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THE ILLUSTRATED JOURNAL of AGRICULTURE



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All matters relating to the reading columns of the Journal must be addressed to Arthur R. Jenner Fust, Editor of the JOURNAL OF AGRICULTURE, 4 Lincoln Avenue, Montreal. For subscriptions and advertisements address the Publishers.

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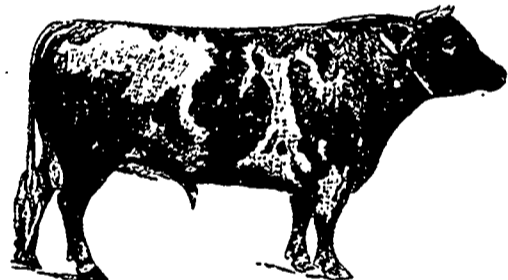
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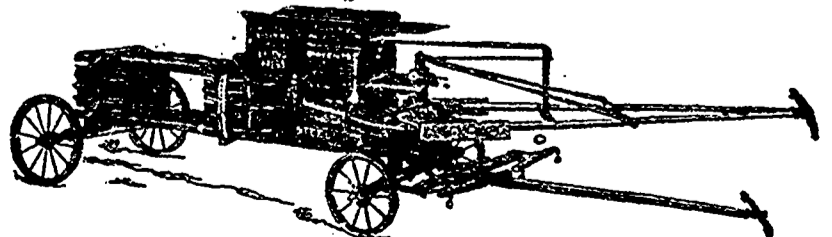
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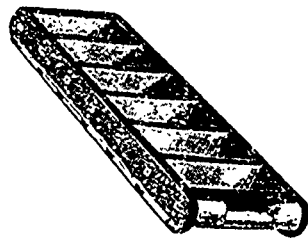
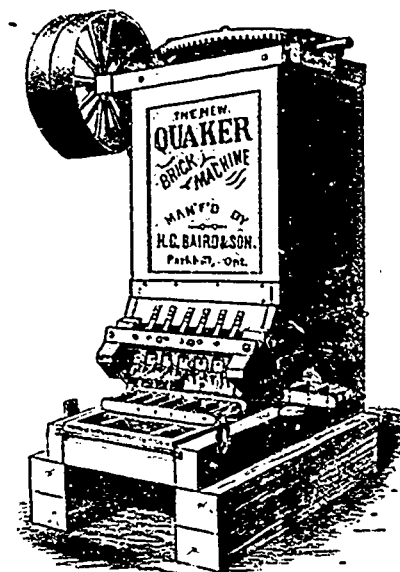
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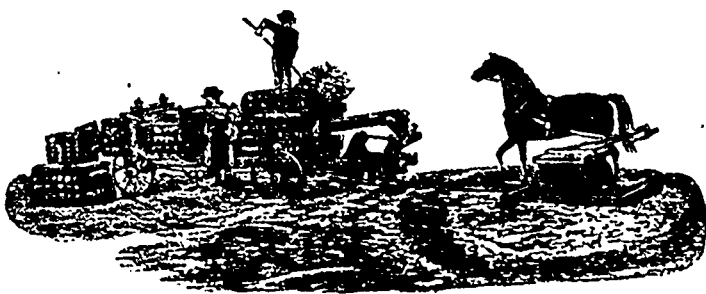
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We manufacture four sizes of presses:
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We will send this press for trial to any responsible party.
Write for our catalogue and list of prices.

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The Foundation cows in this herd are

- Jolie of St. Lambert, 5726, Canada Champion Milk Cow, 15 lbs. 13 1/2 oz. butter, 48 lbs. milk per day.
- Lady Fawn, of St. Anne's, 1920, Victor Hugo's best daughter, 16 lbs. 12 oz. butter 4 days, 47 lbs. 11 1/2 oz. 21 days, 27 1/2 lbs. milk 89 days, when 1 1/2 years old.
- Fet of St. Lambert, 5125, 50 per cent Victor Hugo
- Dam of Oakland Nora, 23 lbs. 5 oz. butter.
- Dam of Diana of St. Lamberts, 16 lbs. 8 oz. butter.
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The sieve of our vibrating machine is longer and wider than all the other machines of the same kind manufactured in Canada. This new shape facilitates the cleaning of the grain and the sieve is less exposed to spread its contents outside. We give seven passes with this sieve.
The horse power runs on cast iron rails, all the shafts of the bridge are in steel and measure 2 of an inch which represents half a line of a larger size than those employed by the other manufacturers. All the shafts in the separator, the sieve and the horse power are in steel. We never use any iron shaft. Our machine is acknowledged to be the easiest to run and the one which lasts the longest.
Write for a catalogue and list of prices.
We also manufacture a Canvas Separator with improved Railroad Horse Power, Railroad Upright Hay Press, Rod Upright Hay Press, Straw Cutter No. 3, 11, 13; Spring Harrows, 16 teeth; a Washing Machine patented May 1892.
We want active and responsible agents in all the localities where we have none yet. Any farmer shall find it an economy and be certain to have the most improved machine in applying for it. We allow a special discount for orders sent by mail.

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THE ILLUSTRATED
Journal of Agriculture

Montreal, February 1, 1894.

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Notes by the Way.

TUBERCULOSIS.—We regret to hear that this terrible disease has been making fearful ravages in the herds at the Ottawa Experiment station and at the Guelph Colloge. There is, at present no known cure for it, and as it is

both contagious and hereditary, the damage done by it is even more extensive than the damage done by pleuro-pneumonia, which is contagious but not hereditary.

Tuberculosis is the same disease as consumption in the human subject. The word *tubercle*, whence it is derived is the diminutive of *tuber*, and its most characteristic appearance is shown by the little pearl-like tumours, varying in size from a pea to an egg, that are found in the lungs and the membrane that covers them. One very awkward part of the complaint is the length of time that often elapses between the infection and its manifestation: the disease may sometimes show itself in three months, or it may take as many years before it is noticeable. The principal signs of an animal's being attacked by it are: the beast does not thrive; eats well to-day and refuses food to-morrow; coughs; the hair is dry, harsh, and dull, and diarrhoea often occurs. The milk of cows and the flesh of all cattle suffering from this complaint are nothing less than poisonous both to man and beast; therefore, the milk should be thrown away and the flesh of slaughtered cattle buried, or, which is better, burned. All diseased and suspected animals must be kept apart from the rest of the herd, and those proved by the inspection of a veterinary surgeon to be affected should be killed at once.

A HEAVY BEAST.—The heaviest bullock exhibited at the show of the Smithfield Cattle Club, in December last, weighed, on foot, 2,538 lbs. Taking the very moderate average of .68 per cent, of dead to live weight, the four quarters of this beast should weigh 1782 lbs. At the then market-price of seven pence halfpenny a pound, sinking the offal, i. e., skin, loose fat, &c., the bullock was worth \$249.48! Many of the best beasts of the show gave as much as 72 per cent.

FOOD AND FAT.—Again this question crops up: can the quality of milk be improved by feeding? Mr. George Smith, Director of Farmers' Institutes in the State of New-York, says that some breeders feed their cows on stimulating food to make them give an abnormally great flow of milk at the expense of quality, and in this way cause the milk of their cows to fall below the present low standard.

Now, if a large flow of poor milk is produced by such food, we can logically conclude that the reverse holds good; i. e. that the quality of milk can be improved by judicious feeding.

THE ROYAL JERSEYS.—At a sale of the Queen's surplus Jerseys from the celebrated herd on the Prince Consort's farm in Windsor Park, fifteen head were sold. The prices were rather low, the highest being only \$88.00, which was paid for a 2-year old heifer.

EXPERIMENT-STATIONS IN THE STATES.—We remember well how, in a certain "Agricultural Colloge" in Canada, the funds supplied by the country for agricultural instruction were used to benefit literary schools, the agricultural feature being a mere annex for the purpose of securing the money belonging to agriculture. The same thing has, according to the Rural New-Yorker, been going on in the States, and that periodical seems to found great hopes of improvement

in the declared intention of the new Secretary of Agriculture, Mr. Morton, to do away with this most dishonest system. "It is our belief," says the Editor, "that unless some of the colleges and experiment-stations are at once overhauled and straightened out, they will have to be abolished within ten years." As far as we can judge from the bulletins, &c., we receive, a good deal of the funds devoted to these so called agricultural colleges is expended in a mere réchauffé of experiments that were carried to a conclusion in England forty years ago.

DUNGIES.—Such is the refined epithet applied to the farm-pupils in the "alleged agricultural colleges," as Dr Hoskins calls them, in the U. S., by the arts' pupils. A pleasant thing, indeed, it must be to be a farm pupil in a "mixed college" then! The good and liberal minded Doctor does not seem to mince matters:

"The feeling against D. Ds. as heads of industrial schools is not a prejudice of ignorance, or an evidence of narrow intellect. It is in a way instinctive; but the instinct is a good one. It is not based on prejudice, but rests upon common sense, and the fitness of things. We want men of science, not men of literature, or fine art, to teach our boys—not only to farm, but how to make agriculture honored in the only way in which honor on the farm can be won,—by making the farm "pay." We want a school where we can send our ambitious boys, and have them taught how to make as much money on the farm as in any other occupation. That, and that only, can make farming honorable, and cause the smartest and best girls to be willing and glad to marry farmers. When agriculture is classed as a liberal art, and the degree of "Master of Agriculture" means to its possessor everything that any college degree can mean, in point of knowledge and character, then will the agriculture of the state or country where that is true offer prizes worth the best men's competition. But that will never be while these schools are officered by men who accept positions in them because they are not able to get positions elsewhere."

PRICE OF CHEESE IN ENGLAND.—The price of picked dairies of Cheshire cheese has been very high this year. While ordinary lots have been sold for from 70s to 80s a cwt., 135s, and even 200, have been paid for selections, and that at auction-sales. As the Cheshire cwt. is 120 lbs., instead of 112 lbs., a deduction of about 1/4 must be made from the above prices to bring them to the usual market quotations, so for 200s we should read 187s, and so on.

SHEEP AT THE SMITHFIELD CLUB.—One of the grandest displays of sheep ever brought together was to be seen at the exhibition of the Smithfield Club of December 1893. There were, in all, 217 pens, or 651 sheep, the largest number, with one exception, ever collected.

The *Lincolns*, of course, were the heaviest sheep in the show, the ewes of Mr. Goodyear scaling 371 lbs. a piece, the lambs only 202 lbs., whereas Mr. Craddock's *Cotswold* lambs weighed 256 lbs. each.

Southdowns had 28 pens (3 each) of wethers, 8 of ewes, and 21 of lambs.

Hampshires, with their 11 pens of wethers, six of ewes, and 12 of lambs, were a splendid display. The wether class was so good that an extra prize was awarded to it. Lord Howe's pen of lambs weighed no less than 6 cwt. 3 qrs 24 lbs., i. e., 290 lbs. each, thereby beating their rival lambs, the *Cotswold*, by 34 lbs. a head, the *Oxford* lambs only going 213 lbs. So our favorite breed still holds its own.

PASTURES.—The, there, apparently novel plan of dividing the pasture for cows into two parts is patronised by the editor of Hoard's Dairyman, writing, we suppose in the State of Wisconsin. He says that it is being practised by some dairymen and they are greatly pleased with it, as it give a pasture a chance to freshen, not only in the growth of the grass, but also in the flavour, which latter improvement the cows highly appreciate, and show their appreciation by the improved flavour of the butter. "There is certainly nothing unreasonable in the claim." No, we should think not. We do not like constantly eating the various dishes of flesh, fowl and vegetables off the same dirty plate, neither does a cow like to go on eternally feeding on the same soiled pasture. But, good gracious, has it taken the great dairy state of Wisconsin all this time to find out what was known to the poorest farmer of Britain a hundred years ago? What an immense amount of good the dairymen of America would derive from the sending of a deputation of farmers, unprejudiced and observant men, to travel through the best farmed districts of England and Scotland!

PASTURING MEADOWS.—A correspondent wants to know if pasturing mowing land in autumn injures it. Well, that depends. If the grass is timothy, feeding cattle on it in the fall will injure it greatly; if heavy beasts are allowed to go on it in wet weather, they will hurt it by poaching it, whatever be the grass grown. But if a variety of grasses and clovers forms the bulk of the pasture, and the cattle are only allowed on it in dry weather, no damage will be caused; and this is one of the great objections we have to timothy: it should never be grazed. The plants roots of this otherwise valuable grass are of a bulbous habit of growth, and the *side-twitch* of the cow in eating is mighty apt, particularly in damp weather, to pull the entire stock out of the ground.

TOBACCO.—We have been a smoker for considerably more than 50 years; and we fear we are what is called by our abstinence friends a "Terrible example." We are pretty fresh, for a man 70 of age, in spite of our depraved taste, wherefore we disagree with our excellent friend the writer of the following paragraph, in the opinion he hold as to the grower of the soothing plant:

"At Windsor Locks, Patrick Grantly's crop of last year's tobacco brought him in nearly \$5,000 and he will use some of it in building two fine barns, a horse and a stock barn," says the *Connecticut Farmer*. Pat will do well thus to change his business. Any farmer ought to be ashamed to grow tobacco."

We have grown a good deal of tobacco in our time, and are utterly unrepentant.

COLOUR IN BUTTER.—Why will our dairymen colour their butter? Does the market really demand such a practice? If so, of course they are in the right, but people should know that in the best restaurants, oyster-shops, &c., in London the butter is very pale in colour, hardly more than very light straw-colour. Hoard's Dairyman says that the cause of high colour in June, when the factors find the greatest difficulty in selling the finest makes, comes from the clover-pasture that are then most fruitful, and that the clover not only over-colours milk but gives it a rank clover flavor. It is for this reason that no English dairyman ever dreams of giving clover, either green or as hay, to his cows, but grazes them on old meadows, and in winter feeds them on early-cut meadow-hay.

STOCK-SALE OF AN OUTGOING TENANT.—The annexed advertisement will give people here some idea of the scale on which what some imagine to be the small farms of England, are carried on:

—“**HAMPNETTS FARM, GLOUCESTERSHIRE.**—Preliminary announcement of an important sale of LIVE and DEAD FARMING STOCK, comprising about 20 useful cart horses, 4 cows and heifers, 1 bull over 100 shorthorn cattle, including about 40 steers (three and four years olds), a valuable flock, consisting of 530 Cotswold ewes, 10 rams, and 550 tegs (1); 23 pigs; a large quantity of clover hay, about 2,000 quarters of grain (various), a large quantity of wheat, barley, and oat straw, about 150 acres of roots, and an extensive assortment of farm implements, including a portable engine.”

The farm is situated on the “foothills” of the Cotswolds, with a good many acres of the low lying grazings of the valleys annexed, which will account for the number of large shorthorn bullocks kept. If some of our readers would consider the acres devoted to the root-crop—probably $\frac{1}{2}$ of the whole farm, and the enormous number of bushels of grain—16,000—grown on this farm, which we believe contains about 900 acres, they would see that farming in that country is really farming and not playing at it. For the “Coteales,” as Shakespeare calls them, are not naturally fertile land, but a poorish light soil on the oolite formation, commonly called stone-brash; they are very much exposed to the wind, and very late in ripening crops, so late that the shocks of wheat are often to be seen standing alongside of the new sown wheat just coming through the ground; and yet, some of the best farming in the world is to be found on these comparatively barren hills.

CANADA has every reason to be proud of the figure she made in the cheese-classes at Chicago. As an exchange says, very honestly, “she took the cake, bakery and all, at the World's Fair, and the United States was not in it.” The judges were two Americans and one Canadian.

“EXPERIMENTS, so far, do not prove conclusively whether fat can or cannot be fed into the milk. One point has been selected, and that is that rich food makes richer milk than poor food.” *Vermont Watchman* This seems to us to give away the question.

(1) A teg is a weaned lamb until it is shorn. The same as hog, hogg, and other.—Ed.

entirely; but in another part of the same paper, Dr Hoskins quotes an extensive experiment with two cows, in which the following changes were wrought in the milk from November, 25th, when the test was begun, till its conclusion a few days after December 14th:

	Fat.	Milk.
1. Hay, 4 quarts cob-meal, 4 quarts shorts.....	3.040	43.20 lbs.
2. Hay silage, cob-meal, 4 quarts shorts.....	4.06	47.50 lbs.
3. Hay, silage, 1 quart corn and cob-meal, 1 quart cotton-seed meal.....	4.236	51.80 lbs.
4. Hay, silage and half a pint of W. I. molasses.....	4.703	

The total solids, at the same time, increased from 12,588 to 14,036. And therefore we see no reason to dissent from Prof. Cooke's assertion that, “by a change of food, the percentage of certain cows was raised from 4.41 to 7.20.”

AGAIN, a dairyman in New-York State grew a mixed crop of oats and pease for his cows. He reports that, in consequence of this food, the milk of his herd decreased 50 lbs. a day, but the butter increased 13 lbs. When the oats and pease were consumed, the cows were fed on corn-fodder, sweet corn with the ears, and pasture, and then gained in milk 30 lbs. a day, but in butter, lost 15 lbs!

GREEN MEAT FOR COWS—At the Connecticut station, they have been trying experiments on various plants used as green meat for the production of milk and butter. The result arrived at were: rations containing large quantities of albuminoids gave more and better yields; clover and pease gave the best results both in quality and quantity. The indications were that rations with a larger proportion of digestible albuminoids than is usually recommended are to be preferred. Large quantities of nitrogenous matter are needed by the cow in the earlier part of her milking season, as a support for the great drain on her general system. The quality and quantity may be improved by exhibiting food rich in nitrogen, and of course the manure is greatly increased in value. In the tests at this station, when green clover was given to the cows, the quantities of milk and butter were considerably increased, “and the percentage of fat was greater than when green Hungarian grass was given.” We have always found Hungarian grass rather poor food for any animals, even when cut very early, though a useful thing to sow where seeds or any other crop has failed.

MANURE-VALUE OF FOODS—As most of our readers know, when an English tenant leaves a farm, a certain allowance is made to him by the landlord or the incoming tenant, for the amount of unexhausted improvements he may have left behind him. The usual allowance for cake, or other purchased food, is one-fourth of the amount expended during the last year of the tenancy, except when cake, &c., have been used in excessive quantities. It is only where sheep are folded in the land that the whole, or nearly the whole, of the manurial benefit of food can be recovered; a great deal of the droppings of cows

and other stock is lost when they are allowed to roam at liberty; for they all have favourite spots for repose, and prefer the shade of trees, fences, &c., to lying and standing about in the open field. The manurial value of food lost in the excrement after it has passed through the digestive organs of a milk-cow in full milk cannot but be comparatively small. We do not believe there is a single land-agent in England who, in valuing the unexhausted improvements of an outgoing tenant, is guided by the theoretical tables of Lawes and others. It is a complete practical business, and, generally speaking, is satisfactory to all parties.

Such being the case, it is clear that the best way to secure the full value of food given to stock is to feed sheep in folds on the land; and we do trust that this summer, 1894, we shall see many acres of that invaluable plant, the rape, sown in this province and fed off by sheep receiving in addition some pint of pease and cake or so. Think what a difference this would make to the fields at the further end of some of our long farms. Five dollars' worth of E. I. bone-dust and 6 lbs. of seed at 15 cents a pound, both sown broadcast, is all the outlay required, and the sowing may be made at fortnightly intervals from May 10th to August 10th with fair prospects of success. If the land is fairly cultivated before sowing and laid up in good form for the winter after feeding off, the following grain-crop will astonish you, as it did astonish the Sorel people in 1885, when Mr. Gustaf Gylling had the Fosbrooke farm from which, after rape fed off by sheep eating a pint each, a day, of pease and oats, he reaped 70 bushels of oats to the imperial acre; an excellent crop anywhere, but on the poor Sorel sand, only 300 lbs. of superphosphate having been used for the rape and no other kind of manure, seemed incredibly large. We, ourselves, sowed the rape and shepherded the sheep, as may be seen in the *Journal of Agriculture* for 188, with an engraving of the field, hurdles, flock, troughs, and farmer, taken—very badly—from a photograph. The land, as may be seen in the cut, was kept ploughed close up to the fold, and the pease cleaned and the water-furrows carefully drawn out on December 6th. The sheep were all sold FAT, and though small, being little Canadians, were not bad mutton, but only think of the trifling cost of the whole! The oats were sown under our own eye, at the rate of $3\frac{1}{2}$ bushels to the imperial acre, and had they been real “Black Tartars,” our firm conviction is that they would have approached 80 bushels an acre, unfortunately, they were sent from a Toronto house, and were such a mixed lot that any respectable firm should have been ashamed of sending out such rubbish. The straw was stout and averaged four feet in height; in fact, it was too heavy to stand, but, fortunately, there were no heavy rains that year. As to the true “Black Tartars,” we should expect an additional yield of about 16 per cent of these more than any other grown, their quality is excellent, for as we have often mentioned, the great training-stables at Newmarket, White wall, &c., England, will not take any other kind as long as they can get these.

EXPERIMENT-STATIONS.—The well known agricultural chemist, Mr. Warrington, who has just returned to England from a tour in the States, does not seem to have been favourably impressed by the work done by the experiment stations in that coun-

try. He finds the average income of the stations to be about \$20,000 a year, whereas the expenditure at Rothamsted, furnished entirely by Sir John Lawes, is only \$15,000, and it is certainly of more value to the world than all the American stations put together “Judging from the published reports of these stations,” says the editor of the English “Agricultural Gazette,” “we should say that they are very dear at the price, as the whole of them have done but little to advance agricultural science. Yet, Mr. Warrington shows that, for the instruction of the local farmers, a good deal of useful work has been done at the stations, which we in this country can hardly appreciate, if we judge from the reports only, many of which describe experiments conducted on too small a scale to be trustworthy.”

WHEAT.—With wheat at—Just as we are writing, January 4th, a thunder-storm is going on. If Mr. Professor Walter H. Smith can show that he predicted this storm and the storm of the 9th October last, we will acknowledge that there is something in his theory of planetary influences on the weather.—well, with wheat at 60 cts a bushel, there cannot be much profit on its cultivation for ultimate conversion into bread. But why not try other ways of utilising it? We hear that, from experiments tried by the managers of the Ottawa Experiment-Farm, it results that an increase in liveweight of 15 lbs. has been obtained from each bushel of inferior wheat fed to pigs. Now, as pork is worth alive, say, \$6.00 a hundred pounds, it follows that, setting the dung against attendance, &c., the return from a bushel of inferior wheat given to hogs is 90 cents!

SOUTHDOWN AND HAMPSHIRE-DOWNS CROSSES.—Many years ago, in, we think, 1853, we put 80 or 90 of our best Hampshire-down full-mouthed ewes to a ram of the Southdown breed, from Jonas Webb's flock at Babraham, Cambridgeshire. When the wether lambs of the year went to Saffron Walden Fair, the best judges were sorely puzzled as to their breed. However, the upshot was that they fetched by 2 shillings a head the highest price in the fair. This was brought to our remembrance anew by an extract, which is subjoined, from the English *Agricultural Gazette*:

The London Live Stock Journal thinks that an exhibit of Southdown-Hampshire sheep at the Smithfield show proves this cross to be “invaluable” for mutton. “They were 10 cwt. 2 qrs., and weighed 2 cwt. heavier than the big Oxford and other crosses.”

Now, a pen, of three sheep, that weighs 10 cwt. 2 qrs. must be made up of sheep that weigh 392 lbs. a head!

HOPS.—There are positively no old English hops in the London market. What will the porter-brewers do? For mild old hops are peculiarly needed for that beer. One of the reasons why Canadian porter is so nasty is that harsh flavoured new hops are used in its confection. Fortunately for the Londoners, there are still some old hops to be had from America.

BARLEY.—Is it the land, as in England, that makes the Canadian barley so superior to the barley grown in the States? In England, the East Anglian

grain is always of malting quality, whereas our own growth in Kent, though quite as heavy, was never fit for anything but pig-food. In the report of the New-York grain-markets we find that "2-rowed State barley is worth 57c. to 62c.; Western, 55c. to 72c.; Canada 4-rowed, 70c to 85c." All along to Bay of Quinte, the States' maltsters used to look for their best malting barley, and now that the duty is to be lowered, let us hope they will return to their favorite hunting ground. (1)

WHEAT-GROWING.—In the South of England wheat is almost invariably hoed in the spring: not deeply, but just scratched over, if done by hand. The following is an experiment made at the Utah experiment station on the relative effect of deep and shallow hoeing for this grain:

Depth of hoeing.	Average yield per acre.			Average for two years.
	Grain.	Straw.	Total yield of grain and straw.	
1 inch.	12.27	1,153	1,889	93.96
2 inches.	*14.66	*1,120	*2,000	*70.93
3 inches.	9.23	633	1,223	71.06
4 inches	8.82	560	1,089	63.49

Amount of straw for each bushel of grain.

As the principal object in growing wheat is to leave the land with a firm bottom, the object of hoeing the crop 4 or even 2 inches deep is not apparent. At any rate the very highest yield, 14.66 bushels an acre, could not pay; for no man unless he is thoroughly accustomed to the work can get over more than $\frac{1}{4}$ of an acre a day, which, in Utah, will not cost less than \$1.50, or \$2.00 an acre, that is a little less than $\frac{1}{4}$ of the whole value of the crop of grain. This is one example of the way in which the liberal grants to the stations are wasted in England, where all grain is sown in drills, wheat is generally horse-hoed, the implement used for that purpose being of the same width as the steerage drill.

FOOD AND FAT.—At a meeting of the New-York Farmer's Institute, the question was asked: Can the butter fat in milk be increased or decreased by feeding the cow? The reply was:

"Under certain conditions, yes; under others, no. When the cow is in her normal condition the fat will not increase over other solids. A good cow, however, that has been

(1) Duty henceforth is to be 25 cts. a bushel.—Ed.

starved and is below her normal condition will increase the fat in her milk if she is properly fed and cared for. Experiments with a herd at Vernon, in this State, gave an increase of more than 1 per cent of fat after being turned out to grass in the spring." That is, the fat was increased 25 per cent, supposing the previous richness of the milk was say four per cent of fat.

"Why is corn-meal a good food to fatten an animal?" Reply:

"Because it is a carbonaceous and fat-forming food. Its office is to make fat, not growth; hence, we feed it for fattening purposes, and discard the nitrogenous foods in great measure." This would be all right in fattening full grown beasts, old cows, bulls, &c., but young stock must have plenty of nitrogen as well as carbon.

AYRSHIRES.—We have always held, and taught, that the Ayrshire was derived in some way or other from a cross with one of the Channel Islands breeds. We inclined to the idea that the Guernsey and the Shorthorn were the most probable ancestors of the breed. But now we find that we were wrong on one side of the pedigree, as the following letter from an Australian will show:

Mr. J. A. Wallace, Dunlop, of Poowong, Australia writes to the *Australasian* as follows regarding Ayrshire cattle: "The following has been handed down to me as the origin of the Ayrshire cattle: My great grandfather John Dunlop, of Dunlop, about the year 1740, put a Devon bull to some Guernsey cows, and a Guernsey bull to some Devon cows; selections were made and recrossed from which crossed sprang the renowned 'Dunlop' or 'Ayrshire cattle.' It is a matter of family history that the foregoing is the true origin of the Ayrshire cattle."

This reads as if the claim were well founded; but, as both Devon and Guernsey cows are, if not very copious milkers, at least givers of rich milk, how is it that the union of the two races has produced descendants that are copious producers of certainly not rich milk? And the horns of the Ayrshire do not assume the habit of growth of the parent stocks. Moreover, we have seen more than one instance of a black Ayrshire at Mile End, but a black Devon or a black Guernsey would be a perfect *lusus naturæ*. Can any of our Ayrshire breeders show us that there were Ayrshires before 1740? Were Devons sent from the extreme South-West of England to the West of Scotland, 500 miles at least, so early as that? We do not mean to cite JEANIE DEANS as a notable witness in the cause, but her evidence is to the effect that the Duke of Argyle "promised to give me two Devonshire Kye, of which he is enamoured, although I do still haud by the real hawkit (white-faced) *Ayrshire breed*." Now, Po teus' murder took place in 1736, and as Walter Scott knew pretty well what he was talking about on most subjects, we should be inclined to think that there was a known breed of Ayrshire cattle before 1740. It is to be hoped none of our readers need be told that our quotation is taken from noble Jeanie Dean's letter to her father, after her interview with Queen Caroline, as narrated in "The Heart of Mid-Lothian."

CALCULATING PROFITS.—We can prove anything by figures, particularly the profits on farm-crops. Here is an instance of the way people reckon:

Eight acres of wheat cost to plough and subsoil. \$24.00
 Eight acres of 64 loads of dung. 64.00
 Eight acres spreading dung. . . 10 00
 As the dung is sufficient for 4 crops of grain and hay, only one-fourth is charged to the wheat crop, i. e. 18 50

Now, 4 crops of grain and hay take 4 years to grow, so the writer believes, or at least says, that 2 loads (pair horse) of dung per annum per acre are sufficient for a farm that produces 30 bushels of wheat an acre! His ultimate profits on the eight acres, H. makes out to be \$125.20. Fancy subsoiling for wheat, the plant of all others that requires a firm bed!

MANGELS.—Mr. H. Stewart, on the contrary, never talks nonsense, and his article on field-beets in the *Country-Gentleman* of January 4th is full of good sense. He very wisely recommends the use of the small hand sowing drill—the Planet jr. or the Mathews—instead of the grain drill as used by a previous writer on the subject. The latter, with no steering, cannot possibly make straight rows.

The rough capsules are not the seeds, but the receptacles of the seed. Two or three seeds are often contained in one capsule. Leaving twin-plants to grow may be feasible when one does the hoeing or singling oneself, but we would rather enjoin the "hired man" to chop out all but one and do it ruthlessly, too.

As to Mr. Stewart's plan of beginning the cultivation of the crop before the plants appear above ground, we prefer mixing a few grains of oats with the mangel seed: these sprout, and come up sufficiently to show the rows, in five or six days.

Mr. Stewart evidently sows his mangels on the flat. When our drills of mangels have been cultivated by horse—and hand-hoe, the land is perfectly flat, and the earth having been early cut away from the plants, there are no forked roots, and the stirring of the land is as thorough as possible.

The hoeing by hand, according to the writer, is got over by the man at the rate of a-half acre daily, which is about as fair a computation as can be made. Of course, what we have said refers entirely to mangels: sugar-beets, to yield any profit, must be grown on the flat.

From the last paragraph, we should judge that Mr. Stewart never saw a field of tiny plants of mangels lying on their backs in the hot sun after the murderous hoe having pulled almost all the earth away from their roots! They will be all upright again to-morrow morning.

"Such crops as are mentioned by Mr. Cook cast ensilage into the shade, both for economy and for feeding. And I would here repeat what I have said before, that the culture of root crops is bound to be at some time the source of our sugar, for this is the only civilized country in the world, in which sugar beets can be grown to perfection, that is not making its own sugar from this plant, and the time when this vast industry becomes established here will be greatly advanced by the successful growth of root crops for feeding stock. (1) Then, when roots are grown by every farmer, it will be a matter of mere business for the sugar factory to come to him, as now the creamery and cheese factory come where the cows are. And still more, we can never hope to excel as we might in

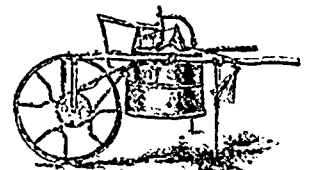
(1) Precisely what we have said at least twenty times in this periodical.

the rearing of sheep either for mutton or wool until we grow roots for the sheep. These are as necessary for the winter feeding of sheep as pasture is for the summer.

I should not omit to say that the thinning is best done when the plants are well established, and then by pinching out the surplus ones, or cutting them out with a small, sharp spud, rather than pulling them up, by which the other plant is weakened by disturbing its roots, when two are growing close together."

II STEWART.

A POTATO SPRAYER.—The Red Jacket Potato Sprayer offered by the Field Force-Pump Co., 101 Bristol Ave., Lockport, N. Y., and shown in the cut, is a comparatively new device, but enough of them were placed in operation during the last season to demonstrate their great usefulness in saving time and labor. The machine has a tubular iron frame, and a wooden tank holding ten gallons. It is fitted with an endless sprocket chain gearing, and has a mechanical auto-



matic agitator which travels in a semi-circle in bottom of tank and keeps the poison from settling. It has double tube sprayers for two rows of potatoes, and has two Vermorel nozzles. The tubes are so arranged that they can be set in a perpendicular position for spraying grape vines, and can also be used for spraying currants, berries and other small fruits. Weight, 90 lbs.

Country Gentleman.

DIGESTIBILITY OF CORN SILAGE AND FODDER.—It is generally believed that the process of ensiling does not increase the digestibility of maize, but that, on the contrary, either ensiling or field curing decreases its digestibility. Experiments at the Pennsylvania station by H. P. Armsby (R. '92) support this belief so far as concerns the ordinary conditions of farm work. They indicate, however, that it is possible to increase the digestibility of the woody fiber of corn by excessive fermentation in the silo. This result is obtained only when the loss by fermentation is so large that the crude fiber is attacked, and is at the cost of a decreased digestibility of every other important ingredient. The albuminoids are especially affected by ensiling, a considerable proportion of her being converted into less valuable forms, and the digestibility of the remainder being reduced sometimes nearly or quite to zero. Such silage may be considerably more digestible than poorly cured fodder, except as to the albuminoids. Field curing seems in every case to decrease the digestibility of the fresh substance. When the processes are successfully conducted and the losses small, ensiling and field curing both decrease the digestibility of the fresh forage somewhat, and to about the same extent.

THE PRODUCTION OF MANURE.—Though it is frequently stated that an average of 80 per cent of the fertilizer value of the food of mature farm animals is recovered in their excrement, comparatively little work has

been done in the past decade to determine the amount of plant food returned in the excrement from that consumed in the food under the varying conditions in which domestic animals are kept. Feeding experiments with young stock at the New-York Cornell University station by G. C. Watson (B. 56), show that an average of 71 per cent. of the three constituents, nitrogen, phosphoric acid and potash: is recovered in the manure. The solid and liquid excrement recovered for every one thousand pounds of live weight of the animal was as follows: Sheep 34 1/10 pounds per day, worth \$26.09 per year; calves, 67 4/5 pounds per day, worth \$24.45 per year; pigs, 83 3/5 pounds per day, worth \$60.88 per year cows, 74 1/10 pounds per day worth \$29.27 per year, horses 48 4/5 pounds per day, worth \$27.74 per year. The rate per year would probably be too high for the classes of animals that are much pastured, though it is correct for those that are kept in stalls or pens. Barn manures, produced from fairly nitrogenous food, liberally fed, contain a much larger proportion of nitrogen than of either phosphoric acid or potash, and where commercial fertilisers are used with such manures, the most economical application will be secured by applying a much larger proportion of phosphoric acid and potash in the commercial manures than is usually sold in complete fertilisers.

HAMPSHIRE-DOWNS.—The reporter of the "American Sheep-Breeder" gives a very favourable account of the Hampshire-Downs at the World's Fair. He was, from what he says, brought up on a Hampshire farm, and knows the animal he is writing about

HAMPSHIRE.

The Hampshires, compared with the other mutton breeds, were small in numbers. There were some good typical sheep in each class, however, but there were also a number that were not. While the "field" (that is the non-show-prepared ones) of the Dorsets and Cheviots, the Shrops and Shrops and Southdowns, were not burnished up, as it were, they still showed purity of breeding; it was easy for a novice to say. "Why there is a Southdown," &c. This could not be done with some of the Hampshires; one ram, for instance, that won a prize was a nondescript. As he was registered, it is fair to presume he was a Hampshire, yet his appearance did not indicate it, and, if purely bred it only show how quickly one or two generations of poor breeding, combined with bad care, will completely obliterate all that the skill and labor of noted pioneers of the various breeds have spent in producing. That there are Hampshires on their native Downs that breed true to type I know, as my father occupied a farm in Hampshire and kept from 500 to 600 ewes, and they bred as true as a flock of Southdowns. Mind you, we are not finding fault with the Hampshires, they were good sheep. How long would it take to get a sheep back to the type, from which it has degenerated, by selection alone? How many anxious hours must be spent each year resolving itself into the conundrums. What will be the result of my last experiment? Will that ram I used restore to me that dense coat of wool to protect their carcasses from the heavy rains, and driving sleet? Next year I've lost my size and constitution, can I regain it with this material? What about that large strong head, indicating

constitution? Shall I regain it? is the question the succeeding year. Here is an object lesson which might profitably be studied by all sheep breeders, and this homily is not directed against the Hampshire breeders alone, but is intended for all (Shropshire breeders especially), clearly showing that skill in breeding is as imperative to retain those points which have made certain breeds valuable, as skill has been required to obtain them. Because you have imported your ewes and your ram, you cannot sit down quietly; and after that just use rams of your own breeding, because they are from an imported ewe, without noting whether they are suitable or not.

That Hampshire sheep must occupy a prominent place in our American sheep-breeding economy cannot be questioned. Their size, hardihood and early maturity are recognised by every well-informed breeder, and they are attracting the attention of Eastern and Western sheepmen alike. We have yet to hear of the lamb raiser who has been unsuccessful in crossing the Hampshire ram with the Merino grade for the early lamb market.

To come to the Hampshire classes, Newton showed a good lot, his old sheep was typical and his lamb which also won the sweepstakes was a grand one, but far better lambs were shown at Jackson Park. His ewes were also very good and nicely brought out. Messrs. James Court and Son also showed some good sheep, especially some yearling ewes; they were very creditable, as were most of the sheep shown by them. The other breeders winning prizes were John I. Gordon, Mercer, Pa.; E. R. Crawford, Reading, Mich., and John Kelly, all showing good sheep and evidently taking pains to breed correct Hampshires.

WOOL.—We see, by a letter in the "Farm and Home," that in Ohio sheep are selling at \$1.00 and lambs at 54 cents a head! This is, apparently, in consequence of the obliteration of the import duty on wool. What a time it would be for Canadian farmers to buy sheep and grow RAPE for their support from August to snow.

THE EXPERIMENT-STATIONS.—Secretary Morton, of the Agricultural Department of the United States, is evidently an ardent reformer. He has already announced his intention of doing his best to upset the useless expenditure of upwards of \$130,000 in the "Seed distribution," and now we hear that he favours the extinction of the agricultural experiment stations, that cost the country \$750,000 in addition to the amount contributed to their support by the several states themselves.

SCOTLAND.—The yield of wheat in Scotland this last harvest was phenomenal as compared with the yield of the same cereal in England. There was plenty of rain in the country north of the Tweed, but, as every one knows, the fall in Southern England was, from February to December, almost nil. Besides, very few counties in Scotland grow wheat, and where it is grown, the most favourable land is always selected for that purpose. We give below the preliminary "Agricultural Produce Statistics for 1893," that is, estimates of the yield of wheat, barley, and oats in Great Britain. It will surprise many to see that the ordinary average yield of oats

in England is nearly 7 bushels an acre more than the average yield of that grain in Scotland; but, it must be remembered that in a good deal more than 2/3 of the southern country, oats seldom exceed 37 to 38 pounds a bushel, whereas in the north, 43 pounds is constantly seen.

What is the grass money returns to the farmer of the produce of an acre of wheat at present prices? 25.31 bushels at 90 cents \$23.22, and the straw, 1 1/2 tons, at *consuming price*, 40s a ton, = \$12.15, and we arrive at a total of \$35.37.

It is certainly remarkable that the yield for Great Britain should be put at only a little over a third of a bushel less than that of last year. The return shows how much more barley and oats were damaged by the drought than wheat was, for, in spite of the excellent barley crop of the Northern counties, the average for England comes out at barley 28 bushels an acre as compared with 34.81 for 1892, and for Great Britain it is only 28.69 bushels, against 34.61 for last year. For oats, there is less difference between the English and Scottish yield than in the case of either of the other cereals, namely, a minute fraction over 35 bushels in the former case, and 37.65 in the latter. For Great Britain, the average is 35.59 bushels, as compared with 39.80 for 1892. Compared with the estimated ordinary averages, the figures for 1893 are as follows:—

	Surplus		
	Ord.	o.	Deficit.
1893. Average.	Bushels.	Bushels.	in 1893.
WHEAT.			
England	25.81	28.94	-3.07
Wales	22.09	21.53	+0.56
Scotland	36.58	32.85	+3.73
Great Britain	25.95	28.80	-2.85
BARLEY.			
England	27.99	34.35	-6.36
Wales	25.06	27.78	-2.72
Scotland	36.38	34.77	+1.61
Great Britain	28.69	34.02	-5.33
OATS.			
England	35.03	42.10	-7.07
Wales	30.94	32.48	-1.54
Scotland	37.65	35.75	+1.90
Great Britain	31.59	39.01	-3.45

This table shows in a striking manner the deficiencies of England and the good fortune of Scotland.

DEEP AND SHALLOW TILLAGE.—All experiments on the relative value of deep and shallow tillage of hoed-crops, roots, potatoes, corn, &c.,—fail in their object unless the effect of the two operations on the succeeding crop of grain and the subsequent crops of hay is also given. At the Utah Station, in an experiment continued through three seasons a comparison is made of deep and shallow tillage and no tillage for potatoes. The average of duplicate plots for three years gives the yield of large and small potatoes on shallow tilled plots as 206.38 bushels per acre, on the deeper tilled plots, 204.87 bushels, and on the untilled plots, 186.7 bushels. Details of cultivation are not given.

We thought this question was settled long ago. The loss—not by any means necessarily attributable to the deep tillage—of 1 1/2 bushels of potatoes is too trifling to be for a moment compared with the benefit derived by the land from the deeper cultivation it received.

AUSTRALIAN TRADE WITH ENGLAND.

In its issue for the 25th September, the MELBOURNE AGE publishes in full the report of Mr. David Wilson, Government dairy expert, to the Victoria Minister of Agriculture, bearing on his recent trip to Europe with the object of obtaining information as to the best means of developing the trade in dairying and other products.

With regard to the problem as to whether it is better to freeze or chill butter for English consumption, Mr. Wilson states emphatically that frozen butter is worth from 3d. to 4d. per lb. more than the chilled article. Calculating the loss on the last three years' shipments, equal to 4,200,000 lbs. of chilled butter, at only 2d per lb, the dairymen have, he states, suffered to the extent of £35,000. In view of the statements made that the refrigerating chambers on the mail steamers were not kept at a uniform temperature, Mr. Wilson gave the subject considerable attention, and his experience of several ships arriving in London with dairy produce proved that the refrigerating logs could not be depended upon. When he endeavoured to get the steamship companies to adopt a self-registering thermometer, they refused to move in the matter, which he regards as a very shortsighted policy. Otherwise he found the shipping arrangements fairly satisfactory. Greater care is required, he says, to insure uniform weight, solid ramming, and the use of better paper. Mr. Wilson is of opinion that the practice of making brokers both commission agents and buyers at the same time is a disadvantage, and asserts that the shipments should be all purchases or all consignments on commission. He was successful in inducing the Peninsular and Oriental, and the Orient Steam Navigation companies to grant increased cool chamber accommodation for the butter trade; but as they were disinclined to lower the freights, he consulted with other shipping companies, who gave him to understand that they would tender at a lower rate next season. A searching inquiry failed to disclose a single instance of Victorian butter having been mixed with margarine, but Mr. Wilson directs attention to the wonderful perfection attained in the manufacture of margarine, and asserts that if we desire to contend successfully against it, and to retain the position secured in the British market, the department must keenly and constantly watch the discoveries in science and improvements in machinery, so as to enable the Victorian dairymen to produce a good article at the lowest cost possible.

Another important feature of the Government dairy expert's report consist in the remarks relative to the frozen meat industry. Mr. Wilson's information on this point is exceedingly opportune just now. He does not claim to be an expert on frozen meat, but he was especially careful to make the most minute inquiries in London in connection with the condition, treatment, and sale of that article after its arrival there. He found that the shipments of mutton from New Zealand were invariably landed in excellent condition, and at some of the sales he saw dressed carcasses, rising two years old, of about 60 lbs. weight, sold at from 4d to 4 1/2d. per lb. He also saw a consignment of Australian lambs, not from New Zealand, sold at 3s. 6d per carcass. They were in very bad condition, but the fault did not arise from any defect

at the English end. He was given to understand that this was an exceptional lot. The great points to be considered in this trade are, Mr. Wilson states, proper selection, killing, dressing, and shipping. The retail butchers admit that the meat is juicy, finely flavoured, and firm in the grain. But they will not sell it as Australian mutton, asserting that the public refuse to buy it as such, so it is labelled as coming from certain English countries.

Adverting to the prospect of Victoria establishing a valuable frozen meat trade, Mr. Wilson mentions that in 1882 New Zealand exported 9,000 carcasses of mutton, and 10 years later the trade had grown to upwards of 2,000,000 annually. Victoria and Riverina for Victoria commands the Riverina district. In 1892, contained upwards of 20,000,000 sheep, about 2,000,000 of which were boiled down for tallow at a return of 4s. per head while scarcely any were exported. Mr. Wilson mentions that those exported from New Zealand, minus the by-products, averaged 15s. per head.

One of the instructions given to Mr. Wilson by the Minister of Agriculture was to ascertain the most profitable make of cheese suitable for the British market, and to note the proper packages and weights likely to suit consumers. In his report, the Government dairy expert states that the great bulk of the cheese consumed in England is of the Cheddar make, weighing from 60 to 70 lbs., two-thirds without colour and one-third with, and of a firm, rich, mellow flavor. It is exported when a month old, and delivered in London, to meet the best market, in January and April. Cheese of this class averages 50s. per cwt. An experimental shipment, taken home by Mr. Wilson compared favourably with Canadian and New Zealand cheese, and with care exercised on the lines being now taught by the department, and more liberal shipping charges, he sees nothing to prevent this industry assuming nearly as large proportions as our export butter trade, which, in his opinion, would mean, in a very short time, a yearly income to the colony of little short of £1,000,000.

Having met many travelling experts of all nations in the various branches of the dairy industry, Mr. Wilson is convinced that, if the colony desires to keep up to date in its knowledge, and to move with the times, this plan of obtaining information should on no account be neglected. He failed to see anything in England, Ireland, or Scotland that would be of much service to the Victorian climate, and saw but little improvement in butter and cheese-making machinery whilst in Denmark, Sweden, and France. In Stockholm, however, he noted several improvements in butter-fat testers and sterilising machinery, by which splendid butter, with extra keeping qualities, is made after the milk and cream has been heated to 170 degrees. He bought two machines, and expects to be able to produce a "tinned" article that will tap the markets of the East. Inquiries made at the ports of call on the outward and homeward voyage convinced him that a large profitable trade can be done with these Eastern countries at prices ruling from 1s. 4d. to 1s. 6d. per pound. The report also deals with a system of sterilising milk for household consumption, a process of preserving cream sweet for months without the aid of chemicals, labour-saving machinery, the exportation of green, canned, and dried fruits, the brandy and wine trade, the preparation of condensed milk, the absence of sufficient gluten

in Victorian wheat, the great importance of establishing the beet-sugar industry, and the necessity of appointing an efficient commercial expert to look after the interest of Victorian produce in London.

ADVOCATES

FOR COLONISATION

CONSIDER ITS NEEDS IN THE PROVINCE OF QUEBEC.

Meeting at the Monument National —Government Advised to Give Free Grants of Land to Immigrants.

A meeting took place last night at the Monument National for the purpose of fostering colonisation in the Province of Quebec. Mr. Gigault, Assistant Commissioner of Agriculture, presided. There were present Recorder de Montigny, Ald. Brunet, Mr. J. X. Perreault, M. P. P., Dr. Grignon, Dr. Brisson, Mayor of Laprairie, Mr. L. E. Cauvel, Secretary of Colonization, read an address to the Assistant Commissioner.

Mr. Gigault then addressed the meeting: "To establish a dairy in a parish," he said, "is to make it flourish, and Mr. Beaubien has done all he could with good results. Agricultural Clubs tend to increase the good of the country, wherever they are established, good results follow." He considered that the railway was a means of fostering colonisation; but the great means, he thought, had been the dairy. "The meeting of to night has for its object to initiate the formation of a company, which would establish dairy farms in the North. The Government would give a subsidy, or might promise an interest on the capital invested for a certain number of years. Many companies at present own butter and cheese factories, and their shares, which at their formation were only worth \$25, are now valued at \$125, and give an interest of 15 or 20 per cent." He would like to see all members of that Company, not only private individuals, but railway companies, owning shares. "The great difficulty with immigrants is that after clearing the land, they cannot at first succeed in reaping much produce, but if the dairy was the pursuit of the farmer or immigrant, once the trees had been felled, green fodder could be sown, and the cattle kept." He considered this best means of ensuring money returns. He gave an example of farmers at Owon Sound, where the ground was rocky, and who, notwithstanding this natural obstacle, had become rich, thanks to the dairy.

"If we have no financial crisis here, as they have in the United States, it is due to the dairy; for we exported a great deal of cheese last year, and it brought into the coffers of the State \$13,500,000. This is a magnificent result, and Quebec did a large share of it: for nowhere is the land so rich as in Quebec. It is generally difficult to transport cereals and hay from remote and unopened district; but if these products are concentrated into milk, their bulk would be much less and the cost of transportation would be much reduced, so the returns would prove to the greater advantage of the immigrant."

Mr. J. X. Perreault concurred in the remarks of the Deputy Commissioner. He thought it would be an easy thing to form a Company; all that would be wanted would be a guarantee from the Government of 5 or 6 per cent. on the capital invested. "This would not cost the Government much," said he, "and it would inspire the capitalists with confidence, for otherwise they would expect a loss I think that it would, indeed, be an easy matter to raise \$100,000. It now costs 40 per cent. of the value of hay to transport it from my farm, a distance of fifteen miles. If put into butter, it would cost less for transportation and pay more. A man who goes into the woods to open the country has a hard task before him, and certainly deserves that a free grant of the land cleared be offered him. This would make the immigrant rich and the country would prosper. In Manitoba, where the country is easily opened, there are grants made of lands, whereas here, where the difficulties are almost insurmountable there are no grants. Immigrants are pestored for the payment of arrears, and thus become discouraged. Neither can they dispose of the wood of their land, which is generally very hard to cut and transport. The Government exacts the payment of 25 cents per cord, then, to send it to Montreal it costs \$20 to \$22 a cord, and a large car only holds 9 or 10 cords of wood. Some cars hold less and cost as much. The consequence of this is that the sale of wood hardly pays freight, and thus colonisation is retarded. When the railroad to the north and to St. Jerome was inaugurated, it was thought that we would get wood for next to nothing. Ask people if that is the case? Something ought to be done to stop these excessive and exorbitant charges. The Government should not only foster the dairy, but should also give immigrants the products of their farms without extra charges, this would make both rich in a short time. Canadians should be called together often, and instead of having a multitude of small societies, that do good in their way, it would be preferable to all unite in one great society. Their resolutions would then be respected by the Government. Their meetings should take place once a year, as they do in France."

Dr. Grignon praised the work of the late Curé Labelle. "Since his death," said the speaker, "colonisation has gone back in the regions called Les Régions Labelle, in which are thirty seven cantons, situated in the counties of Montcalm, Terrebonne, Argenteuil, and Ottawa, land very fertile indeed, and which well repay the tiller." He thought the Government deserved praise for their work; but enough had not yet been done. Dr. Brisson, considered the movement of Canadians to the large centres very pernicious. Colonisation was the best way to counteract this.

His Honor Recorder de Montigny, also spoke and gave his views of the question. (The Star.)

The Flock.

THE DEMAND FOR MUTTON

EDS. COUNTRY GENTLEMAN—Until the last advance in the price of pork, the demand for mutton was out of all proportion with that for other meats. This was due, I think, chiefly to the fact that it was next to impossible to

get mutton that was really fit to eat. Take the average chop for instance; when it is cooked it shrivels to a small piece of tough lean meat, and a long piece of bone with an attachment of fat and gristle often quite unpalatable, to say nothing of its unpalatableness. It ought not to be so. I believe the demand for mutton can be increased at least a third, even at higher prices than now prevail, if the quality is raised. A recent writer says:

"If lamb and mutton are the money crop, we don't need to worry much about the tariff. If wool is only a by-product we shall not need to get the blues if it sells low. With the present tendency of wool we should breed mutton families."

If lamb and mutton be made the money crop, I believe the improvement in the quality of the meat will stimulate the demand and increase the price very much more than one might suppose without a knowledge of the condition of the retail markets in our large cities. I know of a restaurant near the New-York City Hall which is famous for its excellent roast mutton and lamb. It is safe to say that the proportion of these meats to the others which are served, is at least 25 per cent. greater than in neighboring restaurants. The result in one case, from improving the quality of the meat, may be duplicated throughout New-York and all other cities. I believe it will pay farmers to go into the business of raising mutton and lamb as a money crop.

J. H. GRIFFITH.

HOW AGRICULTURE IS ADVANCED BY SHEEP.

Richard Gibson, Delaware, tells what sheep have done.—"In England many thousands of acres of wild and barren wastes, like Lincoln Heath, which formerly was a huge rabbit warren and a home for vermin—so desolate and solitary was it that a column was erected and lighted up at night to guide any belated traveller—this heath land was let for 2s. 6d. per acre, or a couple of rabbits a year.

Where the column stood at Dunstan Toller is now one of the best cultivated and most noted farms in Britain, from under its shadow Royal winners innumerable have been bred and fed, and the name of Cartwright is known in every British colony.

Again on the Wolds, these high tablelands running east and west across the county of Lincoln, are farms which formerly rented for five shillings (English) an acre, and now for \$7 to \$10.

Then take the county of Norfolk, the eastern portion of which is probably the poorest, naturally, of any part of England, having been nothing but a pure white, blowaway sand, piled up in little mounds. Those who have travelled between Detroit and Chicago by the Michigan Central Railway will remember Michigan city, which nearly resembles that portion of Norfolk of which I am speaking. We now find there large farms well tilled, and as prosperous a class of farmers as any in Britain.

I need not go to the counties in the south of England to illustrate my point, but would merely remark that I know of farms of from 1,000 to 2,000 acres that have not over from five to ten acres of permanent pasture immediately surrounding the dwelling, and on which only sufficient cows are kept to supply the family with milk and butter.

The question naturally will be asked How to farm 1,000 acres successfully without cattle? The practical answer, as exhibited on the sheep farms of Britain, would be: Grow green crops and feed them off with sheep.

Let us look at the means adopted, not to keep up a naturally fertile soil, but to reclaim and bring into cultivation the waste places of the earth; and a word here of encouragement may not be thrown away, if we inquire, in passing, who accomplished this work, and to whom we are indebted for this object lesson? Was it some rich landed proprietor? Or perhaps a syndicate of wealthy capitalists? Or a well endowed agricultural college? No; it was wrought out by the tenant farmer, who, having obtained leases and a liberal tenant right, was content to risk his capital in the venture; and when I say on these same farms are to be found the wealthiest farmers in England, that it is on these farms the English malting barley is grown in its greatest perfection, and that it can only be grown on sheep farms successfully (1) has been so often demonstrated that anyone conversant with the question would not try to make one believe it can be grown elsewhere as successfully.

The means at first adopted were large application of artificial manures, generally bone dust, then by encouraging the growth of clover and other green crops, followed by turnips, all eaten on the land by sheep, so that by constant treading the soil became consolidated sufficiently and by the return of all green crops it became rich enough to grow grain. Though these soils are now rich in plant food, they could not be kept up without sheep, and to-day without them they must go out of cultivation. (2)

The rotation was the ordinary four-course—quarter roots, quarter barley, quarter clover, quarter wheat—the roots and clover consumed by sheep. Can we not apply this lesson to advantage in some portions of our Dominion?

SHEEP RAISING ON LONG ISLAND.

J. S. WOODYARD.

Many thousands of acres of the now unused wild lands of Long Island, N. Y., could no doubt be profitably used as sheep pastures, and by this means and the use of phosphates and potash, be made to produce paying crops. Three things this land seems to lack, potash, phosphates and vegetable humus, and quite likely also, nitrogen. The experiment to utilise these lands is well worth trying. I have been told when on the Island that much of this land can be purchased at a mere nominal price, or can be leased for a term of years with the privilege of buying at any time at a named price.

My plan would be to lease in this way a tract of this land, make posts and slats of the larger timber, and while doing so to lop down all other growths so large that the sheep could not reach the same. With the posts and slats I would put a wire and slat fence around if that should keep the sheep in and dogs out. By using light No. 10 galvanised wire and weaving in the slats eight inches apart, such

a fence can be built for not to exceed thirty cents per rod. Into this field put enough sheep to eat all bushes and every green thing, and would still need extra feed to keep them thriving. This extra food should consist of bran, dried brewer's grains, gluten meal or linseed meal, which ever may be the cheapest. For feeding this extra food, troughs should be made of board nine and ten inches wide nailed together V-shaped, with feet or legs put on long enough so that the sheep can not turn them over; and the troughs should have no ends so as not to hold water when it rains; by being a little careful in feeding and leaving ample trough space no food will be shoved off the ends and wasted. This would result in the sheep killing all timber growth in one season, and the manure resulting from the consumption of the extra food would enrich and make possible the seeding of the land.

As soon as the fall rains commence, blue grass, quack grass, redtop, orchard grass and white or Dutch clover should be mixed and sown in liberal quantity, and the land should have at least 200 pounds muriate of potash, or 600 pounds of kainit per acre, sown broadcast. It might be well to try on limited areas bone dust in varying quantity from 200 to 600 pounds per acre. The feeding of the foods named would furnish a good deal of nitrogen to the soil and also produce needed humus, and the potash and phosphoric acid would stimulate the growth of the grasses, and doubtless in a short time would feed a large increase in the number of sheep.

The important question here presents itself. Can this be made to pay? The present uncertainty in the markets generally has been disastrous to the sheep industry. Though the foreign price of wool has not lowered any—in fact has advanced slightly—our manufacturers have refused wools except to meet immediate and pressing demand unless they could buy at prices less the duty, and the result has been that prices have dropped about that much lower than last year. As a result sheep growing has had a bad setback, and sheep can now be bought cheaper than for many years. At times since September first, good health ewes of from three to five years old, somewhat thin, but good for lamb raising, have sold in the Buffalo market as low as one and one-half cents per pound. Of course, even though very low in price, a good fleece of wool will help on the right side of the ledger, yet it is not advisable for any farmer, near the large cities at least, to embark in sheep keeping for wool alone. Mutton must be first considered and he must strain his best energies in this direction.

The moment any sheep, not a ewe for lamb production, is kept after maturity it is kept solely for the growth of wool, to the farmer on Long Island who would try the way previously indicated must so plan as to put his sheep into the mutton market as soon as their growth will not pay for what they are costing to keep. To do this let good, strong, healthy ewes of merino blood be selected, from two to four years of age, and these be mated with a Dorset or Hampshire or Shropshire ram, and at such a time as to have lambs dropped, on Long Island, not later than March on the very first days of April. Let ewes and lambs be well fed both before and after going to the pasture, and sufficiently well fed; they will be ready to market when Long Island is thronged with its summer visitors, and will bring not only New York prices, but

those with the freight added. For the reason that the lambs will sell as indicated for more than ewes will cost, it will not pay to keep any of the ewe lambs to replenish the flock. The poorer ewes and such as get too old should be annually drafted out, fitted for market and sold, and their places filled with fresh ones. For the reason that the character and flavor of the meat of all animals is greatly influenced by the food eaten, it is more than likely that lambs raised and fed as above on the wild pastures and herbage of Long Island would soon become famous and bring an extra price. The excellent mutton of the Welsh mountain sheep, raised and fattened on the peculiar herbage of the mountain highlands of Wales, sells in the London market for several cents per pound more than that of any other sheep. There is no doubt that there is renovation for these now worthless Long Island lands and money in the pocket of those who will intelligently engage in the sheep industry there.

American Agricultural.

HORTICULTURAL DEPARTMENT

Montreal 1st February 1894.

To be devoted principally to the interests of the amateur growers of fruits, flowers and vegetables.

A FEW OPENING REMARKS.

The very liberal manner in which the Minister of Agriculture, the Hon. Louis Beaubien has responded to the request of the "Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec," in granting space in the *Journal of Agriculture* for a horticultural department, cannot be too highly appreciated. Such a department will fill a long felt want in the Province, and will enable the 'Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec' to fulfil their provincial duties and obligations in a manner which otherwise it would be very difficult to accomplish. This space will be utilized to the best of our ability, and our chief aim will be to place before our readers clear and concise articles relating to the culture of fruits, flowers, and vegetables. These articles will be devoted principally to the guidance of the amateur or beginner, and to try and encourage those who may have become somewhat disheartened from unsuccessful experiences in the past. The principal objects which we will keep in view of the readers of these pages will be to prevent failure, and insure success. This we will endeavour to accomplish by making the following articles plain enough to every one who may desire to grow fruit flowers and vegetables to serve his own family, by giving plain but also very necessary instructions from the beginning of the preparations with regard to site, soil, shelter, fencing and drainage. Drainage although here mentioned last is by no means the least important. We will endeavour in the articles to follow on the different subjects to show the paramount necessity of properly preparing the ground for the reception of the intended crop, whether it is an annual one such as onions or cabbages, or a permanent one such as the planting of an orchard, small or large. The proper preparation of the ground in every

case lays the foundation for the success of the expected crop.

The necessary preparations required to put the soil in a proper state for fruit trees to succeed in should be well considered and not too hastily decided upon. From the many sad and unsuccessful attempts visible along the country roads in almost any direction one would come to the conclusion that the trees had been first purchased, and then a make shift place allotted to them. Scarcely any thing but failure could follow. Hurry in such a case is far from scouring speed. Better make all preparations before purchasing trees, select the site, where the soil is suitable, where shelter is natural, or make provision for it; fence it properly, and above all drain the place so that at no time, winter or summer, water will lie within three feet of the surface. With these conditions anything like perfect almost every farmer would be safe in planting a few trees for his own use. There is nothing now in the lessons laid down here; they have been all taught over and over again but the chances are that through this medium they may be presented to a new set of readers and some of our low r Canadian farmers who have tried fruit tree growing and have failed, may take new courage and try again. If we can through any directions in these pages, induce any one to try; and succeed in making one fruit tree grow where never fruit tree grow before we will consider ourselves repaid for any trouble we may have.

CULTIVATION OF THE APPLE.

As the apple is our most valuable fruit, and as its culture so nearly corresponds to that of the pear, the plum and the cherry the few general remarks which are to follow may be taken by the beginner as safe to adopt. The conditions to be decided before planting: are site, soil, shelter, fencing and drainage these must have proper consideration; and a few simple directions under the above headings may serve the purpose intended. The site or position where apple trees are intended to be grown may perhaps be considered the least important of any of the above headings. It may be facing any point almost and still succeed; with perhaps the exception of the north and on rising ground facing that point. East, south and west have been found equally advantageous for the purpose. Rising ground facing any of the points between east and west is preferable on account of the advantage it gives to fulfil the last and most important perhaps of any of the conditions alluded to, viz drainage. If the site has been chosen it may be made of sufficient extent as circumstances will admit, but it is advised that the experiment be tried on not too large a scale for beginners. It will be easy to extend when the hope of success is being realized. Select a place if not larger than to be able to hold six trees; follow these instructions and I hope that you will extend. The soil is the next condition to determine. This can be done with greater freedom than regards the site. We can make it, if it is not suitable or improve it as necessity may require. To wholly make the soil will not be very often required but when it would be imperative that it should be made I would recommend to imitate a rather heavy cal-

(1) This is hardly correct now, though it was 60 years ago. Some of the latest Chevalier barley is grown in the heavy land farms on the outlying beds of the "London Clay" after a summer fallow. Ed
(2) Perfectly true. Ed.

careous loam. The calcareous or lime part need not be a condition as that can be supplied separately. Three feet in depth of such a soil all other conditions being favorable, failure need hardly enter into the considerations. The above I would rate as the best soil for almost any purpose provided with the proper fertilizers to suit the intended crops. To improve any soil it will be requisite to know about what are its parts to be able to say what may be applied to improve it: but a few general instructions may point out the direction to take. For instance a sandy soil would require to be improved with clay; heavy loam, and vegetable soil or what would be better still an equal amount of the three allowing the sandy part about equal to one fourth of the whole. These different materials well incorporated and mixed up will grow almost any fruit tree. Other soils, would require the materials in different proportions, to arrive at, or as near the criterion above mentioned as can be; which we may term a good all round useful soil: and which if it can be in any way nearly imitated will be sure to give gratifying results. The depth of such a soil I would recommend to be about two feet not less more if it can be conveniently had. As soils vary so much in their constituency, it is a safe guide to be advised by the sorts of forest trees growing in the neighbourhood. If Elm, Hard maple, White Thorn, or Oak grow especially well with proper preparations most of our fruit trees would respond as far as the soil was concerned; but it always pays the planter to make sure he has the soil required, and to have it properly prepared. The subsoil too is a very important factor in the growing of any crop. A retentive subsoil is one of the very worst as it, keeps the soil on top in a too saturated condition, preventing the passage of air and heat to enter into its composition and practically shutting out the most useful agents, to plant life. A too porous subsoil might meet with the opposite objection, but with sufficient depth of top soil properly prepared to receive and also retain the rains, it is seldom a porous subsoil is other than advantageous. Besides it is not a very hard matter to supply a few newly planted trees with a few copious waterings the first season if it be a dry one, after which there will be very little danger. Where a dry soil has killed thousands of fruit trees with other bad management combined, wet soils have been the death of tens of thousands. These last remarks might be more correctly applied when we come to drainage but their importance will I hope excuse this being referred to here.

Shelter, being next under consideration will have to be left a good deal to the planter's necessities. Some will want to be better provided for than others; but all fruit trees will be immensely benefited by proper shelter. Evergreens are the proper trees to use as a wind break, dispersed among deciduous trees; planted on the west, north and east. They are better to be planted not too near the subjects they are intended to benefit as crowding and sheltering are very different in their consequences. A screen or belt of about twenty or thirty feet wide pretty closely planted with fast growing trees such as soft maples, Norway spruce, Tamarac, Ash, Elm, &c could be made in a short time or ornamental as well as useful. There is scarcely a farm but what would be benefited by a pretty extensive tree planting policy. In fact there should be some inducement from the government to get up model planted farms,

some plans to induce the owners to improve the appearance and consequently heighten the value of their farms. A pretty place would always draw a larger price if on the market than it would if it were merely a farm without the ornament of a single tree. How many such there are? and how easy it would be to improve them? There must be an inducement; prizes or something to show the utility as well as the beauty of trees. Arbor day without something to stimulate does not seem to make the progress it should. Fencing may be left with the planter with this injunction that fruit trees must be protected from the inroads of cattle by being securely, no matter by what plant enclosed. This advice on fencing one would think superfluous, but how often do we see trees that might have otherwise succeeded destroyed through want of this necessary precaution. Drainage is the next and principal condition that all fruit trees growing so dependently hangs; so that we may be excused for dwelling on the subject for a little. Most of the ordinary farm crops such as potatoes, turnips, mangolds, grain, &c., which have only an annual growth to mature, and whose roots seldom travel so far in search of the food required, as trees do can and are successfully grown on ground not under drained. The proper cultivation of an orchard, or a few fruit trees demand that the position they are planted in is under drained to the depth of at least three feet. When drains are dug and filled again with tiles, or stones, or whatever they are made of, at regular intervals through the orchard say every 40 feet apart, then at least one part of the drainage is provided for, that of the taking away of the bottom water or springs; but to make a success of these drains the intervening spaces between the drains should be trenched or subsoil ploughed, the trenching to be at least two feet deep subsoil ploughing as deep as it can be performed, bearing in mind always to keep the subsoil in the bottom, on no account bring it up to mix with the upper or soil proper. Then you have your place drained, for draining is intended not only to take away superfluous water but in a well drained and thoroughly cultivated soil the supply is more regular. Consequently the necessity of drainage, and also of increasing the capacity of the ground at the same time by properly trenching it and loosening it to carry that better and steeper supply of plant food in the shape of vapor. A soil in a growing condition is always charged with this vapour in a denser degree when too wet, or in a lighter degree when too dry. In this as in almost everything the medium or midway between wet and dry will be found to give the better results. Plant life depends on the earth; and its capacity to supply the proper elements of food in the shape of moisture and the gases necessary to form, when assimilated the different productions in the vegetable world. It is wonderful how very little of the soil is taken up in all these productions. It is through this well drained and well cultivated medium that sufficient heat as well as moisture is brought to supply and stimulate the growth of the crop whose roots are travelling through it in search of the necessary nourishment to produce leaf, wood, flower, and fruit. For these are all drawn from the same workshop. It is to be hoped that the foregoing remarks will show that to grow fruit trees the planter will have to comply in a measure at least with all the conditions which is repeated viz. site which should be the best at com-

mand; soil, which if not up to the mark can be made so. Shelter your trees, but do not suffocate them. Fence them properly and well drain your land as advised and success will follow. Later will follow a short paper on planting trees.

Correspondence solicited in the fruit growing interests of the province of Quebec.

Questions answered by the Montreal Horticultural Society and Fruit Growers' Association of the province of Quebec.

Correspondence or questions relative to horticulture please address.

Mr. F. Roy,
Montreal Horticultural Society
and
Fruit Growers Association
of the Province of Quebec.
P. O. Box 1078,
Montreal.

THE MOTION OF SAP.

The old idea was that the sap rose from the ground in the spring and descended in the fall making a sort of circulation. But we understand the process better now. The sap which rushes up through the sap wood in spring is only water, in which is dissolved the mineral elements which the plants get from the soil. A large part of this water is transpired or evaporated by the leaves, and, with the con-

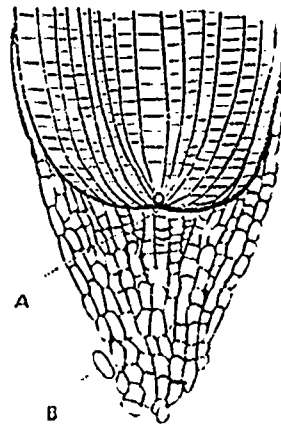


Fig. 1. Magnified section of a root cap of a grass. A—Point where new growth takes place. B—older cells of cap wearing away.

centrated residue and the carbon, which the leaves get from the air under the influence of sunlight, the plant forms all the materials used as food by the living matter and as material for building structure. These materials are then transported through the cambium layer, and the young bark, to every point of the tree where growth is being made. It was formerly thought that the tips of the rootlets absorbed water like a sponge. We now know that the extreme tip of every rootlet is older material than that just behind it, that the end of the root is analagous to the bark, and that the tender young cells are formed just behind the protecting cap, both to the under side of the cap and to the growing tip, so that this tip is always protected in pushing through the soil.

In the first year's growth of a young shoot, the pith is an active agent in bringing up the sap-water from the roots to the leaves, but in subsequent years this is done in the sap-wood, which gets less and less active in this respect as it grows older, until it finally passes into heart-wood and no longer takes any part in the life functions of the tree. The pith never grows after the first year, and gradually is lost sight of in the pressure of the growth of wood around it. The

rapidly growing cells between bark and wood seem to the naked eye only a jelly-like layer, but under the microscope they are shown to be as regular as a honey comb. This soft layer of forming cells is called the cambium layer, and upon its character depends the success of all our operations in grafting or budding. The cells made in this layer in spring are larger than those subsequently added in the slow growth of late summer and autumn. It is this decrease in the size of the cells and the greater thickness of the walls which makes the growth to the naked eye appear in rings, so that the age of a tree can be pretty accurately measured, in our climate, by counting the annual rings.

THE WINDOW-GARDEN IN WINTER.

EBEN E. REXFORD, WISCONSIN.

Early winter is a critical time in the life of plants in the sitting-room windows. They have not, as a general thing, recovered fully from the effects of repotting or removal to the house from the garden, or wherever they were kept during the summer, where they had all the fresh air they could make use of. In the house, there will be lack of good air, and the temperature of most rooms will be unhealthily warm, because the human occupants feel keenly the chill of coming winter after the languid warmth of fall, and keep hot fires going, to burn a great share of vitality out of the air. The plants may be forced to make considerable growth, but it will be a weak one. Another drawback is the lack of sunshine that characterizes this season of the year. Plants that are growing must have sunshine in order to make their growth healthy. In order to do the best for our plants, with an eye to their future, we must treat them in such a manner, at this time, as to keep them as dormant as possible. Let them be getting ready for future work, under more favorable conditions; give but little water,—just enough to keep them from wilting. A liberal supply of water, combined with the effects of warm rooms and impure air, encourages that rapid but unsubstantial growth which is weakening to the plant. On no account give manure. Some persons seem to think the application of a fertiliser is all that is necessary to remedy all the evils plants are heir to. Such is not the case. No plant, not in a healthy condition and making active growth, should be given fertilisers, as it is not in a condition to properly assimilate and make use of strong food. When it begins to show, by vigorous, healthy growth, that it is a condition to dispose a stronger food, give it, but not till then. Too rich a soil only aggravates the trouble under which most plants labor, at this season. Make it a point to give your plants as much fresh, pure air as possible. Do not open the window at which they stand, so that the cold, sharp air from out of doors will strike directly on them, for this may injure them almost as much as a frost, in their weak and enervated condition. Rather open another window, at some distance, or a door, and let the room fill with fresh air which will mix with the warm air of the room before it reaches the plants. Make it a rule to do this at least once a day in favorable weather. Twice a day would be better. It is impossible to give plants or people too much pure air. Provide the room in which your plants are kept with a thermometer, and see that the

temperature does not rise above seventy-two degrees. Seventy would be better still. Most persons, however, seem to feel the need of more warmth than is obtained by sixty-five degrees of heat (1). It would undoubtedly be better for them, as experience proves it to be for plants, if our rooms could be kept cooler than they are. But if fresh air is admitted freely, the bad effect of a high temperature is to some extent counteracted.

Give all the sunshine possible. Never allow the shades to be drawn down by day, and dispense with curtains. Let your plants beautify their window, and put your pretty curtains in some room where there are no plants to use the light. Shift the plants about in order to give all of

TWO PROMISING APPLES.

By R. W. Shepherd, Jr.

There are two apples from the State of Wisconsin that have lately come into prominence in the North Western states, and have also been under trial in this province, for a few years, which are well worthy of notice.

The first—*North West Greening*—a comparatively new variety, originated in Waupaca Co., Wisconsin, about twenty five years ago. It is one of the Waupaca seedlings, and one of the best.

The "*North West Greening*" has been propagated only within the last fifteen years. Although not classed in Wisconsin as an "Ironclad", yet

that we have in *North West Greening* a most valuable acquisition to our late winter apples. The fruit is certainly fine—size, medium to large; color, yellowish green, with creamy blush on sunny side. Roundish, oblong. Flesh yellowish white, tender sub acid, juicy, crisp, pleasant flavor. It is a fine cooking apple, handsome and symmetrical.

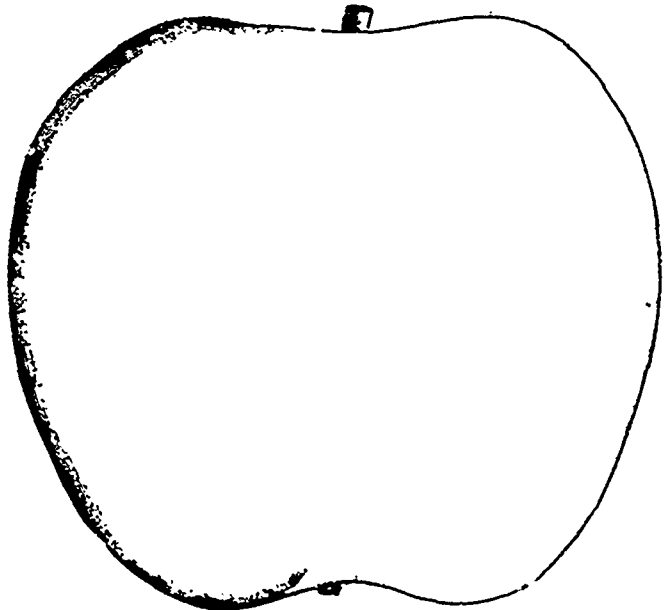
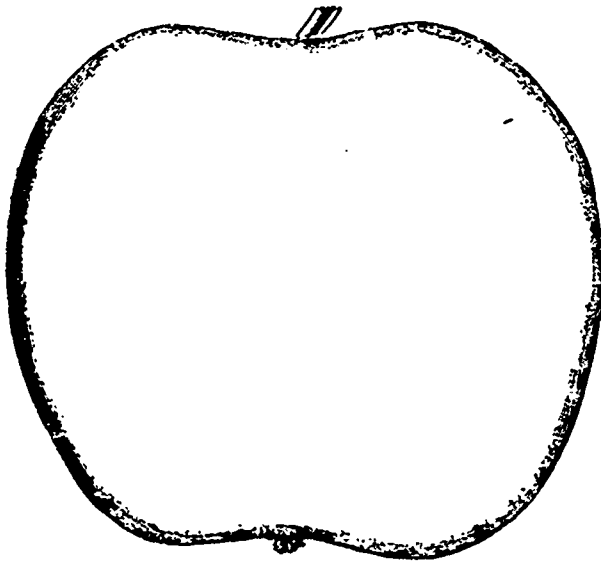
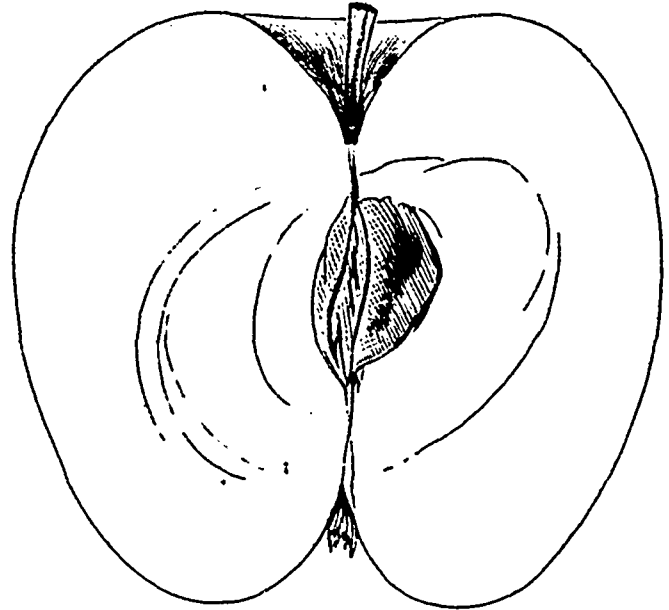
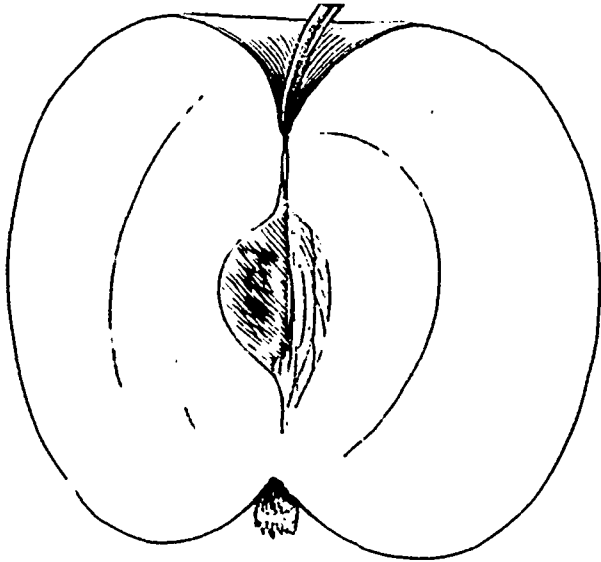
The *North West Greening* is worthy of cultivation for export. It compares favorably with the *R. J. Greening*, one of the leading exportable apples cultivated in Ontario and N. Y. States, but which we cannot grow in this province, commercially, or for profit, satisfactorily.

The season of *N. W. Greening* is January to June.

vato it. With *McMahon*, *Duchess* and the hardier *Russians*, such as *Switzer* and *Hiberna*, they can always be sure of a crop of beautiful and desirable fruit for home markets.

THE FOUNDATION FOR A GARDEN.

A garden is hardly worth having, unless one can have a thoroughly good garden. There are many men who make gardens year after year, and yet never have such an one, simply because they neglect the first matter of importance, which is to make a good soil. A garden soil is something like a poet; only the converse of the axiom is true



NORTH-WEST GREENING.

McMAHON'S WHITE.

them a chance of getting some benefit from what little sunshine there is. Put the taller and larger ones back of the small ones, and farthest from the window. With the low-growing kinds near the glass, the large ones will get a fair amount of sunshine without robbing the others, or by being robbed by them. Stir the soil frequently, and be sure to not give more water until the surface of the soil seems really dry. This is, perhaps, the most important thing to bear in mind at this season.—*American Ag.*

(1) Sixty-five is a perfect temperature for people who take a fair amount of exercise. Sedentary women require two degrees more.

it has proved quite satisfactory in the Southern and Eastern portions of the State where it seems to have been extensively planted. On the very rich prairie soils of Northern Iowa and Minnesota—except on the bluffs—it grows too late and fruit holds on too long to be perfectly hardy. It was noticeable however that on the tables of the State of Wisconsin at the World Fair *North West Greening* occupied a very prominent position, showing that it was a favorite variety. I made special enquiries about this apple while at the Fair, with the result that it was recommended as one of the most promising of the new varieties.

Six years trial in this province, both in nursery and orchard, convinces me

The second variety is *McMahon's White*, or more commonly called *McMahon* (pronounced "Mackman"). This is a fall or early winter variety, large and handsome.

The tree has proved to be one of the hardiest, ranking equal to *Duchess* in that respect.

The fruit is of fine quality—medium to large; color, greenish yellow, sometimes slightly tinged on the sunny side; oblong, conic, tree a good bearer.

The *McMahon* can be recommended for cultivation in the most exposed sections of the province. Our friends on the banks of the lower *St. Lawrence* and north of *Montreal* and of the *Ottawa River*, would do well to culti-

and it is made and not born. There are of course exceptions to this rule, but it does not often happen that one finds just the best soil in just the spot where he wishes to have the garden. Some are discouraged by this fact, and so do not try to have a garden at all. Others put up with what they find ready to their hand, and spend much labor continually in the effort to produce good crops from poor soil, when, if they would expend a portion of their labor in the building up of the soil, they would accomplish much better results in the end, with a great deal less trouble than they now have.

The first thing to be considered in locating the garden is to have it in a convenient place. If it is put off in

some distant corner, where it is never seen except by special effort, there will be too much of a tendency to let it shift for itself—and such treatment is not conducive to good crops. Having located it, next examine into the quality of the soil. If this proves to be a good rich loam, you are very fortunate, for you have the best basis upon which to build. If it is a heavy clay, you must give first attention to improving the mechanical texture, so as to make it friable and "workable." This can be done by hauling on coal ashes or cinders from factories and plowing it in. By this means we have made stiff clay as friable as an ash heap. But if you find a light and sandy soil, then bring to it all the refuse vegetable matter that you can—leaves, straw, coarse manure, &c., and plow it under and let it decay beneath the surface.

Whatever soil you have, and whatever initial treatment, you must not lose sight of the fact that it is very far from the ideal soil for a garden, because it does not contain, naturally, sufficient available plant food to enable you to grow the very best crops, and such crops alone as you can find the fullest satisfaction and profit in producing. To bring it to this stage, you must manure, and manure, and manure. Remember that you have not a whole farm to enrich, but only a little garden plot of a few square rods; so you can afford to apply manure in such quantities as might well frighten you if undertaken on a large area. Of course you are going to apply it beyond the needs of the crop which you expect to grow this year, but your purpose should be to impregnate the soil so thoroughly with plant food, that whatever seed you place there will find at once the element needed for its perfect growth. A load of manure on the garden is not enough. A half dozen loads are not, unless the garden is very small indeed. The entire surface should be covered to a depth of at least six inches, and this not with coarse green manure, but with a fine and well-rotted product. Put it under the surface this fall if you can. If not, put it on the top, and let it mellow and melt through the winter. Then in the spring put on more, and continue the operation every spring and fall as long as you have a garden there. When you plant in such a thoroughly enriched soil, there is no hesitancy about the germination of the seed. The plant springs quickly into vigorous life, and makes the rapid growth which is the warrant for a bountiful maturity.

We have too many starved gardens. My neighbor has one, in which he toils industriously every year; but I have never seen a load of manure or fertilizer of any sort put upon it, and the result is what you might expect. I am not prepared to say that such treatment as I have here indicated would pay for the whole farm, but the garden is conducted on a different principle from that of the meadows and grain fields. If the garden will pay at all, it will pay to treat the soil after this fashion. Most gardens do not pay. They produce a few peas and beans in the early summer, later on some cabbages, and then the potatoes (not very many nor very large) about complete the tale. But the garden should have in it every vegetable that will grow in your climate, from radish and lettuce up to pumpkins and water-melons. It should not be given up and left for the woods to overrun in August, but celery and late cabbages and turnips should keep its memory green to the very verge of winter. If the soil has been put into such condition that all these things can be made to grow easily and well, it will

be quite natural to have a succession of crops; but if strenuous effort is required in order to produce anything, the garden will have little attention after it has given the first few masses of green vegetables in the early summer.

It would be a good idea to make up your mind about the garden now, so that you could be building the soil, as occasion offered, all through the winter; and after you have begun it, do not stint your work, but bear in mind that it is just as necessary to have a good foundation on which to build your garden as for your house or your barn. I was once accused of extravagance in this matter by an old farmer, who waded ankle deep in the manure which covered my garden plot in the late autumn; but the next summer he paid me for vegetables enough to balance the total value of the manure which he thought I had wasted. It is quite possible that in growing farm crops there is a limit to the profitable application of manure, and it may be that there also is such a limit in the garden, but I have never found it, nor do I think many others have. The danger is wholly on the other side.

JAMES K. REEVE,
Cultivator.

Warren County, O.

The Farm.

THE POTATO.

By Mr. G. MOORE.

The importance of this staple esculent can hardly be appreciated until its loss is experienced—as it threatened to be, in the year 1845, by the appearance of a peculiar disease which first attacked the crop in Belgium during that year and spread throughout Europe, and in fact the whole world, during the next few subsequent years—causing an amount of suffering among the poor, only second in consequence to that which would have resulted had the wheat crop met with a similar visitation.

No country however suffered to the same extent as Ireland, for the reason, chiefly, that the potato was the poor man's crop—and the one on which Irishman depended in a great measure for the support of his family; including the pig, which it was said was often treated as a member of the family circle and accommodated with snug quarters in the same apartment as the other members of it; treated in fact as a gentleman because, as an Irishman once asserted, he was the "gentleman that paid the rent."

So great was the distress and famine caused by the failure of the potato crop that the British government had to appropriate millions of pounds sterling to keep alive the starving population of the Emerald Isle—relief being also sent from America and others places where Irish emigrants had settled.

The disease was a profound mystery as to its cause to every one, and so devastating that it was feared the potato would be lost to the world, and, substitutes were suggested, but with no favourable result. Amongst these was the parsnip, and in consequence, during one season parsnip seed went up to 20 times its usual price.

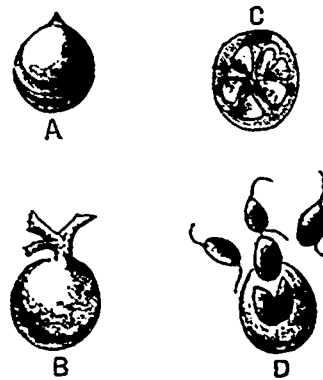
Many suggestions as to the means of checking the disease were also offered, one of which was to mow off the tops, but this did not succeed, for obvious reasons, because when the

tops were removed the tubers ceased to grow—and so the disease continued baffling the skill of all to discover its cause, and therefore any means by which it could be prevented, until that most useful and wonderful of all philosophical instruments the microscope was brought to bear upon the subject, when the fact that it was caused by a minute bacterial fungus *Phytophthora infestans*—so minute that 800 would lie on an inch line was discovered.

Scientific research and experiment having revealed this fact, some clue was found to a means of checking the ravages of the bacteria by means of the application of a caustic poison, which, while it did not injure the development of the plant would prevent the pest affecting it, and that the desired end could be reached by the application to the potato tops of what is known as "Bordeaux mixture." Other remedies and preventatives were also tried but not with so beneficial an effect or with so little danger to the crop.

In every case, where it has been intelligently and faithfully applied, the crop has been saved from rot and the yield largely increased by the proper and healthy development of the whole plant being maintained until maturity. A knowledge of the cause of the disease scientifically explained may aid our potato growers in the adoption of the remedy and induce them to apply it. Simple, cheap, and easy as it is, and with the results achieved, it seems unpardonable in any one not to do so, seeing that the evil is contagious and will injure our neighbours as well as ourselves.

The explanation, then, as given by no less an authority than the "Royal Agricultural Society of England" is that the very small fungus—*Phytophthora infestans*—a plant belonging to the mushroom family, lives as a parasite upon the potato plant as larger fungi live on trees, gradually causing their death. These fungi have an innumerable number of small spores or germs which being magnified 400 times have the appearance given below.



A Ripe germ—B Germ beginning to sprout—C Spores formed in germ —D Spores escaping.

These germs are so light that they float about in the air and their growth is so rapid that it is speedily filled with them by myriads.

They settle upon every thing they touch but grow only on the potato. It is ascertained that peculiar bacteria have peculiar plants or animals which they infest, and these only, the potato being the one which is the natural sustenance of the fungus alluded to. But next we note that moisture is necessary for their germination; not heavy showers which might wash them off, but dew or mist which quietly saturates the leaves, hence the notion that mist causes the disease.

The germ having settled upon its victim and the condition of moisture

being favourable sends out a fine root or *mycelium*—which finds its way into the leaf either by penetrating its skin or, more frequently, through one of its breathing pores. (All leaves have pores in their skin, similar to those of the animal creation, which are found to answer similar purposes of respiration and absorption.)

The contents of the germ also divides in several minutes spores, each having two little tails and these swim about on the surface of the leaf after escaping from the germ cell (see fig. D). These also penetrate the leaf. When they have entered it, they find the food they require and rapidly grow in every direction, killing and blackening the part attacked.

The underside of the germ-bearing mould is seen when greatly magnified to consist of very fine branching threads bearing the egg-shaped gorms; these becoming detached, float about in the air until they find a resting place as described, hence the rapidity with which a crop is destroyed. The fungus having exhausted its supply of food in the leaf passes down the stem and into the tuber—consuming or discoloring the starch and breaking up the organs and the root causes decay.

The growth of the fungus is not dependent upon the access of air, and keeps up a vigorous growth within the potato, the skin of which is too thick to allow it to push out its germ bearing roots. Another way in which the disease may be propagated is from the diseased tuber, because the root or mycelium contained in the seed-potato spreads through the growing plant into the leaves. The fungus then sends out its germ-bearing mould through the pores of the leaves, these producing germs which spread the disease another year.

This is the established theory of the cause and progress of the old fashioned potato disease, and now we give a few hints as to its prevention founded upon the consensus of authority by those who have experimented with this end in view.

In the first place it will be well to understand that the means to be adopted are preventive rather than curative, because all bacterial diseases, either in plants or animals, are difficult to cure, in as much as when the microbes have destroyed the tissue the disease is organic, and the organs then destroyed cannot be replaced, therefore, as in most cases, prevention is better than cure. With this in view we shall do well to observe the following rules:

1. By no means use potatoes for seed that you have even the suspicion of their being diseased.

The disease as we have stated can not be detected until it has been magnified hundreds of times and potatoes that may appear quite sound may contain the germs.

2. Never plant potatoes in the ground where there has been disease for several years or not until it has undergone a full rotation of cropping.

3. Never allow any diseased potatoes to remain on the ground, nor put them on the manure heap; get rid of them by burning, burying, or feeding to pigs or cattle.

Fortunately they are not injurious as an article of food, though not so nutritious as the healthy tubers. It would be better even in case of feeding to separate the good starch remaining and destroy the refuse.

4. Always use the most vigorous and healthy varieties for seed which will be found to be those of more recent introduction. The older varieties have become weakened by age and more liable to disease, and a

weakly growing plant, like a weak animal, will be more susceptible to the influence of whatever vermin may attack it. Change the seed frequently, or the land on which it has been grown, use only eyes of the larger potatoes, small potatoes cannot possess the necessary vigour to produce a robust growth at the start, (who would think of improving his stock of animals from sickly or diminutive parents.) (1)

5. Cultivate your land carefully—that is to say have it in good condition for any crop—by being well ploughed to the depth of 7 or 8 inches, and free from the various weeds.

It is impossible to obtain a large yield of potatoes on a poor piece of land. One season manuring can never produce the result to be obtained from land in a thorough state of cultivation.

6. Composted manure should be used in preference to fresh but excellent crops are being raised, free from rot, by the use of wood ashes or superphosphate. M. M. Cotaro, of Johnsville, near Sherbrooke, succeeded in raising this year 419 bush on the acre by the use of \$9 worth of fertiliser of the Victor brand.

I visited Mr. Cotaro's farm and saw his crop and thinking a plain statement of facts would be instructive I proposed the following questions and received the replies following.

Q. What is the nature of your land?

A. Sandy loam.

Q. What was the last crop?

A. Clover.

Q. When did you plough?

A. In the fall.

Q. How deep?

A. 7 inches.

Q. What manure did you use?

A. 600 lbs. Victor Fertiliser.

Q. What varieties did you plant?

A. Dakota red, St. Patrick and late Rose.

Q. Which do you prefer?

A. The Dakota red, they were all sound, a few of the St. Patrick decayed.

Q. Was the seed imported or home grown?

A. Carefully selected home grown.

Q. Did you plant whole seed?

A. No, eyes from large potatoes.

Q. How did you apply the fertiliser?

A. In the drill when planting.

Q. When did you plant?

A. May 10th.

Q. How did you cultivate?

A. With horse, hoe and earthed up with hand hoe.

Q. When did you harvest?

A. Early in September, at which time tubers were quite ripe.

This is an example of what common sense, judgment and their practical application may accomplish, and such a success deserves notice for the encouragement of others. No Bordeaux mixture was used in this case and scarcely any disease appeared, this is no doubt accounted for by the vigour of the crop from the start to the ripening, and the peculiarity of the season, which was not favourable to the attack of the fungus until the crop had ripened.

A gentleman in Wisconsin succeeded in raising 434 bushels of Early Ohio to the acre by the application of 80 bushels of wood ashes costing only \$7, beating thus 3 others, one of which used 20 loads of compost manure and the two others, commercial fertilisers, costing \$30. The balance of profit in favour of the wood ashes was \$35. This should be a lesson to all, especially to those on light lands, as to the

(1) How, then does the poor Scotch barley of the fens of Cambridgeshire produce the splendid malting barley of the uplands of Essex, Hertfordshire, &c.? Ed.

importance of saving or purchasing at a reasonable price all we can of unleached wood ashes. In dry lands the retention of moisture is nearly of as much consequence to a quick growing root crop as are the fertilising qualities.

The best crops and freest from rot can no doubt be grown, on clean land in good heart by the application noted above and in preference to manure applied at the time of planting.

7. Cultivation after planting, both for the destruction of weeds, and to prevent the land becoming too dry or baked, so that the atmosphere cannot give free access to the roots, a matter of great importance, must be faithfully attended to. Some growers now advocate flat cultivation but ridging up moderately would seem preferable (1).

8. The question of guarding against the ravages of destructive insects and parasites is one which claims the careful attention of the potato grower. The Colorado Beetle succumbs to the faithful application of Paris green—and the Bordeaux mixture which forms and excellent medium in which it can be used is no less effective on the prevention of the potato blight, rust or rot above described, that is to say three applications of Bordeaux mixture:

5 lbs. blue vitriol dissolved in hot water.

5 lbs. quick lime.

50 gallons water—per acre each time—and to this is added ½ lb. of Paris green will kill the bug and prevent the disease.

But there must be attention to detail in all these matters. It is no use locking the stable door after the horse is stolen or going against what experience has proved to be right because we think an easier plan will do as well.

Our powers of observation were given us to use, let us observe processes and results. Knowledge thus gained must be put promptly into practical effect and the good achieved and the evils overcome will astonish those who scoff at advice and laugh at what they think is time wasted in experimenting.

9. The care of the potatoes after digging requires a passing notice. Before stowing away in the root house or cellar, it is recommended to leave them in heaps of twenty to thirty bushels, covered with a little straw and earth, leaving a hole at the top for ventilation or escape of the moisture generated in the slight sweating process which they will undergo, when taken out of these heaps they will be in splendid condition to place in larger bulk in the cellar as the superfluous moisture will have evaporated.

10. Marketing potatoes. Do not attempt to foist off the small ones upon your customers, make the sample as uniform as possible; and if you get a name for a good article you will feel its good effect by being able to obtain the best price. Feed your small potatoes to the pigs, they will pay thus and not to spoil your market sample. With these brief directions faithfully observed, there is no reason why there should be so many failures in potato culture. The crop is an expensive one to handle; and careless growers lose more by attempting its cultivation than they gain; while it is evident that, when properly attended to, it can be made profitable, and especially when we consider the clean condition in which the potato leaves the land and the fertility which remains for a cereal crop.

(1) Earth up just enough to prevent the light from greening the tubers. Ed.

The potato is a staple article now: if it were lost or withdrawn from the market it is impossible to calculate the disastrous results.

Let us not, then, as many farmers do, say, oh potatoes are no use, they will not pay; but take advantage of all the means we possess to increase the output of our farms.

"Whatever thy hand findeth to do, do it with thy might." The might of our will. The might of our intelligence. The might of our attention to the minutest detail. The might of our implicit trust in the Almighty. Let us do this and failures will be few in whatever we undertake.

GEORGE MOORE.

FENCES AND FARM ECONOMY.

BY W. A. HALE, SHERBROOKE, QUEBEC.

For the last few years the financial and social condition of the farmer has in every quarter of the globe been attracting more than usual attention. The press, both agricultural and commercial, is constantly given its own and the opinions of others upon the subject, and even our best monthly magazines contain many excellent articles upon this unsatisfactory and unsettled state of the agricultural industry generally. Just what the reasons for it may be, whether they are from political or from other causes, it is not only my intention at present to discuss. That times are hard, there is no denying, and when such things do exist there seem to be three main points for us to consider as most likely to bring a certain amount of relief.

(1) Better prices, if possible, (2) less cost of production, which is probable, and (3) greater economy in personal expenditure, which, in most cases, is undeniable. Now, in regard to the latter customs which have been in vogue for generations we are apt to look upon as necessities, and are far less likely to reform than those of more recent date. We all have watched the last session at Ottawa with more or less interest to see whether coal oil is to be placed upon the free list or not, but it evidently is to be left as it was, and the wave of indignation which will sweep across the whole rural portion of the Dominion would be enough to make the powers that be tremble, had farmers but the faculty of shouting together. If I use 100 gallons of coal oil a year on my farm, and the duty causes me to pay seven cents a gallon more for it, I am prevented from the benefit of saving in this one item \$7 a year, and I naturally feel aggrieved, but may I not in a way be trying to save coal oil at the spigot while I am wasting other things at the bung? We are told that the average indirect tax, through the customs and inland revenue, is, for the Dominion, \$5.87 per head for every man, woman and child. Just what proportion the farmers pay it is hard to say, but of direct municipal and school tax there is no doubt, and this latter will probably average, including road tax, \$15 a year on every \$1,000 of farm valuation. Taking, for example a farm of 100 acres, worth say \$2,000, with municipal taxes \$30, and indirect revenue taxes, say \$20 more, we have \$50 a year, and these two combined, we are told, are sufficient to break down the struggling man and drive him either to seek employment in cities or in other lines or business; yet how few do we hear protesting against a heavier burden, which, by virtue of a law as

useless as the incubus it brings, we

are at present compelled to submit to, and which annually represents a tax actually greater in money value than all the government, municipal and school taxes put together. I refer to the unnecessary farm fences and the laws which as present compel us to build them. In the Province of Quebec the fence and herding laws are unsatisfactory enough; but why the people of New-Brunswick have so long submitted to the present existing state of affairs seems unaccountable. In Quebec the roadsides are not public pasture ground. They very properly are secured to the man who owns them, to cultivate, row or plant with shade and ornamental trees as he sees fit, but not pasture; and under this wise law, not only are the roadsides constant sources of profit where properly cared for, but all useless roadside fences are fast disappearing, giving place to far better roads in winter, and much cleaner and more attractive appearance to the farms and fields generally. The sentimental idea that the poor woman's cow should have free pasturage in the public highway is too absurd any longer to form an excuse for the continuance of so expensive and unprogressive a custom, for in practice there is little or nothing left for the widow's gentle animal to feed upon, the beasts of the stronger brother have taken what little there might have been, and the necessary costs of gates and fences, where this imaginary benefit to the widow is supposed to exist, make it the most expensive pasture ground that could well be devised. It would, of course, be far better to make the law forbidding the straying of animals upon all highways, beaches and public places a universal one for the whole Province, but if this would be treading too much upon the traditions of those who are wedded to this relic of the dark ages, it might so be passed as to make its adoption optional with municipalities, giving, however, those townships which are wise enough to avail themselves of its power to protect their settlers from the encroachment of animals from such municipalities as have not adopted it. In this way the reform would probably spread rapidly, just as the custom of abolishing roadside fences is spreading, when the improvement derived therefrom is shown by practice. When it is said that the fence burden represents an annual tax greater than all government, municipal and school taxes together, it is not meant that any change in the law would at once entirely remove this burden but there is no denying that in the majority of cases a very great economy could at once be practised.

In the Province of Quebec, Article 428 of the municipal code disposes of this matter as follows.—"Poundkeepers are bound to receive and retain in safe keeping animals found straying on any beach, flat, road or public place, or any land other than that of their owner's, and impounded by the rural inspector, or by any other person who finds them, until such animals are reclaimed by their owners or sold at auction under the provisions of this section."

Here then is the whole thing in a nutshell, so far as straying animals are concerned, and this law is based upon the fundamental principle of all intelligently framed herd and fence laws, namely, that every man should keep his own animals upon his own land, and at his own expense, and, with the exception of the Provinces of Ontario and New-Brunswick, I doubt if there be any other Province or State on this continent that would tolerate any other condition to exist.

Whosoever the law is in force for preventing the straying of animals on highways and public places, an opportunity is thus given for commencing the economy in fencing, by first abolishing those along our roadsides. I have often been asked, "How are crops to be protected from passing droves and stray animals?" The answer is, simply by keeping the droves moving, and by preventing animals from roaming at large. I live on one of the old thoroughfares along which a very large proportion of the cattle and sheep designed for the New England markets pass. Many years ago, when roadside fences were still considered necessary, I cleaned up both sides of the road for the double purpose of keeping down weeds and for making hay, and thus prepared a most tempting feeding ground for all these numerous flocks and herds; and while these animals were by permission of the drovers regaling themselves on the roadsides, large portions of them often found their way through open gates or weak places in the fence, so that not only did I lose the best part of my two tons of roadside hay, but a deal of my meadow and grain fields was trampled over as well. In order to try and prevent this latter loss, I, some years ago, took down in spring about 2,000 feet of roadside fence with intention of replacing it with a new one. On reckoning up the cost, I found that with posts and boards, &c., the total cost would be at least \$100. Charging interest on this at 7 per cent, and allowing 8 per cent more for annual repairs and depreciation of fence, it would represent \$15 a year, and with the extra labour caused by the fence in ploughing, mowing and raking by hand, in driving round to and opening gates, and in extra road work in winter from drifts caused by this fence, say \$10 a year more, or \$25 in all. I found that the annual tax of this fence would be equal to the total loss of five tons of standing hay in this field alone, while practically I have lost none at all, and have had a full crop of uninjured roadside hay as well. Since then, 1,000 feet more have been removed, and as time allows all the rest will follow, and it is very satisfactory to notice that this custom is steadily spreading in every direction. To those who prefer to fence their roadsides in order that their cattle may run upon the after-grass, I would suggest that, if feed in the pastures is short in the autumn, it would be far better, for many reasons, to either grow green corn fodder to take its place, or with the money saved from the cost of fencing to buy and feed bran, than it would to injure the meadow by pasturing them. But if the roadside fences are an unnecessary nuisance, the boundary line fences are in many cases worse. As the law exists in Canada to-day, any man can compel the owners of all the adjoining properties to build half the dividing fences, whether the adjoining lands be in timber, in wood, or what are generally known as unimproved lands. In the United States this condition of things is very properly not allowed, and in most of the States the law goes more fully into the matter, and, being based upon the fundamental principle of all just herding laws, provides that every man must keep his animal upon his own land, and in whatever way suits him best, so long as he does not impose upon any one else in doing so. Taking example from these older sections of the country which have evolved a much more equitable code of farm laws than exists with us, a movement has been set on foot, based upon these improved laws,

and the attention of the Quebec Legislature is now being called to the importance of modifying the present existing and unsatisfactory laws. As the boundary fence law at present exists, it is imperative upon each to build and maintain, under the direction of the rural inspector, one half of all the fences bounding his property, whether they are of any benefit to him or not. This, in the old days when lands, labor and lumber were of very little value, may have been a rough and ready cross-cut way of settling the matter, but as civilisation has brought a different condition of things, it does seem as though a modification of these old customs should now be made more in accordance with the advanced state of agriculture, and in such a way that any man may, if he so wish, relieve himself of an extravagant and often wholly useless burden, greater in actual annual cost than all his yearly taxes, yes, and probably his insurance as well.

This proposed addition to the fence laws is not intended as an amendment to those already in force, for, in all cases where two neighbours find that they both wish to make use of a boundary fence, the present laws and customs would be their guide, but, where a desire to economise exists on the part of one or both neighbours, then the proposed addition would be made effective. Furthermore, in order to give ample time for considering and testing the merits of the proposed reforms, it is only asked that the new law be made operative in such municipalities as desire to adopt them. The following is the change petitioned for, expressed in two articles:—

The councils of any rural municipality may, by by-law or resolution, bring into force article 426 b. of the code, the said article shall only have effect from the first day of November next following the passing of the said by-law or resolution:—

"426 b. The owner or occupant of land, adjoining all timber lands, wild lands, wood lots, unimproved lands and that part of farm lands on which horses, cattle, sheep, swine, goats, poultry, or any domestic animals are not at any time allowed to pasture, or run at large, cannot compel the owner or occupant of such unimproved lands, to build or maintain any part of a boundary fence adjoining such lands. The owner of improved farm lands adjoining land of another, having erected at his own expense, or become possessed of a boundary fence, may, by appealing to the rural inspector of his division, demand and recover from the owner or occupant of such adjoining land, the present value of one half of the amount of the boundary fence so used whenever such adjoining owner or occupant begins to make use of said boundary fence by pasturing any domestic animal or animals upon the land bounded by such fence, whether it be in pasture, meadow, stubble or ordinary farm land, said value to constitute a purchase of that portion of the boundary fence, and which is in future to be maintained by the party so purchasing.

"In cases where a boundary fence has already been built, if the owner or occupant on either side ceases to use his land as pasture at all times of the year, or if his land be timber land, wild land, wood land, or unimproved land, he can no longer be compelled to maintain any portion of such boundary fence, but may, by giving notice in writing to his neighbour before the first day of December in any year, remove on or after the first day of June following, whatever part of the fence

had been allotted to him, and be exempt from maintaining the same, so long as his land adjacent to said fence is not used for pasturing purposes; first, however, giving his neighbour the right to purchase this said portion of the boundary fence, at a fair valuation; the price, in case of disagreement, to be decided by the rural inspector of his division."

These laws, should they come into force, would, I am convinced, be the means in many cases of bringing about an enormous saving without in any case causing an injustice to any one.

POTATO-GROWING.

The most successful competitor in this season's contest was Mr. J. J. Mullock, in the township of East Flamboro, in the County of Wellington, who grew 347 bushels and 32 pounds upon one measured acre of land. His soil was a sandy loam, which for the three previous years had grown hay, which had been cut and drawn from the field. The only preparation that this land received, was, that it had been plowed six inches deep on the 3rd day of June, 1893, just before planting. It had, however, received a thorough working with a disc harrow, which was run over the ground four times. The drills were then marked three feet apart and three inches deep, in which were planted 1,200 pounds of seed, consisting of whole and half potatoes of Rural New Yorker No. 2. One thousand pounds of Freeman's Potato Manure was then applied in the drills over the covered sets. The after-cultivation consisted of three times cultivating with Planet, Jr., and hand hoeing three times. The ground in this case was kept nearly level. Very favorable weather throughout June was experienced for starting the plants, but the extreme drouth of July and August greatly lessened the yield. September proved more favorable, and the rains during this month received the crop, which was harvested on the 21st and 22nd of October, with the result mentioned above. The crop was dug with forks by hand, five men being employed in the work, who gathered, weighed and stored them in the cellar. Mr. Mullock states that he never before had so large a crop. He has already disposed of a large quantity for seed.

The second largest yield was produced by Mr. J. R. Hodgins, of the Township of Adelaide, of the County of Middlesex. This acre consisted of a sandy loam, on which the three previous crops had been corn, to which eight loads of manure per acre had been applied, in 1890, oats in 1891 and hay in 1892. The ground was plowed in September, 1892, harrowed with a common harrow twice, and cultivated May 12th, 1893. The ground was marked four inches deep and thirty inches apart each way; the sets planted in hills; 720 pounds of seed per acre; the two varieties planted were Empire State and Green Mountain. In this case the seed was cut two eyes to the set, twelve days previous to planting. This acre was planted May 20th, and the plants appeared above ground the 8th of June. One thousand pounds of Freeman's Potato Manure was applied, of which 600 pounds was sown broadcast and 400 pounds placed around the hills. The after-cultivation consisted of four times cultivating with a horse hoe and hoeing twice and hilling up with a plow. Very dry

weather was experienced throughout July, August and September. The crop was harvested October 5th with potato forks, and 160 bushels was the result.

The Dairy.

TO THE MEMBERS OF THE BOARD OF DIRECTORS ON THE DAIRY ASSOCIATION OF THE PROVINCE OF QUEBEC.

Gentlemen,

Owing to the satisfaction given by the working of the 14 syndicates last year, there was a great increase in the formation of syndicates for this year, in fact, they were just doubled.

This caused your board to appoint along with me another General Inspector M. Saul Côté who had charge of the travelling dairy school last year and to give up the travelling school altogether; as you thought that, owing to so many syndicates being formed, it was not needed so much as it had been in the past.

M. Côté and myself arranged to divide the province into two divisions: one north of the St. Lawrence River, and the other on the south side. M. Côté took the one on the north while I had the south. There were 25 syndicates altogether: 24 cheese and 4 butter syndicates.

There is room for 40 for next year and perhaps more, and I should again call attention to the fact which I noticed last year, of inspectors having too many factories under their charge. It is quite impossible for an inspector to do justice to 25 or more factories.

There were 3 or 4 inspectors who had more than that number, and the results were not very satisfactory. As a general rule, those inspectors who had from 17 to 20 factories produced the best results. I would advise the board to lower the number of factories to, say, 20 or 22 at the very most. There was a great scarcity of inspectors. Our county, Stanstead, had to go altogether without an inspector, and perhaps some of the others would have been better without one too. While at this point let me say that the results of syndicate formation has been on the whole good, very good; although, of course, there were a few inspectors working in the Province who were not capable of advancing the interests of their respective syndicates and the standard of dairy manufacturing, to the extent desired by myself and the society, yet this is an evil which can be remedied, allow me here to say, especially to the rapidly talking cheese trader or buyer who is ready to condemn the whole system of inspection, inspectors, syndicates, society, &c., &c., on account of an inspector or two who is not competent to consider, which I know is a rare thing for these men to do, that only 1/3 of the number of inspectors have a first class diploma. Last year, owing to the rapid and unlooked for growth of syndicate formation, and the scarcity of good men to fill the position of inspector, the society was obliged to let second class diploma men take positions and to give also certificates enabling the holders to inspect one year, knowing that if they were not capable, they would be replaced by others holding first-class diplomas. This will remedy itself very soon: weed out the poor ones, and hold a very rigorous examination before granting diplomas. Upon the whole, the plan has turned out very satisfactorily.

The trial at Toronto Fair with our cheese rather dampened our ardour, but the results at the Worlds Fair, 105 awards in the last competition, should show the men of Bristol that French cheese are not to be sneered at; and we trust the day is not far distant when we shall obtain our rights. Our exhibits, although not so numerous as Ontario, the percentage of awards was much better than theirs. Out of 105 awards we had 4 with 99½ points, Ontario with 200 awards had only 5 with 99½: ours were about 4 per cent, while theirs were only 2 per cent.

If cheese buyers wish to class cheese, instead of Finest Ontario, Finest Townships, and then French, to bring up the rear, why not grade it like wheat: Finest No 1, 2 and 3? let us stand shoulder to shoulder in this matter, and demand our rights. As a matter of course, it will take time to do so, as the English men are slow to acknowledge merit, but merit must be continuous, we must not be content with present attainments, let us still further improve and when we are acknowledged we shall certainly be prepared for it. The very fact of 3 out of the 4 lots of cheese scoring 99½ points being made by French Canadians and most of these scoring up high were made in sections where the French cows were the majority, raises a point in my mind that the milk more than the men had something to do with these respects. It is a well known fact that the Canadian cow gives very rich milk, equal in many respects to the far-famed Jerseys.

We have not yet attained to the same degree of perfection and uniformity with our butter industry as we have in the cheese department, but in time we shall get there. We received only 7 awards at the World's Fair for creamery butter, in October last, and 7 for dairies, beating Ontario, in butter. Although this is not perhaps and cannot be called a fair criterion of what we are doing in butter, as the selection and shipping of the butter for exhibition was not looked after in the same manner as the cheese, some of the butter being nearly a month old when it was examined, in fact, some of it being nearly melted before it reached its destination. I visited 25 of the 28 syndicates formed once during the season, and some of them oftener. I visited 253 factories altogether creameries and cheese factories. I examined 493 tubs of butter and 16,851 boxes of cheese which I classified as follows: 247 tubs butter finest and 146 fine; cheese 5688 boxes finest 9483 boxes No. 1 and 1680 boxes No. 2.

I have not been able to give a statement in full of the inspectors, as in many places the factories have been in operation later than usual, many factories running the first half of November, while a few ran through to the end. I shall have it shortly and will have it printed with the annual report.

Our exports this year in cheese show a fair gain over last year. Bear in mind, also, that last year was the largest on record. They show a gain of nearly 40,000 boxes over last year, representing a ¼ of a million more dollars than 1892, with possibly more cheese in this country than last year. Our butter exports have declined since last year: they are not nearly what they ought to be.

In summing up my report for 1893, I would say that the system of inspection has done a great deal of good to our cheese trade; in a short time we expect to improve our butter. Then let us maintain our rights: the Bristol Board of Trade to the contrary

notwithstanding; and we may hope for better results in the future.

The whole most respectfully submitted. PETER MACFARLANE, General Inspector.

THE ENSILAGE AND ECONOMIC STOCK-FEEDING SOCIETY will meet in Montreal on the 6th and 7th of February 1894.

THE POMOLOGICAL SOCIETY OF THE PROVINCE OF QUEBEC will hold its annual meeting at Abbotsford, on the 8th and 9th of February.

EXPERIMENTAL STATIONS AND DAIRYING AS REGARDS QUEBEC.

It is interesting, after hearing so many cast-iron opinions as to "Rennet action" and the peculiarities of its results, "to read, mark, learn, and inwardly digest" the opinions of those who have done some experimental work in this matter, and, as a consequence, speak *avec connaissance de cause*.

How thoroughly wrong, for instance, is it to employ during the warm weather, more Rennet than will produce a good coagulation in less than forty-five minutes, wrong we say now, and wrong we always said, yet the assertions carries more weight when we can point to the experiments of Rud-dich of the Staff of the Dominion Dairy Commissioner, who found, generally speaking, that, all things considered, slow coagulation is better (at least for final results) than quick coagulation.

How thoroughly also was the idea that by the use of a large quantity of rennet the quantity of cheese could be increased relegated to the past, along with so many other ideas like unto it, which have done their share in holding back perfection in cheese manufacturing. The quantity may indeed be increased, but in such a small way that, if the increase were always secured, it would not pay for the rennet, much less compensate for the depreciation in quality. Notice the figures, —which are copied from the Report of the Dairy Commissioner for the Dominion.

	Lot A.	Lot B.	Lot C.
Date of Experiment.	3 oz. Rennet per 1,000 lbs. milk.	6 oz.	9 oz.
July 28	1st	Equal	Equal
" 29	2nd	1st	3rd
Aug. 22	Equal	Equal	3rd
" 24	"	"	Equal
" 24	1st	2nd	3rd

Grading of quality done by Commissioner Robertson himself.

The Ontario experiments as well as the experiments elsewhere, have demonstrated the value, in fact the necessity, of experimental stations and of experimental work; by arriving at definite results and securing decisive facts, which, to be secured in any other way would have entailed an endless amount of bickering and a much longer time, besides being always open to the suspicion of uncertainty; and, as remarked above, assertions backed by experimental work obtain a readier acceptance.

But not in all things are the experimental results obtained at certain places to be implicitly received as "determinations" at all other places.

While most of the results obtained by Ontario men may be accepted by us in the Quebec cheese-business without reserve and with great benefit, yet, in other results which they have obtained, we must look narrowly and ascertain, if possible, if the result may not be due to local conditions, and are not, perhaps, applicable in general. One important declaration of the above mentioned most worthy member of the Dominion Commissioner's staff, is, to my mind, most certainly of this order, I refer to his statements before an assembly of Ontario Dairymen which seemed to rather depreciate high cooking, for the very sensible reason that he had seen no better results from it, and further, as one of its disadvantages, that, the greater heat in the curd hindered, in a measure, the very important process of stirring the curd to firm it. This latter is an evident consequence, as the heat certainly induces the curd to "run together," thus certainly rendering stirring more difficult, and of course, as all makers know, imperfect stirring or imperfect condition of the curd at this point, means disastrous results.

However, in the face of this, I must really recommend high, rather than low cooking, for the whole province of Quebec except the district of Beauharnois and the Eastern townships; we must remember that these experiments were conducted with what we should call poor milk running from 3 to 3.75 per cent of fat; now we make cheese of milk very rich, 4.0 and 4.5 being usual *vat tests*, and we must recollect that rich milk makes rich curd, that curd rich in fat is rich in water; so also we find cheese rich in fat is rich in water. Now, our curds are different to sight and touch from the curds of Ontario, are more luscious, softer, containing a larger percentage of fat and of water. In cheese manufacturing, the greater part of the process is simply getting rid of the excess of water, i. e., separating the solids from the liquid before the liquid part becomes injurious owing to the development of acid; the means employed to secure this end are *heat and stirring*; now, from the nature of the case, we must use one or the other, or both, more than the Ontario people, and the spectacle presented after a soft luscious curd is stirred or rather *pounded* to firmness is not calculated to beget confidence in any thing but a reasonable amount of stirring. Some will say: at ordinary heating (98°), with ordinarily good milk, *pounding* is not necessary; they must consider, that, the very cause (rich milk) that gives us soft luscious curds makes it also difficult to handle them, as this rich milk seems naturally to change or become sour more quickly than poor milk. Has not nearly every observant maker noticed that the patron whose milk is returned after a sultry night is either a man who does not take care of his milk, or, failing that, who has milk with a greater percentage of fat than his neighbours? Herein and therein to my mind are substantial reasons for advocating always cooking to 98°; and, in very many cases to 100° for milk which is not positively sweet, an advantage could of course certainly be gained, if time permitted, in letting the vat cool to 96° or 97° at the time the whey is taken off, which would enable the maker to perfect his work by judicious stirring, at the same time securing the advantages of high cooking.

HENRY A. LIVINGSTON, Superintendent Experimental Dairying Quebec; Prof. St. Hyacinthe Dairy School.

ILLUSTRATION.

We take pleasure in presenting to our readers, this week, an illustration of a creamery building. A part of one side and the roof are cut away to show the interior arrangement and location of the different machines. It will be observed that the weigh can, receiving-vat, tempering vat, separator, cream vat, churn and butter-worker, are all shown and so arranged as to facilitate the daily work with the least expenditure of labor. In other words every detail moves forward in consecutive order. Last, but by no means least, it is worthy of remark, that a Babcock tester is provided for and shown just to the left of, and convenient to, the sink.

The company says in explanation of the illustration:

The building is usually made 72x26 feet, but occasionally 65x22, with a lean-to for engine and boiler room, 17x12 feet. It should be prepared and clap-boarded on the outside and papered and ceiled on the inside. This gives dead air-walls and makes a very cool building.

The cut gives quite a clear idea of the arrangement of the rooms and apparatus. The ice-house, refrigerator and cold storage rooms are located at the end and for convenience under the same roof. A stairway leads from the lower to the upper floors, or attic, which is used for storage.

The floor in the end of the work-room, where the churn and butter-worker are placed, next to the ice house, may be lowered three feet so that the cream will run from the cream vat into the churn. This drop in the floor is not shown. Some creameries prefer to have the floor all level, without any drop for the churn and butter worker to be located in, and use an elevating arrangement, which we are prepared to furnish, to elevate the cream vat bodily, with the cream and water in it, to a sufficient height so that the cream will flow from the vat to the churn. This plan has the advantage that the work can all be done on one floor without any running up and down steps. It makes the first cost of the building very much less.

Drains should be so located that water will run off from every part of the creamery floor into the drains, and these drains connected with living water to carry off the drainage.

There is sufficient room in this building so that another cream vat may be put in, and another separator, thus giving it a capacity for 1,000 cows.

A DAIRY SHORTHORN.

The championship of the recent dairy show at London, England, was won by a Shorthorn. She is thus described by an expert. This wonderful dairy performer had a slender build of forequarter, light neck and graceful head, with red hair of soft quality, and fine polished horns. She is refined in bone and displays a remarkable udder and wealthy milking indications. She has produced four calves, is six years and three months old, and at 224 days period after calving has yielded milk as follows, in lbs.:

	Morning	Evening	Or Daily.
First day.....	27.8	20.7	...
Second day.....	28.7	20.2	...
Average.....	25.2	20.4	45.6

This milk contained per cent :

	Morning.	Evening.	Average.
Solids.....	13.4	15.0	14.2
Fat.....	3.5	5.3	4.4
Solids other than fat..	9.9	9.7	9.8

A pound of the milk contains; Of fat, 0.280; of solids other than fat, 0.792.

The "points" claimed for her are:

For time since calving.....	18.0
For weight of milk.....	48.6
For weight of fat in the milk.....	41.4
For weight of solids other than fat.....	19.1

Total points127.1

DAIRY SHORTHORNS ON THE FARM.

The scrub cow is a total failure as a profit-maker. First, because her calf if raised or vealed will not pay for its feed; secondly, because she is unable to earn her keep either as a butter maker or milk producer, and thirdly, when turned off for beef she is unable to pay for the meal required to cover her bones with a poor quality of meat. This can all be changed by the use of a thoroughbred dairy Shorthorn bull on the same scrub cow. I say Dairy Shorthorn because there are strains of Shorthorns that have been bred solely for beef, and there are other strains or families that have been bred for the dairy with good success, as is evidenced by the records of some that have made from 2 to 3 lbs. of butter per day. I sold a young bull for \$75 a few years ago to two brothers that kept a dairy of 24 cows in the neighboring county of Chemung. They sold their milk at a creamery, hence could not raise the calves. One of them stated to me that the increased price they got for their first lot of calves, sold as veals, over former years paid for the bull, and there are a few young half-bred cows now owned in that neighborhood that would readily sell for 25 per cent. more than the ruling prices. Another very successful dairy farmer of the same county came to me this spring and purchased a young bull for use in his dairy. He said that he reared no calves, but from two years experience was convinced that he could not afford to fat veals from any other breed, as he had a good market for strictly prime goods.

At a recent meeting of the Schuylers county farmers' club, stock-raising was discussed in a general way, and veal calves in particular. One member stated that he raised very heavy calves from one of the dairy breeds, but supplemented his statement by remarking that their weight was mainly in their bellies, which is never the case with the Shorthorn grade. It was almost unanimously agreed that in this line the Shorthorn has no superior in regard to its dairy qualities.

I know of several half and three-quarter blood cows that give as high as 50 to 60 lbs. of milk per day on grass alone, and some of them have made more than 2 lbs. of butter per day and held out well though the season. When one wishes to fat one of these cows it is an easy matter to make 1100 to 1300 lbs. gross weight of excellent beef, equal in quality to the best scrub steers. If a farmer wishes to raise a few calves, the grade Shorthorns cannot be surpassed by any breed. Some of my neighbors have sold yearling half bloods for \$25 to \$30 each, when the very best scrubs would bring but \$12 to \$15. One man raised from a cow that would hardly weigh 900 lbs. a steer that at two years, with very poor care, weighed 1300 lbs. It is my belief that no farmer is excusable for raising scrub cattle when he can get a pure-bred dairy Shorthorn bull for the prices they now sell for.—[A. H. Prince Schuylers Co., N. Y.]

Farm and Home.

had grown, the following figures were given. Total export of cheese via Montreal, year 1874, 353,252 boxes; do., 1892, 1,651,798 boxes. The lecturer described the different breeds of cows, and for the province of Quebec a cross between the Ayrshire and French (Canadian) was said to be the best. The manner of aerating and cooling the milk was touched on and illustrated by diagrams. Mr. Muir next described the whole process of cheese-making from the time the milk was received at the factory till the cheese was ready for market. The process was gone into most minutely, and was thoroughly illustrated by drawings and by a large portion of the actual apparatus used, which made this part of the lecture very interesting. The lecturer next tested various samples of milk and showed the working of the priscopo, lactometer, cream gauge and the Babcock milk tester. The audience seemed to appreciate these experiments and evinced great interest in all of them. The various cheese sections of Canada were described in the large markets named. A cheese buyer's life in the country seemed to be a pretty lively one and also a pleasant one, as les-

the Dairy industry of Canada. At the close of the lecture, a vote of thanks was tendered to Mr. Muir for the trouble he had taken in making the first "business talk" the success it was.

HYATT ON TAINTS.

WHEN TO FEED TURNIPS OR SILAGE.

ED. HOWARD'S DAIRYMAN:—Allow me to tell J. C. J., page 691, that it makes no difference, so far as taint is concerned, whether silage is fed just before, while, or after milking. It takes about two hours for the taint of a turnip to reach the milk, and "taint" likely the taint of good silage travels much faster. I have experimented time and again, and I find it takes from eight to ten hours for the taint to depart. (1) I have fed some 2,000 bushels of turnips in the past three months to my milk cows, and the whole milk or cream from it has gone to Chicago. My whole milk went most of October, when my cows were just stuffing with turnips, and the expert, hunting for taint, says, "no taint there." But the roots must be sound. Frosted, mouldy, heating, or rotten roots will not make good milk, fed at any time. Butter, made from such milk, has no keeping qualities. Neither has it from damaged silage. I will send to ex-Gov. Hoard a gallon jar of butter made at home when, my cows were eating 40 pounds each of swedes a day (my flat turnips are gone), if some dairyman will send a jar made from silage fed cows eating about the same amount of silage, and if the Governor pronounces the silage butter best after a fair trial, I will send HOARD'S DAIRYMAN to ten of his friends for a year, free. Not the Governor's friends, but the man whose wife can make better butter from the milk of silage fed cows than mine can from rutabagas.

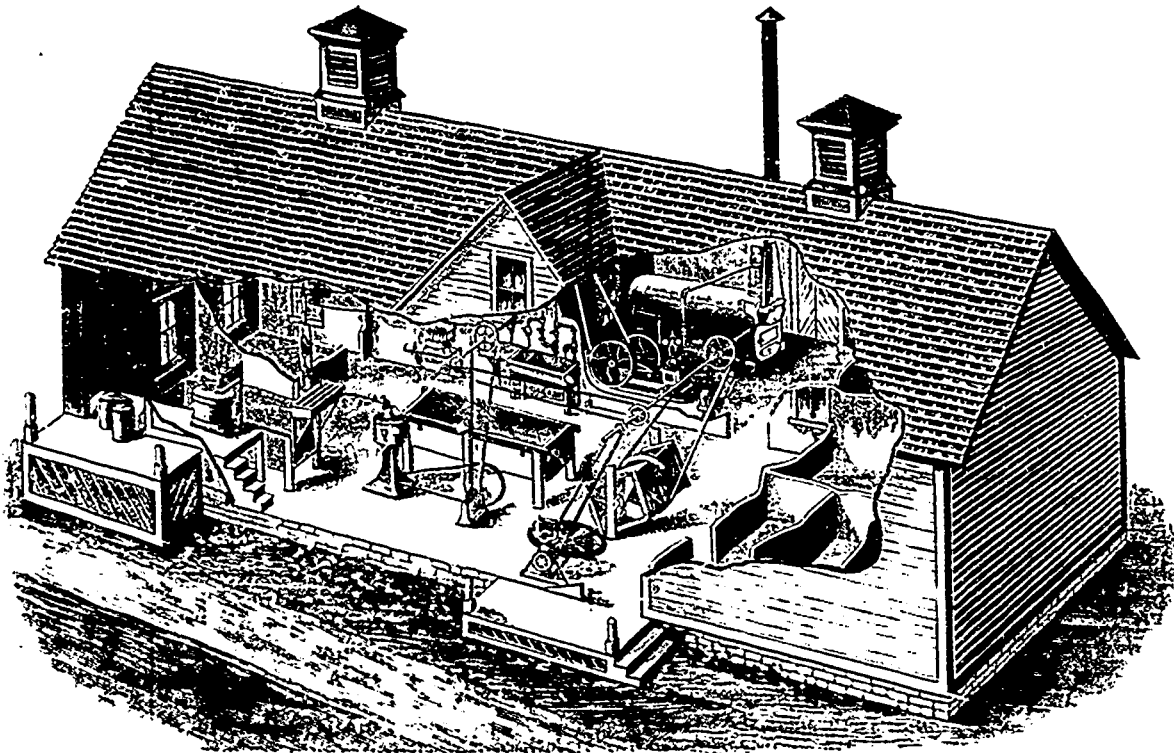
A. X. HYATT.

HOW I WON THE LORD MAYOR'S CUP.

[BY LUCAS CLASSEY, LOTTISHAM, GLASTONBURY.]

The Agricultural Hall, at Islington, is not perhaps, an ideal place in which to make butter; but the arrangements for the butter-making competitions there have improved every year since they were first started, and now, I am glad to say, leave little to be desired. There is no doubt, as the number of entries (229) prove, that these contests have become by far the most popular of any. The acme of a butter-making competitor's ambition is to win the Champion Prize and Lord Mayor's Cup at the Dairy Show—at any rate, it was mine; and now, having secured this, butter-making contests will seem to me as a worker no more.

(1) So have we, and we came invariably to the same conclusion. Ed.



A MODERN CREAMERY. VERMONT FARM MACHINE Co.

THE DAIRY INDUSTRY OF CANADA.

LECTURE DELIVERED BEFORE ST. ANDREW'S CHURCH YOUNG MEN'S ASSOCIATION.

The series of "business talks" being part of the above Association's programme for the winter session, was inaugurated on Monday evening, by the president, Mr. J. M. C. Muir, who took as his topic "The Dairy Industry of Canada." Mr. Muir said that he would confine his remarks entirely to the cheese industry, as in one evening time would not permit taking up both cheese and butter. Cheese-making is by no means a new thing, as it was shown that over 3000 years ago this industry was carried on. To the province of Quebec belonged the honor of having the first Canadian cheese factory, which was started at Farnham in 1863 by Mr. Jas. Burnett. Ontario followed in 1864, as in that year a factory was established at Norwich by Mr. Farrington. To show to what great dimensions the trade

described by the lecturer. Mr. Muir next touched on cheese arriving in Montreal and the manner of handling them; also gave full particulars of how they are not ready for the English market and sent to the steamers. The lecturer said that the largest shipment by one steamer ever made from this port went out on the SS. "Brazilian," of the Allan Line to London and consisted of over 59,000 boxes, valued at about \$415,000 and that the freight alone on this lot would amount to about \$11,000. The lecturer spoke of the cheese trade as a cash business through and through, i. e., on this side of the water, and the financial aspect of it was described. Mr. Muir stated there is an unlimited market for our cheese in Great Britain and said that with both governments, Federal and Local, doing all they can to foster and help on the business with the farmer now knowing that his cheese money was often the only thing that stood between him and poverty, and with the cheese trade of Montreal pushing for all they were worth to extend the business, there could be but little doubt but that there is a great future before

And now to the text—"How I won the Cup." The appliances, placed in the order in which I used them, were; a thermometer, straining cloth, "New Era" disc churn, sieve, squirt, with scoop, butter-dryer, (of which more anon) a pair of Scotch hands, and a butter table on which to make up the butter. Of course, all the utensils, &c. were thoroughly cleaned and prepared in the usual way by scalding and scouring with salt then rinsing with cold water. Each competitor was given twelve pounds of thick, ripe cream at a temperature of 61 degrees. I reduced the temperature of my cream to 54 degrees by placing the bucket containing the cream in another bucket of iced water—each competitor was allowed seven pounds of ice. When the cream was reduced to 54 degrees I poured it into my churn through the straining cloth, and after rinsing the bucket with a little water at 54 degrees I added it to the cream in the churn; having placed the hood or cover over the disc, I commenced churning, turning the handle for the first half minute or so at about 45 revolutions per minute, increasing this afterwards to about 60; this would give the disc 360 revolutions per minute. I reversed the action about every half-minute. The cream thickened in about two minutes and began to form into butter in a little over three minutes, when I added a little water by the squirt, using only just sufficient, however, to wash out the corners and splashes of cream on the sides and hood. The "grains" of butter became large enough to wash in about five minutes from the commencement of churning, when I poured a bucketful of water at 45 degrees into the churn, and turned a few times as fast as possible. I then drew off the water and buttermilk through a sieve, and after repeating this washing floated the grains of butter to the top of the churn by filling up with the iced water. I did not use any special brine, but mixed the salt in all water used to wash the butter. I like this plan much better than the one of using fresh water for washing and a brine to finish, for the reason that salt water being colder than fresh, the grains are kept separate much more easily, and there is less danger of "caking."

The next utensil I used was the Dryer, which, since it is quite a new implement I will endeavor to describe. It consists of a round hoop of perforated metal lined with butter muslin, the top and bottom—or rather, the sides—are of wool, and are detachable. Through the center runs a spindle of wood, with a square hole through its centre to admit the iron spindle of the churn. The grains of butter are scooped from the churn into the dryer, and after the water is let out of the churn and the disc removed (this may be done in a minute), the dryer is placed in the churn, and, after a cloth is thrown over the top, turned as rapidly as possible. At first the water is thrown off in a large quantity, gradually lessening until, after turning for two or three minutes, none come away and the butter may be removed.

After taking the dryer from the churn I turned the butter out upon the table in a ring of perfectly dry butter; this, when touched by the Scotch hands, fell abroad, showing every grain still perfect. Without any further working I made it up into 1 pound bricks. These, when cut by the judge, still showed each grain perfect, and I was awarded the Champion Prize.

Some of the competitors for the championship protested against my taking this prize because I used the newest, most improved, and by far the best appliances in the "New Era" Disc Churn and Butter-Dryer, forgetting that these competitions are intended to find out the best possible way to make butter, and also that the rules for entry distinctly state that competitors are at liberty to use their own utensils. The Disc Churn Company offered the use of their appliances to any of the competitors who would like to use them, and it was not my fault that I was the only one to accept that offer for the champion contest. Before the competition commenced I told one of the stewards that any of the competitors were at liberty to use my dryer. More than this I could not do. I certainly did not wish to reap any undue advantage—for, that the Disc Churn and Dryer gave me a great advantage I am quite ready to admit. Perhaps some of the competitors may say that it was a new implement to them. Well, so it was to me. I had only used it the day previously, in the Show, but it is so simple and easy to use that previous knowledge is quite unnecessary.

Although, as I before admitted, these appliances gave me an advantage, it must be remembered that this is not the first time I have secured premier honors in butter making contests, for amongst others I have taken the Champion Gold Medal at the Bath and West of England Agricultural Society's Show at Rochester; the Champion Gold Medal at the Somersetshire Agricultural Society's Show at Wellington; the Champion Silver Medal at the Great Yorkshire Show at Middlesborough; and the Champion Silver Jug (given in lieu of Gold Medal) at the Gloucestershire Agricultural Society's Show at Bristol—*London Dairy*.

Swine.

FEEDING WHEAT TO SWINE.

EDS. COUNTRY GENTLEMAN—For nearly one year past I have been giving much attention to this subject, and since harvest have fed some wheat to my hogs. Previous experience in feeding rye gave me some idea as to how it should be fed to secure the best results. The great point to be attained is thorough mastication; without this, perfect digestion cannot be secured. It would appear from Mr. Stahl's recent article that grinding did not give satisfactory results, probably because the food was eaten too hastily and not properly mixed with saliva and the juices of the stomach.

I used to feed rye after soaking, and failed to get good returns—too much of the grain was voided whole; and from cooked wheat I should expect the same results, unless the grains were broken by the heat. With past experience cooking would be my last resort. I have not cooked wheat, but have cooked most other foods fed to swine. I abandoned the whole cooking process, because of the many objections and inconveniences belonging to it. This was before the time that station experimenters gave out the results of their work, which were contrary to their expectations as well as to the expectations of farmers in general. They did not experiment with cooked wheat, because it had not yet been brought to the low standing

of being used for hog feed. I know no reason why the results obtained from cooking other foods would not be applicable to wheat—namely, that uncooked food is superior to cooked for hog food.

At present I have a lot of shotes weighing about 60 lbs. each that are fed an occasional ration of whole wheat. They have the run of a clover sod and all the blue-grass they wish in the lines of the fences. I have not noticed that any of this wheat is voided undigested, nor do I think it is. My success in securing perfect mastication and digestion, I believe, is owing to the manner of feeding and the grass ration they gather. If you want a hog to masticate a ration of wheat properly, never feed it in piles or troughs, but scatter it thinly over a grass sward, clean ground or floor. Scattered thinly in this way, they must eat slowly and consequently masticate the grain more thoroughly and mix it with the saliva.

Another point applicable in feeding wheat I learned years ago, when it was the custom to "hog" rye. I did not expect good returns from the rye unless the hogs had good grass of some kind that they could graze upon at will. This is in keeping with the experience of a friend who has been feeding wheat to hogs for two years, and who has been greatly pleased with the returns, claiming that the wheat fed to hogs sold at \$5.10 per cwt., brought \$1.25 per bushel. He always feeds the wheat whole, scattered on a grass sward or floor, his hogs having the run of the pasture fields. He could not be induced to cook the wheat, or to feed it in any other way. It may be proper to say that when I was last on his farm he was experimenting with soaked wheat for his brood sows, I judge he was not taken with the plan or he would have said something about it, as we meet and talk quite often at our pigs.

It has always been my custom to slop my brood sows while suckling their pigs. Last fall they farrowed at too great a distance from the buildings to slop them with any degree of satisfaction. I tried feeding them whole wheat scattered thinly on the ground, but they would not masticate or digest it properly in sufficient quantities to supply the wants of their numerous litters and keep up in flesh. I believe we should have succeeded much better had the pasture been good, but there was little clover or other grasses that they could gather.

Had I an abundance of wheat in the granary I would certainly feed it whole on the clover sod where the shotes run and expect paying results, and should not expect the chickens to follow them to get the unbroken undigested grains.

Last fall, in connection with corn, I fed a part ration of wheat to fattening hogs (spring pigs). If it was well scattered and fed in limited quantities, it was well digested, and I am firm in the belief that if the hogs had found all the grass they wanted each day the results would have been much more satisfactory. There is little danger of pigs, from the time they begin to eat grain up to five months old, voiding wheat undigested, especially if they have an abundance of pasture or other coarse food.

A neighbor has fed wheat in considerable quantities to hogs during the past year—wheat that was unmerchantable on account of smut. He crushed or broke the grain in a corn-crusher—it was not ground fine—thoroughly wet it in a barrel and let it soak about two hours before feeding. He was highly pleased with results. There

were no unfavorable indications on account of the smut, as he feared there might be.

While there is much said in favor of wheat as food for swine, if the farmer has not got it in store and must buy feed rich in albuminoids he had better buy middlings than wheat, as they come nearer a perfect ration for a growing hog than whole wheat, and, besides, they are cheaper. But when the wheat is in the granary he cannot profitably make the exchange unless the mill is at his door.

JOHN M. JAMISON.

Ross County, O.

EXPERIMENTS ON HOGS.

Some experiments in the feeding of pigs have been carried out during two years at the Central Experimental Farm at Ottawa. The object of the first was to discover the difference, if any, in the quantities of grain required to produce a pound of increase in live weight, given steamed and warm in one case, and raw and cold in the other. Four pigs were fed in each way for over six months, and the results showed that there was no appreciable difference in the number of pounds of grain required to produce a pound of increase in live weight whether fed steamed and warm or raw and cold. The averages were 4.16 lbs. of steamed grain per 1 lbs. of increase in live weight, and 4.25 lbs. of raw grain. When sugar beets were added, the quantities were 3.86 lbs. of steamed grain and 2.46 lbs. of beets, and 8.89 lbs. of raw grain and 2.73 lbs. of beets. The advantage was with the steamed grain in both cases; but it was not sufficient to pay for the expense of steaming. Other results shown by the experiment were that after the second month of fattening or after the live weight exceeded 100 lbs., more and more grain was required to produce a pound of increase in live weight. The grain used was composed of equal parts of peas, barley, and rye, ground and saturated with water when not steamed. Other experiments led to the following conclusions:—

1. That 4.45 lbs. of unground grain, soaked for forty eight hours, were needed to produce a pound of increase in live weight.
2. That 4.36 lbs. of the same mixture of grain were needed for the same increase when ground and soaked for twelve hours.
3. That 1 lb. of grain was equivalent to 6.65 lbs. of skim milk.
4. That pigs fed on skim milk with grain were luster and more robust in appearance than those fed on grain only.

FEEDING SWINE.

The feeding is no less important in the production of profitable swine than the breeding. It has been known for a long time that the principal constituents of food must be contained in the rations in order to support life. It is not enough that all should be present in the ration, but there should be enough of each for the needs of the growing body. One variety of food, however, may be deficient in the mineral salts, another in the albuminoids, another in the oils, and still another in starch and sugar. To get a proper ration, it is necessary to combine these in proper proportions. Not only does this give more increase of weight in a given quantity of food, but the proportion of lean meat, the fat and the bone in the growing animal may be

varied by changing the proportions of the constituents which make up the ration.

A knowledge of these facts gives the breeder power to raise the vigor and hardiness of his animals to the highest degree, and to increase or decrease the proportion of bone and fat, within certain limits, as occasion may require. This knowledge enables the thoughtful breeder to control the forces of Nature, and to easily, with certainty and celerity, obtain results which were formerly only reached by accident, and then maintained with the greatest difficulty.

These investigations of the experiment stations demonstrate, what careful breeders have long suspected, that is, that an exclusive diet of corn is neither profitable nor most conducive to the normal development of swine. Hogs should have more mineral salts and more albuminoids than are found in corn. By feeding, in addition to corn, a reasonable quantity of oats, barley, peas, bran, middlings, wheat or other articles of food, and giving lime, ashes, salt, or ground bone, there is secured a greater relish for food, with good digestion and assimilation, and, in addition, there is a normal growth of the body which secures hardiness and vigorous health.

I do not disparage the merits of corn as a food for animals, or discourage its production. There is more animal food in corn, for little money, than there is in any other cereal. Upon that crop for all time will mainly depend the fattening of cattle and swine for the markets of the world. Nevertheless we must urge the desirability of raising other products, which, combined with corn, are required to make better, more healthful and profitable rations for fattening domestic animals.

J. S. MORTON,

Secretary of Agriculture of the U. S.

The Horse.

THE MANAGEMENT OF THE COLT.

BY JOHN M. COAD, FRENONT,
NEBRASKA.

Let the colt run with the mare from six to seven months, and for one month before weaning feed mare and colt on oats and bran or cut feed, so that the colt will learn to eat with its mother. It will learn much quicker in that way than by itself after being weaned. After weaning, continue to feed the colt as above through the winter, so as to keep it growing and thriving all the time. A colt should not be permitted to stop growing for a day. Haltor break it while running with the mare and than you will have no trouble in handling it afterward.

Colts should be broken to harness when about a year and a half old. Begin by biting thoroughly. Do not slight this part of the work. A well-bitted colt is half broke. One-half bitted or not bitted at all can never be as easily, and seldom as well, broke. It is too much like slighting the early education of a child, almost impossible to overcome it in after life. When the colt has become thoroughly accustomed to the bits and reins, and to being handled thereby, he may be harnesses and hitched up by the side of a gentle horse, and driven in that manner until he becomes familiar with the harness and drives well; then and not till then, he may be hit-

ched up with another colt and the two driven together. After a colt has been once broken to drive, he should be driven a little every few months—enough at least not to permit him to forget what he has learned until old enough to put into regular work.

In biting and breaking colts never use a jointed or iron bit. A straight rubber or leather-covered bit is far better. Bear in mind that a colt's mouth is always tender, that in biting the reins must be drawn tight, that an iron or any harsh bit will hurt, and that a colt yields more readily to a bit that does not hurt than to one that does. By using a bit that hurts you will teach a colt to dread the bit and shrink from it. This should never be. He should be taught to drive well up on the bit and yield a quick obedient to it. Besides there is danger of injuring colts with a harsh bit. I have seen them so hurt by iron bits that they would not eat, or eat but a very little, for a long time, and fall away materially in flesh.

It seems almost unnecessary to add that the utmost kindness should be shown at all times in handling a colt. A little caressing, a few words of encouragement, are more to be commended than angry words or whips. Indeed if a colt is properly handled the use of the whip can seldom if ever be necessary or even justifiable. Make him feel that you are his friend and protector. Kindness and affection in man beget kindness and affection in the colt. Cultivate the better elements in his nature by exercising towards him the same elements of yours. Treat him firmly, but not harshly. A kind word is easier, and in nine cases out of ten is more effective than a blow. The disposition of a colt may be spoiled, his very nature changed, by harsh and improper treatment, or it may be cultivated, improved, and built up by kindness and proper handling. Do not forget that the colt is subject to as much improvement in this regard as in his physical proportions.

It is said that horses, when asleep, always have one ear pointed to the front. Exactly why, no human being can tell, but the probability is that the practice is a relic of the time when they were wild and obliged to no be their guard, even when asleep. Whether or not this is the case, the fact is certain that while cattle are apparently indifferent as to the position of their ears while sleeping, and no matter how these appendages may be placed, both are pointed alike, horses always point one ear forward.

FOUNDER IN HORSES.

Dr. N. H. Paaron the Chicago veterinarian, gives the following treatment for founder, in the *Prairie Farmer*: "In the beginning of the disease, remove the shoes and rasp down the heels and edges around the hoofs, so that the bearing of the animal's weight comes entirely on the sole and frog. Then place the fore feet in a roomy, strong tub, with warm water, during half an hour, an repeat this three to four times daily during two days. Thereafter apply hog's lard, or some softening ointment to the hoofs daily. Leave the horse without shoes in a roomy box-stall or comfortable shed with plenty of bedding. To keep such an animal tied up in a stall is objectionable; he must have liberty to frequently change his position, which

cannot be afforded in a single stall. As soon as the shoes have been removed and the feet pared as directed, the horse should be given a purgative dose of medicine, such as six drachms of aloes, half a drachm of calomel, one drachm of cayenne pepper, all in powder, and made into a ball with a little powdered marshmallow root and molasses. Then give every hour, during six hours, ten to fifteen drops of tincture aconite, by placing it on the tongue. Afterwards, during two or three days, give morning, noon and evening, each time four ounces of solution of acetate of ammonia, with an ounce of sweet spirit of nitro, in half pint of cold water. If, after three to four days, much pain and tenderness should yet remain, a fly blister may be applied around the coronet, to a space of three inches in width. The hairs should first be clipped short. The blister should be applied in the morning, and the horse tied so as to prevent his interfering with the blister with his mouth. After six to eight hours he may be let loose. From the beginning he should be kept quiet, in a comfortable, well-ventilated place without draft. The food, which should only be given in limited quantity, should be of loosening nature, such as a mixture of steamed oats, bran and flaxseed meal, and limited rations of hay; which should not be timothy. When the urgent symptoms have disappeared, the horse should have liberty out of doors, with access to proper shelter."

BARLEY AS HORSE FOOD.—COR.—Will some reader kindly give his opinion on the above. Which is the cheaper and most economical to use, oats at 18s. per 300 lb., or barley at 14s. per 400 lb? Both kinds of corn are bruised and fed dry. A carting contractor who keeps over 100 horses in London, seeks my advice, but before advising him I should be glad to hear what some of your practical readers think. Note that both oats and barley are foreign grown. [We invite answers. The barley is the cheaper food, but while oats may be given alone, and are particularly suitable for the digestive system of horses, barley is not quite so suitable. Barley is fed to horses, especially during harvest, when carters usually allow the horses to eat it in the harvest field. We should ourselves recommend a mixture of half oats and half barley, and this is the same as what is called "dredge," or a mixed crop of oats and barley, which is frequently grown for horse crop corn. It is also well known that a mixed crop of oats, barley, and peas gives a capital food for work horses.—J. W.]

CLIPPING; ITS RATIONALE.

The *London Live-Stock Journal* has the following remarks on a timely topic: (1)

When we recently referred to the advantages of clipping, we said that "horses at work, encumbered by long, thick coats of hair, sweat profusely and thereby cause a great waste to the system," and that "their health and usefulness are promoted by the removal of their natural covering." When sweating from any cause unduly occurs in the horse, it is always noticed that it is accompanied by waste of muscle, general debility, and loss of tone. The sweating of horses is peculiar. He is the only hairy animal that perspires

freely over the whole surface of the body. A horse will not only sweat while at work, but when at perfect rest in the stable, after being thoroughly dried and he will often again "break out" two or three times in as many hours. This feature, so far as we know, is peculiar to him alone among animals, and it certainly has no parallel in man. The debilitating effect that sweating produces in the horse remained long a mystery to physiologists as well as to practical horse owners. If the skin, by sweating, simply excreted water and salts from the body, loss of condition and nerve force would not occur. But it has been proved, that the sweat of the horses largely impregnated with albuminous matter—hence the great waste to the system which follows profuse perspiration. Loss of condition—of muscle—is caused by sweating, because the horse thereby dissipates large quantities of muscle-forming material in the form of albumen, which he cannot afford to lose. Clipping largely prevents this loss, and its general effect on the improved condition, spirit, and vigor of the horse by the operation is doubtless due to this cause. This will explain why many practical men consider the effect of clipping to be "equivalent to giving him an extra pound of corn a day." It is a solution of the mystery.

The Grazier and Breeder.

"K's DISCOVERY."

We read in the little volume written by the late famous cattle feeder, Wm McCombie, of Tillyfour, Aberdeenshire, that in preparing his animals for the great London Christmas market, neither cake nor corn was given till the last six weeks of feeding.

That heavy oxen can be made fat in Scotland on swede turnips and oat straw without a particle of any other food, there is no manner of doubt. I well recollect selling eighteen heavy bullocks to a dealer who attended Newcastle fat market, which bullocks were first-rate beef yet never tasted ought but good oat straw and ten stones of swedes per day from the middle of January to the middle of April. The roots were grown on land which was allowed to lie in pasture so long as it carried what was thought to be a profitable quantity of stock. In this particular case, pastures continued good for at least four years, frequently longer, and to the long rest and general conditions favourable to turnip cultivation in counties where wheat and malting barley cannot be so well grown, I think we may safely attribute not only the superior feeding properties, but the larger yield per acre, referred to in professor Wrightson's last letter. I am quite sure that the Scotch farmer, with his well-rested and constantly grazed land, can grow 25 tons of swedes as easily as, and at no greater cost than, his fellow-farmer in the Southern counties of England 15 tons.

It is the custom among our Northern feeders to give both cake and corn, otherwise the process of fattening would be too long and tedious, but I have ever observed that, when used with discretion and on some sound principle, stall-fed oxen progressed more rapidly and gave a better

(1) Worth attention. Eo.

(1) Quite true. Eo.

return for food consumed in Scotland than in the sunnier and warmer parts of England. (1)

The first week of last December, I had the pleasure of going over one of the magnificent arable farms in the neighbourhood of Dunbar, N.B. Among other things I saw a large lot of Canadian steers being finished off for the Edinburgh Christmas mart. They realised an average of over £27 when sold, and were, take them all over, as handsome a lot of beasts as I ever beheld; but what excited my curiosity most of all was the feeding they were getting. Cakes had only been begun three weeks before the date of my visit, and even then the quantity in the eyes of a Southern feeder would have appeared perfectly inadequate. The daily consumption of these great oxen was 2 stones of raw potatoes, 6 stones of yellow turnips, 2 lb. of linseed cake, 2 lb. undecorticated cake, and oat straw *ad lib*. Now the roots must have possessed some virtue beyond the Suffolk feeders' experience. (2) About the correctness of the weight I satisfied myself by weighing some of the skips and standing by at the giving out of the cake. The cattleman assured me that, although he had been "byroman" on that same farm for many years, he had never exceeded 4 lb. of cake to any beast. I was rash enough to ask the farmer if he had any analysis of the roots grown on his land, and if he had put his ration to the scientific test of albuminoid ratio. His reply, if not *rational*, was at least characteristic. "I don't know about albuminoid ratios, and I don't much care to know. The beasts feed well and fatten freely. If fairly bought, they pay middlin', and 'bats' what I am at." It is best to forget about carbohydrates under such circumstances.

Hunter Pringle.

THE GRAZING PASTURES.

It is many years since the pastures have made such rapid progress as they have done during the past week. Hence we venture to draw the attention of both the grazier and the dairyman to this fact. In common parlance the pastures are "running away," and, unless they are closely cropped, considerable loss will ensue. The earlier grasses will soon form seed culms, and if this is allowed to take place, the season's grazing will result in failure. All grazing lands should be closely eaten up to midsummer; any accumulation after that date can be cleared off. If the more worthless varieties are allowed to mature their stems and seeds during the early part of the season, the only remedy I know of is to stock heavily and to have the cattle moved from one field to another every few days. Everywhere the stockyards are bare of fodder. In order to increase the reserve supply, another field may be laid in for mowing, but to do this requires the exercise of sound judgment and forethought. Bad grazing and the mowing of the best feeding pastures are contrary to the rules of good husbandry, and should be treated as dilapidations. (3) You may almost as well breast plough as mow a really productive upland pasture. This is a season when particular attention should be

(1) Also true. Ed.

(2) As we have always said in this periodical. But why does not the analysis show it? Ed.

(3) Mowing pastures is strictly forbidden in the leases on our family property in Gloucestershire. Ed.

given to the droppings. They should either be spread immediately or, what is the better practice, they should be collected into small heaps to be spread later on upon the weak patches. Those who are using cake to hasten on their forward beasts will find decorticated cotton the best food, as it acts as a corrective to the succulent quick growing grasses. The use of cake in moderate quantity pays both directly and indirectly; it hastens the progress of the animal and enriches the soils; it is advantageous even to an outgoing tenant who can claim a two years' interest on his expenditure.

GILBERT MURRAY.

Manures.

METHODS OF BUYING MANURES.

(Continued)

To get potash, he could buy either muriate of potash or high-grade sulphate of potash, either of which would furnish him with about 50 lb. of actual potash per hundred. There are other materials that furnish the different ingredients in a greater or less degree, some of which furnish two in different proportions, such as ground bones and dissolved bones, both furnishing some nitrogen and phosphoric acid. Thus we see farmers can very readily mix their own fertilisers, and by so doing get just the ingredients they wish and also save many dollars by so doing, rather than pay the manufacturers a large profit on much material that is of no practical benefit to them, but rather depletes their purse and fills that of the other fellow.

Knowing, as most of our intelligent farmers do, that in growing plants, trees, &c., nitrogen grows the leaf, potash grows the stem, and phosphoric acid ripens the seed, we can mix a fertilizer suitable to our wants. Therefore, to grow a crop of cabbage composed very largely of leaves, we should want one very rich in nitrogen, with some potash to grow the stem, but very little phosphoric acid for strict economy. On the other hand, for fruit-trees we should want one very rich in potash for the stems, and also in phosphoric acid to ripen the seed—or in other words perfect the fruit (which nature always does if the seed is perfected), and some nitrogen for a good healthy leaf. For grain fields we should want nearly the same as for our orchards with the exception of more nitrogen for a strong healthy growth of straw to bear up the ripened grain. For potatoes, composed very largely of roots or tubers, we want a rich supply of potash, together with some nitrogen and phosphoric acid for a healthy growth of vines. Thus, by knowing the wants of our plants and also the sources from which we may obtain the different ingredients, how much would be gained, if all intelligent farmers would study this question in all its bearings, and particularly from a financial standpoint, and act accordingly.

Although we have mentioned the particular needs of some of our principal crops, it would be impracticable for the average farmer to mix a special formula for each crop. We can, however, from the knowledge gained, procure the chemicals and make one containing the three principal ingredients, in suitable proportion for almost any of the crops grown on our farms, at a great saving of cost over the way generally practised—that of letting other men do our thinking, while we idle away the leisure moments of a long

winter in unprofitable gossip round the fire of a corner grocery, or in other equally expensive pursuits.

FARMER'S SON.

Moorestown, N. J.

TOP-DRESSING.

Many farmers have found by experience that topdressing is the best method of applying the manure under all circumstances. The plant food is where it must be the most available, and will reach the roots, which are mostly near the surface, immediately. It comes the nearest to the natural methods, for in nature all the plant food that the land receives is by the annual topdressing with the leaves or the withered herbage that falls on the ground at this season of the year. And if the student of nature who loves to perceive how admirably things are fitted to each other will, in the depth of the winter or early in the year, when the warmth of the soil, preserved by this natural topdressing, start the first green leaves and the earliest blossoms of the spring, search under the covering, he will find these: nestling under the protecting blanket, and the sweetly scented Mayflower will reward his search as he finds it lying snugly under its protecting covering. He will see, too, in the woods, these leaves which cover the first tender blades of grass, pushed aside by the wild animals or the sheep, who have learned or are taught by instinct to find their food thus prepared for them, at the time of scarcity, when it is most needed. *American Agriculturist.*

NITRIFICATION.

Some interesting experiments on the nitrification going on in the soil under different conditions have recently been published by the well-known French investigator, M. Dehérain. Among the result of these experiments, the most interesting, from a practical point of view, was the striking effect that stirring the soil had in increasing the production of nitrates. In the experiment two equal quantities of the same soil were kept for six weeks under precisely the same conditions, except that the one portion was left untouched, while the other portion was stirred. At the end of the period it was found that the nitric nitrogen formed in the stirred soil was enormously in excess of that formed in the portion which was left untouched. The experimenter is of the opinion that the process of nitrification in soils would be greatly increased by the introduction of implements more suited for pulverizing the soil than those commonly in use.

The Household.

FRIED POTATOES WITH VARIATIONS.

The ever popular Saratoga potatoes, liked on almost every occasion, are not difficult or troublesome in preparation if the cook has proper facilities. A potato slicer consisting of a knife set in a hard-wood board, after the manner of a carpenter's plane, across which the potato is quickly drawn, will reduce a large potato to slices as thin as paper in a minute or less. A large dish can be prepared in a very brief time; after slicing they should be put in cold water, ice-cold if possible, for half an hour or longer. Dry on a folded towel just before dropping into the kettle of deep fat. This may

be half lard and half beef suet, or for those who have a prejudice in favor of vegetable oils, cottoleno is now highly recommended. A common mistake consists in trying to fry too many at a time. To be crisp and dry they must have abundant room while cooking, so as to separate freely. Drain on brown paper in a warm place.

But there are many other ways of frying potatoes, some of them exceedingly dainty and appetising, and at the same time less commonly known. In the fit place, considerable variety may be had in potatoes fried plain, by different modes of cutting. There is an excellent French knife to be had, with an attachment for slicing to any graduated thickness. These slices may then be cut in dice or stamped out in even rounds; or the potato may be cut round and round, as an apple is pared; or in sections like an orange; or small olive-shaped potatoes fried whole, make a very attractive dish. Other methods a little more elaborate, give pretty and tasteful results.

POTATO POFF BALLS.—Mash the pot-boiled potatoes and beat with a fork till light and creamy; season generously with sweet butter and a little cream; salt to taste, cayenne and a handful of chopped parsley. Add for each pint one yolk of egg, well beaten. Mold into round balls, dip in beaten egg, then in bread-crumbs or cracker-dust, and fry in deep fat to a golden brown.

DEVILLED POTATOES.—The hard name (applied also to chicken bones or remnants of game similarly prepared) does not spoil a very toothsome dish. Cut the potatoes lengthwise in long, thin strips, and fry as usual. Of course plain slices, rounds or dice may be used, as one chooses. Cook quickly; have ready meanwhile in a saucepan a good lump of "gilt-edged" butter, rubbed up with a sufficient quantity of French mustard, and if liked a little catsup or hot sauce of some favorite sort. The dish requires a high seasoning. Drop the potatoes into this sauce and shake up until they are well coated. Serve with the sauce in a deep dish.

POTATO CROQUETTES.—Potatoes neatly made into the shape of croquettes form an elegant accompaniment for chops, tongue or any light dish of meat. If desired to serve alone, a little finely chopped meat may be incorporated; chicken or ham, or a mixture of both is good, and a little fine corned beef is by no means to be despised when taken in this form. Prepare the potatoes as for the "puff-balls" given above. A spoonful of thyme or sweet marjoram rubbed to a powder, or a little chopped parsley may be used for flavoring. Season highly and beat the ingredients together until the whole is light and creamy. Shape the croquettes nicely, about two and a half inches long by one in diameter; dip in egg and crumbs and fry carefully. A piece of onion fried in the lard before the croquettes helps to flavor. (1)

FRIED POTATO CREAM.—Prepare a very fine mashed potato, adding an egg, yolk and white beaten separately, and two tablespoonfuls of sweet cream to each pint. Pour into a square pan, slightly floured, and smooth the top so as to make a layer half an inch thick. Let it cool in this pan. Cut in two-inch squares, crumb and fry. For this and the croquettes a wire basket is desirable. (2) It makes frying easier, but with care they may be successfully fried without. *DOROTHY.*

(1) Very good indeed! Ed.

(2) Every kitchen, should have a wire basket for the purpose. Ed.

—Lovers of music will be glad to hear of the success which one of our Canadian manufacturers has actually achieved. The following letter from so critical a musician as the organist of St. Peter's Cathedral, speaks of itself:

Montreal, Nov. 28th, 1893.

L. E. N. PRATTE, Esq.,
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Dear Sir,

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Allow me to congratulate you on your good work.

Yours, etc.

R. OCT. PELLETIER.

NOTES AND NOTICES.

—In announcing their 25th issue of their Annual Seed Catalogue for 1894, Messrs. Wm. Ewing & Co. may well feel satisfied with the appearance and arrangement of their catalogue which is the most comprehensive and exhaustive in its details ever produced in this Province. It is arranged in nine departments. Each of which is very complete. In the Agricultural Department special attention is paid to Ensilage Corn and Forage Plants. This department is the most complete and varied of any that has come to our notice. In the Department of Tools and machinery, the stock consists of the latest and most approved machines for labour saving. Insecticides and Spraying Pumps are most exhaustively dealt with and every farmer and fruit grower can find in it valuable information and particulars of the appliances now so necessary. The department of cattle and poultry food and condiments is in a measure unique. The calf meal here described, is of the greatest importance to all stock raisers. The whole catalogue is most creditable to the firm, the printers and the Province and should be in the hands of every one interested.

—We have much pleasure in calling the attention of our subscribers to the advertisement of John S. Pearce & Co., Seedsmen, London, Ontario, which appears in another

column. We have just received their seed catalogue for 1894 and while not so large and elaborate as some other seed firms' issue, yet for neatness, careful editing, compactness and correctness, we have no hesitation in saying that their catalogue will stand in the front rank. This firm give special and careful attention to growing Onion Seed and Ensilage Corns for fodder and silo purposes. They have some very choice and rare varieties of seed grains which it would be worth while to introduce into Province of Quebec. Send for a copy.

—We would draw special attention to the advertisement of Brick and Tile machines of H. C. Baird & Sons, Parkhill, Ont. The very decided opinion in favor of the new system of drainage, and the complaints of the high prices charged for tiles; give these machines especial interest. The firm of H. C. Baird & Son, originally established in 1869, as manufacturers of agricultural implements; in 1885 commenced making brick and tile machinery and yard supplies, which is now their specialty. They have brought the exclusive right for the Dominion of Kell's patent combined Brick and Tile machine; this machine has a grand reputation for its strength, simplicity and perfect production. It works almost all clays direct from the bank, it will make good brick out of clay that no sand stock brick machine will work, and where sand cannot be had this is the machine required.

Two thirds of the tile manufactured in Ontario are made on the Kell's machines, and that is where the farmers use tile draining most extensively. H. C. Baird & Son also manufacture the New Quaker Brick machine, to work by steam or horse power and makes 5 or 6 bricks to the mould, this machine is very strong, simple and durable, has great grinding capacity, and does the same work as any other machine of its class, with less than half the machinery. They also make large quantities of brick moulds for any make of machine, Brick and Tile yard supplies, Kilm doors, Barrows, &c, and anyone interested should send for their illustrated catalogue.

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