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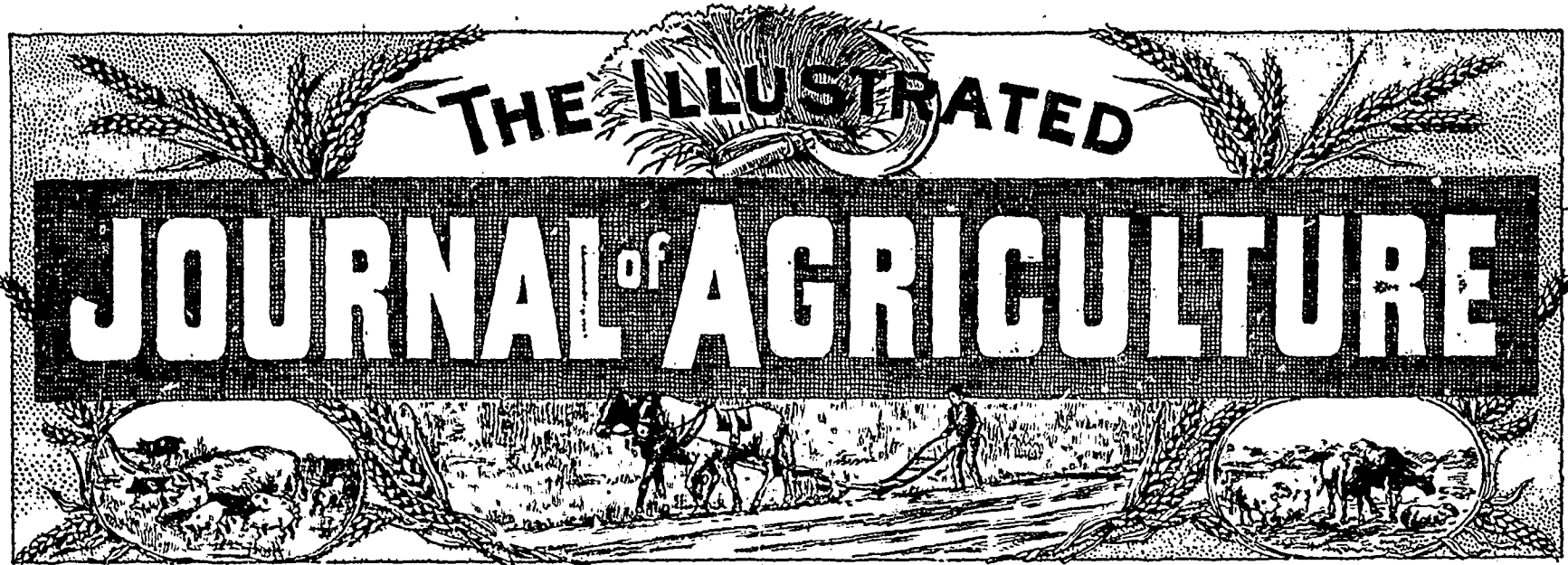
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THE ILLUSTRATED JOURNAL of AGRICULTURE



Vol. 16, No. 12.

MONTREAL, DECEMBER 1, 1894.

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The Illustrated

Journal of Agriculture

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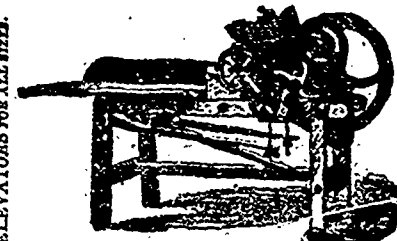
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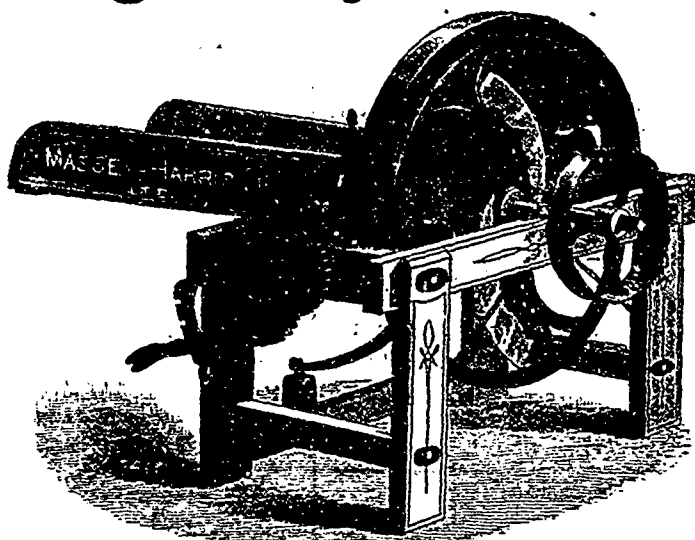
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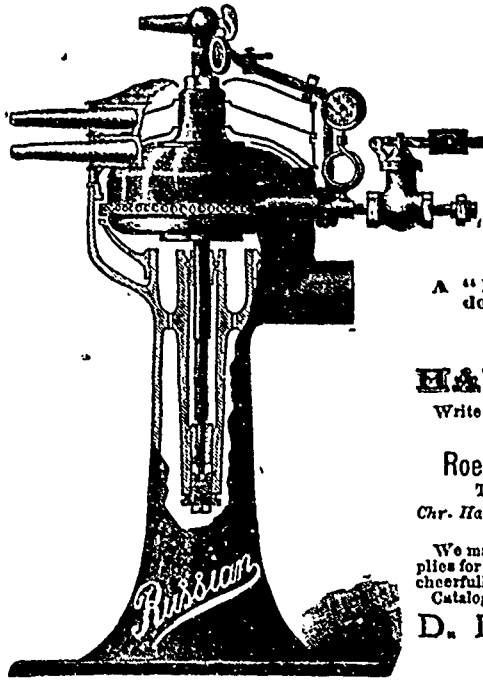
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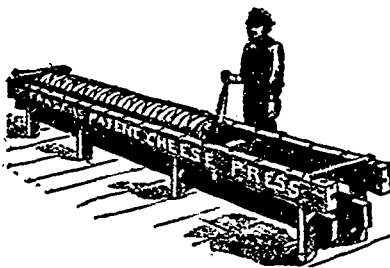
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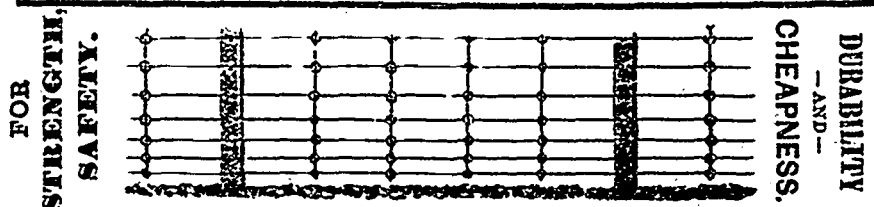
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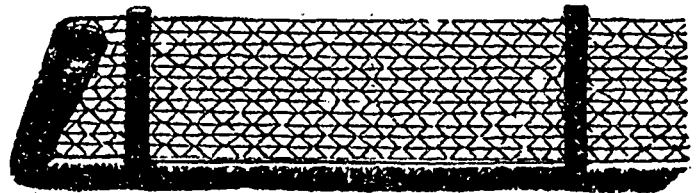
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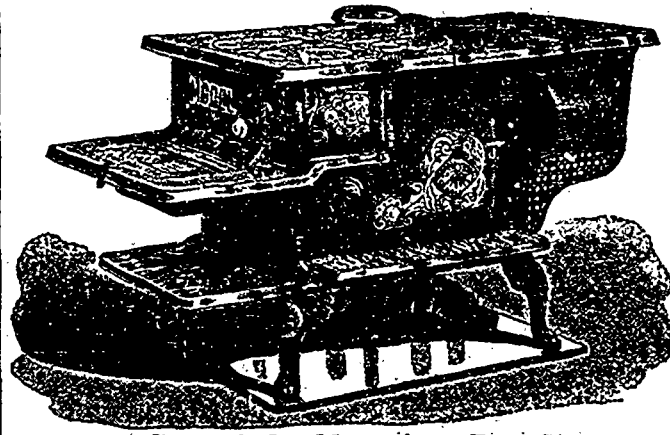
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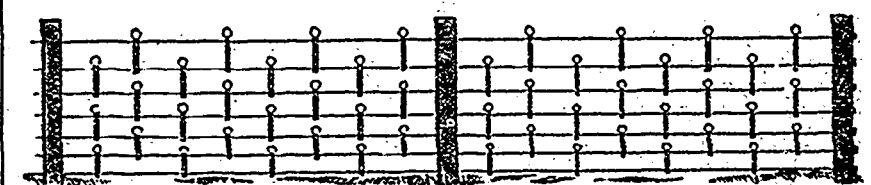
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THE ILLUSTRATED
Journal of Agriculture

Montreal, December 1, 1894.

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Notes by the Way.

A frost on September 6th, and a pretty severe one, though in Montreal the flowers were not cut up in the least. In the yard behind the writer's house, a plant of the scarlet runner, as tender as most things, is to-day, November 5th, as green as it was in August. What a pity it is that, for some reason or other,—prejudice or ignorance,—people do not eat the green pods of this bean. They are, in our opinion, about the best flavoured of the bean-tribe, and highly valued in English kitchens. Besides, if people will not eat them, they might as well pick them, as allowing them to remain and ripen on the plant will soon put a stop to its production of flowers. We never saw the scarlet runner affected by the anthracnose, the scourge of the butter-bean: have any of our readers observed it?

Hop-picking by ladies in dear old Kent is not uncommon sight. Of course it is done for charity purposes, such as to aid an old woman who is unable to fill the bin herself; or the pay is given to the church restoration-fund. Hardly necessary to say that it is not practised in the large hop-gardens where crowds of the scum of Whitechapel and Bermondsey are at work. One great good is done by this custom: the language of the poorer and less instructed class becomes yearly more refined.

Hop-growing, by the bye, cannot be a very profitable occupation just now, judging from the prices obtained for the crop. The finest Goldings—East-Kent—are only worth 20 cts. a lb., and Foggles have hard work to reach 14 cts. Many an acre of land that in most years brings a good return to the grower will go unpicked this year. Many of the late pickings, including Goldings, owing to the frequent changes in both weather and temperature, are bad in both colour and condition. (1) The crop is one of the largest grown during the present century, but the expense of cultivation is enormous, all the ground being dug over once a year, and the cost of picking and drying has been as much, or rather more than, one third of what the hops sell for. It is a speculation-crop after all, is the hop, and, though we were born in the great hop-county, we never knew any one get rich at growing it. Ellis, of Barming, who had 300 acres of the finest soil in Kent under hops, died insolvent, though he was one of the best farmers in the county, and looked closely after his business.

Mustard.—Why should we not try growing mustard here? There is plenty of land fit for it, and, if it hits, it yields prodigious returns: 30 to 50 bushels an acre. Sown early in May it ripens in August. The white sort is not what we are recommending; that is only fit for sheep feeding in its green state. The sort used for the table is the *sinapis nigra*, the black, or more correctly, brown mustard. It does best in moist loamy soil—no use at all on sands—and may be sown in the hoed-crop limb of the rotation. Plough deep before winter; grab, harrow, &c., in spring, and drill in half-a-peck, or a little more, to the acre, about 15 inches apart. It must be well hoed, kept clean, and thinned

(1) Condition refers to the yellow powder in the cones: *Jupulinea*.—Eo.

out about ten inches apart in the row. Black mustard is a quick growing crop and seldom fails. The price in England is very low now, consequently very little will be sown next spring, as it is one of those crops that are either sown there or not according to the market. So now is our time to try it. The ordinary price is from 12 to 15 shillings a bushel.

Winter-calves.—First class Easter veal may be made from the steer calves, which always find ready sale at good prices—yes, at prices which the owner of the same steers a year later would often be glad to get. Christmas veal may also come from a like source.

Prizes awarded at Sherbrooke for a description of the carrots, mangolds, silage, &c., were won by Messrs. Robertson Irving, and others. At page 000 of this No. will be found statements of the manner in which the gentlemen referred to conducted their proceedings. Every agricultural association holding important exhibitions should follow the example set by the Sherbrooke people in offering prizes for the different objects contemplated by the Department of Agriculture in the September No. of the Journal, p. 164.

November 6th, such a "killing frost"! The gardens in the country must be done for at last. The scarlet-runner mentioned above is finished.

Barley is now, in England, worth just twice as much a bushel as wheat. Best malting qualities sell for 5 shillings a bushel, and the average price of dry red wheat is 2s. 6d. Too much of the latter grain was carried too soon and is damp; this has reduced the value below what it would have been had a little patience been exercised; but the harvest was a long and dragging one, the labour cost much more than usual, and the funds in the farmer's hands were very low. While best white samples of 1893 at Reading are worth 28s. a quarter, much decent red-wheat has been sold in Lincolnshire for 16s. New-Zealand oats are still fetching 27s. and 29s., while now black-Tartars hardly exceed 16s.

Mutton in England is high in price; that is, for the best small sheep. Down tegs are worth 19 cents a pound, but Canadian can be bought for 11 cents! We are waiting with anxiety to hear how the 3 yr.-old wethers from Manitoba sell. We can hardly believe that keeping non-breeding sheep for 36 months can prove remunerative to any one.

Hay in England is at a reasonable price; it has not fallen so low as the enormous crop of this season led us to expect. Clover, after having been quoted during the past winter and spring at from 15s. to 25s. lower than meadow hay, has at last regained its normal position, as we observe that it is now worth 135s. a load of 36 trusses = 2,016 lbs., while meadow-hay is to be bought for 120s. Straw is selling for from 22s. to 38s. a load of 36 trusses of 36 lbs. each = 1,296 lbs.; or, according to our provokingly absurd English computation, 11 cwt. 2 qrs. 8 lbs. So most of our readers

will see that to calculate the value of an animal, a lot of grain, or a load of hay, on the London market, to one unaccustomed to that entropot, no easy task. And more: whereas at Islington, cattle are sold at "per stone of 8 lbs.," at Romford, not 12 miles from Islington, butchers buy at "per score of 20 lbs." = 2½ stone! The Cheshire hundred-weight is 120 lbs., whereas the Cheddar is 112 lbs. And yet, no longer ago than last week, a young London Broker, whom we had the pleasure of meeting in Montreal, told us that "there was not the least prospect of the English ever adopting the decimal system."

Fattening pigs for bacon.—We have fattened lots of bacon-hogs in our time. About the best we ever had ran the woods during a great acorn year, and were finished off on pease for only three weeks, dying from 200 to 220 pounds each and plumping rather than shrinking in the pot. At the present low price of wheat, a mixture of that grain and barley, with about one-third pease, should turn out good hogs. If boiled potatoes are given, the proportion of pease should be increased. The Kent men used to give the pease whole, after soaking; but it is better to grind them with the other grain, and if the food is fed warm the pigs will not be the worse for it. Of course, except when the hogs are in styes where the temperature can be kept at from 58° to 60° day and night, all fattening should be finished by the setting in of winter.

Relative value of foods.—The following table must be only taken as a comparative guide. The very great difference that subsists between the skill and pains bestowed by individuals on their herds and flocks, needs no insisting on. On one of the finest farms in the Eastern-Townships, worked by a most intelligent man, we have seen two score of great 3-yr.-old bullocks tied up and feeding on nothing but hay, their house almost entirely without ventilation, and the floor so foul from the accumulation of their dejections, that it was enough to sicken a scavenger. Here, the column, "Cash value of manure produced," would need very large deductions.

Our readers will be good enough to observe the feeding value attributed to our favorite food, linseed; for, after all, the feeding value of any given stuff is the principal thing. Sixty-two pounds more live-weight seems to be derivable from a ton (212 lbs. x 20) of wheat than from a ton of bran, and carrots are superior in feeding value to swedes in the proportion of 26:20. The whole table is worth study.

Relative value of food.—The following is a table showing the average increase in live weight of cattle and sheep per ton of food consumed, and the value of the increase at 3½d. per lb.; also half the original manure value per ton of food consumed in the case of cake, grain, and roots, and one third in the case of hay and straw after deducting the constituent in live weight increase, based on Sir J. B. Lawe's experiments.

What is meant is that when any one of the foods are given in judicious amount and admixture with other foods, which experience shows to be beneficial, it may be estimated that one ton of the food so consumed will approximately contribute the amount of increase in live weight stated.

Description of Food	Average Increase in Live Weight per Ton of Food in lbs.	Value of Increase in Live Weight at 3 ^d . per lb.			Cash Value of Manure Produced.			Total Value per Ton of Food Consumed (Live Weight Increase at 3 ^d . per lb. and the Cash Value of the Manure Produced).		
		£	s.	d.	£	s.	d.	£	s.	d.
Linseed	448	6	10	8	1	9	0	8	0	5
Linseed cake	373 ³ / ₁₀	5	8	10	1	19	3	7	8	1
Cotton cake (Dec.)	344 ⁹ / ₁₀	5	0	6	2	16	6	7	17	0
Cotton cake (Undec.)	280	4	1	8	1	14	4	5	16	0
Peas	320	4	13	4	1	7	6	6	0	10
Beans	320	4	13	4	1	11	0	6	5	1
Maize	311 ¹ / ₁₀	4	10	9	0	12	6	5	3	3
Wheat	311 ¹ / ₁₀	4	10	9	0	14	3	5	5	0
Barley	311 ¹ / ₁₀	4	10	9	0	13	1	5	3	0
Oats	298 ⁷ / ₁₀	4	7	1	0	14	11	5	2	0
Bran	249 ¹ / ₁₀	3	13	9	1	9	2	5	2	11
Clover hay	1 0	2	6	8	0	13	9	3	0	5
Meadow hay	149 ¹ / ₁₀	2	3	8	0	9	6	2	13	2
Wheat straw	106 ⁷ / ₁₀	1	11	1	0	3	4	1	14	5
Barley straw	107 ⁴ / ₁₀	1	8	5	0	3	4	1	11	9
Oat straw	124 ¹ / ₁₀	1	16	3	0	3	10	2	0	1
Potatoes	37 ³ / ₁₀	0	10	10	0	3	2	0	14	0
Carrots	26 ¹ / ₁₀	0	7	7	0	2	1	0	9	8
Swedes	20 ³ / ₁₀	0	6	0	0	2	3	0	3	3
Mangels	23 ³ / ₁₀	0	6	9	0	2	6	0	9	3
Yellow turnips	16 ⁸ / ₁₀	0	4	10	0	2	0	0	6	10
White turnips	14 ⁹ / ₁₀	0	4	4	0	2	0	0	5	4

ANNUAL CONVENTION OF THE DAIRYMEN'S ASSOCIATION.

The annual meeting of this most useful society will be held at St. Joseph, Beauco, on the 4th, 5th and 6th of December. Many of the subjects most deeply interesting to the farmers of the province will be discussed, and the promised presence of such men as Messrs. Taché, Cattle and other practical dairymen should ensure a full attendance. There ought to be at least 2,000 members of the association; for the subscription is only one dollar a year, and the Report, annually issued, of the addresses and discussions at the meeting is worth far more than that trifling sum.

Electricity on farms.—This scheme, for increasing the yield of crops, is again raising its head, and this time in the States. We remember its being put in practice on the estate of Sir Humphry de Trafford, in Lancashire. This was, if we remember, in the forties. Wires were laid under-ground and connected with cross-wires attached to poles about 10 feet high. There is no doubt about the effect, for we remember well the expressive *patois* of one of the men employed in cutting the crop: "Blame t' wires! When us got to them t'gers were so thick and carse, we couldn't do nothing with em." Still, the inconvenience in "handling" the crop was so great that the poles and wires were soon taken down and never replaced. As to electricity being used as a motive power on the farm, that is quite another thing: that will be seen at work before ten years are over.

Three-yr-old wethers.—We have just run up against an extract about the sheep mentioned above that we had mislaid.

The Canadian Agricultural Company, whose headquarters are at Calgary, Alberta, has sold to Gordon & Ironsides, 700 prime fat 3-year-old wethers, from the same band as those with which the Company won the 1st, 2nd and 3rd prizes at the recent Winnipeg Industrial Exhibition. Gordon & Ironsides have shipped them to Liverpool. These are the first sheep

which have been shipped from the N. W. T. to the English market, and should the experiment prove successful, as it is confidently expected it will, further shipments will be made. Gordon & Ironsides have also purchased about 700 fat wethers from W. L. Nichol of Medicine Hat, Assa., for the English market.

Sugar-Beets.—In the October number of the *Journal d'Agriculture*, the common practice in this country derived from the damp soil and climate of Scotland and Northern England—of growing swedes and mangels on raised drills (*billons*), is proposed for adoption in the cultivation of the sugar-beet. To this proposed improvement we cannot agree, and we proceed to give our reasons:

First, the sugar-beet does not grow out of the ground as the swede and mangel do. Secondly, the sugar beet, unlike the other two roots, is above all things to be prevented from growing large, as a weight 1³/₄ lb. is the size the factories desire, that being the weight most easily dealt with in the extraction of the sugar. Thirdly, drills can hardly be made at intervals of less than two feet, and, with the small roots required by the factories, the crop at that distance apart would necessarily be small. The distance recommended by all the authorities on the cultivation of this crop, is 16 x 7 inches = 112 square inches to each plant, whereas the number of square inches, if the drill system is followed, occupied by each plant would be 168. Again, we incline to think that the concentration of the dung in the drills would not tend to improve the quality of the beets, through experiments are needed to settle that point. Lastly, one great advantage in the drill system is that the hoeing and singling of root-crops thus grown, expose large quantities of fresh earth to the air, as in the above operations, the raised drill is necessarily pulled down almost, if not quite, to the original level of the soil, and this, though highly beneficial to the swede and mangel, cannot improve the quantity of the beet.

Vetches.—Tares, or vetches, are being tried with oats for the feeding

of cows in Wisconsin, and a dairyman writes to the editor of Hoard's paper to know how it is that he could get no crop if he sowed them in the spring. The reason for his failure probably was that he sowed the small winter tare instead of the large vetch. The quality of the former is much superior to the quality of the latter, but unless sown in the fall its yield is very much less. It is useless to expect a real crop of tares unless the land is in good condition.

Beans.—The quantity of seed to the acre of this plant depends greatly upon its sort. It is absurd to sow the same number of pounds of the large China bean and the small pea-beans. It is the same with all seeding: one seed of the Talavera wheat the larger wheat-grain we know, occupies half as much space again as a seed of the Chidham wheat, and yet people in England persist—or used to persist—in sowing the same quantity of seed to the acre of each sort, and then wondered why the plant of one looked so much thinner on the ground than the plant of the other!

And so with the condition of the land, its state of fineness, and the earliness or lateness of the season. Land full of manure, thoroughly well worked, and sown early, requires far less seed than worn out land, in a rough state, and sown late.

Rape.—Monsieur Gabriel Henri, in an article in the *Journal d'Agriculture*, advises farmers to sell some of their cows, and to supply their place with sheep at the rate of 8 or 10 sheep to each cow dispensed with. This, he says, will enable them to utilise many products of the farm that are at present wasted. M. Henri recommends the sowing of tares in the early spring to be followed by rape, both crops to be fed off by sheep where they grow. No food, he observed in conclusion, is so adapted to fatten sheep as the rapeseed. Wherein, we need not say, we perfectly agree with M. Henri, and this leads us to consider the early preparation of the land for the two crops, or double crop, mentioned.

Why will not farmers get more land cleaned and ploughed in the fall? Even my good friend and pupil, M. Séraphin Guérémont, of Sorel, though sufficiently amenable to argument on other points, can hardly be persuaded to plough his stubbles for the root-crop before winter. It is very clear that where it is intended to grow the above double crop for sheep, there will be no time in the spring to clean the land before sowing the tares, and the interim between the consumption of that crop and the sowing of the rape must be necessarily so short, that nothing can be done to get rid of the weeds in it: so, it follows that the rubbish of all kind gets ahead, and if, as it naturally will happen, grain and grass seeds are sown in the following year after the rape, the land will lie out for probably at least 4 years, to the intense delight of couch-grass and other weeds.

Monsieur Péloquin, of St. Hyacinthe, sends an account of the cropping of three acres of land at that place, to the French edition of the *Journal*, in which we are glad to remark his success with sugar-beets. The crop turned out 18 tons to the *arpent* which, at \$5.00 a ton, represents about 21 x 5 = \$105.00 to the imperial acre. M. Péloquin, tired of buying rubbish in the form of dung from the stables in the town, follows the plan so common in England of

buying cattle in the autumn—bulls, bullocks, and cows—"to make dung and to give my family something to do during the winter. I strive to lose none of their droppings, buying straw in abundance to absorb the urine. I have a liquid manure tank; the solid dung is well mixed and made into a flattened heap which is trodden down tight by a horse about every fortnight or so, and well water with the contents of the tank. Treated thus, the dung is constantly heating, sufficiently so as to kill all the weed-seeds, but I can regulate the temperature, if I see that it is getting too hot, by adding a greater dose of the liquid. This manure I know to be rich, because it comes from well fed fattening beasts, which are sold to the butcher in the spring: it is far superior to the dung I used to cart from the town."

M. Péloquin states that the gross return from 3 *arpents* during the rotation of ten years was \$595.50.

S. B., A correspondent of the Country Gentleman, writing from England, says that the shorthorns at the Dairy-show lately held at Islington "were not much." That might be the case, but at all events they beat every other breed of cows exhibited there, both in quantity of milk and weight of butter.

Chou melleux or tree cabbage.—A subscriber is anxious to know if the plant has turned out profitable or not; and how the crop compares, as to weight per acre, with such cabbages at the St. Denis, drumhead Savoy, &c. (1)

The *Jersey Bulletin* has commenced its old time carping against the Babcock test. It has been hit under the fifth rib by the test doing justice for some first-class Holstein cows at fairs. It reminds us of the old Hoosier drunkard who said, "it beats all nature how I've lost my taste for everything but whiskey. I don't believe there is any thing else anyway."

Hoard.

The *English Wheat Crop* is reported at 33 bu. p. a. this year. The average yield of the United States will be less than 12 bu. About 300 years ago England's yield was about what that of the United States is now. And still farmers continue to waste manures and turn straw.—*R. & H.*

Mr. N. Simon, of Neonah, Wis., who won such a fine reputation for the making of full cream cheese at the Columbian World's Fair, went to England the past summer to see what he could do in making a market for the fine goods he is making. Let it be remembered that he was in the market largely possessed by Wisconsin cheese only a few years since. The spirit and response he met with was very disheartening and may be stated in the words used by a Liverpool dealer:

We want no more to do with your Wisconsin cheese makers. We have tried you and have been swindled. You will send us a few fine cheese and then the first we know dump a lot of filled cheese on us. We shall trade no more with men who cheat and defraud. *When we want good cheese we send to Canada.*—*Hoard.*

(1) Monsieur Castel, of the Dairy-school, speaks highly of it. Those he saw at Sorel were but poor things, but they were probably planted late.—*Ed.*

Correspondence.

Richmond Nov. 3d. 1894.

Sometime since, I recommended to the farmers of the neighbourhood co-operation, if they wished to succeed in the competition with other countries. His Ex. the Govr. Genl. in his tour lately through the Lower Province gave to the farmers the same advice.

I now propose to show the farmer how he may succeed, with the assistance of his own family, in keeping thirty cows, for one year, on the produce of one hundred acres of good well cultivated land. To do this, the farmer must employ labour, and it is here, where the family, instead of leaving home, must co-operate to save hired labour.

The crops I recommend the farmer to grow will be ten acres of oats, pease and vetches mixed, out green or as soon as the crop begins to change colour—not later or the cows will leave a quantity—cured the same as clover hay, three acres of corn ensilage, two acres of turnips, three acres of beets, one acre of carrots and one acre of potatoes: the best of these latter to be used by the family; ten acres of barley, the straw used for bedding, the grain to be fed to pigs, etc. The barley to be seeded with clover, of different kinds, orchard grass and timothy, ten acres of clover hay, and ten acres of timothy hay, to be pastured the following year. The above will give over sixty pounds of nutritious succulent food per day to each cow, with a constant change for the eight months of winter weather, leaving forty acres for pasturage and ten acres for green fodder, besides a quantity of second crop of clover. The cows must be kept in the house during the eight months, except occasionally during a fine, warm day, but must not be allowed to run on the pasture.

During the four months of summer the cows should be kept in a well ventilated stable with wire netting over windows and doors to keep out flies during the day and be pastured at night.

With this attention and feeding, the cows will give a large quantity of rich sweet milk during the winter and that is the time when butter realises the highest price. No other stock of any kind should be kept in the stables, if the farmer wishes to make a first class article. Cows should commence calving about September.

I have no doubt that the greater part of this will be objected to as an impossibility, and as a farmer told me, I was too far a head of the times. I am sure, however, that something of this kind must be done. The farmers of the Eastern Townships have a great deal in their favour in climate, soil and water.

AYLMER.

BORDEAUX MIXTURE.

TO PREVENT POTATOES FROM ROTTING.

I tried the Bordeaux Mixture this season and found it kept the potato stalks much longer green. This year none of my potatoes rotted and so I cannot claim it would keep them from rotting. I applied it the first time on the 8th July 1894, the second two weeks afterwards, and the third a fortnight later. As regards the crop I could not say exactly how much better the crop was where the Bordeaux mixture was applied, but the stalks keeping green must be an advantage to the crop. I will try it again next year and will mix l'aris green with it; this will save a good deal per acre,

for I am told that a half less Paris green will kill the potato bugs than when mixed with land plaster and put on dry. I used a force pump to spray the potatoes. The barrel I put into an ordinary water cart and sprayed four drills at a time, letting the horse walk as quickly as he liked.

(Signed) D. McLAHLAN,
Petite Côte, Montreal.

(True copy)

(Signed) HUGH BRODIE,
Soc'y. of Hochelaga
Agri'al Soc'y.

Montreal November 12th 1894.

Household-Matters.

The small white bean.—It has been a matter of wonder to me for some time, why the Americans in the country are so fond of pork and beans for breakfast, especially on Sunday mornings. I solve it in this way. Years ago they often had to drive miles to Church, so some wise person must have found out the great nourishing power of the bean, and their descendants have kept up the good old custom.

Who has not heard of the Boston baked beans? Having eaten of them I no longer wonder at people liking them so much. I saw 10 dishes served one morning for breakfast, on board a Pullman-car. Why will not people use them oftener in their houses? They are not troublesome to prepare, and if the way of serving them up is varied a little, no body can object to them. If you want a good dish, you must have good beans to make it; they must cook slowly; and the beans must be of one year's growth, as the old ones take twice as long to cook as the new. The farmer ought to have them to perfection, as he can give the old ones to the cattle. We poor people in town are obliged to put up with the mixture that the unscrupulous seedsman, or store keeper, chooses to dole out to us.

How to make a dish of baked beans.

—One quart of beans will serve a very large family. Soak them all night, well covered with water to give room for swelling. In the morning pick out any that are not nice, and put the rest on, in a pot well covered with fresh water, and let them cook very slowly indeed. A nice piece of pork can be cooked with them, if you feel certain of its not being too salt, or otherwise cook in a separate pot. When the beans are just tender, put them in a dish or pan that you can cover over; a table spoonfull, of molasses is to be mixed with them, taking care not to break the beans, then cover over, having previously put the pork in the centre of the dish, let them remain in the oven till about half an hour, before you want them, then if you like them brown take off the cover and let them stay a little longer in the oven.

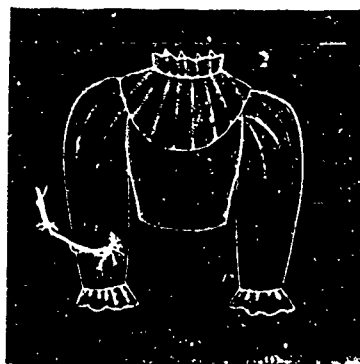
If there are any beans left over after making your dish, they are very good indeed eaten with white sauce poured over them, into which has been put a little chopped parsley, or eaten with pepper and salt with a little vinegar.

Any way they are good, and should you prepare your baked dish on Saturday for Sunday morning breakfast, I hope the whole family would be able to go to church, and having had a nourishing breakfast, would wait patiently till dinner was ready.

I hope this article will convert a few people to the hitherto much neglected little white bean.

A little talk on Roasting Meat.—When roasting meat, be sure to have a wire stand in the pan for the meat to rest on, to keep it from touching the water, that so many people put in the pan to keep the meat from burning. The roasting pan now so much in use has one to be half filled with water, and one other sitting over this made of tin with a dent like a spoon, in one corner for the gravy, and a rack on this on which stands the meat. The water in the bottom pan keeps the top one from burning, and by turning the meat often and basting with its own gravy, you will have the meat well roasted, instead of half stewed as it always is when put into a pan with water.

The little dress shown this month would make a very pretty party dress for a child, or worn with the guimpe, will form a very pretty costume for a child of any age from 4 to 9 years old. It is so simple to make and does not



GUIMPE.



OVERDRESS.

need any trimming, as the whole thing is made of the same material, with the exception of the guimpe which can be made of any kind of silk or stuff to suit the taste or pocket of the maker.

Plum Pudding.

$\frac{1}{2}$ a pound of flour.
 $\frac{1}{2}$ a pound suet chopped fine.
1 pound raisins stoned.
1 pound currants washed and dried.
 $\frac{1}{2}$ a pound citron and lemon peel.
Very small cup of bread crumbs.
 $\frac{1}{2}$ pound of sugar.

This to be well mixed, and 6 well beaten eggs added. Should a little moisture be wanted beside the eggs, add a very little milk. It must be just as stiff as you can just move it: a little brandy if liked. Tie up in a cloth quite firm and boil for 6 hours. To be eaten with brandy sauce: one cup of milk and water boiled thickened slightly with corn starch into which put a little sugar and brandy.

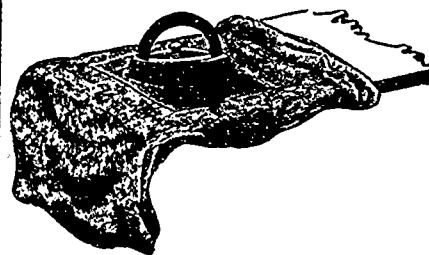
To roast turkey.—The sinews of the legs should be drawn, which over way it is dressed. The head should be twisted under the wing, or cut off. In cleaning be very careful not to break the gall or let it touch the liver, as it will give a bitter taste to it.

Stuff well with sausage meat and bread crumbs with a little seasoning of herbs and one egg to bind it. Cover the bread well with slices of bacon or pork, which will keep the breast from scorching. It will frizzle up and fall off giving plenty of time to cook well with the other parts. Baste well, serve with gravy in the dish, and plenty of bread-sauce in a sauce-tureen.

MENDING GRAIN SACKS.

J. L. TOWNSHEND.

Mending the holes in grain sacks is a task that the farmer's wife dislikes, hence the holes gnawed by mice and rats are often stopped with a corn cob, or the sacks are thrown away. But here is a plan that proves to be what every farmer needs. The articles needed for mending grain sacks are: an old sack that may be cut up for pieces; a batter made of flour and cold water; a hot flat iron and an ironing board to fit inside the sacks. Place the board as shown in the illustration in a sack with the hole to be mended on the upper side. Trim away the ravelled edges with the scissors or a sharp knife. Cut out a



MENDING A GRAIN SACK

patch having at least an inch margin larger than the hole. On this margin apply a coat of the flour paste, place the patch in position and press it thoroughly with the hot flat iron. The batter penetrates both patch and sack and firmly unites them. Pieces of denim, ducking or other stout material may be used where bagging is not available. The process is so rapid that a hundred sacks may soon be repaired. Carpets may be neatly mended in the same manner without removing them from the floor.

Home Made Shoe Polish is prepared as follows; Mix lampblack to a smooth paste with vaseline. Apply with a flannel, and it will preserve instead of cracking the leather, as is the case with most liquid polishes.

For Dish Towels.—In farmers' families where a great many crush towels are needed it is better to take the hand towels for dish towels after they begin to get thin. Cut into convenient length and hem on the machine. They are softer than new ones and if taken before the threads break, will last a long time, while as hand towels they would soon be past usefulness.—(Ella.

Much Depends on the Shoes.—I wonder how many tired, over-worked women have thought what an important part the foot-wear played in the weariness or comfort of the body. By actual experience I know that oftentimes one becomes tired and weary

much sooner by an uncomfortable pair of shoes. A good, comfortable shoe, with a low or spring heel, will add a great deal to the comfort of the housewife who has to be much on her feet. I would not advise a spring heel where one has to be out in muddy or slippery weather, as one is more apt to slip than with a low heel,—although at such times the feet should be protected by rubbers—but for housewear they are much more comfortable than even the low heel. When one is very tired, bathing the feet will be found to be very restful. There is something in the soothing influence of a good foot-bath which seems to be magical to tired nerves and muscle.—(Mary V. Shutt.

Lemons keep well immersed in Indian meal.

Ground Coffee keeps well in glass fruit jars with cover screwed on. One pound of ground coffee will a little more than fill a quart can.

Pancake Turner.—A short-handled pancake turner is much better than a spoon for taking up eggs from a frying pan.—E. R.—A. Ag.

A little fun for the boys, and girls.—Simple steps in science.—An amusing contest.—A candle and tub of water are the materials required for a novel and amusing contest. Put the candle in the water and offer a prize to the boy or girl who can lift it from the water with the mouth. It looks a very easy thing to do but experience will prove that it is not so simple as it appears to be. If any of the contestants object to a candle, a small rubber ball, such as children play with can be substituted, and it will do just as well. J. BRE.

Game of Curtesying.—This is how to play a very merry game. All join hands in a circle, one of the party starts running round them on the outside of the circle. When passing, he touches some one lightly on the shoulder, this one immediately leaves the circle and also runs round, not however, after the person who touched him, but in the opposite direction. When they meet they must curtesy three distinct times to each other, and then run on quickly to see who will reach the gap in the circle first. The winner takes the vacant place, while his adversary repeats the running, touching and curtesying to some one else, and so the game goes on until each player has had a run, or the children want a change.

What is Home?—Home, a world of strife shut out; a world of love shut in. The place where the great are sometimes small, and the small often great.

The father's kingdom, the children's paradise, the mother's world

Where you are treated best and you grumble most.

The comfort youth does not fully appreciate, which young men and maidens desire, which the middle aged generally possess, which the old rightly value.— A. AG

Nut Candy.—2 cups white sugar, $\frac{1}{2}$ cup of milk. Boil 20 minutes and add one cup of nuts. Now beat until very thick, and pour on buttered plates.

The Poultry-Yard.

Something more about Winter Rations
—Cut Green Bones as a perfect food
—Why they are so good Difficulties to be overcome—Inducement to procure eggs in winter.

A. G. GILBERT.

In my last article I mentioned some rations which were calculated to stimulate the hens to lay eggs in winter. In preparing a ration for winter the aim should be to embrace in it all the constituents that go to make the egg. What are the constituents? Mr. Warrington, a chemist of note says in the *Agricultural Gazette* of London, England, that the white of an egg is rich in the alkalies, potash and soda, a part of the latter being apparently present as common salt; the yolk is extraordinarily rich in phosphoric acid; it contains also much more lime than the white. "The largest ingredients in eggs," he continues, after giving several analyses of the different constituents "are lime, nitrogen and phosphoric acid." These are fundamental facts to be borne in mind when arranging the diet of a laying hen. It is apparent that lime is an important constituent, and yet how often are winter rations prepared without any thought of the material to make the shell? Investigation and experiment, up to date, have led to the conclusion that cut green bones are the most perfect egg producing food, at present known, because they are rich in phosphoric acid, albumen and phosphate of lime. Cut green bones are also preventives of egg eating, feather picking and the laying of eggs with soft shells.

WHAT TOO MUCH GRAIN WILL DO.

If nothing but grain is fed to a laying hen in confinement during the winter season, after a while she will lay an egg with a thin shell. This is a hint that she is not able to extract enough lime from her food to make a perfect shell. In other words, that there is not enough of egg shell forming material in her diet. If no attention is paid to this hint, soon eggs will be laid without any shells at all and then the fowls learn to eat them, and I shall probably get a letter to the following effect:—"Dear Sir, my hens have been laying well up to a recent date, when they began to lay eggs with thin shells, and lately the eggs have no shells at all and the hens are eating them. Please tell me what is the matter and you will greatly oblige." Of course, I answer as best I can, without being told what the laying stock are fed on, how much, or how often they are fed, or how many are in their quarters—but from a knowledge of the ordinary treatment of his laying hens by the average farmer—that they are getting too much grain and too little lime to make the shell and it is also very likely that the hens are too fat from so much grain food and, it may be, they have no exercise." As for the egg eating that is no easy vice to cure, after being indulged in. It is far easier to prevent, as will be obvious from the foregoing remarks. But we are only treating of winter rations at present.

DIFFICULTIES TO BE GOT OVER.

It being admitted that "cut green bones" are the most perfect food so far discovered for making egg and shell we are met with the difficulty:

"How can the average farmer feed them to his hens?" Undoubtedly there is the difficulty that the bones have to be cut up by mills made for the purpose, and these mills cost from ten dollars upwards, and so far they are not made in Canada. The question of cost is no doubt a serious one to the individual farmer, but it may be made comparatively light by a number clubbing together to purchase a small machine and by placing it so that it can be used in turn. Or place a larger one worked by power in a cheese factory or oromery, where there is always machinery, and when the farmer brings his milk, he can bring his bones and have them cut up while he is waiting. It takes a short time to cut up enough bones to feed 100 hens once a day. And it is but reasonable to suppose that when there is demand enough the mills will be manufactured in Canada. And the same may be said of the cut bones. As soon as the demand for them becomes general the large *abattoirs*, or butcher-establishments, will cut up the waste bone and dispose of it to farmers at a moderate price. Under no circumstance should the cut bone cost more than a cent per pound.

OTHER RATIONS.

I have devoted considerable space to cut green bones as an egg producing ration because they are such a cheap and perfect food. There are other rations, although of secondary import, such as outlined in my last article, but the necessity of lime as an egg shell maker in some shape must not be overlooked. Red-clover hay is stated by P. H. Jacobs, editor of the *Poultry Keeper*, to be rich in lime and a necessary constituent in the winter ration. It may be fed as the laying stock like it, steamed and mixed in the soft mash, or given alone if the hens will eat it in that state. The *Farm-Poultry* editor, Mr. A. F. Hunter who is a practical poultryman as well as a good writer gives the following as a good winter ration:—3 lbs. oatmeal, 1 pound dried blood, 1 pound green cut bone, 4 lbs. pea meal, 1 quart skimmed milk. Feed to 40 or 50 hens. The objection to this ration will be its expense. What I am trying to get at is a cheap and effective ration for the farmer. It is a subject of no small dimensions, and will be a lengthy but important one to discuss, and it will likely be taken up again.

THE INDUCEMENTS.

After I do get the eggs what shall I get for them? may be asked. I will answer by quoting from a letter I received lately from M. Gilmour, of St. Therese de Blainville, P. Q., who says: "I have built a fowl house this fall with the view of procuring eggs from eighty pullets during the winter. I have a milk round in the city of Montreal and can get from forty five (45) to fifty (50) cents per dozen for eggs during the winter and nothing lower than twenty (20) cents in Summer."

It is not necessary for me to add a word to the statement. If the prices are not such as to induce farmers to profit by them, what other department of the farm will offer him greater?

Wheat for Swine.—An Ohio swine man fed 21 sows for a week on wheat. The hogs weighed 1900 lb. when feeding began and after seven days 2345 lbs., a gain of 355 lbs. The wheat was soaked 24 hours and 12 bu. fed. The hogs were sold to be delivered Sept. 15 at \$4.80 p. cwt. The wheat realized about \$1.33 p. bu.

RULES FOR FATTENING FOWLS.

Recently I have been favored with a statement from one of our most successful poultry fatteners, as to the rules which guide him, and the methods he adopts to secure success. The following is a summary of his observations:

1. In fattening fowls the actual quantity of food supplied goes only a little way in the production of flesh, as compared with the conditions under which the birds are kept.

2. There is considerable difference in the readiness with which fowls fatten, even of the same variety. In selecting for this purpose, a large framed bird should be chosen, and one that has well grown.

3. The birds thus selected should be placed in a large run (outside), and for the first three or four weeks fed on no more than one meal a day; then gradually increasing the quantity until they have as much as they can eat, when they are finally finished off by cramming, which in itself occupies three weeks. The object of this treatment is to reduce them as much as possible at first, and then gradually build up the flesh on the frame. This method is not suitable for young chickens, which are fed right off, but for large fowls to be killed about Christmas.

4. When cramming commences each bird should be placed in a separate pen, or half a dozen of the same age and sex together, in a quiet, sweet, and, if possible, rather dark room or shed, and for the first few days be fed from a trough finishing off by the crammer. The food should consist of either fine barley meal, or fine Kentish ground oats, mixed with a little fat, and made with milk into a paste when feeding from the trough, and like very thick cream when used with the crammer. The fat should be small in quantity at first, but may be gradually increased during the process.

5. Before a bird is crammed each meal the crop is felt, and if there remains any food in it from the previous meal, no food is given until the next time of feeding. Observations should be made as to the quantity assimilated, so as to give a fowl each time as near as possible just about as much as it can digest. Should a bird show any signs of sickness during the process it should be placed in an open run for twenty-four hours without food. To aid digestion grit may be kept in a dish before each pen, and boiled nettles mixed with the food twice or thrice a week, as an aid in keeping the blood cool. Young chickens may be fed thrice a day, but for older birds twice a day is much to be preferred.

6. After the birds are killed, to prepare for which they should be kept without food for thirty-six hours, the blood is drained from the body, and the fowls are plucked immediately. The meat is then drawn by the hands forward to the breast, and the legs tied back to keep it in place. The bird, while still warm, is dipped into cold water, and thus becomes stiff, but it is an improvement to wrap the body in linen cloths dipped in milk or water.

The above indicates the method adopted for producing the best table fowls, and while entailing trouble and care, brings its own reward, for the specimens so produced command good prices.

STEPHEN BEALE, H—, England.

Country Gent.

Breeder and Grazier.

THE TUBERCULIN TEST.

TO BE APPLIED TO ALL CATTLE ENTERING CANADA.

Ottawa, Nov. 14.—The tuberculin lymph test which has been departmentally ordered by the Minister of Agriculture to be applied to all neat cattle entering any of the quarantines from any place outside of Canada, has resulted in the finding, by Mr. E. P. Westell, the veterinary inspector of the department in charge of the animals' quarantine at Point Edward, a Shorthorn bull, the eleventh Duke of Niagara, eighteen months old, to be affected with tuberculosis. The owner is offered, by direction of the minister, the alternative of returning the animal to the place whence it came in the United States, or of having it slaughtered in the quarantine without compensation. The Department of Agriculture is informed that the quarantine station at Grosse Isle will close on November 15.

tury, they received but scant care and feed. With the exception of the milking cows, they were as a rule wintered in the field and were scantily fed with a little hay of the poorest quality, or some straw. Very many had to exist on seaweed heather and rushes. It is said that at least one-fifth of them used to perish of starvation every winter, when the snow lay long on the ground, fully one-half of them succumbed. Of course, the survivors of such treatment were those having the greatest vigor, and the quality of hardiness in the breed was intensified by this process of selection. When a more rational treatment followed the harsh one alluded to, this cattle soon demonstrated their worth. Even now, when subjected to poor treatment and scant fare through the winter, they will respond to a more favorable environment more rapidly than any other breed, putting on flesh with speed.—*Am. Ag.* (1)

TUBERCULOSIS.

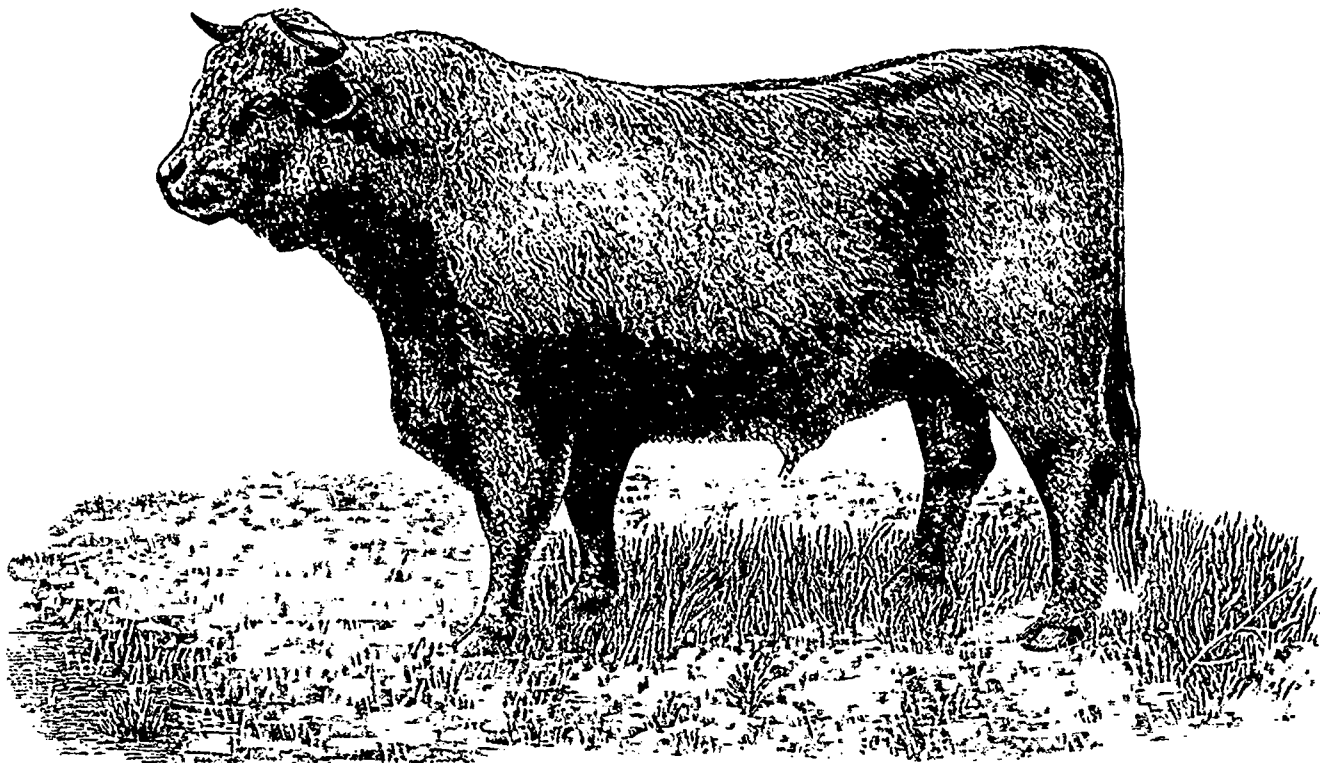
Tuberculosis was now by far the most widespread, and, as regards the

cattle under two years of age the proportion of tuberculous individuals was less than 1 per cent., and that it steadily rose with age until among adult cows it was seldom less than 10 per cent., and not rarely 40 or 50 per cent. These facts were quite incompatible with the view that hereditary transmission of the bacillus played a rôle of any importance in the propagation of the disease. On the other hand, every known fact regarding the incidence of tuberculosis, as regards age, breed, and locality, was in complete harmony with the view that it was a contagious disease, which could, with great certainty, be spread by housing tuberculous and healthy cattle together, but which had only feebly contagious properties among cattle kept in the open air. A few years since, even to the most sanguine, the possibility of being able to grapple successfully with the disease appeared very remote, because of the admitted impossibility of recognising it in its early stages, for to the most careful clinical observation a tuberculous animal might appear perfectly healthy and yet be capable of infecting others. But it was now in the

RAISING FALL AND WINTER CALVES.

We formerly raised the calves that were born in the early spring and kept them in the barn until the middle of June before turning them out, and I think it would have been better to have kept them in and fed milk and hay until after harvest. According to my experience, milk and hay make a better ration for young calves than milk and pasture, which are apt to be too laxative. Some of our calves, after being turned out to grass refused to come to the trough to drink milk until driven to it by thirst.

For several years past we have raised our fall calves and found it a decided improvement on the old way. The calves when taken from the cows are fed their mother's milk freshly drawn, for about a week, than a portion of sweet skim-milk, warmed, is substituted in place of part of the new milk, and the substitution goes on gradually until the mass is entirely composed of skim-milk. The milk is always fed as warm as the calves will drink it, which is warmer than blood heat, and



THE CHAMPION WEST HIGHLAND BULL, CEATHARNACH BUIDHE.

WEST HIGHLAND CATTLE.

There is something in the accompanying illustration of a conspicuous member of the family of West Highland cattle that is at once indicative of his birthplace—the rugged land and climate of Scotland. There is a suggestion of vigor and robust hardiness that at once impresses the observer in studying this breed of cattle. This picture is that of Ceatharnach Buidhe (719), owned by Mr John Stewart of Scotland. This fine animal was first and champion at the Highland societies show at Inverness, Scotland, and also champion at Stirling.

The West Highland, or to be more accurate, the Southwest Highland, breed of cattle are very highly esteemed in Great Britain. They are most at home on the western islands of Scotland and in the adjoining counties. This breed and the Galloways are believed to be descended from the same original stock, the former being often called "Highlanders without horns."

In the early history of this breed, in the beginning of the eighteenth cen-

loss which it occasioned, the most serious, of the disease of farm stock. Probably not less than 20 per cent. of the adult cattle in Great Britain were tuberculous. Could it be stamped out? He believed that that question might be answered in the affirmative. As a first step in that direction it was necessary to diffuse among agriculturists correct notions regarding the causation of the disease. The discovery of Koch's bacillus had in one sense settled all disputes regarding the cause of tuberculosis, but there still prevailed, both among veterinary surgeons and farmers, a very serious misconception regarding one factor in the disease, viz., the belief that it was often congenital. For some time past they had had before them information that made that view quite untenable. They knew that when tuberculous lesions were sought for at birth in the progeny of tuberculous cattle, they were not found in one calf in a thousand. They knew, further, that in

(1) About the best beef in the London market, Giblett, the Bond Street butcher used to have up about 25 in his shop every week.—*Ed.*

power of any stockowner to stamp tuberculosis out of his herd at an expense that would be trifling compared with the loss entailed by the present neglect of all precautions against the spread of the disease. In any herd the use of tuberculin would enable the veterinary surgeon to separate the diseased from the healthy; and this, combined with the thorough disinfection, would with great certainty arrest the spread of the disease. As regards the diseased animals, the owner might be left to decide whether he would have them promptly slaughtered or not; the material point with regard to the arrest of the disease was that the infected animals should not subsequently be allowed to mix with the healthy. But if tuberculin made it possible for anyone to free his stock from tuberculosis it also afforded the means of keeping it free. No animal ought now to be bought for breeding purposes that was not free from tuberculosis as indicated by the tuberculin test. It was to be hoped that some of the famous breeders of pedigree stock would set the example of selling their animals with a guarantee of this kind.

the calves relish it as a man does a cup of hot coffee on a cold morning.

E. E. Rockwood, on page 671, says: "To hot milk is binding to the bowels." I am not disposed to grant it, as it is not confirmed by my experience; but if it were true, I should not be afraid to feed it, as constipation is not an evil that our calves are subject to. On the contrary, the danger is all the other way. Diarrhea is the disease to be guarded against.

Mr. Rockwood says: "Too much milk must not be fed the calf while young." I suppose he means skim-milk, or may be sour, or lopped milk; for our calves will usually take all their mother's milk if she gave ever so much, and I have known farmers who were raising a show calf to let it suck two cows with a decided improvement in its growth. He says that "two or three quarts at a time is sufficient." That is about the average quantity we feed our calves when quite young, though some will drink more and thrive faster. I generally try to find out about how much each one will stand, and give them that much and

no more. As they grow older of course they require more.

A single time over-fed," Mr. Rockwood says, "will give scours." I think he must be mistaken about that. A single over feed may physic a calf, but I do not call that the scours. A persistence in over feeding will no doubt produce scours, but usually a calf by leaving its milk untouched will tell you as plainly as in so many words that you are supplying it too liberally, and must desist, if you regard his future welfare.

Very soon after a calf learns to drink I put a handful of wheat middlings in its milk, and the quantity is gradually increased as the calf grows older, until it is fed a pint at a mess, and will pay well for it in extra growth. I know middlings are better for them than corn meal, which is more laxative, and I think it is better than ground oats, the hulls of which they don't like.

I have raised calves so fat that they could have been sold to the butcher at any time for veal. Calves will begin to eat solid food when two or three weeks old, and they don't seem to be particular whether it is hay, straw or chaff. I have seen them eating straw bedding, but no doubt fine hay is most relished, and will promote the fastest growth.

Mr. Rockwood puts hay into his calf pens. I think the better way is to have a hole in the side of the pens where the calves can put their heads out, and place the hay within their reach where they cannot trample on it. Our pens have such a hole, and before it is little box into which the feeding pail is placed to prevent it from being upset and milk spilled before the calf learns better than to butt it over; and before this hole I put their hay. Mr. Rockwood says: "It pays to give the best of care to calves." That's so. I have bought spring calves in the fall of \$3 and paid too much. I have bought others at \$1 each, and got a better bargain. Our fall calves are kept in the basement of the barn, are never out of it until the next May, never suffer with the cold, and grow as fast in the winter as in the summer. Their pens are cleaned often and kept well bedded.

Country Gent. J. W. I
Sugar Run, Pa.

MIXED FOODS.

Mr. Beach—The results that we get from any given kind of food depend upon so many circumstances that no man can state positively its value. He must understand all the surroundings, the kind of a cow, the condition that she is in, her relations to the length of time that she has been giving milk, the stable that she is in, the man that feeds her, the methods of feeding, all these things enter into it, and you cannot put your finger upon this result and that result and say that it is the result of this kind of feed or that kind of feed. It is a combination of the whole. I will make the statement and the statement will be correct, although you may draw the wrong conclusions from it. It was with regard to feeding four and one half acres of silage corn of a silo to dairy cows in milk. It was the first silo that I built, and I had a good many misgivings and I opened it with fear and trembling. We had about forty cows, most of them giving milk and in good condition. The day we opened it, we opened in a snow storm, so that if it was all rotten and not worth feeding, we wouldn't let anybody know it. I said, "Now,

we want to know something about this, we will keep an exact account of the cows and grain we feed in connection with this silo. There are four and a half acres of corn in this pit." We fed a hundred and twenty dollars' worth of grain; we estimated the hay to amount to \$80, making \$200, and when we got through feeding that four and a half acres of corn, we had after paying \$200 out of it, \$460 of butter money left to pay for the four and a half acres of corn and the labor. I do not say that the results might not have been part of them attributable to the grain, part of it to the hay, and part to the skill in feeding. They were good cows, butter brought a good price, I think thirty five cents that winter, but it don't alter the fact I got \$100 an acre for every acre of corn that I fed. I have never gone back on silage since. If I did not get as good results, I claimed it was either my want of skill or the condition of the cows or the state of the market or something else. Now, don't go home and say that Beach fed his silage and got \$100 an acre for it, for he doesn't say so. I can't tell whether I got it out of the silage or the skill and care in the handling of the cows or the cows themselves. I don't know—but I got the money.—Hoard.

THE AGRICULTURAL PRESS.

It goes without saying that the Agricultural Press of the country, taken as a whole, has been of immense benefit, not only to the farmer as such, but to all classes and conditions of our people. And yet one looking through these papers from week to week, meets with many surprises, finding the most ridiculous and misleading suggestion in least expected quarters. This fact has a recent and most conspicuous illustration in the columns of the *Michigan Farmer*, which in commenting on the discovery of tuberculosis in the herd at the Wisconsin Experiment Station, says:

The statement by Prof. Henry, of the Wisconsin Experiment Station, that the herd of dairy cattle there had to be slaughtered because affected with tuberculosis, comes like a crash of thunder from a clear sky. It would naturally be supposed that a herd under the management of Prof. Henry, who is an accepted authority upon all matters pertaining to the feeding and care of dairy animals, would be in most vigorous health. But it looks as if balanced rations and scientific care were not be relied upon except to increase the production of milk or flesh. Sound health appears to have been left out of the calculation when those balanced rations were prepared. What a commentary upon the long treatises published for the enlightenment of the "moss-backs" who paid no attention to scientific feeding, but whose herds are yet alive and free from disease? With all the heavy expenditures for fitting up warm stables, supplying cotton seed and linseed meals to balance the rations of these cows, and thus show to the world what should be accomplished by chemistry, the scales and other modern appliances, the Experiment Station suddenly finds itself without any cows to experiment upon. The herd has perished utterly and totally. We suggest that Prof. Henry, if he secures another herd, get some plain old moss-back, with common sense ideas of how cows should be kept, and be guided by his advice. The Professor has shown his theories to be worthless, as the cows persist in becoming diseased under the very latest up-to-date meth-

ods of scientific management, explained in columns of well worded and interesting articles. It shows what ungrateful and stubborn animals cows are.

It would be impossible to crowd more ignorance and nonsense into the same number of words, than appear in the above extract. Tuberculosis in cattle, like its congener, consumption in the human race, is no respecter of persons or places. It is quite as much at home in the cottage and stable of the common farmer—the moss-back of this Michigan paper—as in the more expensive dwelling and barn of the progressive dairyman, the scientist or the millionaire. It is not a question of breeds or feeds, but purely of contagion. It is surely communicable from men to cattle, and is more likely, therefore, to break out in an Experiment Station stable than elsewhere, because of the greater number of people who visit such places to inspect the stock, and of the necessity for purchasing animals to keep up an experimental herd.

Breeding of Dairy Stock—Don't Mix Beef and Milk.

We (*Hoard*) copy the subjoined communication from the *Rural New Yorker*, and present it to our readers, not because it is new doctrine in these columns, but in corroboration of the testimony we have been giving these many years and to show that we are by no means alone in advocating the doctrine of breeding specific dairy cows for dairy purposes. It is just as silly to expect the best dairy results (and the best results are none too good) from the general purpose cow—or the granger's cow, as her apologists have named her in recent years, as it would be to expect to succeed in raising the best crop of corn with a general purpose soil stirrer, to be used in succession as a plow, or harrow, or cultivator. The agitation of this subject is, as Mr. S. says, "always in order."

The principles of the breeding of our dairy stock are penetrating the farming community and the agitation of such ideas in our farmer's papers and at farmers' meetings, should always be in order. To start right is a great way towards success; for in starting a dairy both quality and the volume of the cow's milk should be determined. Food must create an important part, and then feeding and breeding must continue. To raise a dairy breed of cattle without a definite end in view, or to attempt to improve our dairy stock without having in mind a well defined animal for the purpose intended, is simply haphazard business. Then how important that our stock should be added to the purpose intended; either as milkers for the dairy or as beefers. Each are what they naturally are, from heredity. Heredity cuts both ways, and it applies to bad breeding just as clearly as to good breeding.

It matters not which of the different breeds of cattle we are using for dairy purposes, if we have those that, in the milking season, lay fat on the body from the food consumed instead of the flow of milk in the pail, abandon them as milkers. The great milkers are produced at the expense of flesh and quality of milk. The butter cows are produced at the expense of flesh and quantity of milk. The beef cows are produced at the expense of both milk and butter qualities. How essential that we ferret out these differences in your dairy cows, and get on a line of breeding much better than many of us

have at present. By making marked selections, the dairymen of the country could better themselves from 25 to 50 per cent in a very few years. I wish to emphasize this care in breeding, that whatever the breed or cross-breed, those that lay on flesh, and those that give a good flow of milk from the food consumed, should never be bred together. An animal, from a breeder's standpoint, represents its entire ancestry rolled into one, and breeding for the motherhood and fatherhood of our coming dairies is emphatically a work for the future. Many dairy breeders claim that it is quite possible to breed cows that are suitable and adapted for both purposes, a milk and beef combined. My word for it, it can't be done. That is where and how we get the go-betweens. No one can determine the character of a sire or cow by looking at the outside of the father or mother. The sires for our common dairies should be selected with great care. A careful knowledge of the performances of the ancestors in the female line will usually reveal the qualities of the male. He should be descended from a long line of dairy cows of great natural capacity. He should have age, from three years old to as old as he is of service. Some say an old bull is too dangerous. Dishorn him; put him to work, then there is no danger. It is a great drawback to the progress of good dairy breeding that so large a proportion of the men who own the cows of the land, either have no idea at all about the true principles of dairy breeding, or else they are controlled by very unsound ideas.

Ellicottville, N. Y. O. H. S.

FATTENING CALVES ON SKIMMILK.

To fatten calves successfully on skim milk and grain to supply the butter fat, the calves should first be fed a moderate amount of new milk for a few days and then skim milk should be gradually substituted so that at the end of a few weeks the calves would be fed entirely on skim milk. If 7 lbs. of corn meal, the Western variety preferred, is mixed with 1 lb. of linseed meal, old process preferable, it will make a fairly good substitute for the butter-fats of the new milk. This meal should be fed in very broad bottom troughs, so that the calves will be compelled to lick it, thereby insalivating it. Care should be taken not to feed too much skim milk. The very best quality of fine clover hay should be placed where it will be accessible to the calves at all times. To properly fatten calves either by this method or by letting them have new milk from the cow or otherwise, it should be remembered that for at least two weeks at the beginning, the calves should not be fed all they want, but should be somewhat restricted if the best results are to be obtained. The last two weeks before sending the calf to market the feed may be increased and the calf given all or nearly all it will eat provided the bowels are not affected. Success will depend almost entirely upon the watchfulness and the skill of the feeder. As the calves get to be 4 to 6 weeks old, very often they will eat a few roots but they should in no case have many. It will take some two weeks longer to make good calves by skim milk feeding than it would by giving new milk. Again let me repeat that success will be due to the judgment and watchfulness of the man who has the calves in charge.—[J. P. Roberts, Director Cornell Exp. Sta.

Swine.

THE SWINEHERD.

Feeding for Pork.

Striking results were obtained by the Utah exp sta during the winter of 1893-94 in feeding wheat, peas, corn and barley for pork. Four sets of Berkshire hogs were fed, one with wheat and bran in equal proportions by weight, one with peas and bran, another corn and bran and a fourth barley and bran. In other respects the conditions were equal. The experiment extended from Dec. 5, '93, to May 15, '94. During this time the pigs in the set which were fed peas made a gain of 1.09 lbs p pig p day. Those fed wheat gained .69 lbs p day; those fed corn .63; those fed barley .56; or during the whole period, the three pigs fed peas gained 528 lbs and those fed on wheat 333 lbs. Wheat ranked next to peas in making growth.

It will be noticed that a bushel of wheat in this case produced about 90c worth of pork. Those interested in feeding wheat to hogs will be able to figure out from this experiment just about how much they can make out of their wheat by so doing. It is summarized as follows:

Peas mixed with bran, half and half by weight, proved to be far superior to either wheat, corn, or barley mixed and fed in the same manner, both as to rapid gain and to the amount required for one pound of gain. The wheat mixture comes second, with corn and barley following in the order named. The pea mixture gave a gain of nearly 200 lbs more than the wheat mixture; 225 lbs more than the corn mixture; and 255 lbs more than the barley mixture.

While the pigs averaged the same weight, it required .89 lb more of the wheat mixture, 1.41 more of the corn, and 1.53 lbs more of the barley mixture to produce 1 lb of gain than of the pea mixture. Peas and wheat proved to be excellent feed, fed mixed with bran in the manner described. Reckoning pork at 4c. p. lb, after deducting the cost of the bran at \$10 p. ton, wheat fed in this experiment brought 89.4c p bu or \$1.49 p cwt; peas \$1.70, corn \$1.26, and barley \$1.23. On the above basis peas should be worth 13% more than wheat, while corn should be worth 15% less and barley 17% less.

POTATO CULLS FOR PIGS.

Farm and Home does well in recommending the feeding of small potatoes to pigs. In potato growing sections there are thousands of bushels of potatoes that are too small to put upon the market in the cities and even when the best "seconds" are saved for seed, there is a large amount of culls. They are good food for all kinds of stock and when fed to pigs should be boiled until thoroughly done and then removed to a slop barrel in which bran, meal, house slops and milk are mixed with them.

Fall pigs can be put upon the market in the spring more cheaply in this way than any other of which I know. The slop barrel should be buried in the earth, or better yet, packet in sawdust to prevent freezing. I have also fed large quantities of cooked turnips to fall pigs and got good results. Turnips are not more than half as valuable as potatoes for food, but

when well cooked make a cheap and good addition to the slop. I have found it a good plan to use some corn cob ashes in the slop. Such soft food as a potato or turnip slop with bran is much better than whole corn and when the culls would otherwise be wasted, it is a far cheaper one. When one does not wish to bother with the cooking of potato culls they can be profitably fed raw to cattle and horses and sheep, a small quantity each day aiding digestion.—[Alva Agee, Gallia Co., O.]

VALUE OF SKIM MILK.

The Chairman—In our factory we once went to the expense of determining the value of skim milk; we bought, I think it was thirty-six shoats, weighing an average of 100 pounds each. We wanted to convince the farmers of two things; first, the value of skim milk as a food, and second, the value of feeding it rightly to young animals. So we fed these shoats for fifty-six days on nothing but skim milk, just as many farmers would feed it; we did not feed it intelligently with something else, because, if we did he would say, "O, that ain't the way to do it." Now, if we had fed it intelligently we would have bought middlings and corn meal and mixed with it, but we didn't. We fed those pigs fifty-six days. We bought them at \$4.50 a hundred, and sold them again at \$4.50 a hundred, and kept track of all the skim milk and fed them nothing but skim milk, and the skim milk netted us 22½ cents a hundred. Then we wanted to show the farmers that if we had fed this intelligently, with corn meal and shorts and bran, mixed with it, it would bring more, so we did that. We did prove that at the same price for pork we could pay for the corn meal and shorts and have the skim milk stand us in at 27 cents a hundred. Those are some figures that we made. They cost us some little money and time, but we wanted to get the farmers around there to understand it. We wanted to prove that skim milk to be made profitable must be fed to young pigs in the young and growing stage. You take a 250 pounds hog and you might pretty nearly as well fatten a mill by running oats through it. Then we proved that it helps the grain very much to mix with skim milk. It has got so now that an intelligent feeder never feeds a pig over 6 to 8 months, months, but I remember when the farmers in Wisconsin almost universally fed hogs to eighteen months old, wintered the hogs and fed them the second year.

Mr. Goodrich—I tried an experiment. I wanted to determine the value of skim milk to feed hogs. I bought a lot of shoats about five months old, weighing about 125 pounds. I divided them in three lots, one lot I fed nothing but skim milk; one lot I fed nothing but corn and gave them water to drink, and one lot I fed corn and skim milk together. Those that I fed skim milk made five lbs. gain for every hundred pounds of skim milk. Those I fed nothing but corn and had water to drink, made ten pounds gain for every bushel of corn, so that being fed separately 100 pounds of skim milk was worth as much as half a bushel of corn. The other lot were fed both, that is, one feed of milk and one of corn, a ration of half a bushel of corn to 100 pounds of skim milk. Now, you see where they were fed separately a bushel of corn and a hundred pounds of skim milk made fifteen pounds of live weight gain. Where they were fed together, it made eighteen pounds gain.

Now, if I had nothing but corn every 100 pounds of skim milk would have paid me eight pounds gain so I could have afforded to buy it and pay a good price. If I had nothing but milk every bushel of corn would have made thirteen pounds gain. So that with the live weight of hogs, at four cents a pound, fed separately, the skim milk was worth twenty cents, and the corn forty cents a bushel; fed together, both were higher.—*Hoard.*

The Dairy.

REGAIN THE LOST PRESTIGE.

The dairymen of Wisconsin have during the recent election had a good deal to say about the damage done to the state dairy interests by the Peck administration on account of its fostering the filled cheese industry. They asserted that in the last few years Wisconsin cheese has been almost entirely driven out of the English market by the Canadian product, and this loss has been ascribed to the adulteration practised in Wisconsin. We think that the following extract from *The Toronto Mail* fully bears out their assertion regarding the loss of the English market:

"It is no small thing for Canada that we are now sending more and better cheese to Great Britain than any other nation in the world. This year, our export of this article to the mother country was nearly double that of the United States, and it is generally admitted that Canadian cheese is synonymous for the best cheese."

The Canadians realize their gain, quite as much as Wisconsin dairymen do their loss. But the English market is not to be regarded as irrevocably lost. The greatest effort should now be concentrated on bringing Wisconsin cheese up to its former reputation. It is one of the most important industries of the state and will well repay the attention bestowed upon it. The coming Republican administration may be relied upon to spare no effort to counteract the injurious policy adopted by the Democrats (1) for four years past in regard to the dairy interests. It should be Wisconsin and not Canadian cheese that is generally admitted to be "synonymous for the best cheese."—*Milwaukee Sentinel.*

A COW WITH AN ENVIABLE
RECORD. (2)

Sayda 3d is one of the most valuable cows living to-day. In the World's fair cheese test she led all but four of the great cheese-making Shorthorns, of the Guernseys but one and 13 of her younger, strong Jersey sisters. In the long 90 day test she again did better than 13 of her Jersey sisters, all but two of the Guernseys and every Shorthorn, even though fresh cows were added to all of the herds. In the lay, butter test, she was sick from action, but did grand work throughout the test.

Sayda 3d entered these dairy tests in her twelfth year, was accepted upon one day's test of 50 lbs. of milk and 2 lbs. 4 oz. of butter. In the cheese test she made 56.82 lbs of cheese from 524 4 lbs. of milk, but made no gain

in flesh. In the 90-day test from 3043 lbs. of her milk were made 170.1 lbs. of butter. In this test she put all of her feed into the pail and 21 lbs. from her own carcass. Her feet were disabled by stable soreness, but she improved toward the last and held her place in spite of fresh cows offered for the 30 days; in fact, she was chosen fourth when she had been milking 170 days. In the three tests she made 4111.1 lbs. of milk, 66.82 lbs. of cheese and 217.92 lbs. butter or 274.74 lbs. of cheese and butter.

Sayda 3d, the only cow presenting a daughter able to take her place, was supported in the supplemental herd by Sayda M., 46.195. She calved on the cars in transit, survived that shock and showed her great strength, after enduring all that the others suffered, by giving, still upon dry feed (Sept. 28 to Oct. 4), 201 lbs. 3½ oz. of milk, making 22 lbs. 11½ oz. of butter. Her bull calf dropped at Chicago, to Koffe's Noble, 14,631, was secured by J. A. Sibley, president of the A. J. C. O. She has been a constant breeder, always catching from first service and has produced 10 healthy calves, among them Sayda M., Sayda's Princess, Sayda's Prince, Koffe's Noble 2d and World's Fair at Chicago. She is with calf again, having caught at first service by Little Harry, while at hard work at the fair. Though crippled with lameness, handicapped with age, and her system drained by 10 years of constant milking and breeding, by the dairy rules, she leaves 13 of her Jersey sisters behind her, 20 of the Shorthorns and over 20 of the Guernseys. She was the oldest cow of the 74 in the trial of the three breeds.

THE SHORT-HORN AS A
DAIRY COW.

EDS. COUNTRY GENTLEMAN.—The advocates of special dairy cattle would have it believed that it is better to keep these cattle, than those commonly called, general purpose cattle. This class is typified by the noble breed known as the Short-Horns. The ancient proverb, that it is safe to have two strings to one's bow, has a bearing on this matter. One cannot question the wisdom of this adage, and thus being wise it certainly has some use in practice. Its wisdom, however, is proved by the tests made at the great exposition at Chicago. Profit is the great purpose of all industry. And the wise man will choose the best stock for this purpose. This exhibition seems to have had the foregone intention of booming the Jersey cows, doubtless worthy of it, but not at the expense of the other breeds competing with them.

The Jerseys were awarded the first place in the competition because they yielded the most butter. But this is not the true test. The dairyman's end in view, is the money he can make, and not the mere quantity of butter. And when the result of this notable competition are analyzed, it appears that the first was really lost, by this ultimate test. For the Guernsey cows made the most butter for the cost expended, and the Short-Horns made the most profit, estimated by the butter and the increase in live weight. Thus it appears that taking the butter and beef of the Short-Horn cow, and of course of her calves which are unquestionably the best beef cattle existing, this breed is the most profitable even now, of the three competitors.

But when we go back to the history of this splendid race of cattle we find that at that time they were unsur-

(1) Those poor Democrats!—Ed.

(2) See portrait in the November No.—Ed.

passed as cows for milk, butter and cheese. And they were then ordinary common cows, never having been pushed by breeder, and then unknown except locally, as dairy animals.

These instances are given in Bell's history of the Short-Horn. Dixon's cow milked 17 years, and "was a handsome cow;" her yield is not given. Mr. Colling's sister's cow gave 26½ quarts at a milking, when visited unexpectedly about milking time; this was her usual yield. The next best cow heard of by Mr. Bates, gave 19½ quarts twice a day, regularly. Mr. Hall's cow gave 18 quarts each meal regularly. Mr. Houghton's cow gave the same quantity and 2½ lb. of butter weekly. Duchess 1st, the great mother of the best cattle in the world, but a race woefully misused, gave 14 quarts at a meal, each quart giving 1½ oz. of butter. This was an average of 5 per cent. of butter in the milk. This cow, for butter and milk, yielded \$10.50 weekly, and this four months after the calf. Brighteyes gave 15 quarts at a meal on "fog," which is the aftermath of a meadow. Of two cows matched for a wager, as they came from the field, one gave 15½ quarts and the other 16 quarts. A nameless cow—she well deserved a name—milked for 15 years, reared 12 calves, and gave 1540 lb. of the finest beef, when fattened, on pasture only.

Then this race of cattle were the common scrubs (as some take pleasure in calling such stock), because they have no special pedigree, and want the usual accompaniment now-a-days of a herd-book register, and had never been more than the usual pasture, for the cottonseed meal and other forcing foods had not then been invented. No grain, only the grass of the meadow, or the hay, of which it is recorded in this history, these animals were not by any means eaters. What might they not have done had there been a great exposition, and a feeder hired at \$150 a month to do nothing else but cram them with the richest and most productive food, beside another expert at nearly the same pay to attend to their welfare, as the jockey nurses the fleet racers! But an evil spell came upon this great breed, the product of honest, healthful and conservative care, by common farmers, who worked for profit. The professional breeder took them in hand, and ignoring their great dairy qualities, fed and bred them for beef only. The cows were not permitted to be milked lest their great size might be diminished. The calves were nursed by other cows not having the best form, or the specially desired color. It was the monster yielding a ton of meat that was desired, and everything was sacrificed to this object, and it was gained.

By the most skillful selection of the biggest cows and the best bulls the race was improved for beef but spoiled for the dairy. It was but a few years until heifers at three years old were fed to weigh as much as 1,820 lb., and steers from 3,000 up to 3,700, which was the weight of "the ox that traveled" when it was in its third year. This, however, was a legitimate and worthy business, and no more to be censured than the present methods of the breeders of what are known as special dairy cattle. But it spoiled the best dairy cow—one whose picture adorns the front of a noted English church, on which it was placed, carved in stone, as a testimony of the wisdom of the Creator who gave such a valuable animal to human race. And it yet remains as an enduring type of a dairy cow *par excellence*, and she was a Short-Horn.

Everything come to the man who work and waits. And these breeders in time gained the end they had in view. They made the finest beef yielding animal in the world, and one that turned every spare ounce of food into flesh and fat. But as by the natural law laid down by Darwin—an organ brought into disuse becomes atrophied and in time abolished. The Short-Horn cow lost her udder; it was bred out of her, and the cow would have been bred out too had there been any way of getting over the necessity of her as a mother for the calves. For it was never possible to make a prolific cow a show animal, and the best heifers were not bred, for the reason that they were desired for the exhibitions of fat cattle. The bull who sired them and the brothers of them were the sources of the great profits, when thousands of guineas were given for the prize bull, and as much for the cow which brought a choice bull into the world. In short, everything that skillful breeding, high feeding and pursuit of wealth could do was done to destroy this splendid dairy race.

But after a century of this mischief—looking at it in the view now taken—the germs of usefulness in this direction survive and may be resuscitated by the opposite methods of breeding and feeding. There are some

There are some remnants of the race which have been so persistent in their old habits that they have been discarded by the beef breeders. And as the progeny of refined races often exhibits that breeding back to the original, called by breeders stamism the old distinguishing character of the race spurts out at times, and thus a field is left for the culture of the Short Horn back to her pristine condition of a milk and butter maker for a long profitable life time, and then to give a full year's income back to her owner as an accumulation of savings laid up, as it were as a legacy, which is paid by her carcass.

The dairy is to be the most important part of agriculture. We have the best facilities in the world for this industry. The foremost—by reputation—of all our dairy cattle is in a state of decadence, as may well be believed, due to the same fault as that which temporarily destroyed the Short-Horn. It is diseased and possibly has become so by excessive forcing for one product. Is there not now a place for the Short-Horn to fill in the dairy as she formerly did so well?
H. STEWART.

WHAT MUST WE COME TO.

Mrs. E. M. Jones, of Brockville, Ont., in an address at the Quebec farmers' congress lately, said: After a long life of study I have come to the conclusion that the oftener one churns the better. Collect a cow's cream for a week before churning it, and in spite of all your care some will be too ripe, some not ripe enough, whereas I am convinced you get a better result if you churn three times a week, a still better result if you churn every day, and the best result of all if you could churn every milking by itself. We all know this to be practical—impossible in private houses, but here is where the factory steps in and carries out this idea to perfection. The idea of winter dairying is one of vast extent and the highest importance. It is destined to work a revolution in farm life. If you wish to average a large quantity, a better price and a higher profit, also better cows and more and better manure, make the bulk of your butter in winter. You will also secure a more

even distribution of your labor, so that it won't be all a feast or a famine. The cow that calves in September will yield well all the winter. When grass comes, it will send her along for a while, and when she does fail it will be in July or August, just when you are heated and tired with haying and harvest and do not want to be bothered with her, just when the cow is tired and hot and worried with flies and only wants to stand in the shade and switch her tail, and just when butter brings the lowest price in the whole year. I hold that the same cow is worth \$10 more a year if she calves in September than if she calves in April.

THE IDEAL COW.

Prof. Thomas Hunt says:—Where calves are raised for dairy purposes it is possible, by judicial training and feeding, to greatly increase their value, for all improvements in dairy cows must begin with the calf, and the first point in this is to procure the best possible sire. No one has yet fixed on the best cow for all purposes combined, nor can it be said that there is any best dairy cow. One dairyman chooses Jerseys, another Guernseys, and others Ayrshires and Holsteins, and all for the same purpose; and each owner will say that his choice is best, and will discuss without end the fine points of his favorite breed. No person can say which is the best cow for any other than himself, and in improving his stock, the owner of native cow can do no better than to choose the best of these, and then procure the best thoroughbred bull he can, of such breed as he may fancy. The improvement of his herd will begin right with this step, and may be continuous as long as he stays in the business. There is not much danger of the average dairyman getting to a point where no further improvement is possible. When we find a man who thinks he can not make his herd any better than it already is, we are pretty sure we have a man who is a ready on the back track, for if improvement does not continue, retrogression will be very apt to set in.

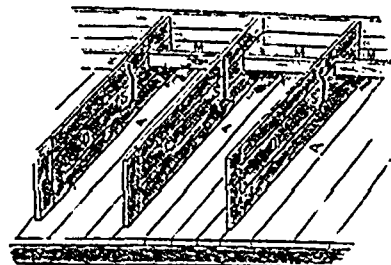
An English paper says:—There is scarcely one of our British breeds which does not show somewhere in its history a record of the aptitude to develop the milking power if trained for that object at expense of an abatement of the growth of beef, at least in the female, whilst under contribution to the dairy. The land after all and the market demand must regulate the supply, and we cannot doubt that where the land is specially favorable to the increase of any one or more of the products of our herds and flocks we have in our present breeds and in their possible combinations in the form of new breeds untold possibilities of bountiful reward for the breeder's skill."

STALL FASTENINGS.

WHY A WELL-KNOWN DAIRYMAN USES CHAINS FOR TYING CATTLE.

George Reburn, of the province of Quebec, describes and illustrates his method of fastening cows, in the Farmer's Advocate. It is not new, but as we have had recent inquiries which his article will answer, we have had an illustration made and reproduce his description as follows:

I would by all means advise the use of the chain in tying cattle. After twenty years' experience I have found this to be the best way. I shall never forget the first time I saw cattle fastened in stanchions; it reminded me of the pictures I had seen of the way prisoners were punished in the olden times by being put in the stocks, and I cannot understand how any enterprising breeder would for one moment endure it in his buildings. The way we fasten our Jerseys is by a chain sliding up and down on an iron rod, made with five eight-inch iron, twenty inches long, bolted to the side of the division top and bottom. (1) All our cows.



DAIRY STALLS.

are in single stalls (which is by far the best) four feet wide by seven feet in length including manger; the divisions are six feet long, three and one-half feet in height at the cow's head, and three feet behind, this is sufficient to separate them and does not hide them in the least. The divisions are made with one-inch planed-boards; posts at each end three by six, and grooved sufficiently to allow the board to be sunk into the post. Opposite where the rod is we put a one-inch board, so as to have it solid to hold the bolts firmly. This gives a perfectly smooth division three inches thick, and no posts projecting to rub the skin off the animal's hips when it lies down. Our mangers are made so as to slide out like a drawer; they are about four inches above the floor, and can be removed any time to remove any foul stuff that has gathered. We have the front of the stalls boarded up with one-and-one-quarter inch boards, but if water is kept in front of the cows, a slide will have to be made above the manger so as to feed by it instead of over the top. This is easily done by having one-and-a-half-inch plank one foot wide, at an angle of forty five degrees, just above the manger, and fastened at every division with iron.

When I make my nightly visit to the stables and notice the comfortable way in which the cattle are resting, with their heads curled round just the same as if they were on pasture, I am satisfied that the chain is by far the best and most humane way.

WINTER-DAIRYING.

This branch of farming is usually discussed from the standpoint of its profitableness as compared with summer dairying. The difference in the cost of production and the price of halves dairy products in these two halves of the year, has been talked and written about a great deal. In addition to the usual remarks made in favor of winter dairying, one very attractive feature of the work in winter is the fact that, butter makers then have more easily available means of controlling the temperature of cream ripening, churning, etc.

Butter is made in many dairies that

(1) We have never used any other plan either in England or Canada.—Ed.

can't afford to have the latest patent of ammonia-refrigerating apparatus, or even ice in the hot summer season but in winter they are provided with some way of heating, and are surrounded by an inexhaustible supply of cold outside, that can be turned on or off by pressing the button, and Jack Frost does the rest.

It undoubtedly cost less to obtain the necessary heat in winter than to supply in the summer season the cold temperature that is essential for first-class butter making.

Next to cleanliness in the dairy, comes the proper temperature at which all the different operations should be conducted. When a dairy man has mastered these two points, cleanliness and temperature in the dairy, he is a long way on the road to success in producing dairy products of a uniformly high quality—and quality is what money is searching for.

In winter the dairyman does not run so many risks of having his milk or cream sour too far and spoil the butter by the development of bad flavors, as is often the case in summer when dairies are not supplied with ice or other means of cooling the milk cream. Another point in favor of cold-weather dairying, is the fact that the cooler the temperature at which cream is churned, the less butter there is left in the buttermilk.

The time required to churn cream is influenced a great deal by the period of lactation of the cows producing the milk. Cream from fresh, new milk cows, churn quicker than that of the same cows when they are strippers. Aside from this factor and also the well known precaution of not having the churn more than half full of cream when churning, warm cream will churn quicker than cold. It is generally true, however, that the quicker the churning of cream to butter, the richer the buttermilk will be in fat, so that it is not advisable to warm the cream too much in order to have the butter come quick. Good butter makers strive to get cream cold rather than warm. Many of them aim to churn cream at a temperature of about 50° Fahr. and do the churning in a place where the temperature do not go much above this degree. Cream that can be churned at this temperature is almost invariably obtained by the use of a separator in skimming the milk. Such cream is, or can be, obtained much thicker than by any process of cream separation by setting the milk in deep cans surrounded by cold water or ice.

This is the secret of being able to churn cream at so low a temperature. The cream must be thick.

The points in favor of winter over summer dairying from the standpoint of the butter maker who does not have ice in summer, are thus seen to be: 1st, the opportunity it gives to obtain cream with the less bad flavors which may be transferred to the butter; 2d, a solid butter with a good grain, because the cream can be kept cool when churned; and 3d, a more thorough churning of all the butter out of the cream, for the reason that the buttermilk contains almost no butter if the cream is cold enough when it is churned.—*Prairie Farmer.*

CONFORMATION OF DAIRY CATTLE.

Commenting on the remark attributed to an American dairy authority that "the English idea of a dairy cow is based on the outline of the Short-Horn and hence is more or less a beef form"—a correspondent of the *London Live-Stock Journal* writes to that paper as below:

There is an increasingly common belief that an ideal dairy cow ought to be, what may be termed, wedge-shaped, wide behind and narrow forward. This of course, means narrow chests, and narrow chests means weak cattle. Granted, for the sake of argument, that such is the proper conformation of the ideal dairy cow, it may be well to consider what this leads to. We all know the story of the ending of the experiment to get a horse to live on nothing. How well it succeeded up to a certain point, and would have been entirely successful had the horse lived; but, as luck would have it, the horse died when only one straw stood in the way of complete success of the experiment.

If we are to breed cattle to be useful we must breed them with strong constitutions, and, after all, it is not yet satisfactorily settled that we must breed cattle with narrow chests if we are to have high-class milking sorts. How does the matter stand at present? We have the Channel Islands cattle, essentially milk breeds, and we have the Ayrshires and Keries. With regard to the Channel Islands cattle, we have in them cattle whose milking qualifications have been most carefully attended to by generations of breeders. These breeders with their circumscribed boundaries, but favorable climatic situations, have produced a class of small cows that give milk of greater richness than that of any other breed. In the Ayrshires and Keries we have small-sized cattle, small food consumers, and yet, comparatively speaking great milkers. While both the Ayrshires and Keries are expected to live on harder fare, and are subject to greater climatic hardships, than the Channel Islanders, the experts in dairy cattle judging are, and have been, insisting upon having the Ayrshire and Kerry cattle with the same narrow chest development as is found in the Jersey. All practical cattle-breeders know where this must end. Sorry tales are already told of the constitutional weakness of one of the breeds, and it is only a matter of time, and that a very little time, when the effects of such a system of breeding will show themselves.

For the practical farmer, who cares more for the productive results of a dairy herd, and their healthy vigor, than he cares for blood," it is perhaps a good time to ask whether a cross of some less delicate race than the Jerseys would not be desirable in many cases. The "Red Devons" have been known to us longer than any other pure bred cattle, and we have always greatly admired them, not only for their sleek and substantial beauty, and their uniformity, but for their merits which are neither few nor small. There are many good milkers and butter makers among them, and those which do not prove such make good beef. Their strong constitutions are well known, and it strikes us that a Devon cross would increase the vigor of the Jerseys, without detracting from their merit as butter producers. The Devon has in perfection what the Jersey is most apt, to prove lacking in—a full chest, giving plenty of lung and heart space. Now supposing we should take a dairy Devon cross on our Jerseys—as yet all right as to their breathing and circulative machinery—would we not be likely to maintain and even enhance the practical value of the herd?

It is true that such cattle would be open to the sneer against "mongrels," but isn't a good mongrel quite as valuable as an even better than some tho-

roughbreds? We are really in earnest in this thought; and the more we dwell upon it, the more it seems to open a way for a more vigorous race of dairy cows that we can even expect to realize from the thorough-bred Jerseys.

We are not ignoring the fact that our Vermont Jerseys, and in fact, Jerseys everywhere in New England, have improved in size and stockiness, and perhaps also in a better chest development, at least in many herds. But if we can still improve them in the most desirable particulars of respiratory capacity and vigor, without reducing their butter-making capacity, would it not be a gain which can be made without loss?

DR. HOSKIN.

The Farm.

GRASSES FOR PASTURE.

The secretary of the American Seed-Trade Association sends us a paper read before that body at its meeting at Toronto in June, by Mr. S. E. Briggs, a part of which seems to be of sufficiently general interest to justify us in making room for it, as below.

Eds. The culture of plants for the food of herbivorous animals has always been confined to nations distinguished by advancement in agriculture. The American agriculturist has not seriously felt the need of special thought on these matters until within the past few years; but now that our fertile prairies and natural pasturage are fast coming under cultivation for other uses, the want of proper grasses to form permanent and luxuriant pasturage is growing. Our experiment stations have done much toward ascertaining the best grasses for our continent. Much has yet to be done. European seed houses supply annually enormous quantities of grass seeds, both for the Continental and American trade. The day is not far distant, however, when we shall become large exporters of varieties, many of which we may reasonably anticipate will be superior to those now obtainable; especially will this apply to varieties adapted for growing on this continent, as we already find that many of the best European grasses will not thrive in our varied climate, owing to extremes of summer heat and winter frosts. In Canada alone no fewer than 300 varieties of grasses are found wild or naturalized, varying largely in degrees of usefulness to the farmer, and while many of them produce but a meagre quantity of food, and poor quality when wild, they will improve in yield and nutritive qualities when cultivated. The same conditions apply to the varieties found in the United States. If therefore such of our suitable native grasses are selected and grown for commerce, we may expect great advantages and improvements in the formation of pasture lands in the near future.

Compare the pastures of England (1) with those at home, and we find that the English pasture, which is formed by the use of many varieties of grasses and clovers, in mixture yields an almost endless quantity of food, rich in flesh-forming constituents, palatable and relished by all kinds of live-stock, while those of Canada and the United States, which are usually composed of clover

and timothy, soon become almost barren of food. The reason is, that when only clover and timothy are sown, there is nothing to follow their season of growth, and when once cut down they remain apparently exhausted, but not so with grass mixtures. These, when composed of suitable varieties, come into growth, and when once cut down they remain apparently exhausted, but not so with grass mixtures. These when composed of suitable varieties, come into growth at various stages of the season, and when eaten off, soon regain their vigor of growth and continue fresh and sweet throughout the season.

We are not so favorably situated in all sections of this country, nor have we the same favorable climate as England. It must not, therefore, be expected that we can obtain the same perfection in growth, generally, which we have in England, but lands can be found in every State and country that are exceptionally well adapted for pasturage, and these should be laid down with mixtures of natural grasses.

Many progressive Canadian farmers enjoy the luxury of such pastures, and sustain one cow per acre for an equivalent of seven months of the year, while the prevailing system of only clover and timothy will barely feed one cow per acre for three months.

It is to be regretted that grass mixtures have not been more generally cultivated; in Canada much has been written upon the subject, and exertions put forth to induce their adoption, but with only partial success. It is well-known that the average agriculturist is slow in making departures in any system practiced by his forefathers, nor is he always ready to invest an extra dollar even when he can double his capital, until his neighbor first makes the experiment and proves it can be done; he may then be willing to make the investment, but through his constant desire to save a penny is only agreeable to pay the price of a low grade mixture. Such ending is that he has not experienced expectations and falls back on old practices.

The cost for laying down pastures with suitable grasses, is somewhat more per acre than with clover and timothy. This, and the effect from using poor mixtures, has to some extent, hindered their more general use, but where desirable and permanent varieties have been found profitable.

There are numerous varieties of grasses which have been used when forming mixtures, but those found best adapted and most permanent in our climate of the imported varieties are: Meadow fescue, *Alopecurus pratensis*; tall oat grass, *Avena elatior*; meadow fescue, *Festuca pratensis*; tall fescue, *Festuca elatior*. We may add to these of our American and Canadian grown varieties: Kentucky blue, *Poa pratensis*; Canadian blue, *Poa compressa*; red-top, *Agrostis vulgaris*; orchard grass, *Dactylis glomerata*; timothy, *Phleum pratense*.

The Italian and perennial rye grasses, *Lolium italicum* and *L. perenne*, are largely used in mixtures, but are unsuitable for our winter climate; the Italian will not survive a winter's frost; the perennial rye (1) may live through a mild winter, but soon disappears. These should not be used when forming permanent mixtures, but for the purpose of a crop of grass or hay, the same season as sown, are very suitable.

It is no doubt a temptation, when making up mixtures, to incorporate

(1) Hundreds of years in grass: the natural product of the soil.—Ed.

(1) Pacey's p. r. we believe will stand the winter here.—Ed.

the rye grasses, as their low cost will yield better profit to the dealer, but the failure and disappointment to the purchaser should be considered.

Clover should also enter into the composition of grass mixtures; the varieties most are suitable: Alsike, *Trifolium hybridum*; white or Dutch, *Trifolium repens*; trefoil, *Medicago lupulina*; lucern, *Medicago sativa*. Red clover (1) is usually included, but it is not of such a permanent character as the other named clovers.

It is not possible or prudent to rely upon any specific formula when composing mixtures; the location and nature of the soil must be considered, as to the varieties required and proportions of each; the quantity of seed should not be less than 23 pounds, including grasses and clovers; even this quantity can be increased with profit.

In selecting soils for permanent pastures it will be found that those which are unduly dry or excessively moist will not be suitable, or in other words, those which are very light or very heavy should not be selected. Clean tillage and thorough pulverization are important essentials. If the soil is not free from foul weeds, they will rapidly grow increase, crowd out and materially injure the grasses. Thorough pulverization is necessary to facilitate the covering of the seeds evenly and uniformly, and to allow easy penetration of the rootlets of the young plants.

The seed should not be sown in spring as soon as the land is dry enough for working; after the ground is prepared it should be first rolled, then sow the grasses separately, followed by sowing the clovers in opposite direction that an even distribution may be obtained; then harrow lightly and finish the operation by again rolling. Seeds thus sown will soon appear above ground and continue to grow rapidly.

Many advocate sowing about one bushel of barley per acre at the time of sowing the grass seeds; should this be done, we would recommend the early cutting and curing of the barley, but would prefer sowing grass mixtures without other crop.

I have omitted several grasses which are usually found in seedsman's lists—some of them are suitable for special purposes only—but for the purposes of this paper have endeavoured to select only those which are found best suited to our Canadian climate. I might, however, mention *Bromus inermis*, or Austrian Bromo grass. This variety has recently been introduced in different part of Canada, and from reports received, it has been found admirably adapted for pasturage on lands of light or moist descriptions, and has thus far stood the frost of Manitoba and Northwest, giving an early, heavy crop, and producing a good aftermath of succulent, leafy shoots. Should this grass continue to give the same good results as for the past three years, it will be an acquisition to our northwest lands, where grasses, such as we can grow in the East, will not permanently thrive. We would not recommend its use for eastern cultivation, unless for the purpose of remaining in pasture for several years, because it is not so easily eradicated from the soil as those with less underground rootstock.

When buying or selling grass seeds, too much care cannot be exercised in observing that they are true to name. Those who deal in grass are aware of the difficulty experienced in obtaining European varieties that are free

from adulteration; for not only does such adulteration reduce the value of the variety to the purchaser, but often foul weeds are introduced, much to the injury of the pasture sown.

Country Gent.

WESTERN NEW YORK METHODS OF GROWING CORN.

P. O. REYNOLDS, NEW YORK.

In the Atlantic States there is a great deal more labor expended upon the corn crop than upon any other cereal crop. Field corn cannot be sown broadcast, as can the other cereals, and then left to grow to maturity without further cultivation. When matured it is not usually harvested with a machine at the rate of fifteen to twenty acres a day, and its grain and stalks separated by another machine, at the rate of eight hundred to one thousand bushels a day and the golden grain delivered in bags, as we harvest and thresh wheat. On the contrary, in the Atlantic States we usually plant by hand in hills, cultivate all through the season as long as practicable, cut it by hand, hill by hill, and husk it by hand, ear by ear; at least a large proportion of our farmers manage thus.

Now I am fully persuaded that there is a much better way; a way by which corn can be produced at much less cost. For many years a good many of our best farmers in Western New York have practised planting their corn in drills, instead of in check rows, first using the ordinary grain drill, and finally the corn planter. The approved way is to plant corn on clover sod in the regular five years' rotation. Late in autumn, when most of the stock are in the stables, commence hauling the manure daily, or at brief intervals, and spreading it upon the clover lea. Continue to do this until the ground becomes soft in the spring, unless the field is covered before. Experience has proved that this is the best way to apply manure to receive the greatest benefit from it. I have seen cornfields where the farmer commences hauling manure late in autumn and continued until just before plowing, and the corn during the season showed greatest luxuriance where the first manure was applied, gradually diminishing in thriftiness through the field to where the last application was made, where the poorest corn in the field was to be seen.

The field is plowed rather below than above medium depth, worked fine with improved harrows, marked in straight rows, and then drilled. If the old grain drill is used, only two or three tubes, according to length of drill, are used, and the seed is drilled in quite thickly, too thickly for best results, the farmer preferring to thin out afterwards to having it seeded too lightly. It is desirable to have a single grain grow every eight or ten inches, but the grain drill will not distribute the seed with such uniformity. After a few days when the weeds begin to start, or the surface become encrusted, commence to harrow with a light harrow, and continue to harrow frequently until the corn is four or five inches in height. With the surface kept mol low, the corn will sprout quicker and grow much more rapidly. Then the cultivator could be started. And here quite a saving can be effected by using a two-horse cultivator, working two rows at a time, instead one, thereby saving the wages of one man.

The aim is to cultivate so closely to the hills as to obviate the necessity of

using the hoe, and, if the rows are marked out straight enough, it can be done; not by cutting up all the weeds in the row with the cultivator teeth, but by covering those that cannot be uprooted. The corn planter drops the seed much more uniformly and is greatly to be preferred to the drill. If the farmer uses commercial fertilizers, they can be applied with the attachments to either drill. I have known New York State farmers to grow from fifty to seventy-five bushels of corn per acre in drills. Where the ground is very stony this method would be impracticable, as by cultivating so closely to the rows as is necessary to cover all the weeds, stones would be thrown upon the corn, breaking it down. But on land not too stony large crops of corn can be produced at much less cost per bushel than by hill culture.—Country Gent.

NITROGEN FIXATION BY CLOVER.

JONS A. FRIES, PENNSYLVANIA
EXPERIMENT STATION.

Leguminous plants, because of their power to enrich the soil in nitrogen, have been much studied. Much has been found out about the assimilation of free nitrogen by plants, and extensive investigations have been carried on in order to ascertain what plants have the power to make use of free nitrogen, how it is brought about, and to what extent it actually is done. In the many experiments the leguminous plants have shown the greatest, if not the exclusive power to gather and make use of nitrogen which does not already exist in the soil in the form of any known compound. Also, that the plant does not take the gas directly from the air to work it into the complex albuminoid bodies, but is brought about through a process which is rather complex, and it is only through the activity of certain microbes found in the soil, that it is done.

The important fact concerning the storing up of large quantities of nitrogen by certain plants has been known for some time, but a satisfactory explanation as to how it is done has been reached only within the last few years, and the following explanation is now generally accepted.

In the moisture and air of the soil are found numerous microscopic organisms of different kinds, and certain ones,—probably only one species,—find in the roots of the leguminous plants a medium, or certain conditions which are favorable to their most active growth and development. The root hairs are attacked, the bacteria enter and take full possession of certain cells, multiply in them, and so destroy the normal healthy condition of these cells. The characteristic abnormal growth, or tubercle, is formed, caused partly perhaps by the presence of other micro-organisms, besides those which supply the plant with nitrogen.

This symbiosis or parasitic action of these bacteria does not in any way interfere with the health and growth of the plant, but on the other hand, it is indirectly the cause of increased growth of the plant, and fertility of the soil; for in these tubercles or bag-like appendages, large quantities of the most valuable plant food are manufactured, in that these bacteria multiply and die, leaving behind nitrogenous substances for the plant to make use of. These observations have brought about a great change in the field of agriculture, and farmers are now

everywhere trying to employ these minute living beings for the purpose of increasing in the soil the most expensive and necessary ingredient of all farm products—the nitrogen.

The intelligent farmer of to-day selects and grows in his rotation, such plant as are known to be able to gather large quantities of nitrogen from sources outside the soil, and thus by plowing the crop under as green manure, or, by making double use of it, in first feeding it to the cattle, and then returning the manure to the soil, he adds to his soil nitrogen in a way much cheaper, and in a form more desirable and lasting than the salts found in most commercial fertilizers.

HOLLAND AND BELGIUM FARMING.

Amsterdam, Holland,
Sept. 26th 1894.

Farming in the low countries of Holland and Belgium is an interesting study. To one whose home is on the boundless prairies of the west, it is a problem. To know that a country no larger than Maryland contains six millions of people who live chiefly by agriculture is interesting, but to see the little nooks and odd shaped corners of land that pass for farms in Belgium is to doubt ones own eyes. The smallest farm lands of Continental Europe are those of Belgium. As one passes into Holland the farms may be seen to increase in size until the Dutch province of Friesland is reached where cattle raising is the chief pursuit. There the flat grazing lands afford plenty of range for the herds of sleek black and white spotted buttermakers which are famous the world over. In Belgium the produce of every farm is varied. A three cornered piece of land containing about two acres and hemmed by ditches filled with water is the size and situation of a typical Belgian farm. As small as it is, it will contain a patch of wheat or rye and another of barley; another fair portion of it grows potatoes.

A row of cabbage grows all around on the sloping sides of the ditches with a row of onions just inside leaving bare walking room between them and the grain. The rest of the tillable soil is planted with a great variety of vegetables, either for substantial food for the farmer's own table or a better priced product for other men's tables. For shade, ornament and profit, a row of fruit trees, mostly pear trees, surround his house. There are no yards or stable lots because they are not needed and besides every inch of ground must produce. I have wondered how these little spots of ground could be made to furnish enough to feed and clothe the farmer and his family of (7) or (8) children: they all seem to have large families. I asked the farmer in Flanders how he could manage to support himself with (2) acres of ground.

"I had the same crop last year, he said, and I had barley and onions and cabbage to sell after selling my early vegetables. Then I had a few hogs, some chickens and eggs, to send to market."

I had not thought of live stock on the place but he showed me where he kept his hogs and chickens and eggs. In a back room, under the same square tiled roof with himself, were six fine porkers. It was a clean and comfortable place for them, too, notwithstanding a score of chickens lived in the same room with them. I knew he

(1) *Trifolium pratense perenne*, the true clovergrass, should be tried.—Ed.

did not have a horse. There was not room enough on the place for one of my little bronchos, not to speak of the big Belgian draft horses which pull the enormously big trucks in Antwerp and Brussels. In one corner of this room, which was his stable two, good sized dogs were chained to a kennel. They were common looking enough, but as dear to him, no doubt, as my horses are to me, they served him as horses do farmers in America. There then were a couple of the famous Flemish *trekhonden*, the draught dogs of Belgium and South Holland where one may see them on the highways and in the streets of every village and city. They seem to be a mongrel breed with all sorts of strains noticeable among them. They draw these heavy little two wheeled wagons loaded with every thing, with milk, with vegetables, with lumber and sometimes one may see two or three of these dogs rattling along over the paved country roads with three or four persons in the cart behind them. They are in every way cheaper than horses, and I believed this Flemish farmer when he said, that with his two good dogs he did not need a horse.

Such dogs, he said would bring (60) francs each in the Sunday morning dog market in Antwerp. In Zealand, which forms that portion of Holland with its low sandy soil, lying on both sides of the mouth of the river Schelde, dogs are not the only draught animals which seem odd to an American. There I have seen sheep and small cows driven between the shafts of carts. Horses however are used more on the farms there than in Belgium. The farms are larger but the soil is not the best except for potatoes. It seems particularly well adapted for that crop. Nearly all of the potatoes sold in Antwerp and the larger cities of Belgium and Holland are grown in Zealand. The favourite variety is a small round potato with a yellow tint when boiled. They are dry and firm with an excellent flavor. Many of these were exported to America last winter. What horses are used in Belgium, however are good ones. There are no finer draught horses; no larger ones and none that draw heavier loads. They are no good however on soft ground, but that does not interfere with their usefulness much; for all the roads and streets of Belgium are hard; chiefly paved with brick or Belgian blocks.

One day last spring I had a load of lumber brought into my show lot in Antwerp. It was drawn by two big Belgian horses, and when they got on to the soft ground of the lot, which happened to be a little boggy just then on account of rain, they stopped. They could not be made to move the wagon. After the driver had given up trying, I had a span of American draught horses from my stables hitched to the wagon they walked off with it without any trouble. The reason of this was, I suppose, that the Belgian horses are accustomed to hard footing while my American horses were used to every kind of roads mostly bad ones.

As horses are used on but few Belgian farms, so are plows scarce articles there. What plows are used are primitive things, made of wood with an iron share for turning the soil. The American cultivator is of course unknown either in Belgium or Holland, as to other improved farming implements, there is no place for them. The spade, the hoe and the reaping hook are their implements. They cut the grain in the same manner that the reapers did in the fields of Bonz and the women still follow the example of Ruth. They glean the fields after the

reapers. They first do their share of the reaping though, just the same as the men do and there is no work on the farms which is considered too hard for the women to do. When the crops are harvested they are stored in the loft of the dwelling house. In Holland I have seen a number of barns. These are more plentiful in the northern provinces, particularly in the cattle country of Friesland. Just now the foot and mouth disease is bad in Friesland and the other countries of Europe have guaranteed against it. The price of Friesland milch cows has fallen from \$125 to \$175 in consequence. As Friesland cows are probably the best for milk, that province of Holland was long a great butter producing country.

Twenty years ago the city of Leeuwarden was one of the biggest butter markets of North Europe. Friday is the day for the big butter market at Leeuwarden. The time was when over ($\frac{1}{4}$) million pounds was the average market day sales for export alone. Now the amount of butter exported does not reach ($\frac{1}{4}$) of that quantity. Danish butter on the one side and Normandy butter on the other have almost crowded the Friesche butter out of the foreign market because they are better.

The Frieslanders have taken since then, to making more cheese. The light coloured cheese with cloves and seeds in it, is the peculiar product of Friesland, with the Dutch name of *nagelkaas*. (1) It is not so good as the more famous *Edammerkaas*. The little round cheese which are painted red for the export trade and so well known in the U. S. as Edam cheese are made by the farmers of the province of North Holland.

They sell here for 10 cents a pound or twice as much as the Friesland cheese with its black spices. A better cheese than either is also made in North Holland. It is more like New-York cheddar and is known as *Hollandche kaas*. It is shaped like a grindstone, about 14 inches in diameter and 4 inches thick. In both Holland and Belgium cheese takes the place of meat at breakfast. The rule of these countries like others of Europe is that nothing is made warm for breakfast but coffee, and this rule has caused no end of trouble with the cow boys with my Wild West show. In Antwerp I had an American cook to keep them in good humor but since I have been touring Holland I have had to dispense with the American boarding house for them and send them to hotels.

In the first three of four cities my contracting agents tried to find hotels that would prepare an American style of breakfast. But soon found that was impossible, an absolute impossibility. They have about gotten used to eating cheese for breakfast, but I fear they will not quit kicking about it until I get back to America with them. It is not the rule of the country to serve a warm evening meal either and it is with great difficulty that I can find hotels that will furnish a warm supper for my Company. Cowboys are human however and the way they are lionized by the Dutch, make up for a great many of the peculiarities of the country that they do not like.

Notwithstanding the appreciative and profitable audiences I find here, from what I have seen of the low countries, travelling from one end to other, I have concluded that I prefer having my ranch in Kansas.

It is true they never suffer from drought here, for the seas, rivers and

canals are higher than the farm lands and with ditches everywhere irrigation is no trouble at all. There are no fences here to be kept in repair either as the field are divided by ditches filled with water.

The only fences are the dykes to keep the waters back. These dykes which are from one foot to fifteen feet high, made of dirt and about as broad as a single track railroad dump, stand between the farmer and the destruction of his fields: in some places of his life. To cut one would be to flood the country, in some places with (12) feet of water. Canals run everywhere and the farm products are taken to market on the boats. At this season barges loaded with hay and cabbage may be seen in every direction in Holland. The farmers of Belgium and Holland work harder than they do in America because of the lack of labor saving implements. They practice pinching economy all the year round, and from the little two acre farmers of Belgium and the cattle growers of Friesland all lay by a few cents, if not more, to steadily increase the family savings.

G. W. LILLIE.
Pawnee Bill.

Cottonseed Meal and Soja-Bean meal were tried the past year at the Mass. agl. college, and the result, appear in its report. Eight cows were divided into two lots to determine the value of each feed in a well-balanced ration. The experiments show that soja-bean meal gave the most milk, cottonseed meal the most cream. The soja-bean meal cream was the richer, giving 18% butter fat, while the cream from cottonseed meal made only 17%. To make a pound of butter 7.27 Cooley spaces of cottonseed cream was necessary, while but 6.27 spaces were required by the soja-bean meal cream. The soja-bean butter was of a higher color and much more agreeable in texture and flavor. The cottonseed butter had a greasy feeling in the mouth, while the other was of an agreeable substance. The experiments show that soja-bean meal is superior to cottonseed meal as a food either for milk or butter production. If further work at the college establishes this conclusion, New England farmers will be able to raise concentrated nitrogenous foods on their own farms.

STUBBLING. (1)

It is not often that allusion is made, even in agricultural papers, to what is familiarly known as stubbling. It is a piece of old world thrift, and resembles gleaning, the difference consisting in the substitution of animals for people, and mouths for hands. In all cornfields there are fallen ears, and scattered grains, which would be lost were it not for stubbling, and therefore, it is necessary, before the steam cultivator or the plough arrives upon the scene, to beat the stubble and secure the remnants of the crop. We have heard energetic farmers discount the value of stubbling as a means of delaying more important operations, and in fact as not worth waiting for. In some circumstances it is true that the advantage is counterbalanced by drawbacks; but, in most cases, nothing is gained by rushing on too rapidly, and the more leisurely system of completing work before proceeding with fresh operation is the most commendable. Geese are in many

(1) We remarked, with grief, the impossibility of "stubbling" at Beaconsfield on account of imperfect fences. v. p. 181, *supra*. In England, we call it, locally, *shacking*. Ed.

districts used for stubbling purposes, and vast droves of these birds are to be seen resting on village greens or on wide road-sides, or thronging the market-places of towns, awaiting purchasers. They are perched upon stubble and brought home at night to the homestead, and quickly fatten and convert waste corn into money. Pigs are however, the most indefatigable stubblers, because they are not content with a mere inspection of the surface, but prospect beneath for roots and for worms. The pig is blessed with both an excellent and an omnivorous appetite. He will eat a wireworm or a snake, an acorn or a bean, with equal impartiality. He is fond of earth nuts and roots, and ploughs up the ground in long furrows, sometimes to the injury of young seeds and sainfoin; but much to the farmer advantage, on the ordinary unseeded stubble. It is pleasant to watch the delight of a herd of pigs at their work on the stubbles after harvest; to see them, sleek and happy, with pricked-up ears, all activity, and alert to the approach of strangers. Towards evening they return, full and thirsty, to enjoy a drink of whey and swill, and rest content until the next morning.

On sheep farms the stubble are an enormous advantage to the flock. They afford room for spreading, and a capital change of food. The ewe flock obtains what it is very properly desired by the thrifty master—namely, an allowance of corn. No one "corns" ewes; but in a surreptitious manner, a certain supply is obtained at this season of the year, which is beneficial in producing a freshness, which results in an earlier and more rapid lambing season. Sheep also eat out the weedy herbage more thoroughly than either pigs or geese. It is a questionable advantage to rip up stubble before the flock has had ample opportunity of beating them out thoroughly. Here, again, the question of young seeds and young sainfoin is a practical problem.

SHOULD SEEDS BE GRAZED AFTER HARVEST?

There are two opinions upon this point, and we incline to a middle view of the question. To graze young seeds hard and late is certainly injurious; but to run sheep lightly over them is not only tempting, but allowable. If the sheep do not top the clover the frost of winter will, and it is a pity to lose such a nice of grazing. Above all, sheep should not be allowed upon young seeds late in the season, when frosty rimes occur. In early autumn no harm follows, provided the seeds are not stocked too hard; and it is in regulating and stopping the process at the proper time that the master best controls the action of the shepherd. We are less in favour of grazing sainfoin after harvest, and believe the wisest plan is to abstain entirely. Sainfoin requires time to develop its root, and it is a tender plant in youth; we, therefore, reason it that sainfoin should be left untouched by stock during the autumn, after it has been sown.

First prize in its class at the Sherbrooke Exhibition of 1894.

CLASS 46. SECTION 6. N° 2.

Robertson Mixture for Silage.

When corn growing for onsilage was first introduced into Canada, corn alone was planted. It was soon found, however, that this lacked the fatty elements so essential to a perfect food.

To supply this want the Robertson mixture was introduced. This consists

(1) *Nail-cheese*.—Ed.

of a mixture of corn, horse beans, and sunflowers. The corn and beans being sown together and the sunflowers separate from them. This mixture I have found to be very good as it contains all the ingredients of a perfect food viz:—Carbohydrates, proteids, and fats. Also it produces a larger yield per acre as I have weighed corn when planted alone and compared the weighed with that when planted with beans and find the yield of corn equally as good in the latter as in the former case, and in latter there is in addition the crop of beans. (1) Each seems to take different ingredients from the soil and to grow and mature independent of the close proximity of the other.

I have found that properly preserved ensilage will not taint milk. In all cases where milk is tainted by ensilage it is due to the ensilage being improperly preserved, which result is almost sure to follow any lack of care in the process of filling the silo.

I will confine myself to the methods followed in the cultivation of my field of corn rather than discuss what might be done under other circumstances.

The place selected to plant my corn was a dark loam which had lain in hay about as long as hay would grow on it. A part of the field was plowed last fall, the remainder in May, and cultivated thoroughly to the depth of 3 in. without plowing again. My experience has been that it is not best to loosen the land too deeply but to make a fine tilth on the surface and to plant the seed as shallow as possible.

I have usually for some years past planted it with a drill seeder, leaving only 2 drills to work, these being 3 feet apart. This year not having a drill I used the common swing plow, with the horses going wide apart, always having one horse in the last mark drawn and making them as straight as possible, as that allows us to cultivate much closer with the horse cultivator. We make the drills 3 feet apart and running from north to south. My reason for this being that the sun shines for a longer time each day on the ground between the rows of young corn, and as the corn requires all the sunshine that it can get, it makes a material difference.

I kept a boy following and dropping the seed by hand, also another boy sowing phosphate 2, into the same drill, about 200 lbs per acre, as I had no manure whatever and none had been applied for a number of years previously.

Then, when all was sown, we covered it by going once over it with a common angle harrow. I now left it until the plants were appearing above the ground when I harrowed it again. This time going across the rows from corner to corner. We did this three or four times changing the direction each time till it was 6 to 8 inches high. I may here state that I think that kind of cultivation much superior to any other kind I have ever tried; it taking out all the young weeds as soon as they commence growing at which time they are very tender, and also cultivating each plant of corn very thoroughly without disturbing the roots, except in a few cases and for that reason I sow a little thicker than is usually recommended as I think it much cheaper to put in too much seed and pull it out than to try to plant it when too thin or to leave it so. (Quite right.—Ed.)

(1) Unfortunately, corn and beans do not demand the same seed-time.—Ed.
(2) But what phosphate?—Ed.

I plant about $\frac{3}{4}$ bush to an acre with about $\frac{1}{4}$ bush of horse beans mixed and my experience has been that I just get about two crops on the same piece of land.

I now begin to cultivate with horse cultivator between the rows, going as close as possible, repeating at intervals of a few days for three times.

The last time I have a short whistle-tree which I hitch close up to the horse to avoid injuring the corn which is usually now up to the horse's ribs. I always go to the same way in each drill as I went the previous time, because in passing the first time we give the little rootlets a little inclination in that direction, and by going the same way we keep them healthy and growing in the same direction; whereas going the other way would break all the little rootlets and retard the growth considerably.

I do not bill up as I like to keep the roots as near the sun as possible and besides it will stand much better in a storm if on the level than if on a hill. (1)

I have now reached about July 1st when we can stop cultivating. At this time the growth is so rapid that we can almost imagine we can see it grow.

By weighing 12 feet each of a few drills I estimate that it is now about 17 tons per acre. The different varieties varying from 15 to 22 tons which, although not up to the top mark, I consider very good under the circumstances.

It is now within about 10 days from being ready for the silo.

I shall cut it about $\frac{3}{4}$ inch in length. And now comes in my opinion, the most particular time, i. e.:—the putting of it into the silo.

Although there is nothing very difficult about it, yet much more good corn is grown than good ensilage fed. It makes no material difference whether it gets wilted or not after cutting.

I differ from most authorities by thinking that the corn should be cut earlier than is usually done, i. e.:—the glazing stage. As I find it is very apt to pass through the cows undigested when left too long before cutting. (2)

I always put my best man into the silo and go in occasionally to help him, if possible, to keep it thoroughly mixed. The leaves being so much lighter than the grain and stalks, in falling from the elevator they separate and do not pack tight enough to exclude the air, and poor ensilage is the result, unless precautions are taken to prevent it.

I also see that the sides are packed tight to the boards and are tramped as well as possible as also the corners, which cannot get too much (the more the better).

After the silo is filled I leave it 4 or 5 days, tramping it evenly all over the surface once or twice every day. I then cover it with cut straw or any other cheap stuff which usually protects the ensilage, excludes the air, and keeps the ensilage from spoiling.

I intend to feed it to milch cows at the rate of 40 lbs a day along with other stuffs. I always find it difficult to place a definite value on any one individual food as each seems to want something that others possess, but I find that I can supply the place of the greater part of the bulky foods with ensilage.

Compared with hay one acre of good ensilage corn will feed from 4 to 6 times as much as the same quantity of land a good hay.

(1) Very good.—Ed.
(2) We are inclined to agree with Mr. Robertson in this.—

I never found that the silo would give me out any feeding value that I did not put in. (1)

It simply keeps it in a good feeding state until I am ready to use it, no matter when that may be.

I have found that I am able to feed milk cows from 2 to 4 cents cheaper a day on ensilage than with hay.

I am exhibiting eight varieties, all of which are about two weeks from being ready for the silo and are taken from a field of 5 acres.

I hereby declare that the Corn mentioned in Paper Class 46, Sec. 6, was grown in a field containing five acres.

ROBT. ROBERTSON, Mgr.

Declared before me, this 5th September 1894.

GEO. O'ROURKE,
Comm'r S. C. St. Francis.

First prize in its class at the Sherbrooke Exhibition of 1894.

CLASS 46, SECT. 1, ENTRY N° 2.

Summer and winter care of cows.

In writing a paper which shall comply with the rules of this class, I shall give the statement given to me by the butter maker of our creamery, which special statement you will please find attached.

From June 1st—14th my herd consisted of 10 cows. On June 14th one more was added, making eleven in all. The total number of days was therefore 99 of one cow from which I received an average of 1,280 lbs. of butter per day.

I shall begin with their going to grass about May 15th. They were allowed to remain out a short time each day and were kept in the stable at nights till about June 10th.

When the weather became somewhat warmer they were allowed to remain out all night.

The pasture consists of rolling land, well watered by a ravine, fed by running springs, running through it, the grass being mostly Canadian Bluegrass with some white clover. It was in a rather poor condition, and did not afford quite sufficient feed for the cows, but I was unable to have any green feed this summer, so nothing additional was fed until August 15th, at which time I commenced giving $\frac{1}{2}$ lb. of wheat bran, $\frac{1}{2}$ lb. of oil cake and cotton seed meal mixed together and fed in the evening, dry. They were allowed access to salt at any time they wished all the summer.

They were brought to the stable at 5.30 A. M. and at 5.30 P. M.

The cows were milked by beginners, and there was very often a change of milkers, which I consider detrimental to the good performance of any cow. The udders and teats were always washed before milking was commenced, and the milking done with wet hands which is, I think, better than with dry. (2) For the horn-fly, which annoyed the cows considerably, I used kerosine emulsion, recommended by the Ottawa Experimental Farm, and we applied it about every two days with a spraying pump. This checked them pretty effectually but did not entirely get rid of them.

I tried two other kinds of fly exterminators but did not find any so effective as the above mentioned. We shall continue to give the cows the same care they are getting now until

(1) Nor any one else, either.—Ed.
(2) So do we.—Ed.

the nights got cold, when they will be kept in at nights. We shall gradually increase the corn fodder and meal until they are kept in permanently when we shall regulate the feed to the individual animal. It is impossible to lay down any definite rule regarding the amount a cow should be fed, as some cows will consume, digest, and pay for a much greater quantity than others. This must be left to the judgement of the feeder.

I will now quote my average feed for 30 cows last winter some getting more, others less, according to their time in milk and general ability to perform, viz.: 40 lbs. corn silage, 7 $\frac{1}{2}$ lbs. clover, 3 lbs. straw, 4 lbs. oats, barley and pease chop, 1 lb. cotton seed meal and 3 lbs. bran. I intend feeding about the same proportion with some roots and less bran this winter, keeping them in the stable all the time with the exception of an odd extra fine day when I may let them out for a short time. They will be tied in pairs with swing stanchions which I consider superior to any other tie I have ever seen for a dairy cow allowing them freedom, and at the same time keeping them quite clean.

The floor on which they stand is 4 ft. 8 in. in length with a drop of 5 in. and 20 in. in width. There is a walk 4 ft. wide behind each row of cows. The cows are placed in two rows, in a stable 42 ft. long, with their heads facing towards the centre. There is a passage 5 ft. wide between the rows at the heads wide leads up to the silo door.

The ensilage is carried in a box suspended from an overhead track and fed to the cows in the bottom of the manger.

The cows are allowed to drink any time as a water box is placed between each pair of cows. I feed only twice each day and allow the cows to rest in the intervals between the feeds. I consider it very essential that the cows are not disturbed while resting. The milking, feeding, cleaning and grooming occupies about 4 hours in the morning and a little less in the evening thus allowing the cows to rest a little more than 16 hrs. each day. The stable is now, 42 feet by 32 feet with ceiling 7 $\frac{1}{2}$ feet high. It accommodates 26 cows allowing about 400 cubic feet of air per cow, with 48 feet square of light, i. e.: about 2 ft per cow.

The walls consist of two ply of rough lumber and one ply of matched lumber inside.

To afford ventilation the windows are all hinged on the bottom side and can be opened as far as may be considered necessary. I have found that cows must not be exposed to cold air or draughts if good results are to be secured.

In my opinion the essentials for a dairy cow are heat, light, kindness, liberal feeding and pure air.

Regarding the care of manure, I expect to absorb all liquids with the cut straw which has been used for bedding.

At present I have no place to keep the manure under cover so I shall be obliged to put it in the open yard, taking the precaution however to put a little horse manure to keep it heating.

It is then to be drawn to the field intended for it and placed in large piles which are to be spread on the ground as early as possible in the spring. "To make more corn grow, to feed more cows, to make more manure, to make more corn grow, to feed more cows, &c.

EXTRACTED FROM THE ORNAMERY BOOKS.

June 1894	Lbs Milk	Lbs Butter fat.	July 1894	Lbs Milk	Lbs Butter fat.	August 1894	Lbs Milk	Lbs Butter fat.
1	396		1	727		1	300	
2	400		2	"		2	298	3.60
3	"		3	395		3	300	
4	652		4	370	3.40	4	302	75.63
5	360		5	380		5	"	
6	371	3.40	6	385		6	602	
7	361		7	385		7	318	
8	353		8	"	89.82	8	310	3.40
9	360	110.46	9	651		9	301	
10	"		10	386		10	310	
11	672		11	348	3.40	11	321	73.61
12	349		12	341		12	"	
13	362	3.60	13	339		13	653	
14	388		14	337		14	329	
15	360		15	"	81.66	15	315	3.40
16	380	90.39	16	668		16	323	
17	"		17	310		17	317	
18	802		18	349	3.40	18	330	77.07
19	384		19	325		19	"	
20	415	3.40	20	324		20	611	
21	413		21	307		21	314	
22	413		22	"	78.64	22	309	
23	430		23	591		23	319	3.40
24	"		24	312		24	285	
25	761		25	332	3.60	25	291	73.40
26	442		26	310		26	"	
27	382	3.60	27	309		27	575	
28	406		28	307		28	320	
29	387		29	"	77.90	29	310	3.60
30	385	99.57	30	604		30	293	
			31	297		31	290	61.36

Total lbs Milk 33394
 " " " Butter fat 1039.64
 " " of Butter 128.

I do hereby certify that this is a true copy of the amount of milk furnish by the exhibitor.

P. HAVEGAARD.

I hereby declare that the statements contained in paper class 46, sec. 1, are true and correct.

ROBT. ROBERTSON. Myr.

Declared before me the 5th day of September 1894.

GEO. O'ROURK.

Commr. S. C. St-Francis.

First prize in its class at the Sherbrooke Exhibition of 1894.

CLASS 46, SECTION 4.

Cultivation of Mangels for feeding Cattle.

After taking a crop of oats from meadow ground, I give a very liberal coating of good barn manure deeply ploughed in in the fall. If the weather continues fine I harrow the ground, then cross plough, harrow again till it is very fine then I drill 26 inches wide. In the spring, as soon as the land is fit to work, I split the drills spread well rotted manure in the bottom of the drills, then cover and put the roller over them. The land is then generally fit for sowing the same day. I sow 5 lbs of seed to the acre, as I find it is better to pull out a few than to fill up the blanks by transplanting. I begin cultivation as soon as the plants are from one to two inches high, cultivate again before thinning, thinning when the plants are about 3 to 4 high leaving them ten to twelve inches apart. Cultivate again in a few days, then give them a thorough hoeing afterwards cultivate till the plants get to large. My crop of mangel generally averages thirty to thirty-five tons per acre. I remember having one crop that yielded me forty five tons to the acre. And from the appearance of this year's crop, I expect to have over thirty tons to the acre.

I feed my milking cows bran and ground grain in the morning, and in

the evening give them a feed of sliced mangels and I consider I derive more benefit from them, than any from other feed I could use.

THO. IRVING,

Logan's Farm, Montreal. (1)

First prize in its class at the Sherbrooke Exhibition of 1894.

CLASS 46, SECTION 5.

Cultivation of Carrots.

I generally sow oats on meadow ground. I then sow my Mangels, then follow this with carrots; as, I find the ground loose and mellow, and very free from weeds. Plough down in the fall a good dressing of well rotted manure. Drill in the spring, making the drills twenty four inches wide, as that leaves plenty of room for a cultivator to get through them, I do not sow my carrots till near the end of May. Drill and sow the same day sowing 1 1/2 lb. of seed to the acre; when the carrots are visible I hoe them very closely before working them with the cultivator. Thin to about two inches apart, cultivate, and hoe again: after this cultivation, they generally require nothing more; yield about 15 tons to the acre. I feed my carrots sliced and find them healthy and profitable food for cattle, especially for young growing animals.

THO. IRVING,

Logan's Farm, Montreal.

STATUTORY DECLARATION.

Dominion of Canada,
County of Hochelaga.

To wit:

I, Thomas Irving of Montreal, in the County of Hochelaga, Farmer. In the matter of the Exhibition of Beets for feeding of Cows. Do solemnly declare that the two

(1) Mr. Irving accidentally omits the height at which the thins the plants. We have mentioned three to four inches as in our judgment about the right height.—Ed.

bushels of field Carrots, and the two bushels of field Beets for the feeding of Cows now exhibited by me, were taken out of a field belonging to me of not less than half an acre under my personal supervision.

And I make this solemn declaration, conscientiously believing the same to be true, and by virtue of the Act respecting extra-judicial oaths.

Declared before me at Montreal, in the County of Hochelaga, this first day of August A. D. 1894.

H. B. WRIGHT, Notary Public, Commissioner authorized to take affidavits and one of Her Majesty, Justices of the Peace.

THOS. IRVING.

The official *Journal of Agriculture* of the Province of Quebec, which has been so much improved under Mr. Beaubien, the present commissioner of agriculture, is to have a distinguished follower. The British minister of agriculture, Mr. Herbert Gardner, has declared his intention of issuing a government journal dealing with matters of interest to agriculturists at home and abroad, crop prospects in foreign countries, dairying fruit farming, poultry, rearing, noxious insects and fungi. (1) This is one of the points in which the province of Quebec, so often reproached for its backwardness, is well to the front. Quebec has had its official *Journal of Agriculture* for many years.—*Montreal Gazette*.

SPEAKING of the necessary amount of moisture needed to hold up a crop of corn, D. A. Kent, in *Rural Life*, says that he has learned this year that with the ground full of moisture the first day he could carry corn to the 23d day of June without rain and still maintain it in perfect estate. Let us add one more essential: with constant cultivation, the first time deep, say two to four inches, ever after that as light and near the surface as possible. We saw this season many pieces of corn badly injured by the farmer allowing the cultivator teeth to run too deep after the corn got ten inches high. It is the deep cultivation, cutting off the corn roots that supply moisture that oftentimes makes the drouth much worse in its effects. Prof. Kent says also that most of our cultivated crops do not wilt until the moisture of the soil gets down to 13 oyo.—*Hoard*.

Fruit and Garden.

LECTURE ON CIDER MAKING.

A few lectures have been arranged by the Agricultural Committee of the County Council to be given by Mr. James Harper, of Ebley, Cainscross, on Cider Making. It was thought that a stimulus might be given to one of the industries of the county if an acknowledged expert were to detail his practice. In the last number of the Bath and West of England Agricultural Society's Journal a very interesting paper appeared, written by Mr. Harper, from which it was evident that much more care was required in the management of the details of gathering the fruit, and in regulating

(1) And a pretty pother the English Agricultural papers are making about it.—Ed.

the fermenting of the juice, than is usually given, if cider is to be made that the public like to drink and will be tempted to buy. The first lecture was given at Berkeley in the Town-hall, the chair being taken by Mr T. P. Bailey. There was a fair attendance of farmers. The lecturer dealt with the subject in an exhaustive way, beginning with the kind of fruit to grow, and suggesting that the best kinds were not as a rule those which were called cider fruit, but table fruit, the larger ones being sold for eating purposes and the smaller ones for mixing with other fruit; the chief object being to grow fruit with a large proportion of juice and saccharine matter. He next dealt with the treatment of the trees, and pointed out the importance of so pruning them as to admit air and sunshine into all parts of them to ripen the wood, and so manuring the trees as to enable a maximum yield of fruit to be grown yearly. He also dwelt on the importance of washing and syringing the trees to destroy lichen and insect pests and to encourage a healthy growth. He laid great stress on the importance of gathering the fruit so as not to bruise it, and not to allow the fruit to lie on the ground until it is sufficiently ripe for grinding. He strongly recommended shaking the fruit into a blanket properly arranged under the tree, and storing the fruit on an arrangement of hurdles, so as to keep the fruit off the ground and allow the air to circulate freely all round. If fruit is allowed to lie on the ground, small microscopic fungi become attached to it, and create in the juice such a state of fermentation that not only makes it exceedingly difficult to control, but also spoils the cider. The next important point he dealt with was the necessity of properly filtering the juice so as to take out of it all the thick residual matter that prevents the finest cider being made, but also to get rid of the germs that produce the bad ferments. The great point in filtering was to do it quickly and with the least possible exposure to the air. Slow filtering and exposure to the air were the main causes of dark cider, the controlling of the fermentation giving the maker the power of having either sweet or dry cider—the sweet cider having more sugar and less alcohol than dry cider. He went on to point out that by this means a cider could be made with less than 2 1/2 per cent. of alcohol, and, in fact, had less n it than most ginger beer that is made. Therefore he pointed out that cider made in this way was the finest temperance drink that could be made.

Chinchas Guano.—This well-known quality of Peruvian guano has been off the market for a good many years, as the Peruvian Government reserved the remaining stocks on the Islands for home consumption. We learn, however, that recently a contract has been completed for the resumption of shipments of Chinchas guano to Europe, and we understand that all the shipments will be made to Anglo-Continental (late Ohlendorff's) Guano Works, who have had the control of the guano business for a great number of years. Besides the guano from the Chinchas Islands, which is high in ammonia, also the shipments from Huanillos and Lobos are coming forward in ample quantities, so that buyers will have the choice of guano high in ammonia and low in phosphates, or high in phosphates and low in ammonia; the latter being specially required for root crops and grass lands.

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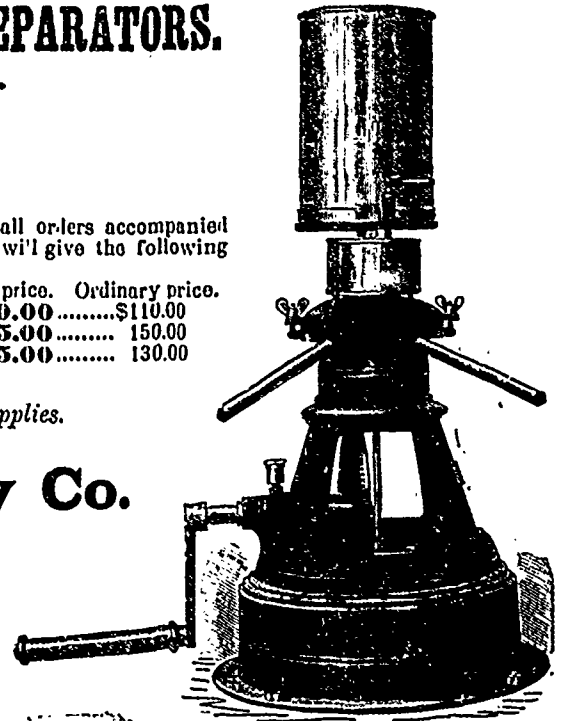
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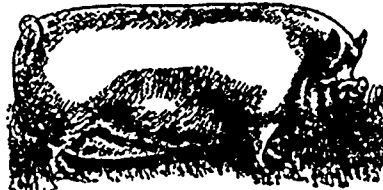
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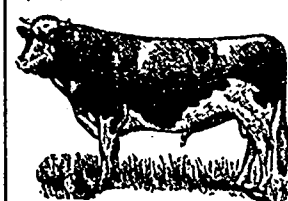


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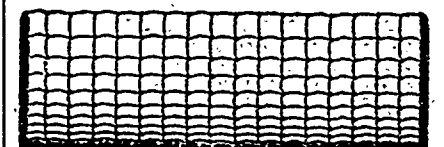
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Westville, N.S., Sept. 8, 1893. DANIEL P. McDONALD.

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French Village, P.Q., May 26, 1889. WADSWORTH & McMANUS.

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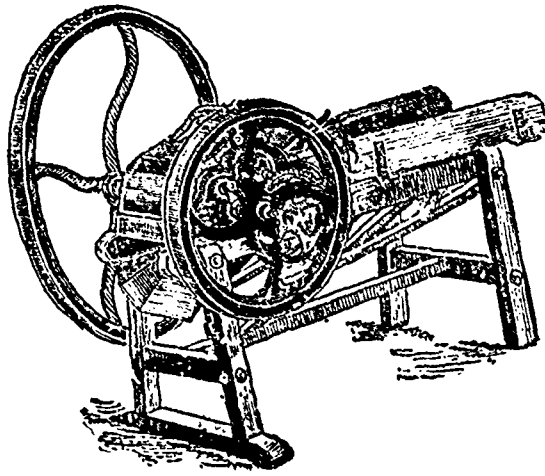
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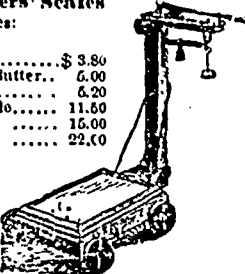
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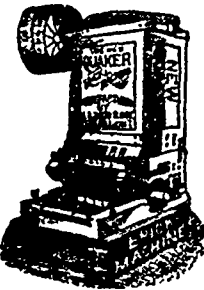
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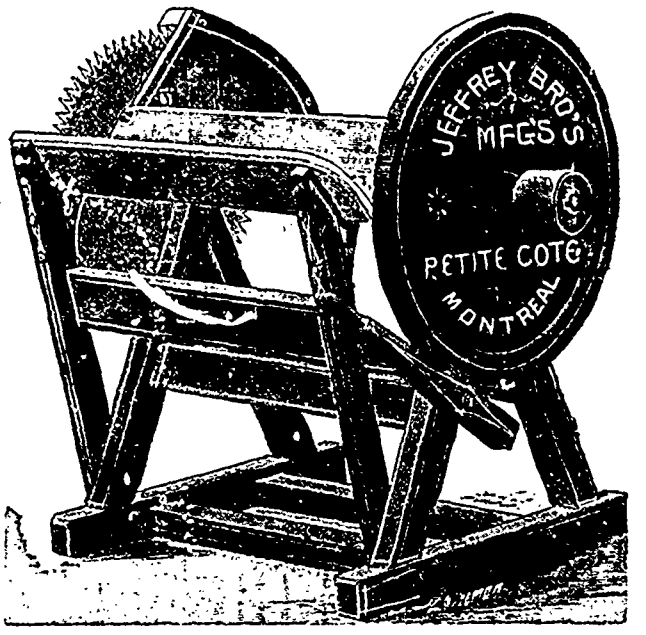
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