stock feeding, so far as cattle were concerned.

And then the lessons from the letters on saving and applying manure. What a wealth of information they contain. There is not a man among them but knows that he cannot afford to lose the liquid manure. The old plank floors are as unprofitable as the mousehole in the granary floor; but how many will act as though they believed it? Every one cannot tear out their old floors and put down cement, but there are few who cannot relay the loose-fitting planks, making them tight, and by using chaff, sawdust, or the manure from the horse stable, absorb all the liquid from the cattle before it runs away. And then after the manure is saved and mixed, our duty to our pockets has not terminated in regard to its final deposit in the soil. Mr. Tillson and others have, after careful study and observation, found that there is no profit in allowing the manure to steam up or rot in piles and leach away with every rain for months, but now follow the plan of spreading it fresh right on the ground to be enriched next season. In this way it is applied in its very fullness and at a time when neither man nor horse labor is at a premium.

In conclusion, we are led to wonder what sort of an individual the farmer is who claims that he cannot afford to subscribe to a good practical agricultural paper. Of all follies, this does appear one of the most glaring, because he is simply depriving himself of a regular and frequent source of information about a most difficult business, in which, by the contribution and publication of experience, so much can be done to help each other to succeed. Our readers appreciate the service of the paper to themselves in this respect, and we think we may fairly ask them, by words of commendation and a little personal effort, to induce others, by becoming subscribers, to share in the general benefit.

Shall We Increase Our Flocks of Sheep?

It is to be regretted that during the past few years the sheep industry of the country has been greatly neglected, the result being that the number of sheep has rapidly decreased. The Bureau of Industries reports that the number in the Province of Ontario has declined from 2,022,735 in 1895 to 1,849,348 in 1896.

In a recent Farmers' Institute address, Mr. Andrew Elliott (of Waterloo Co., Ont.), an excellent authority, pointed out that there are large areas in Ontario that, on account of the quality of the land and its isolated position, are not adapted to profitable dairying, and there are many farmers who, for the lack of help in the house and other reasons, will not adopt dairying nor cattle raising as a specialty. To those, sheep breeding and feeding must recommend itself as an easy means of recuperating the soil exhausted by grain growing, and at the same time giving a sure profit from year to year.

In the newer parts of the country, Mr. Elliott went on to say, sheep can be kept and be made to pay their way by assisting in subduing the undergrowth of hazel, raspberries, etc., which so rapidly spring up when the land is stripped of the large timber. They are such excellent scavengers, too, that no farm can afford to be without them. It has been found that sheep consume over seventy per cent. of all noxious weeds and partially destroy fifteen per cent. more. The profits of sheep are largely made up from cheap pasture and comparatively inexpensive winter foods, instead of the high priced foods of dairying or cattle feeding. Sheep are easily retained and housed. Any farmer with lumber, hammer and saw can in a few days build a house as good as is necessary for their successful management. The returns from sheep are quick and sure, there being two in the year—wool and lambs—and these returns will bring the cost of the ewe at any time. The chief care necessary is required when other branches of farming are slack, and of all farm stock they need the least time to attend to them. Sheep or lambs can be more cheaply winter-fed and with less labor than the same value of any other farm stock. The amount of money invested is small, and if properly handled they will easily return their value in the year. Sheep and their products have suffered less from the past drop in prices than any other farm product. They pay as well to-day as they did twenty years ago, and the prospect now is very bright indeed for Canadian sheep. During the past two years we have shipped large numbers of sheep to Britain, though fewer in 1896 than in 1895, partly, perhaps, because of the embargo. The average American does not take kindly to mutton sheep, and his system of feeding is not up to the mark. U. S. flocks, like those of Canada, have within the past few years been largely reduced, and with the unequaled reputation we have for superior breeding stock and lambs of the right stamp to suit the best class of customers, we should for years to come find a profitable market for all we can raise.

Mr. Elliott has a substantial groundwork for his contention, and there need be little hesitation in giving a decided affirmative answer to the question at the head of this article. But for whatever market the sheep raiser caters, we would remind him that the great consuming centers are well supplied with "second-class" mutton, and if top prices are wanted, breeding, feeding, and management must be such as to produce a still more superior article. That is the rule with every farm product, mutton and lamb not excepted. Canada is the country *par excellence* for *quality*. Let us make the most of it. In this connection we believe the series of letters on "Wintering Sheep," begun in the January 1st issue of the ADVOCATE, will be of practical service.

The Future of our Boys and Girls.

BY JAMES ELDER.

Never did this question force itself more prominently to the front than at present. There has been, and still is, a tendency on the part of our young people to seek the lighter employments, and no one will blame them much. We all rather like to be spruced up and look clean and tidy—quite a desirable preference. The young man or woman needs not to be very observant to notice the difference, commonly in this respect, between the farmer's son or daughter at work and the store clerk, school teacher or office hand. We cannot put old heads on young shoulders, and the young head cannot be expected to look much beyond the present enjoyment, neither can we expect them to look much below the surface and estimate appearances at their true value. But it becomes an absolute necessity for them to look the stern facts fairly in the face. "Things are not always what they seem." Very often the fancy clothing indicates not plenty of money, but, on the contrary, a very small bank deposit. The lighter employments are now flooded. A business man a short time ago told me that being in need of another clerk he advertised, and was at once answered by over two hundred applicants. A few weeks ago our school district advertised for a second-class teacher, and was answered by one hundred and one applicants, including many first-class certificates and B. A.'s. Had the advertisement included third-class certificates I have no doubt we could have had double the number.

At least two bad results follow:—(1st) A great many thoroughly capable young people, after spending both money and time, find themselves out of employment, and (2nd) the agricultural profession is robbed of many who would not only have been its brightest, but also its most successful representatives. A great many of these will have to go back to farm life, where there is plenty of room for them. I know that just here I will be told that they will be all the better farmers on account of the high education they have received. I will discuss that question later on.

Let us now consider some of the causes which lead to this flooding of the lighter employments. Two of these we have already noticed, viz.: love of ease and love of dress, both quite natural to more than young people. Another is the idea that these employments are more lucrative. This idea has its source in the fact that we are apt to notice only the successes—these float on the surface—whilst the failures, which are "legion," drop from sight and drag out a miserable existence in obscurity. Another cause for the prevalence of this idea is that thousands are compelled to put on good appearances though sick at heart. Thousands of our town ladies wear fine bonnets and dresses whose predecessors perhaps of several generations are not paid for, and their poor husbands are driven to their wits' end to know how to pay an installment of interest or to stave off for an eighth or tenth time a long-suffering creditor.

Certainly in the last few years there has been comparatively little money made by farmers, and the salaries paid to many in the professions, teachers, clerks, etc., and the profits claimed by business enterprises, etc., have been out of all proportion to the farmer's earnings; but these things are changing. High salaries are disappearing before excessive competition, and farmers, having contracted the habit of sending large sums of money to the departmental stores, are compelling our merchants to cut their profits in two. I know that many speak of the awful sin of patronizing these departmental stores on account of the "sweating" process indulged in by them. Well, there are two sides to this subject. Why are there so many subjects of the sweating process? Chiefly because there are so many who prefer the needle to the cow's teat. Many of these "sweated" girls would curl their noses in contempt at the noble farmer's daughter who, with hearty laugh and rosy cheek, they see milking a cow or hoeing a flower bed or a row of vegetables in the garden.

This brings me to another cause of this flooding of the lighter employments, viz., the idea that manual labor is dishonorable. Some seem to have the idea that labor was the curse of man. Not at all. The three first laws given to man in his unfallen state were: 1st. The law of the Sabbath—Gen. 2: 3. 2nd. The law of labor, and farm labor at that—Gen. 2: 15. 3rd. The law of marriage—Gen. 3: 21-24. In other words, the first Sabbath observed on earth was by a representative farmer and his wife. On the other hand, the curse of Canaan (Gen. 9: 25) was that he should be "a servant of servants." I fancy this comes pretty near the case of the store clerk, who, notwithstanding his stylish appearance, has to wait upon all grades of society, hand down roll after roll of goods, simply to be looked at by people who have neither the intention nor the ability to purchase. How much more honorable is the position of the farmer who, with sun-browned face and plain clothes, "bows but to God alone."

STOCK.

The Care and Winter Feeding of Cattle.

In these days of close margins of profit in beef production, we are anxious to assist our readers in learning the most profitable method of carrying yearlings and two-year-olds through the winter, and in finishing cattle for the block. We therefore ask the co-operation of practical and experienced men in replying to the following questions:

1.—Do you prefer to tie yearlings during the winter months or allow them to run loose in pens with a view to economy of labor and well-being of the animals?

2.—How long each day do you allow yearlings and two-year-olds to run in the barnyard?

3.—What is the character of your coarse fodder, and do you consider it economical to feed hay to young store cattle?

4.—Should such animals receive any grain; if so, of what sort and how much daily?

5.—Assuming that you feed fodder, roots or ensilage and grain, do you prefer feeding them separately or mixed? If mixed, kindly explain how you prepare and feed it?

6.—At what age do you aim to sell your fatted cattle?

7.—What ration would you advise for fattening cattle from the beginning of February until shipping time?

8.—Do you consider it well to keep fattening cattle continually housed all winter? If not, how often should they be turned out?

9.—What plan of watering do you employ?

10.—How much importance do you attach to currying fattening cattle?

Fattening Cattle.

1.—Prefer to tie yearlings, for the economy of space and that each may get his proper share of food.

2.—We allow yearlings and two-year-olds to run two hours of the day in the yard—long enough for exercise and not long enough to exhaust them.

3.—Our coarse fodder is cornstalks, oat sheaf, and ensilage (one-third each), mixed twenty-four hours in advance. We feed young store cattle all the hay they will eat once a day, at night. We consider it profitable, and add to that millet once a week.

4.—In grain, we feed two pounds a day on the mixture of ensilage and cut feed. Our grain consists of oats, one-quarter; corn on the cob, one-half (ground); and bran, one-quarter, added and mixed.

5.—We always feed grain mixed with cut feed. The roots are fed in the evening, before the hay, the advantage being that it is a partial drink if the cattle have been watered early in the day.

6.—We aim to sell fatted cattle at the age of two and one-half years.

7.—In fattening cattle, from February to shipping we add about four pounds grain to the above mentioned rations. Do not think it economy to feed any heavier.

8.—We prefer letting fattening cattle go to the water trough about one and one-half hours each day, provided the water is just at hand and the cattle dehorned.

9.—We have a trough in each yard running water, and do not know of any better way.

10.—We clip about three inches wide along the back and use thereon oil, applied with a stiff brush, to prevent vermin. We curry their backs one-third down the side. We think this profitable, and have practiced it for years. The oil mentioned above consists of linseed and coal oil in equal proportions.

W. W. SHEPHERD,
Middlesex West. Prin. Indian Institution.

The Value of Corn in Cattle Feeding.

1.—I think yearlings are better tied. There is generally one in a lot that will boss the rest and give them too much exercise. Also when fed some will get more, others less than their share.

2.—About an hour's run in barnyard.

3.—Straw and cornstalks with ears on. Yes; feed hay in April and May.

4.—I think young store cattle should get some grain—corn on the stalk, about the produce of three hills.

5.—I am not settled on the mixing question. Meal, though, should always be fed mixed with cut feed or chaff.

6.—Three years.

7.—I feed fattening cattle corn (ears and all), the produce of eight hills each in two or three feeds; roots, a bushel or less, same number of feeds, and oat straw daily until middle or end of March. After that roots, a diminishing quantity; meal (ground peas, oats, etc., with a little oil cake added) mixed with cut straw or chaff and hay three times a day. Amount of meal can not be specified, animals differ so. So far as I can judge, about ten pounds of meal per day for each beast is what can be profitably fed, but some will make use of much more, some not so much. No beast should get so much meal that it will not eat also a reasonable quantity of hay. But it pays, I think, to feed up to that point.

8.—Have tried both ways. Think that on the whole it is better to turn them out daily. They may not look so fat, but they weigh better for their looks, gain about the same, health better.

9.—I water cattle at the trough outside.

10.—When cattle are turned out they don't need to be curried. If you have a long, heavy, knotty pole fastened low at one end and higher at the other for them to curry themselves on, they will make the hair fly faster than you can, and take great comfort in the operation.

I would add to the above that I think the ideal way of caring for young stock in winter, if they are quiet with one another or are dehorned, is to have them running loose in a yard or pen, eating straw at will, but tied up while eating grain or roots. I do that with my two-year-olds. Saves cleaning stables; manure in perfect condition.

I also want to draw attention to the value and cheapness of corn and roots as a food for fattening cattle. The produce of half an acre—one-third of it roots, two-thirds of it corn, with the addition of what oat straw he will eat—will fatten a steer for five months.

THOS. BATY.
Middlesex Co. (South), Ont.

The System of a Veteran Breeder and Feeder.

1 and 2.—Yearlings intended for any purpose are better to run loose in boxes or pens. Their feed trough can be constructed in such a manner that they cannot possibly get thrown into it, and the exercise is very necessary in young growing stock, and will on same amount of feed make a greater gain than when tied up and let out each day for an hour. If they are in loose they need not be turned out if water is before them. I am a strong advocate of turning cattle out for half an hour each day when tied up. Then, the manure made in box stalls I consider much better than when cattle are tied, inasmuch as it gets thoroughly incorporated together, and none of the liquid is lost.

3.—Coarse fodders are cornstalks and straw; very little hay. Hay is too expensive.

4.—Yearlings—Roots and a few pounds, say ten, of ensilage, with coarse fodder, will keep them in good growing condition. Two-year-old steers should all be fed for beef in spring or for the July market. Coarse cut fodder, 10 lbs. roots, 15 lbs. ensilage, and

2 lbs. of meal per day will produce in live weight an average gain of 200 lbs. in six months per steer. You will have steers just right to finish on grass for July market. If for spring, 30 lbs. ensilage, 15 lbs. roots, 4 to 6 lbs. meal per day, and a feed of uncut hay per day, say 4 lbs., should average 300 lbs. gain.

5.—When practicable, the best method is to mix all together except the hay; that I would feed uncut, 4 lbs. per day to each steer when fitting for spring market. If your feed room is frostproof, mix over night for morning feed, and morning for noon feed, etc.

6.—At two and a half years old, when I raise them on the farm. Every farmer should feed the steers grown on the farm, unless he is in the dairy industry. Cattle intended for winter feeding should be fed in October on the grass a few nubbins of corn each day for two weeks, then tie them or put them in boxes cool nights. In November feed two pounds of meal in stable and let them out each day. If this is attended to your cattle will never shrink; in fact, you will have them weigh 75 to 100 lbs. on the average more than if treated in the ordinary way. Allowing any class of cattle by neglect to shrink, as is generally the case with the majority of farmers, is one of the greatest leakages known to the cattle industry. Therefore, feed from the start a light ration, and you will be surprised the gain you will make in six months, and the quality of your cattle thus fed is or will be far better than those that are forced rapidly for a short time. The former have more flesh, the latter more fat or tallow. The former will ship better, the latter will shrink two pounds to one of the former.

8 and 9.—I would let cattle out for ten or fifteen minutes each day, providing they had water before them. Some are watered inside, some outside. A few minutes' exercise is essential. They should never be exposed to rough weather or allowed in a bleak place. If no warm spring water to hand, I certainly would advise taking the chill off cold ice water when practicable. Cattle have done well with me where they had not all the modern improvements and comforts. No man should defer feeding because he has not all the modern improvements. You can succeed if good judgment is displayed far better than many will with all modern appliances and not judgment. Success depends upon mastering all the little details: kindness, regularity, no excitement, the same feeder. Not getting your cattle chilled is a great factor in producing beef. Get your cattle plump each day, and you will succeed.

10.—Not much importance. If cattle are fed a balanced ration they will not heat; it is when they are not managed properly that they get so itchy.

I would add this: When steers are fed in loose boxes they must be dehorned, and should be dehorned in each case where a number are fed.

When I state 10, 15 or 30 lbs. ensilage, I mean ensilage made from mature corn—corn in glazed stage; meal, oats, and peas; oats and corn ground, or peas and corn reduced with bran and shorts.

C. M. SIMMONS.

Middlesex Co., Ont.

The Evidence of an Expert Cattle Feeder.

1.—No. We give our calves and yearlings all the freedom possible.

2.—We consider an hour or two quite enough for all purposes.

3.—Our rough fodder consists for the most part of rye hay cut when heading out, and for a second crop when the heads are well filled; we also sow a mixture of peas, oats and barley, to cut when three-parts ripe and to be fed as hay.

4.—This is an excellent fodder for young stock and no grain is needed until the fattening period begins.

5.—Our sheet anchor in the past has been roots, cut as for sheep, and shorts sprinkled on roots while being cut in the proportion of ten pounds of shorts to the bushel of cut roots. The morning meal is cut and mixed the night before, and will be slightly warm when fed next day, and the shorts will have absorbed all the outside sap and will be quite sweet and moist. The quantity fed night and morning will average thirty-five pounds each feed, and I have had the best results from this ration, notwithstanding its "onesidedness." The roots mentioned in ration are Swedish turnips, sugar beets, and parsnips.

6.—When turned three years old.

7.—Our ordinary ration for the latter part of the fattening period has been equal parts of oats, bran, buckwheat, and peas, the peas and buckwheat to be steeped five hours before being fed and the oats and bran mixed carefully. A full-grown steer will get away with fourteen quarts of this mixture in two feeds, and we have found that they handle well and keep in good health on the above ration.

8.—We do, decidedly, and take all precautions against one getting loose, even for a few minutes.

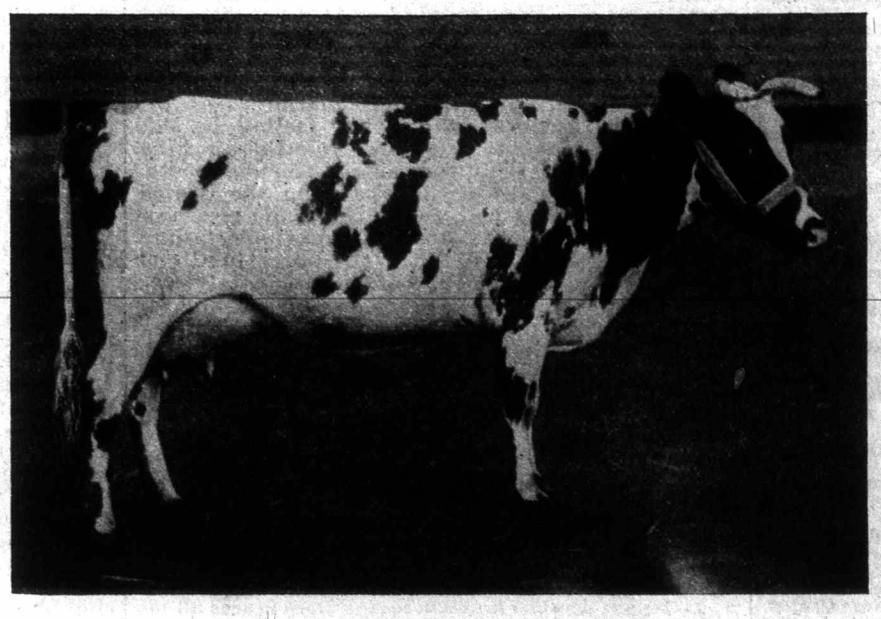
9.—Twice a day, by piping from tanks to boxes in front of animals.

10.—Not much, especially if the stable is cold. For instance, did I own a valuable Clydesdale stallion, trusting to my experience I should not, in this climate, curry him in winter. J. G. DAVIDSON.

Simcoe Co., Ont.

Grain for Growing Stock.

While I do not consider myself an authority on such matters, I have no objections to giving my experience for what it is worth. I will try to answer your questions in the order in which you have arranged them.



THE SWEEPSTAKES AYRSHIRE, SILVA.

1.—I prefer to tie yearlings in the winter rather than to allow them to run loose in pens, for the simple reason that I think there is less labor entailed in that way than in the other, and if they are let out every day or nearly so, as I think all cattle should be, I think they will do equally as well.

2.—I would allow them to run an hour or two, or probably sometimes when the weather is fine a little longer, although I think a couple of hours' run will do them as much good as a longer time.

3.—My coarse fodder is principally straw and cornstalks. While I do feed some hay to store cattle when it is plentiful, yet I do not consider it economical to do so, at least until the latter end of the winter, for I think they will do equally as well without it.

4.—Yes; a little grain to keep them growing, for if a young animal stops growing it takes a long time to gain what it has lost, and I think it is very doubtful if it ever makes as good an animal as it would otherwise have done. I think oats or a mixture of oats and peas the best kind of grain to feed growing stock—about a quart twice a day.

5.—I usually feed roots alone, but mix the meal with cut cornstalks or straw, first putting the cut feed in the mangers and mixing the meal with it there.

6.—I sell my fat cattle at two years old. Have not had a three-year-old steer for several years.

7.—I find that fattening cattle do well on a ration of cut straw, or straw and hay mixed, and about one gallon of meal (one-third peas and two-thirds oats) twice a day, with about a half bushel of roots once a day. About a quart of oil cake once a day, in addition to the above ration, will, if fed to the right class of stock, produce satisfactory results.

8.—No. I think they should be turned out at least twice a week. If they are let out for an hour every day I think they will be still better; that is, when the weather is not too stormy.

9.—I water at a creek, but would not recommend that as being the best plan. If cattle can be watered in the stable I think it is much better, especially in cold and stormy weather.

10.—Cattle that are continually housed I think are much better for being curried, but if they are let out every day or so I think currying is little more than a waste of time.

I fed my cattle last winter and am this winter feeding them corn run through the cutting box without husking, and I find that they do very well on that without any other grain. They get this night and morning—a good bushel basket full between two of them, with all the straw they want to eat in the meantime. Last winter they got turnips in addition to this and they did well, but turnips were a failure with us this season, and consequently they get none. I think, however, that a little bran mixed with the corn would be an improvement. S. B. GORWILL.

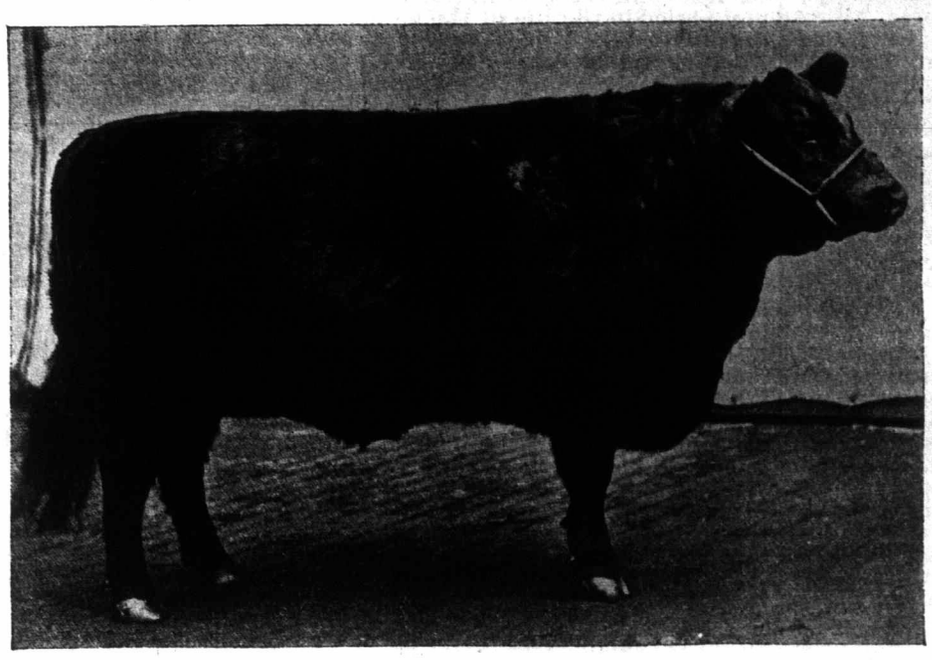
Middlesex Co. (East).

[NOTE.—We invite and will gladly publish additional correspondence embodying the experience of practical men on the above questions. One reader can benefit another in this way and lose nothing himself, but rather gain. Does your experience confirm what these men state, or does it differ, and in what respect? Do you question any of their statements; or wherein do you prefer the plan you pursue? Let us hear from you.—EDITOR.]

A Sweepstakes Ayrshire.

The Ayrshire cow, Silva —904—, herewith illustrated, brought honor to her owners, Messrs. R. Reid & Co., Hintonburg, Ontario, and their valuable herd at the last Ottawa Central Exhibition by winning first prize in the Ayrshire cow class and sweepstakes for best female of the breed. She was bred by J. J. Smith, Billings' Bridge, Ont.; sired by Cherry Prince 2nd —445—, and out of Lily 4th —900—, by Tri-Mountain —125—, tracing to imported Bonny Lass —12—. The herd to which she belongs contains a very fine four-months-old bull calf from her and by the present stock bull, Gold King 1387; also a grand two-year-old son, winner of first prize at Ottawa last fall as a yearling.

This excellent dairy cow is well situated in a herd of some sixty grade and pure-bred Ayrshires, whose business it is to furnish milk for the Ottawa city trade. With such a business in view, Messrs. Reid & Co. retain nothing in the herd that does not produce bountifully. It is well known that there are Ayrshires and Ayrshires, especially in their native home, which is causing considerable agitation between the breeders of the very fine type of cattle and the more vigorous sort, such as Silva proves herself to be. It will be remembered that in the grade dairy class at the Ottawa show this herd captured many of the good prizes, as well as a number in pure-bred Ayrshires.



ABERDEEN-ANGUS HEIFER, "MINX OF GLAMIS," CHAMPION OF THE SMITHFIELD AND BIRMINGHAM FAT STOCK SHOWS OF 1896; BRED AND OWNED BY THE EARL OF STRATHMORE.

Our Scottish Letter.

FAT STOCK SHOWS AND THE MEAT TRADE.

The chief topic of conversation in these days is the success of Scotch cattle at the great fat stock shows in England, and unless something unusual occurs in the near future a notable victory has been won, which is not likely to be eclipsed while the present generation lasts. The Aberdeen-Angus black polled breed has done many notable things in the past, and during the four years 1893-96 it has provided three champion animals at the great show of the Smithfield Club in London. These were Mr. Fletcher's Pride of the Highlands in 1893, Mr. Stephenson's Benton Bride in 1894, and now the Earl of Strathmore's Minx of Glamis (see illustration) in 1896. The winner in 1895 was Her Majesty the Queen's Shorthorn heifer, Frederica. The curious phenomenon of the champion fat animal of Great Britain for four years in succession being a heifer is naturally cause of remark, and we have not yet seen any explanation which altogether meets the case. Some have the feeling that it is too bad

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to waste females which might have proved useful as breeders by slaughtering them so soon. On examination, however, it will be found that there is nothing in this objection; the females fattened are not quite like breeding animals, and there are usually reasons known to breeders which induce them to regard it as more profitable to feed these heifers than to breed from them. It was not only in the live stock classes, but also in the carcass competition, that Aberdeen-Angus cattle scored. First prize there was won by a steer named Ameer, the property of Mr. Fletcher, of Rosehaugh. This was a fine carcass, and the practical lessons to be learned from it could not be ignored. Naturally breeders of Aberdeen-Angus cattle are overjoyed at the result, and as a beef breed the polled blacks are easily first. The reserve champion of Smithfield was also bred in Scotland. This was the black steer, Faultless, bred by Mr. John Ross, Meikle Tarrel, Ross-shire; property of Mr. Learner, Norwich; got by the fine Cruickshank Shorthorn bull, Ringleader, out of a cow whose sire was an A.-A. bull, Carol, and his grandam an unpedigreed Shorthorn. Faultless is a magnificent ox, his worst defect being too great length of leg. As has not infrequently happened in the past, the Hereford breed almost furnished the champion, and there is something very captivating in the form of these noble white face cattle. Their manifest falling off in the hind quarters, where the most valuable beef is found, tells against them when it comes to final ties. Shorthorns are not as strong this season as they have sometimes been in past years, but this can hardly be wondered at. The breed is so much in demand for crossing purposes that nothing short of a complete cessation in the foreign demand would probably send enough males into the market as steers. Nearly all the breed champions at London were females. The Shorthorn champion was Lord Rosebery's Proud Madam, which won both at Birmingham and at London. She was bred in Aberdeenshire, at Barthol Chapel. The A.-A. champion was, of course, Minx of Glamis, the champion of the show and the best fat animal of the season. The Galloway champion was Mr. Wm. Parkin-Moore's heifer, Liberta, as good an animal of her kind as any of her sister champions, but lacking their weight. The champions of both the Red Polled and the Sussex breeds were also heifers, so that a large proportion of the supreme honors went to the ladies. The sections in which championships were secured by the males were those for cross-breds, Highlanders, Devons, Herefords, and Welsh. The Highlander was a really magnificent animal, and his success was as well deserved as it was popular. He was bred by Mr. I. R. Campbell, Shinness, Lairg, and was owned by the Earl of Durham. It will be observed that the sections or breeds in which the steers are beaten are those of which the bulls are very much in demand for crossing purposes. Of the Shorthorn and Aberdeen-Angus one need not speak; everyone knows that they are *the* crossing bulls of the country. Galloways are also much in demand for crossing onto Ayrshires and also Shorthorns; in the latter case for the production of what are probably the most useful feeding cattle in this country—Blue-grays.

In the carcass competition emphasis was laid on the different standard now in vogue for fat cattle. The rage is all for lean meat, and the best butcher's carcass in the show was that of a Welsh runt, which, as a butcher described it, did not carry as much fat "as would grease a skewer." Butchers affirm that what they now want are carcasses ⅔ lean and ⅓ fat; whereas what they most commonly get are carcasses ⅓ lean and ⅔ fat. As a matter of fact show cattle are being fed past profit, and a similar remark may be made about sheep. A show was held at Ayr at which the butchers had the chief say in the judging, and they very plainly indicated what they wanted—light-weights and lean meat. The best mutton carcass at London was that of a Cheviot wedder from Clynelish in Sutherlandshire. This was beautiful mutton and no kind of foreign mutton can ever oust it from the market.

There is, however, a growing feeling in this country that less is to be gained from the marking of foreign meat than was at one time supposed. The quality of some of the beef from the United States is excellent, and unless the home producer can go more than one better he is pretty certain to get left. Nothing can touch the home bred and fed black polled bullock, but, unfortunately, the consumer will not give as much more per pound for his beef as the butcher has to give for the bullock per cwt. alive when compared with the foreign bullock. This creates a difficulty which tells in favor of the foreigner. Still, if the home producer will send out the very best and nothing else, he will still be able to cry,— "SCOTLAND YET."

Wintering Sheep.

(Continued from page 6.)

QUESTIONS.

1.—Do you believe in keeping lambs, shearlings, and older sheep separate? If so, what are the advantages?

2.—Do you consider it well to confine sheep to pens all the time, or at nights, or do you allow them access to the yards and pens all the time?

3.—What is the character of your coarse fodder for sheep? (a) To what extent do you use pea straw? (b) To what extent do you feed hay? (c) How do you feed each or both, cut or uncut, in racks, troughs, or on the floor?

4.—What is your experience with feeding roots or ensilage to young sheep and to breeding ewes?

5.—To what extent do you recommend feeding grain to young or breeding sheep, not fitting for show?

6.—How much importance do you attach to keeping the pens cleaned out down to the floor?

7.—What do you recommend with regard to watering?

Give the Lambs a Good Start.

1.—Yes, I believe and practice keeping the lambs in separate pens from shearlings and older sheep, for this reason: Shearlings and older sheep crowd away the lambs from the feeding troughs and racks and the lambs do not get a fair share of the feed, and the first winter being a very important period in the life of the sheep, it is important that they should not be stunted or set back. Another reason is that I think it pays well to feed the lambs some grain the first winter, and if not kept separate the older sheep would get nearly the whole of it.

2.—Allow them access to the pens and yards at all times, except during severe storms; at such times close them in the pens.

3.—*(a)* If I have it, feed pea straw twice in the day. *(b)* Feed hay once a day until the lambing season, then feed twice usually. *(c)* Feed pea straw sometimes cut, at other times uncut. Always feed hay uncut. Always feed the hay or pea straw in troughs or racks.

4.—Have not yet fed ensilage to sheep, but feed roots liberally to lambs and other sheep, except breeding ewes. My plan is to feed roots morning and night and grain at noon; rations being about one and one-half quarts of roots (pulped, sliced or whole) to breeding ewes and two quarts to other sheep; grain (if oats, which I think are best), pint to a quart to each sheep; in lbs., would be about two pounds oats and three to four pounds roots each ration.

5.—Answered in No. 4. Think it pays well to feed lambs grain all winter, and breeding ewes should get some from the beginning of February until the lambing season.

6.—Think it injurious to sheep to allow the litter or bedding to accumulate until in sufficient quantities to heat. So long as the bedding is dry and no fermentation going on, do not think it necessary to keep bedding cleaned away.

7.—Sheep should have access to water at all times, particularly breeding ewes, except when fed large quantities of roots.

Think the above questions cover the ground pretty fully as to ordinary care of the flock during the winter season, except salting. The flock should be salted regularly at least once a week, or what is better, keep salt before them in boxes at all times. Another very important matter: The shepherd should examine his flock closely when going into winter quarters, and if infested with parasites, such as ticks and lice, see that the usual remedies are applied for their extermination. If this is not done a good deal of feed will be as good as lost and the owner may possibly lose some of the flock.

Bruce Co., Ont. JAS. TOLTON.

Hints for Lambing Time.

1.—We think that lambs should be kept separate from older sheep, as they do not get a chance while feeding with older and stronger sheep. Shearlings need not necessarily be kept separate, as they will generally feed and take good care of themselves until after lambing, when they will require good care and extra feed.

2.—No, it is well to confine them in pens at night, but allow them all the exercise they will take in daytime.

3.—Pea straw, clover hay and corn fodder, cut. *(a)* Feed pea straw twice daily to breeding ewes and once to young sheep. *(b)* Hay not fed for breeding ewes until after the lambing season has commenced; to young stock once daily when it is to be had. *(c)* We have the best satisfaction from cutting both, as the waste is not nearly so great; in racks, with good troughs.

4.—We find that young sheep can be grown very cheaply, principally on roots. We feed all they can eat, but only a very few to breeding ewes. Have fed no ensilage to sheep.

5.—About one pint of oats for young stock and one-half pint for breeding ewes along with a little bran when not fitting for show.

6.—We attach a great deal of importance to keeping the pens cleaned so as not to cause dampness or any foul smell, which is detrimental to the health of the sheep. Would also recommend plenty of pure air, although drafts should be avoided.

7.—Breeding ewes should have a plentiful supply of fresh water; also young sheep where turnips or other roots are not fed, but where they can be fed freely they will drink very little. To those who have early lambs it will be necessary to have good, warm pens so as not to chill the young lambs. Do not feed too heavy for one week after lambing, as it may cause garget, the lambs not being able to take all the milk furnished. When they are two weeks old, a part of the pen should be divided so as to allow the lambs to eat by themselves. A little dampened bran and oats will be very acceptable to the young things. Care should be taken to keep them growing until able to turn out on grass, as a stunted lamb never amounts to much. The ewes should be well fed and a fresh supply of water provided daily, also salt should be regularly supplied. A. TELFER & SONS.

Brant Co., Ont.

How to Manage Sheep for Profit.

1.—Yes, especially the lambs. They require better feeding to keep them growing till matured. This cultivates a tendency to early maturity in the flock. It evens up the lots, giving each sheep a better chance of sharing equally in the feed.

2.—I don't think sheep should be confined to pens. They should be allowed to go out and in yard at will. Doors should be wide for the breeding ewes, to prevent possibility of injury from crowding. This often is the cause of abortion.

3.—Good pea straw cut a little on the green side for early winter feed (say up to 1st March) is excellent. I have found fodder corn with some fairly matured ears run through a cutting box, cut into half-inch lengths, a first-class feed. After about the first of March, depending some on when the ewes are due to drop their lambs, I know of nothing to surpass early cut, well-cured clover hay. Prefer blue grass to timothy hay; prefer rack and trough combined.

4.—Have never fed ensilage. Young sheep may be liberally fed on roots at any time with best results. A small allowance may be fed to breeding ewes through the winter, which should be increased after the lambs are dropped to all they will eat up clean and no more.

5.—Young sheep should be fed just enough grain to keep them growing, and should be such as to produce bone and muscle rather than fat, such as oats, bran, and oil cake (nutted is best). Breeding sheep, when the coarse feed is good quality and having a few roots, require but little grain until after the lambs are dropped, when they may be liberally fed on a similar mixture to the above.

6.—It is very important that pens should be cleaned out as often as is necessary to prevent the ammonia from escaping, which depends on amount of bedding, etc., used. In most cases twice during the winter is sufficient.

7.—Sheep require, perhaps, the least water of any kind of stock, but what they do want should be regularly supplied of the purest and very best quality (not a lick at a snowbank). If fed very liberally of roots they need less water. By a close observation of the above suggestions there is no reason why any man should not make a flock of sheep one of the most profitable investments on the farm. Sheep have touched bottom and are sure to rise. JOHN JACKSON.

Wentworth Co., Ont.

Cut Feed, Grain, and Water for Sheep.

1.—I would not think of keeping lambs and older sheep together, as the older sheep will crowd the lambs from the feed troughs, keeping them from getting their proper share of feed. Lambs should be fed with the object of getting size by feeding liberally of such food as will produce muscle and bone rather than fat. Sheep from one to four years old will do well enough together, but we prefer to feed in small lots, and shearlings will appear to much better advantage if kept separate from older sheep.

2.—Sheep require plenty of exercise at all times

during fine weather, and should only be confined to their pens during wet and stormy weather. It is of the utmost importance that sheep should be kept dry during the winter season.

3.—Corn fodder and pea straw, usually giving a liberal allowance of pea straw during the middle of the day. We use very little hay when using corn fodder, but prefer good clover hay as spring approaches. We consider a saving of fully one-third is effected by using cut feed. We, however, never cut pea straw. We prefer and always use troughs for feeding, the pea straw (uncut) being fed on the ground.

4.—We have never fed ensilage to sheep, but have always found excellent results from feeeding roots liberally to young stock. We always feed roots to our breeding ewes, but limit the quantity until after lambing, believing too heavy feeding on roots has a tendency to produce a crop of weak lambs.

5.—For a grain ration for lambs we prefer oats and bran, equal parts by measure, one pint per head morning and evening, with all the roots they will eat up clean. For breeding ewes we like a light allowance of grain, but it must be fed with caution during the lambing season, as it has a tendency to cause inflamed udder.

6.—It is of the greatest importance that sheep should at all times be kept dry under foot by a liberal use of good bedding or keeping the pens well cleaned.

7.—Sheep should have free access to water at all times, as when allowed this privilege they will drink often and little at a time. D. G. HANMER.

Brant Co., Ont.

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Bringing Sheep Through the Winter.

BY WILLIAM CLARK, PRINCE EDWARD ISLAND.

"Well summered, half wintered," is a trite old saying, but nevertheless a true one. It is highly important in bringing a flock of sheep cheaply and well through the winter season to have them in good condition when they come from the fields in the fall. During the months of October and November I give my sheep almost the entire run of the farm, excepting the young clover; and with what they pick from the hay and grain stubbles and, later on, the turnip tops, I have them fit for the butcher's knife when they come to their winter quarters. It is then an easy and cheap matter to bring them through the winter season to the lambing period in the spring. All that is necessary is to give them enough food to keep them in the same good condition. There is another advantage, too, to be gained by giving sheep a good "run" during the fall months. If ewes are in good thriving condition when being bred they are more sure to produce an abundant crop of lambs. It is also highly essential that the flock be washed with some one of the tick-destroying preparations before going into winter quarters, for nothing will pull down a flock like ticks or lice.

It is well during the winter to keep the lambs separate from the older members of the flock; if not, the older ewes will keep them back from the food and they will consequently fail in flesh, which should be specially guarded against, for it is important, if you wish a flock of big, strong sheep, to feed them well during the first year of their lives. Give them about the same amount of roots per head as the older ewes, the best bits of the hay, and, say, one pound of grain per head daily, which will keep them going along nicely. We feed everything in mangers with V troughs, with entrances for the sheep's heads every twenty or twenty-two inches, depending on the size of the sheep. Having a front like this prevents the sheep from crowding each other to get at the food. We consider it a wasteful practice to feed sheep underfoot, as so many farmers do. The best of the hay, the leaves, must be nearly all lost by the tramping of the sheep, and the whole quantity must be more or less soiled.

Under our system of feeding the cost of food per head, counting hay at $6 00 per ton, current price now, and roots at five cents per bushel on the farm, is about one cent per head daily for our breeding ewes, which is surely a reasonable figure. Their ration is about as follows: Six pounds of roots each, or one bushel to every ten sheep, in two feeds, morning and night, with two pounds each of good clover hay, uncut, in two feeds, morning and noon, which is about the quantity they will eat up clean. For the night feed I throw into their pen the barley or wheat straw that I need for bedding and litter for the other farm stock the following day, and let the sheep pick it over, and I am sure they enjoy this feed more than any other of the day. They seem to revel in picking out the unthreshed heads and the tender young clover leaves through the straw, for which their prehensile lips are so well adapted. In ordinary farm practice all this good feed is lost, as farmers count it of little use to put barley or wheat straw before their horned cattle as food; consequently, it is all used as bedding or litter for the stock; and with such a rainy and favorable growing season as the past one in Prince Edward Island, the wheat straw contains quite an amount of clover leaves, especially if the stubble is cut short.

As to keeping sheep confined to their house or giving them full liberty to run out as they please, I may say we place a good deal of faith in letting them have all the outdoor exercise possible during the winter. We never shut up their doors except on a very stormy night, and on stormy days we drive them out and chase them around the yard a short time, so much do we believe in exercise for breeding ewes.

We do not clean out the manure from the sheep house till the sheep leave it for the fields in the spring. We use plenty of litter, and the tramping of the ewes keeps the manure almost as hard as a board and prevents it from heating or any foul odor from arising from it, and if applied then directly to the corn or root field there is no other farm manure will surpass or even equal it.

When sheep get a fair allowance of roots as part of their daily ration there is no need of watering them till after lambing, when they will drink large quantities of water. I notice that most writers advise keeping salt constantly before the sheep and all other farm animals as necessary to their well-being; but, as far as my experience goes, I have not found it necessary. Our proximity to the sea is, perhaps, the reason that salt is not necessary for our farm stock. The saltness of the sea permeates the air they breathe, and even the food they eat. There are three other requisites in bringing a flock through winter successfully which cost nothing to apply—regularity in feeding, gentleness in handling, and care in everything pertaining to them.

The Sheep Industry in P. E. Island.

BY WALTER SIMPSON.

Sheep raising as a branch of our farm industry has not received the attention from the bulk of our farmers that its importance demands. Many who are engaging in it are not doing so on any well-defined plan, but rather in a haphazard way, keeping a few sheep because the housewife wants a little wool to manufacture some of the family clothing Too little attention has been given to breeding a good type of sheep. Farmers, as a general rule, begrudge the few extra dollars that it takes to get a pure-bred sire for their flocks. Very few own a registered sire, and the consequence is that in traveling through the country the flocks you see will not be of any particular type, but rather a mixture of all the breeds, showing very little of the good points of any of them. Many of these flocks have been bred for years without any infusion of new bood. A description of them should read something like this: A head that does not resemble anything in particular, narrow back, slab sides, sharp and drooping quarters, long tails, long, spindly legs, wool short and thin, and highly ornamented with burs, chaff and hayseed, having altogether a very *sheepish* appearance. Such renegade quadrupeds as these are expert fence-climbers, and can frequently be seen poised on the top rail of a fence, in the act of dropping into a neighbor's field from the highway, which is generally their feeding ground. This kind of sheep-farming won't pay. It would be a pity if it would, as it would put a premium on shiftlessness and ignorance of the laws of breeding. The sheep-farmer to be successful requires to give strict attention to his business. His first care should be to select from among the different breeds the one which he thinks is best suited to his circumstances. If the production of long, coarse wool is his object, he will select a sire from a Lincoln, Leicester, or Cotswold flock; but if the production of the best quality of mutton is his aim, he will secure his sire from some of the gray-faced breeds. But whatever type he chooses, he should breed along in that line, always using a pure-bred sire, and he will soon have a good flock, possessed of that uniformity that is always so pleasing to the eye and which will recommend them to purchasers at any time.

The better bred our flocks are the better the returns we will get from them. A scrub sheep that will shear between 3 and 4 pounds of wool and dress 40 pounds of mutton will consume about as much feed as a high-grade one that will clip 6 or 7 pounds of wool and dress 80 to 100 pounds of mutton—a big difference in favor of the better bred animal—a difference that in one year in a small flock would pay the first cost of more than one pure-bred animal.

A flock of 20 ewes, good individual grades of any of the breeds, well kept and bred to a pure-bred ram, should return to the farmer at least 25 lambs, 15 of which could go to the butcher at

$2.00 each, making	$30 00
10 ewe lambs kept or sold for breeding, at $3 each	30 00
120 lbs. washed wool, at 20 cents	24 00
A total of	$84 00

The above are about the prices obtainable here for good grade lambs and wool. This I consider would be a fairly good return for the cost of keep.

Sheep raising as compared with other branches is the least costly to engage in and can be carried on with the least expenditure of capital and labor. Very little fencing keeps them in place in summer, and cheap sheds that will keep them dry is all that is required in winter. They always thrive better in cool sheds than in warm barns, as close confinement is injurious to their health. They also thrive better in small flocks. We get our profit from sheep by just watching and caring for them properly. Feed them liberally and keep their wool clean and free from ticks if you want them to do their best and give you a good return.

"The sheep has a golden foot," says the old Spanish proverb, but this is only true where the sheep's foot is kept in place. If they are allowed (as they are by many people) to run on the new clover meadows all the fall there will be no gold gathered from their tracks. Better leave them on the old pastures and supplement their feed from the barns than have them destroy your next year's crop of grass. Just as wasteful is the practice of having them lie in the bush during the heat of the day in summer, wasting the manure that should go to fertilize the field. Better put up temporary shelters in the field for them to lie under, and fence out the bush.

There are several farms on the Island where the breeding of sheep is made a specialty. Wm. Clark, of North Wiltshire, makes a specialty of Leicesters, and his ram, imported from E. Gaunt & Sons, Ontario, is, I think, the best specimen of the breed that has ever been brought to the Island. Shropshires are bred by Hon. D. Ferguson, A. Boswell, and others; Cotswolds by John Tweedy and others; Oxfords and Lincolns by F. G. Bovyer. All the above named gentlemen, as well as others, have good stock of the particular breeds they have chosen and will be the means of distributing good breeding animals, especially sires, all over the Island. We look for great improvement in the sheep industry in the near future if breeders will only study their best interests and grade up by using only pure-bred sires, and the best obtainable at that.

It is difficult to get correct figures as to the exact number of sheep and lambs exported from the Island in a year, but from enquiries we have been enabled to make we think the export of lambs would total 15,000, at an average price of about $1.80 each, or in all $27,000. Besides this they are largely used for food by all classes. The export of mutton sheep is also considerable, and large quantities of poor quality of mutton is canned each season. The exports of wool and pelts amount to a large sum annually. In conclusion, I would say give the sheep a chance and they will return you a profit And if you want new blood to improve your flock go to the best breeders on the Island, or correspond with some of the noted breeders who advertise in the old reliable FARMER'S ADVOCATE.

FARM.

Rape in the Cornfield -- Sugar Beets for Cows.

Wm. Mountain, Perth Co., Ont., writes us that he has found great satisfaction in sowing rape along with silage corn for fall pasture. His early Butler Dent corn was well matured by the end of August, and was then harvested, giving the rape a grand opportunity to grow. In a few weeks it grew to be twenty inches high, making capital sheep feed. It was sown about two and a half pounds to the acre, just at the time of the last cultivation of the corn. The corn was cut with a modern harvester, which did the growing rape very little harm.

Mr. Mountain has found the red sugar beet an excellent cropper, and a good milk-producing food for cows. They require good land to yield bountifully. They are also good for laying fowls in spring. We quite agree with the writer when he says that "turnipy" milk should be returned from the creamery to the patron, as it not only takes the money out of the other patrons' pockets by lowering the price of the product, but it also injures the reputation of the factory.

Drive-Wells.

To the Editor FARMER'S ADVOCATE:

SIR,—Replying to an inquiry in your Jan. 1st issue, would say it is not very practical to drive the pipe for a well when the depth exceeds 28 or 30 feet (unless it is through a very soft strata, without danger of running onto large stones). When the depth exceeds this, it is better to get a man with a well-drilling outfit to sink the pipe. In a well of 25 feet dig a hole 6 or 8 feet deep and 4 feet in diameter; this is to allow the pump cylinder to be below ground. Take a piece of gas pipe (usually 1½ or 2 inch pipe) to go below cylinder, place the point on it (a good brass wire screen, one 2 feet long); get a good heavy sledge hammer, place a block of wood on top of pipe and begin driving; drive until a little below surface; then attach cylinder and piece of pipe connecting cylinder to pump head. Now drive this in same way as before until you get the right depth. A drive-well can be made in gravelly soil if not apt to strike large stones, and will be surer to give satisfaction if water is struck in gravel or coarse sand, for if the point is in fine quicksand it is liable to fill up with the sand. I have seen the point driven into a fine sand and fail to work, but when pulled back a little into a coarser vein give first-class satisfaction.

The tools required are a heavy sledge hammer and two pipe wrenches, which will cost altogether five or six dollars. J. C. MCGUIGAN.

Kent Co., Ont.

J. D. DICKSON, Indian Head, N.-W. T., Dec. 26th, '96:—"Congratulations on the Christmas number of your paper."

Barn and Stock of Jas. Anderson, Scotia Settlement, Man.

It is frequently said that one prosperous settler is a better immigration agent than the most gifted lecturer that has yet proclaimed the country's advantages. Therefore, in illustrating the capabilities of Manitoba, we cannot do better than utilize the above photo-engraving of Mr. Jas. Anderson's fine barns, which he and his family have been enabled, by thrift and economy, to erect and fill with high-class stock in the short space of twelve years, besides procuring a quarter-section of land each for the six boys, leaving the homestead quarter for the "old folks," and all this from a very humble beginning. Below we give plans of basement and upper floors of the barn and dimensions. This picture would be incomplete without Mr. Anderson's own description, which we append.

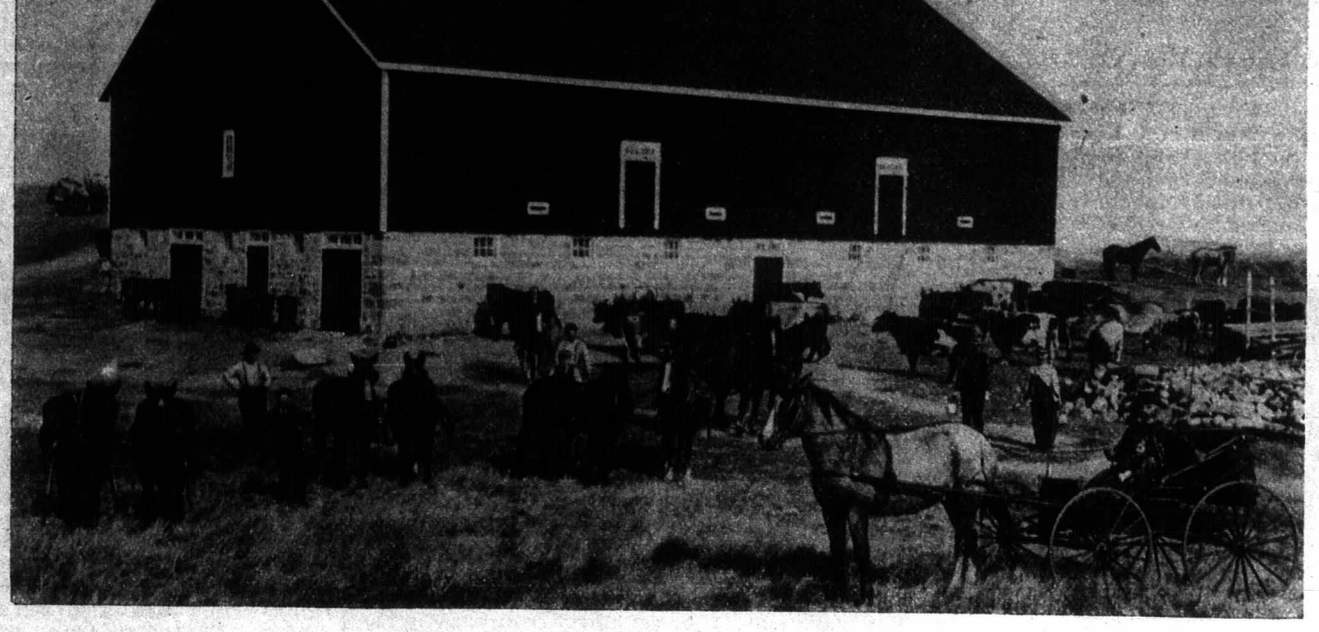
To the Editor FARMER'S ADVOCATE:

SIR,—I gladly send you plans of the ground and upper floors of my barn, and I also send you a photograph of it, by which you may see that I have five boys, one with each of the teams and one on the pony; the two little girls and myself are in the buggy. You will also see the two painters standing with pot and brush in hand; they were painting the barn at the time. The Polled Angus bull stands at the corner and the grade Angus calves at the end of the barn. The white-faced mare standing next the driving-horse is a silver cup winner and mother of the five horses next her. We came here in 1882 from Blanchard, Ont. Our town was St. Mary's. We have got along well here. The boys and I work all together so far. We keep about 40 cattle, 60 sheep, 14 horses, and from 20 to 40 pigs, and go in for mixed farming. Fattening steers at three years old is an important branch. We have seven quarter-sections of land, or 1,120 acres. One of the boys gets the ADVOCATE.

The barn is 54 ft. x 84 ft., the frame timbers 8"x8", with two purlines; 36 ft. rafters, 14 ft. posts; with the sides and ends double boarded; stonework 8 ft. high. It cost $1,600.00, with $120.00 more for two coats of paint. The stonework was done by John Robertson & Sons, Logoch; the frame put on by Robt. McTagart, Lindsay, Ont., and the painting done by Murdock McGlauchlan, Virden.

JAS. ANDERSON.

[NOTE.—It will be observed that Mr. Anderson is neither a bonanza wheat farmer nor one of the "young men" so feelingly referred to in Mr. Angus Mackay's article on the N.-W.T. in our Christmas issue, but a mixed farmer, and a married man.]



VIEW OF JAS. ANDERSON'S STOCK BARN.

Wants the Advocate in French.

P. H. DUMAIS, Chicoutimi, P.Q.: "Gentlemen,—I am greatly satisfied with the FARMER'S ADVOCATE, as it is interesting and instructive, containing much important matter generously lavished in every number for the profit of the intelligent tillers of the soil. It is a pity you do not issue a French edition for this part of the Dominion, as it would be a success for you and a great benefit to the farmers of Quebec."

Has No Equal.

DAVID MCLELLAN, Hants Co., N.S.: "Dear Sirs,—I have taken the ADVOCATE since May, 1890, and am well satisfied with it. As an agricultural journal think it has no equal. I have not missed but one number, the December 1st; if you have on hand any of that date I would be obliged if you would send it, as I keep them on file."

BRANDON TIMES:—"The Christmas edition of the FARMER'S ADVOCATE is an up-to-date issue in every respect, and reflects much credit upon the management of that paper. It appears in fine lithographed covers, and contains a splendid colored engraving of three mares, also many fine photo-engravings from all parts of the Dominion, and two from Scotland. A dollar invested for a year's subscription to the ADVOCATE will pay big returns to the intelligent farmer."

CHAS. HONEY, Alta:—"I beg to congratulate you on the ADVOCATE. I am more in love with it as the years pass on. Don't be weary in well doing. At last I have got some of my friends to acknowledge it is *the best* journal they have read."

Handling and Applying Farm Manure.

We believe there is a diversity of opinion among practical men as to what is the best method of making and applying farmyard manure. We are desirous of publishing the opinions of successful farmers, based upon their experience, and in order to arrive at what has been found to be the best plan, submit the following inquiries:

QUESTIONS.

1.—Do you use cut or uncut straw or some other material for bedding? Which do you prefer, and why?

2.—Do you consider there is any or much advantage in having manure made in box stalls, or sheds, over ordinary stalls where stock is tied?

3.—Do you consider it important to mix the manure from the different kinds of stock. If so, why?

4.—How do you manage to save the liquid and solid manure without loss?

5.—Do you consider it important that manure should ferment before being applied to the land. If so, do you haul it into large piles in the fields or give the pile in the yard any special attention during the winter?

6.—Have you tried spreading the fresh manure on the frozen fields as it is made throughout the winter, and what is your opinion of the practice from a labor-saving and manure-economizing standpoint?

7.—Assuming that you follow out in a general way a certain rotation of cropping, to which crop or crops do you consider farmyard manure most profitably applied?

If answering the foregoing questions does not cover the subject to your satisfaction, you would confer a favor on our readers by dealing with a free hand with any point omitted.

Manure Absorbents and Crop Rotation on the Annandale Farm.

1.—We have always used uncut or long straw for bedding; but think cut straw much better, which I intend using in future when not using sawdust or oat hulls (worth $2.50 to $3.00 at oatmeal mill), both of which I use in large quantities and find them good substitutes for straw.

2.—If using long straw for bedding, cow manure would be much improved by lying under cover for a few weeks to rot before hauling onto the land. Horse manure would heat to fire-fang if allowed to lie under cover; but if cut straw, sawdust or oat hulls were used this would be of no advantage.

3.—I think it a great improvement to mix the horse manure with the cow manure, which we are now doing, and think it improves both, especially the horse manure.

4.—Save the liquid manure by having water-tight cement floors and trenches and using absorbents. Sawdust, oat hulls or cut straw are all good, but have found the chaff and dust from threshing clover seed to be the best absorbent I ever used. We also put the fresh manure from the horse stables into trenches behind the cattle each day to absorb the liquid.

5.—Think it would improve the manure to have it lie under cover and ferment a few weeks, but the improvement would not pay for the extra cost in handling. Think it most economical to haul direct from the stable and spread on the land, except in case of having much long straw, when I would pile in large piles in field and let it ferment or rot a few weeks before spreading.

6.—We are now, for the first time in winter, hauling fresh manure direct from the stable and spreading it on the land, which we now consider the most economical way of disposing of it, taking into account the expense of handling.

7.—We run a three or four years' rotation: corn one year and either fall wheat after ensilage corn or spring grain the next, and clover or meadow grass two years. We have found best results from spreading manure on meadow or clover sod and plowing under in the spring for corn; have had the largest crop (22 tons per acre) from this way of applying the manure.

E. D. TILLSON.
Norfolk Co., Ont.

Fresh Manure Applied Directly to the Land.

1.—We use uncut straw for bedding, as it is much easier handled. After the cows or horses pick out the best of it, they are bedded with it, and it certainly would never pay to cut it, as any farmer who attempts it will soon find out. Last year, when feed was scarce, we bedded our horses with sawdust, and when cow stable was cleaned scattered the horse manure along in the cow-stable gutter, saving all the liquid manure and also mixing the two.

2.—A lot of good manure can doubtless be made in box stalls or pens. The liquid manure is easily absorbed in the litter, but beyond that do not think there can be any advantage. Bulls, calves, and young colts should be kept in pens. Give them plenty of straw and clean out often.

3.—We do not consider it important to mix any but horse manure—that is very necessary. When cleaning stables, we always load the horse manure in bottom of sleigh, then load on the cow and hog manure (cleaning the hog pen every second day); by the time it is spread they are pretty well mixed. Last winter, when bedding was scarce, we used part of horse manure to soak up the liquid in hog pen.

4.—By having concrete cement floors in all our stables, bedding freely, and drawing the manure to the fields as soon as there is a load, spreading evenly as possible.

5.—No; on the contrary, I consider it very important that it should not ferment. There being very little free ammonia (formed along with other gases from that most valuable element of manure, nitrogen, in the process of decomposition) in cold or unfermented manure, a comparatively small amount is lost when drawn to the field every day, but let it once heat and "away it goes—you can tell by your nose." We never have any manure piles, unless in the spring when the land is very soft for a week or two. Any one who has read the report of Prof. Saunders' experiments in FARMER'S ADVOCATE of Dec. 1st should be pretty well convinced that it does not pay to pile manure. He reported that with most crops much *better results were actually obtained from fresh manure than rotted manure, pound for pound.*

6.—Have practiced drawing to the fields and spreading every day (Sundays excepted) for about eight years. Before that we used to cover from six to eight acres a year; now, since adopting the new and improved method, we cover from twelve to fourteen acres a year with much better results (in crops) and with less than half the labor.

7.—To corn, turnips, mangolds, horse carrots, and potatoes.

J. D. THOMPSON.
Middlesex Co., Ont.

Putting Manure in Large Piles Disapproved.

1.—We are using uncut straw for bedding, and like it better for horses, although cut straw may absorb the liquids better and is rather nicer to apply on the surface.

2.—I consider box stalls the most perfect way of saving manure, as the liquids are all absorbed if you give the animals sufficient bedding, but it requires more straw to keep them clean than when they are tied. If the manure is taken from the boxes directly to the field, and spread, there is scarcely any waste.

3.—When the manure is piled in the yard, I think it important to mix the manure from the different kinds of stock, as horse manure heats very rapidly, and the cow manure, being cold, prevents this; also, the horse manure is a much better absorbent and keeps the liquids from wasting.

4.—The habit of hauling the manure and piling in large piles in the field, I believe to be a very wasteful one. In the process of fermentation a large percentage of the ammonia escapes, and besides, there is the extra labor of twice handling.

5.—Where circumstances permit, I think spreading the fresh manure on the fields in winter a saving of manure and of labor as well. We tried it some years with satisfaction, but I would not recommend putting it on when the snow is deep, as

in that case there might be some waste when it thawed.

6.—We have been in the habit of putting most of the manure on the fall wheat, but since we have the silo and grow a large amount of corn, I think it better to apply it to the corn and pea land and thus save the leakage from the pile through all the summer rains.

A. B. SCOTT.

Middlesex Co., Ont.

Horse Manure as an Absorbent.

1.—I use uncut straw for bedding. Straw has been light and short in our section for past three years. If it were long, should much prefer it cut. Have never used any other material.

2.—Provided that in either case no loss occurred from nonabsorbed urine or washing by rains, I do not see why there should be any difference. If the gutters of the stable were not tight, then should expect best results from the box stalls, as straw must be used liberally to keep a fairly firm footing for the animals.

3.—It is certainly best to do so. The horse manure ferments too readily. The cow manure is slow in fermenting. By mixing, there is less danger of fire-fanged parts; also an advantage when drawing in winter, as there is less frost in the manure. In practice, I have not yet been able to mix as I would wish, with one exception mentioned under number 4.

4.—The gutters are cement, 10 in. deep and 18 in. wide. The manure is cleaned out usually only once in two days. In this way the solid part absorbs a part of the liquid; some of the soiled bedding absorbs quite a quantity. What remains is absorbed by using a portion of the horse manure. I know of no better absorbent than horse manure. If stables were cleaned every day, a good wheelbarrow of horse manure scattered in the bottom of the gutter, for every eight or ten cows, should absorb nearly all liquids. The manure is wheeled from stable into large piles in the yard. Occasionally some loss occurs from washing rains.

5.—Most of our manure is applied for corn and roots, and to orchards. Prefer it unfermented, if no long straw. If the weeds were numerous, it might pay to ferment.

6.—If not much snow, say not over six inches, prefer to apply it in winter or fall on frozen ground. It saves a lot of work. Of course, don't put it on rolling land, where washing is apt to occur. I would not put manure out on the field if snow was deep. I would not care how much snow on top of manure but don't want much under it. Some seasons it would pay better to leave in the yard, if we could be sure of getting it out by the first of May.

7.—With about the following rotation: Corn or peas on sod, oats or barley seeded, clover plowed at end of first or second year; would use manure on corn (including roots) and as top dressing after the pea crop to make sure of a catch of seeds.

ELMER LICK.

Ontario Co., Ont.

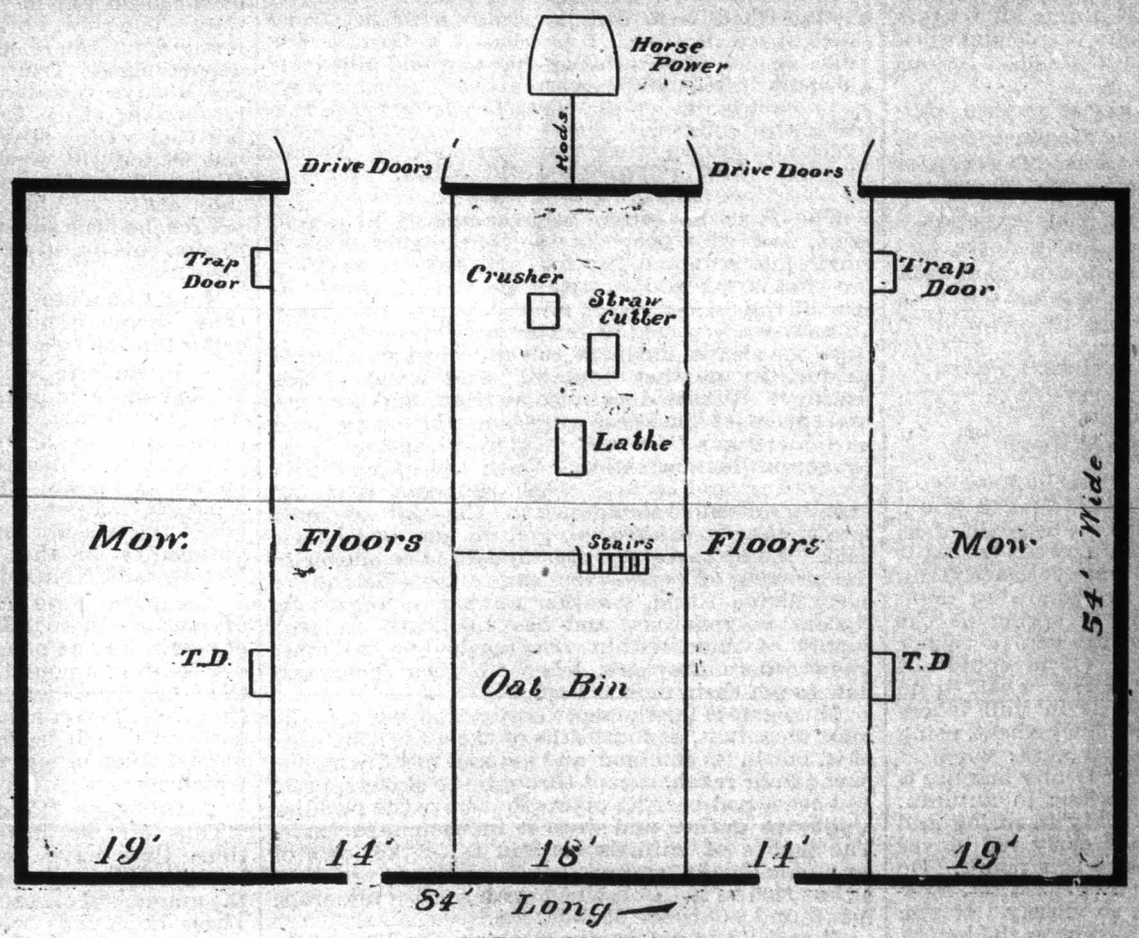
Making and Applying Farmyard Manure.

BY JOHN I. HOBSON, WELLINGTON CO., ONT.

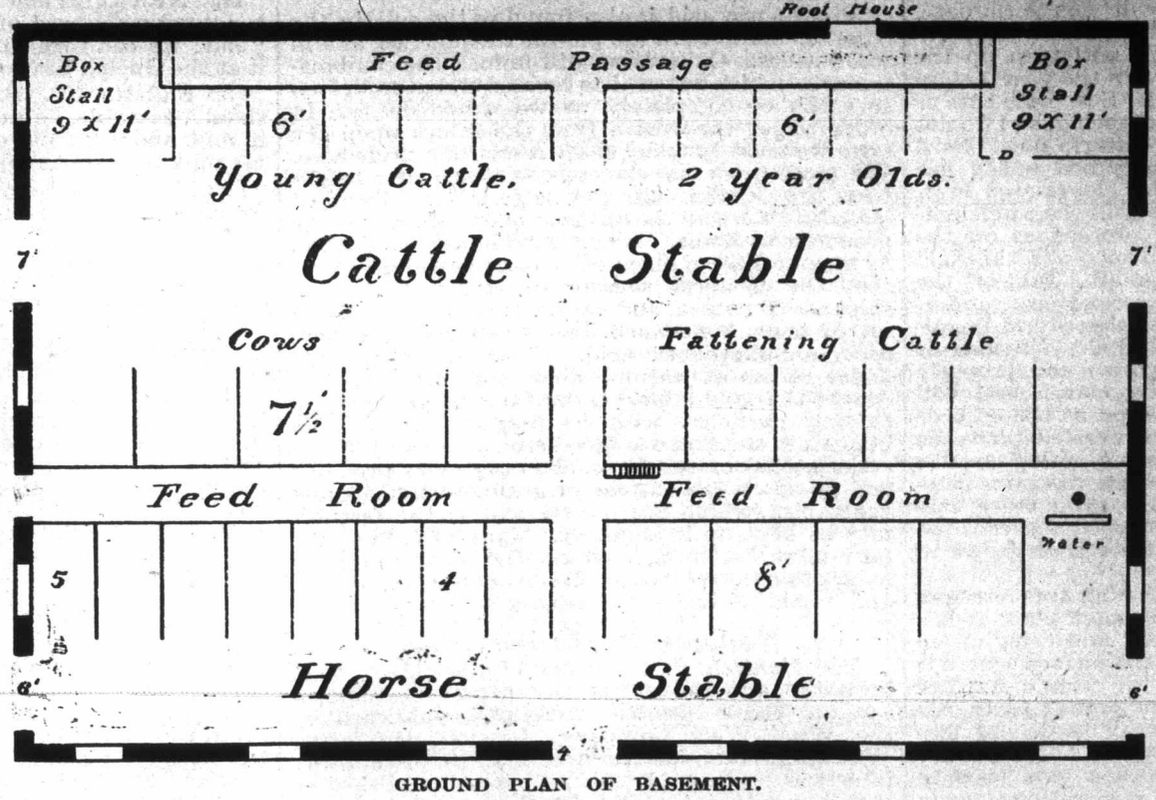
The making and applying of farmyard manure has always been to my mind one of the questions of farm management requiring greater thought and more careful consideration in every matter of detail, and more was dependent upon it than in carrying out any other operation of the farm. How to keep up the fertility of soil is, perhaps, the most difficult of all the problems a farmer has to solve. Whoever has traveled much in this Province (Ontario) at different times, covering a period of years, and whose special business was to note what was being done on the farms, will bear evidence of the decreasing productiveness of the soil. Those of us who have had opportunities of extending our observation beyond the limits of our own country, and have seen the worn-out and unproductive farms of the Genesee Valley—once famous as being amongst the best wheat land in America—and who have read of the deserted homesteads in more than one of the New England States, will fully realize what will certainly follow if great care and attention is not given to the subject of how to keep up the fertility of the soil. So much for introduction before answering the questions which you have forwarded to me.

1.—Almost invariably use uncut straw for bedding, not because it answers the purpose better, but because it entails very much less labor. In exceptional cases we have done a good deal in using cut straw for bedding; in fact, whenever it was considered economical to do so.

2.—I can see no advantage in having manure made in box stalls or shed over ordinary stalls where stock is tied, if sufficient absorbents are used in both cases. If the manure is drawn from sheds, box stalls, and stables where the cattle are tied up, and where in all cases sufficient absorbents have been used and applied directly to the land, there would be literally no waste and no difference in quality.



BARN FLOOR PLAN.



GROUND PLAN OF BASEMENT.

3.—Every farmer does know, or ought to know, that there is a marked difference in the value of manure made from different kinds of stock, and also in the value of that made from the same class of animals fed for different purposes. To illustrate, the manure made from a lot of store steers being wintered mainly on straw and turnips is a very different article from that made from a stable of export cattle fed on meal, hay, bran, and oil cake; and that of horses, cattle, sheep, and pigs fed under normal conditions is widely different in its value. Uniformity of quality is a very important consideration with the best class of farmers, and the only practical way of obtaining it is to have it properly mixed.

4.—I know of no other way to save the liquid and solid manure without loss than by the free use of absorbents. Of course, stables can be so constructed that all would be saved, and some other than the ordinary means used for applying to the land. I have never seen anything of the sort, and it appears safe to say that men who go in for that sort of thing generally fail as farmers.

5.—I have not for many years hauled out any to be put in large piles in the fields. *All* the straw on my farm is passed through the stables, and is in good shape for being applied directly to the fields. This practice has been invariably followed for a number of years past. When it is piled in the yard in late winter and early spring special attention is given to it, but rather with the view of preventing fermentation, and having the pile so made and attended to that the chance of loss from leakage will be reduced to a minimum. It is very important that it should be so constructed and so composed as to absord so far as possible all the rainfall. However, I would further add that while I believe the above mentioned practice to be the best to follow on my own farm, I am well aware that it might not be on the adjoining one. Conditions vary so much that an intelligent answer could only be given by speaking of what would be good practice under different conditions. Certainly a slight degree of fermentation throughout the pile is desirable, and a considerable degree if there are many seeds of noxious weeds to be destroyed.

6.—This question has been partly answered when dealing with the preceding one. Have tested it *carefully* almost every year since following out the practice of winter spreading, and have always found equally good results follow as compared with that plowed under the fall before and that applied to the land the following spring in May. I am speaking of land manured for the root crop. It is quite true that not a few farmers who have followed this system of winter manuring condemn the practice. From personal observation and knowledge of the way the work is carried out on a good many farms nothing else could be expected. If ten or fifteen loads of comparatively rough, strawy, so-called manure per acre is put on in the winter, and on the balance of the field the same number of loads the following spring, when it is reduced in bulk to one-half or one-third, there can only be one result follow. Before correct deductions can be drawn, intelligence and care must be exercised. Full allowance must be made for the condition in which it is put upon the land; the nature of the soil; and perhaps it would be as well not to apply it on a hard frozen hillside, so steep that for a certainty the winter or spring rains would wash the most valuable portion to the part of the field where it was least required. A little good, solid, hard thinking is an important factor in leading up to success in any calling.

7.—Depending as I do, and have done for many years, largely on turnips for winter feed, mangolds for spring, corn for soiling in the fall months, and rape for late fall feed, the manure is necessarily applied mainly for producing these crops; from fifteen to eighteen tons per acre to the first mentioned three crops, and about half that quantity to the last. For the last five or six years I have been doing every year more in the way of top-dressing grass land, and have formed a very decided opinion that I have not been doing enough in that direction in the past. If it had not been that I would be trespassing too much on your space, I would have liked to have dealt with some other phases of this manure question. One of the most difficult problems the Ontario farmer has to work out is how to

get enough manure. It is a fact that on the best managed farms, speaking in a general way, the soil is becoming depleted of plant food, and the bounteous harvests of grain with an abundance of straw are not now reaped. How to provide this plant food in abundance is a difficult question to deal with. To use artificial manures (only in exceptional cases) is out of the question. Many of us have paid dearly before we got that fact fixed in our minds. On the farm is the proper place to make manure. There are men in Ontario who have in a large measure solved the problem, and D. M McPherson, M. P. P., of Lancaster, is one of them. We may not see eye to eye with him in all matters bearing on farming, but he is doing a splendid work as an educator. There are some good object lessons to be seen on that farm.

[NOTE.—We invite and will gladly publish additional correspondence embodying the experience of practical men on the above questions. One reader can benefit another in this way and lose nothing himself, but rather gain. Does your experience confirm what these men state, or does it differ, and in what respect? Do you question any of their statements; or wherein do you prefer the plan you pursue? Let us hear from you.—EDITOR]

How to Enrich an Impoverished Farm,

OR TO PRESERVE THE FERTILITY OF A FARM NOT IMPOVERISHED.

[From a Farmers' Institute address by Joseph Yuill, Carleton Place, Ont.]

If a man became possessed of an impoverished farm, either by bequest or for a bad debt, it would be all right for him to make the best he could of it, but land is so cheap and plentiful nowadays that it would never pay to purchase an impoverished farm.

Treat one field at a time in the following manner: Sow buckwheat, as early in spring as the danger of spring frost is over, at the rate of two or two and a half bushels per acre. (If it would not grow buckwheat I would not know what to do with it.) When the buckwheat is in full bloom plow it down and sow again with buckwheat, using two or two and a half bushels per acre; when at the blooming stage plow under. If any manure is to be had, spread it on the surface in autumn, winter or spring. Sow barley early in spring and seed down, using twelve pounds early red clover seed per acre. I would emphasize this point: Do not allow the young clover to be grazed off, especially by sheep, as they graze so closely. If you succeed in growing clover you have won the battle.

Before winter, run the mower over the field, which will cut the clover and long stubbles, which will drop to the ground and protect the young clover. This will make a splendid mulch to protect the young clover, and the stubble will not rake up in next year's crop of hay. The chances are you will have a splendid crop of clover; cut when it is in full bloom—not a brown head to be seen in the field.

The second crop can be saved for winter feed, or it can be grazed off or plowed under, but in any case the field should be plowed that autumn. Sow peas next spring. After the peas are harvested, and so late that the clover will not germinate, plow the ground. (Clover seed requires a temperature of 60° to germinate). This will turn up the clover sod which was turned down the year before and which is full of clover seed. Sow with oats or any other grain desired the next spring, as I do not approve of growing wheat in Ontario now. Seed again with clover. If the clover sod which has been turned up has considerable clover seed in it, five pounds of seed per acre will be sufficient After the oats are harvested, proceed as on the former occasion. Run the mower over the field and do not allow it to be grazed off. Take off the first crop of clover, plow the second crop under. This will make the most beautiful seed bed imaginable for any kind of grain and also for corn or roots. If corn or roots are grown and properly cultivated, a great part of the clover seed will germinate and be killed. As soon as the corn or roots, as the case may be, are harvested, plow the ground. Seed down next spring, using twelve pounds clover seed, and go through the same rotation as already described; that is, grow clover one year and grain two years. I consider clover is the most valuable plant to the farmer that grows in Canada.

Clover has the power of gathering free nitrogen from the air, and being a deep-rooted plant it has the power of penetrating the soil and bringing up the fertility from the subsoil to the surface, where it is available for plant food. If two crops of hay are wanted, seed down with eight pounds early red clover seed, four pounds timothy seed, and two pounds alsike. Mow for two years, but in no case allow the field to remain more than two years in hay. There is no better way of eradicating Canada thistles and several other kinds of noxious weeds than by growing clover very thickly and two crops the same season. Of course, it is expected that all the available manure is properly saved and applied in the green state to the surface.

I have not one word to say against artificial manures, but the farmer should not allow one particle of solids nor one drop of liquid manure to be lost, and liquid manure is worth far more than most farmers think. The liquid manure of the horse is worth three times as much as the solids; the liquid manure of the cow is worth twice as much as the solids; the liquid manure of the hog is worth once and a half as much as the solids; the liquid manure of the sheep is worth as much as the solids; hen manure is very valuable, and should be mixed with the other manure before being applied. Wood ashes are a very valuable manure, and should be applied to corn or potatoes or to the orchard.

Do not allow manure to heat, as nearly one half the strength of manure is lost in the process of heating. A deep-rooted crop should always be followed by a shallow-growing crop, and a nitrogen-gathering crop should be followed by a nitrogen-consuming crop.

If the above instructions are carried out, an impoverished farm can be made fertile in a very short space of time. I purchased a farm a few years ago, so impoverished that it would not grow a decent thistle, and have treated it in this way, and now it is one of the most fertile farms in this part of the country.

The Farmer's Gold Mine.

BY PROF. H. E. VAN DEMAN.

The farm has often been compared to a gold mine, and very properly too, but a gold mine is worth just so much less for each dollar's worth of ore that is taken out of it. The same is nearly as true of the farmer's gold mine. Every crop, every animal, every pound of butter, and every dozen of eggs that leave the farm rob it of just so much of its fertility as they contain. And what is this fertility? Where does it come from, and how can we replace it? These are questions which we should all understand fully and be able to answer them by actual demonstration. With the exception of lime, iron, and a few other elements that are usually in superabundance in the soil of most farms, they are *nitrogen*, *potash*, and *phosphoric acid*. All of these are absolutely indispensable to the growing of every crop and to the existence of every living thing, whether animal or vegetable. Nature is generous and has furnished a large supply of them within our reach, but we must know where they are, when we need them, and how to get them most cheaply.

Nitrogen is far the most costly, and yet it is the most abundant, as four-fifths of the air is composed of it, but in its common and gaseous form, which is beyond our reach, except through the clovers, peas, and other pod-bearing plants that have the peculiar ability to gather and store it in their structures. The bodies of animals contain it in the form of ammonia chiefly, and all their excrements are more or less rich in it. Combined with certain minerals, it is found as nitrate of soda, etc.

Potash is found in almost every arable soil in fair proportions, but not always in abundance, nor in the most available condition. If one of the three things named is more important than another, it is potash, for it seems to be the backbone of all manures, whether homemade or commercial. Frequent stirring of the soil helps to liberate that which is locked in the mineral particles of the earth. That is one of the ways of extracting the gold from the ores of the farmer's gold mine. The ashes of trees and all other vegetable matter contain potash. But the great mines of Germany contain the most condensed and available supplies of it so far discovered.

Phosphoric acid is also found in the soil, in the bones of animals, in the phosphate quarries, and in wood ashes. Cultivation will unlock the combinations in which nature has secured it, but not often so easily or completely as we would desire. In order to get the wealth from the mines upon the farm we must in many cases resort to outside help. We must grow the clovers, cow peas, etc., to get from the air what nitrogen is possible. We must make and save all the animal manures that can be produced at home. When outside aid is called in by the purchase of chemical or commercial manures, then the cheapest sources are the muriate and sulphate of potash, and kainit, for potash; and dissolved bone, bone-black, and dissolved phosphate rock, for phosphoric acid. These, and slaughter-house refuse of various kinds for nitrogen, will enable the gold-miner on the farm to get out the shining particles, with here and there a solid nugget, in the shape of good crops. Then, if these crops are fed on the farm, and only dairy products and fat stock sold instead of grain, with fruits and vegetables (which are mostly water), the fertility may be kept up indefinitely. Thus, instead of the farm mine becoming exhausted, it may, with good management, return profitable yearly dividends, and become richer as the years go on.

No Equal in the Dominion.

The *Montreal Witness*, one of the oldest, most impartial and influential newspapers in Canada, says: "The FARMER'S ADVOCATE, published by the Wm. Weld Company, London, Ont., and Winnipeg, Man., has for more than a score of years been the leading agricultural paper published in the Dominion. Judging by the recent improvements effected in that journal, the ADVOCATE will soon rival the oldest and best agricultural papers of the United States. The Christmas number of the FARMER'S ADVOCATE is very tasteful gotten up, the beautiful tricolored cover being a work of art creditable to the publishers."

MRS. ACHESON, of Cartwright, called to acknowledge receipt of Bible sent her as a premium, and to say she was much pleased with it. Certainly in her opinion any one taking the trouble to solicit the names were fully repaid by securing such a valuable premium.

DAIRY.

Milk-Fat and Cheese Yield.

To the Editor FARMER'S ADVOCATE:

SIR,—In the ADVOCATE of Jan. 1st, page 9, you were kind enough to give a summary of Bulletin No. 110 from the N. Y. Agricultural Experiment Station (Geneva). We in Canada are always pleased to learn from our American neighbors or from anyone. We recognize the good work being done by our American neighbors. They have many learned and able men in connection with these stations. The New York Station has been particularly fortunate in the selection of men to preside over her departments. True, some of her best men have not always remained with her, but have sought renown in other fields, leaving the way open at fair Geneva for others. Some statements in Bulletins 68 and 110, however, are rather inconsistent. We all are familiar with the proverb, "Consistency, thou art . . . ," but possibly this proverb has not yet reached the sanctum of the author of the bulletins on this question of milk-fat, casein, and cheese yield.

Lest Canadian readers should not be aware of these inconsistencies, will you allow me space to call attention to a few of them?

1. In Bulletin No. 68 (new series), twice on page 211 and again on page 213 the writer tells us "there were two-thirds of one pound of casein for each pound of fat in the milk," and each time it is placed in italics in order that readers shall not miss the point. On pages 212 and 213 the statement is repeated in different words: "For all practical purposes the results may be regarded as showing uniformity in the relation of fat to casein in factory milk from different herds."

Compare these statements with the latter part of conclusion two in Bulletin No. 110: "The amount of casein for one pound of milk-fat decreases about one-tenth of a pound, from 0.70 to 0.60 pound, when the fat in milk increases one pound." It strikes me that these two conclusions are somewhat inconsistent, and it will be in order for the author to harmonize them or else tell us which one is wrong and which correct.

2. On page 215 of Bulletin No. 68 we find: "Thus far we have considered the two objections that have been raised to show that fat in milk cannot be an accurate guide in regard to the amount of cheese that can be made from milk. These objections were (1st) that milk rich in fat contains less casein in proportion to its fat than does milk poorer in fat, and, hence, milk rich in fat makes less cheese for each pound of fat than does milk poorer in fat; (2nd) that the loss of fat is very much greater in cheesemaking in case of milk rich in fat than in case of milk poor in fat. In reply to these objections, which are not based upon the results of careful, long-continued investigations, we have shown that the results of our investigations all go to show that the above objections or claims are not based upon actual facts and are more or less completely false." Bulletin No. 110, referred to, proves that objection "1st" is all right, and if the writer of the foregoing is not yet convinced of the soundness of objection "2nd" we can furnish plenty of evidence to prove it at the Guelph Station.

3. Bulletin No. 68, page 216, says: "There should, as a rule, be made from each pound of fat in milk about 2.7 lbs. of green cheese, whether we use milk poor or rich in fat."

Bulletin No. 110 says: "As a rule, when milk-fat increases the amount of cheese made for each pound of milk-fat decreases. In milk containing 3 per cent. of fat, 2.85 pounds of cheese are made for each pound of milk-fat, while in milk containing 4 per cent. of fat, 2.60 pounds of cheese are made for each pound of fat."

This latter conclusion is closely in accord with the results at the Guelph Station.

4. Bulletin No. 68, page 218, says: "It is important that the reason be made clear why milk richer in fat makes more cheese than milk poorer in fat. The richer milk furnishes more fat and more casein for the cheese; the more fat and casein we have the more water and ash we can retain. Hence, the increased yield of cheese comes, primarily, from the increased amount of fat and casein, and, secondarily, from the added amount of water these can retain." (In this statement we have a mixture of Canadian theory and New York practice.)

Bulletin No. 110 answers the same question in a slightly different manner. Conclusion 4 reads: "Why is the cheese yield greater for a pound of fat in poor milk than in richer milk? What makes the cheese yield . . . , etc.? The increased yield of 0 25 pounds comes from casein and water."

In 1894 the increased yield of cheese from *richer* milk was due to the extra fat, casein, and water. In 1895 the increased yield of cheese from a pound of fat in the *poorer* milk is due to the extra casein and water. We would like these statements harmonized.

These are all the inconsistencies we shall speak of at present, but would like to refer to two other points.

1. "The skim-milk difference" may have terrors for the New York dairymen, but it is a poor sort of a bugaboo to hold up to frighten Canadian dairymen, as we do not know what it means and we do not wish to know. After all, this talk about

skim-milk cheese when discussing this question is nonsense. The casein which is incorporated in cheese made from *normal* milk is as different, at the end of a month, from the casein made into skim-milk cheese, at the end of a month, as two things well can be. In the one case we have proper conditions for ripening the casein or curdy matter, and in the other we have not. When *first made* both are alike—indigestible—but we put them under different conditions, and in the one case we have ripened cheese (as I tried to show in a former article on this question) and in the other we cannot ripen it, consequently it is indigestible and unfit for use. This casein or curdy matter properly ripened is worth more per pound for sustaining the human body than is the fat. The ripened casein largely determines the food value of cheese. When a man wants fine fat to oil himself or to burn in his body he buys butter, but when he wants muscle-forming material that enables him to work, and at the same time needs a little fat, he buys cheese. This talk about casein being worth only two cents a pound and that good cheese cannot be made without having the milk rich in butter-fat is absurd. The table shows the score of the cheese made at the Guelph Station for the past three years:

Per Cent. Fat in Milk.	Flavor. (Max. 35.)		Closeness. (Max. 20.)		Even Color. (Max. 15.)		Texture. (Max. 20.)		Average Total. (Max. 90.)	
	'94-'95	'96	'94-'95	'96	'94-'95	'96	'94-'95	'96	'94-'95	'96
Under 3 %	30.28	32.50	18.11	18.50	14.71	14.00	17.00	17.83	80.10	82.83
3 to 3.5 %	30.49	30.46	17.78	18.36	14.00	14.15	17.15	17.65	79.42	80.61
3.55 to 4.0 %	30.86	31.31	17.92	18.28	14 05	14.06	17.36	18 06	80.19	81.71
4.05 to 4.50%	30 90	31.50	18.10	18.34	13.87	13.96	17.19	17.59	80.06	81 39
4.55 to 5.0 %	32.00	30.66	19.50	18.22	13.00	13.75	17.00	16.66	81.50	79.29
5.05 to 5.50%	32.00	31.00	19.50	19.00	13.50	14.00	16.50	17.25	81.50	81.25

These results on the quality of the cheese made are not "guesses," or "opinions," or "think so's"; but are the average results of the scoring of nearly 400 cheese, many of which were scored a number of times and by men who are recognized authorities on the quality of cheese.

2. The water found in cheese is different from the water which a man pumps from his well. The cheesemaker does not add water to the cheese in the process of manufacturing, but he retains a certain proportion of the *natural* water of milk, which defies the chemist's skill to explain its value or properties. It is quite different from the water in butter, as this water is nearly all added, or foreign, and is not natural to the butter. We have another example of valuable *natural* water in roots and corn silage. These have a value in the animal economy that no one can explain. So it is with the water of cheese.

I have written these notes with the object of correcting any false notions which readers of your excellent farm journal might obtain from the review of the Bulletin, and not with the intention of criticising adversely the excellent work done at our neighboring Station. We should like our dairymen to receive all the light possible; but the light should be good, and not such as may cause darkness in the mind. We have little doubt but that our New York friends will obtain the true light later on, and we shall expect shortly a bulletin coinciding entirely with the results obtained by the Ontario Station at Guelph. When that bulletin appears, Mr. Editor, your readers will expect as good a synopsis as you have given of the one which has caused the writing of this somewhat lengthy article.

H. H. DEAN,
Guelph, Jan. 8, 1897. Ont. Agr. College.

By direction of the Dominion Minister of Agriculture a dairy school for the Maritime Provinces will again be conducted in January, February and March, at Sussex, N. B. Courses of instruction will be provided in practical buttermaking, cheesemaking, and milk testing. The school will be under the charge of Mr. J. E. Hopkins, Superintendent of Dairying for Nova Scotia. The Secretary is Mr. W. W. Hubbard, Sussex, N. B. The course of instruction will be free. Last year 54 students attended the dairy school at Sussex, and it is expected that there will be a large increase in the number this coming season.

The Storage of Ice.

BY PROF. J. W. ROBERTSON, DAIRY AND AGRICULTURAL COMMISSIONER.

For the preservation of ice during the summer, the requirements are that the ice shall be separated from the ground by some insulating substance, such as dry sawdust, dry shavings, or air in hollow spaces formed by wood and paper, or by some other insulating material. If the sawdust or other material becomes saturated with water, it loses its insulating qualities. It becomes then practically a heat-conducting material, like a body of water. The ice should also be protected from the heat of the atmosphere when the temperature is higher than 30° Fahr.

An efficient form of a cheap floor for an ice-house is made by using 12 inches of cobble or broken stones, covered with coarse gravel or sand. The top of that should be covered with 6 inches of dry sawdust. The sawdust becomes an insulating layer, preventing the warmth of the ground from melting the ice. Where dry sawdust is not available, a layer of dry straw, chaff or hay 12 inches thick before the ice is put on it may be used instead. The floor should prevent air from getting in or out, and yet should permit drainage of any water from melting ice.

To prevent the sides of the mass of ice stored from being melted by the influence of the atmosphere it is sufficient to use a building of simple balloon frame, covered by one thickness of clapboards outside, to keep any rain from wetting the insulating material which surrounds the ice. The outside wall of an ice-house is more effective to protect the contents of the building from the heat of the rays of the sun when it is whitewashed or painted almost white. If the inside of the studs of the balloon frame be sheeted with one thickness of inch lumber, the hollow space between the clapboards and the inside sheeting will be a flue for the circulation of air and will prevent the sun's rays, where the building is exposed to them, from warming the inside of the walls enough to make an appreciable difference in the temperature of the insulating material which lies between the wall and the ice. Dry hay and straw when packed fairly close between the ice and the walls make excellent insulators. They do not conduct water by capillary movement as readily as sawdust. When a layer of sawdust between the ice and the sides of the building in which it is kept becomes wet on the side next to the ice, the water or dampness is likely to permeate the whole of the sawdust, and thus to destroy its nonconducting properties. Fine hay and straw are preferable, but when they are used care should be taken to have them thoroughly dry. A serious risk in the use of hay or straw is that they may contain small particles of snow or ice. When hay or straw is used in such a way, with small particles of ice, hail or snow mixed with them, these melt and make the whole of the insulating material damp. To that extent they lessen its efficiency.

For the covering of the top of the ice a layer of sawdust one foot thick is sufficient, *if it be put on dry and left undisturbed.* When sawdust has to be moved frequently for the taking out of ice from time to time, the warmer portion of the sawdust lying near the surface becomes mixed with the other portions and may be put back close to the ice. That causes a slight melting of the ice, and the dampness thus caused makes the layer of sawdust wet, and to that extent destroys its insulating properties. For that and other reasons, notably convenience in removing and replacing, it is desirable to use a layer of clean, dry, fine straw or hay 18 inches thick as a covering on the top of the ice. When the hay or straw is removed from a part of the surface to permit ice to be taken out, it may be put back again with little waste of ice and almost no loss of the nonconducting qualities of the covering.

Where ice is covered with a layer of sawdust or hay or straw to preserve it from melting, provision should be made for ventilation over the top. The covering layer might become heated otherwise, and if the rays of the sun beat on the roof of the ice-house and there be not sufficient ventilation in the gable ends or on the roof to allow the heated air to escape, that part becomes practically a mild-tempered oven for melting the contents of the building.

Fifty pounds of ice, when packed, may be taken to occupy one cubic foot of space. Therefore, every 40 cubic feet of capacity in a building is equal to the holding of one ton of ice. Where the wall of the ice-house is not insulated, the ice should be packed in the building 12 inches from the inside of of the walls, and that space, as well as the space between the studs, should be packed full of thoroughly dry, fine hay or straw, entirely free from ice chips and snow.

For the filling of the ice-house a slide of strong planks may be made, and a rope passing through a pulley inside the ice-house can be used for pulling up the blocks of ice. It is important that the ice should be packed as closely as possible. Any spaces between the blocks should be packed full of broken ice in order to prevent the presence or circulation of air around the several blocks.

When people advocate breeding the horns off their cattle instead of sawing them off, they can hardly be said to be making a point of any note, as in nine cases out of ten an old mulley cow will keep more cattle back from a water trough than one with horns; that is, if she is a natural mulley. They cannot gore, but they can be mighty disagreeable.

Eastern Ontario Dairymen.

The 20th annual meeting of the Eastern Ontario Dairymen's Association was held at Brockville on January 5-7, President Hy. Wade in the chair. The main objects of the Association, he pointed out, were to improve and increase the manufacture of butter and cheese, and to improve dairy cattle and dairy methods on the farm. He urged more attention to the home market, which should be supplied with first-class cheese. He favored a grant from the Dominion Government for holding dairy shows in Eastern Ontario. He referred to the amalgamation of the three Ontario dairy associations into two, whereby it was expected to save $2,000 in expenses and do better work. Three directors from each association would constitute a central advisory board.

Hon. W. D. Hoard, of Wisconsin, said the dairy industry was to-day in the greatest peril of its whole history. Only one man could determine its fate—the farmer. He must produce milk at a less cost per 100 pounds, or he must quit. The problem is, How shall a dairy farmer make as much profit at 50 cents a hundred as he did when he got a dollar a hundred? The three great factors are: The cow, her feeding and care; the farm, how handled and cropped; and the handling of the products.

Dr. Fletcher, of the Central Experimental Farm, in his address on "Grasses," warned his hearers against purchasing impure and unreliable seed, particularly that containing foul seeds. The addresses of Prof. Robertson, on "Bread and Butter" and "Cold Storage," and Hon. John Dryden were highly appreciated, the latter predicting that 1897 would be a historic year in Canadian dairying. Hon. Sydney Fisher promised that by next summer a system of ocean cold storage from Canada to Britain would be in operation. He asked the dairymen to express themselves on the cheese branding question. After a sharp debate it was almost unanimously resolved that it would not be in the interest of Ontario dairymen to have the date branded on the cheese.

Mr. J. A. Ruddick, of the Kingston Dairy School, gave an able paper on "Cheddar Cheese Making," several of his points being supported by Mr. D. M. McPherson, M. P. P. Mr. Wm. Eager commended the use of the Babcock tester in paying for milk at cheese factories; and Mr. Everetts favored Prof. Dean's plan of adding 2 per cent. to the fat readings. The reports of the four inspectors and instructors were read, showing that a great deal of careful work was done by them in improving this industry. We regret still to hear of a good many cases of adulteration, not a few patrons being fined during the past season. The auditors' report showed receipts, $6,146.49; expenditures, $4,943.16; leaving a balance of $1,203.33. During the convention the officers and speakers were entertained at the home of Mrs. E. M. Jones, the widely-known Jersey breeder.

Officers were elected as follows:—President, Mr. D. Derbyshire; First Vice-President, Mr. E. J. Madden; Second Vice-President, Mr. Wm. Eager; Third Vice-President, Mr. R. J. Graham; Treasurer, Mr. P. R. Daley; Auditors—Messrs. Morden, Bird, and F. W. Brenton; No. 1 division, Mr. J. McTavish; No. 2 division, Mr. E. Kidd; No. 3 division, Mr. J. R. Darbavel; No. 4 division, Mr. James Whitton; No. 5 division, Mr. T. B. Carlaw; No. 6 division, Mr. Henry Wade.

Distribution of Grain Samples from the Central Experimental Farm.

To the Editor FARMER'S ADVOCATE:

SIR,—During the past nine years samples of those varieties of grain which have succeeded best on the Experimental Farms have been distributed on application in 3-lb. bags to farmers in all parts of the Dominion, free, through the mail. The object has been to add to the productiveness and improve the quality of these important products throughout the country by placing within reach of every farmer pure seed of the most vigorous and productive sorts. This work has met with much appreciation and a considerable degree of success. Instructions have been given by the Minister of Agriculture to make a similar distribution this season. Owing to the very large number of applications now received it is not practicable to send more than one sample to each applicant, but with this limitation it is hoped that the stock available will be sufficient to permit of every farmer who so desires sharing in the benefits of this branch of the work of the Experimental Farms. The distribution now in progress consists of some of the most promising sorts of oats, barley, spring wheat, peas, field corn, and potatoes. Requests for samples may be sent to the Central Experimental Farm, Ottawa, at any time before March 1st, but after that date the lists will be closed so that applications then on hand may be filled before seeding begins. All communications can be sent free of postage. Each applicant should name the variety which he desires to test, also one or two alternative sorts in case the stock of the sort chosen should be exhausted. While no promise can be made that the variety asked for will be sent, the wishes of correspondents will be attended to as far as practicable. The samples of grain will be sent early, but potatoes cannot be distributed until the danger of injury in transit by frost is over.

WM. SAUNDERS,
Ottawa, Jan. 5th, 1897. Director.

The Montreal Butter and Cheese Association has appointed a committee to draft a resolution strongly advising the discontinuance of the system of granting bonuses by the Quebec Government to creameries, and also the advisability of applying whatever money has been voted for the purpose to increasing and improving refrigerator accommodation both by land and water. It was claimed that the bonus had not promoted buttermaking as intended.

Dairy Shorthorns in Australia.

To the Editor FARMER'S ADVOCATE:

SIR,—In reply to enquiries respecting butter production in these colonies, I send you the results of the tests of the milk and butter production of dairy cows at some of the exhibits. Last week an exhibition was held at Berry, the center of the best butter section of this colony, and a test of one milking was made. The day was very hot, the cows without shelter, and the number of competitors was not large.

Two facts will be noted in connection with the result: The most successful animals were Shorthorns of a milking strain; and secondly, the high percentage of butter-fat. The following was the result of the tests, which were based on the commercial value of the products:—

"The first competition was for one cow, any breed, and one milking. This was won by Mr. M. F. Morton, of Bomaderry, with a Shorthorn. The animal yielded 28¾ lbs. of milk, giving 4.5 per cent. of butter, representing 1.44 lbs. of commercial butter, and 24 lbs. of skim milk. This gave a total value for one milking of 1s. 2d. The second prize for a single cow went to Mr. C. F. Warden, of Milton. The cow, a three-quarter Jersey, gave 21¼ lbs. of milk, and 4.1 per cent. of butter-fat. Value per milking, 9½d. The five-cow contest was pulled off by Mr. C. W. Craig, of Jamberoo, who put in Shorthorns for the test. They yielded 120¼ lbs. of milk, 4.5 per cent. of butter-fat, and 116 lbs. of skim milk, of 5s. 0½d. for one milking. The second five cows were those of Mr. D. Hyam, of Nowra. Their yield was 84½ lbs., 4.3 per cent. of butter-fat, and 80 lbs. of skim milk, giving total value of 3s. 4½d. Value was based on commercial butter at 9d. per lb., and skim milk at ½d. per lb."

The high percentage of butter-fat, and the quantity of milk given, show the careful selection that the Shorthorn herds here have undergone for years. This exhibition is held on what is knowen as the Berry Estate. The pastures of a large portion of it will carry a cow to the acre, all the year round, so it is claimed. The luxuriant appearance of the country just now easily supports the statement, but in much drier seasons it may be doubted. Still, it is an extraordinarily rich country. J. S. LARKE,

Canadian Commercial Agent.

New South Wales, Dec. 1st, 1896.

"Modified" Milk.

BY J. WILSON KNIGHT, B. S. A.

Milk when drawn from the udder of a healthy cow and left standing for a time under normal conditions undergoes a change commonly known as "souring." This action is due to the presence of minute organisms which have the power to secrete an acid, hence the sour taste. This acid thus produced has the property to precipitate the casein in the milk in much the same manner as does rennet, hence the curdling or coagulation. While these organisms of the vegetable kingdom, known as bacteria, are indispensable in the dairy and cheese factory, their presence is not desirable in the fresh milk trade, as they soon render the products unfit for human use. But there is a method of procedure by which skimmed, whole milk, and cream may be kept fresh, sweet, and of a pleasant flavor for from one to three weeks, according to the precautions taken. This may be done by the use of a pasteurizing machine, but we will not go into the details of this process, as the method which will be explained is not that of pasteurization. The use of the pasteurized product as a food for infants and invalids is not very highly commended, as the high temperature to which it is necessary to heat the milk in order to annihilate the germs therein renders the proteids in the fluid less digestible than in the raw material. This treatment also destroys a certain ferment which is present in fresh milk and which is not found in the mouths of young infants.

Medical men require a product easily digested and containing all the qualities of natural milk. Much study has been spent on the subject, and now it is possible to procure an article which complies with the demand of the age. In the preparation of such a product *scrupulous cleanliness* is the all-important watchword. I will endeavor to describe the surroundings such as I have seen where "modified" milk is now produced.

The dairy from which the milk was used is situated in rather a secluded exposure, far from any contaminating odors or objectionable surroundings. The stable in which the cows are milked is a light, airy building, with all modern conveniences. It is kept disinfected and free from obnoxious odors by the liberal use of land plaster. The cows are well combed and brushed, and their udders and teats washed *clean* with warm water and then dried. When flies are troublesome, each animal is sprayed with a fly-killing mixture, and milking begins. This is done as rapidly as possible by *clean*, careful men. As drawn from each cow the milk is weighed and strained immediately into a larger vessel, which is so constructed as to exclude all germs as nearly as is possible. When the milking is finished the cans are taken to the separating room and the machine gotten into motion. A DeLaval turbine, which did excellent work, was used. A separator is indispensable, as the cream must be separated from the skim milk. It is well known that a separator is an important factor in extracting germs from milk during the separation. The slime which adheres to the bowl teems with germ life, and is itself composed of foreign matter and filth, which otherwise must remain in the milk. But let us take a glance at the inside of this room. The floor is painted with a waterproof preparation. The walls are plastered, and everything bespeaks cleanliness in the superlative degree; in fact, it is as free from any undesirable matter as a hospital ward. The separator is kept as bright and clean as a lady's sewing machine. As fat-free skim milk is desired, the adjustments are regulated so as to insure thorough separation. The milk is then poured into the receiving can, over which is tied a cheesecloth strainer. The flow and pressure must be kept regular. As the cream and skim milk come from the machine they are again strained. The operator, who must be a competent person, should never help with the milking or frequent the stable, and when the separator is in motion must give his undivided attention to the machine, taking the speed, keeping the steam gauge at the proper point, and skillfully manipulating the various adjustments of the delicate machine. When the separation is concluded the two products are immediately bottled and capped, using quart bottles and patent pasteboard caps. Care is taken to fill each bottle as full as it will cap neatly, otherwise the air will not be excluded and the fluid on the surface undergoes oxidation, which is favorable to the growth of germs. The filled bottles are then washed in clean water, labelled, and set in the ice box. This covered box is elevated from the floor, and is just deep enough to allow the bottles to stand upright without being immersed in the water. This water is kept at a temperature of from 40° to 44° F. all the time. Thus the few germs which have passed unarrested through the foregoing operations are inhibited in their growth by the low temperature at which the water is kept. Cream and skim milk produced under these circumstances can be kept palatable and sweet for from two to four weeks, and when precaution is taken to place a few drops of melted paraffin wax on each cap they can be kept a much longer time. Perhaps some may question this, but when such unending pains and stringent measures are taken to keep all animals and utensils so *very clean* it lessens the margin of doubting.

The milk cans, pails, strainers, and each part of the separator are washed first in warm water, then rinsed in cold water, then steamed with live moist steam by means of a sterilizer, and left therein until used again.

The bottles of cream and skimmed milk are packed in ice in boxes made for the purpose and expressed to the city laboratory, where the modification begins under more skillful care. Physicians require many different modifications of milk to meet the requirements of their patients, and the trained modifier can produce at will, by working with a fat-free skim milk and the cream, a milk of any desired percentage of fat. This requires great exactness in making the reckonings, testing the cream, and handling the fluids.

Modified milk is put up in small graduated vials holding a gill. They are corked with plugs of cotton batting, which admits the air, but arrests all form of life. Milk in this form is rather expensive, but physicians find it of great value in many cases where milk composes almost the entire diet of their patients. It is the trouble and skill with which it is produced and compounded that the modifier makes his charges for, rather than the intrinsic value of the milk itself.

There are several establishments of this kind in America. In Chicago, New York, Philadelphia, Boston, Brooklyn, and Montreal (Canada) are laboratories where experts modify milk and cream to meet the needs and demands of physicians in those cities.

This industry is yet in its infancy, and will certainly come to be an important feature in the fresh milk trade of all cities in Canada and the U. S. in the near future.

APIARY.

Development of a Queen Bee.

When an egg is laid in a cell, it hatches out into a larva or grub in about three days. At first it is so small as to be hardly visible to the naked eye, but it is fed for five days so liberally by the workers that it literally swims in its food.

The food given to the young queen is called royal jelly and has a rather sharp, somewhat aromatic taste. It is the same as that fed to young workers, being afterward brought down to a coarser diet, while the queen is continued on the best.

While the worker is fed just enough to complete its growth, not an atom being left over, the queen is given so much that she cannot possibly use it all, and when she emerges from the cell there will be found at the bottom of the cell a quantity of partially dried royal jelly half as large as a small pea. The bees are also extravagant in the use of wax in constructing the queen's cell, enough being used for one cell to make a great many worker cells.

During the five days' feeding the young queen lies at first coiled in a half circle at the bottom of the cell, then, having grown too large for that, stretches out at full length in the cell. After a day spent in spinning its cocoon and then two days of rest, a day is occupied in changing into the nymph state, and after remaining in this state for three days the perfect insect emerges from the cell. This makes in all 15 days from the laying of the egg to the emergence from the cell.

Forty years ago the authorities gave 17 or 18 days as the time for the development of a queen, and up to this day 16 days is oftener mentioned than 15.

It is not that any change has been made in the habits or practices of bees, but the probability is, says an exchange, that formerly observations were made by means of nuclei or small colonies, in which more time would be taken for the changes than in full colonies.—*Iowa Homestead.*

POULTRY.

Past, Present, and Future of the Poultry Industry in Manitoba.

HOW IT HAS DEVELOPED SINCE THE DAYS WHEN FROZEN EGGS SOLD AT 50 CENTS PER DOZEN.

(BY M. MAW, WINNIPEG.)

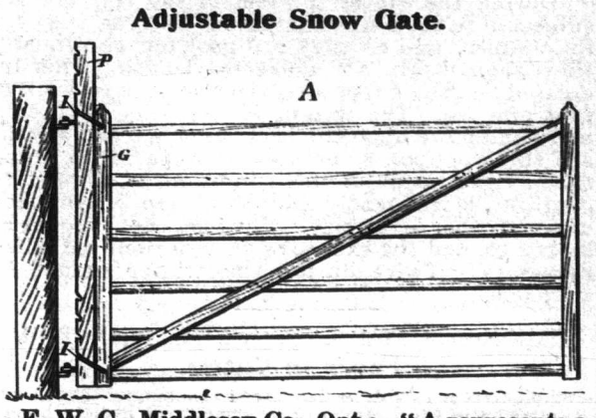
Twenty years ago, when Manitoba was in its infancy, the stock of poultry was very small, mostly in the settlements surrounding Winnipeg, or "Garry," as it was very often called in those days. As the population increased, the demand for eggs and poultry far exceeded the supply. Eggs 40 cents per dozen was the ruling summer price, and lucky was the buyer who could get any. I well remember my first purchase—two clucking hens. I had been trying for some time to get a start, without success. One day in the summer of '77 I purchased two scrub heifers at a long price, and insisted on the two hens being included, and it was some time before the owner decided to let me have them. All the supplies were brought in from the States by rail to Morehead and "flatboated" down the river to Winnipeg, or freighted over the plains by ox train or dog train. During the winter, frozen eggs sold at 50 cents per dozen, and were hard to get. Rev. Walter Beck, steward at St. John's, was one of the first to import improved breeds of poultry. He was quite an enthusiast, and exhibited his Leghorns, Shanghais, and Black Spanish at the first agricultural shows held in Winnipeg. As the country commenced to settle, many of the immigrants brought their stock of poultry with them, and about the year 1880 a poultry and pet stock association was formed in Winnipeg with the object of developing the various breeds of poultry and, by holding exhibitions, drawing attention to the advantages to be gained by using pure-bred stock to impart new vigor to the stock in common use. During the following years several very successful exhibitions of poultry were held in Trinity and Knox Halls, Winnipeg, and the poultry interests made great strides. Mr. Ward, of Chicago, at that time the leading poultry judge of America, was brought up at the expense of the Association, and his knowledge and advice were very valuable in showing us how to improve and avoid deterioration. Many specimens highly valued by their owners were condemned at these shows, and when their unfitness was clearly shown, we determined to do better the next time. From this out a marked improvement was noticeable. About 1885 the Local Government took up the poultry interests in connection with the exhibition held at St. Boniface, and such an interest was created that poultry associations were formed in various central points in the Province; many valuable birds were imported, and the general stock improved. At the present time the Local Government and the Industrial Exhibition Association are doing all in their power to develop the poultry interests, and the exhibitions held this year in Winnipeg, Portage, Brandon, and many other points have conclusively proved that their efforts have been most successful. Many of our settlers are now adding poultry to their general stock, who for many years devoted their whole energies to growing grain. They find it pays to convert some portion of their grain into meat and eggs; it helps pay the store bill, and gives a pleasant variety to the pork diet of many a household. The future of the poultry industry now largely lies in the hands of the farming community. It now lies in the power of every farmer to obtain first-class stock, either to start a flock or develop one already formed. In a very short time the markets of the world will be available. At the present time cold storage warehouses are in working order, and consignments of poultry and eggs are advertised for. A good article will find a paying market, but it is useless to ship low grades in either eggs or dressed poultry. The Thanksgiving market in Winnipeg this year was largely supplied from Ontario, and the dealers complain that the Manitoba stock was poorly dressed and only half fed. Probably the reason is that our shippers have not made any effort to raise poultry for market, and have only shipped a few surplus birds as a venture. I am afraid it will be a disappointment to many of them. The Ontario stock is shipped by parties who consider poultry one of their most valuable products, and ship their best, properly fattened, well dressed, and packed in good shape. Such stock makes a market and causes a larger demand, consequently higher prices, while poor stock is hard to sell at any price.

To those who intend to improve I would advise a thorough weeding out. Commence well, keep a few of the best, kill off all old hens, and get a good cockerel. Hatch all the early chicks possible, and give them as good attention as you do other stock on the farm. In selecting the breed use your own judgment; there are points in favor of most of the useful varieties. In shipping poultry always send the best, well dressed, and properly fattened. All the large packing-houses in the States classify their

shipments, the best commanding several times the price of the culls. Collect eggs regularly, ship often, only those you know are strictly fresh. Try to get up a name for always sending out first-class stock; by doing so you will command the best prices, and always find a demand.

THE HELPING HAND.

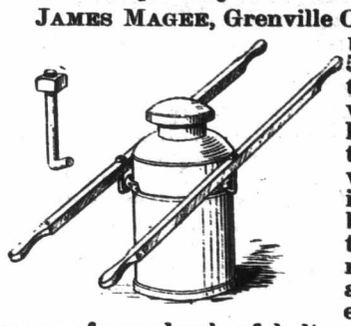
Adjustable Snow Gate.



F. W. C., Middlesex Co., Ont.:—"A represents a gate that may be hung at different heights from the ground. If it be raised slightly there will be a space between the upright (G) of gate and the notched upright which is hinged to the post. The gate is next pushed towards P, and the irons (I and I) are freed from notches. The gate may be raised to the required height to avoid the snow. The notched upright swings with the gate, and the irons (I and I) are only bolted to gate."

Easy Way to Carry Milk Can.

JAMES MAGEE, Grenville Co., Ont.:—"Take two pieces of good wood 5½ feet long, 2 inches thick, and 2½ inches wide; bore a ⅝ inch hole through each in the center the wide way; get two ⅝ x 5½ inch bolts, get your blacksmith to pound the heads level with rest of bolt, then turn an inch of the head end a little more than square from shank of bolt, as seen at A. Put one in each piece of wood, and you have a pair of handles for the two bolts and the labor of turning the hooks. The ends of the handles should be dressed down to fit the hands. I have used a pair for three seasons, and find them very useful for carrying anything in a milk can. The advantage of these handles is that the persons carrying can use both hands at the same time. The hooks must turn to side of handles. Two men can carry twenty-five gallons of milk or water with ease."



GARDEN AND ORCHARD.

Gleanings from the 26th Annual Meeting of the Michigan State Horticultural Society at Grand Rapids, Dec. 1, 2 and 3, 1896.

BY PROF. JOHN CRAIG, DOMINION HORTICULTURIST.

The peach industry is of paramount importance to Michigan fruit-growers. Fully half of the programme was either given to discussing some of its phases or eventually drifted that way by the trend of the questions asked. The manner in which the meeting was conducted is most commendable. Strict attention to the subject under discussion was enforced. This, with businesslike promptness and a large attendance of fruit-growers, characterized the meeting throughout. President Morrell and Secretary Reid (re-elected) are splendid executive officers, and, without doing an undue amount of talking themselves, manage to keep an unflagging interest in the topics under discussion, and secure in each case a profitable interchange of views.

* * * *

The package question gave rise to a great diversity of views. Many favored the bushel basket peculiar to the district of Grand Haven and used to some extent at Grand Rapids. The advocates of this package had much to say in its favor, cheapness and ease of handling being the principal planks in the platform. Some of the best growers, particularly those who catered to the demands of a fancy trade, said that a small package was indispensable. A crate holding four, six or eight five-pound packages had been used by some growers with good success. This is undoubtedly the best view to take. "The finer the goods the smaller the package."

* * * *

Three interesting papers describing what becomes of the fruit after it reaches Chicago were read by representative commission men. One of these more than hinted at overproduction as a cause of the low prices, another said "under consumption," while both agreed that more attention should be given to grading fruits, especially peaches. Only about five per cent. of the fruit shipped to Chicago commanded fancy prices, such as was paid for by the "upper ten." The middle grade of fruit was largely bought by jobbers and shipped by them to small points near Chicago, and also supplied retail grocers and fruit dealers in the city. The lowest grade was bought by hucksters and the poorer class of grocers. Growers were strongly advised against shipping poor fruit to distant markets. One hundred and eighty-five fruit trains carried fruit to or from Chicago each day during the fruit season. Think of the enormous consumption.

* * * *

What varieties of peaches shall we plant? is a question that always elicits answers nearly as varied in character as are the number of districts represented by those who respond. Several varieties of peaches seemed to be growing in favor. *Elberta.*—While the consensus of opinion seemed to be that it was best to consider this variety as yet on trial, a few prominent growers were attesting their faith as to its ultimate value by planting it quite heavily. One or two expressed doubt regarding its productiveness. It is also said to be affected by curl leaf quite badly. On the market it outsells anything of the same season. *Wager* received good words; it was recommended to be sold in one-fifth baskets instead of bushel baskets. It is sensitive to drought. *Kalamazoo* peach was highly spoken of by President Morrell, who said it was a medium sized yellow free stone peach of good quality, about ten days later than Crawford; the trees are very hardy. *Garfield* was recommended as a moderate but regular bearer. Mr. J. H. Hale, of Connecticut, described *Triumph* as a moderate grower, bearing medium to large, early, yellow fruit; a cling, but ripening evenly to the pit. He has faith in it. *Reeve's Favorite* was praised by all on account of its fine quality and appearance, but was thought to belong, on account of softness of texture, rather to the amateur class than the professional; said to do best on clay loam.

* * * *

Orchard Cover Crops brought out a lively discussion, a remarkable feature of which lying in the fact that a number of growers did not seem particularly anxious about securing to peach orchards the nitrogen obtained by growing a clover crop. They seemed to be able to secure the necessary growth by good cultivation, supplemented by fertilizers containing potash and phosphoric acid. Oats, with crimson clover, one-half bushel of the former to eight or ten pounds of the latter per acre, is a combination producing a cover crop said to be giving satisfactory results in the southern and western part of the State. The seed is put in after cultivation ceases in that part, about August 20th. This mixture is also recommended by Prof. Taft, of the Agricultural College.

* * * *

Speaking of the future of peach culture in the United States, Mr. Hale pointed out that the area devoted to the culture of this fruit was being enormously enlarged each year. Georgia, Missouri, Delaware, Maryland, Virginia, Pennsylvania, New York, Colorado, and Texas were among the foremost States in developing the industry. He was of the opinion that it would only be a short time before there would be more peaches produced than could be consumed by the markets that could be reached. It would undoubtedly be a struggle for the "survival of the fittest." He regarded the future as hopeful to the man who went into the work imbued with a love for it and having plenty of ambition, perseverance, and brains.

* * * *

The discussion upon apples brought out the interesting fact that Ontario apples were largely supplying the demands for this fruit in the Chicago market, to the partial exclusion of Michigan-grown fruit. This speaks well for the quality of Canadian Spys, Kings, Greenings, Baldwins, and Snows, as compared with those grown across the line. Among highly commended varieties were Sutton's Beauty, McIntosh Red, Salome, and Hurlbut. As exhibited, *Sutton's Beauty* is of medium size, yellow with reddish flush on one side, tough skin; firm but melting, yellow flesh; quality good; season early winter, perhaps later; tree said to be very hardy.

Canadian Apple Shipments to Australia.

BY J. S. LARKE, CANADIAN REPRESENTATIVE.

I had been advised that a shipment of apples might be forwarded from Ontario as was done last year. If a large quantity were sent, I deemed it advisable that they should be placed in cool storage, and placed gradually on the market only as fast as it could take them at good prices, and had arranged for securing the storage in case it were required. None came to my order, but two parcels were sent out by the last steamer. One of nine cases were sent to Mr. F. Winter, who sold those forwarded me last year. They were sent by friends, as a gift rather than as a business venture, but Mr. Winter treated them as a regular consignment. They were a varied lot, consisting of Spys, Snowapples, Baldwins, Russets, and a few "Seek-no-Furthers." Three cases had been nicely assorted, but the other six had been more hurriedly gotten together and packed. They were wrapped half in Manilla wrapping paper; the balance in pieces of newspapers. They were shipped from Preston, Ont., on the 21st of October; left Vancouver on the 10th of November, and arrived here on the evening of December 4th. They were stowed below decks, as was the case last year. The nine cases yielded six of good fruit and three of defective. The Snows carried better than any other variety, there being but thirty-seven defective apples—eleven decayed, and twenty-six with some spots—in two hundred and sixty-six apples. The Northern Spys were in the worst condition, and decayed more rapidly after being picked over. Owing to the consignment being so small, and Mr. Winter being too busy to devote much time to their sale, in order to make full cases had to mix the varieties and sell as quickly as possible. Five cases he sold at 17s. 6d. per case; a sixth of equal value he retained or gave to friends. The results were as follows:—

6 cases, at 17s. 6d		£5 5s. 0d.
3 cases, at 1s		3 0
		£5 8s. 0d.

Expenditure.

Freight, at 4s. 1d. per case	£1 16s.	9d.
Wharfage		9
Cartage	8	0
Picking over	5	0
Commission	7	6
		£2 18s. 0d.
Balance		£2 10s. 0d.

This netted the Canadian shipper $1.35 per case in Preston. The expenses were higher than they would have been in a commercial shipment. The cartage would have been 1s. 6d., instead of 8s. In such case the net yield to the shipper would have been $1.55 per bushel. Five dollars were offered for the Snows, unmixed with the other varieties, and probably eighteen shillings could have been got for the Baldwins. A consignment of Snowapples arriving in as good condition as did these would have netted the Canadian shipper $2.85 per bushel case.

The second was a larger consignment sent to Mr. Duffy, a successful commission-man. A statement of its financial result cannot be yet given, but it will be an unfavorable one. In the first place, it appears it should have been shipped a month earlier, but was delayed by the strike on the C. P. R. They were in such a condition when shipped that they had to be picked over on the wharf. Though provision had been made for ventilating the cases, this was neutralized by lining the cases with paper and failure to put slats on the cases. The apples were not a selected lot, some being very good and properly wrapped, and others being not so good, nor properly assorted. It is no marvel that they arrived in a very bad condition, and it is probable that not one-third will be really fairly good fruit. Mr. Duffy's opinion is that if they had arrived in fairly good condition a month ago, he could have got from sixteen to twenty shillings per case. He sold California apples at eighteen, not nearly so well flavored as these are. He thinks he will get fairly good prices for the marketable fruit in this lot. Medium sized fruit is worth two shillings per case more than the largest. The retailer does not care to ask more than fifty cents per dozen, though he gets proportionately higher for a single apple, hence he requires a considerable number in a case to net him the profit his business requires.

These statements warrant the conclusion that if properly picked, cased, and handled on rail and steamers, Canadian apples can be handled here in good condition. It is just as important to see that they reach Vancouver in good condition as it is to have them cared for on the sea voyage. California apples arrive in so good state that in many cases it is not necessary to pick them over.

If the proper varieties are sent, at the present rates of freight, it would appear that Canadian apples arriving here about the last of October, November, and December will bring better net prices than when sent to any other market. I have nothing to add to the recommendations made in my report on the shipment of last year. If followed, they will, I think, insure a profitable export trade of some dimensions.

Small Fruit Growing for Farmers.

BY B. GOTT, MIDDLESEX CO., ONT.

I believe it to be the duty of every farmer who has the control of a large or small plot of choice Canadian soil, in our conditions, to make good and liberal provision to supply himself and family with a plentiful supply of health-giving, beautiful fruits in their season. Under our conditions of climate and soil the expenditure in doing this is reduced to a minimum. It is, therefore, a crying shame to our country that so many of our farmers and their growing families of young children do not properly know the taste of good fruit grown upon their farms. Every child should know and readily identify all the various forms of our fruit products, their flavors and qualities.

The Fruit Plot.—The plot on the farm devoted to the culture of small fruits should be well selected, and nicely fenced if possible. It may be large or small as required, but it must receive careful attention, and be kept thoroughly neat and clean. (Small fruits are so called to distinguish them from the larger or tree fruits.) The soil should be well drained, of rich, mellow loam to give ease in working. It must be annually thoroughly and deeply worked, and well enriched with good composted vegetable matter. In this secure plot of choice soil may be successfully grown at least the four following standard fruits, viz.: Strawberries, raspberries, gooseberries, and currants, in all their varieties and perfection.

Strawberries.—The successful growth of strawberries is simple and easy, providing the essential conditions are complied with. The soil, as before, must be deep and moist and well tilled. The culture

must be frequent and thorough, allowing no weeds to appear. The planting must be done in the early spring, as early as the ground will work well, and the plants must be one-year plants. Select good, thrifty, well-rooted, young plants of the variety desired, and after making small holes in the ground, spread the roots well out in the new soil and make them quite firm, and growth will readily commence. The planting should be done in rows three feet apart, and the plants one foot apart in the rows and allowed to mat up close the first year, or they may be made very satisfactory grown in hills. Pinch off runners till plants are well established, and also blossoms, not allowing fruit to set the first season. On the approach of winter a thin, light covering of straw or leaves may be placed on the whole, and in the spring this mulch should be raked in between the rows to remain there. The picking may be safely left to be attended to by the good wife and mother and the children, who, with much pleasure, will look after the fruit.

Varieties.—The small space at my disposal forbids me to attempt more than simply indicate a few of the best for home or family use.

1st.—For early: *Lovets* (S.); early, a new, large, early, promising berry. *Buback No. 5* (P.); large to very large, fine berry. *Haverland* (P.); large, firm, and fine, good bearer. *Clyde* (S.); healthy, vigorous, large size, uniform, quality good, firm, dark, bright scarlet, very productive, stands drought well.

2nd.—Medium: *Warfield* (P.); medium firm, and good producer. *Williams* (S.); plant strong, great bearer. *Maple Bank* (P.); new and good, fruit large and best.

3rd.—Late: *Jersey Queen* (P.); a standard sort, fruit large and fine. *Aroma* (S.); new, fruit large and late, firm and good. *Woolverton* (S.); fruit large, and of good quality. *Gaudy* (S.); fruit large and good, a good grower. *Connecticut Queen*; early, large, and good.

By consensus of opinion Buback, Warfield, Haverland, Clyde, and Woolverton are the five best market sorts to-day. I have named five late sorts because of their great value, and because good late berries are more valuable than early ones. With such a splendid list of this fine fruit, in its new and excellent sorts, I am sure that all farmers and others should have a splendid showing, and a fine, toothsome treat.

[TO BE CONTINUED.]

VETERINARY.

The Care of Young Horse Stock.

(From an address to Manitoba Farmers' Institutes, by F. Torrance, B. A., D. V. S.

Of all our young domestic animals—colts, calves, lambs, and pigs—the colts are those most liable to disease and accident. Many of these mishaps that cause disfigurement, blemishes, or even untimely death, may be prevented by special care on the owner's part. The means at our command for protecting young animals from these evils will form the subject of the following remarks. The care of the colt should begin with the care of the mother. By this is meant not the ill-judged kindness of high-feeding and idleness, but the proper combination of good food and water, sufficient exercise, and comfortable quarters. Mares in foal are not any the better for having no work to do. On the contrary, they are distinctly benefited by doing regular work, provided it is of a suitable kind, and their offspring will be all the more vigorous in consequence of it. Weak colts that cannot stand alone are generally the offspring of mares that have been getting too little exercise during the latter months of gestation. The colt partakes of the nature of its mother, and if the dam is soft and flabby from want of work or exercise, the foal will be weak at its birth and a disappointment to the breeder.

Breeding mares, then, unless running at pasture, should have regular work or exercise every day. Their food should be abundant and contain all the elements required for the formation of bone and muscle. As the time approaches when the birth may be expected, the food should be of a more laxative nature, and the ration should contain a certain amount of bran or of roots. At the birth of the colt steps should be taken to guard against disease and accident. The most important of these are in connection with the treatment of the navel cord. If the birth takes place in the pasture, it is likely that everything will be well; but if it occurs in the stable or barnyard, the young animal is exposed to certain dangers which you should guard against. The most serious of these dangers is the disease known as

BLOOD POISONING, "NAVEL ILL" OR SEPTIC ARTHRITIS.

This disease is caused by disease germs which have gained access to the system through the moist surface of the navel cord during the hours immediately following birth. The disease germs are present in soiled bedding, filth of all kinds, and when the young animal is born indoors he is more or less exposed to infection from these sources. Out of doors the danger of infection is much less, and at pasture is so slight that it may be entirely disregarded. Once infected, the colt will within a few days show some of the following symptoms: He seems indifferent to his feed and unwilling to get up. Then he is found to be lame, and a painful swelling is discovered about some joint or other. This may disappear under proper treatment, but frequently it becomes worse, and eventually bursts and discharges matter (pus), and a running sore is left. This often communicates with the interior of the joint, and the synovia or joint oil escapes. Cases of this kind usually die, and even mild cases are difficult and uncertain to treat. The importance of preventing the disease is, therefore, easily perceived, and the means of doing so are simple and within the reach of any one. Have at hand a small quantity of pure carbolic acid, and as soon as the foal is born dip a feather in the acid and brush it all over the surface of the navel cord, taking care not to touch the skin with it. The effect of this is two-fold—it presents an effectual barrier to the entrance of disease germs and it dries up the navel cord quickly, and once the cord is dry there is no danger to be feared from disease germs. So far I have spoken only of colts. Calves suffer from this disease so seldom that it is unnecessary to take this precaution.

BLEEDING OR HEMORRHAGE FROM THE CORD.

Unless the flow of blood is alarming, it is better not to tie cord without waiting a minute or two to see whether it will not stop of itself. The tying of the cord interferes with its rapid drying, and is to be avoided if possible. When necessary, it should be of stout cord—binding twine will do—and must not be applied too close to the body. Always leave a couple of inches, if possible, between the ligature and the body. Then if the cord is accidentally torn and the bleeding starts afresh you have still something left upon which to apply a ligature.

CONSTIPATION.

After attending to the navel, the young animal, as a rule, requires no help to get up and take its first drink, and this is generally followed by the first movement of the bowels. If this motion does not take place within an hour or two after birth, constipation is present and calls for immediate treatment. During the life of the colt or calf within the womb, although no food enters its mouth or stomach, yet a certain amount of material accumulates in the bowels. This is called *meconium*, and is chiefly composed of bilious matter from the liver and of dried mucus from the mucous lining of the bowels. Nature makes provision for the speedy expulsion of this meconium after birth by giving a purgative quality to the first milk secreted by the mother. If, from any cause, this fails to empty the bowels within a short time after birth, the meconium should be removed artificially, either by giving an injection of warm soap suds, or by hooking it out piecemeal with a stiff piece of wire bent into a loop. [NOTE.—Many find there is no other means so safe and effective as to insert the index finger, well oiled, to remove the meconium.—ED.] After the first hard masses are removed there is usually no further trouble.

DIARRHŒA.

The opposite condition of too great looseness is a frequent ailment of young colts and calves. It may arise from taking cold, or it may be produced by some change in the milk which renders it unwholesome. If the colt or calf is sucking its mother, the udder should be examined for symptoms of inflammation, and if these are present the young animal should be fed artificially for a time. When no change can be detected in the milk or udder, the trouble may be a too rich quality of milk, and the diet of the mother should be lowered for a time. In treating diarrhœa, do not make the mistake of trying to stop it at once by giving laudanum and astringent medicines. It is better to try first, by dieting the mother and removing probable causes of the condition, to get the bowels into a healthier state. A moderate dose of raw linseed oil will generally be useful in helping nature to expel irritating matters in the bowels. Often it will be all that is necessary, but if the diarrhœa continues it is time to give medicine to check it, such as laudanum and tannin, in moderate and frequent doses, until the desired effect is produced.

FEEDING COLTS.

Young colts should be taught to eat oats as soon as possible, so that when they are weaned they will take readily to them and not suffer a serious check to their growth. The care that is bestowed on a colt at the time of weaning and during his first winter is most important to his development. If he is left to feed himself as best he can, and "rustle for grub" around a strawstack, he will never amount to anything. Every colt should have his oats and bran regularly every day from the time he is weaned until he is turned out to grass the next summer. The insufficient food and the care bestowed upon many of the colts in this Province is one reason, and probably the great reason, why most of the horses raised in Manitoba are undersized. Good feeding is essential to the growth and development of the colt.

PARASITES.

During the winter months colts often get infested with vermin. Lice multiply so fast and cause such irritation that unless speedily destroyed they will seriously injure a young animal by stunting his growth. There are many remedies in use for destroying them, but all have some drawback, and the ideal one is not yet discovered. Coal oil emulsion is probably the best of these, being cheap and effectual in destroying not only the lice, but their eggs or nits. The drawback is that it wets the skin, and in cold weather this may be followed by a cold. It should only be applied on a mild day and in a warm stable: Boil two ounces of soap in a quart of water until dissolved, then pour it into half a gallon of coal oil, and churn up the mixture briskly with a syringe until the oil no longer comes to the top. When cool this should form a jelly, and must be diluted with four or five times the quantity of water before using. The colt should be wetted all over with this solution, and the sides of the stall should be painted with coal oil.

CARE OF THE FEET.

During the winter the feet of the colt are not subjected to the same amount of wear as they are in summer, and as they are growing continually they soon attain an unnatural length. This increased length of foot alters the natural relation of foot and leg. The weight of the body is thrown more and more upon the back tendons, and strains are thrown upon structures unprepared to stand them. The result of this condition, if allowed to continue, is frequently the production of ringbone or some other deformity. The feet, then, should be looked to, and the excessive growth removed when necessary. Twice during the winter should be sufficient.

Experience and Experiments with Milk Fever in Cattle.

(Compiled from an address delivered at the annual discussional meeting of the Refrewshire Agricultural Society by Mr. Alex. Pottie, M. R. C. V. S., Paisley)

Milk fever in cattle is attended by a protracted sickness that lasts from twenty-four to forty-eight hours, and then passes off. It may attack the cow two days before calving, or within three days after calving, but never at any other time. The disease is more fatal when it attacks cattle when feeding on grass than house meat. It seldom attacks a cow under five years old, but may attack a cow at any age afterwards. The first attack renders them almost liable to take it a second or third time, for one attack leads to another. Now, I will add to these my own observations: That an animal with a full rumen or first stomach seldom recovers, or is more likely to die than one with a comparatively empty stomach; that a cow in this disease has almost no fever or excess of bodily heat, and that recovery does not depend on temperature; and that in the great majority of cases a cow does not die from constipation of bowels. Now, these are, perhaps, the most of the facts or truths from observation that we can produce, and whatever we find is the first cause must in some measure account for these facts. We will not, then, begin to theorize about the nature of milk fever until we have examined closely the state of the animal immediately after it takes the disease, its internal organs, and the *post-mortem* appearance of a cow that has died of the disease. If you examine, say, ten carcasses of cows that have died of this disease, having passed through all its stages, you will find five at least where not a particle of disease can be found in any organ of the body. If you examine a carcass, say, of a cow twelve hours in it, and which passed as near the gates of death as possible, and which had then been killed, you are no better. Now, suppose I admit that in some cases we find congestion of the brain, blood on the brain, or fluid on the brain or spine; in another tuberculosis in various parts of the body, or disease of the liver; or in another a needle near the heart, or the placenta in the stomach—are we nearer a first cause? No; for if we admit that cases of milk fever have been known where nothing was to be observed, we must also, then, admit that all the other things observed are but accidental diseases or conditions, or are the effects of the disease, which may render the case more difficult to cure, but which can in no way be connected with the true cause of the disease, unless we view them as exciting causes. I admit, then, that the disease, whatever it is, is not structural, but functional. When we see any alteration of structure, as inflammation of an organ or any changed condition of the carcass, we say the disease is structural; but if we see nothing—that is, if the disease has died with the animal—we say that it is functional; that is, it belongs entirely to those diseases where the organ has stopped acting. If a watch stops and the watchmaker can see nothing broken, but only some dust that has prevented the watch from moving, we would call that stoppage of the wheels a functional stoppage. So, you see, we learn much by seeing nothing, for we have proved that whatever the disease is it is a functional derangement—it is a stoppage or interference with the working of some organ of the cow's body. You may have three cases of milk fever, and in every one the symptoms are different. Now, we can only know disease or read it in many cases by its symptoms. First, then, you have what is called a mild case—partial paralysis of the hind legs. She is down and cannot rise; is not very sick; carries her head, and at times keeps it to her side; grinds her teeth; breathes naturally, but is inclined to swell; may get up, stagger, and lie down again. If not tuberculosed she may get up in a day or two; she has almost no milk, and is but slightly affected in the head. This is what I call the partial paralytic form. The second form is that of a cow that seems at first dull; eye dull; staggers, and moans as if very sick; tries to stand as long as possible; probably falls, as the hind legs have become so cramped that she cannot bend them. She struggles a little, but the drooping head, dull eye, and incessant swing of the head all indicate that she is going fast into a sleepy, comatose state, so that in four hours or so from the first visible attack she may not be able to swallow. This is what I call the comatose

form, or sleepy milk fever. If she dies, you hardly know it. If she begins to recover, the recovery is rapid—something like a man that has been dead drunk; you might almost imagine you hear her say, as she raises her head, "What has all this been about?—let me have something to eat." Her milk has returned, and she is looking for straw or hay—this is the second or comatose form. The third form is the apoplectic. The first symptoms are grinding the teeth; the cow is easily excited; staring eye; bellowing; becomes quite unconscious; struggles violently; looks wild, but is quite blind; stertorous breathing; after she is down, throws herself from side to side or on her broadside; continues in this violent way until she gets exhausted; sinks down into a comatose state for a short time. If she is to recover she gets quieter, but she may die in this violent state; the pulse in such cases is always inclined to be strong and wiry—this is the third or apoplectic form. This, then, is but a short description of what I find to exist in our practice in Renfrewshire. And with cases of milk fever there are three distinct forms of the same disease, and, to my mind, the man that treats all these forms alike is committing the greatest blunder that anyone could; for if what I have said is true, if you give a stimulant to the worst or apoplectic form you are just increasing the disease, while with the sleepy or comatose form you can give stimulants freely, but no sedatives or depressing medicines, while with the partial paralysis often a very little attention brings them round. I cannot dwell on the nature of the symptoms nor the condition of the bowels and stomach while the animal was in this first stage of the fever, but I may mention that I found, by passing a long probe into the stomach, and keeping it for a time in an upright position, I could not detect a single movement of the first stomach; while if I pierced the stomach of a cow swelled with gas, and tried the same probe, all my strength could not prevent it moving round, thus conclusively proving that the stomach at the earliest stages was in a very passive, if not entirely inactive, state.

The question then arises, Would this condition of the stomach of a cow, if allowed to continue for say one or two days, produce that brain affection that we have described as secondary symptoms of the disease? It would; for we have staggers in the cow, very often caused by indigestible food, and the symptoms of the disease are quite the same as the apoplectic cases of milk fever, and in many cases are identical. If we examine the cow's stomach in a case of stomach-staggers, we see inflammation of the first stomach, showing that staggers is an inflammatory—that is, a structural—disease of the stomach, while milk fever is functional derangement. We have tried to prove that milk fever, with almost identical symptoms, is a functional disease, because the stomach has simply stopped acting, and no doubt, from what we call reflex action, the disease of the stomach was reflected to the brain. Dyspepsia, or derangement of the stomach, can take place at any time, and as we know that the cow belongs to a class of animals which require to perform a function peculiar to themselves in order that their stomachs may be in order—namely, to chew their cud—you can readily understand that when such a change in the system at calving takes place, and when every blood vessel of the cow's body is gorged with blood, if the cudding operation is interfered with when the stomach is filled with food, if it is suspended longer than it ought to be, the contents of the first stomach become a source of irritation, and this irritation is communicated to the brain. This going on for a time causes an irregular flow of blood to the brain and nervous system, causing giddiness and all the other symptoms. Let us look now at prevention. If this theory is correct, the best prevention is to keep the first stomach and the second very empty. Some think that by allowing the cow to calve on the grass, and letting her suckle her calf, milk fever would be prevented, because it is imitating Nature. My experience does not correspond with this statement, for many a cow have we had to take from the field in a helpless condition through milk fever, the owner having just adopted this method for a trial. What my theory with regard to the disease leads me to as the best preventive, is to keep the first and second stomachs comparatively empty, and you will do more good in the way of preventing this disease than all the methods I know.

We come now to consider the cure for milk fever. It takes all the skill and all the remedies of a well-trained veterinary surgeon to cope with milk fever. After you have heard that there exists three different and distinct forms of this disease, and that the remedy for one would hasten on death in another, it would be unwise of me to ask you to injure your own property. But there are certain things you can do, and others you need not do, in such cases. When you hear a cow grinding her teeth, either before or after calving, give her nothing but a drink of water for at least two days, with a small handful of hay or straw. No soft meat should be given, for perhaps she is not cudding. Do not tempt her to eat; she has possibly a hundredweight of food on her first and second stomachs, enough to serve her for four or five days. If the milk is much less than she ought to give, be doubly on your guard; if she becomes giddy, keep an assistant steadying her Do not attempt to bottle at this stage, especially if she is much excited. If you do, the medicine will in all probability pass partly into the lungs instead of into the stomach. You may think at such times that the cow is a bad swallower, but the truth is she cannot swallow. Sometimes the jaws get stiff and rigid. Take care in such a case while bottling to hold the head in line with the body, and if she coughs, let down the mouth though you should lose all. Do not let her lie flat on her side, but bolster her up, and give her head comparative freedom. She must be turned over at least three times daily. Do not give purgatives if she has been at grass; and give very small doses of physic, if any. Put a cold cloth to her head and spine, and see that her hind legs are in a proper position; and last, but not least, send at once for your veterinary surgeon.

The reason, then, why a cow takes milk fever far more frequently than any other animal is that she has four stomachs, and she must of necessity have a larger supply of nervous energy to keep these stomachs in order, and on this account they are far more easily disarranged when parturition occurs. When the cow's stomach is disarranged she cannot vomit as other animals can to expel the offending food, and therefore, getting no relief in that way, the sickness is protracted. I have long had in view a method whereby some of those fatal cases that occur when cows are at grass might be remedied; but the difficulties are great. It consists in emptying the stomach by pumping off the food. Medicine, I am quite certain, is of no use when, perhaps, 1½ cwt. of fermenting grass is lying on the stomach, and I have stated that in other animals an emetic relieves the animal, while the same medicine given to the cow produces no action at all. For five years I have endeavored to construct a pump to accomplish this purpose, and by next spring I hope to have my object accomplished, since I have obtained a metal tube—the first, and I believe the only metal pipe that has ever been passed into a cow's stomach by the mouth. Since I have obtained this tube—made of aluminium, and quite as flexible as an ordinary probang, and with an opening 1 in. wide—I am almost confident that I will succeed.

MISCELLANEOUS.

Fine Feathers at the New York Horse Show.

A New York paper employed a mathematician to estimate the amount of money that the recent horse show in that city put into circulation, and he tabulates the results of his enquiries as follows:—

FINE FEATHERS FOR MAIDS AND MATRONS.

10 women spent at least $2,000 each in dress and jewels.	$ 20,000
50 women spent at least $1,000 each	50,000
100 women spent at least $500 each	50,000
500 women spent at least $200 each	100,000
1,000 women spent at least $100 each	100,000
2,000 women spent at least $50 each	100,000
5,000 women spent at least $20 each	100,000
Total	$520,000

TO ADORN THE STERNER SEX.

25 men spent with tailors, hatters and haberdashers, $500 each	$ 12,500
100 men spent at least $250 each	25,000
500 men spent at least $100 each	50,000
1,000 men spent at least $50 each	50,000
2,000 men spent at least $25 each	50,000
5,000 spent at least $10 each	50,000
Total	$237,500

TOTALS TO WHICH ALL CONTRIBUTED.

Paid for admission and for boxes at the show	$150,000
Hotel bills and railroad fares of out-of-town visitors	100,000
Carriage hire	50,000
Special dinners and luncheons	100,000
Flowers	25,000
Entrance fee for horses, wages to special attendants, etc	100,000
Total	$525,000
Grand total	$1,282,500

QUESTIONS AND ANSWERS.

[In order to make this department as useful as possible, parties enclosing stamped envelopes will receive answers by mail, in cases where early replies appear to us advisable; all enquiries, when of general interest, will be published in next succeeding issue, if received at this office in sufficient time. Enquirers must in all cases attach their name and address in full, though not necessarily for publication.]

Veterinary.

COUGHING CATTLE.

RANDOLPH SPARROW, Sheppardville, Man.:—"A number of my cattle have coughed for some time; one of them has had it nearly a year. I had them tested for tuberculosis and they were pronounced clear of it. Can you let us know in the ADVOCATE what it is likely to be?"

[The cough may be the result of some chronic bronchial affection, brought on by undue exposure to cold and wet. Your cattle, however, may be suffering from tuberculosis, notwithstanding their not responding to the test. I presume you had them tested with tuberculin, but that test, unless it is properly conducted, is very far from being reliable, and, even when it is carefully and correctly applied, it is not by any means infallible. Without having the opportunity to make a personal examination, I would not be in a position to give a correct opinion as to the cause of the cough. You are within easy distance of two veterinary surgeons, why not have one or both of them examine your cattle?

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

PROBABLY ACTINOMYCOSIS.

SUBSCRIBER, Brandon, Man.:—"Please let me know in next issue of the ADVOCATE what is the cause of a hard swelling coming on the jaw of cattle? It is movable, and comes on near the windpipe—first one side, then on the other, and in time bleeding."

[Perhaps the ailment is actinomycosis, usually known as "lumpy jaw"; but without a more definite description of the disease than your note contains, I would not be able to give a decided diagnosis. Are many of your cattle affected? Do they cough? When the lumps break do they decrease in size or do they continue to grow larger?"

W. A. DUNBAR, V. S.]

EPILEPTIC FITS.

A GREENHORN, Kemnay, Man.:—"I have a bull calf six months old that takes fits. He drops suddenly as though stunned, rolls his eyes, and seems to be trying to get up again; sometimes walks around on his knees, then becomes exhausted and lies down; breathes very quickly; very unsteady when he gets up, and after ten or fifteen minutes commences to eat as well as ever. Fed on oat sheaves and a little chop; in good condition. Please tell me what is the matter, and cure?"

[Your calf is the subject of epileptic fits. The cause is in most cases obscure; but this peculiar affection is sometimes the result of faulty digestion, worms, etc. Give the following on an empty stomach: Raw linseed oil, eight ounces; turpentine, six drams; oil of male fern, one dram. Repeat this dose in one week, and then give, for ten days, morning and evening, in sloppy food: bicarbonate of soda and powdered areca, of each one dram.

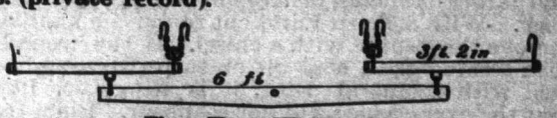
W. A. DUNBAR, V. S.]

Miscellaneous.

HIGHEST BUTTER YIELD—3-HORSE WHIFFLE-TREE.

W. C. WATSON, St. Lawrence Co., N. Y.:—"1. Can you give me the name of the cow of any breed which made the most butter in one year? 2. Give through the ADVOCATE some drawings of three-horse whiffletree."

[Pauline Paul (Holstein-Friesian); 1,153 lbs. 15¼ ozs. (private record).



Three-Horse Whiffletree.

2. "Make a doubletree 6 feet long and attach to either end of it a whiffletree 3 feet 2 inches long. Put common hooks on the long ends and a pulley on each of the short ends, putting a chain about a foot long, having a hook at either end, through them, to which the traces are to be attached. It will be noticed that the clevis is attached to single whiffletree, one foot from the inside end. This equalizes the draft among the three horses."

The above plan was contributed by Thos. Martindale to our Helping Hand Department, May 1st, 1896, issue. We invite readers who consider they have better three-horse whiffletree arrangements to send descriptions of them to us for publication for the benefit of fellow readers.

RATION FOR MILKING COWS AND FATTENING CATTLE.

J. D. S., Oxford Co., Ont.:—"My cows are not milking so well as I think they ought, and I fancy their ration is not as it should be. Can you give me your opinion of the ration? What properties are deficient? What should I add to make it perfect? Can you explain the course of the effect of a change of ration such as you might recommend? We feed ensilage (cut when corn was in early milk), 35 lbs.; mangels, 25 lbs.; oat chop, 6 lbs.; straw *ad lib.* each to fresh milkers. Strippers get no chop. 2. Our heavy fat cattle get ensilage, 40 lbs.; turnips or mangels, 33 lbs.; pea and barley chop (equal weight of each), 12 lbs., and straw, what they will eat. 3. Can I obtain any bulletin on the composition of foods, issued by the Government; if so, what and where?"

[1. While food has much to do with a copious production of milk, it is very important that the animals to be fed, to produce milk, have the necessary capacity as dairy cows. Knowing that the cows in question are all fresh, we would blame their capacity for milk-giving somewhat for the unsatisfactory flow, provided they are in good heart, though the ensilage is probably deficient in solids. While the ration being fed is evidently lacking in protein (flesh- or casein-former), we would not expect its effect to be noticed for at least a few weeks after calving, as the energy of milk-production is so great in good milk cows that it continues for a time unaltered, even when the fodder does not supply sufficient materials. The deficiency is thus supplied from the body of the animal, and the latter loses flesh and fat. As has been stated, the lacking constituent in the ration being used is protein, which can be supplied by feeding pea meal, oil cake cotton-seed cake or bran. As we all like to avoid buying, if possible, we would suggest that the grain ration consist of 2 lbs. of oat chop and 4 lbs. of pea chop, as peas are much richer in protein than oats. If oil cake or cotton cake can be conveniently procured, a good mixture would consist of 3 lbs. of oats and 3 lbs. of either of the cake meals. Regarding the explanation of the effect of supplying the lacking ingredients upon the milk flow, it must be understood that the elements of the animal body consist largely of (1) albuminoids (mainly protein); (2) fat; (3) carbohydrates; (4) ash. The same may be said of the composition of milk, which we know is a perfect food, as it alone can sustain life and supply the elements of growth to the young animal. In the life of the animal, each and all of these constituents are wearing out or burning up, so that without a continuous supply of them the body can not remain normal, nor produce what it does not contain. Therefore, it is all-important that all the constituents of the animal body, which are also the constituents of milk, be supplied in the food, in order that the cow may retain her best

form for doing what she is intended. 2. *Re* the ration for fat cattle, we refer J. D. S. to the letters on that subject in this issue. 3. The Wisconsin Experiment Station issued an excellent bulletin (No. 38), on "One Hundred Rations for Dairy Cows," in 1894. If not exhausted, a copy may be procured from Prof. Henry, Agricultural Experiment Station, Madison, Wis., U. S. A. The Massachusetts Agricultural College, Amherst, Mass., also issued Bulletin No. 39, on "Economic Feeding of Milch Cows."]

COTTON-SEED MEAL FOR POULTRY AND CATTLE.

M.M.M., Middlesex Co., Ont.:—"1. Is cotton-seed meal good for fowls; if so, what quantity would you give 40 hens a day, and how often a week? Is it good for turkeys and ducks, and what quantity ought these to have at a meal? 2. Is it good for cattle, and how much should cows get at a feed, and how much for calves?"

[We have never known cotton-seed meal to be fed to hens, ducks, or turkeys, so cannot speak with authority upon the subject. We would not consider it a very suitable food, however, as it tends to constipate stock to which it is fed. 2. Cotton-seed meal is valuable for feeding dairy cows, especially along with a succulent ration, lacking in protein, such as roots or ensilage. From 2 to 3 lbs. per day, along with other chop, is sufficient for one cow. Would not feed it to calves; linseed meal is better.]

BLACK KNOT.

H. S. T., Mount Pleasant, Ont.:—"1. Can black knot be removed from the stems and larger branches of apple trees? 2. Are there any black-knot-proof plum trees?"

[1. Black knot may be removed from the stems and larger branches of trees by a little careful surgery. With a sharp knife cut round the knot, and remove the center with a chisel. If the wound is then treated with coal oil or turpentine, and covered with a mineral paint, it is altogether likely that the excrescence will not reappear. Plum trees two and three inches in diameter could be stem grafted, but the result might not be successful, and it would be advisable to first try the other surgical operation. 2. There are so-called black-knot-proof plums, but, in experience, I do not know that they exist, except in a relative degree.

With reference to what might be called "nostrum specifics" to prevent black knot, I may say in these times quacks and patent medicines are very numerous. A knowledge of plant physiology makes such a remedy appear ridiculous. Some time ago a man was anxious to sell me the right to use calomel, in the form of an injection, to prevent pear blight. This is said to be a preventive against "worms" in children; but pear blight is hardly an analogous malady. It does not seem likely that we could kill one vegetable organism feeding upon another without injuring the host as well as the parasite. JOHN CRAIG, Horticulturist.

NOTE.—The ADVOCATE was recently tendered, but refused, an advertisement of a "black-knot specific." It purported to be a secret powder, to be inserted in a gimlet-hole in the tree, that would make the tree "proof." We have rejected thousands of dollars' worth of such advertising which we believed would have been detrimental to the interests of our readers.—EDITOR.]

SAUNDERS PLUMS — INDUSTRY GOOSEBERRY.

J. E. W., Clifton, N. B., asks for information regarding the Saunders plum?

[With regard to the quality and value of the Saunders plum, I may say, first, that I am only able to speak from indirect experience with this variety. It was planted at the Experimental Farm six years ago, but died the second year. This variety orginated near Belleville, and was brought into notice by the late P. C. Dempsey, of Trenton, Ont. It was thought very highly of by that experienced fruit-grower. It has had hardly time to prove its value in many portions of Ontario. Its principal valuable characteristic, so far as I know, is its earliness, and for this reason it is likely to be widely planted. The plum, however, is thin in the skin, and therefore will not bear transportation well. Our superintendent at the branch farm at Agassiz, B. C., reports that it is very productive, but that it does not hold its flavor long after maturity, soon deteriorating. The fruit itself is of medium size and yellowish-red in color, of good quality. Last year in British Columbia it was one of the most productive varieties in the collection.

With regard to the Industry gooseberry, it is not a variety that one can commend with confidence for general planting. It is a variety that nearly every one should try if they have a good piece of clay soil and a sheltered location and are prepared to spray for the prevention of mildew. Where it succeeds it is certainly a joy to the grower, and, as I say, is always worthy of a careful trial. On sandy ground and exposed locations I would not recommend the Industry. J. C.]

MARKETS.

Toronto Markets.

The first market of this year augured well for the ensuing twelve months. A slight advance in cattle, sheep and hogs. Prices firmer for all qualities. The trade for Christmas cattle has been considerably better than could reasonably have been expected in view of the unfavorable mild weather and plentiful supply of poultry. It is quite noticeable that the cattle offered were not nearly so big and fat as they were a few years ago. There was a good attendance of buyers from Montreal and outside districts; in fact it is set down that as many strange faces were seen as were present during the first week of the New Year. The number of cattle passing through this market during the last three years shows a marked increase, as follows:—

	1894.	1895.	1896.
Cattle	93,431	99,233	104,887
Sheep	119,710	125,732	95,875
Hogs	139,862	154,384	194,104

In 1896 the increase in cattle was 5,654; there was a decrease in sheep, 30,057; whilst the hogs increased 39,720 over 1895.

Export Cattle.—Four loads of cattle for export via Boston; more would have sold had they been on the market. One or two lots of really good shippers would sell. A few sales at the following figures: One carloads of steers, 1,200 lbs. average, 3½c. per lb.; one carload mixed cattle, 1,300 lbs. average, 3½c. per lb.; one carload cattle, 1,350 lbs. average, $3.70 per cwt. —price ranged from 3¼c. to 3½c. per lb.; one carload of cattle, 1,140 lbs. average, sold for $39 each. There were several dealers buying to-day, having to fill space contracted for at St. John and Portland.

Butchers' Cattle.—Good supply and a brisk market; all butchers of the outside districts on hand. Choice cattle sold for 3c. per lb.; good to common, 2½c. to 2¾c. per lb. Prices ruled from 2c. to 3c. per lb. Cattle were small in size, not many going over 1,000 lbs. in weight; buying for Montreal was slow, and the yards were not cleared up; firmer feeling prevailed.

Bulls.—There were a few sold at 3c. per lb., some fetched 3¼c. for export. Stock bulls are dull, but a firmer feeling prevails.

Stockers and Feeders.—Light stockers not in demand; a few changed hands at from 3c. to 3¼c. per lb. These would weigh about 900 lbs. each. There is a limited demand for feeders weighing 1,100 lbs. to fill vacancies in the distillery byres.

Sheep and Lambs.—Firmer; light offerings made the prices hold. Shipping sheep, ewes and wethers, 2¾c. to 3c. per lb.; bucks, 2¼c. per lb. Lambs selling at 3¾c. to 4c. per lb. Scarce and wanted.

Calves.—Steady; $4 to $6 per head. Choice veals wanted and scarce; $8 would be paid for choice veals.

Milk Cows.—Offerings light, all on offer sold. Prices ruled $20 to $35 per head. One or two choice milkers fetched $40. Sales were poor for anything but choice cows—these sell and are wanted.

Hogs.—Market firmer; large offerings, 1,500 choice selections of bacon hogs selling at 4¼c. per lb., weighed off cars; thick, fat hogs, $3.50 to $3.60 per 100 lbs. Towards the close of the day a further slight advance was made. All sold and good hogs wanted, except rough and stores. Market steady and prices firmer. Stags, $1.75; sows, $2.75; boars, $1 to $1.50.

Dressed Hogs.—Deliveries of dressed hogs were free and market steady; prices advanced as high as $5.25, and for selections, $5.40. Packers are paying from $4.40 to $4.60; for car lots, $5.

Hay.—About 10 loads of hay per day, sold at $12 to $13.50 per ton; four loads on Monday fetched $14.

Straw.—About five loads of straw, at $8 to $9.50 for bundled.

Grain.—On the street market only one load of wheat sold, at 88c. per bushel; two of goose, at 68c. Receipts to-day were somewhat larger, but prices fell 1c. per bushel.

Wheat.—This market had quite a flutter. Prices were stronger to-day. Holders asked 84c. for red wheat and 85c. for white. Quite a few lots of export wheat have been taken from this market.

Oats firmer; 1,000 bushels selling at 25c.

Barley firm; 300 bushels selling at 25c.

Hides.—The demand quiet and market firmer in sympathy. Local dealers are paying 6¼c for No. 1, asking 7¼c. for cured; No. 2 5¼c.; the market is uncertain.

Sheepskins.—The market is steady, with a fair demand. Best quoted at 80c. each. Country skins are quoted steady, at 50c. each. Dealers have advanced the price 5c., now paying 85c. for choice skins.

Wool.—Fleece combings, 21c. to 22c.; tub-washed fleece, 20c. to 21c.; rejections, 17c.; pulled supers, 20c. to 21c.; extras, 22c. to 23c.

Butter.—All lines of butter are accumulating and prices are easier. Dealers are willing to shade prices rather than miss sales. Creameries are selling well at good prices: large rolls at 12c. to 13c. per lb.; small dairy rolls, 14c. to 15c. per lb.; creamery pound, 19c to 20c.

Cheese.—Quiet locally, although there is considerable enquiry for export. Dealers here sell summer make at 10c. to 10½c. and September make at 11c.; stocks short in warehouse.

Poultry.—Mr. Wm. Hinds the well-known cattle dealer, shipped $30,000 worth of turkeys to the Old Country before Christmas by the steamer "Mongolian." The price paid to farmers was 6c. From an exchange we hear that they arrived in good condition and realized good prices.

Jan. 8, 1897.

Montreal Markets.

Cattle.—The markets have settled back into much of the old groove since the holidays. The spurt put on to send in good cattle was not of long duration and the same old scrub lots are now coming in large numbers. During the week just closed a number of the best cattle offered were taken up for export account, for shipment via St. John and Portland. For these as high as 3½c. per lb. was paid for the tops, and others, 3c. to 3¼c., for the same purpose. The numbers offering for this purpose have been limited as to quantity.

Butchers' Cattle.—The trade has been very fair and the demand good, but drovers have not been able to make much money on their deals, as butchers have become so accustomed to low prices of late that it is difficult to get a raise on anything that is really good. For best butchers' 3¼c. has been paid; fair to good, 2¾c. to 3c.; medium, 2¼c. to 2½c. per lb. Culls as low as 1c. per lb.

Sheep and Lambs.—This is one branch of the trade that has been fully maintained, and whether it is that good sheep and lambs are becoming scarce throughout the country, certain it is that a good many more would find ready markets at fair prices. Choice lambs are now making well up to 4¼c. and for anything fancy a shade more per lb. From that to 4¼c. and 4c. per lb is being asked and paid for mixed lots of sheep and lambs. For choice sheep, suitable for shipping, as much as 3½c. per lb. are realized, but not a great many are offering.

Calves.—Offerings very light; some 30 or 40 on each market, running in value from $3 to $10 each, according to quality.

Live Hogs.—With the advent of cold weather receipts have become almost nil, but the few that are offering make from $4 to $4.25 per cwt. in the yards.

Hides and Skins.—Since our last writing no change has taken place in this market in price and the movement has been somewhat restricted, tanners either being well stocked up or confident that lower prices will prevail in the near future. Some grounds were given them for this expectation in the sudden jump from 8c. to 7c. a short time ago, but we do not see anything in the present situation to warrant putting any faith in a further decline. However, dealers are firm holders. Hides are accumulating and the chances are that it will be the tanners who will have to come round in the end. Nos. 1, 2, and 3 make 7c., 6c., and 5c. per lb.

DRESSED MEATS.

Hogs have been in good active demand, the supply of good light bacons being still on the light side, very few finding their way as far east under the 200 lb. mark; neither does there seem to be any overabundance in the market, as all offerings here are quickly picked up by different parties as soon as put on the market. The lighter weight bacon hog is bringing in car lots from $5 to $5.15 and $5.25 per cwt.; small lots and single carcasses from 25c. to 35c. per cwt advance on these figures.

Beef.—The market is a trifle dull owing to the low prices obtaining in the live stock markets. Fronts, 3c. to 3½c. per lb.; hinds, 4½c. to 5½c. per lb.

Lamb is good value and continues in active demand, as high as 7c. being paid for good round lots; that is, less than car lots; for the latter the highest we have so far heard of being between 6½c. and 6¾c. per lb., dressing from 38 to 40 lbs. each.

Chatty Stock Letter from Chicago.

(BY OUR SPECIAL CORRESPONDENT.)

Following are the current and comparative prices for the various grades of live stock:—

CATTLE.	Present Prices.	Top prices Two weeks ago.	Top prices 1896.	Top prices 1895.
1500 lbs. up	$ 4 60 to 5 40	$ 5 25	$ 5 00	$ 5 80
1350 @ 1500	4 20 to 5 45	5 35	4 75	5 35
1200 @ 1350	3 55 to 5 20	5 50	4 65	5 30
1050 @ 1200	3 40 to 5 20	4 65	4 50	5 15
900 @ 1050	3 35 to 4 85	4 65	4 50	4 60
Stillers	4 60 to 4 90	...	4 20	....
Stks. and F	2 90 to 4 25	3 80	3 75	4 00
Fat cows and heifers	3 10 to 4 40	4 10	4 00	4 50
Canning cows	1 35 to 2 40	2 35	2 40	2 25
Bulls	2 40 to 4 00	4 40	3 80	4 50
Calves	2 25 to 6 05	5 75	6 75	5 60
Texas steers	3 25 to 4 30	4 30	4 25	4 40
Texas C. & H	2 50 to 3 80	3 65	2 90	3 75
HOGS.				
Mixed	3 20 to 3 55	3 45	3 87	4 60
Heavy	3 00 to 3 55	3 45	3 90	4 75
Light	3 20 to 3 60	3 45	3 90	4 40
Pigs	2 50 to 3 55	3 45	3 82	4 15
SHEEP.				
Natives	1 75 to 3 75	4 00	3 75	4 00
Western	2 45 to 3 75	3 50	3 75	3 30
Lambs	3 00 to 5 75	5 50	5 00	4 50

The cattle market was higher lately than for some time past, considering quality, which is very poor.

Average weight of hogs at Kansas City last year, 227 lbs., against 216 lbs. for 1895. Average at Sioux City last year, 274 lbs., the heaviest on record, and 50 lbs. heavier than in 1895.

The big corn crops of the past two years showed less in the increased weights than might have been expected, partly because of the prevalence of sickness, which drove farmers to sacrifice their young hogs for fear of losing them; also, the agitation for lighter, leaner hogs had some effect. The cry for more light bacon hogs instead of so many 300 and 400 lb. fat backs is growing louder and promises to last long.

The latest word from Iowa, which is the great hog growing State, is to the effect that the hog crop is very short on account of the ravages of disease. In that State an effort is being made in railroad circles to afford relief by inducing the railroads to make temporary concessions in the way of permitting feeding in transit. One-third of the entire corn crop is unmerchatable. It cannot be shipped, and unless fed at home to stock will be a total loss. But as nearly one-half of the hogs in the State have died of cholera in the past few months there is not stock enough in the State to consume the corn. More stock must be shipped in. Local railroad men, in view of these circumstances, are urging the managers of their roads to grant concessions, such as feeding in transit and lower temporary rates, that the farmers may be enabled to dispose of their surplus corn.

Dealers say most of the cattle coming are being "picked before they are ripe," regardless of the fact that corn never was so plenty and cheap. However, feeders who last year saw these same little cattle outsell their ripe, fat, heavy beeves became tired of the game and thought they would sooner market their cattle when light than to take chances on selling heavy exporters at stock cattle prices, as they have so often done in the past.

A breeder of black polled cattle says prices for black cattle are about one-third higher than a year ago, and the demand exceeds the supply at that. There are now comparatively few large herds of choice breeding cattle, where a few years ago there were so many in the West, and as the demand is growing steadily stronger the effect of the small supplies is to stiffen prices.

The 33 head of two-year-old 1405-lb. Herefords which sold at $5.45 lately were fed and shipped by Chas. Anderson, of Sturgeon, Mo.

Shorthorns continue to hold their own very well as a breed of cattle that everybody knows is all right when properly handled. Choice high-grade Shorthorns are in evidence at market much more commonly than the other breeds, and are therefore less of a novelty. The Herefords, which made the best showing at market, are now invariably sent in before they are three years old. They make the best beef at two to two and a half, but practical butchers here say they begin to deteriorate in quality from the block-test point of view after three years.

Among the receipts of lambs at Chicago lately was a consignment of fancy thoroughbreds from the Iowa Agricultural College at Ames, which, in point of quality and finish, could hardly be excelled the world over. This Station makes a specialty of feeding high-bred lambs, and the experiment this year was very satisfactory to Professors Wilson and Curtiss, under whose personal direction it was conducted. The shipment was as follows:—

10 Southdowns, 95 lbs., at	$5 75
10 Shropshire ewe lambs, 90 lbs	5 65
9 Shropshire wether lambs, 115 lbs	5 60
9 Dorsets, 119 lbs	5 50
9 Oxfords, 126 lbs	5 40
9 Cotswolds, 126 lbs	5 25
9 Leicesters, 125 lbs	5 25
9 Lincolns, 133 lbs	5 25
9 Suffolks, 123 lbs	5 00
8 Merinos, 103 lbs	5 00

These youngsters were all bought in Ontario by Prof. Curtiss, who will follow up the feeding test by issuing a bulletin showing the practical butchers'-block results.

Comparative hide prices now and a year ago are as follows:—

Packer Hides.	1897.	1896.
No. 1 native steers, 60 lbs. and up	@ 9½	@ 8½
No. 1 native steers, spreadies	@ 9½	@ 9½
No. 1 native steers, light, under 60 lbs	@ 8½	7¼ @ 7½
No. 1 native steers, butt branded, heavy	@ 8½	7¼ @ 7½
No. 1 native steers, butt branded, light	@ 7½	6½ @ 6½
No. 1 Texas steers, 60 lbs. and up	@ 8¾	@ 7½
No. 1 Texas steers, 50 and 60 lbs	@ 8¼	6½ @ 6¾
No. 1 Texas steers, extreme light	@ 8	@ 6
No. 1 Colorado steers, 60 lbs. and up	@ 7¾	@ 6½
No. 1 native cows, heavy	@ 9	@ 7½
No. 1 native cows, light	9 @ 9¼	7½ @ 7¾
No. 1 branded cows	@ 8	@ 6½
Native bulls, all weights	7¾ @ 8	7 @ 7¼
Bulls, branded	@ 6	@ 6
Country Hides.		
No. 1 buffs, 40 to 60 lbs	8¼ @ 8½	@ 7½
No. 2 buffs, 35 to 60 lbs	7¾ @ 8	6¾ @ 7
No. 1 extreme light	@ 8½	7¾ @ 8
No. 2 extreme light	@ 7¾	7 @ 7½
No. 1 native steers	@ 8½	7¾ @ 8
No. 2 native steers	@ 7½	6¾ @ 7
Side branded steers, flat	@ 7	5½ @ 5¾
No. 1 heavy native cows	@ 8¼	@ 7½
No. 2 heavy native cows	@ 7¾	@ 7
Side branded cows, flat	@ 7	5 @ 5½
No. 1 bulls	6½ @ 7	@ 5½
No. 1 calfskins, 7 to 15 lbs	@ 10½	@ 9
No. 2 calfskins, 7 to 15 lbs	@ 9	@ 7½
No. 1 kips, 15 to 25 lbs	@ 7¾	6½ @ 6¾
No. 2 kips, 15 to 25 lbs	@ 9¼	7¾ @ 8
Deacons, each	37½ @ 40	@ 40
Slunks, each	20 @ 22½	@ 20
Horse hides, each	@$2.50	$2.00@$2.50

The British Markets.

A slight reaction has taken place since our last and a decline of ½c. per lb. for tops resulted. Best States steers, sinking the offal, 11c. to 11½c. per lb.; best Canadians, 10c. per lb.; sheep, 10c. to 11c. for choice.

THE HOUSE ON THE MARSH.

A Romance.

BY FLORENCE WARDEN.

(Continued from page 17.)

He was trying to pique me; but I only laughed and pointed out to him that he had had a visitor on the evening when he was to have tried my skill, but that I was quite ready to stumble through any music he liked whenever he pleased, if it were not too difficult.

So after tea Mr. Rayner got out his violin, and I sat down to the piano; and we played some of the old operas that have delighted Europe for years.

Dr. Maitland came in while we were playing.

He was our nearest neighbor, and he often came in the evening to play chess with Mr. Rayner, who always beat him. He listened to the music with great astonishment and some pleasure for a long time, until he learnt that I was reading at sight, and that I had accompanied Mr. Rayner only once before. Then he almost gasped.

"Good gracious! I should never have believed it. You seem to have the same soul!" he cried, awe-struck.

Mr. Rayner gave me a strange smile as the doctor uttered his quaint speech, and I laughed back, much amused at the effect of our efforts on a musically ignorant listener. When Mr. Rayner was putting his violin into its case, he suddenly discovered that a corner of the latter was damp.

"This will never do," he exclaimed. "I might as well keep it in the garden as in this den. Here, Sarah," he added, turning toward the table where she had just placed the candles. "Take this to my room—mind, very carefully."

So his room could not be damp, I thought, or he would not allow his precious violin to be taken there. I had said good-night, and was in the hall, just in time to see Sarah, carrying the violin, disappear down the passage, on the right-hand side of the staircase, which led to the study. Now the wing where Mrs. Rayner's room was was on the left-hand side of the staircase. When I got to the foot of my turret staircase, which was only a few steps from the head of the back staircase that the servants used, I heard Sarah's quick tread in the passage below, and, putting down my candle on the ground, I went softly to the top of the stairs and looked down. I saw Sarah, much to my amusement, give a vicious shake to the violin-case, as if it were a thing she hated; and then I saw her take a key from her pocket and unlock a door near the foot of the stairs. Sarah took out the key, went through, and locked it behind her; I saw that it led, not into a room at all, but into the garden.

So far, then, Mr. Reade's guess was right. But there still remained the question—Where did Mr. Rayner sleep?

CHAPTER X.

The day after the violin-playing was very wet, and, looking out of the window during lessons with Haidee, I caught sight of her small sister trotting along composedly without a hat in the fast-falling rain. I jumped up and called to her; but she took no notice; so I ran to fetch my umbrella and set off in pursuit. After a little search, I saw her steadily toddling up a side-path among the trees which led to the stables; and I followed softly without calling her again, as, if irritated by pursuit, she might, I knew, plunge among the trees and surrender only when we were both wet through.

The stables were built much higher up than the house, close to the road, but surrounded by trees. I had never been near them before; but now I followed Mona close underneath the walls, where she began dancing about by herself, making hideous grimaces at two windows on the upper story, and throwing up at them little stones and bits of stick that she picked up, all wet and muddy, from the moist earth. I seized and caught her up in my arms so suddenly that for the first few moments she was too much surprised to howl; but I had scarcely turned to take her back to the house when she recovered her powers completely, and made the plantation ring with a most elfish yell. I spoke to her and tried to reason with her, when one of the upper windows was thrown open, and Mr. Rayner appeared at it.

"Hallo, what is the matter? Kidnapping, Miss Christie?"

"Oh, Mr. Rayner, she will sit in the mud and open her mouth to catch the rain without a hat, and it can't be good for her!" I said, piteously.

"Never mind. It doesn't seem to hurt her. I believe she is half a frog," said her father, with less tenderness than he might have shown, I thought.

"But you will get your own feet wet, my dear child," said he, in quite a different tone. "Come up here and sit by the fire, while I fetch your goloshes. You have never seen my studio. I pass half my time painting and smoking here when it is wet and I can't get out." He had a palette on his thumb and a pipe in his mouth while he spoke. "You don't mind the smell of turpentine or tobacco, do you?"

"Oh, no, Mr. Rayner! But I won't come in, thank you. I am at lessons with Haidee," said I.

"Happy Haidee! I wish I were young enough to take lessons; and yet if I were, I shouldn't be old enough to make the best use of my time," said he, in a low voice, with mock-modesty that made me laugh.

He was leaning a long way out of the window in the rain, and I had work to do indoors; so, without saying anything more, I returned to the house with my prize.

It was to his studio then that Sarah had taken his violin. Could this be where Mr. Rayner slept? No; for in that case he would hardly have asked me to come up and look at his painting. Yet I should have liked, in the face of Mr. Reade's tiresome suspicions, to be sure.

On the following night there was a high wind, which made the door which stood always fastened back at the top of the kitchen-stairs rattle and creak on its hinges. At last I could bear this last sound no longer. I had been sitting up late over a book, and I knew that the household must be asleep, so I slipped down-stairs as softly as I could. I had got to the top of the back-staircase, when I saw a faint glimmer of light coming along the passage below. I drew back quickly, so quickly that my candle went out; and then I waited, with my heart beating fast; not so much to see who it was, as because I did not dare to move. The faint light came along swiftly, and when close to the foot of the stairs below me, I could see that it was a shaded lantern, and could just distinguish the form of a man carrying it. Was he coming up-stairs? For the next few moments I scarcely dared to breathe, and I could almost have given a cry of joy when, by some movement of the head, I recognized Mr. Rayner. He did not see me; he put the key in the lock, turned it, took the key out, went through and locked it after him so quickly and so entirely without noise that a moment afterward I could almost have thought that I had imagined the dim scene. It had been so utterly without sound that, if my eyes had been closed, I should have known nothing about it. I went back to my room again, not only profoundly sorry that Mr. Reade's surmise was correct—for I could no longer doubt that Mr. Rayner did sleep over the stables—but impressed with an eerie dread of the man who could move about in the night as noiselessly and swiftly as a spirit.

When I awoke, however, in the fresh morning, all unpleasant impressions of the night before had faded away; and, when Mr. Rayner brought into the drawing-room after dinner a portfolio full of his sketches and panels, I felt that it was not for me to judge his actions, and that there must be some good motive that I did not know for his sleeping far out of the damp, as for everything else that he did. He proposed to paint me, and I gave him a sitting that very afternoon in the dining-room, and he said that he must finish it next day in his studio, and, when I objected to neglect my lessons again, he said the whole family should emigrate thither for the morning, and then perhaps I should be satisfied.

So the next day at eleven o'clock he came into the school-room with Mrs. Rayner, who wore her usual air of being drawn into this against what will she had, and we all four crossed the garden to the stables, and went up through the harness-room to the big room over the coach-house, which looked even more comfortable than I had expected.

For the floor was polished, and there were two beautiful rugs. At one and of the room was a partition, and behind this partition I guessed that Mr. Rayner slept. There was a bright fire burning in the tiled fireplace, and there were soft easy-chairs, rather worn by constant use, but very comfortable, and there were pictures on the walls, and there was a dark carved-oak cabinet full of curious and beautiful things, and a writing-table; and lastly there were the easel and a great profusion of portfolios and half-finished sketches and studies. Altogether the room contrasted very favorably with the moldy-looking drawing-room. Perhaps Mrs. Rayner thought so as she sat down, with one eager intent look round the room, as if she had never seen it before; and then without any remark she took out her knitting and worked silently, while I posed again as I had done on the previous day, with my head on one side, and my hands, as Mr. Rayner had placed them, clasped under my chin, while he painted and talked.

After two hours' work, Mr. Rayner called us to look at his sketch, which represented a very lovely girl with dark eyes a little larger than mine, a red-lipped mouth a little smaller, teeth a little whiter, and a complexion a little creamier in the white parts and a little rosier in the red; and the brown hair coiled on the top was just a little glossier and smoother than mine ever was. It was just a little like me all the same; and I was rather hurt when Mrs. Rayner summoned spirit enough to say that he had flattered me, although I knew it quite well. But Mr. Rayner said gravely that it was impossible for a portrait to flatter a handsome woman, and Mrs. Rayner raised her thin shoulders in a slight shrug and turned to leave the room. Haidee rose to follow her, but paused on the threshold to look around for me.

"You are an excellent model, you sit so still. What shall I give you as a reward for remaining so long without blinking or yawning as all professional models do?"

"Nothing, Mr. Rayner; I like having it done. It flatters one's vanity to be painted; and flattery is always reward enough for a woman, they say," said I, laughing and following Haidee to the door.

"I shall find something more substantial than that," said Mr. Rayner, in a low voice, as if half to himself, looking up with a very kind smile as I left the room.

That afternoon Haidee had just run out of the schoolroom at the conclusion of her lessons, when Mr. Rayner came in. He held in his hand an old and shabby little case.

"Now see what you have earned by sitting still."

He drew me to the window and opened the case, keeping his eyes fixed upon my face as he did so. There was a large pendant in the form of a heart, which was a blaze of what seemed to me the most magnificent diamonds I had ever seen. The sight of them inspired me not with pleasure, but terror. I drew a long breath of surprise and admiration.

"It is the most beautiful thing I have ever seen," said I at last.

"You like diamonds?" said he, in a low voice.

I looked up and laughed with rather an effort.

"I? Oh, no! I shouldn't care for diamonds for myself, I should look absurb in them. Diamonds are for great ladies, not for governesses."

"Well, without being a great lady, a governess may wear an ornament she has fairly earned, may she not?"

"Yes," said I, trying to keep up a light tone of talk, though my heart was beating fast.

"And so you can accept this pretty little thing as the reward of your services to a grateful painter and a *souvenir* of our pleasant morning all together in the studio."

"Oh, no—oh, no—I can't indeed! Don't be angry with me, Mr. Rayner; but the very thought of possessing anything so valuable would be a burden to me night and day."

Mr. Rayner burst into a long laugh.

"Oh, you simple little creature! This pendant, the enormous value of which frightens you so much, is worth about fifteen shillings. It has a value in my eyes, but for a different reason. Look here."

He turned it over, and I saw on the back a monogram, and the date 1792.

"What are the letters of the monogram?"

I read—"R. G. D."

"'G. D. R.,'" corrected he—"Gervas D. Rayner—my own initials and those of my father and grandfather before me. In full family conclave at tea, you shall hear me announce the presentation, and then you will be satisfied, won't you, you modest little girl?"

"But I can never wear such a thing as this, if it is only what you call paste," I objected.

"Wear it under your dress, and then the blaze of it will dazzle nobody," said Mr. Rayner, bending over me and laughing kindly at my reluctance.

So I took it with most ungracious feelings, which I tried to hide, and thanked him as well as I could. True to his promise, Mr. Rayner said to his wife at tea-time:

"I have with the greatest difficulty prevailed upon this proud Miss Christie of ours to accept as a reward for her services as model a twopenny-halfpenny trinket, which she almost told me was not fit to wear."

"Oh, Mr. Rayner!"

He was putting such a different color upon my reluctance, as if I had not thought it good enough. And there is a great deal of difference between fifteen shillings and twopence-halfpenny. I saw Sarah, who was in the room, look at me very sharply, as if she thought governesses had no business to wear trinkets at all; and Mrs. Rayner did not looked pleased.

When I got up-stairs, I sat down in the arm-chair which had its back to the door, took the case out of my pocket, and looked at the ornament. It certainly was very splendid, and I thought, as I looked at it, that it was great waste of money to buy real diamonds, which cost so much more and looked no better. And, as I was holding it up to the light and feeling at last a thrill of pleasure in its possession, I heard a voice behind me say—

"So that's the twopenny-halfpenny trinket, is it?"

Of course it was Sarah. She had come up to bring me some water, and I had plenty in the jug. I shut up the case, and said coldly—

"Of course Mr. Rayner would not give any one a thing which really cost only twopence-halfpenny, Sarah."

"No, miss, not for such services as yours."

And she said it in such a nasty tone that, when she had left the room, I threw the case down upon the table and burst into tears.

CHAPTER XI.

The school-treat which had been put off this year, first on account of sickness in the village and then because of the wet weather, was now fixed to take place on Saturday; and the following day was to be the harvest festival. The Misses Reade had undertaken most of the decoration of the church, as the Vicar's wife had enough to do in preparing for the school-feast and accompanying sale.

The next day Haidee and I took a longer walk than usual; and, when we returned, Jane met me with a mysterious air in the hall.

"Oh, Miss Christie, young Mr. Reade called while you was out, and asked to see you! He said he had a message for you. So he wrote a note for you; and please it wasn't my fault, but Sarah got hold of it, and she took it to Mr. Rayner. I told her it was directed to you; but she wouldn't take no notice."

I went up-stairs very much annoyed by this fresh indignity offered me by that hateful Sarah, and hurt and sorry besides, for I was longing to know what the note said. As soon as I got into the dining-room, however, Mr. Rayner came up to me smiling, and put it into my hands.

"Here is a *billet doux* which has been left for you, Miss Christie. Now whom do you expect one from?"

"From nobody, Mr. Rayner," said I, blushing very much.

This was not a story, because I knew the letter could not be at all the sort of communication he implied, but would contain, probably, some formal message from Mrs. Maitland.

I opened it at once to show that I did not think it of any consequence. It only said:—

"DEAR MISS CHRISTIE,—My sisters find there is so much to be done for the church that they are afraid they won't be able to do it all. Would you be so very kind as to undertake part? If you would not mind, I will ride over with the work to-morrow after luncheon, about a quarter-past two.

"Yours sincerely, LAURENCE READE."

I think I was a little disappointed in the note; but it was all the better, as I could repeat in quite a careless way what it said; and then, just as I was wondering whether I should tear it up to show that I did not care, I saw that there was something written, on the inside leaf, and I put it back into the envelope as if I did not notice what I was doing, and slipped it into my pocket.

Dinner was long that day; when it was over, I went into the school-room and drew out my letter again. The words on the inside leaf were:

"Why were you so unkind on Sunday?"

I had no way of sending back an answer; I could only wait till next day at a quarter-past two.

I had not thought it necessary to mention to Mr. Rayner the time at which Mr. Reade had said he should bring the work; at a quarter-past two we were always in the drawing-room together. But the next day, Mrs. Rayner asked me, directly after dinner, if I would mind writing some letters for her, to go by that afternoon's post. I should have sat down to write them in the drawing-room, but Mrs. Rayner said—

"You would like to be undisturbed, I know. Shall I send your coffee to your room or to the school-room?"

I said, "To my room, if you please," and went up-stairs trying to swallow the lump in my throat.

I had got through one stupid letter—they were not at all important—when there was a knock at the door, and Jane came in, giggling and excited.

"Oh, miss, I've brought you a parcel, and I have made Sarah so wild!"—and she laughed delightedly. "I answered the bell, and there was Mr. Reade on his horse with this; and he said, 'Take it to the schoolroom, please; it's for Miss Christie;' and then he got off, and I showed him into the drawing-room. And I saw you wasn't in there, nor yet in the school-room. So when I got into the hall, thinks I, 'I'll be beforehand with old Sally this time!' when she comes out and says, 'Give that to me. I'll give it to Miss Christie.' 'Never mind,' says I, half-way up the stairs—'don't you trouble.' And she made a grab at me, but I was too quick for her, and up I run; and here it is, miss."

And she slapped the parcel down upon the table triumphantly.

"Thank you, Jane," I said quietly. "It is only some work for the church from Miss Reade."

Jane's face fell a little; and then, as if struck by a fresh thought, she giggled again. I cut the string and opened the parcel to prove the truth of my words, and showed her the red flannel and the wheat-ears, which were to be sown on in letters to form a text. But in the middle was another note, and a box wrapped up in paper, both directed to "Miss Christie;" and at sight of these little Jane's delight grew irrepressible again.

"I knew it!" she began, but stopped herself and said, "I beg your pardon, miss," and left the room very demurely.

But I heard another burst of merriment as she ran down-stairs. Then I opened the note; it only said—

"DEAR MISS CHRISTIE,—I take the liberty of sending you a few roses from a tree in a sheltered corner where the rain cannot spoil them. I hope they won't smell of cigars; I could not find a better box. I will call to fetch the text, if you will let me know when I can see you.

"Yours sincerely, "LAURENCE READE."

The roses were in a cigar-box, and as long as they lasted they never smelt of anything but tobacco; but I began to think that perfume nicer than their own.

I was so happy that evening that I was glad when Mr. Rayner asked me to accompany his violin, and he was so pleased with my help that he begged me to go on with "Just one more," and "Just one more," until long after Mrs. Rayner had gone to her room.

The clock had struck the half-hour after ten, which was quite late for the household at the Alders.

So I shook hands as hastily as I could, took my candle, and ran up-stairs.

CHAPTER XII.

I slackened my pace when I got to the top of the first flight of stairs, and walked softly through the corridor were the nursery was, for fear of waking Mona, and opened the door of my room.

It was quite a calm night, and I walked in very slowly, yet, as I entered, my candle went out suddenly, as if blown by a gust of wind; and I fancied I heard a slight sound as of a human breath blowing it. I stood for a few moments, frightened, in the middle of the room, and then cautiously made my way in the direction of the mantelpiece, where I kept my match-box. I made a slight noise as I passed my fingers over the different articles there, and, just at the moment that I knocked over a china ornament which fell into the fireplace, above the noise it made as it broke to pieces in the grate I heard a sound behind the screen which stood between the bed and the door, and, turning quickly, I was in time to see a figure come swiftly round it and disappear through the still open door. I could distinguish nothing; nevertheless, suppressing my inclination to scream, I rushed to the door and caught in the air at the figure I could no longer see; but I felt nothing.

Then I crept back into my room, shaking from head to foot, and hardly daring to move for fear of encountering another dim figure. I closed the door behind me, sick with fear lest I should be shutting myself in with more unwelcome visitors, and again searched the mantelpiece for the match-box. My hands trembled so that it was a long time before I could be sure that it was not there; and then I turned and felt my way to the table; and, after moving most of the things on it, I at last satisfied myself that it was not there either. Then I groped my way to one of the windows—I had not thought of that before—drew the curtains and pulled up the blind. The moon gave only a fitful light, being obscured every other minute by thin driving clouds, and it only served to make shadows in the room, which were more fearful to me, in my nervous state, than darkness itself.

It was out of the question to undress by such weird moonlight, so I determined to conquer my fears and go down-stairs. There were sure to be some matches in the kitchen, and I reflected that enough moonlight would come in through the shutters to let me see my way without making a noise.

So I groped my way down the back-staircase, got safely to the bottom, turned to my left, and felt for a door. The first opened into a big cupboard, where I felt brooms, which I shut again quickly; the second was locked, but the key was in the door, and I softly turned it. This was indeed the kitchen; I heard on the floor a sound which I knew too well to be the rush of myriads of blackbeetles; and, as I would rather have faced a dozen dim human figures than have felt under my foot the "scrunch" of one blackbeetle, I had to shut that door too as quickly as I had to shut the other.

[TO BE CONTINUED].

Pembroke Castle.

Pembroke Castle, as seen by Turner. Do ordinary mortals ever see these old English memorials in such a glory of light and shade as our artist did? By a rare chance it is possible. The peculiar exaltation—some would say exaggeration—of a scene which the artist seizes upon for the creation of his picture is really more common than ordinary observers would suppose. It is rare, indeed, for any season to pass over any point of view which possesses picturesque elements without eradiating it with numerous striking effects. The artist, also, not infrequently transfers to one scene, or point of view, an effect which he has witnessed elsewhere, and all that we can require of him is that his effect shall not violate any possibilities or probabilities of nature. In one of the grandest series of views ever produced by one artist—England and Wales, by J. M. W. Turner—the effects throughout are of that class which, though true to nature, have to be watched and waited for, and the spectator will be happy indeed who may see any noted scene with that special effect with which some great artist has immortalized it. It is rare indeed for nature to repeat herself. From its incessant variety arises the ever fresh and exhaustless spring of inspiration for every artistic spirit born into the world whose mission is to train humanity to a comprehension of the glory of its dwelling place; the beauty of infinite variety and of most opposite aspect that in every path awaits man's coming, with a blessing for every eye and heart that are open to it.

Pembroke Castle is an old historical stand-ground. Britons who fought with Romans raised defences here on a rocky ridge running into Mitford Haven, one of the deep indentions of South Wales. Ships can sail here, and all the varied effects of a sea coast scene play about the old walls; deep below is a strange natural cavern, through which communications could be kept up between the castle and the town at some little distance off. The earliest date connected with it that history gives us is some eight hundred years ago, when we read of a son of an Earl of Shrewsbury building here. From time to time great additions were made, and the vast remains give it still an appearance of uncommon grandeur, unsurpassed by any other of the many picturesque and striking views that Wales can offer the tourist. The chief historical events connected with it are the birth here in 1456 of Henry VII., a son of the Earl of Richmond, a certain Edmund Tudor, of royal blood. In this grim old castle we have a passing picture of a young girl, but wife and mother, with cares upon her heart and hands long before her time. It is a Margaret Beaufort, a descendant of old John of Gaunt, who in her girlhood had been married for State reasons to this Edmund Tudor. We can but hope he was kind in the short time he had the opportunity, for he died the same year his son was born—a son who, after a dangerous and troublous boyhood, was to bring to a peaceful close the long and bloody era of the Red and White Rose conflicts. Nearly two hundred years later Cromwell, the destroyer of royalty, besieged the castle for six weeks. Up to that time, though often attempted in different ages, it had never been taken. It fell before the Ironsides, like many another stout old stronghold, witnessing in that age the last of the many conflicts waged round their hoary walls, and henceforth, as time healed the deep wounds of civil war, to become treasured and venerated memorials of a past that now, in its varied influences, lives still in the English race throughout the world.

PEMBROKE CASTLE.

PINEAPPLE CREAM.—Soak one-quarter ounce of gelatine in the liquor strained from a can of pineapple, and stir it over the fire until dissolved, adding sugar if the juice is not sufficiently sweet. Beat the whites of three eggs to a stiff froth, add two tablespoons of white sugar, and the gelatine, which should be nearly cold. Keep whisking all the time, mix in the pineapple, and pile it high on a glass dish.

MINNIE MAY'S DEPARTMENT.

MY DEAR NIECES,—

The Christmas festivities are over, a New Year has dawned, and winter holds full sway.

Mother Earth looks beautiful clad in her soft white robe—emblems of purity and peace—while the shining crystals which adorn the trees atone, in a great measure, for the absence of the beautiful raiment of which Autumn has bereft many of them.

The Frost King, too, has been abroad and breathed on the laughing brooklets, and silenced the majestic rivers; but who will be found to complain when the sound of the ringing steel is heard on the ice and the merry laugh comes floating softly to us, while the rosy cheeks and bright eyes testify to the healthfulness of skating.

As I write, my fancy conjures up the faces of my mady readers, and I cannot help thinking of them as the Spring, Summer, Autumn, and Winter of life.

How glad I should be to speak to each in turn: the merry children, heedless of everything save present enjoyment (children are so dear to my heart that I hope Cousin Dorothy will excuse me for encroaching on her domain); the bright maidens, "standing with reluctant feet where the brook and river meet;" the busy matrons, with their many responsibilities; and the dear ones on whose heads the snows of many winters have left a lingering trace, but whose eyes are calmly fixed on a bright futurity.

What joys and sorrows lie buried with the year just gone!

What memories, sweet and bitter, joyous and sorrowful, crowd upon us; the good resolutions formed, kept or broken; the duties neglected or fulfilled; the lessons of life it taught us, all rise up before us. But a New Year is with us, and let us, with Tennyson, say, "Ring out the False, ring in the True!"

Let us search the innermost recesses of our hearts and discover all its follies and foibles, banish all that is hollow and artificial, to make way for the virtues which render us happy with a consciousness of right living. Ring out the False, ring in the True—for the two can have no coexistence.

Time is too precious to be frittered away in senseless frivolities. Each day we are adding a page to the Book of Life; let us pause and see what we are writing therein.

To each of us have been given talents of some kind. These we should endeavor to find and cultivate, bearing in mind that though the universe is full of good, no kernel of nourishing corn can come to us but through our own toil bestowed on that plot of ground which is given us to till.

To shrink from doing what we can, because we can do so little, is to hinder our own development and the progress of the world. Only by exercise are our faculties strengthened, and only by each one putting his shoulder to the wheel the world moves and humanity advances.

The Past is irrevocably gone, the Future a dim uncertainty, but the Present is all our own. With renewed vigor let us set to work, not letting golden opportunities drift by.

May the bright beams of Hope remain with us throughout the year, flashing across the dark places to show us the sunshine beyond. MINNIE MAY.

Domestic Science.

ORIGIN AND COMPOSITION OF FOODS.

BY MARY E. MILLER.

"Yule is come and yule is gone,
And we have feasted well;
So Jack must to his flail again,
And Jenny to her wheel."

"The ministry of diet in the work of character-building is one of the most important studies a woman can undertake."

In order that one may rightly understand what comprises a proper diet, we must acquire (1st) a knowledge of the origin and composition of foods, and their functions in the body when consumed; and (2nd) a knowledge of the effects produced upon these by different combinations, and by the application of heat.

Chemists tell us that, subject to the surrounding forces, matter is constantly undergoing physical, chemical, and other changes into which the action of life enters, called biological. We do not create anything, we simply mix, combine, and rearrange substances, and subject them to the action of heat and other forces. Vegetable growth is a result of these changes brought about by the action of the sun's rays on the seed and the surrounding soil and atmosphere. When placed in a favorable position, the seed, or plant, draws from the soil and air the elements necessary for the development and growth of the life germ within it, and so prepares these crude constituents in suitable form for us, and we call them our *vegetable foods*—fruits, grains, roots, and herbs.

Certain parts of this vegetable growth is, however, even yet beyond the reach of man for food. Yet these "waste" portions are not "wasted," for by the economy of nature another process is provided. After being consumed and assimilated by the lower animals, they are presented to us in the form of well-known *animal foods*—meat, milk, butter, cheese, and eggs. These are generally found to be more easily digested than the vegetable foods, as we may readily suppose, but are sometimes more expensive. Herein lies the value of a knowledge of proper methods of cooking, that the cheaper food materials may yield to us as much nourishment in digestible form as the more expensive kinds. Food may be defined as that which when taken into the body strengthens the system and provides heat and energy, or work power.

A machine is manufactured or built by human hands, part after part being made and added until the whole is soon complete and ready for action. A living body grows up gradually, little by little—in a manner builds itself as the proper material is supplied to it. Then, again, a machine wears out and must be repaired from without; but the living machine is constantly repairing its own waste of tissue consequent upon the daily wear of active life. For this "building" and "repairing" certain kinds of food are required which have been called "flesh-formers," or *proteids*—familiarly known among agriculturists as albuminoids or nitrogenous foods.

The housewife is familiar with proteid in the form of the lean of meat, in cheese and eggs, or in vegetable foods in the gluten of wheat, and vegetable casein of peas and beans. Analyses of these foods show of this important constituent on an average in lean of meat about 15 to 21 per cent.; in eggs, about 12.5 to 14 per cent.; in milk, about 3.4 per cent.; in cheese, about 25 to 30 per cent.; in dried codfish, about 30 per cent.; wheat flour, about 10 to 12 per cent.; in peas and beans, about 22 to 25 per cent.; in oatmeal, about 11 73 to 16.1 per cent.

Carbonaceous foods include the hydrocarbons or fats and oils, and the carbohydrates or starches and sugars, and serve to provide warmth to the body and work power—just as carbon, in form of coal, is fed to an engine to produce heat and power. We cannot say distinctly that fats are "heat foods," carbohydrates "work foods," and proteids "flesh foods," because the different food principles are, when necessity demands, capable to a certain extent of being used interchangeably for a time in the body; but the best results follow when used in

their proper proportions. According to the latest and highest authorities, a well-balanced diet is about three-fourths water, the remaining one-fourth being made up of one part *proteid*, one part *fat*, and two to four parts *carbohydrates*, with a fraction of *mineral* matter; thus representing the five food principles in due proportion.

The fats and oils we obtain largely from the animal kingdom, yet vegetable oils are sometimes used for household purposes, and in our cereal foods and nuts we consume a certain proportion of fat, cornmeal and oatmeal containing five to eight per cent. and nuts twenty-eight to fifty-four per cent. of it. The starches and sugars have less than half the heat-giving properties of the fats, hence are more largely used than these in warm climates, while the inhabitants of cold regions consume immense quantities of oil. Starch forms a large proportion of vegetables and grains; potatoes, rice, and corn being representative starchy foods. Sugars are found in different forms: lactose, or milk sugar, in milk; dextrose, or grape sugar, in ripe fruits and honey; and sucrose in maple sap, sugar cane and sugar beets.

The small fraction of mineral matter which is found in nearly all our common foods—principally in vegetables and fruits—contributes to the growth of bones, teeth, hair, etc., and, though small in quantity, is a necessary constituent of a complete diet.

When oranges and lemons are cheap, make a supply of marmalade for home consumption.

Marmalade: Six oranges, 3 lemons, ½ gallon water, 5 lbs. sugar. Wash the fruit in hot water, dry, and slice very thin. Put some of the water on the seeds—which should be kept separate—and the remainder on the fruit; soak 24 hours; strain the water from the seeds and add it to the fruit; boil rapidly 2 hours; then add ½ quart more boiling water with the sugar; boil till it jells about ½ hour. The secret of good marmalade is rapid boiling.

Belfast Cake: Cream ½ cup butter, add gradually 1½ cups sugar, 1 cup raisins (stoned and cut up), 1 egg, 1 cup sour milk, 2 cups graham flour, ½ cup white flour (to which has been added 1 teaspoonful soda), ½ teaspoonful cinnamon, 1 saltspoonful nutmeg, and ½ teaspoonful salt; beat thcroughly; put into a buttered baking pan—a square one is nicest—sprinkled with shredded blanched almonds, and carefully bake. Cut in squares to serve.

Blanched Almonds: Shell the nuts and pour boiling water over them; let stand until the skins will slip off easily; drain, pour on cold water, and blanch with the fingers. Wipe dry between two towels.

THE QUIET HOUR.

The Narrow Way.

My Master, they have wronged Thee and Thy love!
They only told me I should find the path
A Via Dolorosa all the way!
Even thy sweetest singers only sang
Of pressing onward through the same sharp thorns,
With bleeding footsteps, through the chill dark mist,
Following and struggling till they reach the light,
The rest, the sunshine of the far beyond.
. . . . And so the steps
That halted where the two ways met and crossed,
The broad and narrow, turned aside in fear,
Thinking the radiance of their youth must pass
In somber shadows if they followed Thee;
Hearing afar such echoes of one strain,
The cross, the tribulation, and the toil,
The conflict, and the clinging in the dark,
What wonder that the dancing feet are stayed
From entering the only path of peace!
Master, forgive them. Tune their harps anew
And put a new song in their mouths for Thee.
For Thou, Divinest Wisdom, Thou hast said
"Thy ways are ways of pleasantness, and all
Thy paths are peace; and that the path of him
Who wears Thy perfect robe of righteousness
Is as the light that shineth more and more
Unto the perfect day." And Thou hast given
An olden promise, rarely quoted now
Because it is too bright for our weak faith:
"If they obey and serve Him they shall spend
Days in prosperity, and they shall spend
Their years in pleasures."
Master, I set my seal that Thou art true.
Of Thy good promise not one thing hath failed!
And I wound send a ringing challenge forth
To all who know Thy name to tell it out,
Thy faithfulness to every written word,
Thy loving kindness crowning all the days.
From strength to strength Thy pilgrims pass and sing
The praise of Him who leads them on and on,
From glory unto glory, even here! —*F. R. H.*

A Pleasant Path.

We are accustomed to the idea that the end of a good man's course is happy. We are aware that when the pilgrim gets home he will have no more sorrow. But does not the journey to the Promised Land lie through a wilderness? It does. It traverses the desert all its length, and yet the path is pleasant notwithstanding. To the honor of the Lord be it spoken, and for the comfort of His people, not the home only, but also the way thither is pleasantness and peace. Those only who have not trod it count it dreary. Those who see what it wants and have not tasted what it is, naturally think that however safe the home to which it leads the traveler at last, it must make him in the meantime "of all men most miserable." Those who abide in Egypt, by its flesh-pots and its river, may pity the host of Israel marching through a land not sown; but Israel, in the desert though they be, get their bread and their water sure from day to day, all the more sweet to their taste that the water leaps in their sight at the Father's bidding from a barren rock, and the bread is rained from heaven around their tents. The young lion may suffer hunger, but they who wait upon the Lord shall not lack anything that is good. *In* the keeping of his commandments there is great reward, not only *after*. The path is peace although storms rage all around it, if there be peace in the heart of the traveler. The peace of God, keeping the heart within, will beam out on the untrodden way and gild its ragged edges with gladness. The path of the just is shining with joy; from the first struggling twilight it grows in beauty until it culminates in perfect day. The *path* is peace; eye hath not seen, nor ear heard, what the home will be.

O heart of mine, we shouldn't
Worry so.
What we've missed of calm we couldn't
Have, you know!
What we've met of stormy pain
And of sorrow's driving rain,
We can better meet again
If it blow.

We have erred in that dark hour,
We have known
When our tears fell with the shower,
All alone—
Were not shine and shower blent
As the gracious Master meant?
Let us temper our content
With His own.

For, we know, not every morrow
Can be sad;
So, forgetting all the sorrow
We have had,
Let us fold away our fears,
And put by our foolish tears,
And through all the coming years
Just be glad.

THE CHILDREN'S CORNER.

Princess Fairise of the White Heart.

BY A. G. B.

Once upon a time, many hundred years ago, there lived a King and Queen named Loyal Hearts; this was not their real name, but it was given to them by their subjects because they were so good and always ready to help those in need. They had two children, Prince Alonzo and Princess Fairise, who were twins. Though they dearly loved their children, they had, however, one great sorrow. I will tell you all about it, but we will have to go back.

The King and Queen had arranged to appoint the fairy godmothers to each of their children at the christening. The King had named who was to stand godmother for the little prince and just in the act of mentioning the name of the fairy who was to stand for his little daugther, when all at once he was startled by an aged fairy whispering in his ear. The King then arose and said: "I appoint the fairy Offell to stand godmother for my first and dearly beloved daughter, Princess Fairise. Then an old hag stood up and said these words in a hard, harsh voice: "Yes, it is all very fine that you stand up and ask me to be godmother for your child, for you are afraid I will have my revenge, but I am sorry to say I have not got my present here, but when I give it, you will be truly thankful for my beautiful present." She closed her sentence with a loud, taunting laugh which echoed through the palace, then she disappeared, leaving everybody in confusion. The news spread quickly through the town and everybody flocked round to see the little princess.

Weeks and months passed by, but yet nothing seemed wrong with her. One day the Queen was out riding, when she saw a messenger coming swiftly towards her, and when they had met he told her she was wanted home. Her Majesty immediately turned her horse and, followed by the messenger, went home. When she arrived at the palace she was met by one of the ladies-in-waiting, who told her that she was wanted in her apartment by an old woman. The Queen, when she entered, saw nothing but the furniture and some of her own clothes; she looked all around carefully, but could not see anything, then she turned round to summon one of her attendants, when the sound of hard, harsh voice made her turn, and she speedily noticed that one of her chairs was taking the form of the old fairy Offell. The Queen turned pale as she remembered her words at the christening banquet. "I suppose," said Offell, "you think I have forgotten my godchild, but I have remembered her every hour since the time of the banquet. I have called to tell you that when Fairise is two years old she shall receive my gift, which is a valuable one." With these words she suddenly disappeared, leaving the Queen in a state of bewilderment. She (the Queen) stood there rooted to the ground, wondering and thinking over all the words Offell had said. King Loyal Heart had been out hunting when Offell had come, but on his return he was met by the Queen, who told him of her visit. The King then summoned all the fairies except Offell, and told of her visit and what she had said; but even the wisest and oldest fairy could not make it out. The princess was over a year old now and her birthday was close at hand. The King and Queen decided to give a large fete and try to forget Offell's words. The day dawned fine and bright, and at the appointed hour the guests began to come. The little princess and her brother were the center of attraction. Suddenly a large black cloud filled the sky, and the party had to adjourn to the palace (the fete had been held in the open air), where all the amusements where carried on as before. Soon the day passed by and the guests returned to their own homes. And as the weeks and months passed on, the King and Queen expected every moment to see something strange come over their daughter.

[TO BE CONTINUED.]

Puzzles.

All matter for this department should be sent direct to ADA ARMAND, Pakenham, Ontario.

1—HIDDEN CITIES.

1. Send Hector on to-morrow.
2. Look at Elms scowling there.
3. Is ale made from hops?
4. They seemed mad riding at such a speed.
5. In the spring fields are green.
6. Ethel, I may see you again.
7. You better take a nap lest you be sleepy.

ETHEL MCCREA.

2—TRANSPOSITION.

Yerrap si hte sltmispe orfm fo heceps.
Hatt tfnain silp nac ryt
Yerrap hte stueblsmi sstnrai htat rhcea
Teh Myatjse no hhgi. ETHEL MCCREA.

3—PUZZLE DIAMOND.

The First you'll find is in "amend,"
The Third, you'll see, is no man's friend,
The Second's an Eastern captain or chief,
The Seventh you're sure to find in "relief,"
The Fourth's a S. American bird,
The Sixth's "sooner than," but a small word,
While Fifth is gracious of mien, I've heard.

CLARA ROBINSON.

4—CHARADE

I read the ADVOCATE to-night,
Of ninety-six the last;
I truly thought it did excel
All numbers of the past.

And Uncle Tom's department, too,
The brightest page, and best,
In holiday COMPLETE adorned,
With greater care was dressed.

My heart rejoiced that Lily Day
Felt "joyful," but alas,
I couldn't make her rebus out,
And so must let it pass.

And Clara spoke of going north,
For "venison," I guessed;
Oh! take me with you, cousin, for
A "sawhorse" I detest.

That rascal, J. S. C., infers
That Annie's scared away,
And then proceeds to taffy give
To Clara and Miss Day.

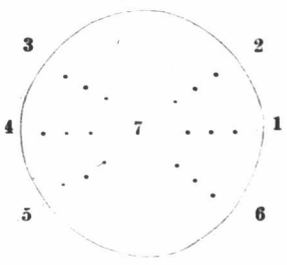
Well, I "won't" have it said that I
Have "won" the girls' offense;
I'll travel to "Morocco" FIRST
Uncle Tom's expense.

But lest I LAST my paper friends,
I'll end my rhyming here,
Hoping to see our circle full,
Throughout the whole glad year.

CHARLIE S. EDWARDS.

5—WHEEL PUZZLE.

Spokes contain four letters.



From seven to one you will use your ear;
From seven to two is for the cannon peer.
From seven to three, a bird you will find;
From seven to four is what light seems to the blind.
From seven to five of a tree is the rind;
From seven to six of coin is a kind.

J. S. CRERAR.

Diagram.

6—ANAGRAM.

They were searching for the thief,
But he'd made a clean escape;
And while they were gathering clues,
He was en route to the Cape.

The detectives blamed the porter
For his giving them the slip;
For they said "he shouldn't oughter
Have been taking a quiet tip."

And so one blamed the other
Till a smart young gent stepped in;
"We have GOT AS A CLUE, my brother,
That the thief is safe in Lynne."

A PUZZLEISTIC COUSIN.

Answers to December 15th Puzzles.

1—Joyful. 2—Good words are worth much and cost little. 3—Venison. 4—Won't—won. 5—Welcome. 6—Sawhorse. 7—Morocco.

SOLVERS TO DECEMBER 15TH PUZZLES.

Charlie S. Edwards, Ada M. Jackson, John S. Crerar, Clara Robinson; also, J. S. Crerar, Ada M. Jackson, Hattie MacDonald, for December 1st.

The winners of prizes for solutions during October, November and December are: 1st, Clara Robinson, Markham, Ont.; 2nd, Ada M. Jackson, Abingdon, Ont.; 3rd, John S. Crerar, Brussels, Ont.

I must request solvers to send in their work for each issue separately and in time; answers to puzzles in first issue should be in not later than the 15th of same month, and to those in second issue not later than 5th of next month. U. T.

L. M. SHEPPARD, Wentworth Co., Ont.:—Dear Sirs,—"I received the beautiful book of pressed flowers from the Holy Land, also the beautiful ring. It was very kind of you to send me the pressed flowers and I shall do my best to obtain another new subscriber for it. I am very much pleased with the ring. It is a perfect fit. I shall endeavor to obtain more new subscribers. Thanking you again for your prompt attention. The subscribers are much pleased with the ADVOCATE."

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TO find the size of ring required, take a narrow strip of paper that will draw tightly around the finger, forward same to us, and we will assure you a perfect fit.

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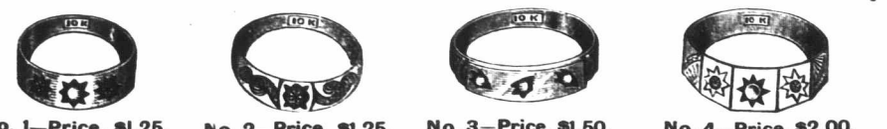


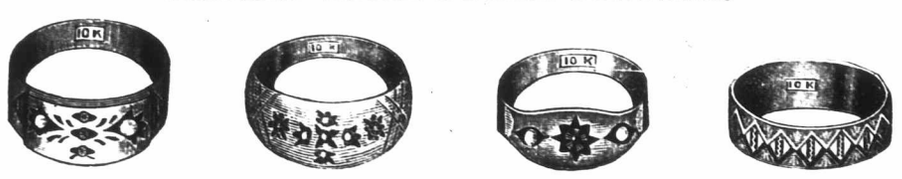
No. 1—Price, $1.25. 1 Pearl, 2 Garnets. 2 New Subscribers.

No. 2—Price, $1.25. 1 Garnet. 2 New Subscribers.

No. 3—Price, $1.50. 3 Pearls. 3 New Subscribers.

No. 4—Price, $2.00. 1 Pearl, 2 Garnets or Coral. 3 New Subscribers.

LADIES' REAL STONE SETTING.



No. 5—Price, $3.50. 2 Pearls, 3 Garnets. 5 New Subscribers.

No. 6—Price, $3.50. 2 Garnets, 5 Pearls. 5 New Subscribers.

No. 7—Price, $3.50. 1 Garnet, 2 Pearls. 5 New Subscribers.

No. 8—Price, $2.00. 3 New Subscribers.

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CONTAINING THE OLD AND NEW TESTAMENTS, ACCORDING TO THE AUTHORIZED VERSION, TOGETHER WITH NEW AND REVISED HELPS TO BIBLE STUDY—A NEW CONCORDANCE AND AN INDEXED BIBLE ATLAS, WITH SIXTEEN FULL-PAGE ILLUSTRATIONS, PRINTED IN GOLD AND COLOR.

Binding—
Strong, durable, flexible American Seal (best material) improved circuit cover, round corners, red-under-gold edge.

Paper, Type, etc.—
Of superior quality, clear and distinct, easy to read

Maps (with index)—
Revised and brought down to January, 1896.

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Covering nearly 2,000 subjects—contain all features so popular in the past, and an endless amount of fresh matter, including concordance on new and improved plan, dictionary of proper names and places, with pronunciation and meaning. Size, 8½x5¾ inches (closed).

How to Obtain this Handsome and Valuable Bible (Which ordinarily would retail at from $4 to $5):

We will send (carefully packed, post prepaid) this Bible to any one sending us the names of THREE NEW SUBSCRIBERS to the "FARMER'S ADVOCATE" at $1 each.

Agents Wanted in Every Locality. Liberal Cash Commission Allowed if Preferred.
A copy of the Christmas Number goes to each new subscriber. Payable in advance, **$1.** Send for Free Sample Copies.

The WM. WELD CO., Ltd., London, Ont.

GOSSIP.

The Province (B.C.):—"The Christmas number of the FARMER'S ADVOCATE will meet with a warm reception in agricultural circles, for it is replete with information of value to farmers, and is properly illustrated."

W. H. Ryan, Treasurer Tp. Normanby:—Gentlemen,—I send P. O. order for one dollar, subscription to the FARMER'S ADVOCATE for 1897. I am not now, or for some years, farming, but don't like to give up the paper I get so much information from.

American Creamery:—"The Christmas number of the FARMER'S ADVOCATE, of London, Ont., has just been received by us, and it is a beauty. The cover is splendidly illustrated in colors, and it abounds in very interesting and valuable information. We congratulate the publishers on their splendid achievement."

It is hardly necessary to say to sheep-men that sheep's hooves require trimming towards spring, especially if they have not had a good outdoor run during the winter months Paring off the hoof is often necessary when sheep become lame from foot rot and other causes. An excellent knife for doing this work conveniently and well is Botly's celebrated sheep-foot knife, made by James Macklin & Son, 7 Catherine street, Salisbury, England. The blade is strong, of the correct form, and made of excellent steel.

Our readers will note the change of advertisement of D. & O. Sorby, Guelph, Ont., in this issue. They have on hand 25 Clydesdale stallions and mares for sale, nearly all of them prize-winners at Toronto, Montreal, Ottawa, and World's Fair, Chicago. Most of our young stock are sired by the Columbian champion, Prince Patrick, and Grandeur, that has won sweepstakes four times at Toronto. Two of their fillies are daughters of Lillie Macgregor, the champion World's Fair mare. They have in stock also a number of Hackneys, Ayrshire bull and heifer calves, and Shropshire sheep.

GOSSIP.

☞ *In writing to advertisers, please mention the Farmer's Advocate.*

The Portuguese Government has authorized the importation of about 138,000 tons of foreign wheat to supplement a deficiency in the national supply.

Cases of "swine plague" have made their appearance in West Middlesex, Ont.; first on the farm of Mr. Wm. Tait, where 15 head died and 21 were slaughtered, and second in the herd of Mr. Jos. Lethbridge, adjoining farm, where 15 were affected and in all 24 slaughtered. Places (near Glencoe) quarantined.

At the last annual meeting of the American Cotswold Association the following officers were elected: President, J. C. Snell, Snelgrove, Ont.; Vice-President, J. Hal. Woodford, Paris, Ky.; Sec.-Treas., Geo. Harding & Son, Waukesha, Wis. Directors—R. C. Watt, Xenia; J. C. Snell, J. Hal. Woodford, Geo. Harding, and F. W. Harding.

The eleventh annual meeting of the stockholders of the Standard Poland-China Record Association will be held in Maryville, Missouri, on Wednesday, February 3, 1897, commencing at 10 a m. There will be an institute session of Swine Breeders held on Tuesday, February 2, when valuable papers will be read on swine husbandry. Geo. F. Woodworth, Secretary.

We are pleased to publish the substance of a note enclosed with Mr. Henry Herron's (Avon, Ont.) change of advertisement for this issue. He has had good success selling both Chester Whites and Poland-Chinas, having sold during the last few months over 30 head of swine. We know the "Avon herd" to be worthy of the success attending it, and are pleased to learn that its stock is being appreciated.

R. J. & A. Laurie, Walkerton, Ont.:—"We are well pleased with the results of advertising in the FARMER'S ADVOCATE. We have disposed of all our boars and surplus poultry, but have a number of choice Tamworth sows left. Among our recent sales in swine are as follows: One boar to J. C. Nichol, Hubrey; one sow in farrow to F. Cornell, Eastwood; one sow to S. G. Meates, Brantford; and a pair to Jas. Lillico, Ayr. We are booking orders for spring pigs sired by our prize-winning boar, Springbook Hero, and orders for eggs from prize-winning poultry."

E Dool, Hartington, writes:—"My Yorkshires have done well this season. Have the best lot of sows to breed I ever have wintered, all looking healthy and thrifty. Am breeding fifteen to three of the best boars I have ever used. Champion, which heads my herd, weighs over 800 lbs. when in show condition. Robin H. is another excellent stock-getter. The other, Frontenac Lad, sired by Champion, now eight months old, if in show condition would weigh 400 lbs. Will sell a few sows in pig at moderate prices."

Mr. H. D. Smith, "Ingleside Farm," Compton, P. Q., on the eve of sailing for England, writes: "I am glad to be able to report my Herefords as wintering very well and the prospects for an extra lot of calves extra good. Sales of young bulls have been most encouraging for the past year. During that time I made sales in five different provinces, viz., Nova Scotia, New Brunswick, Quebec, Ontario, and Manitoba. I get numerous enquiries from the Eastern States and would no doubt make good sales there but for the quarantine. Compliments of the season to you."

The British Board of Agriculture has received from the Foreign Office copies of the regulations issued by the Egyptian Minister of Public Instruction for the institution of a new school of agriculture, which is to take the place of the old Agricultural College. The instruction is intended to be both practical and theoretical, including agriculture, chemistry, land surveying, natural history, mathematics, hydraulics, veterinary science, bookkeeping, and the English and Arabic languages. The complete course of instruction will extend over four years and a diploma will be granted on passing an examination at the end of the course.

A. J. WATSON'S SHORTHORNS.

We again had the pleasure recently of calling on Mr. Watson, whose fine farm, comprising some 110 acres of good soil, is situated a couple of miles east of Castlederg, Ont. A general air of neatness pervades everything about the farm. The farm buildings comprise a comfortable and substantial brick house, well-constructed barns and comfortable stables. A Brantford wind power mill, manufactured by the Goold, Shapley & Muir Co., had been erected since our last visit, and was giving the best of satisfaction as a power for grinding, cutting ensilage, pulping roots, etc., as well as pumping water. The stock of Shorthorns now comprises over twenty individuals. The herd was founded some ten or twelve years ago by the purchase of Village Rose 7th, who, with her family of daughters and granddaughters, form a large per cent. of the present herd. Among her daughters are noticed the fine red cow, Prairie Flower, by Reporter 2nd =2435=. Ivy Leaf, another three-year-old, is another fine, large, well-built daughter of the old cow, possessing considerable quality. This cow was first at London and third at Toronto. A fine bull calf was seen from this cow. Lady Aberdeen =26289=, a grand three-year-old heifer by Coventry Victor =13195=, and the two-year-old heifer, Matchless of Ashton Frontview =26287=, are creditable productions of the old cow, Village Rose 7th. Adelina Patti =26288=, from Prairie Flower =22931=, is also a thick, smooth heifer of the right sort. Princess Josephine, a very fine heifer calf, was also pointed out to us as a second winner at London. Lady Jane is also a calf to attract attention. Both sired by Statesman. Fashion Fair, a beautiful yearling heifer, rich red in color, had been added to the herd since our last visit. She was purchased from Arthur Johnston, of Greenwood, and was sired by the famous Indian Chief. A sister of hers, we were told, was a winner of eleven firsts in U. S. in one year, and another was selected for the O. E. F. A couple of good bulls, rising a year, were noticed; one being out of the first prize cow at London. This year's calves consist of two bulls and two heifers of promising character. The stock bull, Statesman, is still at the head of the herd; a right good one, bred by J. & W. Russell, Richmond Hill; by Prince Royal; dam Nonpareil Victoria, by imp. Vice-Consul.

GOSSIP.

☞ In writing to advertisers please mention the Farmer's Advocate.

A telegram announces that the Government Statist of Victoria, Australia, estimates the wheat yield of the colony at 7,000,000 bushels, a quantity which he considers hardly sufficient for local wants.

MR. JOS. CAIRNS' CHESTER WHITES.

We again had the pleasure recently of calling on Mr. Jos. Cairns, of Camlachie, who, although a general merchant of that place, owns a nice farm adjoining the village and gives considerable attention to the breeding of choice Chester White swine; a few highly-bred Jerseys are also kept. Among the Chesters we noticed a number of exceedingly handsome ones, and since our last visit a couple of fine ones had been added to the herd from the noted herd of Willis Whinnery, Salem, Ohio. The boar, John A. —751—, is a fine lengthy fellow just turned a year, strong boned and well haired, that should give marked results on the herd. The sow, Alma —368—, of same age, is a handsome individual of first-class Chester type. A litter of fine young pigs, about three months old, were seen from this sow, got by Mr. Whinnery's grand stock boar, Cracker Jack. Miss Long —716—, bred by Mr. Cairns, is another of the choice-t sows, sired by Zola —253—dam Miss Thorndale. The aged boar, Boy in Blue —478—, bred by R. H. Harding, Thorndale, is still in the herd doing good service. Several choice young sows of handsome conformation, in farrow, were also noticed that are now being offered by Mr. Cairns at very reasonable prices.

THE BELMONT DAIRY AND STOCK FARM.

Arriving at Brantford, "a city of some fifteen thousand inhabitants," and one of the most thriving business and manufacturing cities of the Province, situated in a very progressive and prosperous community, a short and pleasant drive westward by the old macadamized London and Hamilton road, through varied scenery, with beautifully wooded hills, evergreen dales, and the historic Grand River winding away in the distance, on the one hand, white on the other well-tilled fields and comfortable farm homes, forming an enchanting picture of Canadian rural life, and we arrive at Belmont Dairy Farm, owned and operated by Mr. Jas. Fell. We were shown through the stables and over the farm, which comprises some one hundred and fifty-three acres. The farm dwelling is a good two-story brick, surrounded by dark-foliaged and cheerful evergreens and so situated that a fine view is obtained of the surrounding country, while the barns are commodious and fairly well arranged. The stabling is under reconstruction and when completed will be equipped with the modern improvements. A round silo is in use and giving the best of satisfaction; while water is supplied the stables by wind power.

As above stated, dairying is the special feature at present, Mr. Fell having recently engaged to supply city customers with milk; and in order to furnish a first-class article, excelling in richness, in establishing his herd Jerseys were the breed selected. Special attention is given to cleanliness. The Belmont herd now comprises some twenty-five individuals, all of Jersey breeding, with one exception, among them being a number of fashionably bred ones, including such as Britta of St. Lambert 10293, a handsome heifer by Jay St. Lambert 33813, who traces to the famous Canada's John Bull, her dam being Brittella 2nd, a grand butter producer. Her stable mate, Lack of St. Lambert, is also a favorite and a very promising heifer, by the noted bull, One Hundred Per Cent. Any of Glenrouge is also a choice heifer, with rich milking qualities and high breeding. These heifers, with the head of the herd, Rioter of Glenrouge 6017, were purchased from the well-known Jersey breeder, Capt. Rolph, of Markham, Ont. Rioter of Glenrouge is by the great show bull, Hugo's Bonanza 2852, while his dam, Coquette Nora, has a record of 15.9 lbs. of butter per week, and grandam, Croquette of Glenrouge 2nd, 18.6 lbs. per week; while the g.-grandam gave 22.12 lbs. per week. Thus it may be seen that Mr. Fell has in his herd individuals of a line of celebrated buttermakers. Other fine heifers were also noted from the herd of Mr. Joseph Stratford, of Brantford, who in founding his herd purchased the best obtainable. Therefore, considering the general good breeding of the herd, the high quality of the production, and the evident attention given to minor details, we bespeak for Mr. Fell a liberal city patronage of the Belmont Dairy and, as a breeder, the success which his enterprise deserves.

English Shropshire Interests.

The annual meeting of the English Shropshire Sheep Breeders' Association shows their finances to be in good condition, there being a balance on hand of £1,280. The assets of the Society are valued at £1,361 4s. 10d., a decrease of £45 7s. 2d. upon the valuation of last year, caused through the expenses incurred in connection with the Buenos Ayres exhibition of exported rams. The council desired to call the attention of members to the demand for Shropshire sheep in South America, which, it will be seen from the following statement, has greatly increased since the exhibition of rams was held at Buenos Ayres last December, under the auspices of this Society. Exportations to South America:—September 30, 1894, to September 29, 1895—Rams, 69; ewes, 5; total, 74. September 30, 1895, to September 29, 1896—Rams, 259; ewes, 72; total, 331. Shropshire sheep have been exported this year to the following States, viz.: Australia, Tasmania, South Africa, the Argentine, United States of America, Canada, and Montevideo. The total exportation for the year numbers 558, or 339 rams and 219 ewes, as against a total of 302, or 140 rams and 163 ewes, in the previous year. The council are still making every effort to extend more widely a knowledge of the best attributes of the Shropshire in the foreign agricultural papers, and have every reason to hope that good results will follow the course pursued. It was satisfactory to know that through the exertions of the Society, backed by the Sheep Breeders' Association, they had been able to obtain a reduction in the very excessive quarantine restrictions imposed by the Australian Colonies.