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THE ILLUSTRATED

Journal of Agriculture.

Montreal, January 1, 1897.

THOUGHTS ON THE NEW-YEAR.

Time rolls on, and when this reaches the eyes of the readers of the "Journal" another year will have gone, and soon another Century will be numbered with the past. And what a glorious epoch the century just ending has been. What a privilege to have lived in it. Never in the world's history has such progress been made in all that concerns the amelioration of the condition of mankind religiously, morally and socially.

The arts and sciences have been developed in an extraordinary degree. education and literature have become popular, and have by their improved moral tone and tendency revolutionized society. But what concerns the readers of this paper most is the fact that Agriculture has kept pace with improvements in other respects; and from being a mere muscular occupation of drudgery and guess-work, successful farming has been elevated to a place amongst the sciences, the principles of which are capable of demonstration and adaptation in all our daily practice. I do not aver that every farmer must be able to define all the abstruse theories of his calling, but the more he knows of them, the more likely he will be to make his work remunerative, and even if he has not had the advantages of education to enable him to study them closely, he can, at least, observe the practice of his neighbours, who have done so, and copy, when he sees good results have been achieved.

The opening of the New Year seems full of promise of encouragement for the Canadian farmer. When we take a retrospect of the last year we find that, generally speaking, the crops have been fairly good, and the demand for most kinds of farm produce, although at low prices, has been steadily improving; and we must remember too that although our products are cheap almost everything which we have to buy is equally cheap. Again, the proposition to place our Dairy, Orchard, and others products upon the markets of the old world in good condition, by means of quick transit and cold storage, is being adopted and is most encouraging.

The action of the Federal and all the Provincial Executives, backed by the home authority, is in favor of giving Agriculture in Canada a fair chance to develope itself. This is not a question of party, but of such general and wide spread importance that no party can ignore its claims or neglect them. All well know that the future of what will soon be a great country depends, at the present moment, on the successful developement of its agricultural resources, notwithstanding the querulous outcry of some who allow party prejudice to induce them to find fault with the action of their opponents, be it good or bad, and to look upon all money, spent upon farm education as a waste of the public funds.

Neither would these gentlemen have to find fault with the amount expended for Farmer's clubs, could they witness the advance made where these clubs exist. What has increased the volume of our farm exports and thus brought money to our shores? What has caused the farmer to be more contented, more persevering, more energetic, and therefore a more useful member of the body politic? What but the encouragement given and the newer impulse awakened by the means above alluded to? Yes, the Canadian farmer is working with more zeal, more determination, and better success, and will continue to do so the more he is urged and encouraged.

Another encouragement to the Canadian farmer is that our products are looked upon with a greater degree of favour in the Mother Country and there is a growing disposition to receive them. The public discriminate in our behalf (1) and are anxious that we should keep up the standard of excellence so as to be able to compete successfully with other colonies, and outstrip the importations from foreigners, thus maintaining the unity of the Empire, and remembering that although toiling in a comparatively new country we are "bone of their bone and flesh of their flesh."

The outlook for us this glad New Year's tide is bright according to all signs, let us brighten it still more by trust in Providence, and faithful discharge of duties as they present themselves, let us begin the year with a renewed effort, commence keeping a strict record of all our transactions both financially and with regard to all operations. Plan our work ahead and perform it methodically, see that our buildings are well constructed to insure the comfort of the stock, and attend to the economical preservation and accumulation of the manure, a point more neglected than any other. be careful and thorough in the tilling of our land, the destruction of weeds, noxious insects and fungous diseases, selection of suitable seeds; ever remembering that time lost can never be recalled, and that whatsoever our hands find to do we must do it with our might. Let business be our first earthly consideration; not however to the exclusion of proper recreation: "All work and no play makes Jack a dull boy."

Let the old be not content to walk in the old rut, and say: "Oh what was right for my Grandfather is right for me", but let him adopt all that he finds good in modern methods. Above all let us give all the encouragement we can to our youths, who propose to adopt farming as a profession, to study well and use all the opportunities they enjoy, making up their minds to be proficient when the time comes for them to practise, just as they would if they had learned any other trade or profession. Teaching them, that, if well prosecuted, farming is as honorable, lucrative and worthy a calling as they can follow, and more conducive to domestic happiness than many others.

If we begin the year with these resolves and carry them out with an earnest purpose, we shall reap the reward of those who have done their duty, however humble that duty may be in the satisfaction, that we, while earning an honest living, have contributed to the good of others, and in some small degrees to the progress and happiness of those who shall take our places in the century which is dawning upon us.

GEO. MOORE.

(1) Very doubtful indeed!—Ed.

The Dairy.

THE LONDON DAIRY SHOW.

Mr. J. McLain Smith makes the following summary of the more salient points in the voluminous reports in our English exchanges:

The recent London Dairy show was the largest and most successful ever held. There were 108 entries in the milk and butter tests, but these are largely duplicates. The regular tests of the association are decided by chemical analysis; but in addition to these there are special tests for Shorthorns, Jerseys and mixed breeds in which the churn is used and commercial butter made.

The chemical tests are not yet to hand, but in the special tests, decided by the churn, there were 17 Shorthorns tested, 30 Jerseys, and 14 of other breeds—4 Guernseys, 3 Red Polls, 5 Aryshires, 2 Holsteins, and 3 Cross-bred. As usual the Shorthorns far excel in yield and is the only breed that shows over 3 pounds of butter from 24 hours milk. (1) Two of the Shorthorns do this; one with a yield of 3 pounds, 2 ounces from 46 pounds, 14 ounces of milk; (2) the other with 3 pounds, 1 ounce butter from 55 pounds, 12 ounces of milk. Of the 17 Shorthorns tested, all but one gave over 40 pounds of milk in one day; 14 gave over 45 pounds; 11 gave 50 pounds, or over; and one exceeded 70 pounds. In butter, 7 made over 2 pounds each; 14 made over 1½ pounds each: and the lowest was 1 pound, 7 ounces.

Of the 30 Jerseys the largest yield of milk was 47 pounds, 10½ ounces and it also made the largest yield of butter—2 pounds, 10½ ounces. Only 3 Jerseys exceeded 40 pounds in yield of milk; and only 7 exceeded 2 pounds in yield of butter; 5 of the Jerseys, however, were 2 years old and all of the Shorthorns were mature cows. Confining comparisons to mature cows— 4 years old or over—there were 21 Jerseys. Of these 6 made over 2 pounds of butter each; 13 made over 1½ pounds and 2 less than 1 pound.

It is odd, but the richest milk of all the 61 cows tested, was from a Red Poll. She gave an insignifiant quantity, only 9 pounds, 6 ounces, but it made 12¾ ounces of butter—a pound of butter to 11.76 pounds of milk. The only other cow in the test making a pound of butter from less than 15 pounds of milk was a Jersey, showing a pound of butter to 14.88 pounds of milk. The Red Poll was 127 days in milk and the Jersey 172 days.

Leaving out this nearly dry Red Poll, I find the 4 Guernseys tested, averaged 92½ days in milk and gave an average of 31 pounds, 14½ ounces, which made 1 pound, 4¼ ounces of butter. Two Red Polls, milking 66½ days, averaged 10 pounds, ¾ ounce, which made 1 pound 11⅛ ounces of butter. Two Aryshires, milking 33½ days, averaged 48 pounds 2¼ ounces of milk and 2 pounds, 3⅜ ounces of butter. Two Holsteins milking 77 days, averaged 84 pounds, 11⅞ ounces milk and 1 pound, 4¾ ounces of butter.

Mr. Smith omits to comment, as do all the writers on the other side, so far

(1) The udder of the Dairy Shorthorn, in the Nov. number, comes out badly in the original. A glance at her portrait will at once show any one how very much this kind differ from the "Booth and Bates Shorthorns.—Ed.

(2) About 1 lb. butter from 16 lbs. milk.—Ed.

as we have observed, upon one singular feature in these milking trials. These trials lasted through two days and the champion Shorthorn cow gave in the two morning milkings 50.8 pounds of milk containing 4 per cent of fat and 9.5 per cent of solids not fat, whereas the two evenings' milk had 6.4 per cent fat and 9.2 per cent of other solids. There was a similar though less wide variation in the milk of the first Jersey excepting that there was a slight decrease in the amount of milk.

"Hoard."

MOTTLES IN BUTTER.

SOME NEW IDEAS AS TO THEIR CAUSE AND PREVENTION

Mr. B. T. Quigly, of Philadelphia, whom the "Creamery Journal" introduces to its readers as an "old buttermaker" writes to that paper about "Mottles" as follows:

This is a subject which has been discussed at great length, and many reasons given why butter is mottled. I have given the subject considerable thought and study in the past fifteen years, and I think I have discovered a cause which has been overlooked by most writers on the subject, especially with butter made from separated cream.

Back in the old days of gathered cream butter, the cream on the very hottest days came into the factory with churned butter on the top of each can. Now the buttermaker had to strain that cream in order to separate it from the particles of butter or he would have white specks or mottles in his butter.

The reason for it was that the butter on the top of the cans was churned by agitation at a high temperature, say from 80 to 100o, and of course it would come white, as all buttermakers know that a "scalded churning" (that is butter churned at a high temperature) will lose most of its natural color, and all butter makers know also that particles of butter already churned in cream will not take the artificial color at the time of churning if such particles are allowed to remain, hence we have one source of mottles.

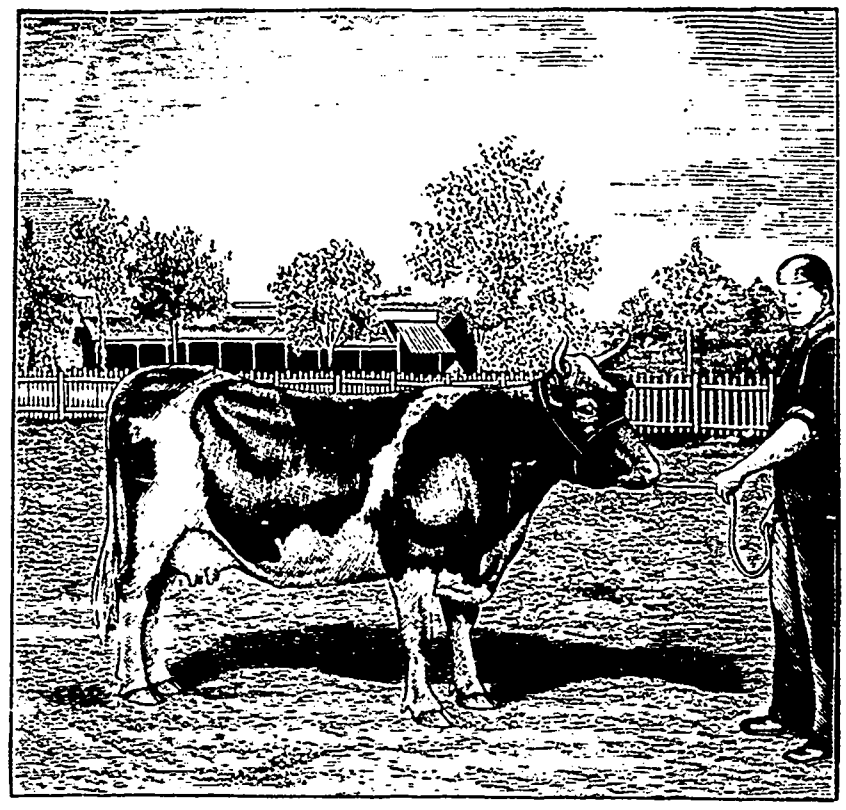
Now every cheesemaker will tell you that once the cream rases on milk it is a hard matter to force that cream back into the milk again, so as to work it all into the cheese. You will see a cheese maker quite often while waiting for the last load of milk to come, in the morning, take a dipper or rake and thoroughly mix the milk in the vat. He is keeping down the cream until the vat is "set."

The dairyman in keeping his night's milk so as to bring it to the factory in the morning, must cool it, consequently the cream will rise more or less during the night, and in passing through the separator these globules of butter fat, which were raised through the night, will separate more readily than the rest unless the milk is well mixed before separating. My experience is that these globules being held so long in the bowl will be delivered by some separators into the cream vat in granular form or churned state, very small to be sure, but under a glass can be seen readily, or even by the naked eye, as perfectly formed as coming from the churn.

Now in running this milk through the separator these globules of butter have been formed at a high temperature which will almost entirely destroy the natural color, and as we know they will not take the artificial color, hence with all the care possible in working the butter we have mottles and we know not whence they came. Now for a cure and I am done. My plan is to fasten a piece of strainer cloth over the end of the cream spout and strain them out. There will not be probably more than from one-half to one pound in a whole skimming yet they will spread over a large territory and knock a cent a pound off a dozen tubs of butter, besides causing trouble between the creamery man and the commission merchant. I think the better plan is to strain the cream from the separator instead of into the churn as they are so small they will pas through the churn sieve. There are other causes for mottles but most makers know how to deal with them.

MILK PRESERVATIVES ABROOD.

The following leading editorial from the Mark-Lane Express agrees with opinions more than once expressed in these columns, and is interesting as showing how the matter is regarded in England:



IONA, SWEEPSTAKES PUREBRED GUERNSEY COW (Imported),

As shown at the Toronto Industrial Exhibition, 1896. The property of Wm. Buller & Sons, Dereham Centre, Ont.

A decision of the Enfield magistrates seems to have been strangely ignored by the press, and its importance has certainly not been appreciated as it deserved to be. The matter is well worth the attention of all milk producers as well as milk dealers. First, to deal with the facts. It appears that an Enfield milk dealer was summoned under the Food and Drugs Adulteration Act for selling milk as an article of food when it contained a mixture of boracic acid and water, which, it was alleged, was injurious to health. The local analyst certified that the milk in question contained in each pint some thirty grains of boracic acid, and ten per cent, of added water. It is important to notice that this case was not one of the common kind of trying to add to the bulk of the milk by means of added water, with a view to increase the profit to be made. On the contrary, it is quite clear that the dealer was only trying to increase the keeping qualities of his milk, and that he was under the impression that in so doing he was pleasing his customers. At any rate, he was not trying to increase his profits by increasing the amount of milk, and it was not suggested that there was any more water added than was required to cause the admixture of the drug and the milk. It was simply a case of adding a preservative to the milk. Of late it has become the fashion to use preservatives in the milk trade, and probably those which are most popular are preparations of boracic acid. It is difficult to understand why this should be so, for as long as milk is good it will keep in vessels which are perfectly clean and sweet for at least twenty-four hours and if it can be made to keep longer—which ought not to be required—it is at the expense of adding some drug which may do more harm than good. In this case the magistrates evidently took this view, for they inflicted a penalty of £1 and costs—which amounted to £1 10s. 6d.

When we come to look into the evidence which was given before the Enfield Bench, the point which is most striking is that a medical authority stated that the amount of boracic acid which can with safety be given to a child in twenty-four hours is ten grains. A larger quantity, it was stated would be injurious to health. The analyst in this case showed that there were thirty grains per pint. This means that if a child took a pint a day—which is probably much less than the average child will take—it would have to imbibe three times as much of the drug as is safe for health. This, of course, is a serious matter. It means that, however much the dealer may have believed that he was improving his milk and assisting his customers, he was also giving them a mixture which would in all probability prove injurious to those who consumed it. From the legal point of view, the decision was undoubtedly correct. The so-called milk was not milk; it was milk plus water and boracic acid. The purchaser asked for milk, and doubtless believed that it was milk that he received. The terms of the Act are plain and explicit. It says (Sec. 3) that "No person shall mix * * * * any article of food with any ingredient or material so as to render the article injurious to health." Further, it is made an offence not to sell an article of the "nature, substance, and quality" demanded. It will, therefore, be readily seen that the case above referred to is practically a double offence. The net result, therefore, is that it is a dangerous thing to use preservatives at all, and that it can never be safe so to do unless it can be clearly shown that what is used is not in any way injurious to health. Under ordinary circumstances it ought not to be necessary to use drugs in this way, and as long as the farmer produces the genuine article, and delivers it in a cleanly and undiluted manner, he has nothing to fear. When he cannot, he had better let that branch of his calling alone.

THE MAKING OF BUTTER.

Milk — Skimming — Ripening cream churning—Making up and working. (1)

In the making of butter a few things are necessary in order to produce an article of the finest quality. To begin with, you must have the right kind of raw material to work with. Cows that test much less than 4 per cent of butter fat should be discarded for a butter dairy, as rich milk will always give a firmer texture and a higher flavored particle than poor milk, other conditions being equal.

SEPARATION OF THE MILK

After you have secured the right kind of milk, the next thing to consider will be how to separate the cream from it. There are several methods in use among dairymen, but perhaps the best and most economical of all is by the centrifugal separator process, as, with right management it will always do its work well in all kinds of weather it stands at the head of all others in this respect. It is advisable to skim thick cream for two reasons: it will contain less casein and will also occupy less time in churning. The cream, after skimming, should be well aerated and cooled down to at least 50o as soon as possible. This is important. Do not add either ice or cold water to the cream while warming (ripening?) as it is almost sure to injure the flavor

RIPENING THE CREAM

The next process to be gone through is the ripening of the cream. This is certainly the most important point as now is the time to secure the fine flavor. Some good butter makers use what is termed a starter. The object in this is to hasten the ripening process. This may be either some skim milk prepared for the purpose, or some butter milk from the last churning will suit as well if kept cool and fresh. This is added to the cream which has been kept sweet at the rate of 1 gallon to 10 or 12, mix thoroughly and set away at a temperature of 60o in summer and 65o in winter. In from 12 to 15 hours it will have developed a mild pleasant acid, it will now be ready for churning; it should have a smooth glossy appearrance, and be about of the consistency of good maple syrup.

CHURNING THE CREAM

The cream is now ready for churning and should be brought to a temperature

(1) An essay sent in for the Exhibition Competition of 1895.

of 56o in summer and 60o in winter, it should be strained into the churn through a strainer made out of ordinary cheese cloth. The common barrel churn is perhaps one of the best for the farm dairy. Do not churn too fast when starting, and draw the plug 2 or 3 times to allow the gas which accumulates to escape. In about 30 to 45 minutes, the butter should show itself in the form of small grains. Add water, at a temperature of not more the 50o. at the rate of 1 gallon to 5, continue churning until the grains show the size of small wheat; then, draw off the butter milk. No occasion to turn the churn after this stage; 2 or 3 waters poured on from a good height will completely rid it of all the butter milk. Do not unnecessarily flood it with water, as it tends to injure the flavor.

SALTING AND PACKING

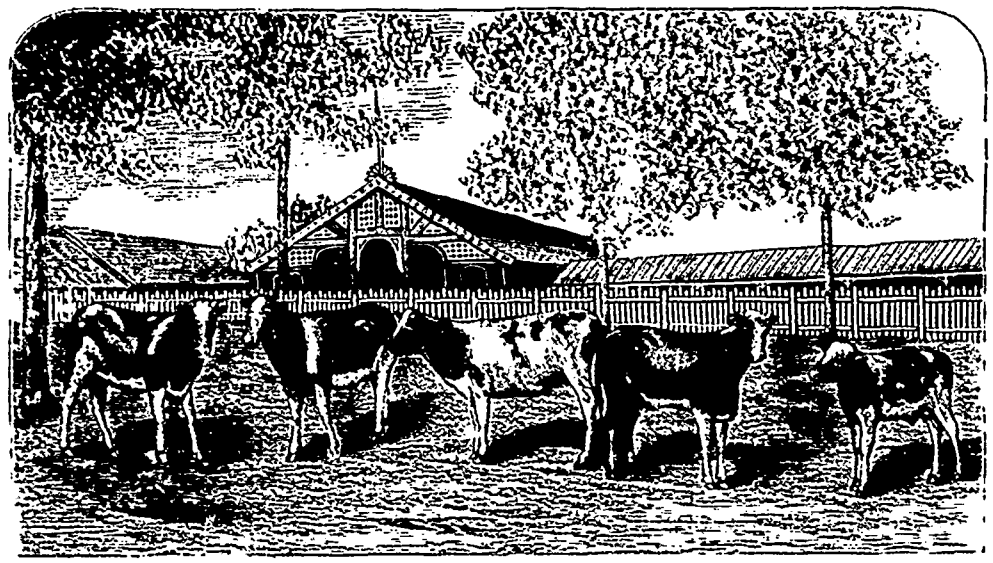
Lift the butter out of the churn and weigh carefully, place on the butter worker and add salt at the rate of one oz. to the pound, or, better still, just enough to suit your customers' tastes; work just enough to mix thoroughly, place away in a cool place for 24 hours, work the second time; then, pack away in tubs, which have been lined with parchment paper, cover with parchment paper the top, then make a thick paste with salt and water and spread it evenly over the surface to exclude the air. You should now have a tub of butter which will keep perfect for months, under proper conditions, and at the same time please the most fastidious.

TIMOTHY HAY EXPENSIVE FEED.

Mr Manchester tells us how he uses bran in the place of hay for feeding cows. Pound for pound the bran is cheaper than the hay, and if the latter were ground as fine as the bran, it would occupy but little more space. In fact, as we have often stated, timothy hay is the most expensive food one can give to a cow. At the writer's home good hay sells at $22 a ton from the farm. The best of baled hay cannot compete with it. With a silo and a few acres of oat hay to feed as dry roughage, our farmers might sell nearly all their timothy and thus make it one of the best crops on the farm. Many people still think it a wise policy to stuff a horse with 20 pounds, or more, of long hay each day. The "Rural New-Yorker" has often told its readers of a new horse food in which hay, corn and oats are all ground to a course powder. This feed is, we understand, giving the best of satisfaction and is certainly more economical than long hay and whole grain.—"Rural New-Yorker."

NEW SHAPED CHEESE.

Square cheese is not unknown, but the fact that cheese is put up in 20 pound boxes is new perhaps to many. Geo. B. Whitmore & Co., 89-91 Warren street, large dealers in butter, cheese and eggs, received this week, a lot of the finest quality full cream cheese, put up in 20 pound packages. The package is an oblong box about 7 x 7 x 10 inches. This cheese is made in the state and bears the state brand. "We have met with an excellent demand for this cheese," said Mr. Whitmore," from uptown grocers, and have got 11c per pound for it, ½c more than for the highest quality in round cheese." One advantage that we claim for the cheese is that it cuts better than the ordinary cheese, being cut square instead of a V shape, thus preventing it from drying so quickly. From the urgent demand we have had for this cheese, I should say we will handle a considerable quantity of it from now on."—"N. Y. Butter Trade."



FIRST PRIZE "BREEDER'S YOUNG HERD" OF PUREBRED GUERNSEYS,

As shown at Montreal Exhibition, 1896. The property of the Hon. Sydney Fisher, Knowlton, Que. [NOTE—The Breeder's Young Herd is to consist of one bull under two years, two heifers of one year old and under two years, and two heifer calves under one year; the whole, except the bull, to be bred by the exhibitor.]

SILAGE EXPERIENCE.

According to the Agricultural Department at Washington, a compilation of experiments from various Experiment Stations shows the following results:

The Massachusetts station found mixed silage of corn and soja beans very fine. Vermont station made a superior silage of oats and vetch; also of oats and peas.

Silage produced more milk at the Ohio station, more butter at the Pennsylvania station, and more mutton at the Michigan station, than beets. Even when there is a loss of 20 per cent in the feeding value of silage, it is a cheaper feed than roots. The Wisconsin station preserves silage at a loss of only 8 per cent of its feeding value. The loss in curing fodder is never less than 20 per cent.

The Pennsylvania station found silage and cured fodder about equally digestible. Kansas station grew 100 tons of silage on ten acres, and it sustained 25 head of cattle 192 days—a result which it is thought could not be attained with ten acres of cured fodder.

Use the largest variety of corn that will mature before frost. Experiments at the Pennsylvania station show that as corn approaches maturity the amount of nutriment it contains and the digestibility both increase very rapidly. The total yield of the digestible food by the matured crop was two or three times that of the same crop in the silk, and 36 per cent greater than when the ears began to glaze. The Minnesota station found that 100 pounds of ensilage from the Northern and Southern, and sweet corn, all contained about the same feeding value.

Silage is distinctively a cattle feed, but the Kansas station finds it not good for feeding bulls. It may be fed in moderation to horses, pigs, poultry and sheep, but sour silage is dangerous to sheep.

There has been some complaint that silage gives milk an unpleasant flavor. This is probably due to sour and decaying silage. The Kansas station found that if the silage be fed just after milking, instead of before, this disagreeable flavor disappears.—"Hoard."

RENNET

Rennet is a ferment found in a calf's stomach. It has the power of curdling and digesting milk.

Who discovered the use of rennet in cheesemaking is not known, but we have a record three thousand years old that Jesse, the father of David, sent ten small cheeses to his sons in the Hebrew army, and we think it probable that he used this peculiar ferment of the calf's stomach to make the cheese referred to.

Rennet is also found in the sheep and pig, but the rennet extract of modern commerce is made from the stomach of calves killed when a week old.

The best rennets are called Bavarian, because they come largely from Bavaria. The suply, however, is not restricted to Bavaria. In Europe the farmer kills the calves at the right age, and just after feeding. The stomach is hung up in a smoke house to cure. There is a middle-man who goes from farm to farm, buying hides, tallow, etc., and rennets. He, in turn, sells these things to the wholesale houses, where the rennets are sorted. Any not of uniform size or that are mutilated are classed as seconds, while the uniform ones are termed firsts.

The sorted rennets are bought up by the houses that make the rennet extract. Some houses buy the seconds to make cheaper but inferior extract.

Rennet extract is a solution of the ferment in water, with salt added to preserve it.

Several hundred or thousand stomachs are put to soak in a large vat of water, or rather brine. The rennets being sorted are very uniform in strength, at least average uniform, where so many ae used, and consequently the extract is of uniform strength where a certain number are soaked in a stated quantity of water.

The extract is made a little stronger than it is sold, and is then diluted to a commercial strength.

Before soaking the rennets are cut open so that the water can easily get into them.

Bennets that are old or that have been kept in cold storage make deeper colored extract. I am told by a prominent manufacturer that the color of extract is not an indication of its strength.

Extract should be kept in a cool and perfectly dark place to prevent decomposition.

It should also be kept tightly corked.

Do not let rennet freeze, as that will also spoil it.—John W. Decker in Hoards Dairyman.

The Horse.

Ranch horses consigned to the Netherlands — Notes — New-York Horse-Show — Frightfull condition of roads in the Province of Quebec —Suggestions for good roads.

We cannot boast of having had a fine Autumn this year. What used to be our boast in the way of Canadian weather, has not been realized during September, October or November. I see that a suggestion, often made by various friends of mine, as well as by myself, has at last, been carried out, and that a consignment of 53 ranch horses was shipped on the 22 of last month, for military purposes, to the Netherlands Government who if pleased, with the experiment will take 200, annually. If they are like the lot of 50, sent down and sold at auction, in the C. P. R yards two years ago, from the Quorn Ranch, they are just the right sort for troopers.

"The twelfth annual Horse Show, " New-York was first last and all the " time a show for high steppers; as " the A I heavy harness horse is now " called, and, as most of these horses " were docked trotters, it may be said " that it was a trotting show. (I have " known Americans before now, who "were under the impression that a " docked trotter was a hunter.)

"One fault on the part of the judges " in the heavy harness classes still "remains, the great speed at which some " of the horses were sent round the " ring. It is true that the converted " trotters used in the majority of the " traps need heavy-weights and a " clipping pace to show action, but this " does not make it right. Almost with- " out exception the regular limit of " speed in the cities of the world is " six to seven miles.

"For the first time, the Horse Show " gave liberal prizes for French Coach " horses, and, also, for the first time " did the New-York public gain as

"idea of what a French Coacher can "be when a perfect harness horse is "wanted, especially as the champion "harness horse of the Show Harry "Hamlin's Cogent, is out of a French "Coach mare.

"Indre, winner of first prize, was champion in 89 at Paris, and, also, at Chicago in 93. His colour is a wee bit "off, but in every other way he is perfection, a long blood like neck topped "by a breedy head, with fine ear "running to oblique shoulders, superb "middle, level round quarters and well "hung flag with good bone. Add to "this fine size, a peacock air that Mambrino King cannot beat, and a slashing way of going that not only picks "up the feet, rounding out the movement, but sends him away at an "amazing clip and we have the harness "horse we all want. The question is: "can Indre, who is one in 10,000 "French Coachers, fill out the cat "quarter of the trotting mare in the "get of such a cross, and also put his "life and action there. If he can—I "am frank enough to say I doubt it—"French Coachers are the horses to "breed. He certainly is one of the few "ideal harness horses I have ever seen

My apology for quoting at such length the above and following extracts from an American paper are that they will I think be interesting to all those interested in the problem of the improvement of special breeds of horses. The Americans have been importing Hackneys for some time, mostly with the idea, of crossing them on native trotting stock in order to get stylish harness horses which are very saleable just now both in the States and abroad. They seem to be getting tired of this and to be coming to the conclusion that it is quicker and cheaper work picking out the larger specimens of their trotting bred stock and docking their tails.

"Ever since the Hackney has been "shown in the Garden, the trotting "horse men have said all sorts of "things except those that are pleasant about him and things looked "squally when this year there was "a class made for Stallions four years "old, or over, registered in any "recognized Stud-Book, to be shown "with four of their get, the get to "have been bred in America, of any "age, and out of native inspected or "unregistered mares; the get only to "be considered. The get in this class "to be judged as animals best suited "for carriage and harness purposes

"It is to be regretted that only one "Hackney owner, A. J. Cassatt, had the "courage to enter in this class, and "equally regrettable is it, that only one "trotting horse owner, Village Farm "placed one of their stallions in com "petition Cadet, 107, with four of his "get out of native mares were drawn "up to face Almont junior 226, with "four of his get, out of a pair of pony "mares. Daisy and Francy, of unknown blood, that Harry Hamlin "purchased in England about 10 years "ago and exhibited at shows in this "country with marked success.

"From the conformation of these "ponies they must have some Hackney blood in them, they were entered "in England as cobs, where the undersized hackneys are called cobs. When "this class came on there was considerable excitement, especially as the "get alone were considered by the "judges, and the most intense interest was shown by all the "horsemen present. When the blue "rosette was tied to Almont junior's "head-stall he was led round the "ring. Every one of Almont's get "were full of quality, remarkable symmetry and very high knee action, but "too loose behind. The quarters were "the usual trotting quarters and the "stifles were deficient. Another vital "defect was that the Almont colts were "undersized and for that reason would "never be fit for heavy leather. Cadet's "get were coarser and not so well "developed, but would all of them be "large horses fit to draw heavy "vehicles."

It appears evident that neither the French coacher nor the Hackney can *get first class specimens of harness* horses out of the ordinary low-sized light boned, trotting mare, (the average height of the American trotter is 15.1, and size of bone below the knee, 7½ inches) in the first cross, and that it is a matter of uncertainty as to how many crosses it would take, before this object could be attained. The transition from horses to roads is easy and if he could only speak, I imagine our equine friend would have a good deal to say on the subject. He must be grateful for the six months of snow that come as a happy interregnum between the awful roads of Spring and Autumn One can safely say, that roads in the country here are bad nearly everywhere, in many places, this county and parish for instance, most outrageously bad, and really very good, hardly anywhere.

Is there anything more conclusive to the pleasure and comfort of one's existence *in the country, than the possession* and enjoyment of good roads? American travellers in Europe are generally not inclined to be difficult in the matter of extolling the advantages of their own country, when oportunity offers, but I have never met the American or Canadian traveller yet, who had anything to say in favour our roads, after having seen the beautiful roads in Europe. In fact, it is with the deepest shame and regret that we have to contrast *the condition of our roads*, with that of those in England, France, Italy, or almost any country in Europe. I am afraid that the amount of money lost to the farming community in general through wear and tear of horses, harness, and vehicles, and loss of time, in the way of approximate statistics, would not have any very convincing effect upon the average habitant of the Province of Quebec. He won't keep his ditches in order or his drains cleaned out, although he will admit to you cheerfully that the crops will suffer, if the water lies on the ground too long in the Spring; how then can you expect him to do any work on a road unless he cannot possibly avoid being compelled to do it? There is plenty of law about road repairing in the Municipal Code, but it is never carried out, and the roads are never in good condition. I am speaking now, more particularly of the County of Terrebonne, and the Parish of Ste. Thérèse. A couple of men from Pembroke, Ontario who have been driving all over the Province were at my place the other day with a new Patent grind stone to sell, and they told me, that of all the parts of Quebec that they had driven ever, the roads here were the worst they had ever seen. Government goes to the expense of making good roads, which are no sooner finished than they are allowed to go to pieces for want of repairs by the very people for whose benefit they were made.

There is an absolute necessity for some provincial legislation on the subject of road repairing, if ever we are going to have good roads. As each municipality can only make laws for itself and cannot compel a neighbouring one to do anything similar in the way of improvement, of what use would it be for instance, for one municipality to compel its members to use broad tires on the roads under its control; than which I know of no other single measure, of greater benefit for the making and conservation of roads, if neighbours cannot be prevented from cutting them up again with their narrow tires at their own sweet evill? A C. P. R., official told me only the other day, of a bit of road, actualy made by no other means, than the continued use of broad tires over it, in addition to the making of a good ditch on either side.

It is not necessary to have very expensive roads in the country, in order to have very fair ones. Where there is not money enough to indulge in Telford or McAdam, with under ground tile draining of the most approved scientific description it is nevertheless possible to make a very good road by draining well on each side, with an open ditch, throwing the earth into the centre, removing the large stones, and using them to fill up depressions where water might collect.

The use of stone carts, with broad tires, going over the ground during the progress of the work will do all the rolling required in a very effectual manner. A supply of small broken stone for filling up ruts, and hobs as soon as they begin to form and the constant *use of broad tired vehicles for heavy* draught, will keep a road of this description in the country in very good condition. I have said that there are plenty of laws about the keeping of roads in repair only they are never carried out. The Montée de St. Thérèse was once a good macadamized road. There were two ditches, on either side, and the road was well drained, and well rounded up in the centre, and there were no ruts or holes. Now, the road *is quite flat full or ruts, in some places*, on either side. no trace of a ditch remains, in other places, the ditch is filled up with boulders, that have been placed there by the owners of land by the road side who considered it the nearest and most convenient place to deposit them. The public highway, 16 miles in length, between the pretty town of Terrebonne and the historic and picturesque village of St. Eustache, runs along by the river side, the North branch of the Ottawa, and in Spring, Summer and Autumn, would be a most delightful drive if the road were only good, but the whole of it is simply abominable in Spring and Autumn, and not good at any time. The system of road mending in vogue must be seen to be appreciated and properly described. At spasmodic intervals notifications are sent to proprietors on the road side to contribute supplies of stone for what they call macadamizing. A man looks round one of his stoneiest fields for the nearest supply of boulders he can get hold of, fills a cart, and upsets them on the road. They are generally left, pretty much as they fell. Sometimes a man breaks them up a bit with a sledge hammer, just as often he does not take that trouble. If a few shovelfuls of sand are thrown over the stones, this is very fine road mending indeed. The final result of this mending, however, is to leave the road a good deal worse than it was before.

Of course there are plenty of municipal by-laws and regulations on the subject of road mending. The big stones should be nicely broken, and the interstices filled in with smaller stones that will just pass through a ring 2 inches in diameter. That is the theory, the practice is as above.

We have also road-inspectors, who can be appealed to, to compel each man to keep his portion of public highway in order. This functionary's chief solicitude is how not to do it, how not to oblige any of his friends and neighbours with whom he naturally wishes to be on good terms, to do any work of this nature, if he can possibly avoid doing so; without being hauled up himself. It should be very much better, if a paid public road inspector, were appointed, a stranger to the community, perfectly independent in sentiment, and willing and anxious to see to the carrying out of the necessary repairs of roads, of his own initiative, without waiting to be appealed to by a complainant.

It is a very rare instance, when a habitant here does complain about a road. If he is only let alone himself, he is perfectly willing and ready to let everybody else alone also.

Something is most urgently required to be done here, for the improvement of roads, either other laws are required or more effective means devised of carrying the existing ones out.

Before the Quebec Legislature, on the 25th of last month, the committee proceeded to the consideration of the vote of $4000 for improvements to rural roads. The Hon. M. Beaubien dwelt upon the necessity of these improvements, especially in the interest of the dairy industry. The Government policy was to assist the municipalities by lending them rollers and other machinery. Messrs Girard, Cook and Dechêne admitted the room for improvement in our country roads.

M. Stephens expressed similar views, in fact he did not think $4000 was enough: He said he was willing to vote more. He would tell the Government how to get more money. Instead of giving money to the railways, devote it to the building of good macadamized roads in every county and the money would be better spent. Mr. Stephens knew no country where the roads were so bad, as they were in the Province of Quebec.

C. F. BOUTHILLIER.

HORSE SHOEING.

Traditional Practices—Erroneous Ideas—Improving upon nature—Abolish the drawing knife.

Good horsemen admit the truth of the aphorism, "No foot, no horse", and yet in no part of the animal's economy has he suffered so many wrongs, or, as a natural consequence, endured so much un-called for suffering, as in his feet; and so shoeing, a very large proportion of these evils, may be blamed. That the system of horseshoeing in *present use, even in the most skillful* hands, is pregnant with mischief to the foot, no one who is conversant with the facts can deny. Every time a horse is shod, every nail driven, means so much injury to the foot. The better the job, the less that injury is: but there is no such thing as absolute immunity from an evil which must always exist in inverse ratio to the skill displayed in the execution of the work.

Without wishing to do injustice to *the rural knights of the anvil*, it is nevertheless a lamentable truth that the votaries of the buttress and the drawing knife are, all the world over,

so wedded to a number of traditionary practices, so heinous, so irrational, so prejudicial to the interests alike of the horse and his owner, that one might well be excused for wondering whether their mission was not to mar, instead of, to protect the marvelously perfect handiwork of the Creator. Ignorant, in most cases, alike of the anatomy, physiology, and economic relations of the parts, they mutilate, they cut and carve as whim, prejudice, or time-honored custom dictates. Disaster, surely follows. Let us glance at some of these traditional practices.

Foremost among them is the insane custom of trimming the frog, and thinning out the sole, till it visibly yields to the pressure of the operators thumbs. The frog is nature's cushion and hoof expander, placed there by an all-wise hand; by its elasticity it wards off concussion from the less elastic portions of the structure, and assists in maintaining the natural expansion of its horny ambit. That is *to say, it does so in its natural state,* but the drawing knife's touch is fatal to it. Once cut and carved, and deprived of pressure, those very acts cause it to shrink, dry and harden, and at once lose those very attributes, which constitute its usefulness to the foot. Robbed of its elasticity and resilience, it is incapable of discharging its allotted functions -both as a cushion, and as an expander, it is a dead failure: indeed it is worse, as in its altered character it is now a menace instead of a protection, a bane rather than a boon to the foot that wears it.

The destruction of this important factor having been thus provided for, the operator probably next pays his attention to the sole, which, by all traditions of the craft, must be pared down, until only a thin film of soft, partially formed horn is left to protect the living structures within, against injury from the substances with which the foot necessarily comes in contact. The sole itself, or what is left of it, consists now of soft, moist, half formed horn, which dries and shrinks on exposure to the air, and thereby entails a further and still more serious injury on the foot.

There seems to be a fascination about this work of destruction, and the incompetent workman, next addresses himself to the self imposed task of improving upon nature, by removing the bars, and what he calls "opening" the heels, a process which, in plain language, means opening a road, to close over again.

On this poor maimed foot a shoe, as likely as not, a size too small, is tacked, and the rasp is most likely brought into operation, to reduce the foot to fit the shoe: for although it is apparently of little moment, whether the shoe fits the foot, it is indispensably necessary that the foot should, somehow or other, be got to fit the shoe, and horseshoeing, like other arts, must needs sacrifice on the altar of appearances. It is sad that art and nature should be so often at variance, and that what satisfies the one, should outrage the demands of the other.

The foot is now shod and protected from undue wear, to be sure, but at what a sacrifice!

Robbed of its cushion, its natural expander; its lateral braces removed; its sole mangled and its natural repair arrested; the hair-like fibres which make up the horny wall, crushed, deflected, and their nutritive function impeded by an unnecessary number of nails; robbed by the rasp of its cortical layer of natural varnish, which retains the moisture secreted by the economy, the strong walls become desiccated and weakened, and the foot is in a sorry plight indeed. To some this picture may seem over-drawn, but it is nevertheless a matter of daily occurrence.

There is one instrument which should be omitted from the shoeing outfit of every farrier, and that is the drawing knife. If our blacksmiths would use their knives less and their heads more, in the execution of their important, and not too easy, duties, our horses would be the better for it, and consequently the owners.

There is no great mystery surrounding the subject, and the application of common sense, in lieu of the barbarous routine, which has been so long handed down from generation to generation, until it has actually become a portion of the creed of the blacksmith, would go a long way towards obviating many, if not most, of the cruel wrongs to which our horses' feet are day by day needlessly subjected.

Nearly all writers on the subject have looked upon the foot as a very wonderful and complex piece of mechanism, and seemingly have forgotten, if they ever knew, that however complex it may be within, it is enclosed in a simple horny box, that all the effects of shoeing should be directed to preserve that box in a natural condition, and that its position in relation to the limb, should not be altered by the shape or form of the shoe.

Many have maintained, and some still maintain, that the horny foot is an elastic, expanding and contracting organ, and its elasticity should be kept intact by paring the sole, peculiar nailing on of the shoe, and by keeping the foot as moist as possible, by "stuffing" etc., etc. Others, again, suppose that a mechanical advantage can be given to its tendons and ligaments by the form of the shoe; in fact, by improving upon nature.

All these are errors and have originated with men who have built their conclusions on hypothesis.

It is not my intention here to enter minutely into the question of horseshoeing, but merely to point out how slowly we have moved in respect to it, and to state that the first essential for its welfare, is to abolish the drawing knife.

W. R. GILBERT.

The Grazier and Breeder.

TO CUT UP A STEER.

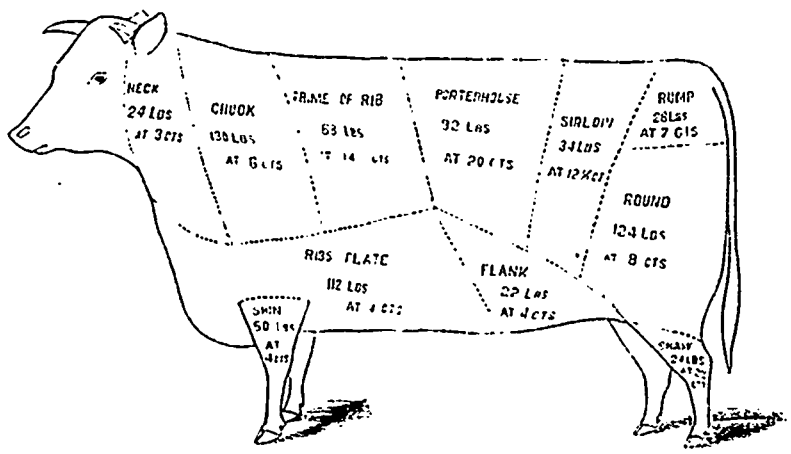
DIAGRAM THAT SHOWS AN ANIMAL'S VALUE AT A GLANCE

A practical lesson on Breeding and Feeding beef for the Market Compare the parts of this finished Steer with your own favorite.

The illustration represents the carcass of a well fattened grade steer as cut up by the Chicago butchers, giving retail price per pound of the different cuts, says The Breeders' Gazette. It is based upon figures secured from Swift & Co. The illustration is primarily intended to show how a beef animal is cut up and the names of the different meat cuts. It is suggestive also in that it shows the relative weights of the various parts, and indicates some of the reasons why one lot of steers brings a higher price than another lot of the same age and weight. In addition to the above, the diagram is of interest as indicating the difference in value of the various cuts and the importance of this factor in determining the value of fat steers.

To the breeder this illustration is of the greatest significance. From the farmer's standpoint, a fat steer is a manufactured article, and, like all other manufacturers, he aims to produce the article most in demand. How shall he accomplish this? What shall be the real aim of the modern breeder of beef cattle? What particular lines of improvement offer opportunities for the greatest success?

In the first place let us consider this diagram from the standpoint of the feeder. There are at least two methods of making the feeding of beef animals more profitable; first, by better methods of feeding, thus reducing the cost of production, and second, by producing a more valuable article, or in other words feeding better steers. The first method has been carefully investigated, and while we are yet much in the dark as to some problems of feeding, still with our cheap food stuffs, it would seem that we have about reached the limit of economical production. We must, then, select better feeders. What advantage has a good grade Shorthorn or Hereford steer over a native or a scrub? Surely not a great advantage in the gain made from the same quantity of food, for careful experiments seem to show that the native will make



HOW A STEER IS CUT UP IN THE CHICAGO MARKET

about as much gain on a given quantity of feed as the grade. Wherein, then, shall we look for the superior excellence of the grade over the native? Not now considering the factor of early maturity, the main difference lies in the increased value of the finished grade over the native. The well-fatened grade invariably brings a greater price per pound. He brings a greater price per pound because he has a greater proportion of the valuable butchers' cuts, as shown in the diagram.

This diagram represents a good 1200 lb. steer, dressing about 800 lb., and furnishing about 708 lb. of marketable meat. Of this 708 lb., 362 lb., including the neck, chuck, ribs, plate, flank, shin and shank, are sold for $16.48. The remaining 346 lb., including the choice meat cuts the prime of rib, porter house, loin, rump and round—bring in the open market $44.55; in other words, less than half the total weight of marketable meat brings nearly three times as much money. But this difference between the valuable meat cuts and the inferior ones is less marked in this illustration of a good grade steer than would be the case were we to compare the same parts of a native. The carcass of a native would show a greatly increased weight of the less valuable meat parts, and a corresponding decrease in the valuable parts. The teaching is plain. A slight difference in the development of the loin, for example, might cause a considerable decrease in the weight of the valuable porterhouse cut, and consequently in the value of the animal."

AN AMERICAN STOCK-FEEDER'S EXPERIENCE.

The Shakers—a sect of American Quakers -have a community at Union Village, Ohio. This community like all others of the sect, holds all property in common. In former days it occupied a high position in Ohio in all agricultural matters, its Shorthorn herd being one of the best and most widely known in the State. Recently new life has been infused into the community by the advent of Dr. J. R. Slingerland, who came from one of the New-York branches, and is now trustee and general manager of the community. He is one of the go-ahead sort, as is evidenced by the fact that he has for fifteen years been experimenting with Shorthorns, Jerseys, Ayrshires, Devons, and Holsteins, endeavouring to secure "the very best general-purpose all-round cow for milk and butter, and also for beef." The breeds named were all tried. Six years ago the Shorthorns had their turn. In a communication sent to a Dayton (Ohio) farmers' paper Dr. Slingerland says:—"I have now pretty well abandoned all save the Durhams." This much confirms the view of many persons of this side of the Atlantic that the Shorthorned is a grand general-purpose all-round beast. But Dr. Slingerland has gone somewhat further, and here his experience is worth nothing by the British farmer, who has now to look after the pence. He says, in the letter mentioned above, that, hearing of Mr. McLain Smith's Red Polled herd at Riverview Farm, Dayton, he went there, saw the stock, the milk and cream record book, and the management, which he found to be carried out on "thorough economical and scientific principles, where everything is done for a practical purpose and profit." A second visit ended in his buying the bull Canum (imported from the Whitlingham herd) and three cows, with the view of building up a herd. The bull he also used on the best Shorthorns. And now for comparative results.

In January and February, 1895, Dr. Slingerland says "I bought some thirty-five of the very best two-year-old Durham steers to grow on pasture and feed out the next fall for fat cattle as a matter of profit. These thirty-five Durham steers averaged in weight 940 lbs." At the same time he says: "I had, by the cross from Osman, just eighteen Red Polled (first-cross) steers. Just the

same age as the Durhams these Red Polled only averaged in weight at the same time 710 lb." As the Shorthorns looked the most kindly doers, and the drought was a great drawback on pasture, in the fall they got hay as well as corn fodder. The Red Polled cross he thought were "some stunted." They were "kept in different pastures, and the Durhams being the bigger herd, we gave them the best pasture and the most water, the drought being severe." But, says the Doctor, "the Red Polls, to my utter astonishment, showed strongly and well their breeding, and they came to time. They had no hay to eat; only corn fodder after the corn was husked." Each of the Shorthorn steers "averaged to feed about 85 bushels of corn (maize) at 25 cents per bushel"; each of the Red Polled cross-bred steers "had that year just 50 bushels of corn." When in January, 1896, the fifty three head were sold to a Mr. Curry, of Baltimore, the thirty-five Shorthorns averaged in weight 1,540 lb. each; the eighteen Red Polled cross averaged in weight 1,192 lb. each. The Shorthorns sold for 4 cents a pound live weight; the Red Polled cross for 4½ cents. A lot of Holstein steers, sold in the bunch, were about as far behind the Shorthorns as these were behind the Red Polled cross. Dr Slingerland thus states his conclusions:—"The Red Polls actually gained 702 lb. to the head, where the Durhams gained only 600 to the head in the same year, and only a trifle more than half the corn fed to the Red Polls that was fed to the Durhams." He notes that when the steers reached Baltimore they were at once loaded on a steamer for the English market. As a consequence of this experience, Dr. Slingerland says he has bought a second pure blood Red Polled bull, and he asserts that his statement is "one of plain, practical facts."

The money difference in the cost of the maize consumed is 8¾ dols. (£1 14s. 5½d.) The money value of the gain per head of the Shorthorns on the year's feeding (calculated on the sale price) was 24 dols. (£5); of the Red Polled cross 29 dols. 83 cents (£6 4s 1½) It will thus be seen that the cross-breds averaged £2 18s. 10d. per head over the Shorthorns, in hard cash, as the result of the year's feeding, and this taking no account of the fact that the latter had hay and the cross-breds had none. The economy resulting from the use of the Black Polled on Shorthorn has been known many years; this demonstration of the results of a similar use of Red Polled should be of value. The experiment will certainly be noted by cattle breeders and feeders in the Argentine as well as in the United States and Canada, where there is a preference for red stock. In these days of small profits such facts ought not to be ignored on this side the Atlantic, where the land is poor as in Norfolk, and on the chalk lands, and where there is a difficulty in keeping Shorthorns.

HENRY F. EUREN.

THE SUSSEX BREED.

A BEEF BREED THAT HAS BEEN TRIED AT THE O.A.C. FOR FIVE YEARS.

The Sussex, breed of cattle (1) is not as yet commonly known in Canada or the United States. Their first introduction into America was in 1884, by Mr. Overton Lee of Tennessee. They have, however, for some five years been represented at the Ontario Agricultural College by a male and a few breeding cows. While some obscurity hangs over their origin, it is supposed that they are closely associated in ancestry with the Devon. The West Highland and Hereford breeds are also claimed to be allied to them in origin. The breed as it now exists, bears a close resemblance to the Devon in color and conformation, the difference being a greater strength, size, and coarseness, especially in the limbs and horns. (2) The size of the horns of the illustrated specimen is exaggerated by the position of the animal when being photographed says the London Farmer'sAdvocate. Their breeding is largely confined at present to the English counties of Sussex, Kent, Hants and Surrey. It is only during recent years that much attention has been given to their improvement, although the Sussex herd book was established in England in 1859. As dairy cattle they have little or no value, but for beef production they hold a fairly creditable standing, as bullocks of the breed have scored well at the Smithfield shows for a number of years.

The bull represented is Sarucen 2nd (1445), bred by and the property of Mr. P. F. R. Saillard, Buchan Hill, Sussex, Eng. He won first prize and championship at the Tunbridge Wells and S. Eastern counties Show in 1896. (1)

(1) A great favourite with English butchers, as they always "die well."—Ed.

(2) Immensely improved, particularly behind the shoulder, during the last 40 years. Famous for plough.—Ed.

(1) The cut is so infamously executed that it is not reproduced.—Ed.

SEASONABLE NOTES FROM MICHIGAN.

FEEDING AND WATERING STOCK.

Waste—Chaff cutter—Corn-stalks—Bean-straw for sheep—Worm-wate.

"Ed. Hoard's Dairyman":—With the rotation of the seasons, we find continual change of conditions under which we must work, and if it does not require brains to run a farm and feed stock successfully, I do not know of any business that does. I tell you the time is past, never to return, when a man can become a successful farmer without studying his business thoroughly. He must be thoroughly posted upon the best methods to pursue, he must feed carefully and intelligently, he must examine results and compare them under different phases. He must study to produce at the least cost the greatest yield possible, and I know of no greater aid to this than such a paper as yours. To the dairyman, it gives the results of other's experiments and study which may be relied upon, and many times puts us in possession of facts regarding our business, which if left to ourselves would have cost considerable by way of time and experiment. I believe the majority of your readers realize this, too; at least I hope they do.

Now, in regard to the winter feed for our stock, what an immense waste is going on from fall to spring on many farms. Ride through the country in any direction and you will see stock eating around hay stacks, wasting more than they eat; you will see hogs fed in mud and filth, treading under foot a good share of their ration; you will see corn stalks thrown out whole for cattle to pick over and soil, straw stacks undermined and toppling over by reason of constant treading and working at it. You will see mangers stuffed with high-priced hay while the farmer imagines he is economizing because he does not feed any grain. There are hundreds of head of stock consuming far more food than they need to consume were they provided with comfortable stables and not compelled to drink ice-water at some distant creek or spring. I sometimes think it is no wonder farmers are poor, for they are the worst business managers on earth. The amount of head work and attention to details which the average merchant puts into his business, the careful watch for little leaks, would put the farmer out of debt in a few years, with money in the bank besides.

In times of prosperity, a little (?) extravagance, like allowing a flock of sheep to eat up a hay stack, might not be noticed, but now-a-days it ought to be looked after, especially when hay is about the only thing among farm products which brings a fair price.

Now, it may not be credited by everybody, but it is a fact, that we may keep our entire stock upon the farm through the winter in good condition without a spear of hay. Grain at present prices is far cheaper to feed than hay, and with corn stalks and straw for roughage will bring them through in most excellent condition.

One of the very best investments I ever made was when I bought a feed cutter. I got a big one, and found a second hand sweep horse power (which I bought of a man who had replaced it with an engine to run his threshing machine with) for $15. This gave me a good rig, one which has saved hundreds of dollars in feed stuff, I verily believe.

We husk out the corn, then through the winter cut the stalks as we need them, a week or two ahead. This machine has a splitter as well as a cutter, and the stalks are so fine that there is very little waste. From experiment, we know that our stalks, cut in this way, mixed with grain and moistened, will make as much butter, ton for ton, as clover hay. Don't believe it? Try it and see. Of course I don't know what your cows may do, but I know what mine did, and do right along. There are two reasons why we have given up feeding clover hay to our cows. The first one, and principal one, is that we cannot get it; the other is that considering that clover hay has a market value and the stalks have not, we cannot afford to do so even if we had the hay.

Now let me tell you exactly how we feed these cut stalks. We have a place fixed in one corner of our granary in the cow barn, where the floor and siding are made of matched stuff, where we spread enough of the cut stalks to make a feeding, in layers with the ground feed, consisting of gluten meal and bran. This is moistened and shoveled over until mixed thoroughly, then packed solidly, covered closely and left for twelve to twenty-four hours. We generally keep two feeds ahead. It is warm when fed and the cows eat it greedily. The cut stalks, without the moistening and mixing, is fed to calves (after the first few weeks) colts and sometimes to the horses. The latter, as a rule, have bright oat straw and a grain ration composed of bran, ground oats and corn with the cob. A panful of this, three times a day, keeps them in good order until spring, when we feed hay as better adapted to hard labor.

My methods may not suit everybody, probably not many. We do not expect it, but I believe if more attention were paid to the feeding, much might be saved the farmer by way of remarkable products, without in the least injuring his stock. My young cattle are fed on barley straw and two quarts a day of grain, consisting of bran, ground corn and cob, with sometimes a small proportion of oats or barley. As you see, bran figures largely in all my feed rations. I consider it indispensable, both from the tandpoint of economy and also the health of the stock. All grain is fed ground, which I consider another important item. The same amount grainnd does much more good than when fed whole. Feed your horse on whole oats, then on ground oats and see if you do not agree with me. Many horses do not properly masticate them when whole and they pass off entirely undigested, a fact worth noticing even if they are cheap. Sheep are very fond of bean straw and it is an excellent way of utilizing the refuse.

WARMING THE WATER.

Last winter I put in a tank heater to take the chill from the water which my stock drink. The source of supply is a spring in the yard, which is piped into a large trough 12 feet or more in length. The device works finely and at a cost of a few cents a day, depending upon the weather. There is a little ice in the extreme ends of the trough in very severe weather and I would not advise having so long a tank. We have a tight cover hinged to one side and this is kept closed when the cattle are not drinking. It will repay the expense of putting it in, in a single winter, and it is a comfort to stand and watch them drink without shivering.

BRAN AND GLUTEN VS. ALL BRAN.

One swallow does not make a spring, Mr. Editor, and neither does one test establish a fact beyond question, but I will give you the result of a single test made on one of our cows recently to see what effect an all bran ration would have upon the milk. She was giving 25 pounds a day of 5 per cent milk, with a ration of two quarts bran and one of gluten twice a day. (This was while they were still on pasture in October.) At the end of one week, with all bran and no gluten, she gave 27 pounds of milk in a day which tested 4 per cent. Or, by the Babcock, 1.46 pounds butter on the gluten and 1.26 on bran alone.

AGRICULTURE IN THE SCHOOLS.

I see in the last "Dairyman" that Mr. Monrad is in favor of teaching agriculture in our public schools. According to my way of thinking this is far the best way of giving this instruction. Comparatively few of our farmer boys ever see the agricultural colleges and all the knowledge on their life work they get is from their fathers or the men they work for. It would be a wise thing in my estimation to have the boys taught the science of soil fertility and production of crops in the only school many of them ever attend, the home district. Would it not beget a better race of farmers if such knowledge of agriculture as it is possible to learn from text books were to be given them there? They might be able to put a flea in the old man's ear when they go to work on the farm, instead of taking his say so for everything. Let's have it by all means.

W. C. ROCKWOOD.

Genesee Co., Mich.

Notes by the Ways.

TOP-DRESSING.—We fear the English farmer is determined to persist in his practice of using manure on grass-land as a top-dressing. The Scotch farmer has, comparatively speaking no permanent grass to deal with, except what are called in his country "Parks, (1) i. e., small enclosures in the neighbourhood of villages and towns, the pastures surrounding the large houses of the gentry, and the sheep-runs of the hilly districts and the Highlands. The regular farms are cultivated all over in rotation of five or six years, as thus :

Roots ;
Grain ;
Seeds for two, or at most three years ;
Grain.

Very little hay is made, the grass being fed off by sheep and cattle. In such a system, all the dung is naturally *applied to the root-crop.*

MANURE ON SECOND YEAR'S SEEDS.—Please say if I am doing right or wasting the manure by spreading it on second year's seeds at this time of the year ? It is good stable manure, and has to go from here by rail to the farm. The land is sandy, of a dark colour ?—H. E. T. (No, you are doing right, unless the question arises if you have any other land to which the manure might be better applied. It will not waste).

The above extract is from the "Agricultural Gazette"; the leading farmer's paper of England.

DUTCH VS ENGLISH PRICES FOR DAIRY PRODUCTS.—A rather well written article, in the "Nineteenth Century" for November, by MM. Smith and Tupplin, advises the English farmer to imitate the practice of the farmer of Holland rather than to follow his own. The amusing part of the article consists in this, that whereas the milk is sold to the Dutch factories for from 6¼ cents to 8 cents a gallon, English milk averages 12 cents a gallon, wholesale, for town consumption ; English butter averages 24 cents a pound, Friesland butter, 17½ cents ; the top price of the best Dutch cheese, this year, was 44s. a cwt ; the top price of the best Cheddar and Cheshire was 70s., all but 60 per cent more than the price of Dutch cheese ! It would hardly answer the Englishman's purpose to change his processes for those of the Hollander : he would have everything to lose and nothing to gain by it.

LECTURERS.—The lecturers on agriculture employed by our growing bodies have not such a difficult part to play as their brothers in England. The English farmer *does not care for teaching ; he* believes in practice and in practice alone. The lecturers sent round the country by the newly established County Councils meet with but an ungracious reception from agriculturists in general, as the "practical man" seems, from all accounts, to be setting up his back against all improvements, and to be perfectly determined not to try to understand even the elementary facts of chemistry, botany, physiology, etc., as taught by men whom he will persist in picturing to himself as pure theorists. The misfortune seems to be, as it was here some few years ago, that the first lecturers sent out were not practical men, not farmers, in fact, and to get the ear of a farmer, in almost any country, the teacher must first show him that he himself is capable of doing what he is trying to persuade his audience to do themselves.

(1) Called in Southern England "accommodation land."—Ed.

PRICE OF WHEAT IN ENGLAND.—The finest samples of wheat in London, and in some of the South-Midland counties of England, are fetching as high as 41s. a quarter, equal to $1.20 the "struck" bushel. Sixty-six pounds is not an uncommon weight for a bushel of the best Talavera or Chidham wheat of this year's harvest. With this price for wheat, and 70s. a cwt. for the finest Cheddar and Cheshire cheese, the spirits of the English farmer ought to revive.

COMPTON MODEL-FARM

A first rate creamery has been established at Compton, at which the whole art of making butter may be acquired. There are always a certain number of students there, and we trust their number will rapidly increase. Our old friend, Mr. John LeMoyne, is at the head of this establishment, and as he has had plenty of experience in agriculture, in Scotland as well as in Canada, he will, we doubt not soon raise the "Compton Model-Farm" to a high position among its congeners.

BUTTER-COLOUR.—We strongly recommend all creamery-manager not to make their export-butter too high-coloured. The finest butter for the West-end of London trade—the highest priced English market—is very pale in colour, hardly dark enough to be called primrose. The fastidious Englishman always associates deep colour with strong flavour.

SCOTCH CHEESE.—At the recent Dairy-show in London, England, the competition between the English and Scotch makers of Cheddar cheese was very great indeed ; however, after a long consultation between the judges, the first prize was awarded to a Scotch exhibitor, Sir Mark Stewart, M. P. The show of butter seems to have been *very strikingly arranged* ; Mr. *W. Cald*well, a correspondent of "Hoard's Dairyman", writes of it as follows :

The most unique exhibit of the whole show to me, was the display of butter. One of the seedsmen had grown grass seed in boxes and had taken some and arranged it into what would be termed a meadow. The grass was closely clipped and matted together and formed the several long tables. Imbedded in this velvet mass, and arranged artistically, were porcelain slabs, and upon these slabs were the pats of butter, conspicuously numbered. In one portion of the room was some remarkable work in decorating with butter. The designs represented almost everything, especially flowers and animals, some tinted, others with the golden yellow natural color. The whole made a handsome effect, standing, as one did on entering the room, a little above the level of the floor and looking down upon the exhibit, especially if during the evening, when the electric lights were on. The combination of the green grass, the white slabs and the yellow butter, with these artistic decorated exhibits was especially pleasing.

GOOD COMMON SENSE.—Well, the following sentence, from "Heard", is indeed refreshing after all the nonsense we have heard and read during the last few years :

"We are pretty well sure that many a good cow is denied all chance to demonstrate her capacity by slavish adherence to the law of averages on the part of her feeder." Which is as much as to say that the practical knowledge and experience of the feeder is the ultimate guide to the proper ration for the cow.

RATS.—There are plenty of rats on this continent. In the malt-floors at the old Morton Brewery, at Kingston, in 1866, '67 then under our management as agent for the Bank of Upper Canada, we have seen as many as forty at a time, amusing themselves on the "pieces ;" but that number fades into utter insignificance compared with the myriads of rodents, of really monstrous size, that are to be found in the great grain-storages of London, alongside of the Thames. And they fight ! Good heavens, how they fight !

Do you want to rid your barn, or your cellar of these vermin ? Try the following plan, endorsed by the "Cornhill." the leading London Magazine :

"TRAPPING RATS.—The following novel plan of trapping rats was described by a writer in "Cornhill" (June, 1890) :—"The cunning of rats makes attempts to catch them in traps almost futile, their keen scent recognizing the places where a hand has been, and warning them to avoid so dangerous a locality. The use of gloves smeared with aniseed may lull the suspicions of the animal, but traps will never be the means of greatly dimishing its numbers where it has fairly established itself. The best course to take where extermination of a colony of rats becomes a necessity is to make them help to destroy one another in the following manner :—A number of tubs, proportionate to the number of rats in the place from which it is desired to rid them, should be placed about, the middle of each occupied by a brick standing on end. The bottom of these tubs should be covered with water to such a depth that about an inch of brick projects above it. The top of the tub should be covered with stout brown paper, upon which a dainty meal of bacon rind and other scraps dear to the rat-palate figures, a slopping board giving the rodents facilities for partaking of it. The feast should be renewed for several nights, so that all the rats in the neighborhood may get to know of the good food which is placed within such easy reach. When it is judged that this policy has been pursued long enough, the centre of the brown paper should be cut in such a manner that any rat venturing on it will be precipitated into the cold water below. It might be thought that, the results of this would be the capture of a rat or at the most two, for each tub prepared, but no such meagre result for the trouble that has been taken need be feared. The rat, finding his trust abused and himself struggling in the water at the bottom of the tub, soon recovers sufficiently from the shock to discover that there is an island of refuge, on to which he clambers, and squeals his loudest for help. Now the squeal of a rat in trouble attracts every one of his kind within hearing, and very few moments will elapse before the victim of misplaced confidence is joined by one of his friends. The new comer is as quick to discover the chance of escape from a watery grave as was the original victim, but when he attempts to avail himself of its presence, it becomes apparent that there is not room for more than one upon it. The first comer resists with tooth and nail the efforts of his companion in troubles, to dispossess him of his coign of vantage and the squeals which form an accompaniment to the fight for a footing upon the brick, attract more rats to the scene of the tragedy. The conflict waxes more and more furious as rat after rat topples into the water, and by morning, bedraggled corpses in plenty *will gladden the eyes of the man whose* losses at the teeth of the rats have induced him to adopt this means of thinning their numbers. Some years ago the plan described above was tried in a city warehouse, with the result that 3000 rats were destroyed in a single night."

We used, when a boy, to be rather fond of rats ; we have caught many a one in our naked hands, but we were completely sickened by finding a half-grown rat, that had been caught in a "gin," dragged into a hole by his friends and relations and greedily devoured.

MICROBES.—Tobacco of the finest quality, we hear, is for sale in Greenary ; in which country fine flavoured tobacco is sure enough ; made by two learned chemists, to whom arrived the happy thought of experimenting on the common growth of the country and the germs extracted in some way or other from genuine Habana leaf ! A most interesting account of the discoveries of Prof. Conn, a well known bacteriologist, is given in an exchange, which shall appear in the next number of the Journal.

RAPE.—Several correspondents of the "Farmers's Advocate" complain of the evil effects of rape on their sheep and cattle, and the Editor of that paper, very properly, rebukes the complainants: "The Advocate" has seldom recommended rape without attaching a number of necessary cautions which must be observed to avoid loss."

As the article is headed : "Inflammation from Eating Frozen and Wet Rape;" we may conclude that the correspondent was not very careful in his use of language ; it should have "after" not "from" Starved sheep turned into a *piece of rape, whether wet or frozen* does not matter, and allowed to gorge themselves, would very likely die in consequence. But, sheep in good, fair condition, introduced into a fold of rape for an horn or so in the afternoon, on a dry day, and that course pursued for three or four consecutive days, may be safely trusted to take care of themselves for the future. We have had our own small flock in rape from the 1st August up to December 7th ; they were never out of it after the first few days of, so to speak, training, and not one of the fifty-three was either sick or sorry.

Another correspondent says that his cows and steers were seriously affected by frozen rape. We never before heard of pasturing rape with horned stock, neither should we like to try it : as bad as wet clover for "blowing," and likely to affect the taste of the milk, as there are always more or less dead leaves in a piece of rape. What would a man expect who turned his cows into a field of cabbages or swedes and left them there all night? We should expect a few of them to be dead in the morning, and so we should if they were left in a rape-field.

BACON.—There are two sorts of bacon required on the English market : the long keeping and the mild-cured. The former is treated with a large dose of

salt and salpetre, the latter has a mixture of salt, salpetre, sugar, one of the chemical antiseptics such as salicylic acid being previously pumped into the veins.

PRICES OF ENGLISH CHEESE.—At Preston cheese-fair, near Liverpool, Eng., very high prices were made for the best samples of cheese; common, 50s. to 55s., medium, 57s. 6d. to 62s. 6s., best, 65s. to 75s. Prizes were given and the first-prize cheese sold for £5; Seventy-five shillings—$18.00, a pretty high price for 120 lbs of cheese in these days, equal to 12½ cents a pound.

PERMANENT GRASS IN SCOTLAND. In our last number (November) we mentioned that, except sheep-walk, and "parks," there was very little permanent grass in Scotland. We have been looking the matter up, and we find that, in Forfarshire, a model county, there were 253,373 acres of arable land and only 27,251 acres of permanent grass including deer-parks, etc. Forfarshire has to our own knowledge always been noted for having a larger proportion of grass than almost any county in Scotland, and Forfarshire has only "one-ninth!" Kincardine has only "one-twentieth" of permanent grass in its whole farmed area; Aberdeenshire stands 604,734 acres under the plough, and 27,406 in grass. On the West-coast, a damp, dripping country, Lanark and Ayr, dairy-counties, have a larger proportion of grass. The figures are taken from the "Journal of the Highland and Agricultural Society."

BALANCED RATIONS are very useful things if administered with judgment, as regards the individual animals and the market. What said the late Dr Voelcker, the Chemist to the R. A. S. of England? "It is not a chemical analysis alone of any food that can determine its exact value. The complicated structure of plants and of their seeds open up subjects of which we know not much."

MALTING-BARLEY.—"Quality in barley," says Dr Wrightson, of the Agricultural College of Downston, Eng., is inherent in the land, appears to belong to certain fields, farms, and districts, and is not explainable by chemistry." Just so; neither can the chemist explain why an Aberdeen sward will, with straw, make a bullock ripe fat, and the same grown in Kent with identical manure and cultivation will hardly keep a sheep going: The present difference of price between grinding barley and barley fit for the great brewer's firms at Burton on Trent is enormous; and it is not the weight that tells. Here is a list of prices at Mark Lane, Eng, as they stood on November 20th:

Barley per quarter of 8 bushels weight about 440 pounds.

English	Fine malting	31s - 46s.
	Grinding	24s — 30s

Foreign.—400 lbs. the 8 bushels:

Danubian	18s - 19s
Persian	16s — 17

No Scaule or Moravian barley in the market; these barleys sell for at least as much as the best English malting. Canada barley has never stood any chance in the English market, and the reason is (and always was to us) clear. "The quality of malting barley is inherent in the land!

The Farm.

PRACTICAL FARMING.

(by James Dickson)

Lifting the Mortgage — Dehorning Cattle—Manure-shed—Water in stable.

LIFTING THE MORTGAGE.

Father! I believe in keeping the manure pile covered, I believe in drawing it out when the team has little to do, and help is plentiful, when the fields will not be cut up by the drawing, and if we are to manure the field on the other side of the hog, it must be drawn in winter. So we ought to have a manure shed. Say the word, Father, and we will have one. Some Farmers hav'nt even a dropping in their yard. Our cattle leave about a tenth of their manure out of doors, that is, the manure of one acre in ten, and you will admit that after it has been washed in the yard for months, it is not worth scraping up. Some writers say, that the urine is the best half of the manure, we lose certainly more than half of it, that means the loss of the manure of one acre in four. We manure about three acres a year, so, figuring it that way, we lose the manure of one acre and one-tenth each year. That, Father, would raise enough extra to pay interest on the mortgage, and means the difference between success and failure. One thing I am sure of, Farmer Hodge's manure smells stronger than ours, and he takes as much care of his dung and urine as if it were gold dust. Somehow he seems to have more manure from his stock, and what he has seems to do more good on the land. Say the word Father and we will have a manure shed—Yes, I know we can't draw it all in winter. I know there are thousands who have no sheds, that don't farm any better than we do, that have bigger mortgages than we have. But if you will give me a hand once in a while we will have a shed. Yes, I know writers speak of big barns, stone walls cemented floors, tanks and pumps, but to begin with I'll build a shed, a lean to, over the pile at the end of our old fashioned barn, that will answer the purpose just as well as the $100 shed you have been waiting for 10 years to build, and for a quarter of that money: $25. The rent of it about two dollars a year. The comfort of it would be worth more than that. The saving of the manure properly, and the gain in drawing will be clear profit.

I'll put cedar posts into the ground 2½ feet, 6 feet apart, pack them well with small stones to defend from frost, cut the tops off level, spot a straight spruce to fit, and spike it on for a plate, spike a scantling to the barn, and a few pieces of plank endways underneath to support it, spike rafters well to the plate and to the barn posts and beam, put a girth at each end proper height for a door to back in a vehicle, board round with ten inch lumber, clapboard fashion, lapping two inches, boards for the roof also. I'll make door hinges out of that old cart tire, and mix the horse manure in the pile to keep it warm, and see that it does not get too hot. Next summer I'll take out a foot or so of the rich earth, and put in a few loads of clay. Soak it well for a few days, work it over, spread it, bed cobble stones in it, and ram them down so that the clay will fill the insterstices. Next summer when the stable floor is dry I'll caulk it, and when it is wet it will hold the urine.

If the spring is not high enough to run the water into the stable, it only requires to be lifted a few feet with a pump in the stable. It is more economical to pump the water, than to loosen and tie the cattle, and my ears are sore yet since watering the horses one morning last winter. The comfort will more than pay for putting down the pipes, and the saving of the manure will "lift the Mortgage."

DEHORNING CATTLE.

Farmers are constantly in danger of being hurt by the horns of their animals. A sudden draw back, a shake of the head, a start by a nervous animal, without constant care might cause a serious wound. And when an animal, though he has never previously shown signs of rebellion, lowers his head, paws the ground, and you clamber the fence, you think of dehorning. Or, as you are thoughtlessly loosening him, with a faint push he throws you to the ground out of his way, and from that moment feeling his ability to cope with you, he makes a another, perhaps badly engineered thrust, and to save yourself from a funeral service, you desperately clutch at the ring in his nose, no amount of argument would prevent you from thinking that if "horns were created for defence," that they ought to be used only for that purpose, and you are willing to admit that hornless bulls are safest. I never had a bull but what at times it was necessary to extract the combative out of him, and long ago learned that no man is in certain safety unless he has the means at hand to defend himself.

In my time I have had three colts ruptured, several cows, several sheep, and dozens tossed high on cattle's horns. One cow had her udder so badly torn, that I cut half of it off. And a young bull that I had lent a neighbour, on being returned, was headed by a large steer, and a long horned cow thrust a horn into the bulls liver, dropping him in his tracks.

I had seen hundreds of Angus and Galloway bulls in market, that were as quiet together as so many sheep. I had seen oxen from Spain 200 in a drove, with horns three to four feet length, (one mounted pair measuring eight feet between tips) and the plump, contented appearance of the bulls, contrasted so forcibly with the bony, restless oxen, with the bayonet like horns, that I determined to try dehorning, Twice I undertook to saw them off, but desisted, once from the moans of the animal, and on the other occasion, on account of the desperate struggles of the animal, proving to me that was a cruel way of proceeding. But after having obtained information on the mode of dishorning in certain districts on the Western ranches, and finding that it gave complete satisfaction to the ranchers, and also to the drovers and butchers, on account of the docility of the animals, and there being no bruised meat, that on the first opportunity I employed a party armed with an imported dehorning shears.

You have had a toothache, wild day and night with pain, and after some hesitation you finally drop into a dentists chair, and—ough! the tooth is out, and in a few minutes the pain is gone. That is exactly how dehorning seemed to affect my cattle. They were huddled into a corner. One man placed the shears properly on the horn, another holding the handles, and—Now! A pressure on the handles, sometimes an exclamation from the animal, a horn dropped, and it was only the work of a few minutes to finish the herd. In a short time they were fed. Not one of them refused to feed as usual. They were apparently free from pain. The combative propensities were completely extinguished. With the result that year old, and two year old, fed and lay together almost like so many sheep. A stump of one ammimal festered for a few days, but did not appear to affect it in any way. There is an admitted grade of superiority among them, but they do not run from one another as if afraid of being seriously hurt. Previously, there were always a few lean, scraggy, cattle, (evidently badly served. Since dehorning they all seem to get their full share. My arrangements are such that having seventy feet of feed rack under the barn floor, for loose and young cattle to feed from, and sometimes having 20 of these, it will be seen that in such case, dehorning is a dire necessity. And my whole experience is that "It is cruelty to leave the horns on an animal."

CULTIVATION OF CARROTS.

Manuring — Previous crops — Sowing Hoeing &c.—Storing.

If you want to grow a good crop of carrots, your land should be manured the year before. You can follow a crop of mangels, potatoes, or corn, in fact, any green crop where the land has been well manured. Or, if you want to follow a rotation of crops and grow them on stubble and, give it a heavy coat of green dung in the spring, plough it in deep, sow any kind of grain on it you want and as soon as the crop is off give it a shallow ploughing cross-ways. In about two weeks give a cultivating and harrowing; then, in the fall, give a good deep ploughing. In spring, after the land is dry enough to work, spread 8 or 9 barrels of wood ashes to the acre, and plough them in; then sow 3 or 4 sacks of common salt to the acre and give a good harrowing: that will help the crop wonderfully. Draw your drills about 24 inches wide for the small topped varieties and 26 inches for the large topped kinds. (1) If the land is dry, pass the roller over the drills, but if a little damp, after letting it dry for half a day, harrow with a saddle harrow well rounded up to keep the drill in shape: it makes the land mellow to run the seed sower along. Sow about the beginning of May if you can, as the seed takes a long time to germinate. It is a good thing to try your seed in a box or flower pot, before the time of sowing, to make sure of its quality. I sow about 1½ to 2 lbs of seed to the acre. When the plants get out their rough leaves and you can see the rows distinctly, pass the cultivator taking care not to go too near the rows. In a few days I pass the hoe close to the rows on each side, then weed and thin them a little; don't let them grow up spindly and slender, for they take a long time afterwards to get bushy and strong. I pass the cultivator about once a week to keep the soil mellow and keep down the weeds. When the plants get about 3 or 4 inches high, I hoe and weed again and thin, leaving them 3 or 4 inches apart

(1) 24 inches are wide enough interval for the horse-hoe, which is all that need be attended to.—Ed.

for some kinds, and 6 inches for the large varieties. When the tops get wide and bushy and interfere with the horse, (1) I stop the cultivator. A deep loamy soil is best for the long varieties, but the short stump rooted kinds do very well when the land is a little shallow. If the land is fresh manured, it is apt to make them grow forked and rooty. I have grown some very large carrots: last year, I had some white Belgians that weighed 7 lbs and one that weighed 9 lbs, and some half long white carrots that measured 18 inches in circumference.

I took 1 first and 3 second prizes for carrots at Quebec and 2 seconds at Ottawa, there being only two kinds shown there; we had no show in our county last year. I take them up about the middle of October, for they keep growing till then, I pull them, put them in heaps, and then cut off the tops. It is best to leave them out in the day, covering them at night with the tops for fear of frost. They are not nearly so brittle, and do not break so much in drawing them to the cellar. The tops make grand feed for horses or cattle, and they are very fond of them (2) I feed the roots mostly to the horses both raw and boiled. (3)

(Signed) WM. GREER,
Grand Frenière, Quebec.
Sept. 4, 1895.

NOTE.—Parsnips are selling in Montreal for 15 cents a dozen! Now 30,000 parsnips can be grown on an acre of land, equal to 2700 x 15—325 dollars an acre! Pretty fair profit somewhere.
Ed.

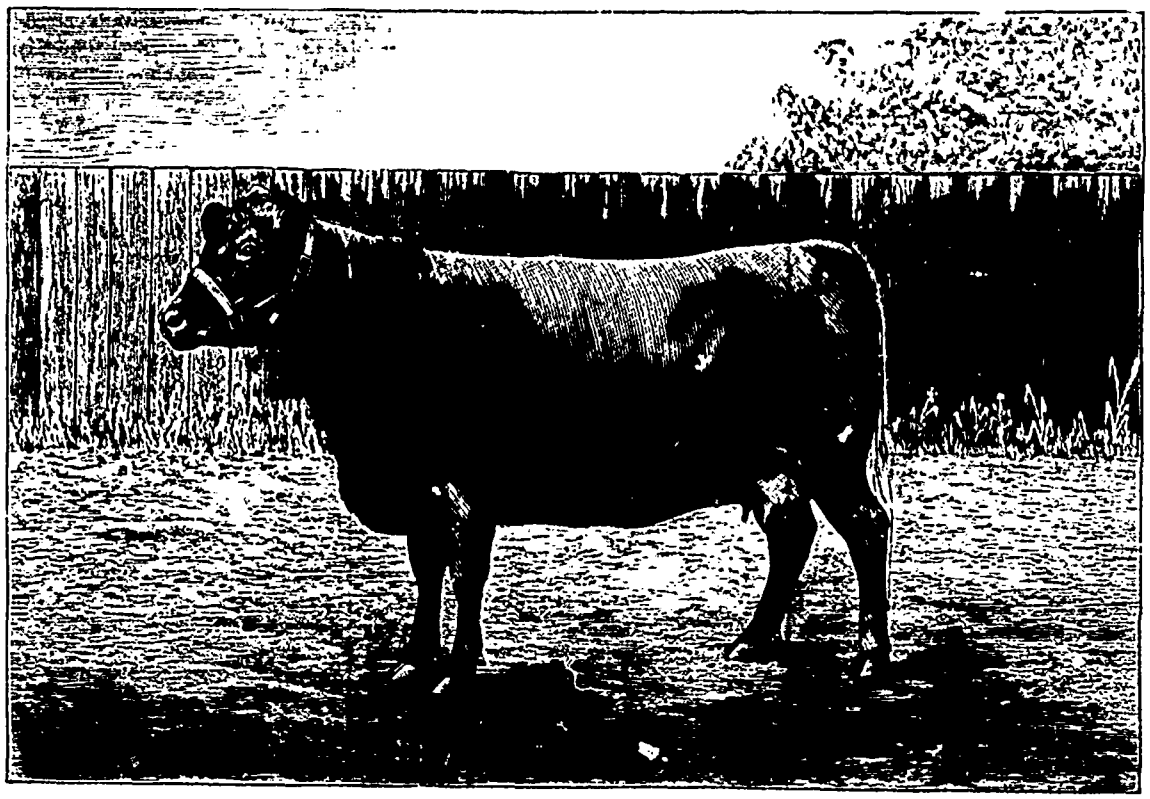
ALFALFA. — Will alfalfa (lucerne) sown with a nursed-crop of grain on poor land and not cut, pastured or plowed under improve the fertility of the soil, and how rapidly? G. O. C. "Troy, N. Y." (The growth of a crop of alfalfa would probably improve the mechanical condition of the soil, as well as its fertility, but not to the extent to justify growing the crop simply for that purpose. Should the inquirer succeed in getting a good stand of alfalfa, he would have a forage crop so valuable that it would hardly be worth while to consider whether it improved the soil or not. It would probably require top-dressing with wood ashes or short barnyard manure, or artificial fertilizer, to develop the crop to its best capacity, and it would certainly pay to spend some money in manure for a crop that, after a year or two, would for several years to come yield annually five tons of hay to the acre. The great value of the clover as a manurial agent is for green manuring by plowing under. We don't think alfalfa would be as valuable for that purpose as common or crimson clover.)

"Country Gentleman."

(1) Rather: "when the horse interferes with the carrots." Ed.

(2) And the tops of a good crop of White Belgian weigh come six tons or so.—Ed.

(3) Why boil them?—Ed.



RED POLLED COW DORENA.
The property of Mr. J. J. Colman. Winner of numerous Prizes.

THE CULTIVATION of MANGELS (1)

Soils for Leguminous crops—Ploughing—Retention of moisture—Nitrogen for mangels - Subsoiling—Dunging drilling up—Kinds—Hoeings.

Owing to the immense yield per acre obtainable, mangels are preferred by the majority of Canadian farmers as a root crop. They will thrive well on a great variety of soils and this admits of their extensive cultivation all over the Dominion. But to ensure a good crop the ground upon which they are sown must be fertile, as the mangels is a heavy feeder, drawing extensively upon the nitrogen, phosphoric acid and potash in the soil, but particularly upon the nitrates. They are therefore benefited by the application of nitrogenous manures. By most farmers a rich clay loam with a deep open subsoil is preferred. They do exceptionally well on clover sod. (2) Plow the land in the early fall, turning the vegetation, which is growing on it, under, and if there is a good growth of clover, it will be found very beneficial. Clover, like all leguminous crops, has the power of assimilating the free nitrogen of the air to a certain extent. They store up nitrogen in the roots, by means of small tubercules, and they retain it so as to be of service to the succeeding crops. During the fall the ground should be cultivated frequently, to eradicate all weeds and to cause any weed-seeds which may be lying in the soil to germinate. In this way the work of weeding will be greatly lessened, the following summer. Just before the heavy frosts set in, the piece should be ploughed in to narrow lands, so as to expose as much surface as possible, and also ensure proper surface drainage in the early spring. In the spring the soil should be stirred, as early as possible, to prevent a crust forming on the surface and the evaporation of too much moisture. It should be the constant aim of the root grower to retain all the moisture possible in the soil. Of course the land should be well drained, either naturally or artificially, but it is essential to the rapid growth of any hoed crop to have sufficient moisture in the soil to dissolve the plant food: all plant food must be in a soluble form, before it can be assimilated by the plants.

Mangels require judicious manuring and there is no better fertilizer for them than farmyard dung, well rotted, and preserved. There are especially prepared commercial fertilizers for mangels which give excellent results, the most common is a mixture of common salt and nitrate of soda. Some farmers use common salt alone and find it gives good results. Farmyard manure should be applied at the rate of from fifteen to twenty five loads per acre. The manure should be put on in the spring, and spread on the surface just as it is drawn out. This should be plowed under, and it is a good practice, when the subsoil is stiff and retentive, to follow the common plow with the subsoil plough. This operation loosens the subsoil without bringing it to the surface, and thus the mangels may penetrate into the under soil and feed therefrom to a certain extent. When the subsoil plow is used the roots do not grow so much out of the ground, but instead grow downwards. (1)

After this plowing the surface should be pulverized thoroughly by the use of the harrow and spring toothed cultivator. The soil should now be in first class condition for making the drills (1) which should be done by throwing together two furrows from opposite directions. About from twenty-six to thirty inches is a convenient width to have the drills apart. (3) This width will give the plants plenty of room to grow and there will be sufficient space for the use of the horse hoe. Any rough lumps which may be on the crowns of these ridges should be raked off so as to have a smooth fine bed in which to deposit the seed.

There are a great many varieties of excellent mangels, among the best known are the improved long Red, Red Globe, Yellow Globe, Golden Tankard, Improved Intermediates, Improved Yellow Intermediate. Of these the Improved long Red and Golden Tankard are considered the best. Globe mangels will thrive better than the longer varieties on land which has a stiff retentive subsoil which has not been stirred. The improved long red and Golden Tankard are both vigourous growers, smooth roots, small tops and excellent keepers.

To ensure perfect germination, mangel seed should be soaked in water twenty four hours before drilling. (4) It should be dried by throwing a small quantity of land plaster or gypsum over it. The seed should be put in with a seed drill, either drawn with a horse or pushed by hand, and should be regulated so as to sow from five to six pounds by acre.

As soon as the plants appear, the horse hoe should be brought into action and when the plants are about three inches high they should be thinned to about from eight to ten inches apart in the rows. Mangels require considerable space and will not grow well if left too thick. It is not desirable to grow very large roots, as analysis of mangels proves that the larger the root the higher the percentage of water, therefore it should be the aim of farmers to grow a good even crop of fair sized mangels, which will give better results than large watery roots. It is a great mistake to award the prizes at our exhibitions to these mammoth roots of whatever kind, they are not of the same quality as a smaller root and cannot be grown so easily. (Pretty nearly true.—Ed.)

The horse hoe should be kept going in the planting field all through the dry weather; the mangels should be run through once every week or ten days, to keep the weeds down and loosen the surface soil. In this way the moisture is preserved and retained just where it is wanted—at the roots of the plants. The loose layer of soil checks evaporation and the plant food in the soil is rendered soluble by the moisture coming from the sub-soil; thus the plants are kept growing steadily through the dry weather. As soon as the leaves of the mangel cover the

(1) This depends a good deal on the hoeing; pull the earth well away from the roots.—Ed.

(2) Why drill up land after it is dunged? Quite an erroneous method.—Ed.

(3) Two feet wide enough.—Ed.

(4) Four or five days before, and then kept in a bag in a warm place. Twelve hours in warm water (90o F.) is long enough.—Ed.

(1) One of the essays in the Exhibition Competition, 1895.—Ed.

(2) Not the proper place in the rotation for them.—Ed.

ground the shallow (1) cultivation may be discontinued. They will not require any further cultivation until harvesting If this method has been faithfully carried out The roots should be pull'd before any frost injures th m, as they are very susceptible of low temperature, and their feeding value is greatly decreased if frozen If they pull hard, (2) by running a subsoil plow along each row this labor will be greatly lessened. They should be placed in a large, airy, frost proof cellar and kept for a few months, as they improve in feeding value for some time after being pulled.

J. W. KNIGHT

THE WHEAT WIRE WORM.

"Eds. Country Gentleman".—I send potato with worms in it that have done great damage to our crops; and should be glad to hear what they are and if there is a remedy. Some crops have been entirely ruined. C. C. "Torresdale, Pa"

The potato contains five slender yellowish wireworms boring in it. They are marked with a pair of dark eye-like spots on the last segment characteristic of the wheat wireworm, "Agriotes mancus." (Say),—a species that experience has shown to be the one most often destructive to other crops in addition to wheat.

These hard-shelled, yellowish wireworms are the larval form of the familiar snapping-bugs or click-beetles, so named from their habit of righting themselves with a sudden snap and accompanying click which sends them flying into the air with the hope of falling right side up, and which, if not successful the first time, is repeated until the desired end is attained. Wireworms are exceedingly difficult to treat satisfactorily, because they spent most of their existence under-ground where we cannot get at them easily, and they do not readily yield to most insecticides. So far, it is pretty generally agreed that the wireworm or larval stage lasts nearly three years, and one would have to wait that length of time for all those now in the soil to leave it, if natural methods are depended upon. According to the experience of Dr. Smith, of the New-Jersey Agricultural Experiment Station, wherever a dressing of kainit or other potash salt is used, wireworms are not troublesome. He recommends a heavy application as early as possible before the crop to be protected is planted: as is well known, the potash salts are of great value for manurial purposes aside from any insecticidal properties they may possess. Other entomologists assert that in their experience kainit is of little or no value against wireworms, even when applied at the rate of from four to nine tons per acre. It would certainly do no harm for any farmer to experiment with this substance for himself and see if it protects from wireworms on his land.

The snapping-bugs or adults of the wireworms can easily be destroyed in large numbers by baits of fresh clover dipped in Paris green water According to the trap-lantern experiments conducted at Cornell University Experiment Station in 1889, the beetles fly from May to August; those of this spe cies fly from early in March until the middle of July. The precise limits of the time within which it would pay to bait these insects could easily be determined by examining the baits and noting the number destroyed. (1)

(1) Cultivation for roots of all kinds should be as deep as possible though not for corn.—Ed.

(2) If the land is sufficiently stirred by the horse-hoe, mangels and Belgian carrots will pull easily enough.—Ed.

SILO COVERING AT THE O. A. C.

A great variety of plans have been tried for preserving the top ensilage in the silo such as swamp grass cut hay, chaff wetted, boards (weighted); others simply tramping down level and leaving without anything additional John Gould's latest plan was to tramp level, sprinkle with water and then sow heavily with oats. In a short time the oats sprout and a dense mat of vegetation grows over the ensilage so that only about an inch or so of the corn will be spoiled. If any of our readers have a better plan than any of the above or this following, we would like to hear from them:

To the Editor "Farmer's Advocate."

SIR, We have been experimenting at the O. A. C. for some time to find an effectual and cheap covering for the silo to prevent the ensilage from molding on top before it is cured, which takes about a month in the silo. The only successful covering we have yet discovered is factory cotton sewed together, making a sheet the size of silo. Before it is required for used spread on barn floor and give two coats of crude petroleum with a paint brush. As soon as the silo is filled and tramped, cover over the top with the prepared sheet. Then lay 2 inch planks, 10 or 12 inches wide, around the sides, fitted neatly at the corners for a square silo; and for a round silo, segments will require to be made to fit neatly around the side of silo. The only ensilage we had spoiled was between the planks and sides of silo. which can be prevented by filling the space between planks and sides of silo with salt.

WM. RENNIE, Farm Supt.
Ontario Agricultural College.

PEANUTS IN ONTARIO.

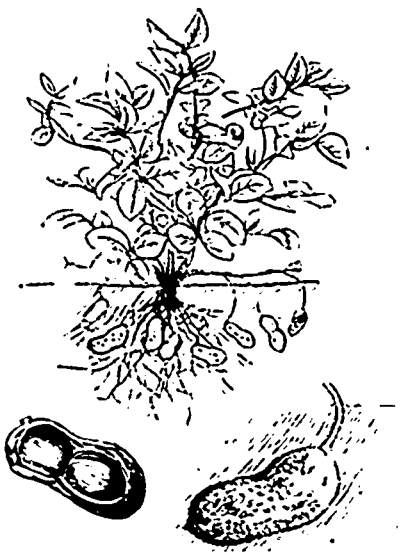
CAN THESE EDIBLE NUTS BE SUCCESSFULLY GROWN HERE?

An Experiment in the County of Carleton—which seems to give an affirmative answer to the question—Contents of a bulletin in culture.

Can the peanut be successfully grown in Ontario? The question is one which is worth considering.

An instance has occurred which suggests the advisability of further experimenting with this plant—a plant which not only yields a popular edible nut, but also furnishes a fodder not to be despised in seasons such as that prevailing during the fall and winter of 1895. The attention of the department was directed to a brief paragraph floating in the provincial press to the effect that Mr. Samuel Scissons of South March, in the County of Carleton, had succeeded in raising peanuts on his farm. A request was made of Mr. Scissons for particulars, and his reply, made under date of November 9, 1895, was as follows:

"I have had but one season's experience. Last spring I received with other seeds from a Toronto seedsman a small packet containing ten peanuts, which he said he was informed would grow in this country. I planted the nuts on the 15th day of May, on land which had been prepared for a root crop a warm, loamy soil. In his instructions for growing the seedman gave what he called the secret of growing peanuts, which was to cover the vines with earth as soon as they began to bear blossoms. When the time came for blossoming I covered four of the vines, leaving the ends exposed; the



THE PEANUT AND ITS CULTURE.

other four vines I did not cover, as I was afraid of smothering them out. About the 1st of October they got a little frost, but it did not hurt them much. On the 20th of October they were killed with frost, but they appeared to be perfectly well matured. I took them up on the 26th of October. From the four vines I had covered, I had one quart of excellent nuts. The other vines which were not covered had only a few nuts on them. My conclusions are that we should plant as soon the land is warm, on a warm, loamy or sandy soil, well exposed to the sun, and be sure to cover the vines well with earth as soon as they begin to blossom."

Description—The peanut (Arachis hypogae), known also in different localities as the earthnut, groundnut, ground pea, goober and pindar, is a trailing, straggling annual, growing from one to two feet high, with thick, angular, pale-green hairy stems, and spreading branches, and has the peculiar habit of maturing its fruit underground. It is supposed to be a native of Brazil, but it is now largely grown in Europe and Africa. Strictly speaking it is not a nut at all, and should be more properly called the ground pea. Its blossom is at the end of a long, pedicillike calyx tube, the ovary being at the base. After the fall of the flowers the peduncle, or "spike," elongates and bends downward, pushing several inches into the ground, where the ovary at its extremity begins to enlarge, and develops into a pale, yellowish, wrinkled, slightly curved pod, often contracted in the middle, containing from one to three seeds. Should the "spike" by accident not be enabled to thrust its point in the ground within a few hours after of the flower, it withers and dies. When fully grown the pods are from one to two inches long, of a dusky, yellowish color, with a nettled surface. There are several varieties, but the Virginia running peanut appears to be the most popular sort.

Climate Suitable for Culture—While the peanut requires a climate where there is a season of five months free from frost, it is not necessary that this should be a period of extreme heat, as the seeds form during the cool weather in the latter part of summer and early autumn. It is probable that on suitable soil the peanut will grow in any latitude where Indian corn will thrive, but whether it will be a profitable crop depends upon other considerations than its ability to withstand the climate. The most favorable weather for the peanut is an early spring, followed by a warm summer of even temperature, with moderate moisture and freedom from drouth, and an early autumn or harvesting time with very little precipitation, as rain injures the newly gathered vines and nuts.

Planting and Culture—Peanuts should be planted in well pulverized soil to a depth of four inches. The distance between the rows should be from 28 to 36 inches, varying with the fertility of the soil and of the variety. Carefully shelled and selected kernels should be used for seed. The seeds should be planted from twelve to twenty inches apart, two to the hill, and covered about an inch deep, either with a hoe or a small turn plow. All grass and weeds must be kept out of the field, and the soil kept loose and open, that the tender "spikes" may meet with no resistance in penetrating the ground. With proper culture there seems to be no need of following the old practice of covering the bloom of the plant. Cultivation should cease when the pods are laid, usually about the latter part of July.

For the copy of the excellent cut we are indebted to the Messrs. Rennie, the seedsmen, of Toronto.

Manures.

ROTATION.

Manured and unmanured plots — Swedes, beans, clover, barley — Superphosphate — Nitric acid — Fed-off roots.

By Sir J. B. Lawes, Bart., LL.D., F.R.S,

"Eds. Country Gentleman."—In your paper of June 1st I gave the results of a rotation of crops, carried on without any application of manure to the soil for thirty-four years. Since the publication of these results the clover crop, to which I there alluded, has been cut, and we find the produce only amounts to seven cwt., per acre. This, it will be seen, is a very significant fact, when I mention that this year the crops of clover have been unusually large, indeed in another experiment in the same field, more than three tons per acre have been cut.

The following are the conclusions which I should be disposed to draw from the experiment upon a permanently unmanured field of fairly good land: 1. That the cereal crops can obtain food from the soil, and give a fairly good produce for a much longer period than such crops as the roots, beans, and clover which have been grown in rotation with them. 2. That under similar circumstances, the cereal crops have derived no benefit from the growth of the roots, and leguminous crops. 3. That if the two cereal crops

of the rotation, wheat and barley, had been grown alternately every year—instead of being grown twice in every four years—a larger produce of grain would have been obtained. This last conclusion is arrived at by comparison of the produce, grown in the rotation, with the produce of wheat and barley grown every year, *without manure*, in other experimental fields on the farm.

I now propose to consider an experiment which has been carried on side by side with that to which I have just been alluding, and has received exactly the same treatment, with this one distinction, that once in every four years—when the turnips were sown—the land has received an application of mineral superphosphate of lime.

In the unmanured rotation, I mentioned that—after the first crop—the turnips grown in the seven rotations that succeeded, became mere weeds: there was in fact no crop of any size to remove, or to consume.

In the experiment to which I am now about to allude, and in other rotations where manures are used, it will be necessary to consider separately the case where the roots are fed by stock upon the land, and that where the roots are wholly carried off.

The average produce of swedish turnips over the eight rotations—including both those fed and those carried off—was a little more than seven tons per acre; the last crop, grown in 1880, being ten tons. The removal of these crops of roots, with their leaves, has reduced the crop of barley six bushels per acre below that grown on the permanently unmanured land; the average produce of one being thirty-four bushels, and of the twenty-eight bushels per acre.

On that part of the experiment where the roots were grown by superphosphate, and fed upon the land by sheep, the barley averaged forty bushels per acre: the removal of the roots was thus equivalent to a loss of twelve bushels in the succeeding crop.

The undoubted influence which superphosphate of lime produces on the growth of the turnip crop, has been so frequently brought forward in the support of the view that these plants derive their nitrogen from the atmosphere, and not from the soil, that it will be as well to consider how far the above experiments do or do not support this conclusion.

The turnips carried off about forty pounds of nitrogen; while the amount of phosphoric acid which they removed was but a small part of that supplied in the superphosphate; the succeeding barley, therefore, had all the advantage of this phosphate, but still could not make use of it, or even produce a crop as good as that grown on the unmanured land.

The turnips are sown in June, and collect their food all through the summer and autumn, at which period nitrification is most active. As it is the custom to use both the horse and hand hoe several times during the season, fresh surfaces of soil are constantly exposed to the atmosphere, and as long as the plant continues growing it takes up the liberated nitrogen. The result of this accumulation of nitrogen is, that where the turnips are fed upon the land as they are upon the adjoining experiment—the succeeding barley crop is considerably larger than it is upon the unmanured land.

Assuming that an equal amount of organic matter was nitrified in the unmanured land, and in that supplied with superphosphate, we might expect that the succeeding barley-crop would be less on the land supplied with superphosphate where the turnips were carried off—than upon the unmanured land, as the plant would be able to gather up so much more of the nitric acid liberated. We might also expect on the other hand, that the barley following the *turnips which were fed, would be a* larger crop than that grown upon the unmanured land, and for this reason—that much of the nitric acid would be washed out of the latter, before the barley was sown in March, while the manure from the turnips—which would not be consumed very long before the barley was sown—would suffer very much less from washing.

In the very tropical summer of 1868 the turnip crop completely failed in both experiments, and in the following year, as might have been expected, the barley crop upon the land which received the superphosphate was superior to the unmanured barley.

Here, I may mention incidentally, what I have more than once pointed out—that the period during which active growth takes place in our root crops corresponds very closely with that of the corn crop in the United States: this fact appears to indicate that phosphates, rather than nitrogen, should play the important part in the artificial manures to be applied to the latter crop.

The consumption of the crop of roots, grown by superphosphate, has produced a crop of barley averaging forty bushels per acre; the use of the phosphate having, in an indirect manner, contributed to the fertility of the soil, not by increasing the stock of nitrogen, but by preventing the loss which would have taken place by the washing out of the nitric acid.

In 1850, three years after the experiment commenced, the crops of clover upon the unmanured land and upon that which received superphosphate were almost equal, but an attempt to grow clover, four years later, having failed, a crop of beans was taken in 1854, and every succeeding rotation up to the year 1870 inclusive: here, also, there was but little difference to be observed in the crops upon the two experiments.

In 1874 clover was again in the place of the beans, and three crops of hay were cut during the summer; the unmanured land yielded, 3,584 pounds of hay, and the superphosphate land 6,324 pounds: this shows a difference of more than one and one-third tons obtained by the application of superphosphates.

In 1878 the fourth year following this clover crop—beans were again taken, when the unmanured crop was slightly the better of the two: and in the present year—that is to say eight years after the last clover crop—red clover was again grown. The two unmanured crops differ very little, one giving 760 pounds, and the other 950 pounds of hay. As regards the clover hay grown upon the land which received the superphosphate, the crop where the turnips were carried away amounts to 3,920 pounds per acre; and on the land where the turnips were fed, to 5,590 pounds per acre: as this, however, is only the first cutting, and it is evident from the present appearance of the two crops that, at the next cutting, the produce on the superphosphate land will be much the larger of the two, it will be advisable to defer giving a general table of the crops obtained in these experiments, *until I have brought forward* the results of the rotation, where the turnips were manured with a liberal dressing of nitrogen, alkalies, and phosphate.

I may, however, here point out that by the application of a mineral manure—furnishing soluble phosphoric acid, and plaster—every fourth year for a period of thirty-five years, the root crop *in a rotation* has been largely increased, that the succeeding barley crop has been reduced where the roots were carried away, and increased, where they were fed on the land; that the bean crops have been very slightly increased, and the clover crops have been very largely increased.

The increase of the wheat has been very slight; but it is quite certain that if the large crops of clover, grown by the superphosphate, had been fed on the land, or ploughed down, a similar increase would have taken place in the wheat, to that which occurred where the turnips were fed on the land.

It will be observed that in these four experiments—in two of which the whole produce grown upon the land has been carried away; and in the other two, three crops out of every four have been carried away—no substance containing nitrogen has been applied to the soil. It will, also, be observed that the amount of nitrogen removed in the produce of the unmanured land has been very considerable, and that this amount has been largely increased by the application of the superphosphate.

FARM MANURES: (1)

Preservation of—Wasteful plans—Box-stalls—Orchard manuring—Farm-papers.

It has always been a surprise to me to see some of our best farmers wasting their farm manure as we call it. They build their horse-stable floors so that the liquid part of the manure, which contains the principal part of the potash, runs through and is lost, also their hog-pens or houses the same. They then draw their manure and pile it in a large pile to heat and kill the foul seed as they say and in so doing lose all the nitrogen. (2) Some of the experimental stations claim that the heat the manures only rises to 110 degrees Far. which does not kill foul seeds; I know by experience that all the heat that can be generated in a hot bed does not kill either clover or foul seeds. (3) I don't have any floors in my stables and keep plenty of straw bedding to absorb all the liquid part of the manure. All stables-floors should be tight so that none of the liquid could escape and use plenty straw bedding. Some people have made cement floors to their stables and have them so arranged that all the liquid will run into tanks or cisterns, but this is too expensive to become in general use. The German system (4) of keeping cattle in box stalls about 8 feet square and running loose, and only one in each stall, giving them plenty of bedding and not cleaning them during the winter, some might think rather a loose easy way, but so far as saving the manure is concerned there is no better way, because there is no waste. I have heard (1) some of our best farmers who have build barns and sheds to cover all their yard, so that none of the manure would leach out and waste, say they did not like them because of their being too much confined for the health of the stock, they preferred to have an open barn yard for day time, and if the liquid manure run off any part of the barn yard, to build a tank or cistern to catch it. I don't have any cistern to my barn yard for the reason that my barn yard is in the centre of part of my apple orchard and the trees get it all. I have an apple orchard of 900 trees, and put all my farm manure on it and have only about half enough. I think the best time to put the barn yard manure on the land is in the spring, for the reason that the experimental stations claim that a portion of the nitrogen escapes in the spring when the water runs off the land and for the same reason they claim that land should not be left bare or without a crop of some kind during the winter (clover is the best) to catch the nitrogen which would escape if the land is left bare. Horse-stable manure should be put in the barn yard where the cattle will eat a part of it, and their tramping on it will prevent it from heating. I dont think it necessary to give particulars as to the amount and particular way that the manure should be applied to the land, the main thing, is to get it and when we get it and *raise all the clover we can, we shall not* have much cause to buy commercial fertilizers, which I have tried and find too expensive; and, lastly, subscribe for some good agricultural papers. I like the Rural New-Yorker the best of all on farm manure and commercial fertilizers.

FRANCIS PEEK.

Albury Prince Edward Co., Ont., Sept. 7th 1895.

(1) The following essay was sent in for the prize competition of the Montreal Ex. of 1895.

(2) Utterly mistaken. Ed.

(3) Our experience is the very reverse of Mr. Peck's.—Ed.

(4) The plan was common in England 50 years ago. Ed.

ABOUT MULCHING PASTURE.

For pastures manure makes an excellent mulch. It may be applied in the autumn, if on hand, but it is usually more convenient to apply it in winter. It may be drawn fresh from the stables, and much straw in it is not objection. When drawn in winter it should be spread at once. We can imagine localities where it could not be thus applied in winter because of the absence of frost, or because of the presence of too much snow. But by exercising due thoughtfulness opportunity will generally be found to engage in this work with advantage at certain intervals *during the winter. In places where* there is much snowfall it may be well to mark the line of application from day to day by the use of stakes. Where this is not done a fresh fall of snow may quite obliterate the line which divides the manured from the unmanured portions of the field.

A mulch thus applied from the barn-yard in the winter season will be found peculiarly helpful to pastures. With every rain that falls the juices from the manure will also furnish a mulch which will greatly add to the degree of the moisture in the ground, and in consequence the growth of the grasses will be still further enhanced. I know of few methods of applying manure which will bring a better return, and when

(1) And the cattle do far better in them, as we have proved by a very long experience.—Ed.

I speak thus I do so from the stand point of experience. When manure is thus applied it is no objection though it should be fresh and composed largely of litter, for it is not easy to say whether the benefits from the manure as a mulch or as a fertilizer will be the greater. And it is easy to see that when the manure has much litter it can be applied with much more profit as a mulch while it is yet bulky and unreduced. *In the dry sections of the* country the value of manure when thus applied cannot be easily over-estimated. If men who live in regions where fresh manure will not decay quickly in the soil would thus apply it, they would find that they can put the same to no better use.—Prof. Thomas Shaw, in Ohio Farmer.

MUCK: ITS NATURE AND USES.

—By—

Frank T. Shutt, M.A., F.C.S., F.I.C.
Chemist of the
Dominion Experimental Farms.

THE FORMATION OF MUCK.

The terms Swamp muck, Black muck or simply Muck are synonymous, being applied on this continent to those black or brown deposits of varying thicknesses found in swamps and other low places where water lies stagnant the greater portion of the year. Muck, apart from the water it contains, consists chiefly of semi-decomposed vegetable matter or humus, resulting from the *partial decay of many successive gene*rations of aquatic or semi-aquatic plants, principally mosses and ferns. Every summer these swamps or bogs are covered by a luxuriant vegetation, which, dying as the season draws to a close, undergoes a gradual transformation, and by various agencies in the presence of water becomes converted into a homogeneous black pasty mass, devoid of structure: this is known as muck.

MUCK DEPOSITS.

While these deposits are often but a foot or so in thickness, they are not unusually found from 12 feet to 20 feet in depth; age and climate influences being the chief factors in determining this thickness. As might be supposed, the muck at different depths frequently presents varying degrees of decay. This likewise is consequent upon the conditions prevailing when it is formed, but the character of the vegetation and thickness of the superincumbent mass also bear their part. In the lower layers, decomposition is practically arrested by exclusion of air and, to a great extent, of bacteria, and the material having assumed a pasty *condition without structure, suffers but* little further decomposition. In the upper layers, fragments of roots and fibrous stems are still noticeable. To sum up, we have in our swamp deposits the accumulation of many years growth, but though the process is slow the conditions are such that the greater part of the vegetable matter and its contained nitrogen are preserved.

THE COMPOSITION OF QUEBEC MUCKS.

During the past nine years many samples of muck collected in the province of Quebec have been analysed in our laboratories; the following data may be considered as representing the composition of typical specimens.

ANALYSIS OF (AIR-DRIED) MUCK.

LOCALITY.	Nitrogen per cent.	Nitrogen pounds per ton.	Organic and Volatile Matter.	Sand and clay.	Mineral matter soluble in acid.	Water.
Ste Adelaide de Pabos	2.30	46 0	68 68	8 13	13 10	10 03
Hatley, Stanstead	2.31	46.2	72.54	4.73	9.64	11.09
Bishop's Crossing	1.76	36.9	77 04	1 93	9 47	11.56
Sutton	1.97	39 5	59 33	10 41	9 33	20 43
Walton	1.70	34.0	73.83	2.71	7.40	16.00
Shawville	1 61	32 2	56 42	9 58	7 18	26 82
	2.27	45.4	73.92	.79	6.70	18.59

Muck, therefore is seen to be a substance essentially rich in humus and nitrogen, and these are the constituents that give it its agricultural value. To realize the worth of this naturally occurring fertilizer, we must first learn the functions of these elements in the soil.

FUNCTIONS OF HUMUS AND NITROGEN IN THE SOIL.

Humus serves to increase the absorptive capacity of a soil and thus plays an important part in preventing a too teady drying out in seasons of drought. Although not a widely recognized fact, it is nevertheless true that one of the chief benefits from an application of barn-yard manure is due to the water-holding capacity of its humus or decaying, organic matter. (1) This at once makes it apparent how by the composting of muck, it may be employed to advantage to supplement the farm's stock of manure.

In the decay of humus much carbonic acid gas is disengaged. This, dissolved in the soil water, acts as a solvent upon the locked-up stores of mineral plant food, making them available for crop use. Further, by this decay its own elements of fertility—organic and inorganic—are liberated in assimilable forms.

The ways in which the presence of humus physically improves a soil are many, some of these we have already indicated. On both clay and sandy lands it exerts an ameliorating action opening up the former and making the latter more retentive. The root system is always better and freer in a soil containing 10 p. c., to 15 p. c., organic matter than in one possessing but traces of humus.

Nitrogen is not only "one of the three essential elements of fertility," but it is the costliest of the three, when it has to be purchased in the form of commercial fertilizers. The foregoing table shows that an average sample of air dried muck contains from 30 lbs of this constituent per ton. It must not however, be supposed that, immediately on the aplication of muck to the soil, this nitrogen is available for crop use. All plants with the exception of the legumes) require that their nitrogen should be in the condition or combination known as nitrates, and the nitrogen in muck must first undergo a change in combination from the organic to the inorganic, before it can appear as such. We must understand that crude muck has little or no readily available nitrogen, and hence it is that its application in the untreated condition is seldom followed by immediate and marked beneficial results.

METHODS FOR THE PREPARATION OF MUCK.

From what has already been said, it is evident that crude muck should receive some treatment before its application to the land. Briefly stated, the three chief reasons for this are (1) to correct or neutralized its natural acidity or sourness, and convert injurious iron compounds into innoxious forms (2); to get rid of a large portion of the water which it contains when freshly dug, and (3) to induce further decomposition. The presence of the humic acids not only prevents further decay of the muck, but brings about a condition of the soil unsuited to the growth of crops and *detrimental to the development of those* micro-organisms whose function it is to prepare plant food. Fresh muck contains in the neighbourhood of 80 p. c. of water; the saving in freight becomes apparent when by simple exposure it can be dried to 15 p. c., of water. The third reason we have already explained in the preceding paragraph.

In whatever manner it is proposed to subsequently treat the muck, the first operation is to dig and pile it, so that it may become partially dry and become mellowed or seasoned. This work is best done in late summer or autumn, when *horses can be used in the swamps. An* ordinary road-scraper will be found in many places a most convenient implement for digging the muck and conveying it to the pile. Piling, especially if the weather be warm and moist, may be found sufficient with some mucks to induce fermentation, and there are occasions when such can then be applied directly to the soil. As a rule however it is advisable to subject the piled muck to the winter's frost, using it the following summer in the compost heap, or as an absorbent: as to be hereafter explained. The process of nitrification thus started greatly enhances the fertilizing value of the muck.

(To be continued)

(1) And to its darkening the soil, and thereby rendering it more receptive of the rays of the sun? Ed.

Public Meetings.

FIFTEENTH ANNUAL CONVENTION OF THE QUEBEC DAIRYMEN.

Joliette meet — Inspector's reports — Trademarks — Tobacco — Cold sterage — Increase in factories— Quarantine-M. Beaubien's address Drains — Syndicates — Butter — Father Lacasse.

The Convention of this year of grace, 1896, was held at Joliette, in which pretty little town we had the pleasure of passing twice a four years, some quarter of a century ago, and where they do us the honour still to talk of our crops of tobacco and vegetables.

December 2nd.—The president of the *Association being unable to be present,* owing to sickness, the Hon, Sydney Fisher, Minister of Agriculture for the Dominion, was inducted into the chair. MM. Taché, Barnard, Ness, and Guay, were appointed members of the committee on nominations. MM. Taché, Vaillancourt, Préfontaine, and Chicoyne were selected as inspectors of butter-samples; while MM. Parent, Bourbeau, Plamondon, and Lister, the last an English expert attending the convention, took charge of the cheese.

M. Bourbeau, Inspector of Creameries and Cheeseries, gave in his report. He, and his assistant, M. Plamondon, had investigated the causes leading to the superiority of the Ontario system of cheese-making, and the former described what he saw in that province.

In his official tour through the province of Quebec, he had visited 160 factories, which he classified as follows:

First class... ... ...80;
Second class... ... ...51;
Third class... ... ...20.

In these factories he had tested 14,824 samples of cheese, which he classified thus:

First class.... ... ...7,510;
Second class... ... ...6,696;
Third class... ... ... 610.

A decided improvement, he was happy to say, was apparent both in the factories and in the class of cheese made therein.

Unfortunately, many young, inexperienced men were employed as buyers by large dealers in cheese; and this tended to lower the standard of cheese made in the province; as sufficient difference—if any at all—was not made between the price paid for good, first-rate cheese and cheese of second quality.

A long discussion followed Mr. Bourbeau's report, he being plied with questions, and giving some interesting advice as to the best way of raising the standard of cheese in this province.

Mr. Fisher, Vice-president of the Association, was congratulated on his accession to the office of Minister of Agriculture, and replied to the address in suitable terms.

After a paper by Mr. Ed. Barnard, Prof. Couture addressed the meeting on the American quarantine, and on the desirability of getting the Government *of the United-States to recognise the* Canadian Herd-books; consequent upon what M. Couture said, a resolution to the above effect was adopted, as was also a motion requesting the Quebec Government to accord a grant to each division of the "Cattle Raisers' Association of the Province of Quebec."

Mr. Lister, a member of the Gloucestershire, Eng., County Council, and a large manufacturer of centrifugal separators, etc., at Dursley in the above named county, so celebrated for its cheese, informed the meeting that "Canadian cheese and taken the very highest place in the English market; but, on the other hand, there was much room for improvement in the butter sent from Canada to the Old Country."

On Wednesday, the Minister of Agriculture and several of the Directors of the Association paid a visit to the Tobacco-factory, probably the largest manufactory of domestic tobacco in the Dominion.

Upon returning to the hall, Mr. Rhaven spoke of the stamping of trademarks upon cheese. M. Chagnon and the Secretary avowed that they could see no use in altering the present system, so the subject was dropped.

The Hon. Sydney Fisher, Minister of Agriculture, being obliged to leave, to attend a meeting of the Ontario Fruit-growers, vacated the chair, and M. J. C. Chapais took his place. Before quitting, Mr. Fisher addressed the meeting, in French, stating, among other things, that Canadian cheese was selling well in the English market, and the shipments had been larger than ever, though, he thought, there was still room for improvement in the general standard. Prince Edward's Island, small as it was, turned out better cheese than Quebec and even than Ontario. Our butter, he continued, was of decidedly better quality than heretofore, and was selling well on the English market. One or two creameries were maintained in the North-West by the

Department of Agriculture, and butter shipped from Saskatchewan viâ rail to Montreal, and thence by boat to England, had sold for 24 cents a pound in that country after its ten weeks of transit! This was very encouraging as regarded the establishment of regularly fitted up cold-storage, refrigerator-cars, and compartments on board the ocean steamers. In this province, we had the very best chance for producing the best of butter: good water, good pasture, and good cows; probably the best cows to be found in the world.

After thanking the Mayor and Council of Joliette for the kind manner in which they had received the Association, Mr. Fisher took his departure for Kingston.

PAPERS READ.

Mr. Ed. A. Barnard then read a most interesting paper on "The Dairy-industry and its adjuncts", tracing the origin and course of the progress of dairying, as now carried on in the province, from the Meeting, in 1870, at the Court House of Bagot to its present condition. The first dairy-school established, in 1881, cotemporaneously with this Association, was started by M. J. C. Chapais, at St. Denis de Kamouraska; the speaker believed it was the first dairy-school set up in the whole world; certainly, it was the first on this continent.

In 1890, there were 617 cheeseries and 35 creameries in the province; at the time of their last convention, the report stated that there were of creameries 307 and of cheeseries 1467; a marvellous growth indeed! but was it, in reality a sound growth? Mr. Barnard held that it would have been better had the increase been less, and a higher standard of butter and cheese manufactured.

Dr. Couture, Professor of veterinary science at Laval University, protested against the way in which Canadian cattle were held in quarantine when sent to the United-States. A motion was passed, by acclamation, requesting the Government to use its efforts with the Government of the United-States to allow the certified genealogy of Canadian cattle to be recognised in that country.

ELECTION OF OFFICERS

Then followed the election of officers for the year 1897:

Honorary President—Rev. Abbé Montminy.

President—Mr. Milton McDonald, M. L. A.

Vice-President—M. J. C. Chapais.

Sec-Treas.—M. Emile Castel.

Directors—M. D. C. Bourbeau, Arthabaska; M. J. de L. Taché, Beauce; Mr. Robert Ness, Beauharnois; Mr. C. Parmalee, M. P., Bedford; Mr. J. D. Guay, Chateauguay; Mr. Joseph Girard, M. L. A., Chicoutimi; Mr. Alex. Chicoyne, Gaspé; Rev. Abbé Charest, Iberville; Mr. F. Gagnon, Kamouraska; Mr. G. Dumont, Montmagny; Mr. J. A. Vaillancourt, Montreal; Mr. M. P. Bédard, Ottawa; Mr. E. A. Barnard, Quebec; Mr. J. L. Lemire, Richelieu; Mr. Chas. Préfontaine, Rimouski; Mr. J. A. Cameron, St. François; Mr. L. P. Brodeur, St. Hyacinthe; Rev. Abbé Cousineau, Terrebonne; and Rev. Abbé Gérin, Three Rivers.

After Mr. Milton McDonald had taken the chair, as the new President, and said a few words in acknowledgment of the honour done him, M. Chapais read the annual address of the out-going President, M. l'abbé Montminy, who, owing to severe illness, was prevented from being present in person.

Next followed the addresses of the Mayor of Joliette and M. Richard, President of the local Agricultural Association. M. Louis Beaubien was then introduced to the meeting. The Provincial Minister of Agriculture was glad to find that the Association had been wise enough, and fortunate enough, to enlist the sympathies of the clergy in its work. Father Lacasse, then present, was a host in himself as an agricultural missioner, as were the Trappist Brothers, of Oka, whose knowledge of agriculture was universally acknowledged. Mr. Beaubien had at one time thought of joining that body, but finding that conversation was strictly forbidden in that community, he had seen the futility of such a step.

DISCUSSIONS.

A general discussion then took place on agriculture as a whole. M. J. C. Chapais giving some useful advice on the management of meadows and pastures.

M. Richard, a Joliette farmer, compared the style of cultivation pursued by the French-Canadians of to-day with that carried on by their fathers 25 years, or so, ago.

Drainage was treated by M. P. L. Brodeur of Bagot (to whom we present our compliments, respectfully observing that the best way of conducting drainage on anything like a large scale, would be to import a gang of drainers—4 in number—from the South-Eastern counties of England, who, being thoroughly accustomed to the work, would make drains from 3½ to 4 feet deep without throwing out from them more than at most two-thirds of the earth that is unnecessarily moved by men who, however competent they may be to dig ditches, are utterly unskilled in the much more difficult art of laying down drain-pipes.)

Nicolet was selected as the place for holding the Convention of 1897, though the good people of Sherbrooke made a hard fight to obtain that honour.

M. Emile Castel delighted the audience by reading a list of prices given for cheese during the last few years at such well known markets as Brockville, London, and Ingersoll in Ontario, and Cowansville in Quebec, by which it appeared that the cheese of this province had, during the past year, fetched higher prices than the cheese of the province of Ontario.

M. J. de L. Taché spoke at large on the subject of butter-making. The best butter was made by churning at a temperature of 55o, and the water used for washing should not exceed 52o. Salt was not the better for being too dry: dampening it a little before adding it to the butter improved it.

Mr. J. D. Leclair, Superintendent of the St. Hyacinthe Dairy-School, spoke of the ripening of cream. No cream of one day should be allowed to ferment before being mixed with the cream of previous skimming. It should be well stirred in to the older cream and allowed to stand for a period that nothing but experiment would teach one.

SYNDICATES.

Mr. J. de L. Taché spoke in favor of the syndicates, which were in a position to demand better prices than private individuals. They had inspectors who visited every factory which joined them and kept the standard up. It was true, as Mr. Castel had pointed out, that in a few cases the cheese of the Province of Quebec had, during the past year, obtained better prices than that of the Province of Ontario, and if this was the case, the formation of the syndicates might be thanked for it. Taking every thing into consideration, and striking an average of the prices obtained, it was fair to say that the syndicates had raised the prices all round at least half a cent a pound. Mr. Ed. A. Barnard spoke upon the same lines, being followed by Dr. Grignon, whose eulogy of the work done by the agricultural missionaries was received with an outburst of applause. Speaking of the particular subject to which he desired to attract attention, viz.: the establishment of cooperative societies for the manufacture of butter and cheese, Dr. Grignon showed that if a hundred farmers combined and subscribed $50 each, the total sum, $5000, would be sufficient to establish a suitable butter and cheese factory, with ice houses and everything necessary. Each farmer would then supply ten cows, which would give 15,000 lbs. of milk each day, which for seven months would amount to 3,150,000 lbs. of milk; this again would represent 136,955 lbs., of butter, which being sold at a profit of three cents per pound would amount to $4108.65. Adding up all expenses for salaries, tins, carriage, ice and various sundries, it would be found that when everything was provided for, only $3975 had been disposed of, leaving a balance on hand of $133.65, for which sum a competent and conscientious inspector could be engaged to supervise the enterprise. (1)

DIGNITY OF AGRICULTURE

Rev. Father Lacasse, the well-known agricultural missionary, whose lessons on farming have been from time to time varied with a brochure on political subjects, was the next speaker. He opened with a story taken from the history of ancient Rome, showing the dignity of agriculture, and from the beginning to the end of an instructive address, he held his audience rapt. As the Minister of Agriculture had pointed out, too many parents thought only of sending the sons to collge to become doctors or lawyers, whereas they would do much better if they secured for them a proper and scientific knowledge of the soil and its possibilities. He urged his hearers to study economy, and not to encourage the extravagant notions of the younger generation: to be proud of their calling, and not look upon it as a disgrace to be a farmer. If these principles were carried out throughout life, the boys and girls would grow up more satisfied with their lot, and would be less likely to emigrate to other countries, and the farms which had descended from father to son would not pass from the hands of the old man who was not able to pay the interest on the mortgage.

At the conclusion of Father Lacasse's speech, which terminated in a succession of amusing anecdotes, related as only Father Lacasse can relate a story, the new president of the society, Mr. M. McDonald, M. L. A., declared the convention closed.

(1) It seems to us that there must be some error in the above calculation; at least, it needs explanation. No competent inspector would be likely to exercise his abilities for such a trifling sum as the one mentioned.—Ed.

MEETING OF THE COUNCIL OF AGRICULTURE.

October 23rd, 1896.

IMPORTANT MEETING OF FARMERS.

Development of dairying — Improvement of meadows and pastures — Lime and ashes for meadows — Composts of turf—Permanent pastures—Artificial pastures—Dividing pastures—Green fodder-crops — Root-crops — Effects of wood-ashes—Fruit-growing.

On the 23rd of last October, an important meeting took place of the leading "agronomes" of the province, members of the Council of Agriculture.

Present: The Hons. A. Landry, F. X. Méthot, P. de la Bruère; MM. Beauchamp, M.P.P., Milton Macdonald, M.P.P., Jos. Girard, M.P.P. J. de L. Taché, Marsan, Ness, Brodeur, Tylee, Foster, Grignon, Lamarre, Rév. O. Tremblay, Dawes, Greig, M L. A.

The addresses and discussions at this meeting were of the most interesting kind, full of valuable information, which coming from the élite of our practical farmers cannot fail to attract the attention of the whole agricultural population.

We publish some of the questions proposed for solution, at this meeting, together with an abstract of the remarks made in reply to each of them.

1st QUESTION.—IF THE DAIRY-INDUSTRY IS TO BE ESPECIALLY DEVELOPED, WHAT CROPS SHOULD BE MOST ENCOURAGED BY OUR AGRICULTURAL ASSOCIATIONS?

REPLY:—The growth of green fodder, roots, and leguminous crops, especially of the clovers, must be encouraged; as well as the improvement of meadows and pastures.

2nd QUESTION.—ARE OUR MEADOWS AND PASTURES WORSE THAN THEY SHOULD BE?

REPLY:—Yes; there is great room for improvement in many instances.

3rd QUESTION.—WHAT MEANS SHOULD BE ADOPTED TO IMPROVE OUR MEADOWS AND PASTURES?

REPLY: Some members of the Council thought that, in the first place, the pastures should be divided into two classes: 1st. "permanent pastures," that cannot be ploughed up; 2nd., pastures that can be made arable land with ease.

For permanent pastures, Messrs. Foster and Greig opined that dressings of manure or dung, of bog-earth mixed with lime or ashes would do much good. In every case, where land is wet, draining should be the first step, and where this is well done, Mr. Foster advised the use of lime and ashes, and, on wet land, a compost in which there are no ashes exist, as ashes, he said, would cause moss to grow. In each case, a good harrowing, and rolling if possible, should precede the dressing.

For ordinary pastures that are ploughable, M. Brodeur strongly recommended breaking them up and sowing them with grain-crops for only one year, seeding down with plenty of clovers of different sorts, especially the white-clover, and the various grasses recommended for pasture according to the nature of the soil.

Mr. Ness would rather grow grain two years consecutively, so as to pulverise the ground more thoroughly, and

secure a more perfect decompesition of the turf. On this point, opinions were divided All depended upon the nature and richness of the soil.

In the replies, there was no question of rotations; simply of a way of rapidly improving pastures.

After sowing grain, etc., it is most important to select most carefully the grass-seeds, so as to get the best kinds of clovers for pastures, as well as several varieties of grasses, which should be chosen according to the soil and climate, so that they may succeed one another during the whole grazing season.

It was explicitly shown that, in the fall, neither meadows nor pastures should be fed too late especially the meadows, in order that at the end of the season a couch of aftermath should be left, to act both as a protection to the roots and as a source of fertility for the next year.

In every case, the pastures should be divided into three or four parts, so that one part may be grazed while the others are growing up again.

Mr. Ness stated that, on his farm, a certain pasture used not to be able to keep four young beasts during the season; but after top dressing it with dung and sowing clovers on it in spring, it afforded abundant keep for twelve head of cattle.

4th QUESTION.—IS THE GROWING OF GREEN-CROPS FOR FODDER SUFFICIENTLY PRACTISED HERE?

REPLY.—There is a great improvement visible in this point; much however remains to be done.

5th QUESTION.—WHAT IS THE BEST GREEN-FODDER TO GROW?

The great clovers, such as the Giant and the Rawdon, common red, and the Alsike, are by far the best green fodder-crops. The crimson clover is not recommended. Besides these clovers, a mixture should be sown of pease, vetches, and oats, 1-3 of each. A small plot of this should be sown at intervals, so that each may be cut when in bloom, before the others are too far advanced.

Indian corn too is highly recommended, but is only profitable for stock when the ear is in an advanced state Mr. Barnard recommended the "Longfellow," which ripens even at Quebec, and produces an abundant and very succulent yield of fodder.

Mr. Ness said that where pastures are abundant and well divided, fodder-crops are less required. He admitted, however, that in certain seasons and on certain soils, they might be indispensable.

6th QUESTION.—ARE HOED-CROPS GROWN EXTENSIVELY ENOUGH HERE?

REPLY: No; but they are becoming more common, though much remains to be done in this respect.

7th QUESTION.—SHOULD WE GROW MORE CORN, MANGELS, CARROTS AND SWEDES FOR CATTLE-FOOD, THAN WE GROW NOW?

REPLY: Decidedly.

8th QUESTION. SHOULD THE AGRICULTURAL SOCIETIES ENCOURAGE THE USE OF PLASTER, WOOD ASHES, AND ARTIFICIAL MANURES?

REPLY: Yes, provided that they counsel farmers not to allow the smallest part of their dung to be wasted. Enormous quantities of it are lost in every parish, especially of the urine, as well as of the more soluble parts of the faeces, which are carried off by the rain and the thawing of the snow, in by far too considerable quantities.

If there is not enough dung, as is commonly the case on the farms of this province, exhausted as they are by too frequent grain-crops and of hay for export, bog-earth should be made into compost, but only after having used every means of getting dung and keeping it in good order. Mr. Tylee observed that people often found fault with the use of bog-earth, that was because they had not dried and aerated it before spreading.

If there is none of this in the neighbourhood, composts can be formed of the ditch-scrapings, weeds, turves taken from broken-up meadows, or of any other kind of good mould, and to these should be added, in layers, lime, ashes, and plain superphosphate.

Mr. Creig, Member for Châteauguay said that, in Scotland, farmers made composts of bog-earth mixed with lime and "plain" superphosphate, which they spread and their meadows and cow-pasture. As soon as the could get out the bog-earth, from the savanne, they threw it up in heaps to drain, (or better, on to a platform to get rid of the water more rapidly and thoroughly); then, after a few months, they composted it with lime, ashes, etc. Bog-earth, thus treated with lime, loses its acidity and becomes almost as good a manure as dung. If there is neither potash nor phosphoric acid in the mixture, these must be added, in most parts of the province. This compost is also used with great success in meadows, a year after its preparation.

Sawdust was recommended as an absorbent for the urine of the stock, and may be afterwards used on light lands as manure without injury. Dr. Grignon said he had got good results from it on both light and heavy land.

M. Marsan said that he spread the ashes of a burnt barn on a meadow so thoroughly worn out that it grew nothing but moss. In the spring, he sowed it and harrowed the seeds in, and it became better than a new meadow, the improvement lasting for three years.

M. Girard, M.P.P. for Lac St-Jean, stated that lime had not always a marked effect. Comparative experiments in his parish have failed to show the value of lime. This might be owing to the season, or to the land containing lime in sufficient quantities already.

Mr. Barnard said that half the farms in l'Ange-Gardien, Château-Richer, and Ste-Anne, situated at the foot of the Laurentides, have been completely exhausted by successive grain-crops. Owing to the difficulty of getting dung and the awful roads to be traversed to reach these heights, the farmers there have tried artificial manure, and have grown marvellous crops with their aid, among others, from 150 to 300 bushels of potatoes to the arpent. (370 Imperial bushels to the imp. acre); but, M. Barnard added, artificials should only be used in conjunction with dung.

M. Marsan found that potatoes yielded 30 to 40 per cent more with alternate dressings of "phosphate" (1) one year, dung the next

Potash was said to be also very useful as a potato manure.

9th QUESTION.—IS THE CULTIVATION OF FRUIT SUFFICIENTLY CARRIED ON?

REPLY: There has been much progress in this point, but we must still advance The demand for Canada fruit in the English market improves year by year It is desirable to find out what varieties are most in request there, and those sorts should be cultivated especially.

In most families, sufficient fruit for even home-consumption is not grown. This is a most important question both as regards domestic economy and health. Abroad, there is an excellent market for some of our fruits, but the demands of the markets must be studied, otherwise disappointment will be the result.

Above all things, the cultivation of winter-apples must be attended to: it is far from being sufficiently extensive. Since the practice of spraying fruit-trees has been followed, fruit-growing has been greatly improved.

10th QUESTION.—WHAT SPECIAL ADVICE SHOULD BE GIVEN BY THE AGRICULTURAL LECTURERS?

REPLY: The advice should be in conformity with the replies given by the Council of Agriculture to the above questions.

There should be an annual meeting of the lecturers, for the special purpose of agreeing on the subjects to be treated during the year, and to prevent any divergence of opinion, between themselves, as to the doctrines they teach.

11th QUESTION. - MEASURES THAT HAVE BEEN OR ARE TO BE TAKEN AS TO OUR DAIRY-INDUSTRY.—Mr. Foster showed how greatly the local Boards of Trade are likely to promote the sale of butter and cheese. He stated that the prices obtained by the Bedford Board for the cheese of that district was even higher than the best prices quoted, this year, in Ontario.

M. Girard supported the recommendation of Mr. Foster, favouring the creation of Boards of Trade in every district of the province, affirming that the factories at Lac St-Jean, through their Boards of Trade, succeeded in obtaining the highest market-price for their cheese, at the same time insisting that the inspection and weighing should be done at the factory, and the covenanted price be paid on delivery at the factory.

Mr. A. A. Ayer, who could not be present, wrote word that the premium given by the provincial government for the encouragement of the export of fresh butter to England having fully attained the desired end, there was no reason to continue to grant this premium.

Mr. Ayer added that the government ought to distribute to all the makers of butter in the province bulletins teaching them how to make the best butter, and the best way of packing it.

(Signed) Ed. A. BARNARD.

(1) Once more. "What phosphate?" - Ed.

Swine.

SELECTION OF SWINE THE CHESTER WHITE.

Whence imported — Characteristics — Litters—Weights—Exhibitions.

Castlebar, Nov. 26 1896.

This famous breed of Swine originated in Bedfordshire, England. When they were first known in the United States or Canada they were imported by a man named Jeffers, to Pennsylvania, Chester County; he was the first known to import them from across the water. He imported one pair, and in a few year more followed. So great was the den for large sized and easy feeding animals that people began to ship anything in the shape of a Chester Hog and that nearly destroyed them by unscrupulous dealers. They were first imported into Canada from Pennsylvania and Ohio, better known as Ohio Chester-white Swine and as Todd's Strain. There are more of this one breed in the United States than of all breeds put together. They are a well developed class of Swine, being low down, lengthy and deep bodied. The male animals are docile and easy to handle, not being savage like as in other classes of swine. The females are very quiet and attentive to their young, they generally raise good strong litters, there is scarcely any difference in size and shape at birth or any age as in other breeds you can find all shapes. The Poland Chinas never raise any number to a litter, they have been known to have two and three for a litter. The Chesters are good thrivers and mature and fatten for early market. We have had them weigh, when 2 months old, 80 lbs and upwards with common food. As a cross, they are also good for all purposes; we have had them weight, nearly 300, at six months they are good weights at any age; they are known to weigh 1000, 1100 and even 1300 lbs; they are fast coming to the front, taking the place of other breeds and a vast number of them are imported from the United States yearly for breeding purposes. I selected a pair from Morton Lodge Stock Farm, a beautiful Boar and Sow. I exhibited them the same season and won the two first prizes where ever shown. We have recently been breeding young boars and sows for the show ring and have been very successful for the past four years. This season we again carried off all first diplomas and prize pens at the leading fairs. Stock for exhibition the one breed only.

Pork is now low, very low, it is true, and so is feed, but even to-day the right kind of bacon is by no means a drug on the market.

I remain as ever

ROBERT J. MACKAY,
Castlebar.
P. Q.
Canada.

PIG FEEDING EXPERIMENTS.

Two experiments in the feeding of pigs have been made by Mr. H. H. Dean, Ontario Agricultural College, says "Farming World," of London. The one was to determine the relative values of wet and dry meal as a food for pigs, and the other to compare sweet milk and sour milk. In the first test, seven grade Berkshire pigs, averaging 141 lbs, were fed for three weeks on middlings made into a slop with skim milk and some whole peas, and in three weeks following the same food dry. The total gain per lot was 142 pounds on wet food and 171 pounds on dry food. Practically the same amount of grain was required to produce a pound of gain, whether fed wet or dry. but the pigs seemed to waste more of the dry feed. The second test was with eleven Tamworth pigs, divided into two lots. Feeding middlings and peas, sweet milk and sour milk with some butter milk were compared in alternating periods of three weeks. The total gain of the two lots while on sweet milk was 379 pounds, and while on sour milk 438 pounds, a difference of 59 pounds in favor or sour milk. In the author's opinion the trial indicates that

sour milk is equal to or better than sweet milk for pigs weighing from 140 to 200 lbs. (1) A somewhat novel experiment is being tried with turnips in the Ashburton district of New Zealand by Mr. Max Friedlander. He is feeding off a small paddock of turnips with about 150 young pigs and breeding sows, and the experiment so far seems to be a complete success. His plan is to fence off about an acre at a time with strong sheep-netting, making a bit of a rough shelter with straw and slabs for the pigs to get into at night. When the pigs had just finished their first break, upon which they had been a month, they had cleared every root and weed out of the land, and were looking in first-class health and condition. Mr. Friedlander estimates that in this way pigs can be reared until they are four months old at a cost of not more than a penny per head per week; and by growing some peas (2) to finish them off with, small farmers could make a very safe and profitable turnover, and at the same time improve their land.

The Orchard and Garden.

KEEPING FALL AND WINTER APPLES.

In order to keep well, apples must be picked at the proper time. Care must be exercised in handling to prevent bruises, carefully assorting the ripe from the unripe, the perfect from the imperfect, and storing in a cool, dry place, with plenty of pure air free from all odors of decaying vegetables or other substances.

THE AVERAGE FRUIT GROWER DOES NOT EXERCISE ENOUGH CAUTION IN HANDLING AND ASSORTING HIS FRUIT

The degree of maturity will have much to do with the keeping qualities. A late fall or winter apple should be mature, but not ripe when it is picked, if it is expected to be kept for any considerable time. The process of ripening is only the first stage of decay, and if this is allowed to continue before picking, till the apple is ripe, or mellow, this breaking down process has proceeded so far that it is a difficult matter to arrest it. As soon, therefore, as the stem will separate freely from its union with the branch, the apple is sufficiently mature for storing.

The proper temperature for keeping apples is as nearly 35o Fahr. as it is possible to keep it, and in order to maintain this, it will often be necessary in this climate to provide a separate place for storing the fruit, as the average cellar under the dwelling house is wholly unfit for this purpose. If the cellar consists of several compartments, so that one can be shut off completely from the others, and the temperature in this is kept below 40o, it will answer the purpose very well. If this cannot be done, a cheap storage house may be built in connection with the ice-house, by building a room underneath, having it surrounded with ice on the sides and overhead, with facilities for drainage underneath, keeping the air dry by means of chloride of calcium placed on the floor in an open water-tight vessel, such as a large milk crock or pan. In this way, the temperature may be kept very near the freezing point the year round, and apples may be kept almost indefinitely.

JAMES TROOP,
Horticulturist.

Purdue University Expt. Station.

"Country Gentleman."

(1) Just what Arthur Young proved 125 years ago.—Ed.

(2) The very food required to harden the meat.—Ed.

CHOOSING TREES FOR PLANTING.

It is very natural for purchasers in choosing trees for planting to select the largest, thinking that these are nearest to bearing age, and will soonest become fruitful. In almost every case, the smaller, if quickly grown, will have the most roots in proportion to its top, and will make the best growth. The size at planting time makes but little difference. The growth and vigor of the tree after planting is what tells most. We once saw an old grape vine carefully transplanted when the family was removing to another place. It had considerable top, and though this was cut back very severely, there were at least 40 shoots growing the next spring. The result was that it took fully two years to get that vine established in its new home. If left where it grew it was more valuable than a new vine would have been, but if transplanted it was no better, though much more cumbrous and troublesome than a well-rooted yearling vine with but a single bud left to grow. Some like two-year-old grape vines, but a yearling that has made a vigorous root will be quite as good after three or five years' growth.—London Free Press.

Experiments, &c.

ROTHAMSTED EXPERIMENTS.

(Continued.)

Experiments with sheep—Amides—Nitrates—Barley—Malt.

There is, however, so far as I am aware, no direct experimental evidence yet at command indicating that the by-products of the transformation of amides may directly contribute to the formation of fat. Direct experiments have, however, shown that the heat of combustion of asparagin, for example, is less than half that of albumin, and, supposing that they do so contribute, it may safely be concluded that a given quantity of amide would yield less fat than an equal quantity of albuminoid. As bearing upon this point it is to be borne in mind that, on the average, the amide bodies most frequently occurring in food stuffs have a higher percentage of nitrogen than the albuminoids. Wolff estimates that while the nitrogen of food should be multiplied by 6. 25 to represent albuminoids, 5.5 would, on the average, be a more appropriate factor for calculating the amount of amide from that of the nitrogen. Further, he admits that so far as the nitrogen in potatoes, roots, and other food stuffs, exists as amides, the nutritive value of the food is reduced; nevertheless, as has been said in his tables, he assumes the whole of the nitrogenous substance of roots to be digestible and of equal value as such with the albuminoids.

Then, again, as generally more or less of the nitrogen in roots will exist as nitrates, it will so far not only have no food value, but it may be positively injurious. It may be added, that other things being equal, the higher the percentage of nitrogen in roots, the lower, as a rule, will be the proportion of it as albuminoids, and the higher that as amides, and as nitrates, etc. Further, in direct experiments at Rothamsted with sheep feeding on roots alone, it was found that while the animals even gained in weight on ripe roots, low in nitrogen, they actually lost on roots that were less ripe, high in nitrogen, and doubtless containing a larger proportion of their nitrogen as nonalbuminoid compounds.

From these various considerations it is obvious that by no means the whole of the nitrogen of the mangels can be estimated as having existed in compounds which could in their transformation yield the amount of fat possibly derivable from true albuminoids. However, with the great variation in the proportion of albuminoids and amides in roots, and the absence of exact knowledge as to the probable value, if any, direct or indirect, of amides for fat formation, it is impossible to form any certain estimate as to which of the percentage given alternatively in the lower division of the table most probably represents the amount of fat producible from the nitrogenous substance of the mangels given ad libitum in each of the 5 pens of the first series of experiments with sheep. It is, however, quite safe to conclude that very much less than the whole would be so available; and if we were to assume that of the nitrogenous constituents of the roots only the albuminoids would be available for fat formation, the figures given in the top line of the lower division of the table, according to which it is reckoned that only 50 per cent of the total nitrogenous compounds of the roots would be capable of fat formation, would in each case represent less than half the amount required.

It is quite clear that at any rate a large proportion of the fat of the increase estimated to be necessarily derived from other sources than the fat of the total food and the nitrogenous substance of the fixed food, must have been derived from other sources than the nitrogenous substance of the roots; in other words it must have had its source in the carbohydrates of the fixed food or of the roots.

Let us now examine the evidence of the results of the second series of experiments on somewhat similar lines.

As in series 1, a fixed quantity of barley or malt was given in each pen, but now a fixed quantity of clover chaff also. This introduction of clover chaff into the fixed food brings us again face to face with the difficulty as to the estimation of the food value of the amides. As already said, the calculation of the amounts of the nitrogenous substance in the clover chaff which will be available, are made on the assumption that 66.7 per cent of the total nitrogen will be digestible, and so available; and this figure agrees fairly with Wolff's estimates. But this amount includes amides as well as albuminoids. In Wolff's most recent tables he estimates that the proportion of the nitrogen of clover hay existing in nonalbuminoid compounds may range from 13.9 to 29.9 per cent of the whole, and probably be on the average about 19 per cent. What proportion, however, of the two thirds of the total nitrogenous substance of clover hay, which is estimated to be digestible, will probably be nonalbuminoid, there is no evidence to show. In these circumstances I have, in the calculations, assumed the whole of the digestible nitrogenous substance of clover hay to have the food value of albuminoids. The figures will, therefore, doubtless overstate the amount of the nitrogenous substance consumed in the fixed foods, which is really available for nitrogenous increase and for fat formation.

Taking the figures as they stand, it is seen that, after deducting the amount of nitrogenous substance estimated to be stored up in 100 of increase from the amount supplied in the fixed food, there remain in the several experiments 44.9 43.6, 48.3, and 51.1 parts, possibly available for fat formation.

Then deducting the amount of digestible fat in the total food from the fat estimated to be stored up in the increase, there remain 55.9, 56.1, 56, 55.7, and 55.2 parts, which must have been newly formed. Deducting from these amounts, those producible from the available nitrogenous substance of the fixed foods, there remain 32.8, 33.7, 31.2, 30.8, and 28.9 parts, to be formed from other sources. Comparing with these amounts, those derivable from the nitrogenous substance of the roots, assuming, as shown in the bottom line of the table, that the whole of it would have the same value for fat formation as true albuminoids, it is seen that in four out of the five cases the fat so assumed to be formed would be less than that required.

In these experiments the roots consisted chiefly of Swedish turnips and in only small proportion of mangels. The evidence at command leads to the conclusion that in Swedish turnips a larger proportion of the total nitrogen exists as albuminoids and a less proportion as nitrates than in the more succulent mangels. We have found the proportion of the total nitrogen of Swedish turnips existing as albuminoids as low as 32.9 and as high as 55.8; and for the purposes of calculation we assume that, on the average, 45 per cent will be in that form. As large or a larger amount will, however, exist as amides than in mangels.

It is evident, therefore, that even if we assume 50 per cent of the total nitrogenous substance of the roots consumed in this second series of experiments to have been of value for fat formation, some amide will be included. But, even on the assumption that 50 per cent had the value of albuminoids for fat formation, less than half the amount of fat required would be derivable from the nitrogenous substance of the roots. Assuming, however, that the amides of the roots would, as such, have a certain, though not an equal, value with the albuminoids for fat formation; or that, as protectors of other constituents, they may contribute indirectly to such formation, there would still remain a considerable amount of the produced fat to be derived from other sources; that is, from carbohydrates.

Upon the whole, then, although the evidence of fat formation from the carbohydrates of the food is admittedly less direct in the case of sheep than in that of pigs, yet, when the foregoing results are carefully considered, with due regard to the facts which have been discussed, no doubt can be entertained that there was a considerable formation of fat from carbohydrates in both of the series of experiments with sheep. And when it is borne in mind that neither of these series of experiments was arranged for the purpose of elucidating this particular question, it must be admitted that the results are more

definite and conclusive than might have been anticipated. Nor can there be any doubt that if experiments were made with oxen, under suitable conditions, they would yield equally conclusive evidence on the point. Indeed, as anticipated by Henneberg in the observations he made at Hamburg in 1876 we may consider that the carbohydrates are reinstated in their position in the formation of the fat of ruminants as well as in that of pigs.

SUMMARY ON THE SOURCES OF THE FAT OF THE ANIMALS OF THE FARM.

It was in 1865 (that is, nearly thirty years ago) that Voit first called in question the then very generally accepted opinions on the subject; and, as his evidence, derived from experiments with the omnivorous dog, accumulated, he more and more urged that his conclusions were equally applicable to Herbivora. His views on the point came to be very generally adopted by agricultural chemists in Germany, and, in 1874, Prof. Emil von Wolff adopted them, but with some reservation so far as pigs are concerned, in his text-book, entitled. "Die rationelle Fütterung der landwirthschaftlichen Nutzthiere, auf Grundlage der neueren thierphysiologischen Forschungen."

It has been already stated that in the discussion at Hamburg in 1876, Wolff more clearly admitted that pigs might behave exceptionally in the matter; whilst Henneberg assumed that ruminants also would prove to be exceptions to the application of Voit's views.

Since that date a number of experiments have been made in Germany and elsewhere, both with pigs and with ruminants, to elucidate the point; and when the conditions of the experiments were suited to the object the results contributed to the REESTABLISHMENT OF THE CONCLUSION THAT THE CARBOHYDRATES PLAY A VERY DIRECT AND IMPORTANT PART IN THE FAT FORMATION OF THE ANIMALS OF THE FARM.

Further, in the edition of Wolff's work published IN 1885, HE ALMOST UNRESERVEDLY ADMITS THE ROLE OF THE CARBOHYDRATES IN THE FORMATION OF AT LEAST A GREAT PART OF THE FAT, NOT ONLY OF PIGS, BUT OF RUMINANTS. Indeed, some years previously Voit himself had made substantial concessions on the point.

It happens, however, that about 1880 Dr, Armsby, now the director of the agricultural experiment station at the Pennsylvania State College, published a work entitled, "Manual of Cattle Feeding; a Treatise on the Laws of Animal Nutrition, and the Chemistry of Feeding Stuffs, in their Application to the Feeding of Farm Animals," which was a very good digest, chiefly of the work done in Germany, on the subject.

So far as the question of the sources of fat is concerned, it gives numerous tabular illustrations from Voit's work; and it follows almost exclusively the views of Voit and of Wolff at that time. He, however, quotes results obtained both with pigs and with other animals, which he admitted indicate, according to the figures, the formation of fat from the carbohydrates. But he considered that the data at command were not sufficient to solve the problem, and, with Wolff, assumed that the question could not be satisfactorily settled without experiments in a respiration apparatus. He also considered that estimates founded on the composition of the increase of fattening animals as determined at Rothamsted are uncertain. He nevertheless concluded that the carbohydrates may serve as a source of fat to swine, and under some circumstances to other animals also.

It happens that Dr. Armsby's book, founded to a great extent on Wolff's earlier editions, is the only work of the kind in the English language; and hence many of the rising generation of agricultural chemists, both in this country and in America, have adopted the view that the albuminoids are the main, if not the exclusive, source of the fat of our farm stock and of the butter of cow's milk.

Under these circumstances it seemed desirable to consider in some detail both the experimental evidence bearing upon the question and the discussion which have taken place in regard to it during the last quarter of a century or more. IT MUST BE ADMITTED THAT THE IMPORTANCE OF THE CARBOHYDRATES AS A DIRECT SOURCE OF MUCH, IF NOT OF THE WHOLE, OF THE FAT STORED UP IN THE ANIMALS WHICH THE FARMER FEEDS HAS BEEN CLEARLY REESTABLISHED. I have reason to believe that Dr. Armsby himself adopts the change of view, though IT WILL PROBABLY BE SOME TIME BEFORE THE TRUTH IS THOROUGHLY RECOGNIZED BY THE YOUNGER AGRICULTURAL CHEMISTS.

(To be continued)

Household Matters.

1897.

Thoughts for the season — Earnings confiscated — Garments — Hints — Kitchen-helps — Good thoughts.

As usual, at this time of the year when people are feeling in good spirits after the gaieties of the season, many say to themselves: I am going to turn over a new leaf, and not have to regret what I have done in the past. Happy the person who can say this and stick to it.

Few of us I fear can reflect on the past, without finding some big flaw in our lives, that might have been prevented with a little care and thought on our part.

So let us turn over the new leaf and keep it so pure and clean, that we can have the pleasure of looking back and saying, my time has been well spent.

The youth of to day require very different treatment to that of their forefathers, who were brought up in an atmosphere of respect for their elders, mingled, with a wholesome amount of fear.

Progress in every stage of life has altered all this, and the young people of to day are young men and women at an age when their fathers and mothers were children.

It is pardonable pride when young people work for wages for the first time to have a wish to receive it into their own keeping, to look at, and realise that their labour has become of some value.

It is rather hard for one to see his or her earnings taken by the father or the mother.

I have seen a few cases of this kind, and I did not like the look the girl gave her mother on these occasions.

It was rather hard, after having worked during the summer and earned what to her seemed a large sum, not to have the pleasure of looking at it and feeling it was her very own. They might have trusted to her good sense not to keep the whole.

In this case, the girl left home, and came to town where she could earn and spend her wages just as she liked, and she did it with a vengeance.

Never having handled money, she did not know how to spend it, and the consequence was that at the end of a year she had very little to shew for her spending.

WINTER WOOLWORK. Now is the time to employ our hands once more with the making of some warm and, therefore, welcome trifles for our friends or ourselves, so we will consider one or two useful things of the kind.

KNEE-CAPS.—These directions are for ladies' size. Berlin wool can be used, though some prefer the fleecy; for my own part, I find the former quite sufficient, both for warmth and size. Take rather large-sized steel needles. Put on twenty five stitches. Do four rows of plain knitting and purl alternately. Then reverse them, so as to form ribs. When three of these ribs are complete, commence in the centre of the fourth one to increase (purl will then be facing you) by making one stitch on each side of the centre one. Then continue the remaining twelve as before to the end. Turn, and work the row right along to the end, purling. Next row, facing, do as before, by increasing by one stitch at the end and beginning of the twelve at the edge. Notice, these twelve stitches must be kept intact all along, from the commencement of the knee-cap to the finish, and one increasing stitch is made at their edge every time the purled centre faces you.

There will come to be forty-four stitches of centre-purling at last, together with the commencement of the sixth rib of plain, which is the eighth on the needle altogether. This is the top. On reaching it, the four rows of the rib at the edge must be done plain and equal in number; that is to say, the standard twelve at the edges and forty-four purl in the centre. On commencing the next ridge at the centre (to correspond with the former increasing) decreasing begins, being worked as usual at the commencement and finish of the standard twelve, so as to go downhill in the same manner as up. It will soon be seen now how to proceed, as the plan is clear enough.

On arriving at the last twenty-five stitches continue, of course, as before to match, and finish with three ribs as at first. When complete, stitch together. Very possibly for men's knee-caps bone needles will require to be used instead of steel ones, with fleecy wool, but I have never made any myself, though I have of course seen some. I would say that if these directions prove puzzling to anyone I shall be very pleased to correspond about them if written to. It is very difficult to explain in this manner. I ought to have added that the above takes 2 oz. of Berlin wool.

Correspondence.

The following letter is quite correct in its statements, but unfortunately they are founded in a misconception. Mr. Stockwell is speaking of "the best milking strains of Shorthorns," we spoke of "Dairy-Shorthorns," i. e., unpedigreed stock, such as is for sale every season at the Northern and Lincolnshire fairs and in Islington, London, market. Two very different things.—Ed.

Danville, Que., Dec. 15th 1896.

A. R. J. Fust, Esq.,
4 Lincoln Avenue,
Montreal.

In a foot note in connection with Mr. McCallum's interesting letter in this month's Journal you make the statement that "there is not a dairy Shorthorn in the province of Quebec."

Well if there are none in Quebec there is none on the continent of America.

It seems rather hard on the few of us here and elsewhere who have been doing our best to improve the stock of the country to be told that we are not "in it to", use a slang phrase.

Mr. C. C. Cleveland, late member for this and the adjoining county has spent both time and money, introducing the best Shorthorn blood he could find.

Mr. H. Elliott who has been so successful in the show ring has done the same.

I have done my best to secure the best milking strains of Shorthorns to be found. I purchased "Red Princess" who has many a time given me as much milk in a day as the average of the seventeen cows at the London (Eng.) show. She is a daughter of "Fair Maid of Hullet 2nd" No. 9047 whose record for ninety days at the World's fair in the butter test was a net profit of $44.88.

My young bull "Christopher Columbus", dropped at the fair, is a son of "Waterloo Daisy" whose record in this same butter test netted a profit of $48.66.

Now if stock from such a foundation cannot be classed as dairy Shorthorns I think you will have to admit that they are not to be found on the continent.

Could you not make an effort to come out to this section of the country and see for yourself what we are trying to do I think you would be pleased to see the spirit of progress amongst quite a number of our farmers and breeders, I am credibly informed that at least three silver medals are coming to this town and perhaps a gold one. You might change your ideas to some extent at least and we want to merit your good opinion.

J. N. Greenshields, Esq., of your city as well as the forementioned gentlemen and several others in a smaller way have done a great deal of good in improving the stock of cattle sheep and pigs in this section of the country and indeed all over the Dominion. Whilst G. K. Foster, Esq., has done his share in horses. We all get plenty of criticism from ordinary farmers for paying such prices for good foundation stock and we naturally expect such men as you to encourage us all you honestly can.

Come then and see us, write me when you are coming, I will meet you and drive you around and I assure you we will do our best to entertain you.

C. F. STOCKWELL.

To Arthur R. Jenner Fust.

Sorel, December 25th, 1896.

DEAR SIR,

We have finished threshing our grain, and, to my great satisfaction, I beg leave to say that we are astonished at the yield. We have:

750 bushels of oats;
260 " " barley;
50 " " pease.

1060

and all this on 23 arpents of land, i. e. 46 bushels to the arpent, (55 bushels, nearly, to the imperial acre!)

This is a proof that when one receives good advice—and follows it—one is always repaid for the trouble.

Most faithfully yours,

SERAPHIN GUEVREMONT.

(From the French.)

The Apiary.

Progress in Bee Culture—Protection during Winter.

At the last meeting of the American Beekeepers' Association the president, R. F. Holtermans, said, in his annual address :

As an occupation, beekeeping is making progress in many desirable directions. True, there are a few yet who try to belittle beekeeping by giving the impression that anyone can keep bees and succeed without experience and labor and others who think the experience of able men should not be presented. All this we are leaving behind us, and we are standing upon a broad and liberal platform. Our industry is being recognized as a wealth-producing power of the country, and we can justly be proud of our occupation.

The study of the life history of the marvelous honey bee has thrown open to scientific men some of the most beautiful laws of nature, in that way increasing our reverence for the Creator of all things, who has set these laws in force.

Many who are going in the cities could take hold of beekeeping with profit. The taking of honey takes nothing from the fertility of the soil. The bees are great public benefactors in the pollination of flowers, and day by day investigations reveal the importance of the honey bee in its relation to plant life. Honey is also one of the most economical and healthful of foods.

The speaker urged beekeepers to stand shoulder to shoulder to protect their market. As an association and as individuals, he said, we could do much to encourage the consumption of one of the most healthful of foods gathered from nature's laboratory, from fields and forests.

Bee Protection During Winter.

A very inexpensive and good way to protect bees for winter is to make bottomless boxes to set over the hives, says Farm and Home, large enough so that there shall be a space of 3 or 4 inches on the sides and 5 or 6 inches on the top. The front should be left open from the bottom up to the entrance. Nail a board about 6 inches wide to fit close to the hive at the lower edge of the board, which should come just above the entrance and upper edge come out to the edge of the box; that will leave the entrance open which can be partly closed with a small stick is so desired. The bees are left on their summer stands and the space between the hive and box packed with dry chaff or leaves. The boxes should come about 6 inches above the hives. After placing a cloth over the brood chamber, set a super on and fill full of chaff, then place the cover of the hive on and also have a cover to fit the box. If the location is very windy, a weight should be placed on the outer cover to prevent wind blowing it off. Bees should be packed about Nov. 1 in Michigan and similar latitudes. They should be examined after every snow storm to see that snow does not obstruct the entrance. That will be all the care they will need until May 1.

The Flock.

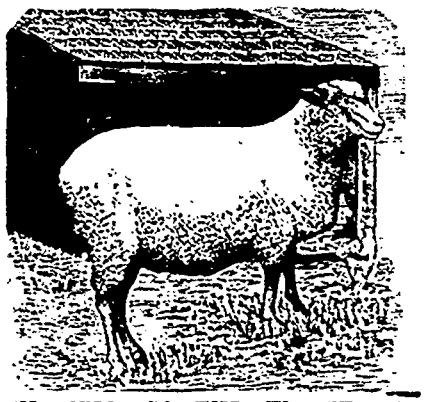
SOUTHDOWN SHEEP.

CHAMPION SOUTHDOWN WETHER "HEAVY WEIGHT" AND HIS RECORD.

Mutton—Origin of breed—Regularity of feeding.

With our improved methods of feeding and the growing of more roots, our farmers have learned how to raise as fine mutton as can be found in the other markets of the world. A Scotchman who judged the fat sheep at the live stock show held in Madison Square Garden, New York, last winter, said that he had never in his life seen a finer lot of sheep. The illustration shows Heavy Weight, 7007, a pure Southdown, bred and fattened by W. H. Beattie of Ontario. Heavy Weight as a lamb won first at Guelph, first as a yearling and sweepstakes at the same place, second as a yearling at the Columbian World's Fair, and first at both Toronto and London as a two-year-old. This wonderful wether should be carefully studied by all breeders and feeders interested in sheep. He is very evenly and symmetrically developed, with a saddle that would delight any epicure. He served as Christmas mutton for the members of the Union League Club. No better evidence of the value of New-York as a market for anything good can be adduced than the sale of fat sheep at the show referred to. They brought three cents a pound more than market price, and the supply was nothing like the demand.

The Southdown breed derives its name from a range of chalky hills or



CHAMPION SOUTHDOWN WETHER

downs in England, and most of the credit is due John Ellman, (1) who, without impairing in the least their hardy constitution, succeeded in bringing them to a great perfection, with regard to a more symmetrical and profitable form, superior flesh with early maturity. His success was so great that he formed a flock, from which the best blood of the breed has since been derived. The Southdowns have a closeset fleece of fine wool, weighing, when the animals are well fed, about four pounds; their faces and legs are of a dusky brown, nearly black color, necks slightly arched limbs short; body broad and compact, offal light and the buttocks very thick and square behind. They are easily confined and do better where land is limited than almost any other breed. Of course they will thrive best where well fed and well cared for, making a very profitable breed for any farmer where wool and mutton are both desired They attain early maturity, are hardy and prolific, often producing two at birth. The lambs are large, hardy and mature early; when eight months old they are said to dress from 60 to 100 pounds. Though naturally an upland sheep, they thrive equally well on lower sections. They make an excellent cross on native sheep, the progeny taking after the sire.

Mr. Beattie's success in the show yard with fat sheep entitles his words to some weight in feeding sheep. Listen to what he says: "I always feed my sheep, with the greatest regularity, never at one time to-day and another to-morrow. I never leave any feed near the sheep; this is suicidal to all success. Give the sheep as much water as they want, and plenty of salt. Be gentle with them, and never startle them. A sheep that is fattening does not need much exercise. Their business is to lay on fat, and to do this they must be contented and happy."—E. T. Reddick, in "American Agriculturist."

(1) Ellman's wethers weighed 64 lbs. at 2 years old; Jonas Webb's weighed 112 lbs to 120 lbs. at 18 months. Lambs of the Hampshire-down breed at 9 months often weigh as much as the latter. Ed.

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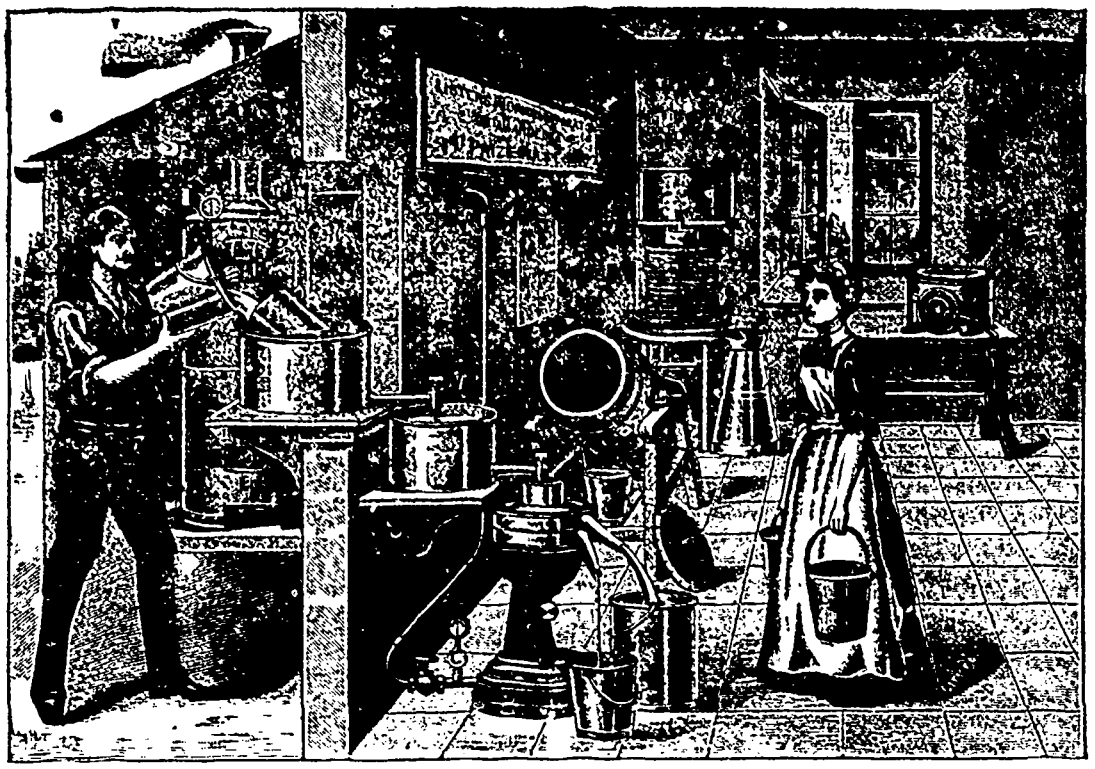

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These improvements make the Press lighter, stronger, easier on the horses and more power with a shorter level. This is the leading Press in the United States and Canada.

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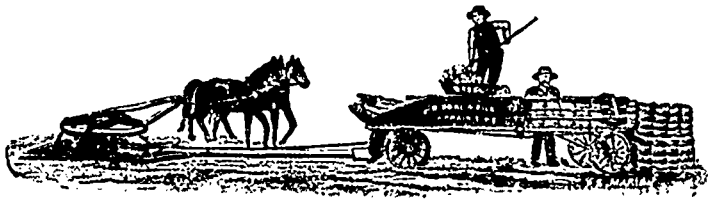

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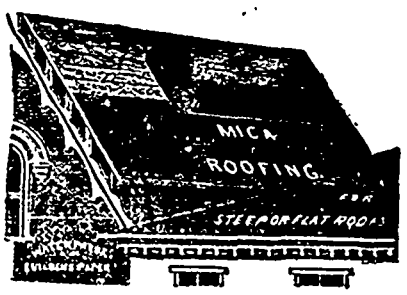

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